AN EVALUATION OF THE COMMUNITY DEVELOPMENT BLOCK GRANT FORMULA

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PREFACE

I would like to thank Fred Eggers who has offered numerous comments and has provided much guidance during this study. In addition, he was very helpful during the final drafting of the report. I am grateful to Jim Broughman, who is certainly an expert on the community development formula, for several suggestions on earlier drafts. I would also like to thank John Gardner and Paul Burke for their comments on earlier drafts of the report.

Harold Bunce

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EXECUTIVE SUMMARY

1. Introduction

Title I of the Housing and Community Development Act of 1974 consolidated several categorical programs for community development into a single program of community development block grants (CDBGs). The title provides for a new system of allocating and distributing community development funds; an allocation formula based on population, amount of housing overcrowding, and extent of poverty (counted twice). Under the previous categorical system, funds were distributed to applicants on a competitive, case-by-case basis.

In order to provide for early Congressional reconsideration of the method for distributing assistance, Congress required that the Secretary of HUD submit a report, no later than March 31, 1977, which would contain the Secretary's recommendations for modifying, expanding, and applying provisions relating to the funding method, fund allocation, and basic grant entitlement determination. In making this report, the Secretary must conduct a study to determine how funds can be distributed in accordance with the maximum extent feasible by objective standards. This paper will present the methodology and results of the formula study conducted by the Office of Policy Development and Research at the request of the Secretary.

The main conclusions of this study are (1) the hold harmless distribution shows a weak relationship with community development need, (2) the existing formula is highly responsive to the poverty dimension but is not responsive to the non-poverty dimensions of CD need, and (3) a formula alternative that includes pre-1939 housing as formula factor should be considered as a replacement for the existing CDBG formula.

a. Objectives

The principal objectives of the study are the following:

(1) To develop criteria that measure the variation in community development needs among entitlement cities.
(2) To evaluate and compare the distributions of funds under the hold harmless continuation of the displaced categorical programs and the existing CDBG formula.
(3) To design alternative formulas that increase the emphasis on those dimensions of community development need ignored by the existing CDBG formula.
(4) To evaluate CDBG allocations under the alternative formulas, comparing them with the hold harmless continuation of the displaced categorical distribution, with the present formula, and with each other.

b. Methodology

Criteria are developed that measure the variation in community development (CD) needs among entitlement cities. To construct an index that positions each city with respect to CD needs, we have used the concept of a need indicator, a variable (e.g., poverty) which provides a rough indication of relative differences among cities. For example, if City A has a higher number of poor persons than city B, then A has the greater need for CDBG funds. Our criteria for selecting need indicators reflects the Congressional intent that CDBG funds be used to assist in the development of viable urban communities by providing decent housing, a suitable living environment, and expanding economic opportunities, principally for persons of low-and-moderate income.

Devising a relative needs index for each of the need variables selected is possible but would result in a very complicated analysis. Therefore, factor analysis is used to reduce the need indicators to five factors, each factor reflecting a different dimension of community development need. For each of these five dimensions of need, the factor analysis computes for each entitlement city a per capita needs score that can be used to measure the relative variation among cities in per capita need. The set of index scores and the need variables provide the basis for judging the current formula, the hold harmless mechanism, and several alternative formulas which seek to provide higher per capita allocations to those cities which have greater community development need. Correlation and regression techniques are used to measure the responsiveness and sensitivity of formulas to each needs index.

c. Limitations of the Study

This study focuses on the equitable distribution among entitlement cities of a given CDBG funding level. The analysis does not provide the information necessary to derive an optimal CDBG funding level. The study does not examine community development need in urban counties and balances of SMSA's. The study cannot determine the appropriate distribution of funds among recipient classes (entitlement cities, urban counties, SMSA balances, and non-SMSA balances).

The methods used in this distributional study cannot resolve issues such as (a) whether or not to include urban counties as entitlement recipients, (b) the population cutoff for entitlement cities, and (c) the SMSA/non-SMSA split. An open issue is the distribution of funds among classes of recipients. We know of no scientific method of establishing that the level of CD need in SMSA's is four times greater than outside SMSA's. Within SMSA's, it is not clear that the funds distribution among entitlement cities, urban counties, and SMSA balances is appropriate. However, our approach does provide information which is useful in addressing issues such as these. In addition, our methods cannot resolve transitional issues such as the optimal rates of phase-in of entitlement cities and phase-out of hold harmless cities. We do compare the present full formula distribution with a "pure" hold harmless distribution.

2. The Present Formula System

The primary purpose of Title I, to provide a suitable living environment to persons of low-and-moderate income, served as the guideline used in designing the needs formula. The formula assumes that a city's need for community development funds can be measured by a weighted combination of three factors (population, poverty, overcrowded housing) and that accurate data is available to operationalize this particular measure of city need. The needs formula provides the basis for computing (1) the total allocation for all entitlement cities and all urban counties; (2) the individual allocations for each entitlement city and urban county; (3) the share of each SMSA area of the SMSA balance; (4) the state area share of the non-SMSA portion. Once the latter two area shares are calculated the formula is not used to distribute funds (1) within SMSA areas to non-entitlement communities and (2) outside of SMSA's to individual units of government. These latter distributions (called discretionary funds) are made by HUD on the basis of applications from non-entitlement communities included within these two areas. Our estimates indicate that under full funding with the present formula, the total SMSA share (approximately 80% of total authorization) would be divided as follows: (1) 522 entitlement cities, 60%; (2) 73 urban counties, 12.5%; and (3) SMSA balance (discretionary), 27.5%. Added to the non-SMSA 20% (discretionary after HH phase down), this results in 42% of CDBG funds being issued on a discretionary basis (after HH phase down). This is a rather large share, given the goal of providing <u>automatic</u> funding on an <u>objective needs</u> basis.

The prospect of such a large discretionary share emerging with the phase down of hold harmless has raised two concerns. First, the administration of so large a discretionary fund would require a tremendous administrative work load, possibly accompanied by many of the same bureaucratic, red-tape problems that supposedly characterized the displaced categorical system.

The second concern over the 27.5 percent SMSA discretionary balance is based on the notion that the present formula is biased against "older, declining cities" and in favor of small communities located in the balance of SMSA's. Because this perception comes partly from reviewing which cities stand to lose funds over prior program levels, the concern is closely linked to the phase down of hold harmless.

Under the present law, the hold harmless provisions represent the primary method of achieving a smooth transition between the displaced categorical programs and the new block grant approach. Under the present law, beginning in 1978, hold harmless will be phased out by thirds and will completely disappear by 1980. One of the primary purposes of this study is to compare a "pure" hold harmless distribution with both the present formula and alternative formulas in terms of indexes of CD need, tax effort, and fiscal capacity. Close correlation between the hold harmless distribution and, for example, several of the dimensions of CD need would provide support for continuing some form of hold harmless.

3. Community Development Need

The need indicators include direct measures of urban blight and indirect surrogates. From case studies of housing abandonment and from the "social indicator" literature, we have selected variables that seem to be correlated with urban blight and neighborhood instability. Our list of community development need indicators follows: age of housing stock (pre-1939 housing), density, houses without adequate plumbing, overcrowded houses, lack of homeownership, unemployment, poor persons, households headed by a poor female, elderly persons, crime, poor persons under 18, nonwhite persons, and persons without a high school education. All variables were expressed in either percentage or per capita terms.

Factor analysis was used to reduce the need variables to five factors, each factor reflecting a different dimension of community development need. Each factor or dimension delineates a separate group of highly intercorrelated variables. The following table defines each dimension of CD need in terms of need indicators with high loadings.

	Dimension	Need Variables Defining Dimension
FACTOR 1	Poverty	Percent of poor persons, percent of female-headed households, percent non-white, percent of overcrowded houses, percent of houses without plumbing
FACTOR 2	Age of Housing Stock	Percent of houses built before 1939, percent of population over 65
FACTOR 3	Density	Percent of owner-occupied houses (negative), population per square mile
FACTOR 4	Crime and Unemployment	Crime rate, percent unemployed
FACTOR 5	Lack of Economic Opportunity	Percent of population without a high school education

For each of these five dimensions of need, we compute for each city a <u>per capita</u> score that can be used to measure the <u>relative</u> variation among cities in per capita need. For example, if city A has a higher percentage of houses built before 1939 than city B, then city A will receive the higher per capita need score on the second dimension. The scores are interpreted in per capita terms because the 13 need indicators used as input variables into the factor analysis were expressed in either percentage or per capita terms. In general, a city will receive a high score on a particular factor (dimension) if the city has a high percentage for each of those need variables that define the particular factor. For example, Birmingham receives a high score on the poverty dimension, Cambridge, on the age-of-housing-stock dimension, and New York City, on the density dimension. Each factor index has an average value of zero.

To construct a single index of CD need, it is necessary to weigh each factor by its estimated importance. Given the difficulty of objectively determining the relative importance of each factor, we conduct most of the statistical analysis in terms of the five dimensions of CD need. However, because a total need score can neatly summarize the responsiveness of alternative formulas to CD need, and because we wanted to evaluate alternative formula using a total evaluation index that combines need with fiscal capacity and tax effort, we decided to assign weights to the factors and thereby compute a composite need score for each city. Our composite, per capita need score is computed by combining the factor index scores as follows:

NEED = .35 FACTOR 1 + .25 FACTOR 2 + .20 FACTOR 3 + .10 FACTOR 4 + .10 FACTOR 5. NEED has an average value of zero.

Within this needs framework, a formula is evaluated on the basis of the degree to which it distributes above average, per capita amounts to cities with above average, per capita need. The simple correlation coefficient between per capita amounts and per capita need scores indicates the degree to which a formula's allocation responds to need. A higher correlation indicates a closer association between a formula's allocation and need.

We supplement the correlation analysis with a multiple regression analysis, which estimates the change that occurs in per capita amounts with a change in a particular factor index score, holding the other four factor index scores constant. The regression analysis therefore allows us to compare formulas on the basis of their sensitivity to the different dimensions of CD need. We use regression analysis to determine the implicit emphasis that the formulas give to the various need dimensions.

4. Hold Harmless, the Present CDBG Formula, and Community Development Need

Small communities in urban counties, balances of SMSA's, and non-SMSA areas are favored under the present CDBG formula relative to the categorical programs. Central cities which received approximately 70 percent of categorical funds would receive only 42 percent under full-formula funding.

On a regional basis, cities in the South are favored under the present formula, primarily, because of the double weight given to the poverty factor. On a per capita basis, central cities in the South receive \$18.43, compared to \$15.98 in the Northeast, \$15.75 in the North Central region, and \$14.47 in the West. As a percentage of total funds going to the 515 entitlement cities, cities in the South, which received 27 percent of the categorical funds, would receive 31 percent under full formula funding; entitlement cities in the Northeast, which received 34 percent of the categorical funds going to the 515 entitlement cities, would receive only 26 percent under the formula. Compared to the hold harmless continuation of the categorical system, full funding under the present formula would reduce funding most in the larger cities, located primarily in the Northeast and North Central regions and characterized by an aged housing stock. The concern for our "older, deteriorating" cities is therefore closely linked with the phase down of hold harmless. For example, the average percentage of housing units built before 1939 for those entitlement cities that would lose funds is 53 percent, compared to only 39 percent for the gainers. In the Northeast and North Central regions, approximately 60 percent of the houses were built before 1939, compared to only 30 percent in the South and West.

The fact that phase-down cities, or losers under the present formula, are more needy than phase-in cities does not necessarily mean that the present system is inequitable, or less equitable than the categorical system. To reach any equity conclusion, one has to examine the distribution of funds over all cities, and, in the case of the categorical system, justify the wide range in per capita amounts. Under the categorical programs, the phase-down cities received, on a per capita basis, $24.81 or 386 percent more than the phase-in cities. This 386 percentage difference is <u>not</u> justified on the basis of the percentages of need variables exhibited by these two groups of cities. Except for age of housing stock, the percentages for the phase-down cities are only slightly higher than those for the phase-in cities. In fact, the average poverty percentage (13.57) for the phase-in cities is approximately the same as that (14.13) for the phase-down cities and the overcrowded housing percentage is actually greater (8.83 vs. 7.22). To summarize, under the categorical system, the gap between the per capita amounts of phase-in and phase-down cities was too large.

Because eliminating the phase down provision is one alternative to the present system, we think it is important to compare the hold harmless distribution of funds with that of the present formula in terms of responsiveness to community development need. The simple correlation coefficient measures the degree to which above-average per capita amounts are allocated to cities with above-average per capita need scores. The results obtained by correlating per capita allocations under both hold harmless and the existing CDBG formula (PRESENT) with need scores are as follows:

	Hold Harmless	Present
FACTOR 1 (Poverty)	.14	.95
FACTOR 2 (Aged housing)	.36	.02
FACTOR 3 (Density)	-.05	.20
FACTOR 4 (Crime)	.11	.09
FACTOR 5 (Lack of economic opportunity)	-.01	.04
NEED (Composite score)	.29	.79

The clearest evidence of the problem with the hold harmless approach is shown by low correlation coefficients in the first column. The coefficients of correlation between hold harmless and five dimensions of CD need indicate that the categorical system was not closely related to need, as defined by our sets of factor scores. These low correlation coefficients tell us that, on an individual city basis, under the categorical programs, above average, per capita dollar amounts were not systematically allocated to cities with above average, per capita need. Similar results are obtained when hold harmless is correlated with each of the need variables.

The present formula exhibits the expected strong correlation (0.95) with the poverty dimension of CD need but very low correlations with the remaining four dimensions. In fact, hold harmless exhibited a stronger correlation (0.36 vs. 0.02) than the present formula with respect to the age-of-housing-stock dimension of CD need. If the goal is to make CDBGs more responsive to, for example, the age-of-housing and density dimensions of CD need, then it will be necessary to change the present formula.

Hold harmless shows a much lower correlation (0.29) with the total need index (NEED). This reflects its low correlation with each of the five separate dimensions of CD need. The present formula's correlation (0.79) with NEED is undoubtedly affected by its low correlations with non-poverty dimensions of need. As mentioned earlier, correlations with a total need index will vary depending on the weights given to the individual factors.

The multiple regression results for hold harmless and the present formula are given below:

Regression Coefficients	Hold Harmless	Present
FACTOR 1 (Poverty)	3.39	3.45
FACTOR 2 (Aged housing)	7.60	.00
FACTOR 3 (Density)	-1.12	.75
FACTOR 4 (Crime)	3.19	.30
FACTOR 5 (Lack of economic opportunity)	-.61	.19
Coefficient of Multiple Determination (R^2)	.19	.95

For each distribution system, the relative magnitudes of the regression coefficients describe its implicit needs logic. Hold harmless places most of its emphasis on the age of housing dimension, as its per capita allocation increases by $7.60 for each one unit increase in the age-of-housing-stock index. The present formula increases by $3.45 per capita with unit increases in the poverty scores, which is a much greater response than with the other dimensions of CD need. As indicated by the .00 regression coefficient, the present formula per capita does not change with unit increases in the age of housing index, for fixed levels of the other four need indexes.

The R^2 statistic tells us how closely the implicit logic of each system, as indicated by five regression coefficients or by the estimated regression, is being followed. For hold harmless, the R^2 statistic is .19, which means that only 19 percent of the variation in hold harmless per capita can be explained by our five indexes of CD need. The .19 is 76 percentage points less than the R^2 statistic for the present formula. In essence, the low R^2 statistic indicates a very weak relation between (1) the actual distribution of hold harmless per capita and (2) that distribution of per capita amounts predicted from a regression equation that supposedly describes the implicit logic or emphasis of the hold harmless system.

5. Evaluating Alternative Formulas

We presented alternatives to the present CDBG formula that included age of housing stock as a formula factor. Age of housing was added for two reasons. Pre-1939 housing is a factor associated with housing abandonment and substandard housing and is a proxy for both government repair costs of sanitation facilities and sewage lines and housing maintenance costs. In addition, age of housing not only defines one of the four dimensions of CD need ignored by the present formula, but is significantly correlated with four of the five need variables that have high factor loadings on the other three dimensions (density, crime, lack of economic opportunity).

The formula factors and weights for the present formula and seven alternatives are as follows:

	Population (POP)	Poverty (POORPER)	Overcrowded Housing (OCRWD)	Pre-1939 Housing (AGE 1939)
Present Formula	.25	.50	.25	
Alternative 1	.20	.40	.20	.20
Alternative 2	.25	.50		.25
Alternative 3		.40	.30	.30
Alternative 4		.60		.40
Alternative 5		.30	.20	.50
Alternative 6	.20	.30		.50
Alternative 7		.40		.60

For example, in fiscal year 1976, the following formula would have been used to compute the total amount of an entitlement city under Alternative 1: (.20(POP/149,695,598) + .40(POORPER/17,157,884) + .20(OCRWD/3,710,656) + .20(AGE1939/18,458,419)) $2,077,600,000.

Numerous alternatives were examined in order to show the effect on the correlations of increasing the weight given to age of housing. The weight given to age of housing increases from Alternative 1 to Alternative 7. Appendix J defines seven other alternative formulas and evaluates each in terms of responsiveness to CD need. A fifth formula variable (without plumbing) is considered in Appendix J.

The correlations between allocations under three of the seven alternative formulas (ALT2, ALT3, ALT7) and need scores are presented below; as baselines for comparison, the correlations for hold harmless and the present formula are reproduced.

	Hold Harmless	Present	ALT2	ALT3	ALT7
FACTOR 1 (Poverty)	.14	.95	.71	.70	.37
FACTOR 2 (Aged housing)	.36	.02	.62	.50	.81
FACTOR 3 (Density)	-.05	.20	.27	.41	.37
FACTOR 4 (Crime)	.11	.09	.15	.18	.17
FACTOR 5 (Lack of economic opportunity)	-.01	.04	.08	.20	.18
NEED (Composite score)	.29	.79	.97	.98	.87

The correlation coefficients between the three alternative formulas and the poverty dimension declined from 0.71 under Alternative 2 to 0.37 under Alternative 7. Given the low correlation between percent poverty and percent pre-1939 housing (0.12), it is not surprising that the correlations between the poverty dimension and per capita allocations decline as we increase the formula weight of AGE1939 and decrease that of POORPER. The cost of adding AGE1939 to increase the formula's degree of responsiveness to non-poverty dimensions of CD need is simply a reduction in the correlation with the poverty dimension. Of course, the important question here is how low should the poverty correlation be reduced. The answer to this question depends on both the increase in correlation with each of the non-poverty dimensions achieved by adding a variable such as AGE1939 and the relative importance of each of these non-poverty dimensions of CD need. The highest correlation increases occurred with the aged-housing and density dimensions of CD need. The correlation coefficients between the age-of-housing dimension and the three alternatives range from 0.50 under Alternative 3 to 0.81 under Alternative 7, while those of the density dimension ranged from 0.27 under Alternative 2 to 0.41 under Alternative 3.

Each of the seven alternatives had a higher correlation with each of the non-poverty dimensions than had either the present formula or hold harmless. In fact, each alternative dominates hold harmless on all five dimensions of CD need. One equity advantage of hold harmless over the present formula -- a higher correlation with the aged-housing dimension -- therefore loses its importance when AGE1939 is added to the formulas. We think that formulas such as, for example, ALT2 and ALT3, not only continue to give priority to poverty areas but also adequately account for two dimensions of CD need -- aged-housing and density -- totally ignored by the present formula. Alternative 3 showed a 0.98 correlation with the total need index, which is 0.19 greater than the 0.79 of the present formula.

The regression results for the present formula and two of the alternative formulas are shown below.

Regression Coefficients ($)	Present	ALT2	ALT7
FACTOR 1 (Poverty)	3.45	2.78	2.28
FACTOR 2 (Aged housing)	.00	2.47	5.24
FACTOR 3 (Density)	.75	1.05	2.28
FACTOR 4 (Crime)	.30	.62	1.13
FACTOR 5 (Lack of economic opportunity)	.19	.34	1.22
Coefficient of Multiple Determination (R^2)	.95	.98	.97

Increasing the formula weight of pre-1939 housing tends to make the formula more sensitive to the nonpoverty dimensions of CD need, especially to the age of housing and density dimensions. In each case the regression coefficients for the nonpoverty dimensions are higher under the two alternative formulas than under the present formula. For example, pre capita aid under Alternative 7 (.4 POORPER, .6 AGE1939) increases by $5.24 for each unit increase in the age of housing index, while per capita aid under the present formula does not change with changes in the age of housing index. Per capita aid under Alternative 7 increases by $2.23 for each unit change in the density index, which is $1.48 more than the increase under the present formula. On the other hand, the alternative formulas are less sensitive to the poverty dimension than is the present formula. Per capita aid under the present formula increases by $3.45 for each unit change in the poverty index, which is $1.17 higher than $2.28 increase for Alternative 7. However, the poverty coefficient remains higher than the age of housing coefficient for Alternative 2.

As the R^2 statistics show, at least 95 percent of the variation in the two alternative formulas can be explained by the five need indexes. This goodness-of-fit measure tells us that there exists a very close relationship between the actual per capita amounts under each of the two alternative formulas and the per capita amounts predicted from a regression equation that describes the implicit needs logic of the alternative formula being considered. In other words, if one agrees with the needs emphasis of one of the alternatives as indicated by its regression coefficients, he or she can feel confident that the actual distribution under the selected alternative will closely reflect its needs emphasis. As explained above, we can not say this about the hold harmless system, because the actual hold harmless amounts are not that closely related to the regression equation that describe its needs logic.

Adding age of housing increases the share going to central cities, particularly those located in the Northeast Central regions. As a percentage of the SMSA appropriation, the increase in the central city share is from 52.8 percent under the present formula to 58.9 percent under Alternative 7. However, even if funds were allocated solely on the basis of pre-1939 housing, central cities would still receive, as a percentage of SMSA funds, 19.4 percentage points less than the 79.2 percent received under the categorical programs.

6. Total Evaluation Index

We tested hold harmless and the present and alternative formulas using an evaluation index which considered a city's need requirements, its tax effort, and its fiscal capacity. We constructed a linear evaluation index by weighing three component indexes as follows:

$$\text{EVALUATION} = .50\ \text{NEED} + .25\ (1/\text{CAPACITY}) + .25\ \text{TAX}$$

The underlying assumption was that the objectives of the CDBG program are such that per capita aid should increase with need requirements and tax effort and decrease with fiscal capacity. We have given NEED a double weight (.50). We did not attempt to justify this weight assignment except to say that the purposes of the CDBG Act emphasize those phenomena (urban blight, poverty, etc) that the need variables supposedly reflect.

The capacity component (CAPACITY) is computed by dividing each city's per capita income by the weighted average of per capita incomes for the 435 entitlement cities included in our analysis. Including a measure of fiscal capacity in our formula evaluation recognizes the different abilities of governments to finance public services from their own revenue sources.

Tax is computed by dividing each city's per capita non-education taxes by the weighted average of per capita non-education taxes for entitlement cities. The assumption is that for given levels of need and capacity, those localities with the higher tax effort should receive a larger share of CD funds. The needs index (NEED) is the same as that defined above except that the scores have been transformed so that NEED is made up of positive numbers only, with a mean of one. By construction, each of these component indexes are comprised of positive numbers only and each has an average value of one.

The correlations between per capita allocations and the evaluation index are given below; for comparison purposes, correlations with component indexes are also presented:

	(1) Evaluation Index	(2) NEED	(3) TAX	(4) CAPACITY
Hold Harmless	.19	.28	.00	-.27
Present	.65	.78	.19	-.51
ALT1	.85	.96	.40	-.46
ALT2	.83	.94	.37	-.46
ALT3	.88	.96	.46	-.41
ALT4	.84	.93	.41	-.41
ALT5	.86	.90	.51	-.30
ALT6	.80	.84	.48	-.26
ALT7	.80	.85	.48	-.28

The present formula which gives a double weight to poverty and excludes AGE1939 exhibited the highest negative correlation with per capita income, or CAPACITY. Increasing the weight of AGE1939 reduced the correlation with CAPACITY to -0.26 for Alternative 6; however, the -0.46 correlation for both Alternative 1 and Alternative 2 was not much lower, in an absolute sense, than the -0.51 for the present formula. The present formula did not do as well with regards to TAX, exhibiting only a 0.19 correlation. Including AGE1939 resulted in a large gain in terms of increased correlation with the tax index. A switch from the present formula to Alternate 5 would increase the correlation with TAX from 0.19 to 0.51.

The alternative formulas were more effective than both hold harmless and the present formula in distributing CDBG funds in accordance with a comprehensive evaluation index based on need, tax effort, and fiscal capacity. For example, ALT3 showed a 0.88 correlation with the linear evaluation index, which compared favorably with 0.65 correlation of the present formula and the 0.19 correlation of hold harmless. The coefficient for the present formula (0.65) was at least 0.15 less than that for each of the alternatives.

The reader should view these correlation results with some caution. There are several problems with the component indexes. For example, in our definition of fiscal capacity, we have neither adjusted income for regional price variations nor included the property tax base. The tax effort index included only non-education taxes and ignored tax exporting and state government taxes paid by city residents. Because of variations among states in financing local services, the tax effort measure used in this study may not accurately reflect the actual level of tax supported services at the local level. We have already mentioned the judgment involved in combining the factor scores in order to compute a total needs index. In constructing a comprehensive evaluation index, additional judgment was required to determine the relative importance of TAX, NEED, and CAPACITY. However, the concept of relating the funding level to fiscal capacity and tax effort is important and we believe the analysis presented provides valuable insights into the relative performance of different formulas.

7. Miscellaneous Topics

a. Population Decline and CD Need

We compared growing and declining cities on the basis of need scores, need variables, and fiscal measures, and we evaluated alternative formulas with respect to an additional criterion, change in population. We look at percentage changes in population between 1960 and 1973 for entitlement cities, focusing on those cities that have experienced the largest changes in population (greater than +10%, less than -10%). These comparisons indicate that, on the average, there is consistency between our ranking according to CD need and a ranking according to population decline.

Of the 109 cities with a decrease in population since 1960 greater than 5 percent, 78 or 72 percent, were located in the Northeast or North Central region. Of the 246 cities with an increase in population since 1960 greater than 5 percent, 166, or 67 percent, were located in the South or West. We found that characteristics other than regional location distinguish growing cities from declining cities. Compared with growing cities, our results showed declining cities as (1) having an older housing stock, (2) having higher concentrations of low income persons, (3) having higher levels of per capita expenditures and taxes, and (4) receiving higher per capita CDBG allocations, especially under the alternative formulas. The main difference between rapid decliners and fast growing cities occurred on the age of housing dimension, which showed a 1.023 average score for declining cities and a -.442 score for growing cities. The average score on the total CD need index was .583 for the rapid decliners, compared with -.20 for the group of fast growing cities.

Aid to the declining cities is much greater under the alternative formulas than under the present formula. Cities that have experienced a population loss greater than 10 percent would receive $22.74 per capita under Alternative 4 (.4 AGE1939, .6 POORPER), or 35.8 percent more than they would receive under full funding of the present formula. On the other hand, the average per capita amount allocated to the fast growing cities would decrease from $14.97 under PRESENT to $13.15 under Alternative 4, a decrease of 12.2 percent.

b. Cost of Living Index

The present formula does not take into account city variations in the cost of living and therefore treats in an inequitable manner those cities with higher input costs. In addition, the 1970 Census did not consider cost of living differences in its definition of poverty income levels. This means that present poverty counts understate actual poverty in cities with above average costs. Each of the formula distributions was evaluated in terms of correlation with an "intermediate income cost of living" index (IYCPI), published by BLS for 38 SMSA's. The following coefficients were obtained:

	ICYPI		ICYPI
Hold Harmless	.2490	ALT4	.4776
Present	-.1238	ALT5	.6061
ALT1	.3626	ALT6	.6164
ALT2	.4047	ALT7	.6066
ALT3	.4513		

For this group of 38 cities, the present formula does not distribute above average, per capita amounts to cities with above average living costs.

c. Community Development Need by Population Size

Several have expressed concern about the decrease in the share going to large cities (and the increase in the share going to small communities) under the present formula relative to the categorical distribution. For example, the entitlement cities account for 74 percent of hold harmless funds, but only 47 percent of present formula funds. Even if funds were allocated on the basis of Alternative 7 (.6 AGE1939, .4 POORPER), entitlement cities would still receive 21 percent less than that received under the displaced categorical programs.

If one believes that the large city share should be higher than its formula share, one must argue that the four variables (AGE1939, OCRWD, POORPER, POP) we are using as formula factors are not picking up the difference in terms of CD need between large and small cities, or that the need variables in small cities should be given less weight than those in large cities. Once we depart from assuming that the formula variables accurately reflect need, we are left with no objective method to determine the shares of large and small cities. Our approach does provide evidence that large cities are more needy than small communities. A factor analysis was conducted on 802 cities with population above 25,000 to determine how per capita need varies with city size. There does seem to be, for each dimension of CD need, a trend from low to high per capita need as population increases. The 237 cities in the lowest population group (25-35,000) received below average need scores on each dimension. Except for an average need score on the age-of-housing-stock dimension, the second population group (35-50,000) also received below average need scores.

d. Distribution Among Types of Recipients Under Two-Formula Systems

A two-formula system would increase the share of entitlement cities to an amount greater than their weighted share of formula factors. One two-formula system would allow each entitlement city to receive the maximum of its present formula amount or an amount computed by Alternative 7 (MAXPOR7). The share of the SMSA balances is computed as a residual by subtracting that amount going to entitlement recipients from the total SMSA appropriation.

In two-formula systems such as MAXPOR7, a question arises concerning whether or not urban counties and non-SMSA areas should share along with SMSA balances the costs of redirecting funds to our larger cities. Under MAXPOR7, 28.2 percent of SMSA funds is left over for urban counties and SMSA balances. To continue to allocate to urban counties their present formula share of 12.8 percent causes some inequity between urban counties and SMSA balances, because this 12.8 percent share to urban counties, which account for 16.8 percent of the SMSA population, is only 2.6 percent less than the residually determined 15.4 (28.2-12.8) percent share allocated to SMSA balances, which account for 30.5 percent of the SMSA population. In this case, assuming for the moment that the optimal "Remainder of SMSA" share is 28.2 percent, one procedure would be to divide the 28.2 percent between urban counties and SMSA balances on the basis of a needs formula. Of course, this problem arises only if we have agreed to increase the share of entitlement cities to an amount greater than their share of formula factors.

An additional problem involves SMSA balances as compared with the non-SMSA area. The switch from the present formula to MAXPOR7 would reduce, as a percentage of U.S. funds, the share to SMSA balances from 23 percent to 13 percent while leaving unchanged the 20 percent allocated to non-SMSA communities. Inequities may result among the non-entitlement city recipients (urban counties, SMSA balances, non-SMSA recipients) from those two-formula approaches that determine the share of SMSA balances as a residual.

CHAPTER 1
INTRODUCTION

Title I of the Housing and Community Development Act of 1974 consolidated several categorical programs for community development into a single program of community development block grants (CDBGs). The primary objective of the title is "the development of viable urban communities by providing decent housing and a suitable living environment and expanding economic opportunities, principally for persons of low and moderate income." This objective is to be achieved primarily through elimination of slums and blight and detrimental living conditions, expansion of housing, and increased public services. The title provides for a new system of allocating and distributing community development funds; an allocation formula will be used that is based on population, amount of housing overcrowding, and extent of poverty (counted twice). Under the previous categorical system, funds were distributed to applicants on a competitive, case-by-case basis.

In order to provide for early Congressional reconsideration of the method for distributing assistance, Congress required that the Secretary of the Department of Housing and Urban Development submit a report, no later than March 31, 1977, which would contain the Secretary's recommendations for modifying, expanding, and applying provisions relating to the funding method, fund allocation, and basic grant entitlement determination. In making this report, the Secretary must conduct a study to determine how funds can be distributed in accordance with community development needs, objectives, and capacities, measured to the maximum extent feasible by objective standards. This paper will present the methodology and results of a formula study conducted by the Office of the Assistant Secretary for Policy Development and Research at the request of the Secretary. The study began in August 1975.

Objectives of the Study

The principal objectives of the study were:

(1) to develop criteria that measure the variation in community development needs among entitlement cities;

(2) to evaluate and compare the distributions of funds under the hold harmless continuation of the displaced categorical programs and the existing CDBG formula;

(3) to design alternative formulas that increase the emphasis on those dimensions of community development need ignored by the existing CDBG formula; and

(4) to evaluate CDBG allocations under the alternative formulas, comparing them with the hold harmless continuation of the displaced categorical programs, with the present formula, and with each other.

Methodology

The basic purpose of this study was to develop and test alternative formulas for distributing program funds according to community development need. The first step was to develop criteria for measuring variation in community development (CD) needs among entitlement cities. An index was constructed that positions each city with respect to CD needs. The index is based on the concept of a need indicator, a variable (e.g., poverty) which provides an indication of relative differences among cities. For example, if city A has a higher number of poor persons that city B, then city A is judged to have greater need for CDBG funds. Our selection of need indicators reflects the Congressional intent that CDBG funds be used to assist in the development of viable urban communities by providing decent housing, a suitable living environment, and expanding economic opportunities, principally for persons of low and moderate income.

Devising an index of relative need for each of the need variables selected is possible but would result in a very complicated analysis. Therefore, factor analysis was used to reduce the need indicators to five factors, each factor reflecting a different dimension of community development need. For each of these five dimensions of need, the factor analysis computes for each city a per capita needs score that can be used to measure the variation among cities in per capita need, that is, can serve as a relative needs index. The scores are interpreted in per capita terms because the need indicators, which were used as input variables into the factor analysis, were expressed in either percentage or per capita terms. In general, a city will receive a high score on a factor (dimension) if the city has a high percentage for each of those need variables that define the factor. The set of index scores and the need variables provide the basis for judging the current formula, the hold harmless mechanism, and several alternative formulas which seek to provide higher per capita allocations to those cities which have greater community development need. For each dimension of CD need, responsiveness to the needs index is measured by the simple correlation coefficient between a particular formula's per capita allocation of funds and the index scores of the entitlement cities.

To obtain a composite index of CD need, it is necessary to assign arbitrary weights to each of the dimensions of need. Although we compute correlations with respect to a total needs index, we place most of the emphasis in this study on the correlations with the separate dimensions of CD need. From the analysis of the separate dimensions, the reader should be able to approximate correlation results for any composite needs index that he or she may choose.

A similar problem arises concerning the importance of fiscal capacity and fiscal effort in an evaluation of the CDBG formula. Should fiscal capacity and fiscal effort be included in this evaluation, and, if so, what is the relative importance of fiscal capacity, fiscal effort, and CD need? Can we combine indexes of capacity, tax effort, and CD need to form a total evaluation index? Again, our approach is to first test each formula with respect to both fiscal capacity and tax effort; after doing this, we combine indexes of fiscal capacity and effort with a total needs index to derive a comprehensive evaluation index. The basic assumption of this evaluation index is that the objectives of the CDBG program are such that per capita aid should increase with need requirements and tax effort and decrease with fiscal capacity.

We did attempt to use our needs index methodology to address questions other than that of distributing a fixed amount of funds to a fixed number of recipients. For example, we expanded the factor analysis to include all cities with a population greater than 25,000 so that we could determine how per capita need varies with city size. Detection of a large positive shift in per capita need at a particular city size could be used to support that city size as the appropriate population cut-off for forumla entitlements.

In addition to the evaluation in terms of need, tax effort, and fiscal capacity, the formula distributions were also evaluated in terms of their correlations with cost of living indexes, percentage change in population (1960-1973), and the central city hardship ratios developed by Richard Nathan. We classify entitlement cities according to population change since 1960 and examine growth and declining cities using the need indexes developed in this study.

Throughout this study, we have attempted to be faithful to the Congressional request to determine how CDBG funds can be distributed in accordance with CD needs, measured to the maximum extent feasible by objective standards. A correlation and regression approach, which measures the extent to which above average per capita amounts are distributed to cities with above average per capita need, is employed to evaluate and compare formulas. Judgment is necessary in the selection of need indicators. We have used the legislation and the urban literature as guides in choosing indicators of community development need. In our approach need cannot be measured absolutely, but only relatively.

An open issue is the distribution of funds among classes of recipients. We know of no scientific method of establishing that the level of CD need in SMSA's is four times greater than outside SMSA's. Within SMSA's, it is not clear that the funds distribution among entitlement cities, urban counties, and SMSA balances is appropriate. Data for formula purposes may not exist to accurately measure the differential need in entitlement cities that arises from widespread externalities caused by a highly concentrated population. It also is not clear that need is a linear function of need indicators, as assumed in the present formula and in this study. We have investigated some of these issues and have provided data on the effect of formula alternatives on the distribution among classes of recipients.

The issues of gainers and losers is an important interest of anyone who considers formula changes. Therefore, we have provided many tables on distributional effects by region and by city size. The purpose here is to see how formula changes recommended on the basis of the correlation and regression results translate into practice, that is, are there any abnormalities. However, we believe that the correlation and regression techniques are preferable methods for comparing formulas as contrasted with a case-by-case review of the various distributions.

Limitations of the Study

(1) This study focuses on the equitable distribution among entitlement cities of a given CDBG funding level. The analysis does not provide the information necessary to derive an optimal CDBG funding level.

(2) The study did not examine community development need in urban counties and balances of SMSA's.

(3) The methods used in this distributional study cannot resolve issues such as (a) whether or not to include urban counties as entitlement recipients, (b) the population cutoff for entitlement cities, and (c) the SMSA/non-SMSA split. Again, our method treats the problem of distributing a fixed amount of funds among a predetermined number of recipients. However, our approach does provide information which is useful in addressing issues such as these.

(4) In addition, our methods cannot resolve transitional issues such as the optimal rates of phase-in of entitlement cities and phase-out of hold harmless cities. We do compare the present full formula distribution with a "pure" hold harmless distribution.

(5) The study cannot determine the appropriate distribution of funds among recipient classes (entitlement cities, urban counties, SMSA balances, and non-SMSA balances). In Chapters 5 through 8 the study adopts the assumption implicit in the CDBG program that, within metropolitan areas, formula factors measure the same level of need regardless of location. In Chapter 9 the study examines an alternative assumption.

Organization of the Paper

Chapter 2 explains how shares for entitlement cities, urban counties, and SMSA balances are determined under full formula funding and during the transition period (FY 75-FY 80).

Chapter 3 reviews recent studies that have attempted to develop relative measures of public expenditure needs and outlines methods used by researchers to compare alternative distribution formulas with respect to certain evaluation indexes. The correlation and regression techniques used in the study are explained in this chapter.

Chapter 4 presents our list of community development need indicators and explains the factor analysis from which the per capita need scores are derived.

Chapter 5 uses the need scores and need variables to evaluate and compare the hold harmless and present formula distributions.

Chapter 6 presents and evaluates seven alternatives to the present formula that include age of housing stock as a formula factor. Need variables, scores on the five dimensions of CD need, and a comprehensive needs index are used to evaluate and compare the alternative formulas. The shares and per capita means of the alternatives are analyzed to determine the extent that various types of recipients gain and lose as compared with the present formula and the displaced categorical programs.

Chapter 7 evaluates the formulas in terms of their correlations with fiscal capacity, tax effort, and a total evaluation index. The evaluation index measures a city's need for CD funds by considering its tax effort, its fiscal capacity, and its score on the total needs index.

Chapter 8 evaluates the formula alternatives in terms of their correlation with cost of living indexes and in terms of the percentage change in population since 1960.

Chapter 9 discusses the issue of distribution among classes of recipients and examines dual formula approaches which direct a larger percentage of funds to entitlement cities at the expense of SMSA balances.

Numerous appendices are included at the end of the study and are referenced and explained in relevant sections of the text. In Appendix K, we compare our methods and results with those of other researchers, and, where possible, evaluate each formula allocation using their techniques. Included are studies by (1) the Institute for the Future, (2) Richard DeLeon and Richard LeGates on the equity of CDBGs in California, and (3) Richard Nathan on central city hardship.

CHAPTER 2

THE PRESENT FUNDING MECHANISM

The community development block grant program and its formula grant device resulted from efforts to improve a grant-in-aid structure that had been dominated by project grants. The categorical grant system, designed to meet specified needs and to stimulate local activity, required that a local government unit or its designated agency initiate an application requesting funds for a specific project under a certain category. In many cases, these categorical programs required that the recipient units provide matching funds out of their own revenue sources. Criticism was directed at this categorical aid system because of the complexity of the application and review procedure and because of the narrowly defined expenditure categories. State and local officials were especially critical of what they considered bureaucratic red tape and administrative waste associated with the application and review procedures. In addition, they claimed that the matching requirements and the narrowly defined expenditure categories distorted their budget priorities. The categorical system also encouraged the practice of "grantsmanship", which worked to the disadvantage of the poorer government units.

Title I of the 1974 Act responded to these problems by consolidating the categorical programs into a single grant, thereby increasing the flexibility of local officials to respond to local urban needs. Local officials are now free to apply fund receipts to any CD expenditure area. After a transition period, grants will be awarded to metropolitan cities, urban counties, and balances of SMSA's according to a needs formula, which is both easier to understand and supposedly more equitable than the previous project method.

In this chapter, we first explain how formula shares for entitlement cities, urban counties, and SMSA balances are determined, assuming full formula funding. Next, we briefly explain the concept of hold harmless and its importance in the transition to full formula funding. In the third section, we summarize (1) some of the arguments against using a formula to distribute CDBGs and (2) frequently stated advantages and disadvantages of hold harmless and "extent of program experience" as methods of distributing community development funds.

Full Funding Under the Present Formula

The primary purpose of Title I, to provide a suitable living environment to persons of low and moderate income, served as the guideline used in designing the needs formula. The formula assumes that a city's need for community development funds can be measured by a weighted combination of three factors (population, poverty, overcrowded housing) and that accurate data is available to operationalize this particular measure of city need. A second implicit assumption is that input prices and productivity are the same in all cities, of if not, at least offset each other so that prices are the same in all cities. Whether or not these are reasonable assumptions will be discussed in Chapters 5 through 8.

In the formula allocation process described below, the needs formula provides the basis for computing (1) the total allocation for all entitlement cities and all urban counties; (2) the individual allocations for each entitlement city and urban county; (3) the share of each SMSA area of the SMSA balance; (4) the state area share of the non-SMSA portion. Once the latter two area shares are calculated the formula is not used to distribute funds (1) within SMSA areas to non-entitlement communities and (2) outside of SMSA's to individual units of government. These latter distributions (called discretionary funds) are made by HUD on the basis of applications from non-entitlement communities included within these two areas.

<u>SMSA Share Under Full Formula Funding</u>

After deducting 2 percent of the CDBG appropriation for a special Secretary's fund, HUD allocates 80 percent of the remaining funds to SMSA's and 20 percent to non-SMSA's. Under the current law, after a transition period (1975-1980) during which phase-in, hold harmless, and phase-out provisions apply, SMSA funds will be distributed to (1) entitlement cities, (2) urban counties, and (3) balances of SMSA's on the basis of a three-factor formula.

<u>Entitlement Cities.</u> "Metropolitan city" or "entitlement city" means the central city of an SMSA, or any other city with a population of 50,000 or more. In FY 76, there were 522 entitlement cities (515 in U. S.), of which 367 were central cities of SMSA's. The computation of each entitlement city's automatic formula amount involves a two-step process. <u>First,</u> out of the total SMSA allocation, the act provides that HUD allocate to all entitlement cities an amount which bears the same ratio to the allocation for all SMSA's as the average of the ratios between all such cities and all SMSA's using factors of population, extent of poverty (counted twice), and extent of housing overcrowding. Out of the allocation for all entitlement cities, HUD determines a <u>basic grant</u> for each entitlement city, computed by the same formula, using data existing in each metropolitan city as compared to that in all cities. The following two equations are used to determine the <u>basic</u> allocation to the jth entitlement city:

(First step)

$$G_C = \left(\tfrac{1}{4}\ \frac{POP_C}{POP_{SMSA}} + \tfrac{1}{2}\ \frac{POV_C}{POV_{SMSA}} + \tfrac{1}{2}\ \frac{OCRWD_C}{OCRWD_{SMSA}} \right) \times G_{SMSA}$$

(Second step)

$$G_j = \left(\tfrac{1}{4}\ \frac{POP_j}{POP_C} + \tfrac{1}{2}\ \frac{POV_j}{POV_C} + \tfrac{1}{4}\ \frac{OCRWD_j}{OCRWD_C} \right) \times G_C$$

where

G_{SMSA} = CDBG allocation to SMSA's = .784 (.80 x .98) times total CDBG allocation = G_C + (Allocation to Urban Counties) + (Allocation to SMSA balances=SMSA "discretionary" amount)

G_C = CDBG allocation to all 522 entitlement cities= $\sum_{j=1}^{522} G_j$

G_j = CDBG allocation to jth entitlement city; also called basic grant to jth entitlement city

POP = population

POV = number of persons whose incomes are below the poverty level defined by the Office of Management and Budget

OCRWD = number of housing units with 1.01 or more persons per room based on data compiled by the Bureau of Census

"c" = indicates that subscripted variable is defined for all entitlement cities

"SMSA" = indicates the subscripted variable is defined for total SMSA area in U.S.

"j" = indicates jth entitlement city

$$POP_C = \sum_{j=1}^{522} POP_j$$

$$POV_C = \sum_{j=1}^{522} POV_j$$

$$OCRWD_C = \sum_{j=1}^{522} OCRWD_j$$

Layering Effect. The above distribution process exhibits a "layering effect" in that the allocation to the jth city is calculated relative to a total city amount rather than to the total metropolitan amount. The total city allocation is calculated by formula in the first step and from this city total, the allocation to each city is derived in a second step. It seems that the more natural procedure would be to compute each entitlement city's allocation in the first step so that its grant share would equal its share of the formula factors, relative to all metropolitan areas. In fact, the share of each recipient unit (entitlement city or urban county) or area (remainder of SMSA area) could be calculated in the first step, using the factor totals for all SMSA areas in the formula denominator, and the relevant city, county, or remainder of SMSA area data in the numerator. Appendix C illustrates how this "layering effect" results in a distribution of funds different from that obtained by computing all shares in the first step.

Urban Counties. The basic formula amount for each urban county is computed in a similar two step process. For CDBG purposes, an urban county (UC) means:

> any county within a metropolitan area which (A) is authorized under State law to undertake essential community development and housing assistance activities in its unincorporated areas, if any, which are not units of general local government; and (B) has a combined population of two hundred thousand or more (excluding the population of metropolitan cities therein) in such unincorporated areas and in its included units of general local government (i) in which it has authority to undertake essential community development and housing assistance activities and which do not elect to have their population excluded or (ii) with which it has entered into cooperation agreements to undertake or to assist in the undertaking of essential community development and housing assistance activities. 1/

In FY 76, 73 urban counties were receiving funds. The basic grant for the jth urban county is computed as follows.
(First step)

$$G_{(c+uc)} = \left(\tfrac{1}{4} \frac{POP_{(c+uc)}}{POP_{SMSA}} + \tfrac{1}{2} \frac{POV_{(c+uc)}}{POV_{SMSA}} + \tfrac{1}{4} \frac{OCRWD_{c+uc}}{OCRWD_{SMSA}} \right) G_{SMSA}$$

(Second step)

$$G_j = \left(\tfrac{1}{4} \frac{POP_j}{POP_{(c+uc)}} + \tfrac{1}{2} \frac{POV_j}{POV_{(c+uc)}} + \tfrac{1}{4} \frac{OCRWD_j}{OCRWD_{(c+uc)}} \right) G_{(c+uc)}$$

1/ 93rd Congress, Title I of Housing and Community Development Act of 1974, August, 1974, p. 3.

where variables previously undefined are

$G_{(c+uc)}$ = CDBG allocation to 522 entitlement cities (G_c) and 73 urban counties (G_{uc}): $G_c + G_{uc}$

G_{uc} = CDBG allocation to urban counties $= \sum_{j=1}^{73} G_j$

"j" = indicates jth urban county

"c+uc" = indicates that subscripted variable is defined for all entitlement cities and urban counties.

SMSA Discretionary Balance. The balance of the total SMSA allocation remaining after allocation of funds to entitlement cities and urban counties is distributed to states and units of general local government (other than entitlement cities and urban counties) for use in SMSA's, with each SMSA allocated an amount computed by the three factor formula, using data defined for in each SMSA as compared to that in all SMSA's. In computing these amounts, the formula-factor quantities of entitlement cities and urban counties are excluded. Within each SMSA, the SMSA balance is distributed by HUD on the basis of applications from the non-entitlement communities.

SMSA Recipient Shares Under Full Formula Funding. Table 2.1 shows variable and formula shares for the three types of SMSA recipients. Our estimates indicate that under full funding with the present formula, the total SMSA share (approximately 80% of total authorization) would be divided as follows: (1) 522 entitlement cities, 60%; (2) 73 urban counties, 12.5%; and (3) balance (discretionary), 27.5%. Added to the non-SMSA 20% (discretionary after hold harmless phase down), this results in 42% of CDBG funds being issued on a discretionary basis (after hold harmless phase down). This is a rather large share, given the goal of providing automatic funding on an objective needs basis.

The prospect of such a large discretionary share emerging with the phase down of hold harmless has raised two concerns. First, the administration of so large a discretionary fund would impose a tremendous administrative work load, possibly accompanied by many of the same bureaucratic, red-tape problems that characterized the displaced categorical system. In this case, one solution would be to expand the entitlement coverage within SMSA's in order to keep the discretionary balance at some manageable level.

A second concern over the 27.5 percent SMSA discretionary balance is based on the notion that the present formula is biased against "older, declining cities" and in favor of small communities located in the balance of SMSA's. Because this perception comes partly from reviewing which cities stand to lose funds over prior

Table 2.1: Variable and Formula Shares for Entitlement Cities, Urban Counties, and Balances of SMSA's Under the Present Formula

	Entitlement City (522)	Urban County (73)	SMSA Balance (SMSA Discretionary) (270)	Total SMSA
(1) Total Quantity[a]				
Population	79,392,095	24,936,840	45,366,763	149,695,698
Poor Persons	10,957,252	1,709,566	4,491,066	17,157,884
Overcrowded Houses	2,191,499	495,898	1,023,259	3,710,656
(2) Percentage Share of SMSA Total				
Population	53.04%	16.66%	30.31%	100.%
Poor Persons	63.86	9.96	26.17	100.
Overcrowded Houses	59.06	13.36	27.58	100.
(3) Formula Share of SMSA Funds	59.95%	12.49%	27.56%	100.%
(4) Formula Share of Total CDBG Funds[b] = (.8 SMSA Share(3))	47.96%	9.99%	22.05%	80.%
(5) Poverty Percentage= (Poor/POP)x 100.	13.80%	6.85%	9.90%	11.46%

a. These are quantities HUD used in fiscal year 1976 computations.

b. Total CDBG funds remaining after Secretary's 2 percent.

program levels, the concern is closely linked to the phase down of hold harmless. In this case, one solution would be to change the present formula in order to redirect funds from SMSA balances to central cities. In Chapter 6, we examine the effect of formula alternatives on the SMSA discretionary share.

A more extreme solution would be to restrict the SMSA discretionary share to a percentage, below that computed using formula variables. We are presently following such a procedure to determine the non-SMSA allocation; the 20 percent share is less than that based on the non-SMSA share of formula factors (35 percent). This fixed-percentage solution requires evidence that goes beyond the premise that large cities are more needy than small communities located in balances of SMSA's because well designed formulas will direct funds to more needy recipients at the expense of less needy recipients. To justify restricting the SMSA balance below its formula computed share requires evidence either (1) that present techniques and data do not measure the higher levels of CD need in large cities adequately or (2) that, given the total appropriation constraint, the amount of funds going to the "older declining cities" under a full formula system is less than some "minimum requirement." In Chapter 9, we examine and provide possible justifications for an alternative that restricts the SMSA balance to a percentage share below that computed using formula variables.

Non-SMSA Funds. The CDBG program allocates 20 percent of total funds to communities in non-metropolitan areas. The total non-SMSA amount going to each state area is computed by the above formula using data existing in the non-SMSA areas of each state as compared to that in the non-SMSA areas of all states. Each state area amount is distributed by HUD on a discretionary basis to state governments for use in non-SMSA areas and to non-SMSA units of general local governments within the state.

CDBG Funding During the Transition Period (FY75-FY80)

Under the present law, the hold harmless provisions represent the primary method of achieving a smooth transition between the displaced categorical programs and the new block grant approach. Basically, the hold harmless amount is the sum of (1) the average of each amount received under the displaced categorical programs (except model cities and NDP) during fiscal years 1968-1972, and (2) the average annual grants received prior to July 1, 1972 under the model cities program and NDP. Recipients of model cities grants will receive a full model cities "hold harmless" amount long enough to give each the equivalent of five action years under the program and additionally will receive a declining percentage (80, 60, and 40 percent) of the full amount for a three-year period following the recipient's fifth action year.

During the first three years (FY75, FY76, FY77), those entitlement cities and urban counties which had been receiving a higher level of funding under the displaced categorical programs will continue to receive this higher level (be held-harmless). For these cities, during the three year period FY78, FY79, and FY80, the excess of hold harmless over formula will be phased out by thirds. If an entitlement city's or urban county's basic grant amount exceeds its hold harmles amount, its full basic amount will be phased in over three fiscal years (FY75, FY76, FY77) so that the first year amount equals the greater of one-third full basic grant or hold harmless amount; the second year amount equals the greatest of two thirds full basic grant amount, hold harmless, or the first year amount; and the third year (FY77) equals the full basic grant amount. According to the present law, all entitlement cities and urban counties will be receiving their formula amounts in FY80.

Those SMSA communities (less than 50,000 and not central cities) which have no formula entitlement but had been participating in either urban renewal, model cities, code enforcement, or NDP will also "be held-harmless" during the initial three year period. However, under the present law, they will be phased out completely by 1980 and at that time must apply for assistance out of the discretionary amounts for their SMSA areas. Funds released by the phase out of hold harmless will be available for discretionary funding in SMSA areas.

The balance of the total SMSA allocation remaining after allocation of formula grants and hold harmless requirements within SMSA's will be distributed to states and units of local government (other than entitlement cities and urban counties) for use within SMSA's. Each SMSA balance is computed by the same formula as above, using data defined for each SMSA as compared to that in all SMSA's. In computing each SMSA balance, the quantities (population, poverty, and overcrowded housing) for entitlement cities, urban counties, and any cities receiving hold harmless amounts are excluded. HUD will distribute these discretionary funds to cities not eligible for formula on a project-application basis, similar to the method used in the displaced categorical system. During the transition period, the non-SMSA portion (20%) is to be allocated first, to meet the hold harmless requirements of non-SMSA cities, and second, for grants to states for use in non-SMSA areas and to non-SMSA units of general local governments. As in the SMSA case, funds released from hold harmless are available for discretionary funding in non-SMSA areas.

CDBG Funding Issues

During the legislative hearings on CDBGs, many controversies arose concerning various aspects of the fund allocation process. A review of those areas where a lack of agreement existed within Congress can provide hints as to the more critical areas that should be investigated in a reevaluation of the formula. In Appendix B we provide a review of the Congressional consideration of CDBGs as a background for the following discussion of the two most important CDBG allocation issue: formula funding and hold harmless.

Criticisms of the Formula Approach

During the legislative debate, a number of arguments were made against the use of an objective formula to distribute CDBG funds. Many felt that because of the inadequacies of available data, it would be impossible for any objective formula to reflect the full dimensions of need. Factors such as neighborhood blight, condition of public facilities, abandonment rates, present level of public services, and condition of the housing stock are essential elements in the consideration of community needs but are very difficult to measure.2/ Questions were raised concerning the crude indicators of community development need used in many of the proposed formulas. The need indicators or formula factors selected most often were total population, poverty, overcrowded housing, lack of plumbing facilities, and age of housing stock; these factors nearly exhaust available national data relevant to community development.3/ The fourth factor, lack of plumbing facilities, was considered as a measure of "the extent of housing deficiencies"; however, housing units can have adequate plumbing facilities and still be in a substandard condition because of defects such as sagging floors, deteriorated foundations, and missing materials such as shingles, bricks, or floorboards over a large portion of the structure. In addition, both age of housing and lack of plumbing emphasize past needs and therefore tend to penalize those cities undergoing rapid change relative to the older, urban centers.

2/ U. S. House of Representatives, Subcommittee on Housing. Housing and Urban Development Legislation-1971, Parts 1-3. 92nd Congress, 1971, p. 984, 990.

3/ U. S. Senate, Subcommittee on Housing and Urban Affairs. 1971 Housing and Urban Development Legislation, Parts 1-2. 92nd Congress, 1971, p. 84.

Many felt that in view of the limited amount of community development funds available each year, it was imperative that funds be directed towards those older cities with the most urgent needs. Giving formula-calculated funds to each city would spread the given authorization so thinly that effective action could not be taken in those urban areas with special problems. The conclusion followed that funds should be distributed by a flexible, discretionary procedure rather than by a fixed formula.

A third argument against the use of an objective needs formula stressed the lack of prior interest displayed by many cities. Support was given to formulas that allocated on the basis of previous participation in the categorical programs. It was argued that a more equitable distribution and a more efficient use of CD funds would result if CDBGs were allocated to those active communities that had previously recognized their CD responsibilities.[4/] Of course, it is possible that those communities that did not participate in the old categorical programs had the need but had neither the matching funds nor the staff required to administer the categorical programs.

Hold Harmless and "Extent of Program Experience"

All proposals that included an objective needs formula also recognized the need for hold harmless as a transition mechanism to help those communities that had been receiving high levels of categorical grants to cut back gradually to their basic entitlement. The 1974 Act even provides special transition funds for issue by HUD to those cities that suffer severe cutbacks.

Under the present law, beginning in 1978, hold harmless will be phased out by thirds and will completely disappear by 1980. In other words, by 1980, each entitlement community will receive only its basic, formula-calculated grant and each non-entitlement community will compete with other such communities in its area for the discretionary funds allocated by formula it its area (SMSA or state) but distributed within the area by HUD.

As demonstrated by the testimony taken in both the House and the Senate, a number of arguments can be made for not phasing out hold harmless. In fact, the initial Sparkman bill in the Senate (S. 2333 in 1971) based its allocation process on past performance and both the House (H.R. 10036) and Senate (S. 1744) bills in 1973 contained the term "extent of program experience" as a formula factor in addition to the transitional hold harmless clause (see Appendix B).

4/ U. S. House of Representatives, op. cit., p. 1184.

One justification for using past performance as a criterion for allocating CD funds emphasized the importance of directing funds to those communities that had shown "prior public concern" and had accepted the responsibility for solving their CD problems by providing matching funds in order to participate in the categorical programs. In light of the small total authorization, it was felt that it would be more efficient to distribute the funds to those cities with ongoing development instead of thinly distributing the limited amount by an automatic needs formula to a larger group of recipients.

A second justification for not phasing out hold harmless is based on the difficulty of developing a satisfactory needs formula. This argument emphasized the infrequent reporting of Census Bureau data and the lack of any data pertaining to the characteristics of a neighborhood.

A third argument for not phasing out hold harmless (HH) looks at the specific communities that will lose funds as a result of the phase out. For example, if one feels that the "older, declining" cities in the Northeast and Midcentral regions are more deserving of CD aid relative to the newer cities, then he will tend to support those allocation formulas that recognize past performance. For example, the weighted average percentage of housing units built before 1939 for those entitlement cities that would lose funds from a switch from HH to present formula funding is 53%, compared to a much lower average of 39% for gainers. This illustration of the link between the phase down of HH and older cities assumes that the age of housing stock contributes significantly to the classification of "older" cities. In a similar manner, if there does exist a bias in our aid structure against "intermediate-sized" cities (10,000-50,000 population) and if these cities were active in the categorical programs, then eliminating the phase-out provision would tend to offset the bias against these cities that results from the cutoff of 50,000 and from other characteristics of our aid system.

Of course, there are criticisms to those formulas that are either based on hold harmless in perpetuity or include "extent of past performance" as a permanent formula factor in addition to the transitional hold harmless clause. For example, as former Secretary Lynn explained, "from the standpoint of equity, the most objectionable feature of a hold harmless provision beyond the transition period is that it denies other communities their rightful share of Federal community development funds determined by objective criteria of need."5/

5/ U. S. House of Representatives, Subcommittee on Housing. Housing and Community Development Legislation-1973, Parts 1-3. 93rd Congress, 1973, p. 11.

This position argues against continuing the fruits of "past grantsmanship" forever. Including past performance as a formula factor could penalize those cities that in the past engaged in self-help to solve their CD problems.

In Chapters 5, 6, and 7, we compare a "pure" hold harmless distribution with both the present formula and alternative formulas in terms of indexes of CD need, tax effort, and fiscal capacity. Close correlations between the hold harmless distribution and, for example, several of the dimensions of CD need would provide support for continuing some form of hold harmless.

Summary and Conclusions

In Chapter 2, we have explained how shares for entitlement cities, urban counties, and SMSA balances are determined under full formula funding and during the transition period (FY75-FY80). A number of advantages and disadvantages of both formula and hold harmless funding were outlined. This discussion has indicated several critical areas that must be considered in any evaluation of the present CDBG funding system, including the (1) size of the SMSA balance, (2) indicators of community development need, (3) phase down of hold harmless, and (4) relation of hold harmless to "older, declining" cities. Other formula issues that will also be analyzed include (1) SMSA/non-SMSA split, (2) tax effort, (3) fiscal capacity, and (4) cost of living.

CHAPTER 3

A FRAMEWORK FOR FORMULA EVALUATION 1/

The purpose of this study is to develop and test alternative CDBG formulas which attempt to provide the most funds to those cities with the greatest needs. To accomplish this goal of distributing funds according to jurisdictional need, criteria must be developed that measure the relative variation in community development needs. After emphasizing the importance of a program's objectives in any evaluation of its formula, we review recent studies of the general revenue sharing formula that attempted to develop relative measures of public expenditure needs.2/ This review will also outline some of the methods used by researchers to examine alternative formulas with respect to certain evaluation indexes.

While recognizing the subjective nature of the public need concept, the investigators of the general revenue sharing formula attempted to provide crude, but reasonable estimates of the relative variation in public need across communities. Factor analysis was used by two of the investigators to develop a needs index based on both the physical characteristics of the communities and the distribution of population subgroups.3/ This factor analysis approach seems particularly relevant for our investigation and will be explained below in the context of constructing a community development needs index. In the next chapter, we use this factor analysis technique to delineate separate groups of intercorrelated variables and to compute indexes that measure the variation in community development needs across entitlement cities.

Principles of Design of Grant Structures in Light of Basic Objectives

In this section we review some of the principles of design for grant structures in light of the basic objectives that might be served. We consider how the allocation formula and the evaluation of such a formula differ depending on the objective, or combination of objectives, being served.

1/ Those readers not interested in methods of measuring public needs may proceed to the fourth section of the chapter, "Statistical Methods," for a discussion of the correlation and regression techniques used in this study.

2/ See Barro (1975), Ross (1975), and Schmid (1975).

3/ Ross (1975) and Schmid (1975).

Selma Mushkin recognizes four broad functions, or objectives, of the grant-in-aid system.4/ One of the functions may be to promote "programs of national concern" while leaving program development and administration at the local level. For example, activities considered to be part of the birthright of citizens (e.g., education, decent housing) would fall into this category. The Federal Government may set certain minimum standards in specific areas and tightly control the use of the grant or it may only require that funds be expended in broad areas (i.e., community development) of "national concern." In either case, matching funds may be required in order to stimulate local interest. To satisfy the first objective, the allocation formula must include measures of local need (e.g., dilapidated housing) and of the extent to which "target populations" (e.g., poor people) are located within the locality.

A second function of a grant-in-aid system is to correct distortions in public expenditure decisions that result from benefit spillovers. Benefits that flow to citizens in other jurisdictions are ignored by the local decision-maker; therefore, in order to achieve economic efficiency from a national point of view, it is necessary to encourage the local decision-maker to increase his production of the undersupplied public good. This efficiency argument calls for an open-ended, categorical grant with the cost shares of the grantor and grantee determined by the extent of benefit spillover.

A third function is to obtain greater equalization among localities; Mushkin defines five different equalization concepts. Currently, the general revenue sharing program achieves some equalization by including a capacity measure (income) in its allocation formula. During the legislative debate over CDBGs, arguments were made for including fiscal capacity measures in the CDBG formula. Mushkin's fifth concept, "equalization of effort to achieve national program standards," defines equalization in terms of the fraction of a locality's revenue base that must be devoted to implement the program standards and, although difficult to operationalize, should possibly be given some consideration in evaluating the CDBG formula. One proxy measure of effort that might be acceptable is per capita local taxes divided by per capita income.

A fourth function of a grant-in-aid system is to promote a more desirable balance between the public and private sectors. Many feel that local public goods are constrained below optimal levels by factors such as interjurisdictional tax competition.

The criteria used to design and evaluate a grant formula depend on

4/ See Mushkin (1969).

the purpose of the grant. The CDBG formula reflects the stated purpose (see Chapter 1) of the CDBG program by including measures of city need (population, over-crowded housing) and a measure of the target population (extent of poverty), which will also be referred to as a needs variable. As it stands, the CDBG formula seems to be serving Mushkin's first function, promoting a program of national concern; however, in order to test its ability to serve other objectives, measures of fiscal capacity and fiscal effort, for example, will also be considered in the formula evaluation.

Evaluation of the General Revenue Sharing Formula: Review

To evaluate the existing general revenue sharing formula and to aid in designing a new formula, evaluators would construct an evaluation index which measured a community's per capita need for general revenue sharing funds by considering its service requirements (needs), tax effort, cost of living, and fiscal capacity. For example, one general form which was employed was:

$$\frac{\text{Service Requirements} \times \text{Tax Effort} \times \text{Cost of Living}}{\text{Fiscal Capacity}}$$

Each component of the above evaluation index was also expressed in index form; for example, the service requirements index would assign a score to each community, with higher scores reflecting a higher relative level of service needs. After component scores were assigned for each community a total score would be computed according to the above formula, with higher scores representing a greater need for revenue sharing funds. The assumption here is that the objectives of the general revenue sharing program are such that per capita aid should increase with service requirements, tax effort, and cost of living, and decrease with fiscal capacity.

Alternative formulas were evaluated by comparing, for example, the allocations under the current formula with those under a proposed formula, using correlation and regression techniques. Any improvement from changes in the definitions of formula factors or changes in eligibility constraints could also be measured by comparing the new distribution of funds with the initial allocation in terms of responsiveness to the evaluation index.

Service Requirements (Needs) Index

Since the purpose of this study is to test alternative formulas in terms of responsiveness to community development need, we are especially interested in the different methods used to construct the service requirements or needs index. Our approach will be to first evaluate the present formula, hold harmless, and alternative formulas in terms of responsiveness to a set of community development need scores rather than in terms of a total evaluation index such as the one listed above. In Chapter 4, we develop a set of community development need indexes, and, in Chapters 5 and 6, we test each formula mechanism in terms of responsiveness to these need indexes. We do not test alternative formulas that include as formula factors, tax effort, fiscal capacity, and cost of living. However, in Chapters 7 and 8, we do test each formula mechanism in terms of its correlation with tax effort, cost of living, fiscal capacity, and a total evaluation index such as the one given above.

The "need indicator" concept. A refined measure of public service need would require (1) the ability to establish minimum standards for each major public service category (e.g., education, health, etc.), and (2) an estimation of the variations in the costs of providing public services across communities.5/ However, because of the difficulties of measuring public outputs and of constructing a local government price index, it is practically impossible to estimate the level of expenditures required to provide minimum standards of service for each community. One approach would be to estimate expenditure requirements by determining which population groups benefit from public expenditures and weighting these subgroups by the amount of dollar costs of benefits received and then summing the weighted population.6/ Unable to realize this ideal, researchers have turned to proxy measures of public service needs, called "need indicators". A need indicator is a variable (e.g., poverty) which provides a rough indication of relative differences among cities; for example, if city A has a higher number of poor persons than city B, then city A has the greater need for public services, but how much greater cannot be answered. We now review three methods to develop an index of public needs that are based on this concept of a "need indicator".

Need Index Based on Demand Behavior

Two approaches that have been used to develop relative need indexes and that are based on actual levels of demand rather than imposing an outside standard are (1) the direct imputation method and (2) the regression method.7/ The direct imputation method, used by Musgrave and Polinsky in a study of state and local expenditure need, defined needs as "the cost of supplying average performance levels for the existing mix of state-local programs," that is, the expenditure required to

5/ Ross, John P. Alternative Formula for General Revenue Sharing: Population Based Measures of Need, June, 1975, p. 5.

6/ Ibid., p. 15.

7/ Barro, Stephen M. Equalization and Equity in General Revenue Sharing: An Analysis of Alternative Distribution Formulas: Part I: Alternative Interstate Distribution Formulas, Rand, June, 1975. See Appendix A for a more detailed discussion of the topics covered in this section.

provide national average levels of services to each group of service recipients.8/ A "need for services" index is computed for each unit by assigning subgroups of the population (service recipients) to the different expenditure functions. For example, education (welfare) expenditures are attributed to the school-age (poverty) population. To construct a needs index for a particular unit, one multiplies the U.S. average expenditure for a function per service recipient by the fraction of that unit's population receiving the service, sums over all functions, and divides the sum by a similar sum computed for the whole United States.

The problem with this approach is that the many of the expenditure categories are difficult to assign. It would be particularly difficult to determine which population subgroups to attribute spending for police and fire protection, housing and urban development, and water and sewers. For example, should police spending be attributed to the population as a whole or should a greater weight be given to poor people? In addition, characteristics (e.g., overcrowded housing, density) other than the size of recipient groups should be taken into account when determining the needs for certain functions (e.g., community development).

The regression method of constructing a relative need index first regresses per capita expenditures by function (education, highway, welfare, etc.) on fiscal capacity, aid, and certain demographic and non-demographic variables (e.g., school-aged population, density) that supposedly reflect the community's need for the particular service.9/ The weights of the need-related variables are therefore determined empirically from the actual expenditure behavior of all the recipient units.

A community's need for each function is determined by estimating how much the community would have spent if it had the U.S. average amounts of fiscal capacity and aid rather than its actual amounts. In contrast to the direct imputation method, this regression procedure recognizes that expenditures are also influenced by fiscal capacity and grants-in-aid and that it is necessary to separate the revenue effects from the effects of the need-related factors. A relative need index is computed by summing these estimated per capita functional expenditures and dividing this sum by the actual per capita expenditures in the U.S.

8/ Musgrave Richard A. and A. Mitchell Polinsky, "Revenue Sharing: A Critical View," in FRB of Boston, Financing State and Local Governments, Boston, 1970, pp. 17-45.

9/ Auten (1974) was the first to use the regression method in constructing a relative need index.

The two main problems with the regression approach have to do with the specifications of the expenditure equations and the correlation that usually exists between the need-related variables and the capacity variables (e.g., a community with a high poverty population is most likely a low income community). As discussed by Barro, the main specification problems are (1) price variables have not been taken into account which can lead to biased estimates of the coefficients of the included variables if the price level is correlated with the capacity and need variables; (2) the influence of aid may not be correctly specified in a single equation model; and (3) the best need variables may not have been included in the expenditure equation.10/

In the next section, we turn to a conceptually different approach, factor analysis, which is not based on actual demand behavior, but on a mathematical technique that attempts to combine a number of need indicators into a set of factors, each factor representing a different dimension of need for the service category being considered. For developing an index of community development needs, we think factor analysis is the best of the methods available. As far as the imputation approach is concerned, it would be extremely difficult to assign community development expenditures to subgroups in the population. There are problems with using the regression approach to develop an index of community development need. First, it would be extremely difficult to construct and estimate a model of city finances that adequately accounts for the simultaneous relationships that exist among city revenues, city aid, CD expenditures, and non-CD expenditures. This problem would be further complicated if expenditure categories were divided into capital and current expenditures. Even if such a model could be developed and estimating equations specified, the necessary city finance data are not readily available on an annual basis, except for a small number of the larger cities. An additional problem with estimating city expenditure functions is the question of how to treat interstate variations in expenditure responsibilities between state and local governments.

Factor Analysis

A third method of constructing a relative needs index uses factor analysis to organize a given set of need indicators for the public service category being considered.11/ Factor analysis reduces the need indicators to a set of factors, each factor defined by a different group of variables that tend to "move together"; on each factor or

10/ Barro, op. cit., pp. 148-149.

11/ Schmid, G., Lipinski, H. and Palmer, M. An Alternative Approach to General Revenue Sharing: A Needs-Based Allocation Formula, Institute For the Future, June, 1975, p. 32.

dimension, the factor analysis assigns to each city a factor index score.12/ If desired, these dimension scores can be converted into a single score for each city.

As an example, we will consider community development needs. The first step is to make a list of indicators of community development need. These need indicators may be chosen so as to reflect the types of need written into the community development legislation. For example, if the legislation specified that attention should be given to the problems of the elderly (poor), one or more measures of the aged (poor) population would be included as need indicators. One possible list of indicators of community development need would be: age of housing stock, density, houses without adequate plumbing, number of poor persons, and crowded housing. Because analysis using many need indicators would be cumbersone and difficult to interpret, it is desirable to simplify the analysis. Factor analysis is an appropriate technique to achieve this objective if one assumes (a) that the origin of urban problems is common across cities and (b) that the causes of these common problems are not themselves observable and are mutually independent. We believe these assumptions are appropriate or, in other words, that our need indicators are symptoms of unobservable urban maladies. Factor analysis is a statistical technique for estimating the unobservable underlying causes on the basis of the observable effects. The product of factor analysis is a set of coefficients which can be used to estimate the unobserved cause by (1) multiplying each observed effect (needs indicator) by its coefficient and (2) summing the products.

The most critical part of any factor analysis that is being used for policy purposes is that each included factor must reflect a dimension of need and must make intuitive sense. For example, if one is dealing with the community development category of public service needs, it is possible that factor analysis would yield the following three factors (dimensions): a housing dimension, a poverty dimension, and a neighborhood dimension. Within each of these dimensions, each need indicator would have a factor loading that determines its importance within the factor (dimension) being considered. The indicators with high "factor loadings" in the above factors may be, for example, inadequate plumbing (housing dimension), number of poor persons (poverty dimensions), and age of housing stock (neighborhood dimension). In this case, a city with a large percentage of poor persons would show a high factor score on the second factor, poverty. Since each need variable input into the factor analysis is expressed in either percentage or per capita terms, each index score is interpreted as a per capita need score for the particular dimension being discussed.

12/ Ross, op. cit., p. 20.

To calculate a single index that ranks the cities in terms of total community development needs, it is necessary in the above example to have some method of combining the three sets of factor index scores. Summation with each dimension receiving equal weight is only one method; greater weights can be given to those dimensions that more closely reflect the findings, purpose, and goals of the legislation. In the above example, a city which, with respect to the national average, has a large percentage of houses with inadequate plumbing, a large percentage of poor persons, and an aged housing stock will show a high index score on each of the three dimensions of CD need and, therefore, a high per capita score for total CD need, regardless of the summation method chosen.

Although a large number of indicators may be available to be used as input for the factor analysis, it is not desirable to include all of these indicators in the actual formula. The requirement that the resultant formula be simple and easy to understand limits the number of indicators that can be used as formula factors. However, the factor analysis can be used to provide an initial set of formula factors. Those indicators with the highest factor score coefficients (Step 3) within each factor could service as an initial set of formula variables because each would represent a separate dimension of community development need and the process of computing factor score coefficients clarifies the factors by accounting for inter-correlations among the need indicators. In any event the formula factors should be chosen on the basis of their logical roles as need variables and of their ability to reflect separate dimensions of community development need.

Statistical Methods

In this study we use correlation and regression analysis to compare the per capita dollar distributions under hold harmless, the present formula, and several alternative formulas in terms of (1) each of five indexes of community development need derived in Chapter 4, (2) a total CD needs index, derived by combining the five separate indexes of need, (3) several need variables, expressed in either percentage or per capita terms, (4) fiscal capacity, (5) tax effort, and (6) a total evaluation index, derived by combining indexes of CD need, fiscal capacity, and tax effort. In this section, we discuss how correlation and regression techniques will be used to compare formulas in terms of the indexes of CD need.

The need indexes referenced throughout this section are derived in Chapter 4. There we explain the use of factor analysis to compute for each city a per capita score that can be used to measure the relative variation among cities in per capita community development need. A score is computed for each of five factors, or dimensions of CD need: poverty, age of housing, density, crime and unemployment, and lack of economic opportunity. For example, for each city, the factor analysis transforms the city's percentages on several variables related to poverty into a single, composite score that positions the city relative to other entitlement cities with respect to poverty. For each dimension, the average score is zero; positive scores indicate above average per capita need for the factor being considered and negative scores indicate below average per capita need.

Within this needs framework, a formula is evaluated on the basis of the degree to which it distributes above average, per capita amounts to cities with above average, per capita need. Correlation and regression techniques will be used to measure the responsiveness and sensitivity of formulas to each need index. During the following discussion, it is important to remember that need scores measure relative, not absolute need.

Simple Correlation Coefficient

In correlation analysis the strength of association between two variables is indicated by the simple correlation coefficient. The coefficient is a measure of linear relationship, being a measure of the goodness of fit of a least-squares straight line.13/ In other words, the closer the relationship between two variables is to a straight line, the higher the degree of correlation. In this study we are interested in the degree of relationship between a particular formula's per capita allocation of funds and the need scores on each of five dimensions of CD need. If a formula's per capita allocations are perfectly positively correlated with the factor index scores, a direct relationship exists such that a higher per capita amount is always associated with a higher need score. The perfect positive correlation will have a coefficient of plus one. If they are perfectly negatively correlated, the coefficient is minus one and an inverse relationship exists such that a

13/ For a more detailed discussion of correlation analysis, see Blalock (1972), Chapter 17, and Roscoe (1967), Chapter 12.

higher per capita amount is always associated with a lower need score. If there is no tendency for a higher per capita amount to be associated with either a higher or lower need score, the coefficient is zero.14,15/ All of our correlations are between plus and minus one.

For a dimension of need, an allocation with a positive correlation is judged more desirable than one with either a negative or zero correlation. This follows because we want above average per capita amounts to go to those cities with above average per capita need scores.

Comparison of Correlation and Regression Analysis

The least squares regression of per capita amounts (Y) on a needs index (X) has the form: $Y= a + bX$. Associated with this least-squares regression is a quantity r^2 which is that proportion of the variance of Y (squared deviation around the mean) which is predicted or determined by the straight line, $a + bX$. The correlation coefficient r is simply the square root of r^2. The correlation coefficient indicates the degree to which per capita amounts are explained by the index scores but tell us nothing about the nature of the relationship between the two variables. The slope (b) of the regression line tells us the rate at which per capita amounts change with changes in need scores but tells us nothing about the goodness of fit of the regression line.16/

Formulas can have the same correlation coefficient while having different regression slopes. To see this, consider the three per capita dollar distributions in the following hypothetical example:

	Need Score	Formula I	Formula II	Formula III
City A, high need	+1.	$10.10	$15.00	$20.00
City B, medium need	0.	10.00	10.00	10.00
City C, low need	-1.	9.90	5.00	0.00

14/ Roscoe, John T. Fundamental Research Statistics, 1969, p. 72.

15/ The simple correlation coefficient between per capita allocations and need scores can be defined as the covariance between per capita allocations and need scores divided by the product of their standard deviations: $r= S_{XY}/S_X S_Y$ where r= simple correlation coefficient between X and Y, X= need score for a particular dimension, also called a factor index score, Y= per capita allocation for CDBG formula, S_{XY}= covariance between X and Y, and S_X (S_Y)= standard deviation of X (Y).

16/ The relationship between the simple correlation coefficient r and the regression slope b is indicated mathematically as follows: $b=r\ (S_Y/S_X)$.

If we assume that each city has the same population, the total appropriation under the three formulas will be the same; therefore, these are viable alternative formulas. The regression equations for these formulas are as follows:

Formula I	Y= 10. + .1 X
Formula II	Y= 10. + 5 X
Formula III	Y= 10. + 10 X

where, Y equals the per capita amounts and X equals the need scores. The simple correlation coefficient between X and Y is a perfect + 1.0 for each of the three formulas. However, the formulas certainly are not in agreement. The response of per capita dollars to the need index changes from $.10 under Formula I to $10. under Formula III. In Formula I, the range in per capita amounts from the lowest to the highest is $.20, while in Formula III the range is $20.00.17/

In this study the alternative formulas are compared using both correlation and regression techniques because of the different information they provide. The choice between alternative formulas may require normative judgments about the relative importance of sensitivity to need (the regression slope) and degree of responsiveness to need (the correlation coefficient).

Multiple Regression Analysis

In this study we supplement the simple correlation analysis with a multiple regression analysis, which estimates the change that occurs in per capita amounts with a change in a particular factor index score, holding the other four factor index scores constant. The regression analysis therefore allows us to compare formulas on the basis of their sensitivity to the different dimensions of CD need. The general form of the equation estimated is as follows:

Per Capita $= a + b FACTOR 1 + c FACTOR 2 + d FACTOR 3
+ e FACTOR 4 + f FACTOR 5

FACTOR 1 to FACTOR 5 represent the per capita scores on the five dimensions of CD need. On each dimension, the average score is zero; an above (below) average level of per capita need is indicated by a score greater (less) then zero. Since the average on each of the independent variables is zero, the intercept term a will equal the average per capita formula amount. The regression coefficient b measures the change in per capita dollars for a one unit change in FACTOR 1, at fixed levels of FACTOR 2 to FACTOR 5.

17/ This example was provided by Paul Burke, Department of Housing and Urban Development.

For each factor, a positive coefficient is preferred to either a zero or negative coefficient. However, in comparing two formulas both with positive coefficients for a particular factor, we can not say that the formula with the higher regression coefficient is the more desirable. This inability to judge between positive regression slopes results primarily from our using relative measures of need, instead of absolute measures. It is even more difficult to judge between formulas when all five regression slopes are considered. Then, one has to make a judgment of the relative importance of the five factors. In this case, it is possible for a formula which has negative regression slopes for certain factors to be judged more desirable than an alternative formula which has all positive slopes, simply because the evaluator assigns a high (low) weight to those factors with the positive (negative) regression coefficients. This problem is identical to that of assigning weights to factors in order to combine the five factors into a comprehensive needs index.

The above discussion has emphasized two problems with using regression coefficients to compare and evaluate formulas. First, limiting the comparison both to a single need dimension and to formulas with positive regression slopes for this dimension, we can not argue that the highest positive regression slope is the most desirable. Second, it is even more difficult to compare formulas on the basis of all five coefficients in the regression equation. Normative judgments are required as to the relative importance of the five factors.

In this study we used multiple regression to determine the implicit emphasis that hold harmless, the present formula, and the alternative formulas give to the various need indexes. In addition to the multiple regression coefficients, we also report in the regression tables (a) the multiple coefficient of determination, (b) the standard error of estimate, and (c) the standard deviation of the per capita amounts. The multiple coefficient of determination is the proportion of variation in per capita dollars that is explained by the multiple regression equation, or by the five need indexes. 18/ A high coefficient

18/ Specifically, the multiple coefficient of determination, R^2 equals the variation explained by the multiple regression equation divided by the total variation of the per capita amounts. The total variation in per capita amounts equals the sum of the squared deviations around the mean. The R^2 statistic will range from zero to one; a value of one would mean that the actual per capita amounts could be perfectly predicted by the regression equation, or, in our case, by the five need indexes. One minus the R^2 value measures the degree to which factors other than our five need indexes explain the variation in per capita amounts. Because it is a relative measure of goodness of fit, the R^2 statistic does not vary with the total CDBG allocation to the 435 entitlement of determination therefore indicates a close relationship between the actual formula allocation and need. The standard error of the estimate measures the "average" disparity between actual per capita amounts and per capita amounts predicted by the multiple regression equation. 19/ It is therefore an absolute indication of how well the regression equation, or estimated per capita amounts, describes the relationship between the actual per capita amounts and the five need indexes. If the standard error of the estimate equaled zero the actual and predicted per capita amounts would be identical, which would indicate an exact relationship between actual formula allocations and the implicit relation between formula allocations and the five need indexes. The standard deviation measures the variability, or spread, of the per capita amounts about the average per capita amount. 20/

(Footnote 18 continued from previous page) cities; therefore, it is appropriate to use it for comparing formulas that allocate different amounts to entitlement cities.

19/ The standard error of the estimate is an average of the sum of the squared residuals. A residual is computed for each city by subtracting its per capita dollar amount predicted by the multiple regression equation from its actual per capita amount under the formula being considered. Approximately 68 percent of the actual per capita amounts will lie within one standard error of the per capita amounts predicted by the multiple regression equation, and 95 percent, within two standard errors. For purposes of comparing formulas, one disadvantage of the standard error of estimate is that it changes with changes in the total CDBG amount allocated to the 435 cities.

20/ The standard deviation is the square root of the average squared deviations about the mean. The standard deviation is an absolute measure and therefore is a function of the total allocation to the 435 entitlement cities. One rule of thumb for normal distributions that can provide an approximation to the spread of the per capita amounts states that 68 percent of all per capita amounts will fall within one standard deviation to either side of the average per capita amount, and 97 percent, within two standard deviations.

Cities Weighted According to Population Size

In order to accurately reflect the community development needs of people as a whole, we used a weighting system in both the factor analysis and the correlation and regression analysis that determines the importance of a particular city on the basis of the percentage of total entitlement city population accounted for by the city size grouping within which this city was located. The weighting system works by "blowing up" the number of cases as follows. First, the 435 entitlement cities included in our data file are divided into 8 population size groups and the percentage of entitlement city population accounted for by each population group is calculated. For example, the 94 entitlement cities in the population group, 100,000 to 250,000, accounted for 18 percent of total population in the 435 entitlement cities. Second, the weights given to each case were set so that the total number of cases would increase from 435 to 2021 and so that the number of cases in each population group divided by 2021 would equal the percentage of population accounted for by the group within which the case is located. For example, each of the 94 entitlement cities in the population group mentioned above was given a weight of 4 so that the total number of cases in this group would equal 18 percent of the 2021 cases ((94x4)/2021=.18).

Although not exact, this procedure is clearly preferred to that of giving the per capita and percentage quantities of each city an equal weight, as would occur if correlation analysis was applied to the 435 cases. A twenty percent deviation between a per capita need score and a per capita formula amount is much more important in the case of New York City than in the case of Birmingham, simply because of the larger number of people in New York City. Therefore, in the following chapters correlations and regressions involving per capita dollar amounts are calculated using this weighting procedure, unless stated otherwise. However, in Appendix H, we do present the factor and correlation and regression results that were obtained when we conducted the analysis on 435 unweighted cases. In other words, in Appendix H, we give each case or city an equal weight of one. We briefly discuss the results obtained and point out any major differences from the weighted results presented in the text.

CHAPTER 4

COMMUNITY DEVELOPMENT NEED

To simplify our evaluation of the present formula and its alternatives, we use factor analysis to reduce several need indicators to five dimensions of community development need. Need variables selected for input into this factor analysis are variables that reflect the Congressional definition of CD need and socioeconomic variables that are frequently found to be associated with urban blight, detrimental living conditions, and housing abandonment. For each of the five dimensions of CD need, the factor analysis computes for each city a factor score that can be used to measure variation among cities in per capita need. A city will receive an above average score on a factor if the city has above average need for each of those need variables that define the dimension being considered. For example if city A has a high percentage of houses built before 1939, then city A will receive a high per capita need score on the age-of-housing-stock dimension. In the final section of this chapter, we assign weights to the five dimensions of CD need so that we can compute a single needs score for each of the 435 entitlement cities.

Appendix A contains definitions and abrreviations for all variables used in this study and a list of all data sources. The primary data source was the County and City Data Book 1972. Because of data problems, the factor analysis included only 435 of the 515 entitlement cities located in the U.S.; however, these 435 cities accounted for approximately 95 percent of the total entitlement city population in FY76. A footnote indicating the number of entitlement cities considered will be included in those tables that have computations based on a group of cities different from the 435 entitlement cities listed in Appendix F.

Input Variables for Factor Analysis of CD Need

The first step is to make a list of indicators of CD need. The criteria for selecting indicators to be used as input for the factor analysis of CD need should reflect the Congressional intent that CDBGs be used to assist in the development of viable urban communities by providing decent housing and a suitable living environment and expanding economic opportunities, principally for persons of low-and-moderate income. Ideally, we would like measures of slum and blight and detrimental living conditions, neighborhood instability, and the level of public services provided to low-income persons. What we have are Census Bureau data on substandard housing that not only fail to recognize many deficiencies defined in housing codes such as interior rooms, inadequate size of rooms, certain fire hazards, light and air requirements, but also ignore environmental deficiencies that are today accepted as contributing to lack of livability of a given neighborhood. We do not have data that measure the relative extent of garbage-littered streets arising from poor sanitation services, cracked and broken sidewalks, unpaved or broken streets, missing or ineffective street lights, inadequate sewage and drainage facilities, noisy and heavy traffic, and the danger of assault, mugging, and robbery. In essence, a person's housing situation depends as much on the location of the house relative to other houses, to community services, to job opportunities, and to environmental amenities as on how sound the house is to begin with.1/

The approach we use to identify the existence of these environmental or neighborhood conditions is to try to find socioeconomic variables that are correlated with detrimental living conditions. Environmental conditions are measured by indirect surrogates rather than by direct measures of urban blight. From case studies of housing abandonment and from the "social indicator" literature, we have selected variables that seem to be correlated with urban blight and neighborhood instability. For example, a recent study on housing abandonment listed the following as characteristics of a neighborhood experiencing abandonment.2/

> A concentration of low-income nonupwardly-mobile families; large families and a high percentage of young people; an old housing stock and a high percentage of substandard buildings; a preponderance of rental properties and multiunit buildings which are suffering from long periods of deferred maintenance; a declining rate of homeownership; strongly antisocial tenant attitudes; minimal public services; a high or increasing vacancy rate; and, despite the high vacancy rate, overcrowding within occupied units.

Appendix D lists characteristics of deteriorating neighborhoods found in several case studies of housing abandonment and urban blight. These studies support the hypothesis that urban blight and substandard housing are related to the socioeconomic characteristics of the population.3/

1/ Marcuse, Peter. "Social Indicators and Housing Policy," Urban Affairs Quarterly, December, 1974, p. 199 and p. 209.

2/ U.S. Department of housing and Urban Development. Abandoned Housing Research: A Compendium. Washington, D.C., 1973, p. 8.

3/ For example, see the studies by Arthur D. Little Inc. (1973), York County Planning Commission (1973), National Urban League (1971), Sternlieb (1973), Bryce (1973), and Linton, Mields, and Coston, Inc. (1971).

Need Indicators. The variables listed below were selected for use in the factor analysis. Each variable is either a direct indicator of community development need or a socioeconomic variable found to be associated with urban blight and substandard housing. All variables will be expressed in either percentage or per capita terms. This important point is emphasized by starting each variable abbreviation with the letter P, e.g. P65AGED for the percentage of the total population that is over 65.

In essence, we included almost every data element available from the 1970 Census which relates directly or as a proxy to community development need, the only exception being closely related variables whose inclusion would be repetitive such as percentage of the housing stock built before 1949. Our efforts to encompass fully the concept of community development need is limited to the extent to which the 1970 Census collected and reported data related to community development need. Other data sources were investigated but were not chosen because of lack of currency, non-uniform definition across cities, or limited availability with respect to the 522 entitlement cities.

The variables, their abbreviations, and rationales for their selection are as follows:4/

(1) Persons aged 65 and over: P65AGED

A subpopulation that has special needs for transportation, housing, recreation, and health care.

(2) Crime rate: PCRIME

A factor associated with urban blight and limited economic opportunities.

(3) Nonwhite population: PNW

In practically all studies reviewed, abandonment and urban blight were found to be concentrated in low-income, nonwhite, inner-city neighborhoods. The non-white population is associated with high crime rates, overcrowded housing, a high degree of infant mortality, welfare dependency, substandard housing, and high rates of unemployment. In the Annual Housing Survey, nonwhites reported a higher incidence of deteriorating housing. It is possible that more sensitive indicators of urban blight and neighborhood instability could be obtained by also using

4/ See Ross, op. cit., pp. 22-23 and Schmid, op. cit., pp. 35-49 for a similar discussion.

as inputs into the factor analysis the nonwhite percentages for the variables listed below. It should be emphasized that statistical association does not imply casuality for this or any of the other surrogates.

(4) Persons over 25 years of age with less than a high school education: PWOHSED

A subpopulation that is characterized by a high crime rate, unemployment, and social problems. Also, a group that is prone to live in declining neighborhoods and is heavily dependent on public support.

(5) Female-headed families below poverty level: PFEMALHP

An indicator of the need for day care centers and a factor associated with neighborhood instability and substandard housing.

(6) Poor persons under 18: PYUTHPOV

See (5) and (7).

(7) Persons below poverty level: PPOORPER

A subpopulation that relies on city governments for basic necessities such as housing, health care, recreational areas, and other public services. Also, a socioeconomic factor associated with substandard housing, urban blight, neighborhood instability, and housing abandonment.

(8) Housing units lacking one or more plumbing facilities: PWOPLUMB

A measure of the physical state of housing units.

(9) Occupied housing units with more than 1.01 persons per room (overcrowding): POCRWD

An indicator of (1) disposal and santitation problems, (2) a high demand for recreational facilities, (3) density of the population, and (4) excess demand for housing.

(10) Unemployed persons: PUNEMP75

An indicator of the economic stability and opportunity in a community.

(11) Housing units built before 1939: PAGE1939

An indicator of substandard housing and a proxy for government repair and maintenance costs of older sanitation facilities and sewage lines. The age of the housing stock is a factor associated with housing abandonment.

(12) Persons per square mile: DENSITY

A measure of population density, a factor associated with urban blight and high crime rates. The more dense the population the more intense will be the use of waste and sanitation facilities and the more difficult the disposal problem. As a general rule, the importance of externality effects increases with population density. For example, density is associated with environmental stress factors such as street noise and heavy street traffic. City expenditure studies indicate that density has a significant, positive effect on per capita expenditures.

(13) Owner-occupied houses: POWNOCCH

An inverse indicator of CD need. Rental properties characterize those inner city neighborhoods experiencing the greatest amount of substandard housing and housing abandonment. In fact, studies indicate that single-family home-ownership may be the strongest barrier to housing abandonment and neighborhood decline.

The main problem with using the above variables is that we must rely primarily on 1970 Census Bureau data, which are continually becoming more out-of-date. However, there are reasons why use of 1970 data may not overly distort the analysis. First, most of the variables are expressed in either percentage or per capita terms, thereby possibly reducing the distortive effects caused by recent absolute or total changes. Second, the needs index to be constructed is a relative index, which means that use of 1970 data would lead to inaccurate results only if recent population movements have caused significant changes in the relative positions of cities. Finally, the conditions (urban blight, abandoned housing) that the factor analysis attempts to identify can be significantly altered only by large changes in (1) public funds for urban renewal, rehabilitation, and new low-income housing construction, (2) the level of employment and income in ghetto areas, and (3) the composition of the inner-city population. We think that changes of the magnitude required are unlikely to have occurred in the period since 1970. Based on the arguments given in this paragraph, we assume that the ranking of cities using 1970 Census Bureau data gives us a reasonable approximation to conditions as they exist today.

Relative vs Absolute Need. The relative nature of the needs indicators should be clearly understood. The following example should be helpful. For each of the 435 cities we know the percentage of the population that is poor. We also know that a poverty population is related to community development need and that the greater the percentage of poor persons the greater the need. However, we do not know the exact relationship between a poverty population and community development need. Is there a minimum threshold? For example, if the poverty population is below 10% of the total population is any community development need generated? We do not know the answer to this or many similar questions. Therefore, we define need in terms of the average. All the need variables are normalized, that is, expressed as standard deviations around the mean for that variable. As a result our approach assumes that any poverty population represents a need and the severity of that need is measured by the closeness or farness of the percentage of poor persons in a city around the average for the 435 cities.

Need Indicator Correlations. Tables 4.1 and 4.2 show how the thirteen need variables are correlated both among themselves (Table 4.1) and with ten other socioeconomic variables (Table 4.2) for the 435 entitlement cities analyzed below in the factor analysis. As expected, the percentage of population in poverty (PPOORPER) is highly correlated with percentage nonwhite (PNW, 0.73), percent of houses overcrowded (POCRWD, 0.59), percent of houses without plumbing (PWOPLUMB, 0.67), per capita income (PCINC72,-0.62), and median family income (MEDINC, -0.84). One rather surprising result in Table 4.1 is the low correlations between the percentage of housing units built before 1939 (PAGE1939) and the poverty (PPOORPER, 0.12; PFEMALHP, 0.17) and housing-condition (PWOPLUMB, 0.33; POCRWD,-0.21) variables. Variables with a correlation above .50 with age of housing stock include percentage of population over 65 (P65AGED, 0.63), percentage of population over age 25 without a high school education (PWOHSED, 0.51), and percentage of housing units in multi-unit structures (PMULTI, 0.59). As shown in Table 4.1, the correlation between density and the age-of-housing-stock variable (PAGE1939) is less than .50 (0.41); as expected, density is correlated with percentage of housing units owner-occupied (POWNOCCH, -0.54) and percentage of housing units in multi-unit structures (PMULTI, 0.61).

As shown in Chapter 5, the low correlations of poverty with age of housing stock (0.12) and density (-0.04) result in low correlations between the per capita fund distribution under the present formula, which gives a double weight to poverty, and these two indicators of CD need. On the other hand, from the remaining correlation coefficients shown in Tables 4.1 and 4.2, we do expect the per capita distribution under the present formula to be highly correlated with PNW, PFEMALHP, PYUTHPOV, POCRWD, PWOPLUMB, PCINC72 (negative), MEDINC (negative), PPOORFAM, and POVAGE65.

As shown in Appendix E and Table 4.3, the correlation coefficients for several need variables change depending on the population group being considered. Especially interesting are the correlations for PAGE1939, DENSITY, and PPOORPER reported in Table 4.3. The correlation between DENSITY and PAGE1939 increases from .41 for all 435 cities to

Table 4.1 Correlations Among Need Variables, 435 Entitlement Cities

	P65AGED	PCRIME	PNW	PWOHSED	PFEMALHP	PYUTHPOV	PPOORPER	POCRWD	PWOPLUMB	PUNEMP75	PAGE1939	DENSITY	POWNOCCH
P65AGED	1.0000	.1489	-.0395	.3389	.1397	.0210	.1909	-.2904	.2292	.2044	.6396	.2297	-.2840
PCRIME	.1489	1.0000	.5188	.1685	.4164	.2792	.2836	.1654	.0123	.3040	.0420	.2068	-.3724
PNW	-.0395	.5188	1.0000	.4057	.7707	.8091	.7351	.7016	.3963	.1522	-.1039	.0875	-.2853
PWOHSED	.3389	.1685	.4057	1.0000	.5423	.5014	.4696	.3924	.4397	.3910	.5194	.2452	-.2089
PFEMALHP	.1397	.4164	.7707	.5423	1.0000	.9062	.8955	.5073	.5471	.2149	.1746	.0330	-.3358
PYUTHPOV	.0210	.2792	.8091	.5014	.9062	1.0000	.9478	.7135	.6278	.1673	.0081	-.0630	-.1893
PPOORPER	.1909	.2836	.7351	.4696	.8955	.9478	1.0000	.5928	.6716	.1474	.1253	-.0437	-.2816
POCRWD	-.2904	.1654	.7016	.3924	.5073	.7135	.5928	1.0000	.4672	.1550	-.2188	-.0244	-.0196
PWOPLUMB	.2292	.0123	.3963	.4397	.5471	.6278	.6716	.4672	1.0000	.1252	.3344	.0198	-.1895
PUNEMP75	.2044	.3040	.1522	.3910	.2149	.1673	.1474	.1550	.1252	1.0000	.2948	.2392	-.1256
PAGE1939	.6396	.0420	-.1039	.5194	.1746	.0081	.1253	-.2188	.3344	.2948	1.0000	.4171	-.4000
DENSITY	.2297	.2068	.0875	.2452	.0330	-.0630	-.0437	-.0244	.0198	.2392	.4171	1.0000	-.5415
POWNOCCH	-.2840	-.3724	-.2853	-.2089	-.3358	-.1893	-.2816	-.0196	-.1895	-.1256	-.4000	-.5415	1.0000

Variable Definitions for Tables 4.1 and 4.2

P65AGED	percent of population over 65
PCRIME	crimes per capita
PNW	percent of population nonwhite (Negro and Spanish)
PFEMALHP	percent of families with a poor, female head
PYUTHPOV	percent of population poor and under 18
PPOORPER	percent of population with incomes below the poverty level
PWOPLUMB	percent of occupied houses without plumbing
PUNEMP75	unemployment rate, 1975
POCRWD	percent of occupied houses with 1.01 or more persons per room
PAGE1939	percent of housing units built before 1939
POWNOCCH	percent of houses occupied by owner
DENSITY	population per square mile
POP	population
PCINC72	per capita income, 1972
MEDINC	median family income, 1970
PPOORFAM	percent of families with incomes below the poverty level
POVAGE65	percent of population over 65 and poor
POLDSTR(PAGE1949)	percent of housing units built before 1949
PNEWSTR	percent of housing units built after 1960
PNEW	annual average, 1965-1970, of new private housing units authorized by building permits as a percentage of occupied housing
PMULTI	percent of occupied housing units in multi-unit structures
PMFG	percent of workers employed by manufacturing industry
PWOHSED	percent of population over 25 with less than a high school education

Table 4.2 Correlations Among Selected Variables, 435 Entitlement Cities

	POP	PCINC73	MEDINC	PPOORFAM	POVAGE65	POLDSTR	PNEWSTR	PNEW	PMULTI	PMFG
P65AGED	.0344	.0261	-.3150	.1086	.7789	.6444	-.5738	-.3867	.3917	.0156
PCRIME	.2252	.0078	-.1555	.2599	.1381	.1031	-.1202	-.0862	.1932	-.1343
PNW	.1893	-.3411	-.5026	.7541	.2196	.0202	-.0943	-.1250	-.0447	-.2326
PWOHSED	.0898	-.5521	-.5790	.4759	.5558	.5763	-.5907	-.4284	.2077	.4350
PFEMALHP	.1173	-.5717	-.7555	.9037	.5171	.2905	-.3063	-.2728	.0252	-.2327
PYUTHPOV	.0833	-.6139	-.7586	.9695	.4413	.1320	-.1851	-.1835	-.1267	-.2799
PPOORPER	.0703	-.6269	-.8439	.9836	.6080	.2488	-.2715	-.2299	-.0469	-.3591
POCRWD	.0729	-.5092	-.4380	.6544	.0404	-.1351	.0257	-.0089	-.1672	-.0792
PWOPLUMB	-.0109	-.4607	-.5527	.6470	.4968	.3892	-.3550	-.2313	.0806	-.0838
PUNEMP75	.0437	-.1859	-.1236	.1544	.1857	.2953	-.2679	-.1763	.2122	.3109
PAGE1939	.0791	-.2244	-.2650	.0531	.5706	.9593	-.8274	-.6141	.5912	.3223
DENSITY	.3255	.1216	.0612	-.0657	.0706	.3876	-.3455	-.3309	.6191	.1914
POWNOCCH	-.2102	-.0031	.2697	-.2400	-.2333	-.4126	.3041	.2930	-.8240	.1203

Table 4.3: Correlation Coefficients Between (1) Percentage of Housing Units Built before 1939 (PAGE1939), DENSITY, and (2) Selected Need Variables by Population Size

Population Size (in thousands)		25-50	50-75	75-100	100-250	250-500	500-1250	500+
Number of Cities	435	72	140	72	94	31	21	26
<u>PAGE1939 correlated with</u>								
DENSITY	.41	.48	.37	.36	.50	.70	.78	.71
POWNOCCH	-.40	-.22	-.39	-.39	-.47	-.48	-.66	-.52
PUNEMP75	.29	.02	.26	.36	.38	.49	.54	.44
PPOORPER	.12	-.04	.10	.30	.20	-.09	.13	.12
<u>Density Correlated with</u>								
PAGE1939	.41	.48	.37	.36	.50	.70	.78	.71
POWNOCCH	-.54	-.48	-.47	-.57	-.58	-.83	-.82	-.70
PUNEMP75	.23	-.16	.16	.25	.44	.58	.45	.36
PPOORPER	-.04	.00	-.10	-.05	.00	.18	.07	.01

.71 for cities above 500,000 population, thereby becoming more consistent with the notion that "older, declining" cities are characterized by both an aged housing stock and a high population density. However, over all population groups, poverty continues to exhibit low correlations with both density and aged housing. This is surprising given the higher correlations of percent unemployed with both density and age of housing at higher population levels; as discussed in Chapter 8, a low correlation between poverty and density may result from our not considering city variations in the cost of living when computing the poverty income level.

Regional Distribution of Need Variables. Table 4.4 provides a regional breakdown of percentages and per capita amounts for thirteen of the variables discussed above. Interesting aspects of Table 4.4 include (1) the high percentage of poor persons in the South (17.3), (2) the high percentage of houses built before 1939 in both the Northeast (66.9) and North Central (54.2) regions, and (3) the low percentage of home ownership in the Northeast (36.8). These percentages suggest that the South would suffer a per capita loss at the expense of the Northeast and North Central regions with a switch from the present formula to a formula with a decreased poverty weight and an age-of-housing-stock variable.

Factor Analysis of Community Development Needs

Devising a relative needs index for each of the need variables is possible but the large number of variables would result in complicated analysis. Therefore, factor analysis was used to reduce the need variables to five factors, each factor reflecting a different dimension of community development need. For each of the 435 cities, factor analysis creates a factor score for each of these five dimensions of CD need; these factor scores are interpreted as per capita need scores. In Chapters 5 and 6, in order to determine whether or not a given formula distributes funds according to a particular dimension of CD need, we correlate each set of factor scores with the per capita fund distributions of hold harmless, the present formula, and several alternative formulas. Regression analysis is also used to describe the sensitivity of the different formulas including hold harmless to the various need concepts.

Varimax Rotated Factor Matrix5/. In this section, we explain the varimax matrix that was the solution of a R-type factor analysis on the thirteen need variables. An orthogonal rotation method was used in order to obtain simple and meaningful factor patterns. The factors described below are linear combinations of the need variables and reveal relationships which cannot be easily seen from an examination of the

5/ This section is based on Chapter 17, Statistical Package for the Social Sciences, pp. 208-244.

Table 4.4: Regional Distribution of Need Variables[a]

	Northeast[b]	North Central	South	West
P65AGED	12.26%	10.47%	9.31%	9.57%
PNW	24.02	22.25	34.30	21.75
PWOHSED[c]	52.89	43.58	48.42	34.69
PFEMALHP	5.03	4.27	5.88	3.70
PYUTHPOV	5.25	4.55	7.28	3.98
PPOORPER	13.58	11.84	17.30	11.69
PWOPLUMB	2.84	3.02	2.86	1.96
POCRWD	7.88	7.45	9.58	6.99
PAGE1939	66.94	54.20	29.17	29.24
POWNOCCH	36.86	55.20	54.94	51.76
PPOORFAM	10.39	8.67	13.63	8.31
POVAGE65	2.68	2.33	2.57	1.79
MEDINC[c]	$9795.	$10636.	$8543.	$10755.

a. Except for PAGE1939 (443), data base consisted of 449 entitlement cities.

b. The list of states within each region follows. Northeast: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania. North Central: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas. South: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas. West: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, and Hawaii. Source is City and County Data Book 1972.

c. Unweighted average.

variables in their original form. The varimax rotated factor matrix in Table 4.5 shows five factors, each factor delineating a separate group of highly intercorrelated variables. We initially retained all six factors with an eigenvalue greater than .5. However, the sixth factor had very low coefficients and did not clearly describe a dimension of CD need; therefore, we reran the factor analysis retaining only five factors. The five factors explain 79 percent of the common variance in the thirteen need variables. The coefficients in Table 4.5 are called "factor loadings" and they can be examined to determine which need variables are critical to the definition of a factor.

Factor loadings represent correlation coefficients between factors (presented in the columns) and need variables (presented in the rows). For example, the correlation between FACTOR 1 and percent of poor persons (PPOORPER) is .97789. An estimate of the correlation between any pair of need variables can be derived from Table 4.5 by first multiplying the two variable loadings for each factor and next, summing the five results. Using this method, it is easy to see how the high correlation between, for example, DENSITY and POWNOCCH is mainly due to FACTOR 3. On the other hand, the correlation between DENSITY and PYUTHPOV should be relatively small because these two variables do not load highly on the same factor. This correlation interpretation of the factor loadings suggests how different variables can be used to define the different factors. As we will explain below, the high correlations between the poverty (PPOORPER, PFEMALHP, PYUTHPOV, PNW) and housing-condition (POCRWD, PWOPLUMB) variables and FACTOR 1 will establish FACTOR 1 as the "poverty and housing" factor. All we are saying is that as evidenced by their high correlations with FACTOR 1, these variables tend to "move together" as a group, separate from those variables (e.g., DENSITY, PAGE1939) that define the remaining factors.

Factor loadings in a given row also represent regression coefficients of factors with respect to a given need variable. Under this interpretation, PPOORPER after normalization would equal

$$(.97789 \times \text{FACTOR } 1) + \ldots\ldots\ldots + (-.0744 \times \text{FACTOR } 5)$$

It is obvious that the most important determinant of PPOORPER is FACTOR 1. The importance of a given factor for a given need variable can be also expressed in terms of the variance in the need variable that can be accounted for by the factor. The variance of PPOORPER accounted for by FACTOR 1 is equal to $(.97789)^2$, or .95626. The proportion of the variance in PPOORPER accounted for by all five factors is equal the sum of the squared loadings and is referred to as the communality of the variable.

In a similar manner, the coefficients in a given column show the contribution of each need variable to each factor. In this case the most important determinants of FACTOR 1 are PYUTHPOV (.97839), PPOORPER (.97789), PFEMALHP (.85808), PNW (.73808), POCRWD (.67983), PWOHSED (.49895), and PWOPLUMB (.49196). This pattern establishes FACTOR 1 as

Table 4.5 Varimax Rotated Factor Matrix

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
P65AGED	.00607	.72651	.17345	.15086	-.04685
PCRIME	.24849	.03422	.41850	.66353	-.14422
PNW	.73808	-.21502	.26464	.39479	.13491
PWOHSED	.49895	.36803	.14246	.20958	.55949
PFEMALHP	.85808	.16137	.13421	.26656	.03951
PYUTHPOV	.97839	-.03145	.03796	.08974	.10629
PPOORPER	.97789	.15975	.05076	.05838	-.07441
POCRWD	.67983	-.36119	.22732	.01618	.30346
PWOPLUMB	.49196	.34992	-.02282	-.13792	.07458
PUNEMP75	.06349	.28548	.04350	.55519	.25056
PAGE1939	.04873	.84632	.33580	.12768	.27763
DENSITY	.00835	.23460	.79343	.20391	.23900
POWNOCCH	-.21492	-.21023	-.88562	-.09692	.07949

the poverty-and-housing dimension of community development need. We will refer to it simply as the poverty dimension of CD need.

From the above discussion and from the loadings in Table 4.5, it should be obvious that DENSITY and POWNOCCH are both highly correlated with FACTOR 3, that FACTOR 3 is the most important determinant of both these variables, and that DENSITY and POWNOCCH are the most important determinants of FACTOR 3. We therefore refer to FACTOR 3 as the density dimension of CD need. The following table defines each dimension of CD need in terms of need indicators with high loadings.

	Dimension	Need Variables Defining Dimension
FACTOR 1	Poverty	Poverty variables (PYUTHPOV, PPOORPER, PFEMALHP, PNW), percent of overcrowded houses, percent of houses without plumbing.
FACTOR 2	Age of Housing Stock	Percent of houses built before 1939, percent of population aged over 65
FACTOR 3	Density	Percent of owner-occupied houses (negative), population per square mile.
FACTOR 4	Crime and Unemployment	Crime rate, percent unemployed
FACTOR 5	Lack of Economic Opportunity	Percent of population without a high school education

Per Capita Need Scores. After the rotation matrix is obtained and the number of factors (dimensions) determined, the factor analysis will produce factor scores for each of the 435 cities. Since the need variables were input into the factor analysis in percentage terms, we interpret these scores as per capita need scores. In other words, each city receives a per capita need score for each of the five dimensions of community development need.

Factor scores for each city are calculated from the factor-score coefficients presented in Table 4.6. These factor-score coefficients are derived from the factor loadings in Table 4.5 by a method that eliminates double counting of need variables that are highly correlated. For example, in Table 4.6, we see that only PPOORPER and PYUTHPOV retain high coefficients for FACTOR 1. This means that these two variables are good proxies for the remaining need variables (PFEMALHP, PNW, POCRWD, PWOPLUMB) that had high loadings on FACTOR 1 in Table 4.5.

Table 4.6 Factor Score Coefficients

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
P65AGED	-.07051	.05641	-.02880	.12577	.05660
PCRIME	-.00205	.03938	-.03525	.50643	-.19892
PNW	.03036	-.31636	.11413	.41983	.05145
PWOHSED	.00033	.03669	-.03735	.05902	.37999
PFEMALHP	-.28183	-.07664	-.10813	.60749	-.03616
PYUTHPOV	.57220	-.61560	-.01243	-.40246	1.17065
PPOORPER	.67350	.99459	-.16380	-.44423	-1.57074
POCRWD	.01016	-.09126	.06383	-.12357	.41081
PWOPLUMB	-.03689	-.06709	.01156	.00492	.02811
PUNEMP75	-.01109	.01165	-.05314	.25234	.03178
PAGE1939	.08053	.82444	-.08313	-.18833	.35040
DENSITY	-.12459	-.11643	.31096	.09757	.20294
POWNOCCH	-.06387	.11797	-.76634	.36916	.36383

The factor score coefficients are a means of clarifying the factors by eliminating repetitive information.6/

Computing a factor score for a particular city with respect to, for example, FACTOR 1 requires two steps: (1) multiply each of the city's need variables (in normalized form) by the corresponding coefficient in the first column of Table 4.6, and (2) add the thirteen results obtained in step (1). Appendix F list the 435 cities and their scores on each of the five dimensions of CD need. In general, a city will receive a high score on a particular factor (dimension) if the city has a high percentage or per capita amount for each of those need variables that define the particular factor. For example, Birmingham (case 1) receives a high score on the poverty dimension, Cambridge (case 190) on the age-of-housing-stock dimension, and New York City (case 282) on the density dimension.7/

6/ Schmid, op. cit. p. 76.

7/ One problem with using factor scores as per capita need scores is that there may be a few cases where rankings based on factor scores are not consistent with rankings based on the need indicators that define a factor. An example of this occurred in the factor analysis conducted in Appendix H, which gave each city an equal weight of one. New York City, which has an above average percentage (62.13) of pre-1939 houses, received a below average score (-.46, see case 282 in Table H.3, Appendix H) on the age of housing dimension (FACTOR 2). This arises because the second factor reflects the average on all measures associated with aged housing. As shown by the Varimax Rotated Matrix in Appendix H (Table H.1), the average city with a high percent of pre-1939 houses also tends to have an above average percentage of aged persons (P65AGED, .71427 loading) and a below average percentage of overcrowded houses (POCRWD, -.54226 loading). In other words, a city scores high on FACTOR 2 if it has high rankings on PAGE1939 and P65AGED and a low ranking on POCRWD. Such is not the case for New York City. The FACTOR 2 score for New York City is decreased to a below average level of -.46 by its above average percentage for over-crowded housing (POCRWD, 9.9 percent). The fact that cities with high percentages of pre-1939 houses also tend to have low percentages of over-crowded houses is suggested by the regional distribution of need variables given in Table 4.4. Cities in the Northeast show an above average percentage of pre-1939 houses (66.94) but a below average percentage of overcrowded houses (7.88). This negative effect of POCRWD on the FACTOR 2 score is inconsistent with our designation of POCRWD as a need indicator; however, POCRWD does have a positive effect on each of the scores for the remaining factors. In addition, as indicated by a high correlation of PAGE1939 with the FACTOR 2 index scores, the inconsistency between rankings on FACTOR 2 and ranking on its key variable (PAGE1939) probably occurs in only a few cases. For a similar discussion, see Keeler (1973), p.8.

Weighting the Factor Scores. To construct a single index of community development need, it is necessary to weight each factor by its estimated importance. One study determined the importance of the factors statistically, weighting each factor by the proportional variance explained by that factor.8/ The proportion of common variance accounted for by each of our five factors can be easily computed from the coefficients given in Table 4.5. First we calculate the total amount of common variance accounted for by each factor by adding the square of the coefficients in each column of Table 4.5. Doing this for the first factor, we obtain 4.258. We next divide this amount by the variance accounted for by all common factors. Recall that the total variance of a variable accounted for by the combination of all five factors is equal to the sum of the variable's squared factor loadings; this sum is referred to as the communality of the variable. To obtain the variance accounted for by all factors, we add up the thirteen communalities. This procedure is equivalent to summing all the squared loadings in Table 4.5; this sum is equal to 9.863. The proportion of common variance explained by the first factor is therefore equal to 43 percent (4.258/9.863). The remaining proportions of explained variance are as follows: FACTOR1(43), FACTOR2(20), FACTOR3(19), FACTOR4(11), and FACTOR5(7). According to this weighting system, poverty is the most important dimension of community development need.

There are reasons why the amount of variance explained by a factor should not be used to determine its importance.9/ The factor solution given by the varimax rotated matrix in Table 4.5 was not obtained by extracting factors in the order of their importance. An initial unrotated factor solution (not presented) extracted orthogonal factors in the order of their importance. However, these unrotated factors did not give us a clear indication of which variables tend to "move together". To obtain a more meaningful patterning or clustering of variables, it was necessary to rotate this initial factor solution. In our case, the varimax rotation method, which assumes a fixed amount of common variance (79 percent) and a fixed number of factors(5), was used to simplify the columns of the factor matrix. In the extreme, a simple factor is defined as one with 1's and 0's in a column.10/

A second reason the amount of explained variance should not be used to determine the importance of each factor is that the input variables can be selected to overrepresent a certain factor or dimension.

8/ See Ross (1975).

9/ This paragraph based on SPSS, op. cit.

10/SPSS, op. cit.

The importance of a factor in a rotated solution (Table 4.5) often reflects only the number of variables defining a given factor relative to the total number of variables.11/ For example, in our case, if we would continue to input into the factor analysis variables such as PPOORFAM, MEDINC, and POVAGE65 that are highly correlated with the poverty variables already included in the data, the importance, in terms of explained variance, of the first factor would necessarily increase because the first factor itself is highly correlated with the included poverty variables and therefore would be highly correlated with these added poverty variables. In other words, each additional poverty variable, and its variance, can be explained by the poverty factor, which then increases the apparent importance of the poverty dimension; this is, of course, not a significant discovery.12/ However, the fact that the poverty factor does not explain PAGE1939 and DENSITY is a significant discovery. With respect to these two dimensions of CD need, additional factor runs indicated that including PMULTI and tax effort as input variables would increase the amount of variance explained by the density factor, and including PNEWSTR, PAGE1949, and percentage change in population (negative loading) would increase that explained by the age of housing dimension. We tried several factor runs using different combinations of variables. In most cases, and especially with respect to the first three factors, the factors and their interpretations were quite similar to those given in Table 4.5.

Because we cannot justify the exact number and types of CD need indicators to input into the factor analysis, we will not determine the importance of each factor statistically by weighting according to explained variance. In final analysis, the question of factor weights rests with the policy maker, not the statistician.13/

Total Need Score

Given the difficulty of objectively determining the relative importance of each factor, we conduct most of the correlation and regression analysis in terms of the five dimensions of CD need. However, because a total need score can neatly summarize the responsiveness of alternative formulas to CD need, and because we wanted to evaluate alternative formulas using a total evaluation index that combines need with fiscal capacity and tax effort, we decided to assign weights to the factors and

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11/ This paragraph based on Keeler (1973), pp. 48-49.

12/ Keeler, E. and Rogers, W. <u>A Classification of Large American Urban Areas</u>, NSF, May, 1973, p. 48.

13/ Schmid (1975), p. 77.

thereby compute a composite need score for each city. Although we do not attempt to provide a detailed justification for each factor weight, the weights are not entirely arbitrary. Our approach has been to weight each factor based on our perceptions of the importance of the group of variables that define that factor. Given the legislative emphasis placed on directing funds to areas with high concentrations of low income persons, we gave the highest weight to FACTOR 1 (.35), which reflects the poverty dimension of community development need. In addition to poverty variables such as female-headed households, nonwhite population, and poor persons under 18, this factor was also defined by two housing condition variables--overcrowded housing and housing without plumbing. This factor reflects many of the social, economic, and housing problems that arise from concentrations of persons of lower income in our larger cities; therefore, it receives the highest weight in our definition of community development need.

The next highest weight was assigned to the age of housing dimension (.25), which reflects the physical dimension of CD need. Age of housing is a factor associated with housing abandonment in our older declining cities and is also a proxy for both government repair costs of sanitation facilities and housing maintenance costs.

Of the remaining three factors, we gave the density dimension the highest weight (.20). We think the two density variables (population per square mile and lack of home ownership) can be used to measure the extent of important "neighborhood effect" externalities, which are likely to be especially significant in slum and blighted areas. One major goal of the CDBG program is the elimination of slums and blight. The problem of blight results from the existence of externalities--the influence of the neighborhood.14/ The housing consumed by a household consists not only in occupancy of a specific dwelling but on the character of dwellings in the neighborhood, together with their state of maintenance-repair. Each owner of property comprising the neighborhood obtains the highest return if his property is undermaintained while all or most others are well maintained. He obtains the least return if his property is well maintained while all or most others are poorly maintained. Each owner therefore has an incentive to let his property be undermaintained while others maintain their property well. The very generality of this incentive means that it cannot be realized and all property will tend to be undermaintained. This is one respect in which slums, or low income housing, may represent suboptimal resource use; strictly individual action does not result in redevelopment. Rental properties characterize those inner city neighborhoods experiencing the greatest amount of housing abandonment. Studies indicate that single-family home-ownership may be the strongest barrier to housing abandonment and neighborhood decline. Across cities, the extence of situations of undermaintenance and housing abandonment will

14/ This discussion is based on Rotherberg (1967).

increase with the increase in neighborhoods of low income persons living in substandard houses. In our needs methodology, we are assuming that the two density variables will provide us with a relative measure of this effect. In addition, we think that a number of social ills that slums are alleged to generate will increase with population and housing density. These include: (1) fire hazards, (2) health problems, (3) crime, and (4) individual personality problems. In terms of the other need indicators, we are saying that for given levels of, for example, female-headed households, poor persons under 18, unemployment, and nonwhite population, community development problems (and need) will increase with higher levels of population and housing density.

A higher level of population and housing density also means that sanitation facilities will be used more intensively, thereby increasing government costs. A review of several city expenditure studies indicated that density exhibits a significant, positive effect on per capita city expenditures.

Relative to the poverty, age of housing, and density dimensions, the remaining two dimensions--crime and unemployment, lack of economic opportunity--receive low weights. Giving these two factors an equal weight of .10, the total need score (NEED) is computed for each city as follows: NEED =+.35 FACTOR 1 + .25 FACTOR = + .20 FACTOR 3 + .10 FACTOR 4 + .10 FACTOR 5.

Changes in correlations between formula allocations and total CD need that would result from using different weight assignments can probably be estimated fairly accurately from the individual factor correlations. For example, if the present formula shows a high positive correlation with both FACTOR 1 and FACTOR 2 and a zero correlation with each of the remaining three factors, then decreasing the weight of the first two factors in the definition of total need would result in a lower correlation of the present formula with total need, especially when compared to those formula alternatives that show high correlations with FACTOR 3, FACTOR 4, and FACTOR 5.

Chapter 5

HOLD HARMLESS, THE PRESENT CDBG FORMULA, AND COMMUNITY DEVELOPMENT NEED

The basic purpose of this chapter is to evaluate and compare hold harmless and the present formula in terms of the need scores and need variables discussed in the last chapter. Chapter 5 is divided into five sections. In section one, we compare the categorical and formula distributions by describing the changes in relative shares by type of recipient and by population size. In section two, we show the regional breakdown of funds under both hold harmless and the existing formula and, in section three, we analyze gainers and losers in terms of their average need variables. For our purposes, a gainer (loser) is defined as an entitlement city with a hold harmless amount less (greater) than its full formula amount. Section four contains the most important analysis, a correlation and regression analysis of the two per capita fund distributions with both per capita need scores and need variables. Section five provides a summary and lists our conclusions with respect to hold harmless and the existing formula.

The main conclusions of this chapter, which are derived in section four, are (1) hold harmless is not responsive to need as defined in this study and (2) the existing formula is highly responsive to the poverty dimension but is not responsive to the other dimensions of CD need.

Hold Harmless Data

In this and later chapters the hold harmless amounts currently received by cities which qualify for entitlement shares are used in the analysis for two related purposes. First, the hold harmless amounts are used as typical of the distribution of funds under a discretionary approach to program funding. Under this assumption we compare the discretionary approach to the formula approach with respect to funding equity. Second, the hold harmless amounts are analyzed as one option for a community development block grant funding mechanism, that is, each city should receive what it received in the past. The advantages and disadvantages of hold harmless funding are naturally the same in both cases because the data are the same.

As discussed above, we use the distribution of hold harmless amounts in fiscal year 1976 to approximate the distribution under the displaced categorical programs. Such a procedure introduces some error into our analysis. To become eligible to receive a hold harmless amount, a city had to participate in one or more urban renewal projects, code enforcement programs, neighborhood development programs, or model city programs. Those non-entitlement cities, in both SMSA's and non-SMSA's, that participated in only water and sewer (WS), open space (OS), or neighborhood facilities (NF) are not being held harmless, and are not included in our data file. By not including these cities, our hold harmless data therefore understates the average amounts allocated under the categorical program.

Table 5.1 Comparison of Hold Harmless Distribution with Present Formula Distribution by Type of Recipient, Fiscal Year 1976

	(1) Hold Harmless (per capita)	(2) Hold Harmless % Share	(3) a UR/NDP % Share	(4) Model Cities % Share	(5)b Other Categorical % Share	(6) c Formula per capita	(7) Formula % Share	(8) Change in Share (7) - (2)	(9) % of Population
SMSA	$12.25	87.5%	84.7%	95.4%	89.0%	$13.67	80.%	- 7.5%	72.4%
Entitlement Cities(515)	19.67	74.0	70.3	84.8	73.0	15.33	47.	-27.0	38.1
Central Cities(363)	21.70	69.6	65.6	82.6	65.1	16.09	42.	-27.6	32.5
Non Central Cities(152)	7.95	4.4	4.7	2.2	7.9	10.94	5.	+ .6	5.1
Remainder of SMSA	4.01	13.5	14.4	10.6	16.0	11.83	33.	+19.5	34.3
Non-SMSA	4.60	12.5	15.3	4.6	11.0	9.20	20.	+ 7.5	27.5
U S	$10.75	100%	100%	100%	100%	$13.44	100%	0.0%	100%

a. NDP is the abbreviation for Neighborhood Development Program

b. "Other Categorical" grants include (1) water and sewer, (2) open space, (3) rehabilitation, (4) neighborhood facilities, and (5) public faulty loans

c. Based on FY76 SMSA appropriation of $2,077,600.

In the analysis below, we divide hold harmless amounts into three categories: (1) urban renewal (UR) and neighborhood development programs (NDP); (2) model cities (MC); and (3) other categoricals. For the first two categories given above (UR/NDP, MC), only very small differences exist between our hold harmless amounts and the actual categorical averages. The main discrepancies occur in the third category, which includes water and sewer, open space, and neighborhood facilities. Our estimates of these discrepancies, in both per capita dollar and percentage terms, are as follows:

	Actual Categorical Allocation	Hold Harmless Data
Other Category		
(a) SMSA	$ 1.74 (78.5%)	$ 1.25 (89. %)
(b) Non-SMSA	$ 1.26 (21.5%)	$ .43 (11. %)
(c) Total	$ 1.62 (100.%)	$ 1.03 (100.%)
Total		
(a) SMSA	$12.74 (86.1%)	$12.25 (87.5%)
(b) Non-SMSA	$ 5.43 (13.9%)	$ 4.60 (12.5%)
(c) Total	$10.74 (100.%)	$10.15 (100.%)

In the "other category", the discrepancies in percentage terms are rather large; however, because this category accounted for such a small proportion of categorical funds (15 percent), the "Total" figures are not greatly affected. The SMSA share of "Total" funds is reduced by only 1.4 percentage points, from 87.5 to 86.1 percent.

There are two reasons why we use the hold harmless amounts instead of the actual categorical averages. First, the categorical data were not readily available in a form suitable for computing averages by city size and by region. Second, as discussed above, not phasing out hold harmless is frequently mentioned as an alternative to the present system and therefore we would like our data set to be consistent with that alternative. For these two reasons and because the distortion seems to be rather small, we have conducted our analysis using hold harmless amounts, instead of actual figures on the displaced categorical programs.

Relative Shares by Type of Recipient and by Population Size

Column (8) of Table 5.1 shows the percentage point differences between formula shares (column 7) and hold harmless shares (column 2) for six types of recipients. The 7.5 percentage point difference for SMSA communities is not divided equally among metropolitan recipients. The 363 central cities which received 69.6 percent of categorical funds would receive only 42 percent of formula funds, a decrease in share of 27.6 percentage points. On the other hand, the combined share going to non-central entitlement cities, urban counties, and communities in SMSA balances would increase from 17.9 to 38 percent, an increase of 20.1 percentage points. Non-SMSA communities which account for only 12.5 percent of hold harmless funds presently receive 20 percent of formula funds, an increase in share of 7.5 percentage points. To summarize, Table 5.1 shows us that assistance under the categorical programs favored the 363 central cities as a group and assistance under full-formula funding would favor smaller communities located in SMSA balances and non-SMSA areas.

Table 5.2 compares for the 515 entitlement cities hold harmless with the present formula by population size. As shown in column (11) of Table 5.2, the only group with a formula share greater than its hold harmless share is the group of three cities each with a population over 2.5 million. The largest decreases occur in the three population groups between one hundred thousand and one million; the combined share for the 148 entitlement cities in these three population groups would decrease from 44.6 percent to 23.7 percent with a switch to full formula funding. A comparison of columns (5) and (9) of Table 5.2 indicates that full formula funding would decrease the combined share of entitlement city funds going to these three population groups from a 60.3 percent hold harmless share to a 50.4 percent formula share, a decrease of 9.9 percentage points.

Regional Analysis of Hold Harmless and the Present Formula

Assistance under the displaced categorical programs favored the Northeast. As shown in column (1) of Table 5.3, for the five years between 1968 and 1972, communities in the Northeast received, on a per capita basis, an average categorical grant of $13.63, compared to $8.38 in the North Central region, $9.95 in the South, and $9.03 in the West. The Northeast, which accounted for 24.1 percent of the population and 17.8 percent of the poverty in the U.S., received 34.2 percent of the urban renewal and NDP funds, 30 percent of the model city funds, and 23.7 percent of the remaining categorical funds, or 32 percent of total categorical funds. In Table 5.4, the regional distribution of each categorical program is broken down by type of recipient. As expected, in each region the SMSA area received a much higher share of categorical funds than the non-SMSA area. The South is the only region to have a non-SMSA, hold harmless share greater than 5 percent.

Entitlement Cities. Entitlement cities are analyzed by region and by city type (central city, non-central city) in Table 5.5. Entitlement cities in the Northeast received 33.6 percent (Column 7) of categorical funds allocated to all entitlement cities while accounting for only 27 percent of the population and 26 percent of the poverty. As shown in columns (9) and (10) of Table 5.5, the 124 entitlement cities in the Northeast received on a per capita basis, $16.68 in combined urban

Table 5.2 Comparison of Hold Harmless with Present Formula by Population Size, Fiscal Year 1976, 515 Entitlement Cities

Population (thousands)	(1) Number of Cities	(2) Hold Harmless (per capita $)	(3) % of Total Hold Harmless	(4) % of SMSA Hold Harmless	(5) % of Entit. City HH	(6) Formula (per capita$)	(7) % of total Formula	(8) % of SMSA Formula	(9) % of Entit. City Formula	(10) Per Capita $ Change (6) - (2)	(11) % Change in Share (7) - (3)
Under 50	103	$27.96	4.6%	5.3%	6.3%	$15.73	2.1%	2.7%	4.5%	-$12.23	-2.5%
50 - 100	258	13.39	11.5	13.1	15.6	12.77	8.9	11.2	19.0	- .62	-2.6
100 - 250	96	23.35	15.4	17.6	20.8	14.65	7.9	9.9	16.8	- 8.70	-7.5
250 - 500	31	26.68	13.7	15.7	18.6	16.19	6.8	8.5	14.5	- 10.49	-6.9
500 - 1,000	21	23.52	15.5	17.7	20.9	16.72	9.0	11.3	19.1	- 6.80	-6.5
1,000 - 2,500	3	22.36	5.0	5.8	6.8	15.72	2.9	3.7	6.2	- 6.57	-2.1
Over 2,500	3	12.04	8.14	9.3	11.0	16.97	9.4	11.8	19.9	+ 4.93	+1.26
Entitlement Cities	515	$19.67	73.9%	84.5%	100.%	$15.33	47.0%	59.0%	100.%	-$ 4.34	-26.9%

Table 5.3: Hold Harmless Distribution by Region

Region	(1) Hold Harmless (per capita $)	(2) Hold Harmless % Share	(3) UR/NDP (per capita $)	(4) UR/NDP % Share	(5) Model Cities (per capita $)	(6) Model Cities % Share	(7) Other Categorical (per capita $)	(8) Other Categorical % Share	(9) % of Population	(10) % of Poverty
Northeast	$13.63	32.0%	$9.62	34.2%	$2.99	30.0%	$1.02	23.7%	24.1%	17.8%
North Central	8.38	22.8	5.33	21.8	2.16	25.0	.89	23.9	27.9	22.0
South	9.95	30.1	6.96	31.7	2.01	25.7	.98	29.3	30.9	45.6
West	9.03	15.1	4.91	12.4	2.70	19.3	1.42	23.6	17.1	14.6

Table 5.4 Hold Harmless Distribution by Region and by Type of Recipient

Region	Hold Harmless[a] % Share	UR/NDP[b] % Share	Model Cities % Share	Other Categorical % Share
Northeast	32.0%	34.2%	30.0%	23.7%
SMSA	29.6	30.9	29.9	22.1
Entitlement City(124)	24.9	25.3	26.5	18.6
Remainder of SMSA	4.7	5.6	3.4	3.5
Non-SMSA	2.4	3.3	.1	1.6
North Central	22.8	21.8	25.0	23.9
SMSA	19.7	17.7	24.6	21.5
Entitlement City(132)	17.8	15.4	24.1	19.3
Remainder of SMSA	1.9	2.3	.5	2.2
Non-SMSA	3.1	4.1	.4	2.4
South	30.1	31.7	25.7	29.3
SMSA	24.7	25.4	22.9	23.4
Entitlement City(149)	20.0	20.2	19.4	18.4
Remainder of SMSA	4.7	5.2	3.5	5.0
Non-SMSA	5.4	6.3	2.8	5.9
West	15.1	12.4	19.3	23.6
SMSA	13.5	10.8	17.9	21.6
Entitlement City(110)	11.3	1.4	14.7	16.2
Remainder of SMSA	2.2	1.4	3.2	5.4
Non-SMSA	1.5	1.6	1.4	2.0

a. Hold Harmless is divided as follows: 66% UR/NDP, 25% model cities, and 10% other categorical (open space, water and sewer, neighborhood facilities, rehabilitation, and public facility loans.)

b. UR/NDP = (Urban Renewal grants and Neighborhood Development Program grants)

Table 5.5: Comparison of Hold Harmless Distribution with Present Formula Distribution by Region and by City Type, Fiscal Year 1976, 515 entitlement cities

Region	(1) Number of Cities	(2) Hold Harmless (per capita $)	(3) Hold Harmless % Share	(4) Formula (per capita $)	(5) Formula % Share	(6) % Change in Share (5) - (3)	(7) % Share of Entit. City HH[a]	(8) % Share of Entit. City Formula[a]	(9) UR/NDP[b] (per capita $)	(10) % Share of Entit. City UR/NDP[a]	(11) Model City (per capita $)	(12) % Share of Entit. City Model City[a]
Northeast	124	$26.46	24.9%	$15.65	12.4%	-12.5%	33.6%	26.4%	$16.68	35.9%	$6.19	31.2%
Central City	78	26.96	22.8	15.98	11.0	-11.8	30.8	23.4	18.01	32.6	7.07	30.0
Non-Central City	46	13.09	2.1	10.46	1.4	- .7	2.8	3.0	9.70	3.3	1.53	1.2
North Central	132	18.54	17.8	14.22	11.4	- 6.4	24.1	24.2	10.31	22.0	5.71	28.5
Central City	90	20.37	17.0	14.75	10.1	- 6.9	23.0	21.4	11.54	20.7	6.70	28.2
Non-Central City	42	5.30	.8	10.18	1.3	+ .5	1.1	2.8	3.78	1.3	.37	.3
South	149	20.25	19.9	18.09	14.6	- 5.3	26.9	31.0	13.67	28.7	4.65	23.0
Central City	135	21.01	19.5	18.43	14.0	- 5.5	26.4	29.7	14.15	28.2	4.86	22.8
Non-Central City	14	7.22	.4	13.46	.6	+ .2	.5	1.3	4.99	.5	.83	.2
West	110	14.63	11.3	13.74	8.7	- 2.6	15.4	18.4	8.01	13.4	4.42	17.3
Central City	60	17.20	10.2	14.47	7.0	- 3.2	13.8	14.8	9.34	11.9	5.53	16.5
Non-Central City	50	5.98	1.1	11.32	1.7	+ .6	1.5	3.6	3.73	1.5	.86	.8
Entitlement Cities	515	$19.76	73.9%	$15.33	47.1%	-26.8%	100%	100%	$12.42	100%	$5.29	100.%

a. In (7), (8), (10) and (12), the share is relative to 515 entitlement cities; (7) is obtained by dividing (3) by .739, and (8) is obtained by dividing (5) by .471.

b. Urban Renewal and Neighborhood Development Program renewal and neighborhood development (NDP) funds, or 35.9 percent of total urban renewal and NDP funds allocated to all entitlement cities. Of these 35.9 percentage points, the 78 central cities located in the Northeast accounted for 32.6 percentage points and the 46 non-central cities, only 3.3 percentage points.

The combined urban renewal and NDP category accounted for 63 percent of total categorical funds allocated to the 515 entitlement cities. The distribution by HUD of these urban renewal and NDP funds seems to have been affected by the existence of an aged housing stock in Northeastern cities; in 1970, approximately 65 percent of the housing units in entitlement cities located in the Northeast were built before 1939. On the other hand, entitlement cities in the West with only 30 percent of their housing units built before 1939 received a much lower per capita amount $8.01, or only 13.4 percent of total urban renewal and NDP funds allocated to entitlement cities.

As shown in columns (4) and (5) of Table 5.5 and as expected from our earlier analysis of the regional distribution of poverty (see Table 4.4), entitlement cities in the South are favored under the present formula, primarily, because of the double weight given to the poverty factor. On a per capita basis, central cities in the South receive \$18.43, compared to \$15.98 in the Northeast, \$14.75 in the North Central region, and \$14.47 in the West (Column 4). Of the total amount going to entitlement cities under the existing formula, 31 percent is allocated to the South, 26 percent to the Northeast, 24 percent to the North Central region, and 19 percent to the West.

Column (6) of Table 5.5 shows that the hold harmless share is greater than the formula share for each of the four groups of central cities. As shown earlier in Tables 2.1 and 5.1, the main reasons central cities as a group lose under the existing formula are (1) balances of SMSAs and urban counties are given full formula status, and (2) approximately 20 percent of the total CDBG appropriation is allocated to non-SMSA areas. Under full formula funding, 52 percent of CDBGs would be allocated to small communities in (1) the balance of SMSAs (22 percent), (2) urban counties (10 percent), and (3) non-SMSA areas (20 percent). In Chapter 6, we consider the share going to central cities under several alternative formulas.

Again, in column (6) of Table 5.5, notice that the percentage point loss is highest for those central cities in the Northeast, equaling 11.8 percentage points, compared to 6.9 in the North Central region, 5.5 in the South, and only 3.2 in the West. It is obvious from a comparison of the per capita amounts given in columns (2) and (4) of Table 5.5 that without either a large increase in the CDBG appropriation or a formula change that significantly benefits central cities, the phase down of hold harmless will result in reduced Federal funding to central cities, especially those located in the Northeast and North Central regions.

Gainer and Loser Comparisons: Entitlement Cities

A phase-in city or "gainer" is defined as an entitlement city that has a formula amount greater than its hold harmless (HH) amount. In Table 5.6, phase-in cities are divided into two groups. First, of the 435 cities being considered in Table 5.6, 35 did not participate in the categorical programs (HH = 0.). Second, there are 192 entitlement cities that did participate (HH > 0.) but in each case, the hold harmless amount is less than the full formula amount. The remaining 208 cities are the phase-down cities or "losers"; these are entitlement cities each with a full formula amount less than its hold harmless amount. Table 5.6 which characterizes each group by listing average percentages for ten of the need variables reveals two important points. First, the percentages in column (1) indicate that when compared with the other two groups of entitlement cities those 35 cities that did not participate in the displaced categorical programs have, on the average, a lower level of per capita need. Second, as compared with the 192 phase-in cities, the 208 phase-down cities show a higher level of per capita need on nine of the ten need indicators. Although many of the percentage differences are quite small, there does exist a rather large difference with respect to the percentage of housing units built before 1939 -- 52.93 vs. 40.45. Again, this reflects the fact that many of the phase-down cities are the "older, declining cities" located in the Northeast. Appendix G lists for each city in the three categories five need variables (DENSITY, POCRWD, PPOORPER, PUNEMP75, PAGE1939), one measure of tax effort (TAX1INC), and per capita aid under hold harmless (HH), the existing formula (PRESENT), and one alternative formula (ALT5).

According to Table 5.6 and Appendix G, full funding under the present formula would tend to direct funds from more needy to less needy cities. As we explain below, this fact alone does not provide a sufficient argument for eliminating the phase-down provisions because it does not consider the per capita fund distribution within each group of cities. However, it does indicate that there may be dimensions of need that are not included in the existing formula. If so, the appropriate procedure would be to continue the phase-down of hold harmless and to derive a new formula that is responsive to those important dimensions of need ignored by the present formula.

To understand the inequity of not phasing down hold harmless, consider the per capita distributions given in Table 5.6. Under the categorical programs, the 208 phase-down cities received, on a per capita basis, \$24.81 (\$33.48 minus \$8.67) or 386 percent more than the 192 phase-in cities described in column (2) of Table 5.6. This 386 percentage difference is not justified on the basis of the percentages of need variables given in column (2) of Table 5.6. Except for age of housing stock (PAGE1939), the percentages for the phase-down cities are only slightly higher than those for the 192 phase-in cities. In fact, the poverty percentage (13.57) for the 192 phase-in cities is approximately the same as that (14.13) for the 208 phase-down cities and the over-crowded housing percentage is actually greater (8.83 > 7.22). In the following sections, we will further demonstrate the

Table 5.6: Average Percentages of Need Variables for Phase-In Cities and Phase-Down Cities, Fiscal Year 1976; 435 Entitlement Cities

	Phase-In Cities[a] (HH = 0.)	Phase-In Cities (HH>0.)	Phase-Down[a] Cities
Number of Cities	35	192	208
Per Capita $			
Hold Harmless	$ 0.0	$ 8.67	$33.48
CDBG Formula	$10.69	$15.94	$15.48
Percentages			
PPOORPER	7.22%	13.57%	14.13%
POCRWD	5.67	8.83	7.22
PWOPLUMB	1.16	2.46	3.06
PAGE1939	24.04	40.45	52.93
POWNOCCH[b]	65.50	58.90	54.17
PFEMALHP[b]	2.20	3.75	4.69
PNW[b]	8.95	17.35	19.32
PWOHSED[b]	38.97	42.08	48.70
PUNEMP75[b]	8.17	8.69	10.01
P65AGED[b]	8.52	9.37	11.15

a. A phase-in city or "gainer is an entitlement city with a full formula amount greater than its hold harmless amount. A phase-down city is an entitlement city with a full formula amount less than its hold harmless amount.

b. Unweighted average

inequity of the displaced categorical system by correlating the per capita hold harmless amounts of the 400 entitlement cities that received categorical funds with the per capita need scores developed in the last chapter and by regressing the per capita hold harmless amounts on the factor need scores.

Table 5.7 compares the categorical distribution with the formula distribution by gainer/loser status and by city type (central city, non-central city) for all 515 entitlement cities. The phase-down, central cities received 55.6 percent of urban renewal/NDP funds, 58.3 percent of model city funds, and 44.2 percent of the remaining categorical funds, or 55.1 percent of total categorical funds. The inequity of the categorical system can be seen from Table 5.7 by comparing the population and poverty shares with the hold harmless share for the two groups of central cities. As seen in columns (1) and (3), the two groups account for similar shares of both population and poverty; however, the phase-down central cities received 55.1 percent of total categorical funds, compared to only 14.4 percent for the phase-in central cities. A switch to full-formula funding would result in each group receiving a 21 percent share of total CDBG funds.

It is important to emphasize the differences between the present formula method and the displaced categorical method of distributing CD funds. For example, under the categorical system, per capita grants to the 515 entitlement cities varied from a minimum of $0.00 to a maximum of $333.79; under the existing formula, per capita grants vary from $6.15 to $45.14, a reduction in range from $333.79 to $38.99. Table 5.8 shows that the range in per capita amounts would be decreased in each region by a shift to full funding under the existing CDBG formula. Notice that the South receives a maximum per capita formula amount ($45.14) much higher than that received by any other region. The tendency of Southern cities to receive high per capita amounts under the formula is due to the high percentage of poverty existing in several cities located in the South (e.g., Laredo, 44.7 percent, Brownsville, 45.4 percent). Of the thirteen cities with a per capita formula amount greater than $25, twelve are located in the South. Still, as Table 5.8 clearly shows, the variation in formula funds is much less than the variation in hold harmless amounts.

To summarize, there does not seem to be justification for one city receiving a per capita amount of $333.79 while other cities receive nothing. It may be true that the most needy cities received the most funds under the categorical system, but still, there was no reason for ignoring as the categorical system did the community development need that existed in these less needy, phase-in cities. A formula, on the other hand, recognizes the need in all eligible cities by distributing funds according to each city's share of the need variables included in the formula. Of course, the problems of determing the formula factors and the eligible cities must be adequately dealt with to ensure equity in any formula system.

Table 5.7: Relative Shares for Phase-In and Phase-Down Cities Under the Categorical Programs and Under the CDBG Formula

	Phase-In Cities		Phase-Down Cities		
	Central City	Non-Central City	Central City	Non-Central City	Entitlement Cities
	(1)	(2)	(3)	(4)	(5)
Number of Cities	170	124	193	28	515
Hold Harmless Share[a]	14.4%	.7%	55.1%	3.7%	73.9%
UR/NDP	10.0%	.5%	55.6%	4.1%	70.2%
Model Cities	24.2%	.0%	58.3%	2.2%	84.7%
Other Categorical	20.9%	3.6%	44.2%	4.3%	73.0%
CDBG Formula	21.0%	3.6%	21.0%	1.3%	46.9%
Poverty Share	17.2%	9.8%	16.6%	1.9%	36.7%
Population Share	15.7%	4.5%	16.8%	1.2%	38.2%
Hold Harmless(per capita $)	$ 9.31	$ 1.61	$33.32	$32.48	$19.67
CDBG Formula(per capita $)	$16.66	$10.11	$15.56	$14.14	$15.33
(Formula-Hold Harmless $)	+$7.34	+$8.50	-$17.75	-$18.33	-$4.34

a. Each percentage share is computed relative to the U.S. total for the program or variable being considered. The percentages in column (5) can be used to compute shares relative to the totals for the 515 entitlement cities; for example, the 193 phase-in, central cities received 74.56 percent (55.1/.739) of categorical funds allocated to the 515 entitlement cities.

Table 5.8: Range in Per Capita Amounts of Hold Harmless and the Present CDBG Formula by Region, Fiscal Year 1976; 515 Entitlement Cities

	Northeast (124)	North Central (132)	South (149)	West (110)	All Entitlement Cities (515)
<u>Hold Harmless</u>					
Range[a]	$333.79	109.76	228.92	61.50	333.79
<u>Present CDBG Formula</u>					
Minimum	$6.15	6.20	8.66	6.62	6.15
Maximum	$23.11	30.37	45.14	23.43	45.14
Range	$16.96	24.17	36.48	16.81	38.99

a. For each region, the minimum per capita hold harmless amount equaled zero; therefore, the range equaled the maximum amount.

The Responsiveness of Hold Harmless and the Present CDBG Formula To Community Development Need

In this section, we measure the responsiveness of per capita amounts under both hold harmless and the present formula to need variables and the per capita need indexes developed in Chapter 4. We use hold harmless and full formula amounts for entitlement cities as computed by HUD in fiscal year 1976. Because eliminating the phase down provision is one alternative to the present system, we think it is important to compare the hold harmless distribution of funds with that of the present formula in terms of responsiveness to community development need.

The statistical techniques used to measure the responsiveness and sensitivity of hold harmless and the present formula to CD need are correlation and regression analysis.1/ The simple correlation coefficient between per capita amounts and per capita need scores indicates the degree to which a formula's allocation responds to need --the question in correlation analysis is how closely related are per capita amounts and need scores. A higher correlation indicates a closer association between a formula's allocation and need. The regression analysis tells us the nature of the relationship between a formula and need.

Correlation Analysis

The clearest evidence of the problem with the hold harmless approach is shown by low correlation coefficients in the first column of Tables 5.9 and 5.10. In Table 5.9, the coefficients of correlation between hold harmless and the five dimensions of CD need indicate that the categorical system was not very responsive to need, as defined by our five sets of factor scores. The three low positive correlation coefficients and the two low negative coefficients tell us that, on an individual city basis, under the categorical programs, above-average per capita dollar amounts were not allocated to cities with above-average per capita need. Recall that Table 5.6 showed us that, on the average, phase-down cities were more needy than phase-in cities. However, when correlation analysis is used to examine hold harmless on an individual city basis, the point that stands out is the weak relationship between hold harmless and need. As can be seen from Table 5.10, similar results are obtained when hold harmless is correlated with several need variables; there is little or no relationship between hold harmless and any of the need variables.

Hold harmless did exhibit a much stronger correlation (0.36 vs. 0.02)

1/ The fourth section of Chapter 3, "Statistical Methods", provides a summary of the correlation and regression techniques used in this and the remaining chapters.

Table 5.9: Correlation Coefficients Between (1) Per Capita Amounts and (2) Per Capita Need Scores

Dimension of CD Need	Hold Harmless[a]	Present Formula[b]
(1) Poverty	.14	.95
(2) Age of Housing Stock	.36	.02
(3) Density	-.05	.20
(4) Crime and Unemployment	.11	.09
(5) Lack of Economic Opportunity	-.01	.04

a. Only 400 of the 435 entitlement cities participated in the categorical programs; therefore the correlation analysis for hold harmless was limited to 400 entitlement cities. A correlation analysis using 435 cities yielded similar results.

b. 435 entitlement cities

Table 5.10: Correlations Between (1) Per Capita Amounts and (2) Need Variables

Need Variables	Hold Harmless[a]	Present Formula[b]
P65AGED	.22	.10
PCRIME	.10	.38
PNW	.06	.79
PWOHSED	.23	.55
PFEMALHP	.27	.85
PYUTHPOV	.14	.93
PPOORPER	.18	.95
POCRWD	-.10	.79
PWOPLUMB	.18	.50
PUNEMP75	.15	.13
PAGE1939	.34	.13
DENSITY	-.04	.21
POWNOCCH c	-.09	-.38
PMUITI	.09	.19
PNEWSTR c	-.32	-.27
PCINC72 c	-.21	-.51
MEDINC c	-.25	-.78

a. 400 entitlement cities

b. 435 entitlement cities

c. These variables are inverse indicators of need; therefore, high negative coefficients are desired.

than the present formula with respect to the age-of-housing-stock dimension of CD need. This was not entirely unexpected given our results in Tables 5.6 and 4.4. In Table 5.6, we saw that 52.9 percent of the housing units in phase-down cities were built before 1939; on the other hand, this percentage was only 29.1 for the South which receives the highest per capita allocation ($18.09) under the present formula.

The second column of Tables 5.9 and 5.10 presents the results obtained from correlating allocations under the existing CDBG formula with both need scores and need variables. The present formula exhibits the expected strong correlation (0.95) with the poverty dimension of CD need but very low correlations with the remaining four dimensions. This pattern of correlations carries over to Table 5.10. The present formula has a fairly strong linear relationship with need as defined by the following poverty-related variables: PPOORPER (0.95), PNW (0.79), PFEMALHP (0.85), POCRWD (0.79), PWOHSED (0.55), PWOPLUMB (0.50), MEDINC (-0.78), and PCINC72 (-0.51). However, the present formula shows a weak relationship with those variables that define other dimensions of CD need: PAGE1939 (0.13), DENSITY (0.21), POWNOCCH (-0.38), PUNEMP75 (0.13), P65AGED (0.10), PMULTI (0.19), and PNEWSTR (-0.27). Therefore, if the goal is to make CDBGs more responsive to, for example, the age-of-housing and density dimensions of CD need, then it will be necessary to change the present formula. As we will see in Chapter 6, alternative formulas that include age of housing as a formula factor will increase the responsiveness of CD funding to the age-of-housing and density dimensions of CD need.

Regression Analysis

We use regression analysis to determine the implicit emphasis that hold harmless and the present formula give to the various need dimensions. The general form of the multiple regression equation estimated is:

$$\text{Per Capita \$} = a + b \text{ FACTOR 1} + c \text{ FACTOR 2} + d \text{ FACTORS 3} + e \text{ FACTOR 4} + f \text{ FACTOR 5}$$

The coefficient b measures the change in per capita dollars for a one unit change in the poverty dimension (FACTOR 1), at given levels of FACTOR 2 to FACTOR 5. The regression coefficients c to f have a similar interpretation.2/ Since the average score on each of the need dimensions

2/ The regression coefficients are affected by the total CDBG amount allocated to the 435 entitlement cities. For example, all estimated coefficients will double if the CDBG allocation is doubled. This fact is important for our purposes because in fiscal year 1976 the total amount allocated to the 435 cities under the present formula was three-fourths that allocated under hold harmless. Therefore, to make coefficient is zero, the constant term a will equal the average per capita amount. In addition to the multiple regression coefficients, we also report in the regression tables (a) the multiple coefficient of determination, (b) the standard error of estimate, and (c) the standard deviation of the per capita amounts. The multiple coefficient of determination (R^2) is the proportion of variation in per capita dollars that is explained by the multiple regression equation, or by the five need indexes. A high R^2 statistic therefore indicates a close relationship between the actual formula allocation and need.

The standard error of the estimate measures the "average" disparity between actual per capita amounts and per capita amounts predicted by the multiple regression equation. It is therefore an absolute indication of how well the regression equation, or the estimated per capita amounts, describes the relationship between the actual per capita amounts and the five need indexes. If the standard error of the estimate equaled zero, the actual and predicted per capita amounts would be identical, which would indicate an exact relationship between actual formula allocations and the implicit relation between formula allocations and the need indexes. The standard deviation measures the variability, or spread, of the per capita amounts about the average per capita amount.

The regression results for hold harmless are presented in the first column of Table 5.11. The relative magnitudes of these regression coefficients describe the implicit logic of the hold harmless system. Hold harmless increases by $7.60 per capita for each one unit increase in the age-of-housing-stock needs index. The rate of increase in hold harmless per capita with the poverty dimension is $3.39, and with the crime and unemployment dimension, $3.19. Hold harmless decreases with unit increases in the density scores ($1.12) and the lack-of-economic-opportunity scores ($.61). The relative magnitudes of these scores indicate that hold harmless places most of its emphasis on the age of housing dimension of CD need.

For the case of hold harmless, the most important statistics are

(footnote 2 continued from previous page)
comparisons between these two distribution methods that are based on the same total CD allocation, the hold harmless coefficients should be multiplied by .75. We do not do this in our description of the multiple regression results because here we are only interested in a comparison of the relative magnitudes of regression coefficients for each of these two allocation systems considered separately. Such analysis will tell us the implicit emphasis that each allocation system gives to each of the five dimensions of need.

Table 5.11: Regression of Per Capita Amounts Under Hold Harmless and the Present Formula on Per Capita Need Scores

	(1) Hold Harmless[a]	(2) Present Formula[b]
Regression Coefficients for Dimensions of CD Need: ($)		
(1) Poverty	3.39	3.45
(2) Age of Housing	7.60	.00
(3) Density	-1.12	.75
(4) Crime and Unemployment	3.19	.30
(5) Lack of Economic Opportunity	-.61[c]	.19
Other Statistics:		
(6) Coefficient of Multiple Determination (R^2)	.19	.95
(7) Standard Error of Estimate ($)	17.42	.80
(8) Standard Deviation of Per Capita Amounts ($)	19.43	3.64

a. 435 entitlement cities; intercept equaled $20.39.

b. 435 entitlement cities; intercept equaled $15.48.

c. Insignificant at .05 level.

given in rows (6)-(8) of Table 5.11. First, the R^2 statistic tells us how closely the implicit logic of the system, as indicated by five regression coefficients or by the estimated regression, is being followed. For hold harmless, the R^2 statistic is .19, which means that only 19 percent of the variation in hold harmless per capita can be explained by our five indexes of CD need. The .19 is 76 percentage points less than the R^2 statistic for the present formula. In essence, the low R^2 statistic indicates a very weak relation between (1) the actual distribution of hold harmless per capita and (2) that distribution of per capita amounts predicted from a regression equation that supposedly describes the implicit logic or emphasis of the hold harmless system.

Second, the standard error of estimate for hold harmless is $17.42, or approximately 85 percent of its mean, which also indicates that the hold harmless equation does not provide a very good description of the relationship between hold harmless and per capita community development need. One interpretation of the standard error of estimate is that there is a probability of 68 percent that the actual hold harmless amount for a city is within plus or minus $17.42 of the amount predicted by the hold harmless regression equation for that city. The width of the interval (plus or minus $17.42) indicates how imperfectly the implicit logic of the hold harmless system is followed, especially when compared to how well the present-formula regression describes the relation between the present formula and need--the standard error of estimate is a low $0.80 for the present-formula regression. Also notice that the standard deviation of hold harmless is $19.43, which is over five times that of the present formula.3/

The regression coefficients for the present formula given in the second column of Table 5.11 are quite consistent with the correlation results for the present formula. First, the present formula increases by $3.45 per capita with unit increases in the poverty scores, which is a much greater response than with the other dimensions of CD need. As indicated by the .00 regression coefficient in the second row of Table 5.11, the present formula per capita does not change with unit increases in the age of housing index, for fixed levels of the other four need indexes. Second, the R^2 for the present formula is a very high .95 and the standard error of estimate is a very low $0.80, both of which can be interpreted as indicating a close relationship between the actual per capita distribution of the present formula and that per capita distribution predicted by its regression equation.

3/ Notice that the standard error of estimate (17.42) is almost as high as the standard deviation of hold harmless per capita ($19.43). This also indicates that the five need indexes are doing a poor job of explaining the variation in hold harmless per capita.

Summary and Conclusions

Small communities in urban counties, balances of SMSA's, and non-SMSA areas are favored under the present CDBG formula. Central cities which received approximately 70 percent of categorical funds would receive only 42 percent under full formula funding. As a percentage of total funds going to the 515 entitlement cities, cities in the South, which received 27 percent of the categorical funds, would receive 31 percent under full formula funding; entitlement cities in the Northeast, which received 34 percent of the categorical funds going to the 515 entitlement cities, would receive only 26 percent under the formula.

For each dimension of CD need, the correlation between per capita hold harmless allocations and the recipient city need scores indicates that hold harmless was only weakly related to CD need as defined by each of our five indexes. The present formula exhibits the expected strong correlation (0.95) with the poverty dimension of CD need but very low correlations with the remaining four dimensions. In fact, hold harmless exhibited a stronger correlation (0.36 vs. 0.02) than the present formula with respect to the age-of-housing-stock dimension of CD need. In Chapter 6, we include the age of a housing stock as a formula factor in order to derive a formula distribution that is responsive to non-poverty dimensions of CD need.

The regression analysis showed that the rate at which hold harmless per capita increases with increases in the age of housing index was over twice that for each of the other four indexes. The five indexes of CD need explained only 19 percent of the variation in hold harmless per capita; in other words, 81 percent of the variation in hold harmless can be explained by factors other than the five need indexes. In the case of the present formula, the regression coefficient for the age of housing index was zero, while that for the poverty index was $3.45. To summarize, hold harmless is most sensitive to the age of housing index and the present formula to the poverty index.

Chapter 6

EVALUATION OF ALTERNATIVE FORMULAS

In the first section of this chapter, we present alternatives to the present CDBG formula that include age of housing stock as a formula factor. The number of housing units constructed before 1939 was selected as a formula factor because of its significant correlation with variables that define those four dimensions of CD need to which the present formula is not responsive.

In the second section we first evaluate each alternative using the same correlation method that we applied in the last chapter to hold harmless and the present formula. For each alternative, the distribution of per capita allocations is correlated with need scores and need variables. In this section, we also evaluate each formula in terms of a total needs index. After presenting the correlation analysis, the alternative formulas are analyzed using the regression technique. In the third section, the formula shares and per capita means of the various alternatives are analyzed to determine the extent that various types of recipients gain and lose as compare with the present formula and hold harmless. We are especially interested in the effect of each alternative on the formula share of central cities.

Alternative Formulas

Each alternative examined in this chapter adds the number of housing units constructed before 1939 (AGE1939) as an additional formula factor. Age of housing was added for two reasons. Pre-1939 housing is a factor associated with housing abandonment and substandard housing and is a proxy for both government repair costs of sanitation facilities and sewage lines and housing maintenance costs. In addition, age of housing not only defines one of the four dimensions of CD need ignored by the present formula but is significantly correlated with four of the five need variables that have high factor loadings on the other three dimensions (density, crime, lack of economic opportunity). These four dimension-defining variables and their correlations (weighted) with percentage of housing units built before 1939 (PAGE1939) are as follows: DENSITY (0.55), POWNOCCH (-0.48), PUNEMP75 (0.40), and PWOHSED (0.56).1/

1/ The unweighted correlations (see Table 4.1) are as follows: DENSITY (0.41), POWNOCCH (-0.40), PUNEMP75 (0.29), and PWOHSED (0.51). The unweighted analysis gives each case an equal weight of one. The weighted correlation analysis is described in Chapter 3.

The formula factors and weights for the present formula and seven alternatives are as follows:

	Population (POP)	Poverty (POORPER)	Overcrowded Housing (OCRWD)	Pre-1939 Housing (AGE1939)
Present Formula	.25	.50	.25	
Alternative 1	.20	.40	.20	.20
Alternative 2	.25	.50		.25
Alternative 3		.40	.30	.30
Alternative 4		.60		.40
Alternative 5		.30	.20	.50
Alternative 6	.20	.30		.50
Alternative 7		.40		.60

For example, in fiscal year 1976, the following formula would have been used to compute the total amount for an entitlement city under Alternative 1: (.20(POP/149,695,698) + .40(POORPER/17,157,884) + .20(OCRWD/3,710,656.) + .20 (AGE1939/18,458,419.) $2,077,600,000. Rather than following the two-step approach used in the present formula (see Chapter 2 for explanation), we compute each entitlement city's share relative to SMSA totals (e.g., 149,695,698.) in a one-step procedure. Experimentation with the present formula indicates that the correlations are not affected by the switch to a one-step calculation procedure.

Numerous alternatives were examined in order to show the effects on the correlations and regression coefficients of increasing the weight given to AGE1939. The weight given to AGE1939 increases from Alternative 1 to Alternative 7. Appendix J defines seven other alternative formulas and evaluates each in terms of correlation with CD need. A fifth formula variable (without plumbing) is considered in Appendix J. As mentioned before, there are few variables which could be included in the formula (i.e., data exist and they are intuitively appealing).

Appendix H presents the correlation and regression results for the seven alternative formulas that were obtained when we conducted the analysis on 435 unweighted cases. Appendix I provides correlations between per capita amounts and need scores and need variables by population size.

Alternative Formulas and Community Development Need

Correlation Analysis

The correlations between allocations under the seven alternative formulas and need scores and need variables are presented in Tables 6.1 and 6.2; as baselines for comparison, the correlations examined in the last chapter for hold harmless and the present formula are also included in these tables.2/ As shown in the first row of Table 6.1, the correlation coefficients between the seven alternative formulas and the poverty dimension decline from 0.78 under Alternative 1 to 0.34 under Alternative 6. Given the low correlation between PPOORPER and PAGE1939 (0.12, see Table 4.1), it is not surprising that the correlations between the poverty dimension and per capita allocations decline as we increase the formula weight of age of housing stock and decrease that of poverty. The cost of adding age of housing stock to increase the formula's degree of responsiveness to non-poverty dimensions of CD need is simply a reduction in the correlation with the poverty dimension. Of course, the important question here is how low should the poverty correlation be reduced. The answer to this question depends on both the increase in correlation with each of the non-poverty dimensions achieved by adding a variable such as age of housing stock and the relative importance of each of these non-poverty dimensions of CD need. We now turn to rows (2)-(5) of Table 6.1 to see what we gain by increasing the weight of age of housing stock at the expense of poverty, overcrowded housing, and population.

As shown in rows (2) and (3) of Table 6.1, the highest correlation increases occur with the aged-housing and density dimensions of CD need. The correlation coefficients between the age-of-housing dimension and the seven alternatives range from 0.45 under Alternative 1 to 0.86 under Alternative 7, while those of the density dimension range from 0.27 under Alternative 2 to 0.43 under Alternative 5. Notice also that each of the seven alternatives has a higher correlation with each of the non-poverty dimensions than has either the present formula or hold harmless. In fact, each alternative dominates hold harmless on all five dimensions of CD need. One equity advantage of hold harmless over the present formula--a higher correlation with the aged-housing dimension--loses its importance when age of housing stock is added to the formula.

Consider, for example, Alternative 3. Under ALT3, the correlation with the poverty dimension drops from 0.95 under the present formula to 0.70 but those with the aged-housing and density dimensions increase from 0.02 to 0.50 in the case of aged-housing and from .20 to .41 in the case

2/ The correlation analysis of hold harmless was based on those 400 entitlement cities in our 435-file that had positive hold harmless amounts. Correlations using all 435 cities were approximately the same as those reported in this chapter.

Table 6.1: Coefficients of Correlation Between (1) Per Capita Amounts Under Hold Harmless, the Present Formula, and Seven Alternative Formulas and (2) Per Capita Need Scores

	Hold Harmless	PRESENT	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7
FACTOR1 (poverty)	.18	.95	.78	.71	.70	.62	.45	.34	.37
FACTOR2 (age of housing stock)	.38	.02	.45	.62	.50	.69	.72	.82	.81
FACTOR3 (density)	-.03	.20	.35	.27	.41	.31	.43	.37	.37
FACTOR4 (crime and unemployment)	.12	.09	.16	.15	.18	.16	.19	.17	.17
FACTOR5 (lack of economic opportunity)	-.01	.04	.15	.08	.20	.11	.23	.19	.18

of density. We think that formulas such as, for example, ALT1, ALT2, ALT3, and ALT4, not only continue to give priority to poverty areas but also adequately account for two dimensions of CD need--aged-housing and density--totally ignored by the present formula.

This point is even more striking in Table 6.2 which shows correlation coefficients for several need variables. Compare the coefficients of the present formula with those of ALT3 for PPOORPER, PAGE1939, and DENSITY. The correlation with PPOORPER falls from 0.95 under the present formula to 0.78 under ALT3, a decrease of only 0.17, while those for PAGE1939 and DENSITY increase from 0.12 and 0.20 under the present formula to 0.51 and 0.52 under ALT3, increases of 0.39 and 0.32, respectively.

To summarize Table 6.2, consider those variables with correlations that change as the weights given to age of housing stock and poverty change. In general, the correlation coefficients of P65AGED, DENSITY, PWOHSED, PUNEMP75, POWNOCCH (-), PMULTI, and PNEWSTR (-) tend to increase in absolute value as the formula weight of AGE1939 increases; those of PPOORPER, PNW, PYUTHPOV, POCRWD, PFEMALHP, PCINC73 (-), and MEDINC (-) tend to decrease. The correlation coefficients for PCRIME and PWOPLUMB do not vary with changes in the formula weights.

Correlations with a total needs index. To summarize those correlations given in Tables 6.1 and 6.2, we constructed a single index of CD need by weighing the five dimensions as follows: NEED = .35 FACTOR 1 + .25 FACTOR 2 + .20 FACTOR 3 + .10 FACTOR 4 + .10 FACTOR 5. The correlations of hold harmless, the present formula, and the seven alternatives with NEED are:

	NEED
HH	.2987
PRESENT	.7912
ALT1	.9778
ALT2	.9701
ALT3	.9807
ALT4	.9616
ALT5	.9250
ALT6	.8656
ALT7	.8789

Hold harmless shows a much lower correlation (.29) than either the present formula or any of the seven alternatives. This reflects the low correlations of HH with the five dimensions of CD need given in Table 6.1. In each case, the correlation between NEED and an alternative formula is higher than that between NEED and the present formula. The present formula's correlation with NEED is undoubtedly affected by its low correlations with the nonpoverty dimensions of need. Alternative 3 shows a 0.98 correlation with NEED, which is 19 percentage points greater than the 0.79 of the present formula.

Table 6.2: Coefficients of Correlation Between (1) Per Capita Amounts Under Hold Harmless, the Present Formula, and Seven Alternative Formulas and (2) Need Variables

	Hold Harmless	Present	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7
P65AGED	.22	.10	.43	.53	.47	.58	.63	.68	.67
PCRIME	.10	.38	.44	.38	.45	.38	.40	.34	.35
PNW	.06	.79	.66	.54	.62	.48	.40	.27	.30
PWOHSED	.23	.55	.71	.68	.72	.69	.69	.64	.65
PFEMALHP	.27	.85	.82	.80	.77	.74	.60	.53	.55
PYUTHPOV	.14	.93	.78	.70	.71	.62	.46	.35	.38
PPOORPER	.18	.95	.85	.80	.78	.73	.55	.46	.49
POCRWD	-.10	.79	.55	.33	.51	.26	.23	.05	.07
PWOPLUMB	.18	.50	.58	.58	.56	.56	.51	.48	.49
PUNEMP75	.15	.13	.30	.32	.32	.34	.38	.39	.38
DENSITY	-.04	.20	.45	.42	.52	.46	.59	.55	.55
POWNOCCH	-.09	-.38	-.56	-.52	-.61	-.54	-.62	-.56	-.56
PMULTI	.09	.19	.48	.46	.55	.51	.65	.62	.61
PAGE1939	.34	.12	.59	.70	.67	.78	.88	.93	.92
PNEWSTR	-.32	-.27	-.64	-.72	-.69	-.77	-.83	-.86	-.85
PCINC72	-.21	-.51	-.46	-.46	-.41	-.41	-.30	-.26	-.28
MEDINC	-.25	-.78	-.74	-.72	-.68	-.66	-.51	-.45	-.47

As mentioned earlier, correlations with a total need index will vary depending on the weights given to the individual factors. Since the present formula shows the highest correlation with the poverty dimension (see Table 6.1), increasing the weight of FACTOR 1 in our definition of total need would increase the correlation of the present formula with NEED. In a similar manner, increasing the weight of the age of housing dimension (FACTOR 2) would tend to increase the difference in correlations with NEED between each of the seven alternatives and the present formula. The correlations with NEED therefore depend on one's judgment concerning the relative importance of the five factors. However, it is probably safe to say that correlations for alternatives such as ALT3 and ALT5 will always be greater than that for the present formula as long as some importance is attached to the nonpoverty dimensions of need, especially to FACTOR 2 and FACTOR 3.

Regression Analysis

The regression results for hold harmless, the present formula, and four of the alternative formulas are shown in Table 6.3. As can be seen from the regression coefficients listed under the alternative formulas, increasing the formula weight of pre-1939 housing tends to make the formula more sensitive to the nonpoverty dimensions of CD need, especially to the age of housing and density dimensions.3/ In each case the regression coefficients for the nonpoverty dimensions are higher under the four alternative formulas than under the present formula. For example, per capita aid under Alternative 7 (.4 POORPER, .6 AGE1939) increases by $5.24 for each unit increase in the age of housing index, while per capita aid under the present formula does not change with changes in the age of housing index. Per capita aid under Alternative 7 increases by $2.23 for each unit change in the density index, which is $1.48 more than the increase under the present formula. On the other hand, the alternative formulas are less sensitive to the poverty dimension than is the

3/ The fact that the present and alternative formula amounts are computed using the same CDBG authorization suggests that it is appropriate to make coefficient comparisons between formulas. When making such comparisons, the reader should realize that the total dollar amount going to the 435 entitlement cities still varies under the formulas. As a rule the entitlement city amount will increase relative to SMSA balances and urban counties as the formula weight of pre-1939 housing increases. However, as shown below by the per capita averages (the intercept term) listed below in column (1) of Table 6.5, the per capita differences among the formulas are small, especially when compared to the per capita differences between hold harmless and the formulas.

Table 6.3: Regression of Per Capita Amounts Under Hold Harmless, the Present Formula and Four Alternatives on Per Capita Need

	Hold Harmless	Present	ALT1	ALT2	ALT3	ALT7
Regression Coefficients						
(1) FACTOR1 (Poverty)	3.39	3.45	2.91	2.78	3.27	2.28
(2) FACTOR2 (Age of Housing)	7.60	.00	1.65	2.47	2.31	5.24
(3) FACTOR3 (Density)	-1.12	.75	1.32	1.05	1.92	2.23
(4) FACTOR4 (Crime and Unemployment)	3.19	.30	.57	.62	.76	1.13
(5) FACTOR5 (Lack of Economic Opportunity)	-.61	.19	.61	.343	1.02	1.22
Other Statistics						
(6) Coefficient of Multiple Determination (R^2)	.19	.95	.97	.98	.96	.97
(7) Standard Error of Estimate	17.42	.80	.64	.50	.90	1.02
(8) Standard Deviation of Per Capita Amounts	19.43	3.64	3.75	3.96	4.68	6.37

present formula. Per capita aid under the present formula increases by $3.45 for each unit change in the poverty index, which is $1.17 higher than the $2.28 increase for Alternative 7. However, the poverty coefficient remains higher than the age of housing coefficient for ALT1, ALT2, and ALT3.

As the R^2 statistics show, at least 95 percent of the variation in each of the four alternative formulas can be explained by the five need indexes. Of all the formulas considered, the standard error of the estimate is lowest for Alternative 2. These two goodness-of-fit measures therefore tell us that there exists a very close relationship between the actual per capita amounts under each of the alternative formulas and the per capita amounts predicted from a regression equation that describes the implicit needs logic of the alternative formula being considered. In other words, if one agrees with the needs emphasis of one of the alternatives as indicated by its regression coefficients, he or she can feel confident that the actual distribution under the selected alternative will closely reflect its needs emphasis. As explained in Chapter 5, we can not say this about the hold harmless system, because the actual hold harmless amounts are not that closely related to the regression equation that describes its needs logic.

Regression analysis using a total needs index. To determine the rate of response of per capita allocations to the total needs index (NEED), we ran simple regressions of the following form: Per Capita $ = a + b NEED. The regression coefficient, b, measures the change in per capita amounts that occurs with a one unit change in the total needs index. Among the formulas, which are all computed using the same CDBG authorization, a higher regression coefficient or slope indicates a greater sensitivity to differences in need.4/

4/ This is not exactly correct because even with the same CDBG authorization the total entitlement city amount will vary under the different formulas (see footnote 3 above). The reader can easily adjust the slopes reported in Table 6.4 to reflect the same total allocation to the 435 entitlement cities by using the per capita averages given in column (1) of Table 6.4. For example, the slopes for ALT7 should be reduced by 10 percent relative to that of the present formula because ALT7 allocates approximately 10 percent more dollars to the 435 entitlement cities than the present formula. Although the adjustments are small for the formulas, the required change is rather large for hold harmless, requiring a 24 percent reduction to make it consistent with the present formula. If NEED had consisted of all positive numbers, we could have computed elasticities from a simple log-linear regression of per capita dollars on NEED. The advantage of using elasticity coefficients, which measure the percentage change in per capita dollars associated with a one percent change in NEED, is that they do not vary with the total entitlement city allocation level.

Table 6.4: Simple Regression of Per Capita Amounts Under Hold Harmless, the Present Formula, and the Alternative Formulas on Total Need (NEED)[a]

	(1) Intercept[b]	(2) Regression Co-efficient for NEED	(3) Coefficient Determination R^2	(4) Standard Error of Estimate
Hold Harmless	$20.39	$12.84	.10	$18.37
Present	15.48	5.85	.62	2.22
ALT1	15.94	7.45	.95	.78
ALT2	16.13	7.81	.94	.96
ALT3	16.47	9.33	.96	.91
ALT4	16.97	10.65	.92	1.49
ALT5	16.87	10.38	.85	2.09
ALT6	16.61	9.17	.74	2.61
ALT7	17.26	11.38	.77	3.04
ALT8[c]	17.82	12.82	.46	6.84

a. The statistics reported in this table resulted from regressions of the following form: Per Capita $ = a + b NEED, where a is the intercept and b is a measure of slope, or the change in per capita dolloars associated with a unit change in NEED. All statistics are defined in the last section in Chapter 3.

b. The intercept equals the per capita amount for the formula being considered.

c. ALT8 distributes funds solely on the basis of pre-1939 housing.

The regression results are given in Table 6.4. For comparison purposes we have added Alternative 8, which allocates funds solely on the basis of pre-1939 housing.

As shown by the slope coefficients given in the second column of Table 6.4, increasing the formula weight of age of housing stock tends to increase, relative to the present formula, the sensitivity of formulas to differences in NEED. For example, replacing overcrowded housing by pre-1939 housing increases the slope from $5.85 for the present formula to $7.81 for Alternative 2. Among the formulas, the highest slope is for Alternative 8, which allocates solely on the basis of pre-1939 houses.

Among the alternative formulas, there is a trade-off between rate of change and degree of fit.5/ For example, Alternative 7, which has a higher standard deviation or spread in per capita amounts than Alternative 1, shows a higher slope coefficient ($11.38 vs. $7.45) but a lower R^2 statistic (.77 vs. .95). The R^2 value for the present formula is .62 which is lower than that for each of the alternatives except Alternative 8.

The sensitivity of the various formulas to the total needs index can also be determined by arranging the cities by need score category and computing for each formula the average per capita amount allocated to cities within each category, as is done in Table 6.5. The need score categories in Table 6.5 are defined by standard deviations of NEED above and below the mean. A negative NEED score indicates below average need and a positive score, above average need. First, notice that for each formula the per capita averages with few exceptions increase as one moves from low to high need score categories. For example, the present formula's average per capita allocations increase from $8.95 for cities with a NEED score less than - .98 to $29.25 for those cities with a NEED score greater than +.98. Alternative 4 shows a wider range increasing from $3.87 to $29.94 for the same categories. Hold harmless shows the greatest range, increasing from a very low $2.87 per capita for the least needy cities to $36.56 per capita for the most needy cities. However hold harmless also shows an obvious inconsistency with need, allocating $28.05 per capita to cities in the NEED category, 0.0 to +.49, but only $22.32 per capita to those cities in the next higher NEED category, +.49 to +.98. Alternative 8 shows a similar inconsistency among the three categories with above average need.

5/ The proportion of variance in per capita amounts explained by need is indicated by the R^2 value in Table 6.3 and by R^2, in Table 6.4. Notice that for each of the formulas given in Table 6.3, the R^2 value is greater than the corresponding R^2 value given in Table 6.4. This results because to construct the total needs index, NEED, we had to assign weights to the five factor indexes, instead of allowing, as in Table 6.3, the least squares procedure to determine the coefficients for the five factor indexes. The least squares procedure finds the line of best fit by determining the regression coefficients which minimize the sum of squared residuals.

Table 6.5: Average Per Capita Amounts for Hold Harmless, the Present Formula, and Seven Alternative Formulas By NEED Score; 435 Entitlement Cities

	NEED Score Category[a]					
	Less than -.98	-.98 to -.49	-.49 to 0.0	0.0 to +.49	+.49 to +.98	Greater than +.98
Hold Harmless	$2.87	$8.43	$18.30	$28.05	$22.32	$36.56
Present	8.95	11.83	14.28	16.91	18.23	29.25
ALT1	7.29	10.93	14.30	17.98	19.88	27.62
ALT2	6.53	10.67	14.49	18.52	20.04	26.85
ALT3	5.75	10.16	14.34	18.98	21.65	29.80
ALT4	3.87	9.46	14.68	20.26	22.50	29.94
ALT5	4.60	9.54	14.43	19.88	22.95	26.76
ALT6	5.31	9.93	14.50	19.50	21.87	23.40
ALT7	3.25	9.00	14.65	20.83	23.72	26.24
ALT8[b]	2.00	8.00	14.60	21.97	26.16	18.83

a. The NEED Index is constructed by weighting the five factors as follows: NEED = .35 (Poverty) + .25 (Age of Housing Stock) + .20 (Density) + .10 (Crime and Unemployment) + .10 (Lack of Economic Opportunity). Scores greater (less) than zero represent above (below) average per capita need. The categories are defined by standard deviations above and below the mean.

b. ALT8 allocates funds solely on the basis of pre-1939 housing.

The per capita averages given in Table 6.5 and the regression slopes given in Table 6.4 tell us that hold harmless and the alternative formulas respond more to differences in relative need than does the present formula. However, in comparing two formulas both with positive regression slopes, we can not say that the formula with the higher slope is the more desirable. The inability to judge between positive slopes or differences in range results primarily from our using relative measures of need, instead of absolute measures. Normative judgments are required to argue that the per capita spread given in Table 6.5 for Alternative 7 is more desireable than the smaller spread given for the present formula. As we stated in Chapter 3, the choice between alternative formulas may require normative judgments about the relative importance of sensitivity to need (the regression slope and per capita range) and degree of responsiveness to need (the correlation coefficient).

Allocations to Central Cities Under Alternative Formulas

Table 6.6 shows for hold harmless, the present formula, and the seven alternative formulas, per capita amounts and percentage shares allocated to central cities as a group. In column (2) of Table 6.6, the central city share is expressed as a percentage of CDBGs going to all SMSA's located in the U.S., and in column (3), as a percentage of total U.S. CDBGs. As shown in column (1), the per capita formula amounts for central cities increase from $16.09 under the present formula to $17.94 under Alternative 7, which includes two formula factors (AGE1939, .6; POORPER, .4) heavily concentrated in central cities. As a percent of the SMSA appropriation, the increase in the central city share is from 52.8 percent under the present formula to 58.9 percent under Alternative 7, or 6.1 percentage points. As indicated by the factor percentages given in the last four lines of column (2), the central city share increases as the formula weights of aged-housing (AGE1939) and poverty (POORPER) are increased at the expense of population (POP) and overcrowded housing (OCRWD). Central cities account for 59.8 percent of aged-housing and 57.7 percent of poor persons but only account for 51.8 percent of over-crowded housing and 44.9 percent of population. The share of SMSA funds allocated to central cities can be easily calculated for any formula that is limited to these four variables (AGE1939, OCRWD, POORPER, POP) by first multiplying each percentage share by the corresponding formula weight and then, summing the four products. Of course, the formula weight and the resulting product will be zero for those variables not included in the formula. It should be obvious that the central city share for a formula that includes only population will be 44.9 percent and the share for one that includes only aged-housing will be 59.8 percent. In other words, considering only the above four variables, central cities as a group are most favored under a formula that distributes funds solely on the basis of pre-1939 housing and least favored under one that distributes funds on a per capita basis.

The share received by central cities under each of the alternative formulas is much less than that received under the categorical system. Under the categorical programs central cities accounted for 79.2 percent of the SMSA amount or 69.6 percent of the total amount. Even if

Table 6.6: Per Capita Amounts and Percentage Shares Allocated to 363 Central Cities Under Hold Harmless, Present Formula, and Seven Alternatives[A]

	(1) Per Capita $	(2) % of SMSA CD Funds	(3) % of Total U.S. CD Funds
Hold Harmless	$21.70	79.2%	69.6%
Present Formula	16.09	52.8	42.
Alternative 1	16.55	54.3	43.3
Alternative 2	16.75	55.0	43.8
Alternative 3	17.21	56.5	45.0
Alternative 4	17.82	58.5	46.6
Alternative 5	17.52	57.5	45.8
Alternative 6	17.11	56.2	44.8
Alternative 7	17.94	58.9	46.9
		% of SMSA	
POP		44.9	
POORPER		57.7	
OCRWD		51.8	
AGE1939		59.8	

a. SMSA appropriation of $2,077,600,000 was used in all formula computations in column (1). In columns (2) and (3), each CDBG appropriation used as the base is net of that amount going to outlying, entitlement cities.

funds were allocated solely on the basis of pre-1939 housing, central cities would still receive, as a percentage of SMSA funds, 19.4 percentage points less than they received under the displaced categorical programs. In other words, adding aged housing in the framework of the present system will not restore central cities to the relative position they held during the categorical years.

Central City Allocations by Population Size and by Region

Table 6.7 provides a breakdown of central city shares under the present formula and the alternative formulas by population size. As a percentage of SMSA funds, the share to those cities with a population greater than 250,000 increases from 35.3 percent under the present formula to 40 percent under Alternative 7. As could be demonstrated by taking ratios of the variable shares given in Table 6.7, this largest population subgroup benefits more than the two smaller subgroups from increases in the formula weight of aged housing. Table 6.8 shows per capita allocations to central cities under hold harmless (column 2), the present formula (column 3), and the seven alternative formulas (columns 4-10) by region and by population size. Only 325 of the 363 central cities are considered in Table 6.8.6/ The table highlights the advantage to central cities in the Northeast and North Central regions of funding under one of the alternative formulas instead of funding under the present formula. For example, columns (3) and (6) show that the average per capita amount for central cities in the Northeast increases from $15.48 under the present formula to $19.75 under Alternative 3; for central cities in the North Central region, the increase is from $14.79 to $17.23. Table 6.8 also highlights the decreases in the average per capita grant for central cities in the South that takes place under the alternative formulas. The central cities in the South are reduced from $18.43 under the present formula to $17.24 under Alternative 3, and all the way to $14.83 under Alternative 6, which increases the influence of AGE1939 at the expense of POORPER. Central cities in the West receive about the same average per capita grant under each alternative formula as they receive under the present formula. Within each region, the changes for cities above 250,000 are similar to those for all central cities.

Summary and Conclusion

In this chapter we have evaluated alternatives to the present formula that included age of housing stock as a formula factor. Adding age of housing to the formula significantly increased the correlation between per capita allocations and need scores for both the age-of-housing

6/ Only 325 of the 367 central cities were included on our 435 data file. These 325 cities accounted for 82 percent of central-city population and 89 percent of central-city poverty.

Table 6.7: Percentage of SMSA Appropriation Allocated to Central Cities Under the Present Formula and Seven Alternative Formulas by Population Size

	(1) Population Less Than 100,000	(2) Population 100,000 - 250,000	(3) Population Greater Than 250,000
Present Formula	8.9%	8.6%	35.3%
Alternative 1	9.2	8.6	36.5
Alternative 2	9.5	8.9	36.6
Alternative 3	9.3	8.7	38.5
Alternative 4	10.0	9.2	39.3
Alternative 5	9.5	8.7	39.3
Alternative 6	9.4	8.9	37.9
Alternative 7	10.0	9.0	40.0
POP[b]	8.1%	7.7%	29.0%
POORPER	10.1	9.6	38.0
OCRWD	7.9	7.6	36.3
AGE1939	9.8	8.7	41.3

a. SMSA appropriation used as a base is equal to the total SMSA allocation ($2,077,600,000) minus that amount going to outlying, entitlement cities ($45,629,839).

b. Variable percentages computed relative to SMSA totals.

Table 6.8: Per Capita Amounts for Central Cities Under Hold Harmless, the Present Formula, and Alternative Formulas by Region and by Population Size; 325 Central Cities

	(1) Number of Central Cities	(2) Hold Harmless	(3) Present Formula[a]	(4) ALT1	(5) ALT2	(6) ALT3	(7) ALT4	(8) ALT5	(9) ALT6	(10) ALT7
<u>Northeast</u>	73	$27.00	$15.48	$18.20	$18.71	$19.75	$21.00	$21.85	$21.39	$23.02
POP GT 250,000[b]	8	20.35	16.95	19.00	19.24	20.74	21.63	22.55	21.72	23.45
<u>North Central</u>	80	20.48	14.79	16.31	16.79	17.23	18.25	18.76	18.66	19.68
POP GT 250,000	15	21.26	15.58	17.26	17.73	18.42	19.51	20.03	19.73	21.01
<u>South</u>	116	21.10	18.43	17.11	16.97	17.24	17.34	15.59	14.83	15.33
POP GT 250,000	22	21.72	18.55	17.27	16.82	17.58	17.19	15.93	14.89	15.37
<u>West</u>	56	17.29	14.43	14.25	14.30	14.24	14.37	14.10	14.07	14.15
POP GT 250,000	12		14.70	14.79	14.84	15.02	15.16	15.12	14.97	15.22

a. Formula computations in columns (3)-(10) are based on an SMSA appropriation of $2,077,600,000.

b. Population greater than 250,000

dimension and the density dimension, and for three of the alternatives (ALT1, ALT2, ALT3), at a rather small expense in terms of a lower correlation with the poverty dimension. Each alternative considered completely dominated hold harmless in the sense of a higher correlation with each dimension of CD need. One equity advantage of hold harmless over the present formula--a higher correlation with the aged-housing dimension--loses its importance when age of housing is added to the formula.

In each case, the correlation between a comprehensive need index (NEED) and an alternative formula was higher than that between NEED and the present formula. Of course, correlations with a combined index will vary depending on the weight given to each of the five separate dimensions of CD need; however, it is probably safe to say that correlations for alternatives such as Alternative 3 and Alternative 5 will always be greater than that for the present formula as long as some importance is attached to the nonpoverty dimensions of need, especially to FACTOR 2 and FACTOR 3.

The multiple regression coefficients listed for the alternative formulas showed that increasing the formula weight of pre-1939 housing tends to make the formula more sensitive to the nonpoverty dimensions of CD need, especially to the age of housing and density dimensions. On the other hand, the alternative formulas are less sensitive to the poverty dimension than is the present formula.

Adding age of housing increases the share going to central cities, located primarily in the Northeast and North Central regions. As a percentage of the SMSA appropriation, the increase in the central city share is from 52.8 percent under the present formula to 58.9 percent under Alternative 7. However, even if funds were allocated solely on the basis of pre-1939 housing, central cities would still receive, as a percentage of SMSA funds, 19.4 percent less than the 79.2 percent received under the categorical programs.

Compared with the present formula, a switch to an alternative formula would benefit central cities located in the Northeast and North Central regions, at the expense of SMSA balances, urban counties, and central cities in the South. The average per capita amount for central cities in the Northeast (North Central region) would increase from $15.48 ($14.79) under the present formula to $19.75 ($17.23) under Alternative 3; central cities in the South would be reduced from $18.43 under the present formula to $17.24 under Alternative 3, and all the way to $14.83 under Alternative 6.

CHAPTER 7

FISCAL CAPACITY, TAX EFFORT, AND A TOTAL EVALUATION INDEX

In the first two sections of this chapter, we compare the present formula and the seven alternatives in terms of correlation with fiscal capacity and fiscal effort. In the third section, we analyze the formula alternatives using a comprehensive evaluation index that provides a relative measure of an entitlement city's need as well as the city's tax effort in meeting its non-education requirements given its level of fiscal capacity. In a concluding section, we discuss the implications of the analysis for changing the existing formula in order to make CDBG allocations more responsive to tax effort and fiscal capacity.

Fiscal Capacity

Measures of fiscal capacity are concerned with the ability of governments to obtain resources for public purposes. Including a measure of fiscal capacity in an aid formula recognizes the different abilities of governments to finance public services from their own revenue sources. Many feel that the provision of housing and community services to persons of low income should not place a differential burden on taxpayers in different cities and therefore call for inclusion of a measure of fiscal capacity in the CDBG formula. Others rationalize including a measure of community fiscal capacity in a formula that distributes CD funds because the externalities associated with urban blight require city-wide rather than individual solutions.[1/]

The case for a "partial equalization" feature in the CDBG formula is especially strong if the objective is to obtain either a minimum level of low income housing and community services across cities or a greater equality of such services across cities.[2/] With the wide diversity among cities in fiscal capacity and in program levels, complete uniformity in housing and community development levels is probably not a feasible or an appropriate objective; however, if a greater degree of

1/ Friedly, Philip H. "Experimental Approaches to the Amelioration of Housing Abandonment and Neighborhood Decline," paper prepared for 1971 annual meeting of the American Real Estate and Urban Economics Association.

2/ Advisory Commission on Intergovernmental Relations. The Role of Equalization in Federal Grants, 1964, p. 60.

uniformity is desired, including a partial equalization feature in the CDBG formula will increase the level of services in the lower capacity cities.

There are problems with the use of equalizing provisions in a CDBG formula. First, there is the question of the appropriate definition of fiscal capacity. Most categorical programs that incorporate equalizing features and the general revenue sharing program have used per capita income as their measure of a recipient's fiscal capacity. An Advisory Commission on Intergovernmental Relations study criticized the frequently used per capita income variable as an inappropriate measure of the relative financing capability of state and local governments because income fails to reflect closely the potential of certain revenue sources. In its place ACIR proposed an alternative capacity measure based on an "average-financing system" approach.3/ However, data problems and variations in local financial responsibilities especially below the state level, prevent the use of this capacity measure in allocation formulas. Therefore, if a capacity factor is included, it will be necessary to use the money income variable published by the Census Bureau.

A second problem with equalization features concerns regional price differences. If regional variations in prices are not accounted for in the allocation formula and funds are distributed according to differences in per capita income, the high income recipients are most likely being treated in an inequitable manner. This inequity occurs because their higher per capita income may in part be due to the higher living costs in these cities. Our results indicate a significant correlation between per capita income and four measures of the cost of living. 4/ In this case, an equalization formula based on <u>real</u> per capita income or an explicit recognition of price differences in the allocation formula would result in a different and more equitable distribution in CDBG funds.

A third problem concerns the relationship between community development and housing needs and the level of fiscal capacity. If the greatest need exists in the higher income cities and if there

3/ Advisory Commission on Intergovernmental Relations. <u>Measuring the Fiscal Capacity and Effort of State and Local Areas</u>, 1971.

4/ See Table 8.6

existed either inadequate measures of need in the formula or arbitrary weight assignments or both, an equalizing provision could direct funds away from those areas that needed them most. In this case a non-equalizing formula would provide a more equitable distribution of CD funds. On the other hand, if need and income are inversely related, an equalizing provision will reinforce the other formula factors in directing funds to those cities with the greatest need. Table 7.1 shows the correlation coefficients between one capacity measure (PCINC-72) and several need variables. As expected the poverty variables, POCRWD and PWOPLUMB, exhibit large negative correlations; however, the correlations between per capita income and DENSITY and PAGE1939 are much lower, in an absolute sense.

Instead of adding a capacity variable to the formula, we choose instead to simply evaluate the per capita amounts of the present formula and the seven alternatives in terms of their correlation with PCINC72. We interpret a high negative correlation as providing additional support for the formula being considered.

The correlation coefficients between per capita allocations and per capita income (PCINC72) are as follows:

	PCINC72
Hold Harmless	-.21
PRESENT	-.51
ALT1	-.46
ALT2	-.46
ALT3	-.41
ALT4	-.41
ALT5	-.30
ALT6	-.26
ALT7	-.28

As expected from the correlations between income and need variables given in Table 7.1, the present formula which gives a double weight to poverty and excludes age of housing stock exhibits the highest negative correlation with per capita income. Increasing the weight of age of housing reduces the correlation with fiscal capacity to as low as -0.26 for Alternative 6; however, for both Alternative 1 and Alternative 2, the correlation with per capita income is not much lower, in an absolute sense, than that for the present formula (-0.46 vs. -0.51).

Table 7.1: Coefficients of Correlation Between Per Capita Income and Need Variables; 435 Entitlement Cities

	PCINC72
P65AGED	.02
PCRIME	.00
PNW	-.34
PWOHSED	-.55
PFEMALHP	-.57
PYUTHPOV	-.61
PPOORPER	-.62
POCRWD	-.50
PWOPLUMB	-.46
PUNEMP75	-.18
PAGE1939	-.22
DENSITY	.12
POWNOCCH	.00

PCINC72 = per capita income (1972)

Tax Effort

A related fiscal concept that has received some support as a formula factor is "tax effort." Tax effort or revenue effort is an expression of the percentage relation between actual amounts of taxes or revenues obtained by a city government and its tax or revenue capacity. The idea is that those localities with the higher tax effort should receive a larger share of CD funds. There is one main argument for not including tax effort in the design of a CDBG formula: taxes are not imposed specifically for community development purposes. A city with a high tax effort may be doing relatively little to meet its CD needs. The tax effort factor is considered more appropriate for general revenue sharing where the funds are not used for a specific purpose. In addition, taxes that are exported do not impose a burden on the local population, and data problems prevent including the portion of state taxes that the residents of a given locality pay. The problem of an appropriate measure of fiscal capacity is also present.

Instead of adding tax effort to the CDBG formula, we choose to simply evaluate the per capita amounts under the present formula and the seven alternatives in terms of correlation with tax effort. In this analysis, we interpret a high positive correlation as providing support for the formula being considered. Before examining these formula correlations, we show how tax effort varies by region and by city type and how selected variables are correlated with tax effort by city size.

As shown in Table 7.2, taxpayers in the 96 Northeastern cities pay, on the average, 7.8 percent of their income in non-education taxes; this compares with only 3.58 percent for taxpayers in the North Central region, 3.88 percent in the South, and 3.22 percent in the West.5/

5/ These tax effort percentages are overstated because non-education taxes in 1974 are divided by income in 1972. Using total taxes and income in 1970, we obtained the following regional tax efforts: Northeast (8.0 percent), North Central (2.9 percent), South (3.1 percent), and West (2.5 percent). Using own general revenue (total general revenue minus total aid, or, taxes plus user charges) and income in 1970, we obtained the following regional revenue efforts: Northeast (9.5 percent), North Central (4.3 percent), South (4.5 percent), and West (3.9 percent). The correlation analysis using tax effort and revenue effort in 1970 yielded similar results to the analysis reported later in Chapter 7, which uses non-education taxes in 1974 divided by income in 1972 as the definition of tax effort.

Table 7.2: Tax Effort by Region and by City Type, 435 Entitlement Cities

Region	Number of Cities	(Tax/Income)[a]
Northeast	96	.078
North Central	112	.0358
South	128	.0388
West	99	.0322
City Type		
Central City	325	.049
Non-Central City	110	.030
Entitlement Cities	435	.046

a. Tax = Non-education taxes (1974)
Income = 1972 income

The high tax effort on the part of Northeastern cities is usually explained as follows. First, as a percentage of combined state and local expenditures, direct expenditures by state governments in the Northeast tend to be smaller than those by state governments in other regions. In other words, more expenditure responsibility is given to local governments in the Northeast. Second, and more important for our purposes, the high tax effort results from the concentration in Northeastern cities of several factors found in expenditure studies to be significant determinants of the demand for public services. These expenditure determinants include variables such as density, poverty, population, relatively high concentration of old persons, relatively high concentration of persons without high school education, unemployment, and aged housing. Finally, another explanation emphasizes the high input costs in Northeastern cities. Table 7.2 also shows that, on the average, taxpayers in central cities pay 4.9 percent of their income to their city governments for non-educational functions, which is 1.9 percent greater than the 3 percent paid by taxpayers in non-central cities.

Table 7.3 gives the correlation coefficients between tax effort (TAX1INC) and selected variables by city size. A comparison of the coefficients in columns (4)-(7) with those in columns (1)-(3) indicates that variables such as DENSITY, POWNOCCH, PAGE1949, PAGE1939, and PNW are more closely associated with tax effort at higher than at lower population levels. The correlations in columns (5)-(7) are consistent with expenditure studies that report variables such as DENSITY, PNW, and PAGE1939 to be significant determinants of expenditures, and therefore, taxes. For our purposes, the most important correlations are those between PAGE1939 and tax effort. As shown in columns (2)-(7), PAGE1939 exhibits a 0.41 or greater correlation with tax effort for all population groups greater than 50,000. The correlation coefficients between PAGE1939 and TAX1INC are particularly high for the three population groups greater than 250,000;0.52 for the 250-500 group, 0.68 for the 500-1250 group, and 0.65 for the greater than 500 group. These results, and the low correlations given for PPOORPER and POCRWD in Table 7.3, suggest that if one objective is to distribute CDBGs according to tax effort, aged housing should be considered as an additional formula factor. We next compare the present formula and the seven alternative formulas in terms of correlation with tax effort.

Table 7.4 presents correlation coefficients between per capita formula allocations and tax effort by city size. As shown by the coefficients in the second row of Table 7.4, the present formula does not allocate above-average per capita amounts to cities with above average tax effort. As expected, the correlation coefficients for the present formula in Table 7.4 are similar to those reported in Table 7.3 for PPOORPER. For both PRESENT and PPOORPER, the highest correlation with tax effort occurs in the population group, 250,000 to 500,000. The pattern of the correlation coefficients for each of the alternative formulas closely resembles that of PAGE1939 in Table 7.3. The coefficients reported in columns (5)-(7) are again higher than those reported in columns (1)-(4) for the lower population groups. For the population group, 500,000 to 1,250,000, three of the seven alternative

Table 7.3: Correlation Coefficients Between Tax Effort (TAX1INC) and Selected Variables by City Size, 430 Entitlement Cities[a]

Population (thousands)	(1) 25-50	(2) 50-75	(3) 75-100	(4) 100-250	(5) 250-500	(6) 500-1250	(7) GT 500
Number of Cities	72	137	72	94	31	20	25
DENSITY	.29	.09	.26	.38	.59	.73	.80
POWNOCCH	-.28	-.40	-.42	-.58	-.69	-.71	-.80
PAGE1949	.26	.40	.53	.43	.56	.66	.63
PAGE1939	.27	.42	.53	.41	.52	.68	.65
PPOORPER	.02	.05	.28	.23	.47	.10	.14
PUNEMP75	.12	.02	.11	.21	.34	.05	.01
PNW	-.09	.28	.45	.16	.45	.39	.56
PWOHSED	.19	.26	.35	.37	.74	.13	.22
PCINC72	.07	-.03	-.19	-.06	-.49	.08	.12
POCRWD	-.04	.00	.00	.01	.19	-.08	-.04

a. Because it also functions as a state government, Washington, D.C. was excluded. Four other cities (Gadsden, Taylor, Poughkeepsie, and Sterling Heights) were excluded because of data errors.

Table 7.4: Coefficients of Correlation Between Tax Effort (TAX1INC) and Per Capita Amounts Under the Present Formula and the Seven Alternative Formulas by Population Size

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Population (thousands)	25-50	50-75	75-100	100-250	250-500	500-1250	GT 500
PRESENT	.0202	.0535	.2537	.2286	.3916	.1432	.1350
ALT1	.1771	.2167	.4775	.3978	.6248	.5134	.5002
ALT2	.2020	.2402	.4979	.4065	.7052	.5827	.5445
ALT3	.2165	.2606	.5036	.4231	.6260	.5739	.5630
ALT4	.2358	.2800	.5169	.4243	.6969	.6332	.5940
ALT5	.3019	.3686	.5448	.4536	.6377	.7021	.6746
ALT6	.3077	.3808	.5407	.4430	.6051	.7126	.6723
ALT7	.3030	.3729	.5402	.4433	.6166	.7087	.6683

formulas exhibit a 0.70 or greater correlation with tax effort. As Table 7.4 clearly shows, a large gain in terms of increased correlation with tax effort is possible with a switch from the present formula to one of the alternative formulas. For example, a switch from the present formula to Alternative 3 would increase the correlation with tax effort in cities above 500,000 from 0.13 to 0.56. Similar increases occur for the other population groups. To summarize these correlation patterns, we conducted the anlaysis on 430 cities using the "weighted correlation" method defined in Chapter 3. This method determines the importance of a particular city on the basis of the percentage of total population accounted for by the city grouping within which the city is located. The weighted correlations between per capita formula amounts and tax effort are as follows:

	Tax Effort (TAX1INC)
Hold Harmless	.05
PRESENT	.28
ALT1	.50
ALT2	.47
ALT3	.55
ALT4	.51
ALT5	.60
ALT6	.56
ALT7	.56

Again, the coefficients are much higher for the alternative formulas than for the present formula. Conducting the same analysis but this time giving each city an equal weight of one yielded the following results:

	Tax Effort (TAX1INC)
PRESENT	.09
ALT1	.23
ALT2	.25
ALT3	.26
ALT4	.27
ALT5	.32
ALT6	.32
ALT7	.32

Giving each city an equal weight results in a much lower correlation between the per capita distribution under each formula and tax effort. To understand why the correlations for the alternative formulas are much lower when each city receives an equal weight, consider columns (1) and (2) of Table 7.4. The coefficients in these columns indicate that within each of the two population groups below 75,000, the alternative formulas do not allocate funds according to tax effort. The coefficients vary from as low as .18 for ALT1 in the population group--25,000 to 50,000--to 0.37 for ALT7 in the population group--50,000 to 75,000.

These correlations are much lower than those given in columns (3)-(8). In the correlation analysis using equal weights, the 209 cities in the two lower population groups, while accounting for only 15 percent of the population in the 430 entitlement cities, represent 48 percent of the cases. The coefficients given above for the analysis using equal weights are therefore heavily influenced by the low correlations given in columns (1) and (2) of Table 7.4. On the other hand, the weighted method rightfully places more emphasis on the higher correlations given in columns (3)-(7). The fact that the two lower population groups account for only 15 percent of the population is reflected in the weighted analysis.

The correlation results were quite similar using a different measure of tax effort, non-education taxes as a percent of the market value of the property tax base (TXEFFORT). Table 7.5 presents correlation coefficients between per capita formula allocations and TXEFFORT by population size. Again, the coefficient for each alternative formula is higher than that of the present formula for each population group. These correlation patterns are summarized by the following weighted correlations:

	Tax Effort (TXEFFORT)
PRESENT	.37
ALT1	.56
ALT2	.55
ALT3	.59
ALT4	.58
ALT5	.63
ALT6	.60
ALT7	.60

The correlations are much higher for the alternatives than for the present formula. Conducting the analysis giving each city an equal weight of one yielded the following results:

	Tax Effort (TXEFFORT)
PRESENT	.23
ALT1	.39
ALT2	.41
ALT3	.41
ALT4	.43
ALT5	.45
ALT6	.45
ALT7	.45

Table 7.5: Coefficients of Correlation Between Tax Effort (TXEFFORT) and Per Capita Amounts Under the Present Formula and the Seven Alternative Formulas by Population size

Population (thousands)	(1) 50-75	(2) 75-100	(3) 100-250	(4) 250-500	(5) 500-1250	(6) GT 500
PRESENT	.1000	.2797	.3220	.4767	.3253	.2693
ALT1	.2180	.5287	.4503	.5886	.5413	.5243
ALT2	.2403	.5560	.4568	.6245	.5777	.5690
ALT3	.2433	.5561	.4593	.5672	.5685	.5583
ALT4	.2638	.5760	.4621	.5897	.5992	.5979
ALT5	.3062	.6039	.4607	.4998	.6199	.6318
ALT6	.3132	.6009	.4492	.4352	.6176	.6363
ALT7	.3102	.6003	.4522	.4517	.6184	.6353

Comprehensive Evaluation Index

In this section, we test the present formula, hold harmless, and the alternative formulas using an evaluation index which considers a city's need requirements, its tax effort, and its fiscal capacity. Two functional forms are considered, a linear index and a multiplicative index. We construct the linear evaluation index by weighing three component indexes as follows:

$$\text{EVALUATION} = .50\ \text{NEED} + .25\ \text{TAX} + .25\ (1/\text{CAPACITY})$$

We construct the multiplicative index by multiplying the needs index by the tax index and then dividing the product by the fiscal capacity index:

$$\text{EVALUATION} = \frac{\text{NEED} \times \text{TAX}}{\text{CAPACITY}}$$

In both evaluation indexes, the underlying assumption is that the objectives of the CDBG program are such that per capita aid should increase with need requirements and tax effort and decrease with fiscal capacity. Beyond this, it is not entirely clear to us how indexes of need, tax effort, and fiscal capacity should be combined for the purposes of evaluating CDBG formula alternatives.

In the linear case, the relative importance of the component indexes are indicated by the weights attached to NEED, TAX, and CAPACITY. We have given NEED a double weight (.50). We do not attempt to justify this weight assignment except to say that the purposes of the CDBG Act emphasize those phenomena (urban blight, poverty, etc) that the need variables supposedly reflect. Fiscal capacity and tax effort are not even mentioned; however, as discussed in Chapter 3 and in the first two sections of this chapter, arguments can be made for distributing federal aid on basis of local fiscal capacity and local effort.

The weighing problem is also present in the multiplicative form, as the square of a component index could be used instead of the index itself. The multiplicative index is similar to the formula presently being used to allocate general revenue sharing funds. As compared with the linear index, the multiplicative index exhibits a much greater range and variability. It varies from .044 to 5.6 and has a standard deviation of 1.031; on the other hand, the linear index varies from .373 to 2.214 and has a standard deviation of only .327.

The fiscal capacity component (CAPACITY) is computed by dividing each city's per capita income (PCINC72) by the weighted average of per capita incomes for the 435 entitlement cities. Since we are dividing PCINC72 by a constant (the average PCINC72), the correlations between formula allocations and CAPACITY are the same as those for PCINC72. The needs index (NEED) is the same as that defined in Chapter 4, except that the scores have been transformed so that NEED is made up of positive numbers only, with a mean of one.6/ The tax effort index (TAX) differs from the tax effort measure (TAX1INC) used earlier. Instead of dividing taxes by income, we use a per capita tax index. Specifically, TAX is computed by dividing each city's per capita non-education taxes by the weighted average of per capita non-education taxes for entitlement cities. By construction, each of these component indexes are comprised of positive numbers only and each has an average value of one.

Table 7.6 gives the correlations between per capita allocations and the two evaluation indexes; for comparison purposes, correlations with component indexes are also presented. The correlation coefficients for the multiplicative index are on the average about 20 percentage points less than those for the linear evaluation index. Given the much larger variability in the multiplicative index, this is not unexpected. In the following, we limit our discussion to the linear form.

Table 7.6 summarizes much of the correlation analysis up to this point. Hold harmless is not strongly correlated with any of the component indexes and therefore shows a low correlation with the linear evaluation index (0.19). The coefficient for the present formula (0.65) is at least 15 percentage points less than that for each of the alternatives; the present formula shows the highest negative correlation with CAPACITY (-0.51) but suffers from its lower correlations with TAX (0.19) and NEED (0.78).

The reader should view these correlation results with some caution. There are several problems with the component indexes. For example, in our definition of fiscal capacity, we have neither adjusted income for regional price variations nor included the property tax base. The tax effort index includes only non-education taxes and ignores tax exporting and state government taxes paid by city residents. Because of variations among states in financing local services, the tax effort measure used in this study does not accurately reflect the actual fiscal burden on city residents. We have repeatedly mentioned the judgment involved in combining the factor scores in order to compute a total needs index. In constructing a comprehensive evaluation index, additional judgment was required to determine the relative importance of TAX, NEED, and CAPACITY.

6/ The following transformation was used: (1) if NEED < 0, NEED = e^{NEED}; (2) if NEED > 0, NEED = 1. + NEED. See Schmid, (1975), Appendix A.

Table 7.6: Correlation Coefficients Between (1) Per Capita Amounts Under Hold Harmless, the the Present Formula, and Seven Alternative Formulas, and (2) a Comprehensive Evaluation Index

	Evaluation Indexes		Component Indexes		
	(1) Linear[a]	(2) Multiplicative[b]	(1) NEED[c]	(2) TAX[d]	(3) CAPACITY[e]
HH	.19	.09	.28	.00	-.27
Present	.65	.44	.78	.19	-.51
ALT1	.86	.65	.96	.40	-.46
ALT2	.83	.62	.94	.37	-.46
ALT3	.88	.70	.96	.46	-.41
ALT4	.84	.64	.93	.41	-.41
ALT5	.86	.71	.90	.51	-.30
ALT6	.80	.66	.84	.48	-.26
ALT7	.80	.66	.85	.48	-.28

a. Linear Evaluation Index = .50 NEED + .25 TAX + .25 (1/CAPACITY)
b. Multiplicative Index = (NEED x TAX)/CAPACITY
c. The NEED Index is the same as that defined in Chapter 4 except that the scores have been transformed so that NEED is made up of positive numbers only, with a mean of one. Footnote 6 explains the transformation.
d. TAX Index = (per capita non-education taxes)/(average per capita non-education taxes)
e. CAPACITY Index = (per capita income, 1972)/(average per capita income, 1972)

Summary and Conclusion

The present formula which gives a double weight to poverty and excludes age of housing exhibited the highest negative correlation with per capita income. Increasing the weight of age of housing reduced the correlation with per capita income to -0.26 for Alternative 6; however, the -0.46 correlation for both Alternative 1 and Alternative 2 was not much lower, in an absolute sense, than the -0.51 for the present formula. The present formula did not do as well with regards to tax effort, exhibiting only a 0.28 correlation. Including age of housing resulted in a large gain in terms of increased correlation with tax effort. A switch from the present formula to Alternative 3 would increase the correlation with tax effort from 0.28 to 0.55.

The alternative formulas were more effective than both hold harmless and the present formula in distributing CDBG funds in accordance with a comprehensive evaluation index based on need, tax effort, and fiscal capacity. For example, Alternative 3 showed a 0.88 correlation with the linear evaluation index, which compares favorably with 0.65 correlation of the present formula and the 0.19 correlation of hold harmless.

CHAPTER 8

POPULATION DECLINE AND COST OF LIVING

The two objectives of the first section of this chapter are to relate our needs methodology to population decline and to examine alternative formulas with respect to an additional criterion, change in population. In the second section, using BLS data for 38 SMSA's, we evaluate each formula in terms of correlation with price indexes.

Characteristics of Declining and Growing Cities

In this section we distinguish growing from declining cities on the basis of need scores, need variables, and fiscal measures, and we evaluate alternative formulas with respect to an additional criterion, change in population. We look at percentage changes in population between 1960 and 1973 for entitlement cities, focusing on those cities that have experienced the largest changes in population.1/

We first relate our needs index methodology to population change using all 435 entitlement cities included in our data file. Table 8.1 ranks the 435 cities in terms of per capita community development need. For example, East St. Louis, the most needy of the entitlement cities, shows a per capita need score (NEED) of 1.4312; this score is to be interpreted relative to an average score of zero for the 435 entitlement cities. Each city's need score was constructed by weighting five dimensions of CD need as follows: poverty (0.35), aged-housing (0.25), density (0.20), crime and unemployment (0.10), and low education (0.10). The scores on the separate dimensions and details of the factor analysis are given in Appendix H. Table 8.1 also provides the percentage change in population between 1960 and 1973 (PCH6073) for each city.

As shown in Table 8.1, 38 of the 50 most needy cities have suffered a decline in population since 1960. Ten of the twelve growth cities in this group were Southern cities that scored high on our CD need index because of their high percentages of poverty (e.g., Laredo, 44 percent). Arranging the 435 cities by percent of population decline indicated that of the 109 entitlement cities that suffered a decline of 5 percent or greater, 95 had above average per capita need scores (greater than zero). The top 50 of the 150 decliners all showed above average need scores whereas only 3 of the 50 fastest growing cities showed above average scores. In addition, only 24 of the 224 cities in Table 8.1 with below average needs scores have lost population since 1960.

1/ In calculating the change in population (1960-73), we subtracted the 1973 population estimates given in Initial Data Elements: Entitlement Period 7 (published by the Office of General Revenue Sharing) from the 1960 population figures.

Table 8.1 Entitlement Cities Ranked According to Per Capita Need Score

RANK	STATCODE	NAME	NEED	PCH6073
1	17.	EAST ST LOUIS	1.4312	-25.2889
2	48.	LAREDO	1.4199	26.7636
3	48.	BROWNSVI LLE	1.3534	34.4035
4	34.	ATLANTIC CITY	1.2693	-22.1653
5	34.	NEWARK	1.2577	-10.1004
6	13.	AUGUSTA	1.0890	-20.4270
7	48.	HARLINGE N	1.0640	-9.6810
8	48.	MC ALLEN	1.0287	36.3830
9	10.	WILMINGT ON	1.0113	-22.2715
10	34.	CAMDEN	.9783	-14.6903
11	42.	HARRISBU RG	.9661	-23.5350
12	29.	ST LOUIS	.9445	-26.1000
13	22.	NEW ORLE ANS	.9431	-7.8905
14	42.	CHESTER	.9241	-20.0161
15	45.	CHARLEST ON	.9194	-1.6269
16	34.	UNION CI TY	.9176	3.0323
17	22.	ALEXANDR IA	.9061	25.8131
18	44.	PROVIDEN CE	.9042	-18.1762
19	34.	TRENTON	.8644	-8.0253
20	13.	SAVANNAH	.8449	-29.3896
21	24.	BALTIMOR E	.8209	-6.4851
22	34.	PATERSON	.8128	-.5168
23	36.	NEW YORK CITY	.8024	-1.4651
24	37.	WILMINGT ON	.7995	16.6581
25	9.	HARTFORD	.7948	-8.3330
26	39.	CLEVELAN D	.7934	-22.6577
27	34.	PASSAIC	.7915	-.5995
28	25.	BOSTON	.7811	-8.0237
29	47.	CHATTANO OGA	.7554	29.1017
30	36.	BUFFALO	.7532	-20.1266
31	9.	NEW HAVE N	.7406	-13.4986
32	51.	PETERSBU RG	.7315	18.7904
33	25.	CAMBRIDG E	.7287	-5.1735
34	22.	MONROE	.7209	11.8929
35	34.	EAST ORA NGE	.7107	-4.7507
36	6.	BERKELEY	.6962	1.3338
37	11.	WASHINGT ON	.6889	-3.9718
38	34.	JERSEY C ITY	.6817	-8.6036
39	48.	GALVESTO N	.6792	-9.1535
40	12.	DAYTONA BEACH	.6658	25.3151
41	6.	SAN FRAN CISCO	.6601	-7.1326
42	5.	PINE BLU FF	.6585	23.9959
43	1.	BIRMINGH AM	.6438	-13.9829
44	25.	NEW BEDF ORD	.6369	-1.1821
45	42.	YORK	.6255	-11.0126
46	17.	CHICAGO	.6172	-9.8374
47	26.	DETROIT	.6146	-16.5270
48	6.	OAKLAND	.6067	-4.9663
49	42.	PITTSBUR GH	.5918	-20.8638
50	25.	FALL RIV ER	.5863	-.3481

RANK	STATCODE	NAME	NEED	PCH6073
51	42.	PHILADEL PHIA	.5731	-6.6007
52	42.	JOHNSTOW N	.5529	-24.0755
53	42.	LANCASTE R	.5520	-6.4058
54	39.	CINCINNA TI	.5475	-14.9707
55	42.	EASTON	.5473	-11.2487
56	12.	MIAMI	.5457	21.4069
57	45.	SPARTANB URG	.5456	3.7627
58	54.	HUNTINGT ON	.5408	-12.8308
59	13.	ATLANTA	.5284	-7.6304
60	36.	ELMIRA	.5281	-19.9643
61	25.	HOLYOKE	.5269	-8.5704
62	25.	SOMERVIL LE	.5177	-10.9274
63	51.	RICHMOND	.5142	7.1981
64	13.	MACON	.5075	74.6743
65	21.	COVINGTO N	.4932	-20.0086
66	45.	GREENVIL LE	.4891	-8.5660
67	26.	BATTLE C REEK	.4779	-14.2965
68	42.	READING	.4735	-14.6309
69	42.	WILLIAMS PORT	.4726	-10.6466
70	36.	TROY	.4726	-7.8739
71	18.	EAST CHI CAGO	.4706	-21.8862
72	36.	ROCHESTE R	.4648	-13.0591
73	36.	POUGHKEE PSIE	.4648	-17.4153
74	25.	LAWRENCE	.4603	-4.8108
75	42.	WILKES-B ARRE	.4560	-9.9678
76	36.	ALBANY	.4529	-13.8481
77	37.	FAYETTEV ILLE	.4466	23.1385
78	37.	DURHAM	.4457	29.6590
79	21.	LOUISVIL LE	.4384	-13.8485
80	36.	SYRACUSE	.4278	-14.5162
81	12.	PENSACOL A	.4205	12.2184
82	1.	MONTGOME RY	.4105	13.1901
83	1.	MOBILE	.4071	-3.3185
84	34.	IRVINGTO N	.4037	-2.3197
85	36.	UTICA	.3971	-14.5978
86	36.	MOUNT VE RNON	.3955	-7.2930
87	54.	CHARLEST ON	.3921	-20.5257
88	9.	BRIDGEPO RT	.3920	-5.8063
89	13.	ALBANY	.3895	38.0868
90	1.	TUSCALOO SA	.3868	10.9648
91	54.	WHEELING	.3740	-12.0718
92	39.	DAYTON	.3607	-18.7056
93	23.	PORTLAND	.3598	-16.1449
94	53.	YAKIMA	.3597	4.3322
95	34.	PERTH AM BOY	.3570	.2411
96	48.	WACO	.3530	1.5247
97	25.	LYNN	.3503	-11.1275
98	37.	ASHEVILL E	.3452	.9202
99	34.	ELIZABET H	.3438	1.2610
100	48.	SAN ANTO NIO	.3415	29.1687

Table 8.1 Entitlement Cities Ranked According to Per Capita Need Score

RANK	STATCODE	NAME	NEED	PCH6073
101	42.	ALTOONA	.3405	-11.6262
102	36.	BINGHAMT ON	.3386	-20.3516
103	51.	PORTSMOU TH	.3377	-3.2852
104	48.	PORT ART HUR	.3377	-19.3866
105	51.	NORFOLK	.3327	-5.6956
106	39.	YOUNGSTO WN	.3315	-18.9979
107	22.	SHREVEPO RT	.3288	11.6674
108	28.	JACKSON	.3239	12.9482
109	6.	COMPTON	.3212	-1.2162
110	9.	NEW LOND ON	.3190	-11.9163
111	1.	GADSDEN	.3178	-10.9560
112	6.	SANTA CR UZ	.3045	40.4293
113	26.	JACKSON	.3038	-13.6763
114	27.	MINNEAPO LIS	.3004	-20.9606
115	6.	STOCKTON	.3001	34.8454
116	12.	ORLANDO	.2971	24.4486
117	42.	SCRANTON	.2970	-10.9105
118	39.	STEUBENV ILLE	.2951	-9.5167
119	25.	SPRINGFI ELD	.2919	-3.1126
120	48.	TEXARKAN A	.2918	12.8008
121	12.	TAMPA	.2859	1.1415
122	45.	COLUMBIA	.2856	14.6377
123	26.	SAGINAW	.2752	-12.3959
124	25.	WORCESTE R	.2701	-6.6149
125	12.	LAKELAND	.2699	13.4166
126	25.	LOWELL	.2693	.9454
127	44.	PAWTUCKE T	.2690	-7.7133
128	12.	WEST PAL M BEACH	.2603	8.3601
129	47.	MEMPHIS	.2597	32.9039
130	37.	WINSTON- SALEM	.2582	25.7474
131	34.	LONG BRA NCH	.2550	25.7726
132	36.	SCHENECT ADY	.2518	-5.5202
133	51.	ROANOKE	.2471	-6.7710
134	8.	DENVER	.2461	4.3476
135	47.	KNOXVILL E	.2387	61.4226
136	41.	PORTLAND	.2344	.3640
137	6.	SANTA MO NICA	.2259	9.4757
138	18.	GARY	.2252	.9626
139	26.	MUSKEGON	.2234	-7.0931
140	23.	LEWISTON	.2140	2.5250
141	39.	CANTON	.2139	-6.0624
142	12.	GAINESVI LLE	.2123	142.0815
143	34.	BAYONNE	.2107	-2.2047
144	5.	LITTLE R OCK	.2099	27.8770
145	48.	BRYAN	.2069	33.5623
146	12.	FORT MYE RS	.2019	49.5318
147	6.	FRESNO	.2012	28.6904
148	6.	PASADENA	.1973	-5.7699
149	51.	LYNCHBUR G	.1951	-.8255
150	49.	SALT LAK E CITY	.1931	-8.2113
151	26.	KALAMAZO O	.1920	-5.3404
152	26.	PONTIAC	.1903	-4.6238
153	22.	LAKE CHA RLES	.1899	23.5803
154	13.	COLUMBUS	.1899	34.2461
155	22.	LAFAYETT E	.1848	81.1351
156	48.	EL PASO	.1812	28.2071
157	39.	SPRINGFI ELD	.1793	-5.6861
158	48.	BEAUMONT	.1775	-4.1064
159	55.	SUPERIOR	.1768	-4.3994
160	29.	ST JOSEP H	.1766	-1.9625
161	42.	HAZLETON	.1680	-6.8716
162	6.	LOS ANGE LES	.1644	10.5373
163	18.	TERRE HA UTE	.1641	-9.4091
164	26.	GRAND RA PIDS	.1600	8.0607
165	29.	KANSAS C ITY	.1537	2.0825
166	39.	AKRON	.1499	-10.1940
167	22.	BATON RO UGE	.1485	88.4245
168	39.	LIMA	.1453	2.5475
169	55.	MILWAUKE E	.1448	-7.4787
170	25.	MALDEN	.1396	-2.5873
171	36.	NIAGARA FALLS	.1216	-19.6555
172	18.	MUNCIE	.1191	17.6071
173	25.	HAVERHIL L	.1155	-2.3657
174	25.	FITCHBUR G	.1049	-5.1106
175	6.	SAN BERN ARDINO	.1029	15.7497
176	20.	KANSAS C ITY	.1012	43.0810
177	39.	COLUMBUS	.1012	14.7430
178	6.	SANTA BA RBARA	.0905	25.2851
179	12.	ST PETER SBURG	.0874	28.1990
180	48.	TEMPLE	.0839	20.6596
181	48.	SAN ANGE LO	.0786	11.2196
182	5.	NORTH LI TTLE ROC	.0772	12.5502
183	21.	ASHLAND	.0729	-7.5614
184	42.	ERIE	.0707	-6.4278
185	26.	FLINT	.0704	-7.3894
186	53.	SPOKANE	.0692	-4.5592
187	42.	ALLENTOW N	.0632	.4112
188	37.	CHARLOTT E	.0597	39.6622
189	12.	TALLAHAS SEE	.0588	73.5980
190	9.	WATERBUR Y	.0562	3.4620
191	9.	NORWICH	.0538	14.7314
192	48.	CORPUS C HRISTI	.0510	25.7586
193	53.	SEATTLE	.0442	-9.3432
194	39.	TOLEDO	.0433	18.1306
195	27.	DULUTH	.0411	-8.5964
196	26.	BAY CITY	.0400	-8.6670
197	27.	ST PAUL	.0336	-8.3363
198	53.	TACOMA	.0336	3.6495
199	6.	SACRAMEN TO	.0270	36.7587
200	17.	PEORIA	.0251	24.6658

Table 8.1 Entitlement Cities Ranked According to Per Capita Need Score

RANK	STATCODE	NAME	NEED	PCH6073
201	39.	MANSFIEL D	.0244	19.4189
202	33.	MANCHEST ER	.0235	-5.0799
203	6.	LONG BEA CH	.0213	.8669
204	55.	LA CROSS E	.0196	2.5971
205	17.	BLOOMING TON	.0167	12.9943
206	6.	BAKERSFI ELD	.0152	30.7448
207	12.	JACKSONV ILLE	.0149	157.3412
208	1.	FLORENCE	.0141	-7.1929
209	9.	NEW BRIT AIN	.0117	-2.8062
210	6.	RICHMOND	.0115	1.8997
211	6.	ALAMEDA	.0093	11.4790
212	37.	HIGH POI NT	.0007	2.2988
213	5.	FORT SMI TH	-.0019	23.3248
214	39.	LAKEWOOD	-.0062	2.4119
215	28.	GULFPORT	-.0072	46.8422
216	17.	EVANSTON	-.0088	-3.0309
217	28.	BILOXI	-.0099	7.1753
218	36.	YONKERS	-.0106	2.7593
219	17.	CHAMPAIG N	-.0140	16.0355
220	5.	FAYETTEV ILLE	-.0177	63.1054
221	18.	EVANSVIL LE	-.0179	-4.0110
222	17.	SPRINGFI ELD	-.0332	11.2153
223	8.	PUEBLO	-.0337	13.1833
224	48.	DALLAS	-.0351	21.2066
225	37.	GASTONIA	-.0353	31.1465
226	48.	AUSTIN	-.0356	57.5743
227	40.	LAWTON	-.0373	32.1284
228	48.	HOUSTON	-.0464	40.2635
229	25.	MEDFORD	-.0486	-2.1485
230	37.	RALEIGH	-.0578	43.1239
231	55.	OSHKOSH	-.0585	14.3830
232	49.	PROVO	-.0589	54.4035
233	6.	EL MONTE	-.0608	398.3694
234	49.	OGDEN	-.0617	-5.4837
235	17.	URBANA	-.0642	23.5723
236	48.	KILLEEN	-.0644	90.3809
237	36.	NEW ROCH ELLE	-.0655	-5.4422
238	53.	EVERETT	-.0714	23.7351
239	51.	NEWPORT NEWS	-.0717	20.7305
240	17.	BERWYN	-.0742	-6.5316
241	36.	WHITE PL AINS	-.0831	-2.1063
242	55.	RACINE	-.0833	3.6496
243	25.	QUINCY	-.0856	3.6146
244	6.	ALHAMBRA	-.0934	9.8748
245	39.	MIDDLETO WN	-.0940	14.1344
246	19.	SIOUX CI TY	-.0959	-4.0847
247	26.	LANSING	-.0964	19.8692
248	47.	KINGSPOR T	-.0999	21.5940
249	40.	OKLAHOMA CITY	-.1058	15.5301
250	47.	NASHVILL E-DAVIDS	-.1060	6.1403
251	25.	BROCKTON	-.1118	28.7570
252	6.	SOUTH GA TE	-.1139	.9503
253	39.	WARREN	-.1144	2.8462
254	21.	OWENSBOR O	-.1146	19.8471
255	18.	SOUTH BE ND	-.1164	-8.2022
256	17.	JOLIET	-.1195	14.1265
257	41.	EUGENE	-.1209	76.8873
258	48.	FORT WOR TH	-.1212	3.5433
259	42.	BETHLEHE M	-.1244	-2.5781
260	31.	OMAHA	-.1254	24.3548
261	17.	DECATUR	-.1288	13.1439
262	6.	INGLEWOO D	-.1291	36.6490
263	48.	TYLER	-.1311	19.1673
264	6.	VALLEJO	-.1338	20.9744
265	19.	DES MOIN ES	-.1376	-3.5625
266	48.	LUBBOCK	-.1414	19.9211
267	39.	CLEVELAN D HEIGHT	-.1424	-9.4570
268	51.	ALEXANDR IA	-.1491	19.3123
269	17.	ROCKFORD	-.1513	12.3553
270	6.	POMONA	-.1530	24.9893
271	6.	GLENDALE	-.1571	7.4116
272	35.	ALBUQUER QUE	-.1572	34.4258
273	34.	BLOOMFIE LD	-.1573	-.6315
274	37.	GREENSBO RO	-.1577	28.7444
275	26.	ANN ARBO R	-.1594	53.8119
276	48.	WICHITA FALLS	-.1613	-7.2014
277	18.	FORT WAY NE	-.1626	15.0118
278	25.	PITTSFIE LD	-.1729	-3.4657
279	20.	TOPEKA	-.1745	13.3104
280	19.	COUNCIL BLUFFS	-.1751	7.5473
281	6.	SEASIDE	-.1820	79.6808
282	41.	SALEM	-.1828	59.2186
283	30.	BILLINGS	-.1861	25.7037
284	12.	FORT LAU DERDALE	-.1866	82.1508
285	19.	DAVENPOR T	-.1878	11.7162
286	8.	BOULDER	-.2007	99.5639
287	25.	WALTHAM	-.2016	5.6751
288	39.	LORAIN	-.2039	180.8258
289	6.	ONTARIO	-.2086	36.2281
290	8.	COLORADO SPRINGS	-.2095	150.4832
291	29.	COLUMBIA	-.2102	69.3258
292	12.	CLEARWAT ER	-.2156	91.7443
293	6.	SANTA RO SA	-.2182	107.9087
294	6.	SAN DIEG O	-.2193	30.0030
295	18.	ANDERSON	-.2242	45.2531
296	48.	ABILENE	-.2251	2.7640
297	20.	WICHITA	-.2256	3.1539
298	17.	MOLINE	-.2257	4.7597
299	40.	TULSA	-.2258	27.1935
300	18.	INDIANAP OLIS	-.2274	52.9341

Table 8.1 Entitlement Cities Ranked According to Per Capita Need Score

RANK	STATCODE	NAME	NEED	PCH6073
301	6.	MODESTO	-.2315	110.1068
302	36.	ROME	-.2320	-2.5572
303	34.	VINELAND	-.2326	34.7697
304	30.	GREAT FA LLS	-.2369	94.3980
305	55.	MADISON	-.2375	32.7266
306	19.	WATERLOO	-.2378	5.2276
307	40.	NORMAN	-.2423	74.1413
308	51.	CHESAPEA KE	-.2470	
309	48.	SHERMAN	-.2472	8.8610
310	6.	SALINAS	-.2480	122.2356
311	4.	TUCSON	-.2483	45.2406
312	6.	OXNARD	-.2545	104.5493
313	6.	MONTEREY	-.2557	112.0390
314	9.	MERIDEN	-.2633	9.4869
315	55.	KENOSHA	-.2637	17.1473
316	38.	FARGO	-.2663	18.0266
317	18.	LAFAYETT E	-.2719	2.9352
318	25.	LEOMINST ER	-.2754	24.1746
319	26.	EAST LAN SING	-.2836	59.8204
320	17.	ELGIN	-.2841	16.0323
321	9.	WEST HAV EN	-.2844	23.8139
322	17.	AURORA	-.2894	20.5885
323	17.	WAUKEGAN	-.2899	16.9761
324	31.	LINCOLN	-.2931	26.6623
325	19.	DUBUQUE	-.2940	9.4851
326	9.	STAMFORD	-.2942	12.2148
327	25.	NEWTON	-.2944	-2.3217
328	6.	RIVERSID E	-.2950	82.1242
329	6.	SANTA MA RIA	-.3018	74.8879
330	37.	BURLINGT ON	-.3046	6.8669
331	6.	REDONDO BEACH	-.3092	35.7999
332	6.	SANTA AN A	-.3196	66.6714
333	51.	HAMPTON	-.3229	42.7092
334	4.	PHOENIX	-.3303	45.5344
335	25.	CHICOPEE	-.3304	2.8782
336	27.	ST CLOUD	-.3329	21.9521
337	46.	SIOUX FA LLS	-.3331	13.3756
338	9.	NORWALK	-.3384	14.2110
339	48.	AMARILLO	-.3391	-5.4846
340	16.	BOISE CI TY	-.3543	169.4488
341	9.	DANBURY	-.3640	130.9914
342	18.	HAMMOND	-.3720	-3.6035
343	6.	LOMPOC	-.3921	84.0938
344	41.	SPRINGFI ELD	-.4096	57.1687
345	44.	CRANSTON	-.4116	15.6801
346	34.	CLIFTON	-.4118	-1.8994
347	6.	VENTURA %SAN BUE	-.4145	114.1088
348	39.	ELYRIA	-.4147	22.7163
349	12.	HOLLYWOO D	-.4152	224.1772
350	6.	SAN MATE O	-.4292	11.3153
351	27.	ROCHESTE R	-.4307	34.8629
352	6.	BURBANK	-.4326	-5.0747
353	19.	CEDAR RA PIDS	-.4363	19.0941
354	6.	NAPA	-.4406	96.0520
355	6.	PALO ALT O	-.4410	3.1515
356	33.	NASHUA	-.4422	52.7413
357	6.	MOUNTAIN VIEW	-.4488	102.6473
358	48.	ODESSA	-.4492	-1.3403
359	6.	HAWTHORN E	-.4497	66.5858
360	48.	TEXAS CI TY	-.4505	24.5680
361	1.	HUNTSVIL LE	-.4506	93.0180
362	55.	GREEN BA Y	-.4552	41.2112
363	6.	HAYWARD	-.4628	30.1584
364	6.	SAN JOSE	-.4742	156.0476
365	6.	SAN LEAN DRO	-.4818	2.7589
366	6.	CHULA VI STA	-.4841	73.0066
367	6.	EL CAJON	-.4896	53.1707
368	27.	MOORHEAD	-.4899	27.6957
369	6.	REDWOOD CITY	-.4906	17.7419
370	12.	MELBOURN E	-.4909	240.1899
371	26.	DEARBORN	-.4929	-9.6443
372	55.	WEST ALL IS	-.4987	8.1801
373	48.	MIDLAND	-.5020	-6.5184
374	6.	COSTA ME SA	-.5078	99.2309
375	32.	LAS VEGA S	-.5087	124.0694
376	19.	CEDAR FA LLS	-.5125	56.5768
377	6.	WHITTIER	-.5142	112.0529
378	6.	DALY CIT Y	-.5287	54.4588
379	55.	APPLETON	-.5338	17.7274
380	54.	WEIRTON	-.5360	-6.5831
381	9.	BRISTOL	-.5473	26.5359
382	6.	FAIRFIEL D	-.5497	179.8364
383	51.	VIRGINIA BEACH	-.5548	
384	4.	TEMPE	-.5871	237.2952
385	6.	DOWNEY	-.5884	3.2654
386	6.	ANAHEIM	-.5918	79.8194
387	6.	SANTA CL ARA	-.5923	50.0937
388	12.	HIALEAH	-.6148	81.1639
389	44.	WARWICK	-.6163	25.5588
390	29.	INDEPEND ENCE	-.6165	89.4851
391	4.	MESA	-.6179	157.8175
392	6.	FULLERTO N	-.6421	58.3727
393	2.	ANCHORAG E	-.6439	228.4836
394	39.	EUCLID	-.6450	4.8298
395	9.	MILFORD	-.6464	19.2839
396	6.	ORANGE	-.6483	213.1295
397	48.	GRAND PR AIRIE	-.6750	82.9349
398	26.	LINCOLN PARK	-.6985	-5.0694
399	26.	WYOMING	-.7067	24.8332
400	26.	ROYAL OA K	-.7128	.8752

Table 8.1 Entitlement Cities Ranked According to Per Capita Need Score

RANK	STATCODE	NAME		NEED	PCH6073
401	49.	OREM		-.7314	77.7968
402	6.	TORRANCE		-.7370	32.4478
403	12.	BOCA RAT	ON	-.7411	454.2784
404	6.	GARDEN G	ROVE	-.7414	39.6227
405	6.	SUNNYVAL	E	-.7537	101.0664
406	12.	TITUSVIL	LE	-.7542	390.8596
407	8.	AURORA		-.7654	119.9460
408	6.	WESTMINS	TER	-.7698	148.5500
409	48.	ARLINGTO	N	-.7714	124.5796
410	48.	PASADENA		-.7922	66.6306
411	6.	HUNTINGT	ON BEACH	-.7979	1124.4786
412	6.	BUENA PA	RK	-.8029	32.2019
413	48.	IRVING		-.8101	121.1445
414	6.	CONCORD		-.8163	154.0112
415	39.	PARMA		-.8707	22.3886
416	17.	DES PLAI	NES	-.8756	58.6972
417	6.	FREMONT		-.8764	154.3151
418	6.	WEST COV	INA	-.8881	42.8251
419	53.	RICHLAND		-.8957	5.8678
420	26.	ROSEVILL	E	-.8983	17.0699
421	34.	SAYREVIL	LE	-.9004	51.0905
422	39.	KETTERIN	G	-.9127	36.1781
423	4.	SCOTTSDA	LE	-.9145	636.2431
424	26.	TAYLOR		-.9408	62.6343
425	53.	BELLEVUE		-.9533	402.0675
426	48.	GARLAND		-.9551	162.9290
427	26.	WARREN		-.9768	97.1754
428	48.	MESQUITE		-1.0054	117.7363
429	20.	OVERLAND	PARK	-1.0122	
430	26.	DEARBORN	HEIGHTS	-1.0162	
431	26.	ST CLAIR	SHORES	-1.0206	12.0916
432	26.	STERLING	HEIGHTS	-1.0337	
433	27.	BLOOMING	TON	-1.1153	58.9569
434	29.	FLORISSA	NT	-1.1603	75.6539
435	26.	LIVONIA		-1.1688	72.8993

Restricting the analysis to the 63 cities with population over 200,000, Table 8.1 shows that each of the 16 most needy cities has lost population. On the other hand, only one of the 28 least needy cities in this over 200,000 group has lost population. To summarize, these comparisons indicate that, on the average, there is some consistency between our ranking according to CD need and a ranking according to population decline.

We now consider characteristics that distinguish growing from declining cities, focusing on the following four groups of cities:

Group A: Declining cities which have experienced a population decline of 10 percent or more during the period 1960-73. The 52 cities in Group A account for 12 percent of total entitlement city population.

Group B: Declining cities which have experienced a population decline between 5 and 10 percent during the period 1960-73. The 57 cities in Group B account for 18 percent of total entitlement city population.

Group C: Growing cities which have experienced a population increase between 5 and 10 percent during the period 1960-73. The 17 cities in Group C account for 2 percent of total entitlement city population.

Group D: Growing cities which have experienced an increase in population increase of 10 percent or more during the period 1960-73. The 229 cities in Group D account for 37 percent of the total entitlement city population.

Of the 109 declining cities in Groups A and B, 78, or 72 percent, are located in the Northeast or North Central region. Of the 246 cities in Groups C and D, 166, or 67 percent, are located in the South or West.

Characteristics other than regional location distinguish growing cities from declining cities. As shown in Table 8.2, the quantities for several need variables tend to increase from Group A to Group D. In 1970, 68.1 percent of the housing units in Group A cities were constructed before 1939, compared to only 26 percent in the fast-growing Group D cities. As indicated by the percentages for POWNOCCH and PMULTI, the population density in the declining cities exceeds that in the growth cities. Substandard housing as measured by percent of houses without plumbing is more of a problem in declining than growing cities. However, the percent of overcrowded housing (POCRWD) is actually higher in Group D cities (8.21) than in either of the two declining groups. This finding is consistent with the regional results presented earlier in Table 4.4. There we saw that the percentage of overcrowded housing was a high 9.58 percent in the South, compared to 7.88 in the Northeast, 7.45 in the North Central region, and 6.99 in the West. POCRWD is probably higher in the growth cities because 83 of the 229 Group D cities

Table 8.2: Need Indicators by Percent Change in Entitlement City Population, 1960-73

	Group A LT - 10%	Group B LT - 5% and GT - 10%	Group C LT + 10% and GT + 5%	Group D GT +10%
Number of Cities	52	57	17	229
PAGE1939	68.1%	60.9%	39.6%	26.0%
PAGE1949	81.2	73.9	55.4	39.4
PAFTER60	7.9	12.1	23.1	30.5
PMULTI[a]	49.1	44.9	37.6	30.7
POWNOCCH[a]	49.9	53.6	56.9	60.4
PWOPLUMB	3.5	3.2	2.6	2.2
POCRWD	7.3	7.6	6.3	8.2
PPOORPER	16.1	14.4	11.8	12.7
PYUTHPOV[a]	6.2	4.7	3.5	4.5
PFEMALHP	6.3	5.4	3.8	4.1
PPOORFAM	12.2	10.7	8.8	9.8
PUNEMP75[a]	11.0	9.9	8.8	8.5
POVAGE65[a]	3.4	2.7	2.4	1.9
P65AGED	12.5	11.4	11.3	8.7
PNW	29.6	29.0	17.5	23.5
PNEGRO	28.1	24.7	14.4	13.0
PCRIME	.055	.043	.036	.039

a. unweighted average

LT = less than (algebraically)

GT = greater than (algebraically)

are located in the South.

The percentages for the poverty variables given in Table 8.2 were all higher in the declining than in the growth cities. Both the percentage of families below the low income level and the unemployment rate were approximately 2.5 percentage points higher in Group A cities than in Group D cities. The declining cities showed a higher incidence of (1) female-headed households, (2) poor persons under 18 and over 65, (3) minority populations, and (4) per capita crime.

The CD need scores given in Table 8.3 reinforce our picture of declining cities as being disadvantaged relative to growth cities. Except for FACTOR 5, both groups of declining cities show above average per capita need levels, while the two groups of growing cities show below average scores. The main difference between the rapid decliners and the fast growing cities occurs in the age of housing dimension, which shows a 1.023 average score for Group A cities and a -0.442 score for Group D cities. The average score on the total CD need index was 0.583 for the rapid decliners, compared with -0.200 for the group of fast growing cities.

Spending and taxing patterns differ between declining and growing cities. In his discussion of local finance, George Peterson presented numerous fiscal comparisons showing declining cities as (a) having higher per capita expenditures and employment on common city functions; (b) paying higher average monthly wages for common function employees; (c) having a negative percent change in public employment levels, 1973-1975, (d) having a lower percent change in taxable property value, 1965-1973, (e) having both a higher effective property tax rate and a higher level of tax effort; and (f) relying to a greater extent on Federal and state aid as a revenue source.2/ Our results also indicated that per capita tax and expenditure levels are higher in declining cities. Per capita general expenditures were 63 percent higher in Group A than in Group D cities. In fiscal 1974-75, per capita non-education taxes were $168 in Group A cities, which was $53 greater than the $115 in Group D cities. As a percentage of total income, "own general revenue" (total revenue - aid) equaled 4.47 percent in Group A cities, 4.55 in Group B cities, 3.99 in Group C cities, and 2.42 in Group D cities. Per capita income, one measure of a city's fiscal capacity, averaged $3986 in Group D cities, or 13 percent above the level in Group A cities. Between 1970 and 1972, per capita income increased in Group D cities by 20 percent and in Group A cities by 18.4 percent.

2/ George E. Peterson, "Finance," Chapter 2 in The Urban Predicament edited by William Gordon and Nathan Glazer, The Urban Institute, Washington, D.C., (1976). Also see Muller (1975) for a similar classification of cities.

Table 8.3; Per Capita Need Scores by Percent Change In Entitlement City Population, 1960-73[a]

	Group A LT - 10%	Group B LT - 5% and GT - 10%	Group C LT + 10% and GT + 5%	Group D GT + 10%
FACTOR 1 (Poverty)	.495	.055	-.326	-.029
FACTOR 2 (Age of housing)	1.023	.527	.053	-.442
FACTOR 3 (Density)	.367	.296	-.043	-.248
FACTOR 4 (Crime and unemployment)	.548	.286	-.045	-.297
FACTOR 5 (Low education)	.258	-.061	-.228	-.003
Total Need Score[b]	.583	.233	-.137	-.200
% Change population 1970-73	-7.25%	-3.96%	-2.78%	+5.91%

a. The factor analysis is explained in Appendix H; each city receives an equal weight of one.

b. Need score = .35 FACTOR 1 + .25 FACTOR 2 + .20 FACTOR 3 + .10 FACTOR 4 + .10 FACTOR 5

LT = less than (algebraically)

GT = greater than (alegbraically)

We now compare per capita amounts allocated to declining and growing cities under five of the formulas. Table 8.4 provides the data. First, notice that under each formula, the average per capita amount decreases as you go from Group A to Group D; higher per capita amounts are allocated to the more needy, declining cities. However, aid to the declining cities is much greater under the alternative formulas than under the present formula. Declining cities in Group A would receive $22.74 per capita under ALT4 (.4 AGE1939, .6 POORPER), or 35.8 percent more than they would receive under full funding of the present formula. On the other hand, the average per capita amount allocated to the growth cities in Group D would decrease from $14.97 under PRESENT to $13.15 under ALT4, a decrease of 12.2 percent. The explanation for these shifts lies in the percentages for PAGE1939 given in Table 8.2; there is anobvious, positive relationship between age of housing and population decline.

Correlation analysis can be used to evaluate the formulas in terms of the additional criterion, population decline. For the moment, we assume that hardship is greater in declining cities; therefore, we desire a high negative correlation between per capita formula amounts and changes in population (PCH6073). The correlations are as follows:

	PCH6073
HH	-.18
PRESENT	-.23
ALT1	-.42
ALT2	-.46
ALT3	-.44
ALT4	-.48
ALT5	-.50
ALT6	-.50
ALT7	-.50

The above results show that the alternative formulas are more closely correlated with population decline than either the present formula or hold harmless. These results are therefore consistent with the per capita averages given in Table 8.4.

Two problems exist with the above correlation results. First, there is some indication that, on a group basis, hold harmless has a stronger relationship with population decline than is indicated by the -0.18 correlation given above. Forty-seven of the 52 Group A cities and 36 of the 57 Group B cities had hold harmless amounts greater than their present formula amounts. Only 66, or 26 percent, of the two groups of growth cities would lose with the phase out of hold harmless. From these and our earlier results, we can characterize phase-down cities (losers) as being located in the Northeast, as having an aged housing stock, and as experiencing a decline in population since 1960. The low negative correlation results not because per capita allocations to declining cities are less than per capita allocations to growing cities (see Table 8.4), but because the variation of per capita allocations

Table 8.4: Per Capita Formula Amounts by Percent Change In Entitlement City Population, 1960-73

	Group A LT - 10%	Group B LT - 5% and GT - 10%	Group C LT + 10% and GT + 5%	Group D GT + 10%
PRESENT	$16.75	$15.93	$13.78	$14.97
ALT1	18.99	17.65	14.11	13.91
ALT2	20.12	18.30	14.56	13.61
ALT4	22.74	20.42	14.88	13.15
ALT6	22.41	20.23	14.92	12.29
Hold Harmless	34.71	26.48	18.24	13.66

LT = Less than (algebraically)

GT = Greater than (algebraically)

between cities in the same or different groups is only weakly related to population decline.

A more important qualification concerns our assumption that need increases with population decline. There is another argument that CD need, in the form of infrastructure requirements, is higher in growing cities than in declining cities. A growing population puts pressure on public facilities, thereby forcing either a cut-back in other services or an increase in debt or taxes to finance the needed increase in capital stock. This aspect of CD need has been ignored in this study. Our main purpose in this section has been simply to document the higher incidence of need indicators that exists in declining cities and to examine the effects of different formulas on growing and declining cities. We do not say that population loss is an indicator of need; we only show that need indicators, as defined in this study, are concentrated in declining cities. Of course, our definition of need is deficient to the extent that population growth itself is a positive indicator of CD need.

Cost Variations

The present formula does not take into account city variations in the cost of living and therefore treats in an inequitable manner those cities with higher input costs. In addition, the 1970 Census did not consider cost of living differences in its definition of poverty income levels. This means that present poverty counts understate actual poverty in cities with above average costs. Using BLS data for 38 SMSAs, we correlated certain variables with an "intermediate income cost of living" index (IYCPI), obtaining the following results:3/

	IYCPI
POP	.4383
DENSITY	.7131
MEDINC	.2214
PERCAPIN	.2444
PPOORPER	-.1932
PAGE1939	.6916
POWNOCCH	-.5843

3/ U.S. Bureau of Labor Statistics. Handbook of Labor Statistics 1974, Bulletin 1825, tables 138-140, pp. 346-348. Budget costs are for Autumn, 1972. Honolulu and Anchorage were dropped, reducing the file from 40 to 38.

Density (0.71) and age of housing stock (0.69) exhibit the highest correlations with the cost of living index. The importance of density in explaining variations in the cost of living was also observed in a regression analysis of the BLS data. The two best fitting equations are reported in Table 8.5. The constant term,DENSITY, and DUMSOUTH were highly significant in both equations. For our purposes the most important result was the .69 correlation between PAGE1939 and IYCPI. This .69 correlation provides yet another reason for including age of the housing stock as a formula factor.

Each of the formula distributions was evaluated in terms of correlation with IYCPI; the following coefficients were obtained:

	IYCPI
HH	.2490
PRESENT	-.1238
ALT1	.3626
ALT2	.4047
ALT3	.4513
ALT4	.4776
ALT5	.6061
ALT6	.6164
ALT7	.6066

For this group of 38 cities, the present formula does not distribute above average, per capita amounts to cities with above average living costs. Given the -0.19 correlation between PPOORPER and IYCPI and the significant, negative coefficients for DUMSOUTH in both regression equations, the insignificant, -0.12 correlation between the present formula, which gives POORPER a double weight and favors the South, and IYCPI was not unexpected. The effects of adding aged housing to the formula are illustrated by the correlations of the alternative formulas with IYCPI. The correlation with IYCPI increases from -0.12 for the present formula to 0.45 for ALT3, and, to 0.61 for ALT6. Positive correlations are desirable, of course, because above average amounts should go to those cities with above average living costs; ideally, we would rather express everything in real, rather than money terms.

So far we have restricted the analysis to the "intermediate income cost of living" index. BLS also publishes the following indexes:

IYRPI=intermediate income rent index

Table 8.5: Regression Equations for Cost of Living Index

	Intermediate Income Cost of Living Index	
	Equation (1)	Equation (2)
Regression Coefficients		
(1) Intercept	95.2	91.7
(2) Density	.00788	.00743
(3) DUMSOUTH[a]	-.6.71	-4.56
(4) JANTEMP[b]		-.133[d]
(5) PERCAPIN[c]		.0024[e]
Coefficient of Multiple Determination (R^2)	.67	.71

a. DUMSOUTH = Value of 1 for Southern city, 0 otherwise.

b. JANTEMP = Average January temperature.

c. PERCAPIN = Per Capita income

d. Insignificant at .05 level, significant at .10 level.

e. Insignificant at .10 level.

IYHPI=intermediate income housing price index

Similar indexes are given for lower income families (LYCPI, LYRPI, LYHPI). A correlation analysis similar to that above was conducted on each index; the results are presented in Table 8.6.

Summary and Conclusions

Compared with growing cities, our results show declining cities as (1) having an older housing stock, (2) having higher concentrations of low income persons, (3) having higher levels of per capita expenditures and taxes, and (4) receiving higher per capita CDBG allocations, especially under the alternative formulas. The correlation analysis showed that the alternative formulas are more responsive to population decline than either the present formula or hold harmless.

DENSITY and PAGE1939 exhibit a significant, positive correlation with the cost of living. For the 38 cities considered, Alternative 6 exhibited a 0.61 correlation with an "intermediate income cost of living index", which compares favorably with the -0.12 exhibited by the present formula.

Table 8.6: Coefficients of Correlation Between (1) Cost of Living Indexes and (2) Per Capita Formula Amount and Need Variables, 38 Entitlement Cities

	LYCPI[a]	LYHPI	LYRPI	IYCPI	IYHPI	IYRPI
PRESENT	-.08	-.03	-.03	-.12	-.14	-.12
ALT1	.35	.17	.18	.36	.26	.13
ALT2	.39	.18	.19	.40	.29	.16
ALT3	.42	.21	.22	.45	.34	.18
ALT4	.45	.21	.22	.47	.35	.20
ALT5	.55	.27	.28	.60	.48	.27
ALT6	.57	.27	.28	.61	.48	.28
ALT7	.56	.26	.28	.60	.47	.28
POP	.32	.06	.05	.43	.39	.17
DENSITY	.62	.32	.33	.71	.61	.43
MEDINC	.26	.21	.23	.22	.26	.34
PERCAPIN	.40	.35	.37	.24	.25	.42
PPOOPER	-.13	-.07	-.07	-.19	-.22	-.16
PAGE1939	.59	.26	.27	.69	.56	.30
POWNOCCH	-.59	-.54	-.53	-.58	-.54	-.45
MEDVALUE	.51	.56	.57	.44	.52	.55
MEDRENT	.44	.64	.64	.33	.41	.64

a. LYCPI = lower income cost of living index
LYHPI = lower income housing price index
LYRPI = lower income rent index
IYCPI = intermediate income cost of living index
IYHPI = intermediate income housing price index
IYRPI = intermediate income rent index

Indexes constructed by the Bureau of Labor Statistics.

Chapter 9
Allocations Among Types of Recipients

An unresolved issue is the distribution of funds among types of recipients. Our estimates indicate that under full funding with the present formula, the total SMSA share (approximately 80% of total authorization) would be divided as follows: (1) 522 entitlement cities, 60%; (2) 73 urban counties, 12.5%; and (3) SMSA balances, 27.5%. Added to the non-SMSA 20 percent, this results in approximately 52 percent of all CDBG funds being directed toward small cities in urban counties, SMSA balances, and non-SMSA areas. This result is surprising given the predominant large-city focus of the previous categorical programs.

The Introduction to this study emphasized two limitations to our methodology: (1) it cannot determine the appropriate rural-urban split in funding and (2) it accepts the implicit assumption of the CDBG program that, within metropolitan areas, all persons, poor persons, and overcrowded housing represent equal CD need regardless of their location. However, our techniques and data can add to the understanding of these two issues. In this chapter we present information and analysis related to these questions. We also discuss allocation mechanisms, involving more than one formula, which would direct more funds to entitlement cities.

The first section explains how funds are distributed among types of recipients in the present, single-formula allocation mechanism, and discusses what assumptions must be accepted to prefer a distribution which favors entitlement cities more than the single formula alternatives discussed earlier. The second section reports the results of a factor analysis on 803 cities with population above 25,000 to determine how need varies with city size. In this section we also use our methodology to determine if central cities with populations below 50,000 have greater need for CD funds than all similarly populated cities. The next two sections examine an alternative allocation system, the dual formula approach. A final section outlines some of the arguments for changing the allocation between urban and rural areas.

Present Allocation Mechanism and Underlying Assumption

The 20% - 80% division of funds between non-metropolitan areas and metropolitan areas is mandated by the CDBG legislation. The distribution of the metropolitan area funds among entitlement cities, urban counties, and SMSA balances is proportional to the relative population, overcrowded housing, and poverty (counted twice) in the different recipient classes. In other words, the CDBG allocation mechanism implicitly assumes that each person, poor person, and overcrowded house (or, in the case of our alternative formulas, aged housing unit) indicates the same level of CD need regardless of its location within the SMSA. We adopted this assumption in the analysis in Chapters 5 through 8. Consequently any redistribution among types of recipients brought about by introducing age of housing into the formula is determined by the relative share of aged housing in entitlement cities, urban counties, and SMSA balances.

The percentage shares of SMSA funds allocated to all 522 entitlement cities under hold harmless and the various formulas are as follows:

	% of SMSA funds
Hold harmless	84.5%
Present	60.0
Alternative 1	61.3
" 2	61.9
" 3	63.2
" 4	64.9
" 5	64.2
" 6	63.0
" 7	65.5

A similar result is obtained if we consider only those entitlement cities which are central cities. The share of SMSA funds allocated to central cities increased from 52.8 percent under the present formula to 58.9 percent under Alternative 7, and to 59.8 percent under an alternative that allocated solely on the basis of aged-housing. In other words, by adding aged housing to the formula, we not only increase the equity of the entitlement city distribution, but we also increase the total allocation to the larger, central cities, primarily at the expense of urban counties and balances of SMSA's. On the other hand, the share received by central cities under each of the alternatives was less than the 79.2 percent of SMSA funds received under the categorical programs. In fact, even if funds were allocated solely on the basis of pre-1939 housing, central cities would still receive, as a percentage of SMSA funds, 19.4 percentage points less than that received under the displaced categorical programs.

An alternative assumption would be that these formula factors denote greater need in entitlement cities.1/ Although intuitively appealing,

1/ This alternative assumption is already implicitly contained in the CDBG legislation because non-SMSA areas receive only 20% of CDBG funds although they account for 27.6% of the population, 41.3% of the poverty, 31.8% of the overcrowded housing, and 32.6% of the aged housing.

this alternative assumption is difficult to verify. Poverty and older housing can be found throughout urban areas and generate similar problems regardless of location. Analysis presented below shows that per capita need does seem to increase with city size but that the rate of increase is small. Logically the choice of the alternative assumption over the equal-need assumption must be based on one or more of the following four premises:

1. In the less densely populated areas of SMSA's, the formula need variables may indicate specific need, such as the existence of old housing; but the link between the formula factors and urban maladies either does not exist or is weaker. In other words, the existence of old housing may be a problem in itself in a small suburban jurisdiction; but, in suburbs, it is not necessarily associated with neighborhood decay. This premise can be expressed in terms of our factor analysis methodology by saying that the relationship between aged housing and the age of housing dimension of CD need is weaker in suburban areas.

2. Data for formula purposes does not exist to measure accurately the differential need in large cities that arises from the dense concentration of formula factors. In economic terminology, the negative externalities associated with poverty and aged housing may be more serious in per capita terms in densely populated areas.

3. The needs approach may ignore other important factors such as the capacity of a local jurisdiction to solve its own problems using its own resources. In other words the relatively wealthier suburban jurisdictions may need less assistance. Of course, this premise could also justify the addition of a capacity measure to the formula.

4. Without a limit on the distribution to other areas, the share going to central cities is not sufficient to overcome the serious problems of those cities.

The methodology of this study cannot prove or disprove these premises.

Adoption of this alternative assumption presents the problem of determining how much more need the formula factors represent in entitlement cities than in the remainder of the SMSA. Once we depart from assuming that the formula variables accurately reflect need, we are left with no objective method to determine the shares of large and small cities. We can use a fixed percentage method similar to the rural-urban split or we can use a residual method such as a two-formula system.

Variation in Need by Size of City

Our data provide evidence that large cities are more needy than small communities. A factor analysis was conducted on 802 cities with population above 25,000 to determine how per capita need varies with city size. The initial reason for extending the factor analysis to all cities above 25,000 population was to determine if a large, positive shift in per capita need occurred at a particular city size. Detection of a large positive shift in per capita need at a particular city size could be used to support that city size as the appropriate cutoff for entitlement cities.

The "factor loadings" of the varimax rotated matrix are presented in Table 9.1. These results differ from those reported in Table 4.5 because the factor analysis is now performed over all cities over 25,000. The following table defines each dimension of CD need in terms of need indicators with high loadings.

	Dimension	Need Variables, defining dimensions
FACTOR 1	Poverty, without Plumbing	Poverty Variables, PNW, PWOPLUMB.
FACTOR 2	Age of Housing Stock	PAGE1949,2/ P65AGED
FACTOR 3	Crime	PCRIME, PNW
FACTOR 4	Density	POWNOCCH, DENSITY
FACTOR 5	Low Education, Overcrowded housing	PWOHSED, POCRWD

It should be noted (a) that Factor 3 is now the crime dimension and Factor 4 the density dimension, and (b) that overcrowded housing is now loading on Factor 5 rather than on Factor 1, the poverty dimension.

Table 9.2 provides unweighted average need scores for each city size group. Although a large shift was not detected, there does seem to be, for each dimension of CD need, a trend from low to high per capita need (from negative to positive scores) as population increases. The 237 cities in the lowest population group (25-35,000) received below average need scores on each dimension. Except for an average need score (+.007) on the age-of-housing-stock dimension, the second population group (35-50,000) also received below average need scores.3/ To summarize, the data in Table 9.2 provide evidence that, on a per capita basis, cities

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2/ PAGF1949 (percentage of houses constructed before 1949) was used in this analysis in the place of PAGE1939 because our 845 city file did not contain PAGE1939.

3/ The average score for each dimension is zero. Other results indicate that only with respect to houses without plumbing do small cities exhibit a higher per capita need than large cities.

Table 9.1: Varimax Rotated Factor Matrix from Factor Analysis of 802 Cities, Population Greater than 25,000[a]

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
P65AGED	.07634	.73243	.08409	.12805	-.05598
POWNOCCH	-.29966	-.24898	-.24698	-.68930	.09703
PCRIME	.14661	.05396	.69828	.21501	.03380
PNW	.65761	-.12682	.55330	.12911	.22370
PWOHSED	.40460	.44127	.11056	.16030	.61130
PFEMALHP	.85840	.18732	.33218	.04033	.12996
PYUTHPOV	.93166	.01584	.23127	-.03930	.21090
PPOORPER	.94792	.18282	.16193	.04888	.01944
POCRWD	.58766	-.38587	.10797	.07681	.56334
PWOPLUMB	.72302	.22804	-.17239	.07187	.14352
POLDSTR	.17123	.79450	-.07285	.30768	.15553
DENSITY	-.13279	.17465	.10716	.65057	.15908

a: We did not have crime data for 43 of the 845 cities; therefore, the factor analysis was conducted on only 802 cities.

Table 9.2: Average Per Capita Need Scores By City Size[a]

	Population Size (thousands)								
	25-35	35-50	50-75	75-100	100-250	250-500	500-1000	1000-2500	Greater Than 2500
Number of Cities	237	189	152	71	97	30	20	3	3
Need Dimension:									
Poverty Variables; without Plumbing	-.03	-.048	+.012	-.273	+.143	+.345	+.453	+.197	+.175
Age of housing stock (1949); % over 65	-.056	+.007	-.007	+.005	+.077	+.080	+.114	+.384	-.09
Crime; Nonwhite; female headed household	-.344	-.103	-.094	+.189	+.522	+.719	+1.115	+1.457	+1.28
Lack of Homeownership; Density	-.186	-.038	+.079	+.150	+.004	+.351	+.496	+.419	+2.19
Low education; overcrowded housing	-.088	-.013	+.026	+.139	-.021	+.154	+.145	+.542	+.371

a. Factor analysis conducted on cities above 25,000. For each dimension, the average score is zero. Scores above (below) zero indicate above (below) average per capita need.

between 25 and 50,000 are less needy than cities above 50,000 population. Such comparisons do not necessarily justify treating small cities in SMSA balances as residual recipients (with a share less than their formula share), but do suggest that, if policy decisions were to be made to reduce or eliminate aid to low need recipients, city size may be an appropriate dividing line.

Central Cities Below 50,000 Population

Another issue concerns the question of whether or not we should strive to get rid of "artificial" distinctions created by SMSA's in administering entitlement funds. In other words, are the 92 entitlement cities with populations below 50,000 in greater need of CD funds than other similarly populated cities simply because they are central cities of SMSA's? A comparison of need variables and per capita need scores for 76 central cities with a population below 50,000 with all 456 cities with a population between 25,000 and 50,000 indicates that the 76 central cities are on the average in greater need of CD funding per capita than the average city in this population subgroup. Column (1) in Table 9.3 gives average need percentages and per capita scores for 76 central (entitlement) cities below 50,000 population; column (2) gives the same for all cities with a population below 50,000 and above 25,000. For each variable and dimension, the percentage or need score in column (1) is greater than that in column (2). This suggests that, for determining entitlement city status, the SMSA and central city concepts may not be "artificial" at all. Furthermore, a comparison of column (1) with column (3) -- which provides the averages for 389 entitlement cities above 50,000 population -- indicates that except for POCRWD and the aged housing dimension of CD need, the 76 central cities below 50,000 are, on a per capita basis, in greater need than entitlement cities above 50,000. Columns (2) and (3) of Table 9.3 summarize per capita need in cities below and above 50,000 population. Large cities as a group and on a per capita basis are more needy than small cities on all measures of need considered except that relating to houses without adequate plumbing.

Dual Formula Approach

As part of its overall evaluation of the CDBG program, the Department of Housing and Urban Development funded a two-year monitoring study by the Brookings Institution. The Brookings study attempts to answer three questions: (1) is the CDBG formula an equitable and effective distribution mechanism, (2) how have CDBG funds affected local government expenditures, and (3) how has the block grant mode of funding affected the way local governments make community development decisions.

The principal focus of the formula portion of the Brookings study is the effect of the present CDBG allocation system on various types of recipients (e.g., central cities, small cities, urban counties) and a

Table 9.3: Central Cities Between 25,000 and 50,000 Compared with Cities by Population Size in Terms of Need Variables and Per Capita Need Scores

	(1) Central City 25-50,000 (76)	(2) All Cities[a] 25-50,000 (456)	(3) All Cities 50,000+ (389)
Need Variables			
PPOORPER	14.30%	10.80%	13.58%
POCRWD	7.27%	6.74%	8.20%
PWOPLUMB	3.56%	2.72%	2.63%
PAGE1949	59.50%	48.61%	58.4%
Dimension Scores[b]			
(1) Poverty and Overcrowded housing	+.194	-.053	+.062
(2) Aged-housing and density	+.069	-.131	+.154
(3) Without plumbing	+.254	+.041	-.048

a. This population subgroup includes the 76 central cities in column (1).

b. The per capita need scores were derived from a factor analysis on 845 cities with population above 25,000. The average score for each of the three dimensions is equal to zero. Dimensions are defined by variables with high loadings.

comparison of this distribution pattern with that for the seven folded-in categorical grants. The Brookings analysis posits that the most urgent needs are in urban centers (central cities) and adopts this urban focus as the framework against which alternatives are evaluated. Numerous tables document (1) the decrease in the share going to central cities under the present formula relative to the categorical distribution, (2) the decrease in the share going to the Northeast, and (3) the large discretionary amount remaining under the present formula. The main recommendation is that each of the 587 entitlement recipients should be given the maximum of either its present formula amount or an alternative amount computed from a formula that substitutes the age of the housing stock for overcrowded housing as a formula variable and gives the double weight to age of housing rather than poverty. This two-formula approach would reinstate the urban focus of the CD distribution system by increasing the central city share of SMSA funds from 52.8 under the present formula to 62.2 percent under the proposed two-formula approach and decreasing the SMSA discretionary share from 28 to 16 percent.4/

The Brookings recommendation reduces the SMSA balances since each entitlement city receives at least its present formula amount and many cities receive a larger amount based on the second formula. The use of two formulas also reflects Brookings conclusion that community development need has two dimensions, poverty which is adequately provided for by the current formula and the combination of poverty and community age to which the second formula is designed to be responsive. This dual formula approach is one significant contribution of the Brookings study.

We shall examine similar distribution systems that allow each entitlement city to receive the maximum of its present formula amount or an amount computed by a formula containing pre-1939 housing. The relative emphasis given to aged housing increases across the distribution systems examined. The distribution systems considered in this section are defined as follows:

MAXPOR5	an entitlement city receives maximum of present formula amount or an amount computed by Alternative 5
MAXPOR6	an entitlement city receives maximum of present formula amount or an amount computed by Alternative 6
MAXPOR7	an entitlement city receives maximum of present formula amount or an amount computed by Alternative 7

4/ These recommendations and conclusions are contained in Chapters 3-6 of Block Grants for Community Development (Interim Report) by Richard P. Nathan, Paul R. Dommel, Sarah F. Liebschutz, Milton D. Morris, and Associates, The Brookings Institution, Washington, D.C. (forthcoming).

MAXPOR8 — an entitlement city receives maximum of present formula amount or an amount computed by Alternative 8. Alternative 8 allocates solely on the basis of pre-1939 housing.

Table 9.4 presents per capita amounts and percentage shares under MAXPOR8, MAXPOR7, the present formula, and hold harmless by type of recipient and by region.5/ First, compare the figures for MAXPOR8 given in columns (1) and (2) with those of both the present formula and hold harmless given in columns (5) - (8). The most striking point is that the entitlement city share of SMSA funds increases from 59.0 percent under the present formula to 79.2 percent under MAXPOR8, which is only 5.3 percentage points less than the 84.5 percent received by these 515 entitlement cities under the categorical programs. As expected, the main gainers under MAXPOR8 are central cities located in the Northeast and North Central regions; 72 of the 78 central cities in the Northeast and 71 of the 90 central cities in the North Central region received higher allocations under MAXPOR8 than under the present formula. The share of SMSA funds allocated to central cities in the Northeast and North Central regions increases from 26.5 percent under the present formula to 42.6 percent under MAXPOR8, which is only 3 percentage points less than the 45.6 percent share received under the categorical system. On the other hand, entitlement cities in the South and West receive practically no advantage under MAXPOR8 compared to the present system; the share for these cities increases by only 2.1 percentage points, from 29.5 percent under the present formula to 31.6 percent under MAXPOR8, which is 3.9 percentage points less than the 35.5 percent received under the categorical system. Of course, this is not unexpected given that only 30 percent of the housing units in these cities were constructed before 1939 (see Table 4.4).

The disadvantage with MAXPOR8 as an alternative to the present system is the substantial reduction in the share going to other recipient classes. MAXPOR8 approximates the SMSA shares that existed under the categorical programs (column 8); however, given the population shares listed in column (9), this objective of approximating the categorical share is questionable. Entitlement cities which account for only 52.7 percent of the SMSA population receive 84.5 percent of the CDBG funds. At the same time, the small communities in SMSA balances which account for 30.5 percent of the population would be reduced from a 28.2 percent share under the present formula to the residual share of 9 percent under MAXPOR8.

This 9 percent share for SMSA balances assumes that urban counties continue to receive their present formula share of 12.8 percent under the MAXPOR8 system. Of course, the 21.8 percent non-entitlement city share

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5/ In computing the entitlement city share, we assume that each of the 80 cities not in our 435-file has a formula amount greater than that under an alternative formula. This means that the entitlement city shares in Tables 9.4 and 9.5 are slightly underestimated.

Table 9.4: Per Capita Amounts and Percentage Shares Under MAXPOR8, MAXPOR7, Present Formula, and Hold Harmless by Type of Recipient and by Region; Shares are Computed Relative to SMSA Totals[b]

	(1) MAXPOR8 Present/ALT8[a] (per capita $)	(2) MAXPOR8 Present/ALT8 % Share	(3) MAXPOR7 Present/ALT7 (per capita $)	(4) MAXPOR7 Present/ALT7 % Share	(5) Present Formula (per capita $)	(6) Present Formula % Share	(7) H H (per capita $)	(8) H H % Share	(9) % of SMSA POP
Entitlement Cities(515)	$20.56	79.2%	$18.66	71.8%	$15.33	59.0%	$10.67	84.5%	52.7%
Northeast(124)	25.51	26.3	21.64	22.3	15.65	15.3	26.46	28.7	14.1
Central Cities(78)	26.99	23.4	22.97	19.9	15.98	13.6	26.96	26.2	
Non-Central City(46)		2.9		2.4	10.46	1.7	13.07	2.5	
North Central(132)	20.97	21.3	18.35	18.6	14.22	14.6	18.54	20.3	13.9
Central Cities(90)	22.46	19.2	19.61	16.8	14.75	12.9	20.37	19.4	
Non-Central Cities(42)		2.1		1.8	10.18	1.7	5.30	.9	
South(149)	18.69	18.8	18.64	18.7	18.09	18.3	20.25	22.8	13.7
Central Cities(135)	18.95	18.1	18.91	18.0	18.43	17.7	21.01	22.5	
Non-Central Cities(14)		.7		.7	13.36	.6	7.22	.4	
West(110)	15.99	12.8	15.22	12.2	13.74	11.2	14.63	12.7	11.0
Central Cities(60)	17.11	10.4	16.22	9.8	14.47	9.0	17.20	11.6	
Non-Central Cities(50)		2.4		2.4	11.32	2.2	5.98	1.2	
Remainder of SMSA	$ 6.30	21.8%	$ 8.15	28.2%	$11.85	41.%	$ 4.01	15.5%[c]	47.3%
Urban County[d]	10.41	12.8	10.41	12.8	10.41	12.8			16.8
SMSA Balance[e]	4.03	9.0	6.90	15.4	12.62	28.2			30.5
SMSA Total	$13.67	100.%	$13.67	100.%	$13.67	100.%	$12.26	100.%	100.%

a. ALT8 distributes CDBGs according to the recipient's share of AGE1939; see text for definitions of MAXPOR8 and MAXPOR7.

b. Shares are computed relative to an SMSA appropriation of $2,077,600,000. In computing the entitlement city share, we assume that each of the 80 cities not in our 435-file has a formula amount greater than that under Alternative 8. This means that the entitlement city share is underestimated.

c. The $4.01 and 15.5 percent is the combined per capita amount and share for Urban Counties and SMSA balances.

d. The figures for urban counties in columns(1)-(4) assume that each urban county receives its present formula amount.

e. In columns (1)-(4), the SMSA balance is computed as a residual: SMSA Balance equals Total SMSA minus Entitlement Cities minus Urban County or Remainder of SMSA minus Urban County.

(Remainder of SMSA) under MAXPOR8 could be divided between urban counties and SMSA blances using a needs formula. This would reduce the urban county share and increase the SMSA balance and, therefore, increase the equity between urban counties and SMSA balances under MAXPOR8 but decrease the equity between urban counties and entitlement cities. Still, the "Remainder of the SMSA" would be receiving only 21.8 percent while accounting for 47.3 percent of the SMSA population, and, assuming that the present formula reflects need, 41 percent of the need (column 6).

This is opposite to that situation we found when we computed central city shares for the seven alternative formulas. In that case, we mentioned that even after adding aged housing to the formula, many would consider the central city share (e.g., 56.6 percent under ALT3) of SMSA funds to be too small, especially when compared with the 79.2 percent share received by central cities during the categorical years, and when compared to intuitive notions about the level of aid that should be directed to our "older, declining cities."

Considering MAXPOR8 and recalling that central cities account for 56.5 percent of the need as defined by ALT3, the central city share of 71.1 percent under MAXPOR8 may be too large. Therefore, in columns (3) and (4) of Table 9.4, we illustrate the two-formula approach using ALT7, which reduces the weight of aged housing to .6 and includes poor persons with a .4 weight. MAXPOR7 results in an entitlement city share of 71.8 percent and a central city share of 64.5 percent, the latter being 11.7 percentage points greater than the 52.8 percent received under the present formula and 14.7 percentage points less than the 79.2 percent received by central cities during the categorical years. The regional distribution again favors entitlement cities in the Northeast and North Central regions (presumably the older cities); approximately 170 of the 256 entitlement cities in these two regions would gain from a switch from full-funding under the present formula to full-funding with MAXPOR7. Another advantage of MAXPOR7 over MAXPOR8 is that the 28.2 percent left over for the "Remainder of SMSA" appears more acceptable than the 21.8 percent under MAXPOR8. Although 12.8 percentage points less than the 41 percent received under the present system, the 28.2 percent to urban counties and SMSA balances under MAXPOR7 does represent a 12.7 percentage points increase over the 15.5 percent received under the categorical programs.

As before, Table 9.4 assumes that the urban county share remains at 12.8 percent, and, as before, this causes some inequity between urban counties and SMSA balances because this 12.8 percent share to urban counties, which account for 16.8 percent of the SMSA population and 12.8 percent of the need as defined by the present formula, is only 2.6 percentage points less than the residually determined 15.4 percent share allocated to SMSA balances, which account for 30.5 percent of the SMSA population and 28.2 percent of SMSA need as defined by the present formula (column 6). In this case, assuming for the moment that the optimal "Remainder of SMSA" share is 28.2 percent, an alternative procedure would be to divide the 28.2 percent between urban counties and SMSA balances on the basis of a needs formula, instead of allowing urban counties to receive their fixed 12.8 percent share and treating SMSA balances as the residual recipients. Using the present formula to implement such a procedure would reduce the urban county share of SMSA funds from 12.8 to 8.8 percent and increase that of SMSA balances from 15.4 to 19.4 percent. Under this method, the small communities in urban counties would share along with SMSA balances the costs of redirecting funds to the larger cities. As indicated by a higher percentage of population below the low income level (9.8 percent compared to only 6.9 percent in urban counties), SMSA balances, on a per capita basis, are more needy than urban counties.

Table 9.5 presents several percentage shares computed using U.S. totals as a base. The purpose here is to show in a manner similar to that shown above for urban counties and SMSA balances certain interdependencies among CDBG recipients that should be considered in order to arrive at an equitable outcome in two-formula systems such as MAXPOR8, MAXPOR5, MAXPOR6, and MAXPOR7. First, in row (7) of Table 9.5, notice that the variable shares for the non-SMSA area are all greater than the fixed 20 percent, non-SMSA share. In fact, the non-SMSA share under both the present formula and Alternative 7 would be approximately 36 percent. The switch from the present formula to MAXPOR7 reduced, as a percentage of U.S. funds, the share of SMSA balances from 23 percent (column 2, Table 9.5) to 13 percent (column 6) while leaving unchanged the 20 percent allocated to non-SMSA communities. Assuming that the initial SMSA/non-SMSA split was optimal and that the goal is now to increase the share to central cities, the residual method may create an inequitable distribution between SMSA balances and non-SMSA areas.

Proposed HUD Dual Formula System

In the above discussion of the dual formula system, we used in our examples of second formulas, formulas designed to serve both general and specific purposes. A general formula is designed to be relevant to all recipients and includes variables such as population that tend to spread funds among a broad spectrum of recipients. Examples include Alternative 6 (.2 POP, .30 POORPER, .5 AGE1939) in MAXPOR6 and the Brookings alternative (.25 POP, .25 POORPER, .50 AGE1939) in its dual formula proposal. A specific formula, on the other hand, tends to key in on especially trouble cities to the exclusion of most recipients. Two examples of a specific formula discussed above include Alternative 8 and Alternative 7. In these two formulas, age of housing stock is the variable used to target funds to older cities.

There are variables that can be used other than age of housing to target funds to cities with serious economic and community development problems. Efforts at the Department of Housing and Urban Development to improve the present formula system have focused primarily on identifying a good secondary formula to target CD funds to especially troubled cities. The Department's dual formula proposal would allow each entitlement city to receive the greater of its present formula amount or an amount computed using a secondary formula based on poverty (.3), age of housing (.5), and decline in population, 1960 to 1973 (.2).

Table 9.5: Percentage Shares for Formula Amounts and Selected Variables by Type of Recipient; Shares Computed Relative To U.S. Totals

	(1) Hold Harmless	(2) Present Formula[a]	(3) MAXPOR8 Present/ALT8	(4) MAXPOR5 Present/ALT5	(5) MAXPOR6 Present/ALT6	(6) MAXPOR7 Present/ALT7	(7) Population	(8) Poverty	(9) Overcrowded Housing	(10) Age of Housing Stock
(1) Entitlement Cities(515)[b]	74.%	47.%	63.%	55%	55.%	57.%	38.1%	36.8%	39.8%	
(2) Central Cities	69.6	42.	56.7	49.8	49.8	51.5	32.5	33.8	35.3	40.4
(3) Remainder of SMSA	13.5	33.	17.	25	25	23	34.3	21.9	28.4	
(4) Urban Counties		10.	10.	10	10	10	12.2	6.	9.3	
(5) SMSA Balance		23.	7	15	15	13	22.1	15.9	19.1	
(6) SMSA	87.5	80.	80.	80.	80.	80.	72.4	58.7	68.2	67.4
(7) Non-SMSA	12.5	20.	20	20	20	20	27.6	41.3	31.8	32.6
(8) U S	100.%	100.%	100.%	100.%	100.%	100.%	100.%	100.%	100.%	100.%

a. The percentages in column (2) were obtained by multiplying those in column (6) of Table 6.8 by .8, the SMSA share. A similar procedure was followed in columns (4)-(6).

b. The following row equalities hold: (1) + (3) = (6), (4) ÷ (5) = (3), (6) + (7) = (8).

This secondary formula responds to three kinds of need. First, including poverty recognizes the concentrations of poor in our larger cities. Second, by including age of housing stock, the formula recognizes the costs of maintaining or rehabilitating an aging physical infrastructure in our older cities. As discussed in Chapter 5 of this study, age of housing is one dimension of CD need to which the present formula is non-responsive.

The population loss variable responds to the middle class flight from the central cities, and with it, the problems of a declining tax base. The efficiency with which the population loss variable can put money into cities with particularly serious fiscal and economic problems was suggested in our section on population decline in Chapter 8. Relative to growing cities, declining cities showed a higher incidence of (1) female-headed households, (2) poor persons under 18 and over 65, (3) minority populations, (4) per capita crime, (5) houses without plumbing, and (6) unemployment. The population density in the declining cities exceeds that in growing cities. Except for FACTOR 5 (lack of economic opportunity), both groups of declining cities considered in Chapter 8 showed above average per capita need levels, while the two groups of growing cities showed below average scores. Fiscal comparisons between growing and declining cities showed declining cities as (a) having higher per capita expenditures and employment on common city functions; (b) paying higher average monthly wages for common function employees; (c) having a negative percent change in public employment levels, 1973-1975; (d) having a lower percent change in taxable property value, 1965-1973; (e) having both a higher effective property tax rate and a higher level of tax effort; and (f) relying to a greater extent on Federal and state aid as a revenue source.6/ Per capita income, one measure of a city's fiscal capacity, is approximately ten percent lower in declining than in growing cities.

The present formula is not responsive to many of the above fiscal and community development problems associated with declining cities. The dual formula system described above responds to these problems. For example, 138 of the 197 cities whose secondary formula amounts were greater than their present formula amounts showed an above average score on our total needs index (NEED).

This dual formula will also make the phase-out of hold harmless less painful. Of the 175 hold harmless losers (out of 187) for which we have completed data, the number which lose funding decreases to 101 in 1980.

6/ George E. Peterson, "Finance," Chapter 2 in The Urban Predicament edited by William Gordan and Nathan Glazer, The Urban Institute, Washington, D.C., (1976).

The number which lose more than 10% is reduced from 157 to 89.7/

The dual formula achieves these results by directing funds to declining cities at the expense of SMSA balances and those entitlement cities which have experienced population growth since 1960. We estimate that under this dual system SMSA balances would be less than 5 percent of total SMSA funds in FY80.

Allocation Between Urban and Rural Areas

Our earlier discussions of the SMSA discretionary share and per capita need by population size is related to the question of the proper allocation of CDBG funds between urban and rural areas. Should the non-SMSA share be increased or decreased? To provide support for the development of small towns in rural areas, a fixed portion (20 percent) is being allocated to non-SMSA areas. Under the categorical programs, non-SMSA recipients received approximately 14 percent of total CD funds.

After HUD meets the "hold harmless" requirements of qualifying non-SMSA communities, the remaining funds in the non-SMSA allocation are allocated among the states on the basis of the three factor formula and distributed on a discretionary basis by HUD to eligible non-SMSA applicants. This represents the first time that a fixed portion of HUD funds has been allocated to rural areas. Administration proposals would have allowed state governments to control the intrastate allocation of non-entitlement funds (both within and outside the SMSA's). However, primarily because of the lack of interest displayed by state governments in the past for the community development problems of small rural cities, Congress mandated that HUD deal directly with the rural city and therefore control the intrastate distribution of CD funds.

During the legislative debate on CDBGs, proponents of a fixed rural share argued that CD aid to small cities would slow down the migration of the poor to urban areas and therefore alleviate the fiscal problems of our central cities. In addition, it was considered essential that aid be distributed to rural areas, given our national policy of balanced population growth. To support their contention that a need for CD funds does exist in small rural communities, the proponents of a fixed rural

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7/ In addition to the formulas discussed in the text, we also simulated the two-formula system using tax effort in the second formula. One of the formulas (.33 AGE1939, .33POORPER, and .33 TAX) that included non-education taxes (TAX) as a formula factor exhibited the following correlations with the need scores and tax effort: 0.28, (poverty); 0.49, (age of housing); 0.66, (density); 0.26, (crime and unemployment); 0.13, (lack of economic opportunity); 0.77, total need (need), and 0.90, tax effort (TAX1INC). The results are not reported in full because they required certain simplifying assumptions which may introduce small inaccuracies in the percentage shares.

allocation referenced in 1970 HUD study that identified the governmental, economic, physical, and social needs of these communities.8/ The HUD study found that there was a significant need in the following areas: city administration, code enforcement, supervised recreation programs, fire and police services, street maintenance, garbage collection, library services, industrial development, and health and medical services. The greatest needs existed in those communities with less than 15,000 population. We agree that there is no basis for assuming that non-SMSA communities have no CD program needs. Moreover, an additional basis for extending formula assistance to them might be simply that since their populations support CDBG aid through taxes, they should at least be made eligible in some systematic way for the benefits of the program.

Some argued that it was unfair not to consider formula factors in determining the initial rural-urban split. In 1976 a formula calculated urban-rural split would have given rural areas a 35.5 percent share, since these areas in 1976 accounted for 27.5 percent of the nation's population, 41.3 percent of its poverty population, and 31.8 percent of its overcrowded housing. A suggestion has been made for increasing the rural share to at least 30 percent.9/

Some also argued that the present system seems to discriminate especially against those small cities (both within and outside SMSA's) between 10,000 and 50,000 population.10/ The cities below 10,000 rely on the Farmers Home Administration while those above 50,000 rely on the formula grants for CD aid. This bias against the 10,000-50,000 cities will increase with the phase-out of "hold harmless." Such reasoning leads to proposals that call for either a decrease in the population cut-off for entitlement cities below the present 50,000 cut-off or, at least, dropping the phase-out of "hold harmless" since many of the cities in this range participated in the old categorical programs.

Arguments for maintaining or even reducing the 20 percent and not decreasing the population cut-off for entitlement cities can also be presented. First, the stated purposes of the 1974 CD Act placed more emphasis on the CD problems in the urban areas, as opposed to rural areas. Because of the higher density of such areas, urban population, poverty, and overcrowding should be given more weight because of the likely

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8/ U.S. House of Representatives, Subcommittee on Housing. Housing and Urban Development Legislation-1971, Parts 1-3. 92nd Congress, 1971.

9/ See James Abourezk statement in Congressional Record-Senate, July 25, 1975, pp. 13679-13681.

10/ Ibid., p. 13681 and U.S. Senate, Subcommittee on Housing and Urban Affairs. 1973 Housing and Urban Development Legislation, Parts 1-2. 93rd Congress, 1973, p. 149.

externalities involved. For example, given amounts of population, poverty, and overcrowding imply a higher degree of neighborhood instability in urban areas simply because of the higher concentration in these areas. This reasoning provides one rationale for not using the formula factors to determine the initial urban-rural split.

Decreasing the entitlement city population cut-off to, for example, the 25,000 level would bring in a large number of communities. It is important to remember that under the present, fixed-percentage system for non-SMSA's, the larger SMSA cities are at a relative advantage because their CDBG amounts are computed using formula variables. If you bring in all cities above 25,000 population (both SMSA and non-SMSA) on an entitlement basis, the share to larger SMSA cities could possibly decrease because included in the 25-50,000 group would be some non-SMSA cities which are presently receiving an amount smaller than that based on their share of formula factors. Our earlier conclusion that per capita need varies positively with city size and the externality argument briefly mentioned above both support maintaining the entitlement city threshold above a population level that would allow numerous non-SMSA cities to enter on a full-formula basis.

Extending "hold harmless" would be another method of aiding those smaller cities (both within and outside SMSA's) that have taken an active interest in their CD problems. However, this extension of "hold harmless" would not benefit those small cities that for whatever reason, did not participate in the old categorical programs; in addition, the inequity of the hold harmless distribution has already been documented.

Based on the above discussion, we recommend not providing non-SMSA areas with a full formula share; however, we cannot provide an objective method for determining the SMSA/non-SMSA split. Assuming for the moment that 20 percent was the initial optimal share, we do recommend, however, adjusting the share downward as new SMSA's are created. According to Table 9.6 the increase in the number of SMSA's from 243 in 1970 to 266 in 1976 has reduced the non-SMSA share of population by 3.9 percentage points, of poor persons by 2.5 percentage points, and of overcrowded housing by 3.4 percentage points. Formula weights would be used to adjust the 20 percent share downward as new SMSA's are created.11/ For example, assuming for the moment that 20 percent was the optimal share in 1970 and using the 1976 non-SMSA shares in column (2) of Table 9.6, we derived

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11/ The downward adjustment would have to be from a starting date of January, 1975, instead of from 1970.

Table 9.6: Non-SMSA Share of Selected Variables, 1970 and 1976[a]

	(1) 1970 Non-SMSA % Share	(2) 1976 Non-SMSA % Share	(3) % Change (2 - 1)
POP	31.4%	27.5%	-3.9%
POORPER	43.8	41.3	-2.5
OCRWD	35.2	31.8	-3.4
AGE1939	36.7	32.6	-4.1
WOPLUMB	63.6	58.9	-4.7

a. This table does not incorporate 1973 population estimates; decreases in the non-SMSA shares are due to an increase in the number of SMSA's from 243 in 1970 to 266 in 1976.

a 1976 non-SMSA share of 18.4 percent.12/

Summary and Conclusion

Concern has been expressed about the decrease in the share going to large cities under the present formula relative to the categorical distribution and the related increase in the share going to small communities. In this chapter we have presented information and analysis related to the distribution of CD funds among types of recipients. It is not clear what the appropriate distribution of funds among entitlement cities, urban counties, SMSA balances, and non-SMSA areas should be. We have shown that community development need on a per capita basis increases with city size but at a moderate rate. We have also shown the small cities (less than 50,000) which are central cities have more need than the average small city.

In the third section we examined in some detail a dual formula approach that is designed to increase the share of entitlement cities at the expense of SMSA balances. The dual formula system would allow each entitlement city to receive the maximum of its present formula amount or an amount computed by an alternative formula. The share of the SMSA balances is computed as a residual by subtracting that amount going to entitlement recipients from the total SMSA appropriation. Although it is hard to prove that small cities in SMSA balances should receive less than their formula share, we did show that, on a per capita basis, cities below 50,000 are less needy than cities above 50,000.

In the fourth section, we examined a second formula which was designed to direct funds to cities with special problems. For the reasons discussed in previous chapters, age of housing stock was included to respond to the non-poverty dimensions of need. Decline in population was included to respond to fiscal problems and the problems of long-run economic decline. As in all the dual formula approaches, entitlement cities gain at the expense of the SMSA balances.

In dual formula systems, a question arises concerning whether or not urban counties and non-SMSA areas should share along with SMSA balances the costs of redirecting funds to our larger cities. To continue to allocate to urban counties their present formula share of 12.8 percent may cause some inequity between urban counties and SMSA balances. An

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12/ To calculate the 1970 non-SMSA formula share, use the percentages in column (1) of Table 9.6 as follows: .25 (31.4) + .50 (43.8) + .25 (35.2) = 38.55. Using the percentages in column (2) we derive a 1976 non-SMSA share of 35.47 percent. Therefore, if 20 percent was optimal in 1970 when the non-SMSA formula share was actually 38.55 percent, then 18.4 percent is optimal in 1976, since formula share is now only 35.47 percent (35.47/38.55 = 18.4 / 20). Of course, instead of using a 1970 starting date, we would have to use January, 1975, the starting date of the CDBG program.

alternative procedure would be to divide the 28.2 percent between urban counties and SMSA balances on the basis of a needs formula.

In a final section, we outlined some of the arguments for changing the allocation between urban and rural areas. We outlined one method that proportionately reduces the non-SMSA share as new SMSA's are created.

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Appendix A

VARIABLE DEFINITIONS AND DATA SOURCES

Variable Definitions

AGE1939	number of housing units built before 1939
CD	community development
CDBG	community development block grant
DENSITY	population per square mile
HH	hold harmless
MEDINC	median income, 1970
MEDRENT	median gross rent, renter-occupied property
MEDVALUE	median value, owner-occupied, single family house
PCTXBASE	per capita market value of the property tax base (1972)
PRESENT	present CDBG formula
POORPER	persons with incomes below the poverty level
P65AGED	percent of population over 65
PCRIME	crimes per capita
PNW	percent of population nonwhite (Spanish and Negro)
PFEMALHP	percent of families with a poor, female head
PYUTHPOV	percent of population poor and under 18
PPOORPER	percent of population with incomes below the poverty level
PWOPLUMB	percent of occupied houses without plumbing

PUNEMP75	unemployment rate, 1975
POCRWD	percent of occupied houses with 1.01 or more persons per room
PAGE1939	percent of housing units built before 1939
PNEGRO	percent Negro
POWNOCCH	percent of houses occupied by owners
DENSITY	population per square mile
POP	population
PCINC72	per capita income, 1972
MEDINC	median family income, 1970
PPOORFAM	percent of families with incomes below the poverty level
POVAGE65	percent of population over 65 and poor
POLDSTR(PAGE1949)	percent of housing units built before 1949
PNEWSTR(PAFTER60)	percent of housing units built after 1960
PNEW	annual average, 1965-1970, of new private housing units authorized by building permits as a percentage of occupied housing
PMULTI	percent of occupied housing units in multi-unit structures
PMFG	percent of workers employed by manufacturing industry
PWOHSED	percent of population over 25 with less than a high school education
OCRWD	number of occupied houses with 1.01 or more persons per room

TAX1INC	non-education taxes (1972) as a percentage of personal income (1972)
TXEFFORT	non-education taxes (1972) as a percentage of the market value of the property tax base (1972)
WOPLUMB	number of occupied houses without adequate plumbing facilities

Formula Definitions

	Population (POP)	Poverty (POORPER)	Overcrowded Housing (OCRWD)	Pre-1939 Housing (AGE1939)	Without Plumbing (WOPLUMB)
Present Formula	.25	.50	.25		
Alternative 1	.20	.40	.20	.20	
Alternative 2	.25	.50		.25	
Alternative 3		.40	.30	.30	
Alternative 4		.60		.40	
Alternative 5		.30	.20	.50	
Alternative 6	.20	.30		.50	
Alternative 7		.40		.60	
Alternative 8				1.00	
Alternative 9		1.00			
Alternative 10		.30		.70	
Alternative 11	.15	.30	.20	.25	.10
Alternative 12		.40		.40	.20
Alternative 13		.50		.30	.20
Alternative 14		.40	.20	.30	.10

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Appendix B

REVIEW OF CONGRESSIONAL CONSIDERATION ON CDBGs

Serious consideration of CDBGs began in 1971 with the Nixon Administration's proposal for special revenue sharing for community development. In the "Community Development Act of 1971" (S. 1618 and H.R. 8853), the Nixon Administration proposed a special revenue sharing grant for community development based on a fixed formula. Eighty percent of the alloted funds was to be divided among the SMSA's for distribution to local general purpose governments within those areas. Each SMSA's share was to be based on a needs formula comprised of four equally weighted factors -- population, poverty, amount of overcrowded housing, and extent of housing deficiencies. Within SMSA's, central cities and cities of over 50,000 were to receive an automatic grant on the basis of the same four-factor formula. The balance of each SMSA's allocation was to be used for "holding harmless" metropolitan cities and for distribution to counties and smaller cities within the SMSA.

The remaining twenty percent was to be distributed by HUD to units of general local governments and states (both within and outside SMSA's) on a discretionary basis. These funds were to be used to provide "hold harmless" funds and to assist localities with special needs. S.1618 and H.R. 8853 also contained the following features: (1) eligible activities included all those activities that were eligible under the displaced categorical programs; and (2) the only precondition was to be an annual statement of the recipient's objectives and projected use of funds. Not included in these bills were (1) a local matching requirement; (2) an automatic formula allocation to qualified urban counties; and (3) a fixed percentage allocation to non-SMSA (rural) areas. Small cities outside of SMSA areas were included in the administration's Rural Community Redevelopment proposal (S.1612) in which the Department of Agriculture would distribute funds to state governments for distribution to small rural cities.

The Community Development Block Grant proposal (Title VI of H.R. 9688), prepared by the House Committee on Banking and Currency in 1971, was similar to that of the Administration in that both called for an automatic distribution to large cities on the basis of an objective needs formula. Funds were to be allocated on the basis of community need (population, overcrowded housing, and poverty, counted twice) both among and within SMSA's to central cities and cities of over 50,000.

An incentive for regional planning was incorporated into the House proposal by allowing the smaller general local governments within SMSA's to combine their CD efforts in order to be eligible for an automatic grant. The House proposal also set aside a fixed amount to be distributed to rural cities, primarily to be used to finance water and sewer projects.

In the Senate, the Sparkman Bill (S.2333) would have distributed 75% of the funds to those communities that were conducting on-going community development programs with 25% going to the remaining localities. For communities conducting on-going programs, an initial grant entitlement was computed based on the average assistance received under the categorical programs. The bill allowed for maximum annual increments of fifteen percent.

This formula took no account of objective need factors and would have tended to perpetuate the grant distribution that existed under the categorical programs. The bill also contained a local matching requirement (10%) and required that the entitlement communities submit with their applications detailed development and housing plans.

In 1973, hearings were again held on community development legislation. The Administration's "Better Communities Act of 1973" (S. 1743 and H.R. 7277) called for 65% of the funds to be issued to metropolitan cities (central cities and cities of over 50,000) and urban counties on the basis of an objective needs formula (population, overcrowding, and poverty, counted twice). The bill proposed that the states be given the responsibility of making funding decisions for 90% of the remaining funds, on the condition that each state's share be divided equally between SMSA and non-SMSA areas. As before, the Administration's bills required neither local matching funds nor the detailed application procedures that attempted to link local activity to national community development and housing goals.

The Barrett and Ashley Bill in the House (H.R. 10036) would have distributed 80% of the funds to SMSA areas with the remaining 20% going on a discretionary basis to non-SMSA communities and state governments. Within SMSA areas, only metropolitan cities would have been eligible for formula entitlements; in addition to the usual objective need factors, a fourth factor, "past program experience," was included in the formula for distribution between and within SMSA areas. The formula in the Sparkman bill in the Senate (S. 1744) was similar except that SMSA areas received only 75% of the funds. In the Sparkman Bill, the term "extent of program experience" was computed by summing the average, during the five fiscal years preceding the date of enactment, of each of the displaced categorical grants received by the community.

Appendix C

FORMULA MATHEMATICS

I. One-step procedure.

Under this method, the allocation to each recipient unit or area would be determined as follows:

$$(1)\quad G_j = \left(\tfrac{1}{4} \frac{POP_j}{POP_m} + \tfrac{1}{2} \frac{POV_j}{POV_m} + \tfrac{1}{2} \frac{OC_j}{OC_m} \right) \times G_m$$

where G_m = total amount going to all metropolitan (SMSA) areas.

G_j = total amount going to jth city

"m" = refers to total metropolitan (SMSA) quantities

"j" = refers to quantities of either the jth city, jth urban county, or remainder of jth SMSA area

POP = population

POV = persons in poverty

OC = overcrowded housing

II. Two-step procedure (using the jth city as an example).

In the first step, the allocation to all cities (G_c) is determined as follows:

$$(2)\quad G_c = \left(\tfrac{1}{4} \frac{POP_c}{POP_m} + \tfrac{1}{2} \frac{POV_c}{POV_m} + \tfrac{1}{4} \frac{OC_c}{OC_m} \right) \times G$$

where "c" refers to total city quantities and G equals total authorization.

The second step computes the allocation to each individual city (e.g., jth city) as follows:

$$(3)\quad G_j = \left(\tfrac{1}{4} \frac{POP_j}{POP_c} + \tfrac{1}{2} \frac{POV_j}{POV_c} + \tfrac{1}{4} \frac{OC_j}{OC_c} \right) \times G_c$$

Using the definition of G_c from equation (2) above, we get

$$(4)\quad G_j = \left(\tfrac{1}{4} \frac{POP_j}{POP_c} + \tfrac{1}{2} \frac{POV_j}{POV_c} + \tfrac{1}{4} \frac{OC_j}{OC_c} \right) \times$$

$$\left(\tfrac{1}{4} \frac{POP_c}{POP_m} + \tfrac{1}{2} \frac{POV_c}{POV_m} + \tfrac{1}{4} \frac{OC_c}{OC_m} \right) \times G$$

Expanding (4), we obtain

$$(5)\quad G_j = 1/16 \left(\frac{POP_j}{POP_c} \right)\left(\frac{POP_c}{POP_m} \right) \times G + 1/8 \left(\frac{POV_j}{POV_c} \right) \frac{POP_c}{POP_m} \times G +$$

$$1/16 \left(\frac{OC_j}{OC_c} \right) \frac{POP_c}{POP_m} \cdot G + 1/8 \left(\frac{POP_j}{POP_c} \right) \frac{POV_c}{POV_m} \cdot G + \tfrac{1}{4} \left(\frac{POV_j}{POV_c} \right)$$

$$\frac{POV_c}{POC_m} \cdot G + 1/8 \left(\frac{OC_j}{OC_c} \right) \frac{POV_c}{POV_m} \cdot G + 1/16 \left(\frac{POP_j}{POP_c} \right) \frac{OC_c}{OC_m} \cdot G +$$

$$1/8 \left(\frac{POV_j}{POV_c} \right) \frac{OC_c}{OC_m} \cdot G + 1/16 \left(\frac{OC_j}{OC_c} \right) \frac{POV_c}{POV_m} \cdot G$$

The allocation to the jth unit (G_j) calculated by equation (5) (two-step process) will equal that calculated by equation (1) (one-step process) only if

$$(6)\quad \frac{POP_j}{POP_c} = \frac{POV_j}{POV_c} = \frac{OC_j}{OC_c}$$

Substitution of condition (6) into equation (5) will reduce (5) to equation (1). This difference between the two procedures can also be seen by considering the effect on the allocation to the jth unit of a change in one of the formula factors (e.g., POV_j); ignoring the second-order effects, from equation (1), we obtain

$$(7)\quad \frac{\Delta G_j}{\Delta POV_j} = \tfrac{1}{2} \left(\frac{1}{POV_m} \right)$$

From equation (5), we obtain

$$(8)\quad \frac{\Delta G_j}{\Delta POV_j} = 1/8 \left(\frac{1}{POV_C} \right) \frac{POP_c}{POP_m} + \tfrac{1}{4} \left(\frac{1}{POV_c} \right) + 1/8 \left(\frac{1}{POV_c} \right) \frac{OC_c}{OC_m}$$

If condition (6) holds, equation (8) reduces to equation (7).

Appendix D

ABANDONMENT STUDIES

I. <u>The National Survey of Housing Abandonment</u>:

A. National Urban League and the Center for Community Change

B. Seven Cities

C. Characteristics of a "crisis ghetto":

decreasing median family income
female headed families
declining total population
public welfare dependency
increasing rates of crime and vandalism
primarily black neighborhoods
increasing unemployment

D. Barriers to the formation of "crisis ghettos":

single family homeownership
black middle class
continued investment in home mortgages

II. <u>The Urban Housing Dilemma</u>

A. George Sternlieb

B. New York City

C. Characteristics of poorly maintained areas:

high turnover
nonwhite tenancy
welfare tenancy
large families
low incomes
older buildings
vandalism
multi-unit structures

III. <u>A Study of the Problems of Abandoned Housing</u>

A. Linton, Mields, and Caston, Inc.

B. Five cities

C. Characteristics of neighborhood experiencing abandonment:

low income

high percentage of young people
rental properties
multi-unit buildings
declining rate of homeownership
minimal public services
high vacancy rate
overcrowding within occupied units
strongly anti-social tenant attitudes
old housing stock
substandard buildings

IV. <u>Housing and Poverty</u>

A. William G. Grigsbly

B. Baltimore

C. Factors in neighborhood decay:

high turnover
vandalism
vacancy rates
low income
high rent-income ratio

V. <u>A Study of Property Taxes and Urban Blight</u>

A. Arthur D. Little, Inc.

B. Ten cities

C. Characteristics of blighted and downward transitional neighborhoods

low income
increased population turnover
crime and vandalism
nonwhite
old housing stock
rental units

VI. <u>An Analysis of Socio-Economic Factors and Housing Conditions</u>

A. York County Planning Commission

B. York, Pennsylvania

C. Socio-economic indicators associated with substandard housing:

female family heads
households without autos

unemployed persons
persons below poverty level
renter occupied units
persons on public assistance
single persons
divorced persons
widowed persons
income (negative)
crime
high school education (negative)
married persons (negative)

Appendix E

CORRELATIONS AMONG SELECTED VARIABLES BY POPULATION SIZE

The coefficients of correlation among selected variables are given for seven population groups in Tables E.1 to E.7. Within each population group, each city receives an equal weight of one. Definitions of the variables used in this appendix follow.

P65AGED	percent of population over 65
PCRIME	crimes per capita
PNW	percent of population nonwhite (Spanish & Negro)
PFEMALHP	percent of families with a poor, female head
PYUTHPOV	percent of population poor and under 18
PPOORPER	percent of population with incomes below the poverty level
PWOPLUMB	percent of occupied houses without plumbing
PUNEMP75	unemployment rate, 1975
POCRWD	percent of occupied houses with 1.01 or more persons per room
PAGE1939	percent of housing units built before 1939
POWNOCCH	percent of houses occupied by owner
DENSITY	population per square mile
POP	population
PCINC72	per capita income, 1972
MEDINC	median family income, 1970
PPOORFAM	percent of families with incomes below the poverty level

POVAGE65	percent of population over 65 and poor
PAGE1949	percent of housing units built before 1949
PNEWSTR	percent of housing units built after 1960
PNEW	annual average, 1965-1970, a new private housing units authorized by building permits as a percentage of occupied housing
PMULTI	percent of occupied housing units in multi-unit structures
PMFG	percent of workers employed by manufacturing industry
PWOHSED	percent of population over 25 with less than a high school education

Table E.1 Correlations Among Selected Variables for 72 Entitlement Cities, Population less than 50,000

	P65AGED	PCRIME	PNW	PWOHSED	PFEMALHP	PYUTHPOV	PPOORPER	POCRWD	PWOPLUMB	PUNEMP75
P65AGED	1.0000	.4362	.0310	.3717	.2092	.0134	.1950	-.3458	.1904	.1983
PCRIME	.4362	1.0000	.3753	.2524	.4080	.1604	.2229	-.0268	.0245	.2841
PNW	.0310	.3753	1.0000	.3824	.7785	.8432	.7771	.7547	.6143	.0403
PWOHSED	.3717	.2524	.3824	1.0000	.4688	.3676	.3515	.2333	.4949	.1475
PFEMALHP	.2092	.4080	.7785	.4688	1.0000	.8515	.8476	.4850	.5692	.0851
PYUTHPOV	.0134	.1604	.8432	.3676	.8515	1.0000	.9446	.7679	.6649	.0733
PPOORPER	.1950	.2229	.7771	.3515	.8476	.9446	1.0000	.6301	.6874	.0687
POCRWD	-.3458	-.0268	.7547	.2333	.4850	.7679	.6301	1.0000	.5195	-.0194
PWOPLUMB	.1904	.0245	.6143	.4949	.5692	.6649	.6874	.5195	1.0000	.0149
PUNEMP75	.1983	.2841	.0403	.1475	.0851	.0733	.0687	-.0194	.0149	1.0000
PAGE1939	.5444	.1594	-.1955	.5390	.0729	-.1653	-.0401	-.3420	.2335	.0287
DENSITY	.1516	.0856	-.0169	.0903	.0896	-.0807	.0001	-.1549	.1482	-.1651
POWNOCCH	-.0516	-.3926	-.2340	-.0716	-.2600	-.1037	-.1790	-.0134	-.0895	.0493
PCINC7	.2326	.0117	-.3338	-.2622	-.4503	-.5064	-.5201	-.4675	-.2606	-.0143
MEDINC	-.2197	-.2323	-.5744	-.4270	-.7416	-.7533	-.8238	-.4486	-.4710	-.0521
PAGE1949	.5214	.1617	-.0983	.5913	.1851	-.0379	.0831	-.2765	.3132	-.0108
PNEWSTR	-.3969	-.1202	-.0029	-.6226	-.2551	-.0840	-.1871	.1286	-.3465	.0459
PNEW	-.0127	-.1206	-.1095	-.4311	-.2856	-.1734	-.2083	-.0345	-.1312	.0804
PMULTI	.2854	.2603	-.1557	.0855	-.1011	-.2742	-.1913	-.2859	-.0571	-.0342
PMFG	.0645	-.1192	-.2591	.5489	-.2244	-.3020	-.3595	-.1683	.0276	.1541

Table E.1 Correlations Among Selected Variables for 72 Entitlement Cities, Population less than 50,000

	PAGE1939	DENSITY	POWNOCCH	PCINC73	MEDINC	PAGE1949	PNEWSTR	PNEW	PMULTI	PMFG
P65AGED	.5444	.1516	-.0516	.2326	-.2197	.5214	-.3969	-.0127	.2854	.0645
PCRIME	.1594	.0856	-.3926	.0117	-.2323	.1617	-.1202	-.1206	.2603	-.1192
PNW	-.1955	-.0169	-.2340	-.3338	-.5744	-.0983	-.0029	-.1095	-.1557	-.2591
PWOHSED	.5390	.0903	-.0716	-.2622	-.4270	.5913	-.6226	-.4311	.0855	.5489
PFEMALHP	.0729	.0896	-.2600	-.4503	-.7416	.1851	-.2551	-.2856	-.1011	-.2244
PYUTHPOV	-.1653	-.0807	-.1037	-.5064	-.7533	-.0379	-.0840	-.1734	-.2742	-.3020
PPOORPER	-.0401	.0001	-.1790	-.5201	-.8238	.0831	-.1871	-.2083	-.1913	-.3595
POCRWD	-.3420	-.1549	-.0134	-.4675	-.4486	-.2765	.1286	-.0345	-.2859	-.1683
PWOPLUMB	.2335	.1482	-.0895	-.2606	-.4710	.3132	-.3465	-.1312	-.0571	.0276
PUNEMP75	.0287	-.1651	.0493	-.0143	-.0521	-.0108	.0459	.0804	-.0342	.1541
PAGE1939	1.0000	.4815	-.2239	-.1108	-.0826	.9344	-.8283	-.5115	.5448	.4935
DENSITY	.4815	1.0000	-.4801	-.0391	-.0259	.4237	-.3540	-.2661	.4753	.0440
POWNOCCH	-.2239	-.4801	1.0000	.1699	.3663	-.1760	.1329	.2650	-.6901	.2137
PCINC73	-.1108	-.0391	.1699	1.0000	.6436	-.1524	.2834	.5598	.0685	.1390
MEDINC	-.0826	-.0259	.3663	.6436	1.0000	-.1623	.2458	.3215	.0405	.3196
PAGE1949	.9344	.4237	-.1760	-.1524	-.1623	1.0000	-.9411	-.5902	.4240	.4948
PNEWSTR	-.8283	-.3540	.1329	.2834	.2458	-.9411	1.0000	.7173	-.2710	-.4687
PNEW	-.5115	-.2661	.2650	.5598	.3215	-.5902	.7173	1.0000	-.1645	-.2234
PMULTI	.5448	.4753	-.6901	.0685	.0405	.4240	-.2710	-.1645	1.0000	.1317
PMFG	.4935	.0440	.2137	.1390	.3196	.4948	-.4687	-.2234	.1317	1.0000

Table E.2 Correlation Among Selected Variables for 140 Entitlement Cities, Population Between 50,000 and 75,000

	P65AGED	PCRIME	PNW	PWOHSED	PFEMALHP	PYUTHPOV	PPOORPER	POCRWD	PWOPLUMB	PUNEMP75
P65AGED	1.0000	-.0603	-.0360	.3411	.1083	.0140	.1334	-.2787	.1565	.1248
PCRIME	-.0603	1.0000	.4165	.0229	.3615	.2650	.2567	.1285	.0338	.1347
PNW	-.0360	.4165	1.0000	.4100	.8029	.8725	.8098	.7043	.6082	.2197
PWOHSED	.3411	.0229	.4100	1.0000	.5114	.5084	.4669	.4631	.4516	.5502
PFEMALHP	.1083	.3615	.8029	.5114	1.0000	.9176	.9096	.5569	.6898	.2621
PYUTHPOV	.0140	.2650	.8725	.5084	.9176	1.0000	.9587	.7694	.7897	.2958
PPOORPER	.1334	.2567	.8098	.4669	.9096	.9587	1.0000	.6652	.8046	.2312
POCRWD	-.2787	.1285	.7043	.4631	.5569	.7694	.6652	1.0000	.6294	.3516
PWOPLUMB	.1565	.0338	.6082	.4516	.6898	.7897	.8046	.6294	1.0000	.2043
PUNEMP75	.1248	.1347	.2197	.5502	.2621	.2958	.2312	.3516	.2043	1.0000
PAGE1939	.6767	-.2403	-.1346	.5019	.1197	.0120	.1078	-.1869	.2514	.2619
DENSITY	.2284	-.0191	-.0573	.2761	-.0955	-.1164	-.1038	-.0581	-.0206	.1663
POWNOCCH	-.3273	-.2068	-.2114	-.1823	-.2804	-.1629	-.2538	.0238	-.2110	-.0669
PCINC72	-.0104	-.0001	-.4230	-.5941	-.6414	-.6734	-.7030	-.5879	-.5884	-.3503
MEDINC	-.2996	-.1005	-.5655	-.5951	-.7839	-.7778	-.8562	-.5114	-.6583	-.2464
PAGE1949	.6878	-.1722	.0047	.5820	.2409	.1408	.2369	-.0980	.3296	.2792
PNEWSTR	-.6107	.1238	-.0612	-.5911	-.2400	-.1626	-.2214	.0279	-.3045	-.2721
PNEW	-.4903	.0910	-.1395	-.4398	-.2406	-.1853	-.2136	-.0018	-.2361	-.1313
PMULTI	.3926	-.1096	-.2115	.1131	-.1246	-.2255	-.1592	-.2473	-.0156	.0890
PMFG	.0290	-.2148	-.2794	.4145	-.2914	-.3055	-.3910	-.1087	-.2130	.3655

Table E.2 Correlation Among Selected Variables for 140 Entitlement Cities, Population Between 50,000 and 75,000

	PAGE1939	DENSITY	POWNOCCH	PCINC73	MEDINC	PAGE1949	PNEWSTR	PNEW	PMULTI	PMFG
P65AGED	.6767	.2284	-.3273	-.0104	-.2996	.6878	-.6107	-.4903	.3926	.0290
PCRIME	-.2403	-.0191	-.2068	-.0001	-.1005	-.1722	.1238	.0910	-.1096	-.2148
PNW	-.1346	-.0573	-.2114	-.4230	-.5655	.0047	-.0612	-.1395	-.2115	-.2794
PWOHSED	.5019	.2761	-.1823	-.5941	-.5951	.5820	-.5911	-.4398	.1131	.4145
PFEMALHP	.1197	-.0955	-.2804	-.6414	-.7839	.2409	-.2400	-.2406	-.1246	-.2914
PYUTHPOV	.0120	-.1164	-.1629	-.6734	-.7778	.1408	-.1626	-.1853	-.2255	-.3055
PPOORPER	.1078	-.1038	-.2538	-.7030	-.8562	.2369	-.2214	-.2136	-.1592	-.3910
POCRWD	-.1869	-.0581	.0238	-.5879	-.5114	-.0980	.0279	-.0018	-.2473	-.1087
PWOPLUMB	.2514	-.0206	-.2110	-.5884	-.6583	.3296	-.3045	-.2361	-.0156	-.2130
PUNEMP75	.2619	.1663	-.0669	-.3503	-.2464	.2792	-.2721	-.1313	.0890	.3655
PAGE1939	1.0000	.3730	-.3979	-.2245	-.2827	.9628	-.8221	-.6200	.5642	.2590
DENSITY	.3730	1.0000	-.4732	.1170	.0612	.3311	-.2987	-.2966	.5607	.2513
POWNOCCH	-.3979	-.4732	1.0000	.0041	.2569	-.4133	.2968	.2746	-.7874	.1084
PCINC73	-.2245	.1170	.0041	1.0000	.8433	-.2811	.2250	.1607	.1902	.0652
MEDINC	-.2827	.0612	.2569	.8433	1.0000	-.3946	.3493	.2910	.0761	.2626
PAGE1949	.9628	.3311	-.4133	-.2811	-.3946	1.0000	-.9022	-.6913	.4832	.2288
PNEWSTR	-.8221	-.2987	.2968	.2250	.3493	-.9022	1.0000	.8451	-.3186	-.2284
PNEW	-.6200	-.2966	.2746	.1607	.2910	-.6913	.8451	1.0000	-.2098	-.1130
PMULTI	.5642	.5607	-.7874	.1902	.0761	.4832	-.3186	-.2098	1.0000	.1386
PMFG	.2590	.2513	.1084	.0652	.2626	.2288	-.2284	-.1130	.1386	1.0000

Table E.3 Correlations Among Selected Variables for 72 Entitlement Cities, Population Between 75,000 and 100,000

	P65AGED	PCRIME	PNW	PWOHSED	PFEMALHP	PYUTHPOV	PPOORPER	POCRWD	PWOPLUMB	PUNEMP75
P65AGED	1.0000	-.0050	-.0710	.3763	.2810	.1218	.3806	-.3617	.4877	.2471
PCRIME	-.0050	1.0000	.7020	.1118	.5267	.4708	.3869	.4533	-.1356	.4757
PNW	-.0710	.7020	1.0000	.2364	.7256	.7401	.6034	.5979	-.0577	.1695
PWOHSED	.3763	.1118	.2364	1.0000	.5824	.5690	.5823	.3667	.5902	.3716
PFEMALHP	.2810	.5267	.7256	.5824	1.0000	.9504	.9276	.4687	.3737	.3231
PYUTHPOV	.1218	.4708	.7401	.5690	.9504	1.0000	.9259	.6053	.3010	.2054
PPOORPER	.3806	.3869	.6034	.5823	.9276	.9259	1.0000	.3814	.4113	.2081
POCRWD	-.3617	.4533	.5979	.3667	.4687	.6053	.3814	1.0000	.0859	.1513
PWOPLUMB	.4877	-.1356	-.0577	.5902	.3737	.3010	.4113	.0859	1.0000	.1296
PUNEMP75	.2471	.4757	.1695	.3716	.3231	.2054	.2081	.1513	.1296	1.0000
PAGE1939	.8340	-.0774	-.1370	.5413	.2932	.1298	.3062	-.2055	.6516	.3698
DENSITY	.3763	.1786	.1374	.0998	.0531	-.1003	-.0554	-.1084	-.0901	.2554
POWNOCCH	-.5368	-.2884	-.1911	-.1863	-.2614	-.1037	-.2680	.2436	-.1143	-.1823
PCINC72	-.0484	-.1374	-.2680	-.6985	-.6225	-.6821	-.6514	-.5588	-.4591	-.1567
MEDINC	-.3951	-.1673	-.3417	-.7123	-.7559	-.7646	-.8597	-.3322	-.5159	-.0970
PAGE1949	.8555	.0366	-.0093	.5691	.3930	.2291	.4015	-.1188	.6353	.4109
PNEWSTR	-.7303	-.1060	-.1101	-.5845	-.4290	-.3270	-.4533	-.1013	-.5009	-.4144
PNEW	-.6292	-.1021	-.1688	-.3728	-.3277	-.2403	-.3443	-.0689	-.2751	-.2908
PMULTI	.5953	.0635	-.1073	.2462	.0431	-.1341	.0180	-.3258	.2191	.2917
PMFG	-.0200	.0357	-.1182	.4384	-.1102	-.1728	-.2366	.1375	.1511	.3519

Table E.3 Correlations Among Selected Variables for 72 Entitlement Cities, Population Between 75,000 and 100,000

	PAGE1939	DENSITY	POWNOCCH	PCINC73	MEDINC	PAGE1949	PNEWSTR	PNEW	PMULTI	PMFG
P65AGED	.8340	.3763	-.5368	-.0484	-.3951	.8555	-.7303	-.6292	.5953	-.0200
PCRIME	-.0774	.1786	-.2884	-.1374	-.1673	.0366	-.1060	-.1021	.0635	.0357
PNW	-.1370	.1374	-.1911	-.2680	-.3417	-.0093	-.1101	-.1688	-.1073	-.1182
PWOHSED	.5413	.0998	-.1863	-.6985	-.7123	.5691	-.5845	-.3728	.2462	.4384
PFEMALHP	.2932	.0531	-.2614	-.6225	-.7559	.3930	-.4290	-.3277	.0431	-.1102
PYUTHPOV	.1298	-.1003	-.1037	-.6821	-.7646	.2291	-.3270	-.2403	-.1341	-.1728
PPOORPER	.3062	-.0554	-.2680	-.6514	-.8597	.4015	-.4533	-.3443	.0180	-.2366
POCRWD	-.2055	-.1084	.2436	-.5588	-.3322	-.1188	-.1013	-.0689	-.3258	.1375
PWOPLUMB	.6516	-.0901	-.1143	-.4591	-.5159	.6353	-.5009	-.2751	.2191	.1511
PUNEMP75	.3698	.2554	-.1823	-.1567	-.0970	.4109	-.4144	-.2908	.2917	.3519
PAGE1939	1.0000	.3645	-.3931	-.2578	-.3940	.9646	-.8044	-.5822	.6159	.1987
DENSITY	.3645	1.0000	-.5777	.2133	.0923	.3762	-.3828	-.4129	.6474	.1562
POWNOCCH	-.3931	-.5777	1.0000	-.0853	.2241	-.4147	.2725	.2888	-.8483	.0021
PCINC73	-.2578	.2133	-.0853	1.0000	.8412	-.2689	.2972	.1347	.1122	-.1587
MEDINC	-.3940	.0923	.2241	.8412	1.0000	-.4523	.4402	.3029	-.0676	.0735
PAGE1949	.9646	.3762	-.4147	-.2689	-.4523	1.0000	-.8538	-.6815	.5649	.1709
PNEWSTR	-.8044	-.3828	.2725	.2972	.4402	-.8538	1.0000	.7819	-.4261	-.0926
PNEW	-.5822	-.4129	.2888	.1347	.3029	-.6815	.7819	1.0000	-.2939	-.0793
PMULTI	.6159	.6474	-.8483	.1122	-.0676	.5649	-.4261	-.2939	1.0000	.1940
PMFG	.1987	.1562	.0021	-.1587	.0735	.1709	-.0926	-.0793	.1940	1.0000

Table E.4 Correlations Among Selected Variables for 94 Entitlement Cities, Population Between 100,000 and 250,000

	P65AGED	PCRIME	PNW	PWOHSED	PFEMALHP	PYUTHPOV	PPOORPER	POCRWD	PWOPLUMB	PUNEMP75
P65AGED	1.0000	.1902	-.1204	.3044	.0569	-.0099	.2021	-.3057	.2891	.2827
PCRIME	.1902	1.0000	.4242	.2118	.3234	.2562	.2879	.1690	.1213	.4141
PNW	-.1204	.4242	1.0000	.4389	.7623	.7924	.6982	.7239	.1635	.0880
PWOHSED	.3044	.2118	.4389	1.0000	.5644	.5303	.4598	.3996	.4194	.3822
PFEMALHP	.0569	.3234	.7623	.5644	1.0000	.9389	.9142	.4155	.4446	.1715
PYUTHPOV	-.0099	.2562	.7924	.5303	.9389	1.0000	.9270	.5472	.3334	.0598
PPOORPER	.2021	.2879	.6982	.4598	.9142	.9270	1.0000	.4039	.4600	.0887
POCRWD	-.3057	.1690	.7239	.3996	.4155	.5472	.4039	1.0000	.0894	-.0058
PWOPLUMB	.2891	.1213	.1635	.4194	.4446	.3334	.4600	.0894	1.0000	.1272
PUNEMP75	.2827	.4141	.0880	.3822	.1715	.0598	.0887	-.0058	.1272	1.0000
PAGE1939	.5178	.2163	-.1004	.4854	.2099	.0569	.2059	-.2464	.5699	.3804
DENSITY	.2280	.4208	.0581	.2906	.0529	-.0551	.0049	-.0251	.1299	.4433
POWNOCCH	-.2270	-.4300	-.2278	-.2100	-.3279	-.2125	-.3410	.0052	-.3373	-.1642
PCINC72	.0002	-.0451	-.4035	-.5874	-.5954	-.6024	-.5748	-.4092	-.4030	-.1503
MEDINC	-.3926	-.1841	-.5071	-.5682	-.7528	-.7513	-.8451	-.2783	-.4611	-.0788
PAGE1949	.5113	.2515	.0348	.5405	.3314	.1928	.3361	-.1511	.6207	.3391
PNEWSTR	-.5323	-.2269	-.1187	-.5590	-.3532	-.2553	-.3812	.0198	-.5826	-.2683
PNEW	-.3171	-.1438	-.0876	-.4121	-.3040	-.2166	-.2972	.0092	-.3896	-.1910
PMULTI	.3587	.3309	-.0765	.2424	.0439	-.0772	.0487	-.1242	.3231	.3199
PMFG	-.0367	-.0347	-.1001	.4754	-.1302	-.1903	-.3081	.0994	.0211	.3473

Table E.4 Correlations Among Selected Variables for 94 Entitlement Cities, Population Between 100,000 and 250,000

	PAGE1939	DENSITY	POWNOCCH	PCINC73	MEDINC	PAGE1949	PNEWSTR	PNEW	PMULTI	PMFG
P65AGED	.5178	.2280	-.2270	.0002	-.3926	.5113	-.5323	-.3171	.3587	-.0367
PCRIME	.2163	.4208	-.4300	-.0451	-.1841	.2515	-.2269	-.1438	.3309	-.0347
PNW	-.1004	.0581	-.2278	-.4035	-.5071	.0348	-.1187	-.0876	-.0765	-.1001
PWOHSED	.4854	.2906	-.2100	-.5874	-.5682	.5405	-.5590	-.4121	.2424	.4754
PFEMALHP	.2099	.0529	-.3279	-.5954	-.7528	.3314	-.3532	-.3040	.0439	-.1302
PYUTHPOV	.0569	-.0551	-.2125	-.6024	-.7513	.1928	-.2553	-.2166	-.0772	-.1903
PPOORPER	.2059	.0049	-.3410	-.5748	-.8451	.3361	-.3812	-.2972	.0487	-.3081
POCRWD	-.2464	-.0251	.0052	-.4092	-.2783	-.1511	.0198	.0092	-.1242	.0994
PWOPLUMB	.5699	.1299	-.3373	-.4030	-.4611	.6207	-.5826	-.3896	.3231	.0211
PUNEMP75	.3804	.4433	-.1642	-.1503	-.0788	.3391	-.2683	-.1910	.3199	.3473
PAGE1939	1.0000	.5049	-.4749	-.3250	-.3273	.9665	-.8383	-.6504	.5981	.3501
DENSITY	.5049	1.0000	-.5806	.0443	.0169	.4415	-.3419	-.3083	.6745	.3068
POWNOCCH	-.4749	-.5806	1.0000	-.0450	.2684	-.4804	.3526	.2893	-.8686	.1044
PCINC73	-.3250	.0443	-.0450	1.0000	.7002	-.3578	.3872	.3261	.1117	-.1394
MEDINC	-.3273	.0169	.2684	.7002	1.0000	-.4215	.4662	.3119	-.0696	.2431
PAGE1949	.9665	.4415	-.4804	-.3578	-.4215	1.0000	-.9161	-.7216	.5303	.2973
PNEWSTR	-.8383	-.3419	.3526	.3872	.4662	-.9161	1.0000	.8172	-.3769	-.2599
PNEW	-.6504	-.3083	.2893	.3261	.3119	-.7216	.8172	1.0000	-.2716	-.2289
PMULTI	.5981	.6745	-.8686	.1117	-.0696	.5303	-.3769	-.2716	1.0000	.1502
PMFG	.3501	.3068	.1044	-.1394	.2431	.2973	-.2599	-.2289	.1502	1.0000

Table E.5 Correlations Among Selected Variables for 31 Entitlement Cities, Population Between 250,000 and 500,000

	P65AGED	PCRIME	PNW	PWOHSED	PFEMALHP	PYUTHPOV	PPOORPER	POCRWD	PWOPLUMB	PUNEMP75
P65AGED	1.0000	.3326	-.2472	.1821	-.1434	-.3754	-.1384	-.2710	.2684	.1975
PCRIME	.3326	1.0000	.4226	.2848	.5308	.3079	.3988	.2096	.2286	.4743
PNW	-.2472	.4226	1.0000	.4962	.6804	.8304	.8443	.8780	.3335	.4135
PWOHSED	.1821	.2848	.4962	1.0000	.6653	.5690	.5537	.4014	.4506	.5268
PFEMALHP	-.1434	.5308	.6804	.6653	1.0000	.8751	.8306	.4379	.1969	.4526
PYUTHPOV	-.3754	.3079	.8304	.5690	.8751	1.0000	.9227	.6771	.2959	.3063
PPOORPER	-.1384	.3988	.8443	.5537	.8306	.9227	1.0000	.6994	.3154	.2628
POCRWD	-.2710	.2096	.8780	.4014	.4379	.6771	.6994	1.0000	.4424	.1641
PWOPLUMB	.2684	.2286	.3335	.4506	.1969	.2959	.3154	.4424	1.0000	.2683
PUNEMP75	.1975	.4743	.4135	.5268	.4526	.3063	.2628	.1641	.2683	1.0000
PAGE1939	.6067	.2366	-.1841	.5595	.1599	-.1047	-.0997	-.2434	.4399	.4916
DENSITY	.3160	.3680	.2499	.6374	.3930	.1849	.1818	.2386	.4373	.5843
POWNOCCH	-.2001	-.4815	-.4669	-.6259	-.6056	-.4112	-.4294	-.3845	-.3469	-.5562
PCINC74	.3170	.0357	-.6074	-.6134	-.5598	-.7224	-.6765	-.6231	-.4115	-.1744
MEDINC	.0283	-.2904	-.7100	-.5734	-.7351	-.8058	-.8960	-.6466	-.3545	-.1381
PAGE1949	.6586	.3318	-.1505	.5914	.2487	-.0526	-.0153	-.2229	.3903	.4470
PNEWSTR	-.6630	-.3427	.0797	-.5886	-.3058	-.0440	-.0860	.1372	-.3782	-.3643
PNEW	-.6356	-.2376	.0469	-.4941	-.2579	-.0362	-.0302	.1266	-.3643	-.3657
PMULTI	.3132	.3450	.2703	.6650	.4502	.2305	.2172	.2141	.4369	.6406
PMFG	.2241	.0976	-.0914	.5144	.0479	-.0944	-.2051	-.1031	.1757	.3630

Table E.5 Correlations Among Selected Variables for 31 Entitlement Cities, Population Between 250,000 and 500,000

	PAGE1939	DENSITY	POWNOCCH	PCINC73	MEDINC	PAGE1949	PNEWSTR	PNEW	PMULTI	PMFG
P65AGED	.6067	.3160	-.2001	.3170	.0283	.6586	-.6630	-.6356	.3132	.2241
PCRIME	.2366	.3680	-.4815	.0357	-.2904	.3318	-.3427	-.2376	.3450	.0976
PNW	-.1841	.2499	-.4669	-.6074	-.7100	-.1505	.0797	.0469	.2703	-.0914
PWOHSED	.5595	.6374	-.6259	-.6134	-.5734	.5914	-.5886	-.4941	.6650	.5144
PFEMALHP	.1599	.3930	-.6056	-.5598	-.7351	.2487	-.3058	-.2579	.4502	.0479
PYUTHPOV	-.1047	.1849	-.4112	-.7224	-.8058	-.0526	-.0440	-.0362	.2305	-.0944
PPOORPER	-.0997	.1818	-.4294	-.6765	-.8960	-.0153	-.0860	-.0302	.2172	-.2051
POCRWD	-.2434	.2386	-.3845	-.6231	-.6466	-.2229	.1372	.1266	.2141	-.1031
PWOPLUMB	.4399	.4373	-.3469	-.4115	-.3545	.3903	-.3782	-.3643	.4369	.1757
PUNEMP75	.4916	.5843	-.5562	-.1744	-.1381	.4470	-.3643	-.3657	.6406	.3630
PAGE1939	1.0000	.7087	-.4860	-.0947	.0693	.9694	-.8440	-.7119	.7138	.6283
DENSITY	.7087	1.0000	-.8330	-.2417	-.1885	.7131	-.6202	-.5314	.9230	.4727
POWNOCCH	-.4860	-.8330	1.0000	.1996	.3624	-.5319	.4404	.3891	-.9142	-.2244
PCINC73	-.0947	-.2417	.1996	1.0000	.6626	-.0792	.1440	.0943	-.2166	-.1522
MEDINC	.0693	-.1885	.3624	.6626	1.0000	-.0353	.2246	.2178	-.2000	.2400
PAGE1949	.9694	.7131	-.5319	-.0792	-.0353	1.0000	-.9278	-.7628	.7022	.5884
PNEWSTR	-.8440	-.6202	.4404	.1440	.2246	-.9278	1.0000	.8635	-.5700	-.5029
PNEW	-.7119	-.5314	.3891	.0943	.2178	-.7628	.8635	1.0000	-.5331	-.4075
PMULTI	.7138	.9230	-.9142	-.2166	-.2000	.7022	-.5700	-.5331	1.0000	.4318
PMFG	.6283	.4727	-.2244	-.1522	.2400	.5884	-.5029	-.4075	.4318	1.0000

Table E.6 Correlations Among Selected Variables for 21 Entitlement Cities, Population Between 500,000 and 1,250,000

	P65AGED	PCRIME	PNW	PWOHSED	PFEMALHP	PYUTHPOV	PPOORPER	POCRWD	PWOPLUMB	PUNEMP75
P65AGED	1.0000	.5258	-.1931	.1171	.0967	-.2016	.0133	-.2989	.6426	.6529
PCRIME	.5258	1.0000	.3493	.1113	.2686	.0313	.2015	-.0338	.1787	.1646
PNW	-.1931	.3493	1.0000	.5182	.6668	.7313	.6978	.7917	-.1828	-.1687
PWOHSED	.1171	.1113	.5182	1.0000	.7097	.7102	.6909	.5225	.0978	.1651
PFEMALHP	.0967	.2686	.6668	.7097	1.0000	.8543	.9031	.5922	.0458	.1499
PYUTHPOV	-.2016	.0313	.7313	.7102	.8543	1.0000	.9648	.8437	-.0193	-.0550
PPOORPER	.0133	.2015	.6978	.6909	.9031	.9648	1.0000	.7696	.1391	.0492
POCRWD	-.2989	-.0338	.7917	.5225	.5922	.8437	.7696	1.0000	-.0192	-.0086
PWOPLUMB	.6426	.1787	-.1828	.0978	.0458	-.0193	.1391	-.0192	1.0000	.4633
PUNEMP75	.6529	.1646	-.1687	.1651	.1499	-.0550	.0492	-.0086	.4633	1.0000
PAGE1939	.8435	.4721	.0002	.4020	.3425	-.0377	.1394	-.2170	.5166	.5408
DENSITY	.6638	.6305	.1989	.2228	.2747	-.0860	.0757	-.1138	.3944	.4507
POWNOCCH	-.5185	-.6003	-.3228	-.1321	-.4500	-.0759	-.2259	-.0554	-.1522	-.3905
PCINC72	.0737	.3496	-.1945	-.7625	-.5395	-.6659	-.6102	-.4463	-.1388	-.1524
MEDINC	-.0059	-.0997	-.5869	-.7375	-.8469	-.9222	-.9360	-.7164	-.2247	-.1330
PAGE1949	.8337	.5253	.1021	.4161	.4021	.0272	.2110	-.1481	.5092	.4975
PNEWSTR	-.8394	-.5271	-.1590	-.4662	-.4477	-.0999	-.2780	.0944	-.5064	-.4902
PNEW	-.7768	-.4999	-.2264	-.5179	-.5114	-.1990	-.3717	-.0246	-.4945	-.4872
PMULTI	.6568	.4778	.0740	.1776	.3404	-.0398	.1161	-.0889	.3236	.4675
PMFG	.1248	-.3320	-.3380	.3985	-.1241	-.1697	-.2344	-.2971	-.1453	.0711

Table E.6 Correlations Among Selected Variables for 21 Entitlement Cities, Population Between 500,000 and 1,250,000

	PAGE1939	DENSITY	POWNOCCH	PCINC73	MEDINC	PAGE1949	PNEWSTR	PNEW	PMULTI	PMFG
P65AGED	.8435	.6638	-.5185	.0737	-.0059	.8337	-.8394	-.7768	.6568	.1248
PCRIME	.4721	.6305	-.6003	.3496	-.0997	.5253	-.5271	-.4999	.4778	-.3320
PNW	.0002	.1989	-.3228	-.1945	-.5869	.1021	-.1590	-.2264	.0740	-.3380
PWOHSED	.4020	.2228	-.1321	-.7625	-.7375	.4161	-.4662	-.5179	.1776	.3985
PFEMALHP	.3425	.2747	-.4500	-.5395	-.8469	.4021	-.4477	-.5114	.3404	-.1241
PYUTHPOV	-.0377	-.0860	-.0759	-.6659	-.9222	.0272	-.0999	-.1990	-.0398	-.1697
PPOORPER	.1394	.0757	-.2259	-.6102	-.9360	.2110	-.2780	-.3717	.1161	-.2344
POCRWD	-.2170	-.1138	-.0554	-.4463	-.7164	-.1481	.0944	-.0246	-.0889	-.2971
PWOPLUMB	.5166	.3944	-.1522	-.1388	-.2247	.5092	-.5064	-.4945	.3236	-.1453
PUNEMP75	.5408	.4507	-.3905	-.1524	-.1330	.4975	-.4902	-.4872	.4675	.0711
PAGE1939	1.0000	.7889	-.6614	-.1539	-.1395	.9887	-.9643	-.8763	.8054	.3031
DENSITY	.7889	1.0000	-.8227	.1677	-.0067	.8082	-.7892	-.7555	.8020	.0198
POWNOCCH	-.6614	-.8227	1.0000	-.2024	.0907	-.6925	.6532	.5742	-.8960	.1580
PCINC73	-.1539	.1677	-.2024	1.0000	.7532	-.1295	.1678	.1897	.0613	-.3943
MEDINC	-.1395	-.0067	.0907	.7532	1.0000	-.1751	.2468	.3140	-.0436	.1597
PAGE1949	.9887	.8082	-.6925	-.1295	-.1751	1.0000	-.9827	-.9093	.7985	.2221
PNEWSTR	-.9643	-.7892	.6532	.1678	.2468	-.9827	1.0000	.9470	-.7524	-.2153
PNEW	-.8763	-.7555	.5742	.1897	.3140	-.9093	.9470	1.0000	-.6676	-.1751
PMULTI	.8054	.8020	-.8960	.0613	-.0436	.7985	-.7524	-.6676	1.0000	.1138
PMFG	.3031	.0198	.1580	-.3943	.1597	.2221	-.2153	-.1751	.1138	1.0000

Table E.7 Correlations Among Selected Variables for 26 Entitlement Cities, Population greater than 500,000

	P65AGED	PCRIME	PNW	PWOHSED	PFEMALHP	PYUTHPOV	PPOORPER	POCRWD	PWOPLUMB	PUNEMP75
P65AGED	1.0000	.4226	-.1637	.1748	.1062	-.1986	.0079	-.2974	.5528	.4859
PCRIME	.4226	1.0000	.3104	.0216	.2159	.0100	.1483	.0098	.1271	.3363
PNW	-.1637	.3104	1.0000	.5034	.6580	.7021	.6598	.7347	-.1998	.0483
PWOHSED	.1748	.0216	.5034	1.0000	.6806	.6584	.6303	.4192	.0694	.2564
PFEMALHP	.1062	.2159	.6580	.6806	1.0000	.8504	.8960	.5568	.0469	.1440
PYUTHPOV	-.1986	.0100	.7021	.6584	.8504	1.0000	.9635	.8166	.0142	-.0553
PPOORPER	.0079	.1483	.6598	.6303	.8960	.9635	1.0000	.7404	.1606	-.0065
POCRWD	-.2974	.0098	.7347	.4192	.5568	.8166	.7404	1.0000	.0194	-.0859
PWOPLUMB	.5528	.1271	-.1998	.0694	.0469	.0142	.1606	.0194	1.0000	.1332
PUNEMP75	.4859	.3363	.0483	.2564	.1440	-.0553	-.0065	-.0859	.1332	1.0000
PAGE1939	.8288	.2900	.0478	.4940	.3432	-.0259	.1235	-.2189	.4132	.4462
DENSITY	.5788	.3138	.1798	.3270	.1971	-.0737	.0189	-.0548	.1414	.3619
POWNOCCH	-.4432	-.4269	-.2472	-.0595	-.3325	-.0416	-.1538	-.1483	-.1089	-.0776
PCINC72	.0682	.3286	-.1803	-.7295	-.5405	-.6614	-.6089	-.3814	-.1683	-.0983
MEDINC	.0057	-.0295	-.4924	-.6392	-.8071	-.8948	-.9189	-.6533	-.2583	.0432
PAGE1949	.8198	.3631	.1551	.5022	.3995	.0290	.1828	-.1610	.3960	.4940
PNEWSTR	-.8194	-.4069	-.2152	-.5377	-.4402	-.0915	-.2385	.1186	-.3834	-.5285
PNEW	-.7680	-.3894	-.2725	-.5531	-.4824	-.1638	-.3066	.0071	-.3357	-.5185
PMULTI	.5782	.3631	.0807	.1792	.2617	-.0415	.0652	.0232	.2414	.2422
PMFG	.1646	-.2174	-.1777	.4517	-.0740	-.1562	-.2325	-.2972	-.1952	.3555

Table E.7 Correlations Among Selected Variables for 26 Entitlement Cities, Population greater than 500,000

	PAGE1939	DENSITY	POWNOCCH	PCINC73	MEDINC	PAGE1949	PNEWSTR	PNEW	PMULTI	PMFG
P65AGED	.8288	.5788	-.4432	.0682	.0057	.8198	-.8194	-.7680	.5782	.1646
PCRIME	.2900	.3138	-.4269	.3286	-.0295	.3831	-.4069	-.3894	.3631	-.2174
PNW	.0478	.1798	-.2472	-.1803	-.4924	.1551	-.2152	-.2725	.0807	-.1777
PWOHSED	.4940	.3270	-.0595	-.7295	-.6392	.5022	-.5377	-.5531	.1792	.4517
PFEMALHP	.3432	.1971	-.3325	-.5405	-.8071	.3995	-.4402	-.4824	.2617	-.0740
PYUTHPOV	-.0259	-.0737	-.0416	-.6614	-.8948	.0290	-.0915	-.1638	-.0415	-.1562
PPOORPER	.1235	.0189	-.1538	-.6089	-.9189	.1828	-.2385	-.3066	.0652	-.2325
POCRWD	-.2189	-.0548	-.1483	-.3814	-.6533	-.1610	.1186	.0071	.0232	-.2972
PWOPLUMB	.4132	.1414	-.1089	-.1683	-.2583	.3960	-.3834	-.3357	.2414	-.1952
PUNEMP75	.4462	.3619	-.0776	-.0983	.0432	.4940	-.5285	-.5185	.2422	.3555
PAGE1939	1.0000	.7186	-.5270	-.1679	-.0988	.9843	-.9543	-.8710	.7010	.3830
DENSITY	.7186	1.0000	-.7030	.1626	.0684	.7167	-.6848	-.7099	.7673	.1743
POWNOCCH	-.5270	-.7030	1.0000	-.2798	.0020	-.5339	.4841	.4752	-.9021	.1437
PCINC73	-.1679	.1626	-.2798	1.0000	.7437	-.1407	.1715	.1505	.1367	-.3366
MEDINC	-.0988	.0684	.0020	.7437	1.0000	-.1116	.1616	.1935	.0467	.2367
PAGE1949	.9843	.7167	-.5339	-.1407	-.1116	1.0000	-.9831	-.9112	.6879	.3454
PNEWSTR	-.9543	-.6848	.4841	.1715	.1616	-.9831	1.0000	.9445	-.6361	-.3563
PNEW	-.8710	-.7099	.4752	.1505	.1935	-.9112	.9445	1.0000	-.6061	-.3197
PMULTI	.7010	.7673	-.9021	.1367	.0467	.6879	-.6361	-.6061	1.0000	.1371
PMFG	.3830	.1743	.1437	-.3366	.2367	.3454	-.3563	-.3197	.1371	1.0000

Appendix F

PER CAPITA NEED SCORES FOR THE 435 ENTITLEMENT CITIES

The factor scores presented below were calculated from the factor score coefficients in Table 4.6. Since the need variables were input into the factor analysis in percentage terms, we interpret these scores as per capita need scores. The following table defines each factor (dimension) in terms of need indicators with high loadings. In general, a city will receive a high score on a particular factor if the city has a high percentage for each of the need variables that define the particular factor. For example, Charleston (case 355) receives a high score on the poverty factor because 26.31 percent of its population is below the low income level. The following table defines each factor in terms of need indicators with high loadings.

	Dimension	Need Variables Defining Dimension
FACTOR 1	Poverty	Poverty variables (PYUTHPOV, PPOORPER, PFEMALHP, PNW), percent of overcrowded houses, percent of houses without plumbing.
FACTOR 2	Age of Housing Stock	Percent of houses built before 1939, percent of population aged over 65
FACTOR 3	Density	Percent of owner-occupied houses (negative), population per square mile.
FACTOR 4	Crime and Unemployment	Crime rate, percent unemployed
FACTOR 5	Lack of Economic Opportunity	Percent of population without a high school education

CASE-NO	STATCODE	NAME	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
1	1.	BIRMINGH AM	1.836	.472	-.674	-.269	-.627
2	1.	FLORENCE	.827	.128	-1.448	-.832	-.512
3	1.	GADSDEN	1.210	.728	-1.342	-.519	-.718
4	1.	HUNTSVIL LE	-.341	-1.247	-.942	-.046	-.614
5	1.	MOBILE	2.145	-.411	-1.185	-.294	-.452
6	1.	MONTGOME RY	2.104	-.362	-.837	-.962	-.603
7	1.	TUSCALOO SA	1.337	-.016	-.488	-.668	-1.802
8	2.	ANCHORAG E	-1.104	-2.089	1.114	-.709	-.967
9	4.	MESA	-.773	-1.261	-.698	-.469	.554
10	4.	PHOENIX	-.243	-1.135	-.637	.191	-.223
11	4.	SCOTTSDA LE	-1.669	-1.672	-1.118	.169	-.437
12	4.	TEMPE	-.850	-1.212	-.291	-.331	-1.748
13	4.	TUCSON	.053	-.952	-.561	-.409	-.517
14	5.	FAYETTEV ILLE	.225	1.002	-.225	-2.091	-2.965
15	5.	FORT SMI TH	.621	.509	-1.187	-1.326	-.274
16	5.	LITTLE R OCK	.779	.186	-.812	-.029	-1.438
17	5.	NORTH LI TTLE ROC	.929	.077	-.964	-.916	-1.116
18	5.	PINE BLU FF	2.676	.047	-1.124	-1.129	-.714
19	6.	ALAMEDA	-.565	-.306	.673	-1.085	-.161
20	6.	ALHAMBRA	-1.381	-.079	.533	-.209	-.816
21	6.	ANAHEIM	-1.354	-1.734	.112	.070	-.507
22	6.	BAKERSFI ELD	.365	-.508	-.750	.150	-.938
23	6.	BERKELEY	.132	1.823	.676	.188	-4.191
24	6.	BUENA PA RK	-1.505	-2.129	-.276	-.118	.934
25	6.	BURBANK	-1.453	-.915	.198	-.318	-.425
26	6.	CHULA VI STA	-.827	-1.689	-.331	.056	-.146
27	6.	COMPTON	1.619	-2.917	-.123	3.572	1.662
28	6.	CONCORD	-1.664	-1.870	-.578	.323	-.303
29	6.	COSTA ME SA	-1.195	-1.490	.192	-.131	-1.220
30	6.	DALY CIT Y	-1.524	-1.824	.165	.204	.006
31	6.	DOWNEY	-1.475	-1.677	.199	-.199	-.475
32	6.	EL CAJON	-.879	-1.449	-.183	-.361	-.472
33	6.	EL MONTE	.218	-1.634	.625	-.602	.878
34	6.	FAIRFIEL D	-.313	-2.283	.306	-1.011	-.123
35	6.	FREMONT	-1.496	-2.026	-.814	.035	.641
36	6.	FRESNO	.746	-.180	-.667	.216	-1.036
37	6.	FULLERTO N	-1.468	-1.473	-.137	-.137	-.697
38	6.	GARDEN G ROVE	-1.552	-1.961	-.316	.274	.176
39	6.	GLENDALE	-1.254	.036	.537	-.692	-1.099
40	6.	HAWTHORN E	-1.541	-1.933	1.098	-.022	-.334
41	6.	HAYWARD	-.855	-1.758	-.058	.519	-.090
42	6.	HUNTINGT ON BEACH	-1.519	-1.886	-.606	.061	-.261
43	6.	INGLEWOO D	-1.336	-1.192	1.226	.495	-1.240
44	6.	LOMPOC	-.162	-1.873	.250	-.877	-.597
45	6.	LONG BEA CH	-.754	-.080	.352	.019	-1.296
46	6.	LOS ANGE LES	-.102	-.734	.557	.699	-.923
47	6.	MODESTO	-.690	-.634	-.659	.781	-.677
48	6.	MONTEREY	-1.224	-.644	.634	.211	-1.904
49	6.	MOUNTAIN VIEW	-1.244	-1.712	1.370	-.953	-1.774
50	6.	NAPA	-1.096	-.390	-.572	-.545	-.816

CASE-NO	STATCODE	NAME	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
51	6.	OAKLAND	.332	.257	.145	1.642	-1.042
52	6.	ONTARIO	.023	-.915	-.552	-.015	.327
53	6.	ORANGE	-1.405	-1.503	-.236	-.166	-.433
54	6.	OXNARD	.298	-2.178	-.121	.356	.717
55	6.	PALO ALT O	-1.457	-.530	.026	-.238	-1.994
56	6.	PASADENA	-.613	.188	.298	.648	-1.447
57	6.	POMONA	.025	-1.202	-.224	.024	.018
58	6.	REDONDO BEACH	-1.077	-1.448	.764	.171	-.408
59	6.	REDWOOD CITY	-1.469	-1.264	.373	-.217	-.805
60	6.	RICHMOND	.006	-1.424	-.527	1.746	.115
61	6.	RIVERSID E	-.602	-.806	-.622	.619	-.964
62	6.	SACRAMEN TO	.196	-.307	-.534	.047	-.759
63	6.	SALINAS	-.406	-1.384	-.068	.301	.480
64	6.	SAN BERN ARDINO	.467	-.793	-.711	1.135	-.272
65	6.	SAN DIEG O	-.538	-.979	-.050	-.016	-.750
66	6.	SAN FRAN CISCO	-.432	.908	1.118	.760	-1.317
67	6.	SAN JOSE	-.807	-1.520	-.354	.051	-.034
68	6.	SAN LEAN DRO	-1.537	-1.191	-.429	.546	.094
69	6.	SAN MATE O	-1.504	-1.185	.320	-.066	-.871
70	6.	SANTA AN A	-.442	-1.629	.088	-.101	.797
71	6.	SANTA BA RBARA	-.403	.289	.207	-.367	-1.941
72	6.	SANTA CL ARA	-1.369	-1.839	.210	-.079	-.274
73	6.	SANTA CR UZ	-.094	1.905	-.714	.132	-2.988
74	6.	SANTA MA RIA	-.187	-1.295	-.119	-.421	.093
75	6.	SANTA MO NICA	-.809	-.051	1.602	.091	-2.842
76	6.	SANTA RO SA	-.788	.173	-.731	.153	-1.952
77	6.	SEASIDE	.484	-2.422	.765	-.546	.063
78	6.	SOUTH GA TE	-1.033	-.389	.305	.139	-.447
79	6.	STOCKTON	.575	-.172	-.522	.756	-.347
80	6.	SUNNYVAL E	-1.639	-2.103	.142	-.393	-.275
81	6.	TORRANCE	-1.814	-1.965	.222	-.023	-.492
82	6.	VALLEJO	-.574	-.614	-.426	.431	-.398
83	6.	VENTURA *SAN BUE	-1.166	-1.022	-.283	.168	-.714
84	6.	WEST COV INA	-1.671	-2.019	-.877	.371	.164
85	6.	WESTMINS TER	-1.330	-1.945	-.539	-.071	.558
86	6.	WHITTIER	-1.573	-1.069	-.208	-.078	-.573
87	8.	AURORA	-1.418	-1.896	-.242	-.344	-.629
88	8.	BOULDER	-.678	.264	.180	-.919	-3.464
89	8.	COLORADO SPRINGS	-.363	-.463	-.391	-.466	-1.124
90	8.	DENVER	-.080	.084	-.072	.566	-1.329
91	8.	PUEBLO	.056	.005	-.973	-.421	.936
92	9.	BRIDGEPO RT	-.392	.273	.612	.536	.776
93	9.	BRISTOL	-1.600	-.287	-.615	-.438	1.664
94	9.	DANBURY	-1.238	.052	-.678	-.409	1.118
95	9.	HARTFORD	.583	.401	1.200	.230	.124
96	9.	MERIDEN	-1.256	.163	-.442	-.350	1.518
97	9.	MILFORD	-1.547	-.415	-1.204	-.070	1.174
98	9.	NEW BRIT AIN	-1.033	.392	.334	-.364	.854
99	9.	NEW HAVE N	.529	.993	.551	.324	-.558
100	9.	NEW LOND ON	-.374	.814	.166	-.307	-.213

CASE-NO	STATCODE	NAME	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
101	9.	NORWALK	-1.259	-.410	-.290	-.209	.815
102	9.	NORWICH	-.715	1.173	-.652	-.626	.827
103	9.	STAMFORD	-1.114	-.578	.115	-.464	.443
104	9.	WATERBUR Y	-.715	.065	-.147	-.268	1.237
105	9.	WEST HAV EN	-1.228	-.013	-.244	-.672	.589
106	10.	WILMINGT ON	1.592	1.287	-.845	1.548	-.031
107	11.	WASHINGT ON	.529	-1.040	1.499	1.516	-.476
108	12.	BOCA RAT ON	-1.969	-1.082	-1.082	.600	-.414
109	12.	CLEARWAT ER	-.968	-.072	-1.059	.570	-.788
110	12.	DAYTONA BEACH	1.485	1.159	-1.027	.859	-2.656
111	12.	FORT LAU DERDALE	-.611	-.778	-.488	1.039	-1.071
112	12.	FORT MYE RS	.745	-.490	-.926	.208	.154
113	12.	GAINESVI LLE	.948	.084	-.233	-.554	-3.462
114	12.	HIALEAH	-.892	-2.334	.044	.472	1.710
115	12.	HOLLYWOO D	-1.207	-.477	-1.049	.978	-.604
116	12.	JACKSONV ILLE	.715	-.614	-1.220	.039	-.330
117	12.	LAKELAND	.751	.499	-1.211	-.205	-1.182
118	12.	MELBOURN E	-.237	-1.192	-1.340	-.110	.009
119	12.	MIAMI	1.066	-.722	1.044	.815	-.257
120	12.	ORLANDO	1.066	-.346	-.752	.559	-1.100
121	12.	PENSACOL A	1.537	-.041	-1.296	-.040	-.437
122	12.	ST PETER SBURG	-.424	.891	-1.429	.748	-1.345
123	12.	TALLAHAS SEE	.469	-.612	-.163	-.711	-2.499
124	12.	TAMPA	.771	.041	-1.231	.677	-.765
125	12.	TITUSVIL LE	-1.274	-1.610	-1.064	.523	-.225
126	12.	WEST PAL M BEACH	.255	.423	-.580	.562	-1.144
127	13.	ALBANY	2.371	-1.361	-.206	-1.408	.231
128	13.	ATLANTA	1.337	-.660	.135	.719	-.707
129	13.	AUGUSTA	3.111	1.037	-.546	-.950	-.757
130	13.	COLUMBUS	1.273	-.585	-.677	-.787	-.414
131	13.	MACON	1.853	-.162	-.674	-.296	-.185
132	13.	SAVANNAH	2.441	.057	-.573	-.089	-.712
133	16.	BOISE CI TY	-.911	.158	-.874	-.628	-1.027
134	17.	AURORA	-1.385	.035	-.186	-.780	1.483
135	17.	BERWYN	-1.907	1.114	-.102	-.823	1.273
136	17.	BLOOMING TON	-.799	1.246	-.488	-1.016	-.255
137	17.	CHAMPAIG N	-.404	.480	.063	-1.302	-2.397
138	17.	CHICAGO	.266	.094	1.072	-.336	1.027
139	17.	DECATUR	-.803	.459	-1.109	-.040	.653
140	17.	DES PLAI NES	-1.993	-1.335	-.757	-.483	.612
141	17.	EAST ST LOUIS	3.953	.131	-1.227	1.735	.739
142	17.	ELGIN	-1.726	.322	-.267	-.434	.999
143	17.	EVANSTON	-1.494	.379	.895	-.727	-.593
144	17.	JOLIET	-1.036	.279	-.458	-.233	1.152
145	17.	MOLINE	-1.238	.648	-.758	-.591	.371
146	17.	PEORIA	-.543	.717	-.751	-.162	-.074
147	17.	ROCKFORD	-.856	.166	-.567	-.272	.398
148	17.	SPRINGFI ELD	-.637	.857	-.522	-.958	.251
149	17.	URBANA	-.406	.380	.485	-2.032	-1.795
150	17.	WAUKEGAN	-.918	-.591	-.106	-.423	.945

CASE-NO	STATCODE	NAME	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
151	18.	ANDERSON	-.654	.301	-1.063	-.478	.999
152	18.	EAST CHI CAGO	.224	-.119	.539	.572	1.783
153	18.	EVANSVIL LE	-.457	.923	-.937	-.240	.168
154	18.	FORT WAY NE	-.848	.322	-.913	.156	.463
155	18.	GARY	.470	-1.095	-.318	1.358	1.642
156	18.	HAMMOND	-1.284	-.054	-.519	-.377	1.476
157	18.	INDIANAP OLIS	-.636	-.393	-.519	-.309	.692
158	18.	LAFAYETT E	-1.224	.498	-.669	-.709	.354
159	18.	MUNCIE	-.196	1.036	-.752	-.507	.010
160	18.	SOUTH BE ND	-.863	.536	-1.199	.332	.757
161	18.	TERRE HA UTE	-.374	1.901	-1.193	-.823	.059
162	19.	CEDAR FA LLS	-1.141	.354	-.829	-1.526	-1.115
163	19.	CEDAR RA PIDS	-1.302	.378	-.837	-1.156	-.003
164	19.	COUNCIL BLUFFS	-.355	.814	-1.299	-.658	1.019
165	19.	DAVENPOR T	-.835	.531	-.814	-.853	.585
166	19.	DES MOIN ES	-.805	.808	-.862	-.623	-.226
167	19.	DUBUQUE	-1.083	1.009	-.867	-1.248	1.079
168	19.	SIOUX CI TY	-.695	1.446	-1.155	-1.078	.368
169	19.	WATERLOO	-.569	.467	-1.212	-.870	.552
170	20.	KANSAS C ITY	.152	.318	-1.059	.137	.599
171	20.	OVERLAND PARK	-2.043	-1.847	-.674	-.435	-.602
172	20.	TOPEKA	-.697	.120	-.662	-.329	-.300
173	20.	WICHITA	-.428	-.413	-.564	-.468	-.422
174	21.	ASHLAND	.098	1.564	-1.145	-1.620	-.316
175	21.	COVINGTO N	.438	2.080	-.457	-.882	1.535
176	21.	LOUISVIL LE	.618	.693	-.480	-.017	.229
177	21.	OWENSBOR O	-.077	.262	-.770	-1.256	.126
178	22.	ALEXANDR IA	3.377	.054	-1.001	-.991	-.903
179	22.	BATON RO UGE	.919	-.320	-.585	-.177	-1.334
180	22.	LAFAYETT E	1.860	-.394	-.954	-1.348	-.443
181	22.	LAKE CHA RLES	1.712	-.634	-1.040	-.936	.053
182	22.	MONROE	3.172	-.285	-1.107	-1.322	-.488
183	22.	NEW ORLE ANS	2.750	.365	-.136	-.148	-.422
184	22.	SHREVEPO RT	1.637	-.102	-1.073	-.699	-.345
185	23.	LEWISTON	-.153	1.640	-.318	-1.496	.504
186	23.	PORTLAND	.050	1.808	-.213	-1.544	-.441
187	24.	BALTIMOR E	.920	.311	.093	1.223	.478
188	25.	BOSTON	.098	1.241	1.018	.100	-.493
189	25.	BROCKTON	-.934	.668	-.457	-.659	.958
190	25.	CAMBRIDG E	-.518	1.836	1.690	-.246	-1.946
191	25.	CHICOPEE	-1.182	.066	-.233	-.765	1.418
192	25.	FALL RIV ER	.045	2.242	.206	-.802	.560
193	25.	FITCHBUR G	-.705	1.661	-.410	-.907	.543
194	25.	HAVERHIL L	-.850	1.873	-.608	-.823	.794
195	25.	HOLYOKE	.105	1.771	.027	-.326	-.105
196	25.	LAWRENCE	-.614	1.544	.645	-.956	.646
197	25.	LEOMINST ER	-1.179	.706	-.669	-.713	1.329
198	25.	LOWELL	-.446	1.316	.094	-.993	.890
199	25.	LYNN	-.627	1.524	.009	-.177	.515
200	25.	MALDEN	-1.188	1.313	.270	-1.116	.847

CASE-NO	STATCODE	NAME	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
201	25.	MEDFORD	-1.441	1.433	-.342	-1.001	1.104
202	25.	NEW BEDF ORD	.308	2.179	-.172	-.946	.480
203	25.	NEWTON	-1.787	1.040	-.986	.203	.116
204	25.	PITTSFIE LD	-1.151	1.012	-.716	-.898	.765
205	25.	QUINCY	-1.283	1.136	-.312	-.448	.608
206	25.	SOMERVIL LE	-.963	1.593	1.181	-.858	1.250
207	25.	SPRINGFI ELD	-.251	.924	-.378	.315	.305
208	25.	WALTHAM	-1.300	.456	.276	-1.300	.509
209	25.	WORCESTE R	-.768	1.552	-.110	.096	.098
210	26.	ANN ARBO R	-.741	.153	.427	-.486	-3.107
211	26.	BATTLE C REEK	.129	1.568	-1.479	1.109	-.155
212	26.	BAY CITY	-.627	1.500	-1.516	-.149	1.462
213	26.	DEARBORN	-1.692	.070	-1.229	.230	.775
214	26.	DEARBORN HEIGHTS	-1.983	-1.712	-1.268	.187	1.825
215	26.	DETROIT	.075	.445	-.721	2.941	.652
216	26.	EAST LAN SING	-.777	-.226	1.130	-1.833	-3.758
217	26.	FLINT	-.249	-.226	-1.136	1.647	1.168
218	26.	GRAND RA PIDS	-.238	1.034	-1.095	.100	.449
219	26.	JACKSON	-.216	1.740	-1.070	-.251	.804
220	26.	KALAMAZO O	-.395	1.388	-.684	.092	-1.253
221	26.	LANSING	-.640	.100	-.954	.763	.311
222	26.	LINCOLN PARK	-1.668	-.971	-1.190	.533	2.003
223	26.	LIVONIA	-2.195	-1.737	-1.614	.332	1.306
224	26.	MUSKEGON	-.430	1.250	-1.330	1.049	.848
225	26.	PONTIAC	-.027	-.074	-1.138	2.752	1.535
226	26.	ROSEVILL E	-1.627	-1.502	-1.137	.258	2.214
227	26.	ROYAL OA K	-1.995	-.956	-.630	-.002	.608
228	26.	SAGINAW	.126	.559	-1.172	.899	1.351
229	26.	ST CLAIR SHORES	-2.100	-1.570	-1.202	.192	1.892
230	26.	STERLING HEIGHTS	-1.930	-1.872	-1.281	.356	.891
231	26.	TAYLOR	-1.470	-1.636	-1.422	.494	2.343
232	26.	WARREN	-2.003	-1.654	-1.262	.460	1.727
233	26.	WYOMING	-1.443	-.630	-1.552	-.066	1.668
234	27.	BLOOMING TON	-1.988	-2.004	-.635	-.669	.286
235	27.	DULUTH	-.782	1.961	-1.190	-.905	-.247
236	27.	MINNEAPO LIS	-.749	1.527	-.111	-.140	-.773
237	27.	MOORHEAD	-1.063	-.213	-.242	-1.119	-1.186
238	27.	ROCHESTE R	-1.293	.214	-.347	-1.572	-.951
239	27.	ST CLOUD	-1.015	1.028	-.806	-1.327	-.104
240	27.	ST PAUL	-1.068	.983	-.358	-.092	.046
241	28.	BILOXI	.659	-.630	.271	-1.921	-.132
242	28.	GULFPORT	.990	-.249	-.832	-1.643	-.655
243	28.	JACKSON	2.396	-.572	-.785	-1.447	-.561
244	29.	COLUMBIA	-.427	.269	.140	-1.832	-2.909
245	29.	FLORISSA NT	-2.006	-2.057	-.948	-.651	1.692
246	29.	INDEPEND ENCE	-1.409	-.438	-.957	-.801	.518
247	29.	KANSAS C ITY	-.099	.474	-.644	.348	-.309
248	29.	ST JOSEP H	-.109	1.995	-1.177	-1.164	.323
249	29.	ST LOUIS	1.174	1.097	.143	.818	.748
250	30.	BILLINGS	-.523	.091	-.565	-.650	-.979

CASE-NO	STATCODE	NAME	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
251	30.	GREAT FA LLS	-.716	.040	-.464	-.921	-.200
252	31.	LINCOLN	-1.101	.610	-.484	-1.175	-1.104
253	31.	OMAHA	-.575	.160	-.471	-.509	.139
254	32.	LAS VEGA S	-.769	-1.603	-.175	.002	-.638
255	33.	MANCHEST ER	-.718	1.461	-.267	-1.462	.506
256	33.	NASHUA	-1.289	.110	-.386	-1.545	1.058
257	34.	ATLANTIC CITY	1.086	1.993	-.063	2.800	-2.273
258	34.	BAYONNE	-.882	.902	.877	-1.645	1.183
259	34.	BLOOMFIE LD	-1.684	.684	.116	-.868	1.012
260	34.	CAMDEN	1.527	.839	-1.000	1.797	1.315
261	34.	CLIFTON	-1.914	.126	-.367	-.683	1.065
262	34.	EAST ORA NGE	-.715	-.051	1.883	.834	-.050
263	34.	ELIZABET H	-.319	.564	.988	-.782	.713
264	34.	IRVINGTO N	-1.322	1.083	1.391	-.724	.462
265	34.	JERSEY C ITY	.047	.692	1.450	-1.034	1.556
266	34.	LONG BRA NCH	-.091	.387	.433	-.417	-.462
267	34.	NEWARK	1.925	-.277	1.335	1.377	1.081
268	34.	PASSAIC	.343	.786	1.165	-.174	1.158
269	34.	PATERSON	.674	.463	1.046	-.004	1.549
270	34.	PERTH AM BOY	-.126	.808	.349	-1.082	1.103
271	34.	SAYREVIL LE	-2.058	-1.223	-.939	-.412	1.470
272	34.	TRENTON	.485	1.183	-.256	1.289	.985
273	34.	UNION CI TY	-.682	1.108	2.805	-1.390	1.897
274	34.	VINELAND	-.563	-.115	-1.082	-.051	1.494
275	35.	ALBUQUER QUE	.278	-1.415	-.607	.496	-.890
276	36.	ALBANY	-.165	1.685	.196	-1.124	-.520
277	36.	BINGHAMT ON	-.590	2.216	-.239	-1.053	-.275
278	36.	BUFFALO	.030	1.939	-.065	.338	.355
279	36.	ELMIRA	.370	2.526	-.714	-1.442	-.059
280	36.	MOUNT VE RNON	-.902	.266	1.444	-.247	.935
281	36.	NEW ROCH ELLE	-1.185	.255	.498	-.673	.086
282	36.	NEW YORK CITY	.037	.133	1.943	.202	.321
283	36.	NIAGARA FALLS	-.582	.899	-.731	.419	.934
284	36.	POUGHKEE PSIE	-.383	1.613	.308	-.901	-.103
285	36.	ROCHESTE R	-.335	1.435	-.029	-.259	.659
286	36.	ROME	-.850	.319	-.500	-1.191	1.106
287	36.	SCHENECT ADY	-.881	1.984	-.142	-1.203	.120
288	36.	SYRACUSE	-.147	1.519	.035	-.764	-.436
289	36.	TROY	-.122	2.185	.126	-1.669	-.262
290	36.	UTICA	-.209	1.986	-.372	-1.313	.475
291	36.	WHITE PL AINS	-1.391	.088	.818	-.746	-.319
292	36.	YONKERS	-1.295	.000	1.154	-.843	.211
293	37.	ASHEVILL E	.448	1.316	-1.232	.090	-.814
294	37.	BURLINGT ON	-.642	-.516	-.646	-.810	.987
295	37.	CHARLOTT E	.462	-1.002	-.232	.410	-.533
296	37.	DURHAM	1.187	-.220	-.114	-.317	-.883
297	37.	FAYETTEV ILLE	2.047	-.971	-.762	-.154	-.885
298	37.	GASTONIA	.147	-.306	-.674	-.347	1.055
299	37.	GREENSBO RO	-.196	-1.055	-.348	.044	-.134
300	37.	HIGH POI NT	.107	-.369	-.465	-.598	.897

CASE-NO	STATCODE	NAME	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
301	37.	RALEIGH	-.061	-.592	-.033	-.537	-1.083
302	37.	WILMINGT ON	2.379	.560	-.908	-.079	-1.317
303	37.	WINSTON- SALEM	.677	-.332	-.655	.650	-.570
304	38.	FARGO	-1.178	.437	-.030	-1.643	-.540
305	39.	AKRON	-.476	.718	-.908	.510	.282
306	39.	CANTON	-.351	1.216	-.791	-.347	.677
307	39.	CINCINNA TI	.657	.718	.268	-.501	.012
308	39.	CLEVELAN D	.705	.949	-.015	.462	.428
309	39.	CLEVELAN D HEIGHT	-1.677	1.358	-.676	-.459	.108
310	39.	COLUMBUS	-.020	.055	-.158	-.288	-.745
311	39.	DAYTON	-.110	.310	-.217	1.046	-.059
312	39.	ELYRIA	-1.169	-.315	-.823	-.424	1.188
313	39.	EUCLID	-1.851	-1.166	.144	-1.027	.310
314	39.	KETTERIN G	-2.002	-1.581	-.594	-.630	-.089
315	39.	LAKEWOOD	-1.778	1.104	.750	-1.517	.220
316	39.	LIMA	-.212	.979	-.999	.159	.920
317	39.	LORAIN	-.454	-.333	-.781	-.174	1.550
318	39.	MANSFIEL D	-.483	.584	-.875	-.129	.327
319	39.	MIDDLETO WN	-.536	.333	-.741	-.193	.500
320	39.	PARMA	-2.020	-1.179	-1.197	-.254	.920
321	39.	SPRINGFI ELD	-.299	1.031	-.538	-.813	.523
322	39.	STEUBENV ILLE	-.149	1.557	-.856	-.568	-.548
323	39.	TOLEDO	-.600	.728	-.939	.160	.563
324	39.	WARREN	-.828	.137	-.777	.189	.702
325	39.	YOUNGSTO WN	-.148	1.219	-1.281	.897	.681
326	40.	LAWTON	.968	-.887	-.685	-.716	-.769
327	40.	NORMAN	-.165	.322	-.380	-1.676	-2.354
328	40.	OKLAHOMA CITY	.171	-.093	-.936	-.781	-.572
329	40.	TULSA	-.247	-.381	-.904	-.461	-.628
330	41.	EUGENE	-.443	.406	-.244	-.533	-2.881
331	41.	PORTLAND	-.519	1.406	-.649	.302	-1.366
332	41.	SALEM	-.928	.561	-.627	-.312	-1.424
333	41.	SPRINGFI ELD	-.731	-.760	-.655	-.235	-.031
334	42.	ALLENTOW N	-1.035	1.425	-.733	-.628	.486
335	42.	ALTOONA	-.029	2.492	-1.360	-1.320	.681
336	42.	BETHLEHE M	-.986	.739	-.793	-.807	.605
337	42.	CHESTER	1.215	.708	-.449	1.344	.728
338	42.	EASTON	.003	2.181	-.624	-1.013	.249
339	42.	ERIE	-.575	1.237	-.657	-1.000	.489
340	42.	HARRISBU RG	1.108	1.650	-.300	-.053	-.886
341	42.	HAZLETON	-.760	2.193	-.639	-1.561	.507
342	42.	JOHNSTOW N	.030	2.156	-.148	-1.664	.354
343	42.	LANCASTE R	.028	2.154	-.496	-.799	.158
344	42.	PHILADEL PHIA	.149	.900	-.397	.141	1.101
345	42.	PITTSBUR GH	-.047	1.464	-.253	.317	-.028
346	42.	READING	-.483	2.346	-.674	-.798	.859
347	42.	SCRANTON	-.513	2.399	-.539	-1.250	.455
348	42.	WILKES-B ARRE	-.284	2.601	-.535	-1.446	.405
349	42.	WILLIAMS PORT	.091	2.782	-.561	-1.610	-.512
350	42.	YORK	-.223	1.902	-.407	-.202	.325

CASE-NO	STATCODE	NAME	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
351	44.	CRANSTON	-1.610	.378	-1.148	-.034	1.218
352	44.	PAWTUCKE T	-.598	1.543	-.146	-.667	.823
353	44.	PROVIDEN CE	.629	2.386	.088	.096	-.778
354	44.	WARWICK	-1.541	-.229	-1.593	.346	1.328
355	45.	CHARLEST ON	2.515	.063	-.282	-.163	-1.103
356	45.	COLUMBIA	.603	-.387	-.333	.309	-1.128
357	45.	GREENVIL LE	1.200	-.106	-.468	.333	-.833
358	45.	SPARTANB URG	1.623	.191	-.633	-.115	-.543
359	46.	SIOUX FA LLS	-1.052	.458	-.688	-1.222	-.220
360	47.	CHATTANO OGA	2.027	1.086	-.762	-.387	-1.064
361	47.	KINGSPOR T	.310	.309	-1.143	-1.627	-.571
362	47.	KNOXVILL E	.754	.812	-.819	-1.004	-1.285
363	47.	MEMPHIS	1.714	-.799	-.555	-.794	.011
364	47.	NASHVILL E-DAVIDS	-.031	-.508	-.618	-.306	-.310
365	48.	ABILENE	.342	-.490	-.768	-1.479	-.178
366	48.	AMARILLO	-.252	-.516	-.846	-.874	-.346
367	48.	ARLINGTO N	-1.471	-1.587	-.151	-.659	-.683
368	48.	AUSTIN	.559	-.572	.036	-1.418	-1.503
369	48.	BEAUMONT	.998	-.300	-.892	-.638	-.022
370	48.	BROWNSVI LLE	7.519	-1.489	-1.282	-2.790	2.158
371	48.	BRYAN	1.577	-.554	-.762	-1.519	-.533
372	48.	CORPUS C HRISTI	1.809	-1.418	-.563	-.807	.346
373	48.	DALLAS	.264	-1.223	-.041	.107	-.342
374	48.	EL PASO	2.053	-1.720	-.381	-.904	1.372
375	48.	FORT WOR TH	.145	-.755	-.567	-.334	.168
376	48.	GALVESTO N	1.482	.282	-.220	.294	-.482
377	48.	GARLAND	-1.586	-2.007	-.781	-.480	.986
378	48.	GRAND PR AIRIE	-.761	-1.788	-.422	-.648	.921
379	48.	HARLINGE N	6.601	-.846	-1.441	-3.129	.697
380	48.	HOUSTON	.447	-1.378	.024	-.278	-.064
381	48.	IRVING	-1.317	-1.893	-.126	-1.025	.279
382	48.	KILLEEN	1.396	-1.414	.574	-2.228	-1.356
383	48.	LAREDO	7.758	-.723	-1.086	-3.444	2.472
384	48.	LUBBOCK	1.065	-1.021	-.489	-1.431	-.337
385	48.	MC ALLEN	6.248	-.885	-1.194	-3.233	1.394
386	48.	MESQUITE	-1.546	-1.915	-.974	-.669	1.342
387	48.	MIDLAND	.192	-1.553	-.895	-1.401	-.018
388	48.	ODESSA	.276	-1.460	-.745	-1.528	1.028
389	48.	PASADENA	-1.164	-1.906	-.189	-1.247	.849
390	48.	PORT ART HUR	1.348	-.053	-1.282	.065	.785
391	48.	SAN ANGE LO	1.150	-.018	-1.059	-1.403	-.078
392	48.	SAN ANTO NIO	2.156	-1.277	-.634	-.418	1.289
393	48.	SHERMAN	-.780	.281	-.895	-.605	-.071
394	48.	TEMPLE	.860	.140	-.983	-1.249	-.126
395	48.	TEXARKAN A	.815	.500	-1.076	-.297	-.820
396	48.	TEXAS CI TY	-.313	-1.670	-.781	-.360	1.150
397	48.	TYLER	-.139	-.316	-.708	-.475	-.540
398	48.	WACO	1.361	.643	-.974	-.617	-1.360
399	48.	WICHITA FALLS	.033	-.127	-.710	-1.297	-.230
400	49.	OGDEN	-.231	.356	-.746	-.537	-.003

CASE-NO	STATCODE	NAME	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
401	49.	OREM	-.066	-1.231	-.994	-1.638	.289
402	49.	PROVO	.743	1.197	-.013	-3.017	-3.126
403	49.	SALT LAK E CITY	-.051	1.121	-.372	-.343	-1.407
404	51.	ALEXANDR IA	-.876	-1.359	1.687	-.853	-1.700
405	51.	CHESAPEA KE	.376	-1.289	-1.160	-.836	1.414
406	51.	HAMPTON	-.344	-1.430	-.528	-.377	.475
407	51.	LYNCHBUR G	-.079	.940	-.781	-.617	.012
408	51.	NEWPORT NEWS	.338	-1.322	-.355	-.240	.164
409	51.	NORFOLK	.725	-.722	.078	.106	-.392
410	51.	PETERSBU RG	1.845	-.164	-.262	-.648	.911
411	51.	PORTSMOU TH	1.199	-.832	-.560	.060	.521
412	51.	RICHMOND	.734	.012	-.257	.663	-.385
413	51.	ROANOKE	.134	.925	-.884	-.149	-.393
414	51.	VIRGINIA BEACH	-.647	-1.749	-.896	-.307	.051
415	53.	BELLEVUE	-1.881	-1.917	-.586	-.296	-.943
416	53.	EVERETT	-.660	.640	-.829	-.151	-.480
417	53.	RICHLAND	-1.378	-1.748	-.685	-1.041	-.533
418	53.	SEATTLE	-1.006	.652	-.216	.327	-1.295
419	53.	SPOKANE	-.300	1.474	-1.160	-.581	-1.069
420	53.	TACOMA	-.369	.821	-1.055	-.101	-.360
421	53.	YAKIMA	.406	1.643	-1.093	.133	-1.631
422	54.	CHARLEST ON	.534	1.755	-.602	-1.084	-1.845
423	54.	HUNTINGT ON	.701	2.445	-.889	-1.175	-1.452
424	54.	WEIRTON	-1.271	-.099	-1.271	-.594	1.206
425	54.	WHEELING	-.109	2.453	-.921	-1.144	-.452
426	55.	APPLETON	-1.606	.119	-.824	-1.027	.982
427	55.	GREEN BA Y	-1.122	.141	-.733	-1.314	1.003
428	55.	KENOSHA	-1.082	.316	-.651	-.907	1.627
429	55.	LA CROSS E	-.574	1.900	-.872	-1.499	-.733
430	55.	MADISON	-.791	.364	.222	-1.675	-2.113
431	55.	MILWAUKE E	-.450	.267	.168	-.616	.599
432	55.	OSHKOSH	-1.138	1.611	-.750	-1.148	-.084
433	55.	RACINE	-.872	.151	-.542	-.258	1.444
434	55.	SUPERIOR	-.261	2.075	-1.277	-1.096	-.149
435	55.	WEST ALL IS	-1.805	-.072	-.451	-.836	1.284

Appendix G

PHASE-IN AND PHASE-DOWN CITIES

A phase-in city or "gainer" is defined as an entitlement city that has a present formula amount greater than its hold harmless amount. Phase-in cities are divided into two groups. First, of the 435 entitlement cities being considered, 35 did not participate in the categorical programs. Second, there were 192 other cities that did participate but, in each case, the hold harmless amount is less than the formula amount. The remaining 208 cities are the phase-down cities or "losers"; these are entitlement cities each with a formula amount less than its hold harmless amount. In this appendix, we list for each city in the three categories, five need variables (DENSITY, POCRWD, PPOORPER, PUNEMP75, PAGE1939), one measure of tax effort (TAX1INC), and per capita aid under hold harmless, the existing formula and one alternative formula. The definitions of the variables used in this appendix follows:

DENSITY	population per square mile
POCRWD	percent of occupied houses with 1.01 or more persons per room
PPOORPER	percent of population with incomes below the poverty level
PUNEMP75	unemployment rate, 1975
PAGE1939	percent of housing units built before 1939
TAX1INC	non-education taxes (1974) as a percentage of personal income (1972)
HH	hold harmless
PRESENT	present formula
ALT5	Alternative 5 (.3 POORPER, .2 OCRWD, .5 AGE1939)

Table G.1 Need Variables, Tax Effort, and Per Capita Amounts for 35 New Phase-In Cities

CASE-NO	NAME1	NAME2	DENSITY	POCRWD	PPOORPER	PUNEMP75	PAGE1939	TAX1INC	HH	PRESENT	ALT5
1	ALHAMBRA		8283.	4.00	7.92	6.1	38.39	2.14	0	10.59	13.61
2	BUENA PA	RK	6365.	9.10	5.16	9.0	4.35	2.30	0	10.60	5.51
3	COSTA ME	SA	4780.	4.50	7.60	8.4	4.54	3.13	0	10.49	5.40
4	DOWNEY		6910.	4.90	5.88	6.8	5.48	1.54	0	9.63	5.10
5	EL CAJON		4393.	6.10	9.31	9.7	4.55	2.46	0	12.26	6.67
6	FULLERTO	N	3891.	4.90	5.98	8.3	9.19	1.92	0	9.69	5.72
7	GLENDALE		4512.	3.70	7.94	7.0	38.73	1.89	0	10.67	13.92
8	ORANGE		4472.	5.50	6.08	7.0	10.29	2.44	0	9.57	5.72
9	SOUTH GA	TE	7588.	6.10	9.27	8.3	28.01	1.89	0	12.75	12.69
10	WEST COV	INA	4660.	6.10	4.58	8.2	1.27	1.55	0	9.22	3.99
11	WESTMINS	TER	5544.	8.40	6.23	6.8	2.68	1.70	0	10.77	5.33
12	WHITTIER		6336.	3.60	6.17	6.1	17.37	1.71	0	9.33	7.21
13	BERWYN		13462.	2.70	5.19	5.5	67.09	1.56	0	8.39	17.71
14	DES PLAI	NES	5349.	5.20	3.20	5.4	15.93	2.37	0	7.87	5.52
15	ELGIN		3814.	5.10	5.04	8.0	56.25	2.22	0	9.36	14.34
16	LEOMINST	ER	1156.	8.40	7.19	11.3	59.90	4.28	0	11.40	15.86
17	DEARBORN		4253.	4.70	5.53	11.0	39.47	4.28	0	9.39	11.37
18	ROSEVILL	E	6176.	12.40	4.97	15.1	11.68	1.65	0	11.66	7.50
19	STERLING	HEIGHTS	1668.	5.60	2.82	13.2	3.90		0	7.83	3.47
20	WYOMING		2318.	7.60	5.96	11.1	26.72	1.91	0	10.77	9.42
21	CLEVELAN	D HEIGHT	7411.	1.20	5.52	9.5	72.75	1.66	0	7.74	16.42
22	EUCLID		6880.	3.80	4.20	6.5	17.34	3.50	0	8.28	6.53
23	LAKEWOOD		12759.	2.40	5.40	7.1	73.45	1.56	0	8.40	19.18
24	LIMA		4593.	7.40	12.22	16.5	64.12	1.88	0	14.28	19.47
25	PARMA		4818.	4.30	3.66	5.7	13.16	1.37	0	8.03	5.17
26	SPRINGFI	ELD	2609.	6.20	9.98	12.5	13.50	2.13	0	12.90	8.85
27	BRYAN		2007.	9.90	20.86	4.5	19.40	1.75	0	20.38	14.91
28	MESQUITE		2137.	9.20	4.59	5.0	2.59	2.46	0	9.99	4.80
29	MIDLAND		2036.	8.30	12.40	3.5	5.78	2.22	0	14.53	8.45
30	ODESSA		4260.	11.40	12.61	4.3	10.19	1.94	0	15.92	10.30
31	SHERMAN		1522.	4.90	10.19	12.4	36.92	2.79	0	12.45	13.42
32	TEMPLE		1479.	8.50	17.11	5.0	29.94	2.38	0	17.73	15.40
33	OREM		1639.	13.10	11.47	8.2	9.23	1.75	0	14.78	8.91
34	VIRGINIA	BEACH	782.	5.40	9.62	6.0	6.89	4.13	0	11.48	6.21
35	RICHLAND		1138.	3.80	5.87	6.9	.85	1.67	0	9.12	3.75

Table G.2 Need Variables, Tax Effort, and Per Capita Amounts for 192 Other Phase-In Cities

CASE-NO	NAME1	NAME2	DENSITY	POCRWD	PPOORPER	PUNEMP75	PAGE1939	TAX1INC	HH	PRESENT	ALT5
1	BIRMINGH	AM	3785.	9.70	22.56	7.6	42.67	4.85	16.75	21.50	20.34
2	GADSDEN		1664.	7.20	20.24	15.1	35.03		.26	18.83	16.91
3	MOBILE		1630.	10.60	23.17	7.3	23.78	3.39	10.60	21.79	16.45
4	MONTGOME	RY	2875.	9.60	22.77	7.3	27.22	3.18	17.73	21.01	16.51
5	ANCHORAG	E	2968.	10.50	6.47	8.5	3.65	3.63	9.90	10.04	4.92
6	MESA		3022.	10.90	9.18	7.8	9.11	1.54	.35	14.02	8.69
7	PHOENIX		2346.	8.90	11.61	10.3	11.24	2.56	2.24	14.65	9.59
8	FORT SMI	TH	1396.	6.70	15.95	10.1	34.66	.86	11.72	16.19	15.43
9	ALAMEDA		7097.	5.00	10.02	8.2	47.49	1.71	.06	12.18	14.96
10	ANAHEIM		4997.	6.00	6.36	8.5	6.00	2.51	.20	10.22	5.56
11	BAKERSFI	ELD	2684.	6.40	15.01	6.8	23.30	4.39	4.70	15.83	12.74
12	BURBANK		5197.	5.00	6.56	9.0	22.50	3.86	1.10	10.24	9.55
13	CHULA VI	STA	4782.	7.10	9.47	10.3	5.76	2.55	.37	12.66	7.18
14	CONCORD		3301.	5.00	4.69	8.2	3.35	1.89	.20	8.71	3.94
15	DALY CIT	Y	9699.	5.90	5.75	7.6	13.08	1.72	1.46	10.30	6.97
16	EL MONTE		7680.	12.70	13.39	8.8	16.68	2.43	.21	17.48	12.74
17	FAIRFIEL	D	2867.	9.50	9.87	8.5	3.04	2.17	2.13	12.98	6.76
18	FREMONT		1197.	7.20	4.79	8.1	5.04	1.88	2.05	9.52	4.78
19	GARDEN G	ROVE	6975.	7.20	5.56	8.5	2.16	1.59	.16	10.08	4.74
20	HAWTHORN	E	9692.	7.00	5.75	9.4	9.33	2.00	.26	10.94	6.98
21	HAYWARD		2455.	8.00	8.02	10.7	8.40	2.87	1.29	12.03	7.17
22	HUNTINGT	ON BEACH	4359.	4.80	5.17	7.8	3.74	2.61	3.97	8.93	4.16
23	LOMPOC		2554.	7.50	10.84	7.5	6.90	1.45	.99	13.03	7.49
24	LONG BEA	CH	7369.	4.70	11.23	9.6	31.61	2.80	4.22	12.96	13.61
25	LOS ANGE	LES	6060.	8.40	12.98	10.7	32.18	3.84	13.73	15.87	15.25
26	MODESTO		6496.	5.40	10.53	12.4	19.31	2.58	1.68	12.72	9.59
27	MONTEREY		3329.	3.80	7.45	11.1	23.46	1.47	1.18	10.38	9.29
28	MOUNTAIN	VIEW	4982.	4.90	6.78	6.9	6.67	2.57	2.07	10.14	5.82
29	ONTARIO		2862.	9.50	12.53	12.8	18.20	1.98	4.60	15.40	11.32
30	PALO ALT	O	2216.	2.50	6.69	6.5	24.08	1.89	.12	9.19	8.75
31	POMONA		3867.	8.80	12.38	9.6	18.15	3.47	.51	15.05	11.10
32	REDWOOD	CITY	2716.	4.70	5.96	6.9	15.54	2.73	1.42	9.88	7.51
33	RIVERSID	E	1959.	6.30	10.48	9.7	18.73	2.06	11.48	12.80	9.56
34	SACRAMEN	TO	2741.	6.70	14.23	9.7	27.66	3.33	14.74	15.33	13.64
35	SALINAS		4428.	10.50	10.73	12.2	20.47	3.11	1.48	14.90	11.45
36	SAN DIEG	O	2200.	6.70	11.03	10.4	21.72	2.41	13.12	13.29	10.68
37	SAN LEAN	DRO	5409.	4.20	5.90	8.1	18.18	2.86	.41	9.36	7.42
38	SAN MATE	O	6990.	3.50	6.19	6.8	17.90	2.32	.77	9.36	7.51
39	SANTA AN	A	5769.	11.30	10.13	9.1	16.49	2.49	.72	14.72	10.72
40	SANTA BA	RBARA	3344.	5.20	13.21	7.0	34.66	2.84	7.56	14.55	15.47
41	SANTA CL	ARA	5316.	6.30	6.19	9.7	6.29	2.43	4.15	10.42	5.73
42	SANTA CR	UZ	2629.	3.50	16.57	13.2	41.76	3.18	5.11	15.52	17.61
43	SANTA MO	NICA	10637.	4.40	11.73	9.4	27.74	2.38	3.00	13.63	14.01
44	STOCKTON		3678.	8.90	16.76	12.2	36.76	3.88	16.40	17.39	16.34
45	SUNNYVAL	E	4458.	4.90	4.66	8.3	3.59	1.87	.30	8.85	4.15
46	TORRANCE		6584.	5.10	4.07	7.2	5.11	2.68	7.87	8.56	4.28
47	AURORA		2756.	4.90	5.49	4.8	3.87	2.43	.29	9.12	4.30
48	BOULDER		5144.	3.80	11.55	7.1	21.98	2.70	2.89	12.18	9.53
49	PUEBLO		4331.	10.50	13.30	6.2	45.40	2.73	10.43	16.17	16.64
50	MERIDEN		2361.	6.90	6.58	11.9	52.67	3.21	7.29	10.84	14.65

Table G.2 Need Variables, Tax Effort, and Per Capita Amounts for 192 Other Phase-In Cities

CASE-NO	NAME1	NAME2	DENSITY	POCRWD	PPOORPER	PUNEMP75	PAGE1939	TAX1INC	HH	PRESENT	ALT5
51	NORWALK		3596.	7.10	6.55	8.4	42.33	4.50	10.24	10.87	12.60
52	CLEARWAT	ER	3591.	4.80	12.00	7.8	13.62	2.39	3.71	13.40	9.80
53	DAYTONA	BEACH	1988.	6.60	23.19	10.8	33.75	3.05	14.89	20.70	19.25
54	FORT LAU	DERDALE	4716.	6.50	11.99	11.8	7.62	2.90	3.72	14.60	9.27
55	GAINESVI	LLE	2472.	6.40	19.71	7.7	14.24	2.18	1.36	17.96	11.91
56	HIALEAH		5123.	18.60	8.67	8.3	3.56	1.96	.77	16.64	9.91
57	HOLLYWOO	D	4258.	5.80	9.82	13.5	5.23	2.45	2.05	12.70	7.26
58	JACKSONV	ILLE	690.	8.10	16.84	7.0	20.93	2.72	9.82	17.13	12.86
59	LAKELAND		3397.	5.30	18.59	8.0	33.14	1.79	3.78	16.92	15.56
60	MIAMI		9763.	20.60	20.39	10.3	29.88	3.99	8.70	26.11	22.03
61	ORLANDO		3600.	7.70	19.16	11.0	20.96	3.56	9.45	18.51	14.27
62	PENSACOL	A	2479.	9.20	21.79	8.9	36.49	1.86	2.72	20.53	18.51
63	ST PETER	SBURG	3902.	4.20	15.75	9.5	22.37	2.15	1.69	15.55	13.38
64	TALLAHAS	SEE	2783.	7.20	17.73	6.7	14.91	1.24	10.42	17.03	11.52
65	WEST PAL	M BEACH	1494.	7.70	16.60	12.1	34.97	3.36	2.28	17.80	17.76
66	ALBANY		2470.	14.50	24.42	10.1	16.43	1.79	9.50	23.90	16.51
67	AUGUSTA		3938.	13.00	30.05	9.7	51.48	3.34	17.41	27.08	25.94
68	MACON		2498.	11.70	22.34	9.0	33.71	2.99	8.36	21.81	18.58
69	AURORA		5261.	8.10	6.01	6.9	56.04	3.40	.73	10.93	15.31
70	CHAMPAIG	N	6811.	4.10	12.87	4.0	35.59	2.10	6.60	13.14	12.35
71	CHICAGO		15136.	9.50	14.33	9.1	66.56	4.69	11.62	16.80	22.35
72	DECATUR		2954.	6.40	10.36	11.3	50.10	2.09	5.70	12.91	16.22
73	EVANSTON		10682.	3.40	6.41	7.6	60.30	2.52	.76	9.22	15.40
74	JOLIET		4781.	7.80	8.37	9.1	55.96	2.90	1.89	12.47	16.46
75	MOLINE		4128.	5.00	7.83	6.1	54.77	3.14	.09	10.86	15.88
76	URBANA		6431.	6.20	12.14	4.7	41.74	2.02	.83	13.11	13.00
77	WAUKEGAN		4054.	9.20	7.87	8.1	41.02	2.86	4.11	12.76	14.02
78	ANDERSON		1908.	6.70	9.75	14.7	46.58	1.84	10.76	12.80	15.54
79	FORT WAY	NE	3457.	5.80	9.14	11.3	48.15	1.85	11.69	11.99	14.93
80	LAFAYETT	E	5167.	5.50	7.66	6.6	51.44	1.75	.11	11.06	15.28
81	MUNCIE		5397.	7.20	13.44	12.9	53.50	2.43	.65	14.29	15.70
82	TERRE HA	UTE	2695.	6.60	13.20	6.7	70.78	2.55	4.59	14.57	21.33
83	CEDAR FA	LLS	1838.	4.80	8.32	5.2	36.25	1.37	1.94	10.79	9.74
84	COUNCIL	BLUFFS	1494.	9.90	11.26	9.2	54.33	1.87	4.16	14.71	17.56
85	DAVENPOR	T	1666.	6.80	9.50	5.1	54.07	2.11	9.39	12.67	16.43
86	DUBUQUE		3799.	10.20	8.68	6.9	61.85	2.32	3.71	12.90	16.41
87	OVERLAND	PARK	1711.	2.10	2.50	7.2	4.35	.85	1.62	6.34	2.42
88	TOPEKA		2632.	5.00	9.86	7.0	41.52	2.50	8.77	12.09	13.31
89	ASHLAND		3656.	5.40	14.33	6.7	54.80	2.18	.21	14.86	18.76
90	OWENSBOR	O	5921.	8.80	13.78	7.7	34.58	2.17	1.51	15.76	14.71
91	ALEXANDR	IA	3463.	11.00	29.79	10.5	32.04	2.06	1.88	26.45	20.70
92	BATON RO	UGE	4107.	9.80	18.53	6.4	20.74	4.28	7.46	18.41	12.35
93	LAFAYETT	E	3445.	13.30	22.11	5.6	19.44	2.60	.46	21.90	15.58
94	LAKE CHA	RLES	3391.	11.40	21.21	9.2	20.99	3.02	18.95	20.77	15.25
95	MONROE		2539.	12.60	29.48	8.9	26.43	2.72	25.10	26.09	19.79
96	NEW ORLE	ANS	3011.	14.00	26.28	9.5	49.44	4.32	24.95	25.41	24.46
97	SHREVEPO	RT	3200.	10.20	21.51	8.9	30.62	3.32	2.60	20.87	17.51
98	BROCKTON		4200.	6.80	8.59	12.1	61.49	8.71	11.59	11.93	16.76
99	CHICOPEE		2813.	8.50	6.94	12.7	46.77	4.72	5.47	11.51	13.44
100	MEDFORD		8050.	4.00	6.12	9.5	80.91	5.69	.06	9.34	17.79

Table G.2 Need Variables, Tax Effort, and Per Capita Amounts for 192 Other Phase-In Cities

CASE-NO	NAME1	NAME2	DENSITY	POCRWD	PPOORPER	PUNEMP75	PAGE1939	TAX1INC	HH	PRESENT	ALT5
101	NEWTON		5098.	2.40	4.79	16.0	67.52	5.53	7.18	7.79	14.06
102	SOMERVIL	LE	21653.	6.80	9.58	12.9	90.10	6.31	2.78	12.65	23.06
103	WALTHAM		4927.	6.30	6.70	9.2	55.64	6.55	.44	10.45	14.01
104	BATTLE C	REEK	3299.	4.00	15.76	12.2	68.91	4.16	.23	15.19	22.09
105	DEARBORN	HEIGHTS	6672.	9.40	3.37	10.4	7.08	1.17	.09	9.63	5.34
106	EAST LAN	SING	5282.	4.80	10.82	12.7	18.78	1.27	1.30	11.46	7.52
107	KALAMAZO	O	3492.	4.60	12.92	11.7	57.74	2.65	.75	13.33	16.64
108	LINCOLN	PARK	8831.	9.60	5.30	12.7	18.96	1.52	8.61	11.01	8.41
109	LIVONIA		3050.	8.10	2.14	8.9	6.47	1.84	1.51	8.04	4.00
110	ROYAL OA	K	7371.	5.50	3.85	10.0	22.92	1.55	.14	8.53	7.49
111	ST CLAIR	SHORES	7403.	10.30	3.23	11.7	9.70	1.60	1.85	9.85	5.94
112	TAYLOR		2918.	12.30	4.91	15.6	9.12		1.43	11.37	6.84
113	WARREN		5242.	8.70	3.28	12.3	8.68	2.44	8.85	9.41	5.43
114	BLOOMING	TON	2203.	7.60	2.71	5.3	3.77	1.52	1.63	8.36	3.84
115	MOORHEAD		4567.	8.50	9.63	6.7	21.88	1.02	6.80	12.90	9.78
116	ROCHESTE	R	4012.	4.80	7.96	2.9	37.29	1.88	.19	10.73	11.75
117	ST CLOUD		3675.	9.40	9.79	6.3	48.87	2.19	4.86	13.27	13.23
118	JACKSON		3067.	12.20	23.53	5.3	22.49	2.57	13.87	21.92	16.21
119	COLUMBIA		1410.	5.00	12.69	4.1	25.21	2.00	1.16	13.31	10.72
120	FLORISSA	NT	7323.	10.90	3.03	6.5	2.18	.85	1.03	9.50	4.46
121	INDEPEND	ENCE	2335.	5.10	6.11	6.6	28.37	1.88	9.62	9.73	9.39
122	BILLINGS		4189.	5.60	11.68	8.5	33.69	2.04	2.97	13.29	12.86
123	GREAT FA	LLS	4088.	7.30	10.47	8.8	39.97	1.92	1.95	13.49	14.42
124	LINCOLN		3033.	4.10	8.88	6.3	44.24	2.79	1.84	10.82	13.25
125	OMAHA		4529.	7.10	10.40	8.5	46.06	3.02	2.24	13.06	14.96
126	LAS VEGA	S	2438.	7.60	9.36	12.3	3.78	3.02	4.05	13.07	7.14
127	NASHUA		1778.	7.20	6.40	6.4	49.12	2.28	5.80	10.56	13.62
128	BAYONNE		13471.	6.80	9.06	8.3	72.99	3.91	6.87	12.34	20.16
129	BLOOMFIE	LD	9635.	3.90	5.03	8.8	63.29	3.22	1.27	8.59	15.61
130	CLIFTON		6986.	3.40	4.25	7.9	44.04	2.37	1.73	7.94	11.30
131	ELIZABET	H	9629.	9.20	11.41	10.2	64.92	3.50	1.30	15.09	20.62
132	IRVINGTO	N	20601.	3.90	8.80	9.4	65.35	3.30	4.97	11.27	19.73
133	LONG BRA	NCH	6230.	7.70	13.17	8.4	50.36	10.41	1.73	15.15	18.06
134	PASSAIC		17226.	9.10	14.80	14.6	75.69	2.88	2.96	17.11	24.40
135	SAYREVIL	LE	2007.	6.50	2.69	8.3	19.92	2.64	1.54	7.88	6.06
136	UNION CI	TY	44081.	11.20	12.82	14.8	81.26	3.43	1.88	17.47	26.44
137	NEW ROCH	ELLE	7249.	6.00	7.56	9.5	55.98	3.78	5.84	11.28	15.53
138	NEW YORK	CITY	26345.	9.90	14.58	10.5	62.14	10.96	11.63	17.44	22.34
139	RALEIGH		2757.	6.50	13.18	6.1	24.07	3.13	4.02	14.00	11.05
140	WILMINGT	ON	2638.	7.60	25.29	9.9	39.52	3.25	20.81	22.05	20.44
141	CANTON		5792.	5.70	12.24	9.3	66.20	3.43	10.08	13.65	19.85
142	KETTERIN	G	3927.	3.20	3.26	4.8	7.14	1.57	.10	7.19	3.58
143	MANSFIEL	D	2284.	5.80	11.49	8.3	52.85	2.43	5.85	12.99	16.09
144	SPRINGFI	ELD	4907.	6.30	12.55	8.6	62.61	2.63	8.13	14.04	18.95
145	NORMAN		300.	4.60	13.10	7.3	21.32	1.25	.08	13.18	10.05
146	EUGENE		3028.	3.50	12.88	10.7	22.31	2.49	5.33	12.79	10.19
147	HAZLETON		5157.	3.70	10.28	10.2	82.19	1.67	.23	11.63	21.70
148	CRANSTON		2597.	4.60	5.68	12.5	48.38	2.21	6.21	8.95	11.75
149	WARWICK		2398.	6.20	5.69	14.3	34.20	1.76	4.59	9.75	10.05
150	CHARLEST	ON	3892.	10.20	26.31	7.0	44.42	2.71	13.40	23.70	22.11

Table G.2 Need Variables, Tax Effort, and Per Capita Amounts for 192 Other Phase-In Cities

CASE-NO	NAME1	NAME2	DENSITY	POCRWD	PPOORPER	PUNEMP75	PAGE1939	TAX1INC	HH	PRESENT	ALTS
151	MEMPHIS		2868.	11.80	20.47	6.4	22.98	3.05	9.21	20.41	15.20
152	ABILENE		1197.	8.00	13.95	4.1	21.88	2.39	3.35	15.33	12.02
153	AMARILLO		2092.	7.20	11.83	3.8	19.24	2.68	.53	14.02	11.08
154	ARLINGTO	N	1471.	4.90	5.20	5.4	3.62	2.30	.42	9.26	4.45
155	BEAUMONT		1642.	8.30	17.62	6.8	31.18	2.73	.21	17.82	15.47
156	BROWNSVI	LLE	3455.	31.70	45.45	11.9	20.48	2.89	2.95	40.86	28.34
157	CORPUS C	HRISTI	2033.	14.40	19.08	7.0	11.69	2.79	8.33	20.76	13.70
158	DALLAS		3179.	8.70	13.36	5.6	18.13	3.94	3.19	15.76	11.86
159	EL PASO		2724.	17.90	20.48	10.1	22.68	2.77	2.65	22.67	16.71
160	FORT WOR	TH	1919.	9.20	13.37	5.9	22.41	3.01	3.75	15.90	12.76
161	GALVESTO	N	2943.	9.90	20.62	7.1	46.79	2.95	10.16	20.48	21.10
162	GARLAND		1885.	7.40	4.09	6.5	2.86	2.02	.20	9.33	4.40
163	HARLINGE	N	1489.	22.40	40.25	11.0	13.13	3.53	5.46	35.27	23.64
164	HOUSTON		2841.	10.00	13.93	5.5	17.32	3.33	10.25	16.44	12.07
165	IRVING		2413.	7.40	5.49	4.6	3.39	2.14	.07	10.05	4.96
166	KILLEEN		1366.	9.60	16.86	5.0	4.92	1.68	1.89	18.14	10.74
167	LAREDO		3367.	31.90	44.72	19.5	32.78	3.35	36.94	40.29	29.75
168	MC ALLEN		2788.	24.40	38.65	10.4	23.22	2.79	3.08	35.25	25.23
169	PASADENA		2522.	8.40	6.00	4.0	4.36	2.03	2.96	10.82	5.74
170	SAN ANGE	LO	1896.	9.50	18.28	5.6	27.63	2.28	.75	18.81	15.57
171	TEXAS CI	TY	580.	10.20	10.73	6.0	11.81	2.44	6.50	14.33	9.39
172	TYLER		2501.	7.10	13.11	6.3	27.28	2.20	.10	14.50	12.62
173	WICHITA	FALLS	2281.	6.90	13.23	4.9	29.66	2.57	.12	14.46	12.92
174	OGDEN		3293.	7.40	12.32	10.2	45.34	1.77	9.43	14.96	16.36
175	PROVO		2592.	10.60	18.18	8.3	30.31	1.81	7.06	18.02	13.76
176	CHESAPEA	KE	258.	9.20	13.63	5.2	17.05	4.73	7.33	15.34	10.61
177	HAMPTON		2208.	6.80	10.60	7.0	18.11	4.77	11.79	12.82	9.19
178	NEWPORT	NEWS	2000.	7.50	13.81	7.7	19.20	4.77	14.86	14.86	10.71
179	PETERSBU	RG	4513.	13.30	22.59	7.6	54.65	5.86	16.58	20.08	19.41
180	BELLEVUE		2593.	2.20	3.24	5.7	3.38	1.98	2.24	6.62	2.44
181	EVERETT		1830.	4.40	11.09	9.0	44.32	3.74	4.16	12.70	15.49
182	SPOKANE		3357.	4.30	13.55	10.2	53.62	2.84	3.38	13.79	18.01
183	YAKIMA		3999.	4.60	16.93	12.0	49.26	3.05	5.62	15.88	18.69
184	WEIRTON		1459.	7.10	7.23	8.4	35.56	2.08	1.51	10.85	11.19
185	APPLETON		4439.	6.90	5.85	5.2	46.49	2.20	5.32	10.28	12.53
186	KENOSHA		5752.	8.40	7.88	5.6	54.74	1.85	1.02	12.22	15.58
187	LA CROSS	E	3365.	5.10	12.04	7.5	64.74	2.39	11.83	13.07	18.12
188	MADISON		3542.	6.40	10.94	4.8	34.44	2.64	4.37	13.08	12.69
189	OSHKOSH		5417.	4.50	9.35	8.7	66.00	1.77	1.60	11.21	16.49
190	RACINE		7264.	7.20	8.82	6.6	55.89	2.39	3.45	12.33	16.13
191	SUPERIOR		853.	4.70	13.23	7.8	77.09	1.24	.31	13.57	21.22
192	WEST ALL	IS	6230.	5.50	4.35	8.1	44.47	1.97	1.37	9.10	12.09

Table G.3 Need Variables, Tax Effort, and Per Capita Amounts for 208 Phase-Down Cities

CASE-NO	NAME1	NAME2	DENSITY	POCRWD	PPOORPER	PUNEMP75	PAGE1939	TAX1INC	HH	PRESENT	ALT5
1	FLORENCE		2002.	7.10	18.07	11.1	23.99	1.94	30.15	17.04	13.23
2	HUNTSVIL	LE	1277.	5.60	10.63	9.8	10.83	2.15	26.36	12.19	7.54
3	TUSCALOO	SA	2400.	7.40	21.60	7.8	21.97	2.77	22.62	19.11	13.69
4	SCOTTSDA	LE	1312.	4.50	5.11	8.3	1.14	2.15	27.01	8.79	3.61
5	TEMPE		2542.	7.10	9.26	9.0	3.29	1.86	13.42	11.91	6.05
6	TUCSON		3287.	9.80	13.67	7.4	13.11	3.07	19.61	16.30	11.10
7	FAYETTEV	ILLE	1698.	5.10	16.04	10.1	26.96	1.06	27.79	15.28	12.75
8	LITTLE R	OCK	2509.	6.50	17.19	7.1	32.77	1.82	44.32	16.86	15.49
9	NORTH LI	TTLE ROC	2327.	7.90	18.36	6.6	21.44	.75	48.28	17.95	13.68
10	PINE BLU	FF	3565.	10.50	26.31	6.8	31.73	1.06	37.78	23.77	19.54
11	BERKELEY		11011.	4.10	18.15	13.4	57.09	2.79	24.65	17.06	22.12
12	COMPTON		8268.	22.50	18.82	14.6	13.01	2.79	60.13	23.43	15.81
13	FRESNO		3971.	7.10	17.02	9.7	27.84	4.15	57.46	17.16	14.45
14	INGLEWOO	D	10111.	5.30	7.68	8.7	19.75	2.92	20.57	11.44	10.00
15	NAPA		2746.	5.00	8.77	5.4	21.84	2.16	58.41	11.24	9.09
16	OAKLAND		6771.	7.10	16.08	12.7	53.26	3.97	35.23	17.09	21.17
17	OXNARD		3615.	13.40	13.06	10.0	6.59	2.98	22.44	16.80	10.14
18	PASADENA		4976.	4.40	11.42	7.6	44.38	3.52	22.88	13.25	16.79
19	REDONDO	BEACH	9575.	8.00	7.84	9.8	16.06	2.80	20.00	12.34	9.07
20	RICHMOND		2462.	8.90	12.96	12.0	22.99	4.55	47.46	15.60	12.51
21	SAN BERN	ARDINO	2407.	8.90	15.54	11.9	22.86	3.83	29.17	16.64	13.12
22	SAN FRAN	CISCO	15764.	6.80	13.57	10.5	66.93	7.64	40.24	15.76	24.52
23	SAN JOSE		3279.	7.60	8.64	10.1	13.93	2.61	13.58	11.75	7.78
24	SANTA MA	RIA	2290.	10.20	11.32	7.5	17.12	2.33	26.26	14.67	10.69
25	SANTA RO	SA	2513.	3.00	11.19	11.3	22.61	2.85	36.42	11.93	10.24
26	SEASIDE		3993.	12.30	13.87	11.1	5.55	1.43	48.03	16.44	9.47
27	VALLEJO		4718.	6.30	10.89	7.1	28.21	2.51	17.56	12.61	11.08
28	VENTURA	$SAN BUE	3813.	4.20	7.85	8.6	17.67	2.73	22.86	10.40	7.88
29	COLORADO	SPRINGS	2221.	5.10	11.20	7.5	27.77	2.52	13.28	12.82	11.44
30	DENVER		5406.	5.20	13.49	6.2	40.96	5.05	28.69	14.42	15.81
31	BRIDGEPO	RT	9723.	8.50	11.52	12.3	60.05	5.37	24.57	14.81	19.40
32	BRISTOL		2086.	7.60	4.79	14.3	40.69	3.26	27.63	10.24	11.81
33	DANBURY		1157.	7.10	7.09	12.5	45.76	3.30	23.59	10.98	13.36
34	HARTFORD		9081.	9.30	16.43	11.9	66.96	8.23	63.73	18.37	23.89
35	MILFORD		2281.	6.50	4.90	11.7	34.50	4.45	10.13	9.39	9.70
36	NEW BRIT	AIN	6274.	7.40	8.47	13.3	54.74	3.63	50.12	12.47	16.57
37	NEW HAVE	N	7484.	7.20	16.56	11.4	69.16	6.61	131.89	16.99	22.71
38	NEW LOND	ON	5185.	4.80	12.23	8.4	63.31	3.32	202.91	13.12	18.06
39	NORWICH		1599.	5.30	9.99	8.4	65.63	2.29	35.41	12.03	17.94
40	STAMFORD		2856.	6.90	7.05	7.0	40.53	5.63	18.70	11.18	12.53
41	WATERBUR	Y	3914.	8.10	9.54	13.8	62.19	3.91	52.65	13.14	18.32
42	WEST HAV	EN	4719.	5.20	7.21	9.1	42.42	2.18	14.34	10.40	12.46
43	WILMINGT	ON	6231.	6.50	21.16	14.5	71.65	5.76	51.60	19.17	25.25
44	WASHINGT	ON	12321.	12.00	16.18	7.4	46.97	14.73	56.03	19.16	20.36
45	BOCA RAT	ON	1593.	4.20	6.18	10.9	3.68	2.41	13.81	9.89	5.00
46	FORT MYE	RS	2279.	8.10	17.14	12.3	29.41	2.68	18.94	18.28	15.96
47	MELBOURN	E	1554.	7.40	11.80	13.4	7.51	2.17	14.41	13.73	8.10
48	TAMPA		3287.	7.10	18.51	10.0	28.55	3.15	27.94	18.17	15.49
49	TITUSVIL	LE	2008.	6.50	7.03	13.4	4.67	2.12	31.43	10.79	5.72
50	ATLANTA		3783.	10.50	19.87	12.7	30.28	3.68	35.51	20.37	17.16

Table G.3 Need Variables, Tax Effort, and Per Capita Amounts for 208 Phase-Down Cities

CASE-NO	NAME1	NAME2	DENSITY	POCRWD	PPOORPER	PUNEMP75	PAGE1939	TAX1INC	HH	PRESENT	ALT5
51	COLUMBUS		2231.	9.50	19.95	8.6	22.03	3.72	25.61	19.15	14.29
52	SAVANNAH		4416.	10.30	25.92	8.9	39.94	3.59	60.28	23.31	20.67
53	BOISE CI	TY	3205.	4.60	9.99	7.8	31.81	1.75	61.50	11.58	10.75
54	BLOOMING	TON	3960.	4.60	10.11	6.6	63.92	3.01	54.24	12.24	18.69
55	EAST ST	LOUIS	5036.	16.30	33.68	18.0	54.87	3.99	44.09	30.37	28.41
56	PEORIA		3395.	5.80	11.20	6.6	54.33	2.90	16.66	13.20	17.11
57	ROCKFORD		4309.	5.60	9.36	11.6	44.27	2.61	17.69	12.07	14.30
58	SPRINGFI	ELD	3641.	6.30	10.43	6.3	57.82	2.56	49.19	13.34	18.71
59	EAST CHI	CAGO	3820.	14.80	13.46	7.1	70.71	8.13	46.00	18.15	23.34
60	EVANSVIL	LE	3855.	7.90	12.00	9.5	51.27	2.41	20.74	14.62	17.63
61	GARY		4177.	15.50	14.85	9.2	43.72	3.21	36.71	18.97	18.21
62	HAMMOND		4477.	9.60	6.56	6.5	46.97	2.67	13.23	12.11	14.62
63	INDIANAP	OLIS	1967.	8.00	9.51	8.5	39.73	2.94	17.49	13.00	13.94
64	SOUTH BE	ND	4301.	5.90	9.27	9.1	54.02	2.02	25.86	12.06	16.15
65	CEDAR RA	PIDS	2182.	6.00	7.68	5.2	46.18	2.97	11.24	10.96	13.81
66	DES MOIN	ES	3187.	5.80	10.13	5.8	54.38	2.74	16.28	12.48	16.88
67	SIOUX CI	TY	1652.	6.70	10.52	6.7	66.98	2.81	45.73	12.96	19.03
68	WATERLOO		1276.	7.50	10.65	5.6	49.69	2.64	15.65	13.54	16.04
69	KANSAS C	ITY	2961.	8.20	13.77	9.3	47.42	3.62	34.69	15.51	16.62
70	WICHITA		3197.	6.30	11.10	5.0	29.04	2.36	41.94	13.26	12.32
71	COVINGTO	N	5416.	13.40	16.21	10.8	82.76	4.33	24.19	19.71	28.25
72	LOUISVIL	LE	6028.	9.20	17.02	7.2	53.26	3.70	23.88	18.34	20.67
73	LEWISTON		1207.	6.30	12.39	12.9	68.13	3.75	63.07	14.06	20.13
74	PORTLAND		3015.	5.80	14.50	9.5	76.14	5.34	75.36	15.13	23.60
75	BALTIMOR	E	11568.	8.20	18.07	10.7	59.06	4.94	34.11	18.15	21.05
76	BOSTON		13936.	7.20	15.35	12.8	77.19	10.62	47.65	16.30	24.20
77	CAMBRIDG	E	16187.	5.60	12.86	11.9	79.68	9.33	37.33	14.13	23.77
78	FALL RIV	ER	2936.	6.80	13.62	14.7	83.44	5.29	54.15	15.14	24.24
79	FITCHBUR	G	1559.	6.10	9.82	11.3	74.07	4.95	13.06	12.55	20.20
80	HAVERHIL	L	1428.	5.00	9.17	11.3	80.36	4.56	42.84	11.80	21.22
81	HOLYOKE		2398.	7.00	14.58	14.8	77.37	5.53	54.04	15.65	24.02
82	LAWRENCE		9840.	6.10	11.31	12.6	79.98	5.57	23.58	13.50	23.34
83	LOWELL		6929.	7.00	11.27	13.1	74.20	4.95	35.88	13.55	20.58
84	LYNN		8599.	5.70	10.76	12.5	79.78	9.45	35.74	12.91	22.38
85	MALDEN		11005.	4.50	8.10	10.6	76.63	5.80	80.99	10.93	19.66
86	NEW BEDF	ORD	5219.	5.50	15.12	8.5	80.75	4.98	97.54	15.36	24.06
87	PITTSFIE	LD	1411.	4.50	7.39	11.1	66.68	5.73	23.54	10.32	16.83
88	QUINCY		5464.	5.60	6.83	11.0	71.20	5.61	11.17	10.46	17.80
89	SPRINGFI	ELD	5171.	6.20	12.42	13.4	64.36	5.76	54.22	13.89	19.25
90	WORCESTE	R	4721.	5.40	9.96	10.9	74.37	8.53	32.60	12.14	19.51
91	ANN ARBO	R	4578.	4.60	10.54	10.3	28.12	2.44	24.75	12.09	10.68
92	BAY CITY		4945.	5.80	10.51	15.2	72.67	2.66	26.65	12.86	19.90
93	DETROIT		10968.	7.30	14.62	21.6	61.63	5.38	20.87	15.74	20.23
94	FLINT		5894.	8.60	12.16	19.1	45.60	2.86	42.33	14.78	16.05
95	GRAND RA	PIDS	4402.	4.60	12.14	13.1	61.97	2.44	23.32	12.99	18.14
96	JACKSON		4251.	6.00	12.51	10.4	80.75	3.12	23.35	13.71	22.39
97	LANSING		3934.	6.30	9.89	12.5	46.46	2.89	50.09	12.53	14.95
98	MUSKEGON		3433.	6.90	12.36	12.7	67.20	2.64	24.83	14.30	20.61
99	PONTIAC		4329.	11.30	12.83	29.9	47.26	5.09	37.50	16.07	16.85
100	SAGINAW		5309.	8.50	13.77	14.8	64.07	3.59	39.28	15.58	19.71

Table G.3 Need Variables, Tax Effort, and Per Capita Amounts for 208 Phase-Down Cities

CASE-NO	NAME1	NAME2	DENSITY	POCRWD	PPOORPER	PUNEMP75	PAGE1939	TAX1INC	HH	PRESENT	ALT5
101	DULUTH		1494.	5.00	11.45	9.0	72.59	2.42	30.32	12.84	20.14
102	MINNEAPO	LIS	7884.	4.30	11.58	8.2	68.13	3.44	36.70	12.88	20.83
103	ST PAUL		5933.	5.60	9.22	7.8	62.43	3.02	60.78	12.07	17.85
104	BILOXI		4368.	10.60	15.76	8.2	25.97	1.48	81.12	16.58	12.79
105	GULFPORT		1581.	8.80	17.80	6.1	22.97	1.72	57.32	18.14	14.06
106	KANSAS C	ITY	1604.	6.10	12.60	9.5	51.21	5.22	31.77	14.28	18.02
107	ST JOSEP	H	2533.	7.10	13.63	7.5	71.44	2.28	21.92	15.06	21.78
108	ST LOUIS		10167.	12.30	19.74	12.9	73.76	7.86	22.75	21.40	28.01
109	MANCHEST	ER	2734.	6.80	10.14	10.7	67.62	5.17	25.96	12.82	19.19
110	ATLANTIC	CITY	3860.	5.50	22.20	12.1	66.01	13.73	69.79	20.10	28.62
111	CAMDEN		11395.	8.30	20.86	16.6	69.97	4.56	54.16	19.84	24.03
112	EAST ORA	NGE	19352.	5.10	11.10	10.2	67.82	5.33	33.38	13.18	21.18
113	JERSEY C	ITY	17242.	10.40	13.59	10.5	78.92	4.48	24.91	16.88	24.74
114	NEWARK		16252.	14.30	22.15	16.2	68.44	6.12	53.71	23.11	26.09
115	PATERSON		17241.	11.30	16.37	14.5	70.51	3.57	27.87	18.63	23.72
116	PERTH AM	BOY	8255.	8.00	12.26	8.3	67.26	3.07	37.14	15.01	20.80
117	TRENTON		13971.	7.40	16.41	10.1	80.97	5.09	45.45	16.83	24.09
118	VINELAND		682.	7.90	9.82	14.0	40.30	2.58	32.05	12.80	13.23
119	ALBUQUER	QUE	2965.	8.30	13.90	7.8	12.63	1.70	37.04	15.51	10.25
120	ALBANY		5540.	4.10	13.27	8.2	74.67	4.75	18.22	13.65	22.44
121	BINGHAMT	ON	5829.	4.10	11.99	10.3	81.36	5.89	83.51	12.76	22.80
122	BUFFALO		11205.	4.70	14.80	16.5	85.72	5.64	24.67	14.63	24.50
123	ELMIRA		5472.	4.90	15.67	9.5	87.59	4.92	40.31	14.99	24.23
124	MOUNT VE	RNON	16925.	8.30	9.39	10.7	71.08	3.61	35.59	13.70	20.95
125	NIAGARA	FALLS	6389.	6.70	10.94	17.9	61.50	4.35	18.35	13.18	18.06
126	POUGHKEE	PSIE	6673.	5.30	12.40	5.7	78.98		333.79	13.75	23.69
127	ROCHESTE	R	8072.	5.30	11.99	8.7	79.49	5.65	48.94	13.50	22.52
128	ROME		691.	6.30	8.29	11.9	54.27	1.76	30.37	11.25	13.91
129	SCHENECT	ADY	7569.	3.20	10.05	8.8	81.26	2.55	19.09	11.30	22.35
130	SYRACUSE		7647.	4.40	13.51	9.0	70.85	3.07	60.12	13.82	21.15
131	TROY		6230.	4.70	13.52	8.6	81.01	2.82	22.47	13.93	22.40
132	UTICA		5709.	4.30	13.18	12.2	79.00	2.77	16.98	13.62	22.46
133	WHITE PL	AINS	5190.	5.20	6.73	7.4	53.50	6.31	73.73	10.44	15.54
134	YONKERS		11542.	6.20	7.18	9.7	51.41	3.47	25.67	11.27	15.16
135	ASHEVILL	E	2587.	6.20	17.71	13.8	51.01	3.60	52.69	17.02	18.80
136	BURLINGT	ON	2364.	7.10	9.54	11.4	30.11	2.80	37.24	12.67	11.91
137	CHARLOTT	E	3173.	7.80	14.74	11.6	19.31	3.48	36.60	14.87	10.69
138	DURHAM		2608.	8.10	19.45	7.5	33.65	3.13	24.98	18.91	16.46
139	FAYETTEV	ILLE	2287.	9.90	23.50	5.7	18.89	2.32	26.99	21.68	15.55
140	GASTONIA		2369.	10.90	13.69	9.9	32.51	1.98	29.74	16.42	14.61
141	GREENSBO	RO	2648.	6.90	11.72	8.3	20.72	3.23	15.21	13.69	10.39
142	HIGH POI	NT	2054.	9.60	13.66	8.2	33.08	3.41	61.06	16.08	14.43
143	WINSTON-	SALEM	2366.	7.60	17.43	14.4	28.51	3.00	38.31	17.42	14.56
144	FARGO		4640.	6.20	8.63	5.6	48.23	1.62	12.33	11.64	14.27
145	AKRON		5082.	4.90	11.67	9.7	56.99	3.35	38.06	13.04	17.35
146	CINCINNA	TI	5780.	9.30	17.05	10.5	59.27	5.41	41.52	18.38	22.65
147	CLEVELAN	D	9893.	7.10	17.06	6.3	73.36	4.24	21.43	17.08	23.45
148	COLUMBUS		4012.	6.20	13.23	7.5	38.97	3.26	15.51	14.32	14.48
149	DAYTON		6342.	7.30	13.71	10.4	52.13	4.25	25.72	15.34	18.14
150	ELYRIA		3053.	6.90	7.12	9.5	41.19	2.46	25.87	11.10	12.28

Table G.3 Need Variables, Tax Effort, and Per Capita Amounts for 208 Phase-Down Cities

CASE-NO	NAME1	NAME2	DENSITY	POCRWD	PPOORPER	PUNEMP75	PAGE1939	TAXIINC	HH	PRESENT	ALTS
151	LORAIN		3506.	9.80	9.99	9.9	42.32	2.51	16.21	13.66	14.18
152	MIDDLETO	WN	2540.	7.10	10.73	13.0	44.95	4.12	109.77	13.44	15.25
153	STEUBENV	ILLE	3578.	4.60	14.85	5.4	61.82	2.84	46.08	14.96	19.75
154	TOLEDO		4718.	5.30	10.77	11.6	56.81	2.78	28.76	12.59	16.79
155	WARREN		5291.	6.10	9.66	10.7	47.06	2.24	14.40	12.35	14.52
156	YOUNGSTO	WN	4194.	6.60	13.93	13.3	67.42	3.64	26.47	14.73	19.88
157	LAWTON		2387.	8.40	17.13	6.5	15.42	1.89	85.28	17.44	12.22
158	OKLAHOMA	CITY	579.	6.30	14.03	5.5	29.12	2.57	22.23	15.15	13.82
159	TULSA		1922.	5.00	11.93	4.7	25.95	2.85	26.25	13.21	11.69
160	PORTLAND		4265.	3.20	12.57	10.0	57.21	2.79	21.90	12.98	18.93
161	SALEM		2784.	3.40	10.68	11.5	34.54	2.79	46.48	11.59	12.03
162	ALLENTOW	N	6173.	3.10	9.32	9.3	66.54	2.33	22.08	10.76	17.97
163	ALTOONA		6936.	3.90	13.82	9.6	84.06	1.85	19.41	13.69	22.91
164	BETHLEHE	M	3727.	3.60	6.69	7.8	55.46	2.45	17.49	10.58	14.88
165	CHESTER		11985.	7.80	19.87	14.2	66.88	3.35	40.88	18.91	22.63
166	EASTON		6544.	3.80	14.95	7.9	84.24	2.33	105.53	14.86	24.47
167	ERIE		6838.	5.60	11.00	7.9	66.79	2.28	32.15	12.77	18.46
168	HARRISBU	RG	8955.	3.30	20.45	8.7	73.65	2.76	36.47	17.47	25.97
169	JOHNSTOW	N	7452.	5.30	14.99	6.9	84.73	2.56	23.00	15.45	25.14
170	LANCASTE	R	8013.	3.80	14.83	12.4	79.15	2.25	69.09	14.39	22.96
171	PHILADEL	PHIA	15175.	5.90	15.07	11.0	69.50	6.57	31.19	15.44	21.31
172	PITTSBUR	GH	9422.	6.30	15.00	10.0	74.37	3.66	31.59	15.59	23.20
173	READING		8853.	3.20	12.43	8.7	86.87	2.18	45.78	12.57	24.65
174	SCRANTON		4030.	4.70	11.38	13.0	86.63	1.96	75.44	12.65	23.11
175	WILKES-B	ARRE	8784.	4.30	13.19	10.8	90.03	2.37	136.33	13.58	24.31
176	WILLIAMS	PORT	4167.	5.20	14.95	10.1	88.44	2.64	28.48	14.70	24.43
177	YORK		9497.	3.80	14.53	11.4	81.21	3.00	24.52	14.38	24.35
178	PAWTUCKE	T	8748.	5.90	11.47	16.3	68.93	3.55	71.77	13.38	20.52
179	PROVIDEN	CE	9896.	5.30	17.88	17.1	80.67	3.49	48.53	16.78	25.89
180	COLUMBIA		1069.	7.90	17.84	8.8	30.36	2.15	17.05	17.03	13.35
181	GREENVIL	LE	2968.	9.10	20.02	10.1	35.64	3.08	35.89	19.45	17.48
182	SPARTANB	URG	2733.	10.10	21.63	12.0	39.06	2.47	94.55	20.61	18.74
183	SIOUX FA	LLS	2900.	6.40	9.33	5.3	44.29	3.45	42.27	12.06	13.71
184	CHATTANO	OGA	2284.	9.40	24.21	7.8	48.34	3.64	39.09	18.72	17.17
185	KINGSPOR	T	1836.	5.30	15.28	5.4	29.43	3.01	21.20	15.09	13.41
186	KNOXVILL	E	2267.	6.60	18.26	6.3	36.98	3.20	23.43	17.44	16.38
187	NASHVILL	E-DAVIDS	882.	7.20	13.16	7.2	24.83	4.13	21.45	14.72	11.99
188	AUSTIN		3492.	8.70	15.94	4.3	16.99	2.62	31.67	16.89	12.12
189	GRAND PR	AIRIE	576.	10.50	7.89	6.6	5.44	2.23	64.77	13.05	7.51
190	LUBBOCK		1970.	10.50	16.21	4.7	11.30	2.84	35.73	17.73	11.60
191	PORT ART	HUR	1190.	10.50	19.26	9.9	39.17	2.88	23.08	19.91	18.68
192	SAN ANTO	NIO	3555.	16.10	21.40	8.4	25.80	2.30	22.63	22.23	16.84
193	TEXARKAN	A	1883.	8.10	19.02	9.8	36.06	2.91	74.24	18.10	16.81
194	WACO		1624.	7.50	20.44	8.3	30.04	2.87	54.29	19.01	16.26
195	SALT LAK	E CITY	2966.	6.00	13.90	8.0	52.09	2.71	23.74	15.04	18.53
196	ALEXANDR	IA	7546.	4.70	8.33	4.2	18.28	4.80	15.64	11.38	9.29
197	LYNCHBUR	G	2155.	6.10	14.26	8.1	55.44	5.01	28.42	15.01	18.14
198	NORFOLK		5855.	7.90	17.32	7.4	30.56	5.77	54.63	17.08	13.98
199	PORTSMOU	TH	3826.	9.10	18.63	8.0	28.78	5.06	41.18	18.62	15.33
200	RICHMOND		4137.	7.30	17.42	6.0	44.85	7.79	40.36	17.46	18.01

Table G.3 Need Variables, Tax Effort, and Per Capita Amounts for 208 Phase-Down Cities

CASE-NO	NAME1	NAME2	DENSITY	POCRWD	PPOORPER	PUNEMP75	PAGE1939	TAX1INC	HH	PRESENT	ALT5
201	ROANOKE		3463.	5.10	14.74	8.5	50.16	6.03	28.54	14.89	17.70
202	SEATTLE		6350.	3.30	10.03	8.6	47.57	3.35	19.91	11.55	16.35
203	TACOMA		3237.	4.40	12.39	9.5	48.45	3.61	15.93	13.32	16.70
204	CHARLEST	ON	2629.	4.80	17.24	6.4	58.31	3.97	19.37	16.40	20.83
205	HUNTINGT	ON	5055.	4.90	18.59	7.3	67.24	2.88	20.43	16.88	22.74
206	WHEELING		3623.	5.30	15.33	6.9	76.58	2.97	32.10	15.37	23.69
207	GREEN BA	Y	2106.	8.50	7.65	7.2	44.90	2.98	20.01	12.09	13.57
208	MILWAUKE	E	7551.	6.90	11.21	9.4	55.04	2.70	18.66	13.72	17.39

Appendix H

FACTOR ANALYSIS AND STATISTICAL RESULTS USING EQUALLY WEIGHTED CASES

In this appendix, we present the factor analysis and statistical results that were obtained when we conducted the analysis giving each city or case an equal weight of one. The tables presented below should be compared with those obtained from the weighted analysis in Chapters 4, 5, 6, 7, and 8.

The varimax rotated factor matrix in Table H.1 differs from that shown in Table 4.5, primarily with respect to the fourth and fifth factors. The following table interprets each factor in terms of need indicators with high loadings.

	Dimension	Need Variables Defining Dimension
FACTOR 1	Poverty	Poverty variables (PYUTHPOV, PPOORPER, PFEMALHP, PNW), percent of overcrowded houses, percent of houses without plumbing.
FACTOR 2	Age of Housing Stock	Percent of houses built before 1939, percent of population aged over 65.
FACTOR 3	Density	Percent of owner-occupied houses (negative), population per square mile.
FACTOR 4	Lack of Economic Opportunity	Percent of population without high school education and unemployment rate.
FACTOR 5	Crime	Crime rate and percentage non-white.

Table H.2, which corresponds to Tables 6.1 and 6.2 in Chapter 6, shows the coefficients of correlation of formula amounts with need scores and need variables. Table H.3, which corresponds to Table 6.3 in Chapter 6, shows the multiple regression coefficients. Table H.4, which corresponds to Table 6.4 in Chapter 6, provides the statistics obtained from regressing per capita dollars on a composite needs index. Table H.5 gives the average per capita amount under hold harmless, the present formula, and the alternative formulas by need score category. Table H.6 lists the 435 cities and their scores on each of the five factors; for each factor (dimension), the average score is zero.

In general, the data in Table H.2 support the conclusions reached in Chapters 5 and 6 concerning the equity advantages of adding age of

Table H.1 Varimax Rotated Factor Matrix

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
P65AGED	.06363	.71427	.14721	.16197	.07102
PCRIME	.18674	.00919	.21785	.16838	.72282
PNW	.74455	-.26287	.15625	.16235	.41530
PWOHSED	.46142	.25952	.13080	.62582	-.02846
PFEMALHP	.86060	.11708	.06875	.12673	.31284
PYUTHPOV	.96684	-.07541	-.03015	.12592	.14076
PPOORPER	.96697	.12980	.01494	.01192	.13977
POCRWD	.67707	-.54226	.03872	.34441	-.05643
PWOPLUMB	.69152	.20014	.07515	.14667	-.23834
PUNEMP75	.07678	.13730	.09548	.51260	.20664
PAGE1939	.06279	.75221	.36250	.37258	-.16881
DENSITY	-.08963	.11974	.70431	.25643	.06532
POWNOCCH	-.21319	-.22815	-.74011	.05727	-.22867

Table H.2 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 435 Entitlement Cities

	HH	PRESENT	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	ALT8
FACTOR1	.1410	.9708	.8612	.7914	.7976	.7155	.5353	.4257	.4574	.0546
FACTOR2	.2914	-.0391	.3488	.5373	.3955	.6075	.6466	.7621	.7512	.8129
FACTOR3	.1477	.0619	.2553	.2493	.3130	.2925	.4080	.3948	.3869	.4447
FACTOR4	.1538	.1453	.2996	.2208	.3688	.2591	.4152	.3499	.3429	.3943
FACTOR5	.0898	.1402	.0592	.0537	.0284	.0266	-.0453	-.0564	-.0484	-.1362
P65AGED	.2215	.1051	.4111	.5143	.4576	.5674	.6225	.6746	.6680	.6881
PCRIME	.1570	.3085	.3064	.2698	.3018	.2554	.2346	.1895	.1973	.0915
PNW	.0977	.8026	.6431	.5218	.5945	.4510	.3301	.1998	.2263	-.0965
PWOHSED	.2872	.5121	.6708	.6341	.7031	.6458	.6857	.6224	.6286	.5051
PFEMALHP	.2476	.8695	.8319	.7924	.7845	.7359	.5866	.5018	.5284	.1787
PYUTHPOV	.1433	.9589	.8258	.7408	.7617	.6621	.4865	.3684	.4002	.0019
PPOORPER	.1704	.9695	.8956	.8488	.8340	.7786	.5951	.4996	.5307	.1292
POCRWD	-.0341	.7557	.5256	.3283	.4880	.2534	.1826	.0079	.0326	-.2540
PWOPLUMB	.1482	.6685	.7204	.6925	.7076	.6681	.6010	.5354	.5520	.3149
PUNEMP75	.1474	.1740	.2797	.2685	.3059	.2846	.3290	.3070	.3067	.2852
DENSITY	.0756	-.0072	.1954	.2026	.2548	.2505	.3704	.3704	.3606	.4427
POWNOCCH	-.2591	-.2646	-.4301	-.4513	-.4565	-.4720	-.4998	-.4911	-.4922	-.4385
PMULTI	.2506	-.0524	.2358	.2873	.3066	.3526	.4852	.5149	.5018	.6108
PAGE1939	.3495	.0594	.5087	.6216	.5979	.7105	.8532	.9111	.8965	.9886
PNEWSTR	-.3005	-.2322	-.5770	-.6440	-.6421	-.7034	-.7984	-.8171	-.8107	-.8164
PCINC72	-.1755	-.6360	-.6316	-.5883	-.6096	-.5544	-.4757	-.4037	-.4214	-.1838
MEDINC	-.2324	-.8089	-.8207	-.8005	-.7843	-.7569	-.6287	-.5594	-.5827	-.2665

housing stock to the formula. Again, hold harmless is only weakly related to need and the present formula exhibits a strong correlation only with the poverty dimension of CD need. Compared to the present formula, the alternatives show much higher correlations with aged housing and density, and for three of the alternatives (ALT1, ALT2, and ALT3), at a rather small cost in terms of a lower correlation with poverty. However, there are two minor differences between Table H.2 and Tables 6.1 and 6.2. First, the coefficients for FACTOR 2, PAGE1939, PNEWSTR, FACTOR 3, DENSITY, PMULTI, PUNEMP75, PCRIME, and POWNOCCH in Table H.2 range from about .05 to .15 less, in an absolute sense, than those reported in Tables 6.1 and 6.2 for the same variables. On the other hand, the coefficients for FACTOR 1, PPOORPER, PWOPLUMB, PCINC72, and MEDINC range from .05 to .10 more, in an absolute sense, than those reported in Tables 6.1 and 6.2 for the same variables.

The regression results for hold harmless, the present formula, and four of the alternatives are shown in Table H.3. A comparison of the relative magnitudes of the regression coefficients indicates that (1) hold harmless emphasizes the age-of-housing dimension of need, (2) the present formula shows a response greater than $.50 only on the poverty dimension, and (3) increasing the weight of pre-1939 housing in the formula increases the emphasis on the age-of-housing dimension, the density dimension, and lack-of-economic-opportunity dimension. The regression results are therefore consistent with those given in Tables 5.11 and 6.3 and discussed in Chapters 5 and 6. The main difference is that the regression coefficients in Table H.3 for the poverty dimension for hold harmless are higher than the corresponding coefficients given in Table 6.3. The goodness-of-fit statistics (R^2, standard error of estimate) again show that hold harmless is only weakly related to the five need indexes.

A comprehensive needs index (NEED) is constructed by weighting the five dimensions as follows:

$$\text{NEED} = .35\ \text{FACTOR 1} + .25\ \text{FACTOR 2} + .20\ \text{FACTOR 3} + .10\ \text{FACTOR 4} + .10\ \text{FACTOR 5}$$

The correlation results using this needs index are as follows:

	NEED
HH	.3831
PRESENT	.7457
ALT1	.9393
ALT2	.9649
ALT3	.9442
ALT4	.9625
ALT5	.9081
ALT6	.8675
ALT7	.8824

Table H.3: Regression of Per Capita Amounts Under Hold Harmless, the Present Formula, and Four Alternative Formulas on Per Capita Need Scores

	(1) Hold Harmless	(2) Present Formula	(3) ALT1	(4) ALT2	(5) ALT3	(6) ALT7
Regression Coefficients for Dimensions of CD Need:						
(1) Poverty	4.69	4.29	3.68	3.69	4.10	3.13
(2) Age of Housing	9.01	-.21	1.49	2.55	2.03	5.30
(3) Density	3.74	.32	1.06	1.07	1.56	2.47
(4) Lack of Economic Opportunity	4.84	.50	1.20	.93	1.84	2.36
(5) Crime	3.49	.46	.11	.13	-.16	-.44
Other Statistics:						
(6) Coefficient of Multiple Determination (R^2)	.17	.96	.97	.98	.97	.97
(7) Standard Error of Estimate	25.72	.79	.66	.53	.89	1.15
(8) Standard Deviation of Per Capita Amounts	28.18	4.41	4.29	4.67	5.16	6.94

The simple regression results using the comprehensive needs index are given in Table H.4.

Next, we examined the formula alternatives using a comprehensive evaluation index which considers a city's need requirements, its tax effort, and its fiscal capacity. Both a linear index and multiplicative index are considered. Each is defined in Chapter 7. We obtained the following simple correlation results:

	Evaluation Index	
	Multiplicative	Linear
HH	.3502	.3909
PRESENT	.4251	.6284
ALT1	.6194	.8325
ALT2	.6335	.8495
ALT3	.6480	.8510
ALT4	.6523	.8578
ALT5	.6744	.8428
ALT6	.6488	.8046
ALT7	.6533	.8149

Table H.4: Simple Regression of Per Capita Amounts Under Hold Harmless, the Present Formula, and the Alternative Formulas on Total Need (NEED)[a]

	(1) Intercept[b]	(2) Regression Coefficient for NEED	(3) Coefficient Determination R^2	(4) Standard Error of Estimate
Hold Harmless	$20.87	$22.19	.14	$26.07
Present	14.38	6.78	.55	2.93
ALT1	14.60	8.31	.88	1.46
ALT2	14.90	9.29	.93	1.22
ALT3	14.72	10.05	.89	1.69
ALT4	15.28	12.45	.92	1.70
ALT5	15.01	11.00	.82	2.45
ALT6	15.11	10.12	.75	2.80
ALT7	15.40	12.63	.78	3.25
ALT8	15.65	13.00	.41	7.57

a. The statistics reported in this table resulted from regressions of the following form: Per Capita $ = a + b NEED, where a is the intercept and b is a measure of slope, or the change in per capita dollars associated with a unit change in NEED. All statistics are defined in the last section in Chapter 3.

b. The intercept equals the average per capita amount for the formula being considered.

Table H.5: Average Per Capita Amounts for Hold Harmless, the Present Formula, and Seven Alternative Formulas By NEED Score; 435 Entitlement Cities

	NEED Score Category[a]					
	Less than -.97	-.97 to -.485	-.485 to 0.0	0.0 to +.485	+.485 to +.97	Greater than +.97
Hold Harmless	$2.81	$3.83	$13.94	$29.24	$23.92	$43.00
Present	8.77	10.36	12.75	15.56	18.32	29.13
ALT1	7.04	8.95	12.74	16.45	19.81	27.55
ALT2	5.75	8.32	12.88	17.22	20.66	27.47
ALT3	5.66	7.75	12.51	16.99	21.20	29.43
ALT4	2.91	6.25	12.61	18.49	23.15	30.67
ALT5	4.41	6.72	12.71	17.87	22.41	26.53
ALT6	4.74	7.20	13.04	17.98	21.91	23.73
ALT7	2.50	5.62	12.81	18.95	23.83	26.69

a. The construction of the NEED index is defined in Appendix H. The average score of the 435 cities is zero. Cities with scores greater (less) than zero have above (below) average per capita need. The categories are defined by standard deviations above and below the mean; 68 percent of the cities are between -.485 and +.485.

Table H.6 Per Capita Need Scores for 435 Entitlement Cities

CASE-NO	STATCODE	NAME1	NAME2	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
1	1.	BIRMINGH	AM	1.533	.388	-.183	-.233	.701
2	1.	FLORENCE		.768	.274	-1.246	-.538	-.201
3	1.	GADSDEN		1.011	.897	-1.130	-.284	-.057
4	1.	HUNTSVIL	LE	-.190	-.644	-1.022	-.759	.571
5	1.	MOBILE		1.811	-.232	-.975	-.301	.563
6	1.	MONTGOME	RY	1.830	-.188	-.568	-.770	.078
7	1.	TUSCALOO	SA	1.256	.397	-.300	-1.345	.423
8	2.	ANCHORAG	E	-.786	-2.157	1.089	-.622	.150
9	4.	MESA		-.468	-1.411	-.549	.418	-.336
10	4.	PHOENIX		-.154	-.873	-.627	.083	.589
11	4.	SCOTTSDA	LE	-1.120	-.918	-1.249	-.770	.339
12	4.	TEMPE		-.635	-.946	-.224	-1.303	.467
13	4.	TUCSON		.169	-.879	-.322	-.430	.195
14	5.	FAYETTEV	ILLE	.202	.864	-.075	-2.190	-.704
15	5.	FORT SMI	TH	.577	.463	-1.084	-.365	-.662
16	5.	LITTLE R	OCK	.652	.352	-.604	-.836	.981
17	5.	NORTH LI	TTLE ROC	.830	.128	-.833	-.829	.041
18	5.	PINE BLU	FF	2.404	.366	-.707	-.872	-.456
19	6.	ALAMEDA		-.176	-.240	1.105	-.673	-.227
20	6.	ALHAMBRA		-.885	.222	.920	-.694	.464
21	6.	ANAHEIM		-.941	-1.138	.092	-.570	.607
22	6.	BAKERSFI	ELD	.377	-.081	-.635	-.698	1.001
23	6.	BERKELEY		.068	1.483	1.771	-2.089	1.563
24	6.	BUENA PA	RK	-.984	-1.839	-.047	.278	-.171
25	6.	BURBANK		-.962	-.498	.331	-.556	.181
26	6.	CHULA VI	STA	-.467	-1.119	-.233	-.363	.422
27	6.	COMPTON		1.098	-3.430	.799	3.009	3.336
28	6.	CONCORD		-1.151	-1.137	-.645	-.598	.593
29	6.	COSTA ME	SA	-.833	-.763	.076	-1.106	.697
30	6.	DALY CIT	Y	-.988	-1.166	.577	-.569	.500
31	6.	DOWNEY		-1.014	-.938	.203	-.805	.409
32	6.	EL CAJON		-.529	-.859	-.245	-.603	.196
33	6.	EL MONTE		.330	-1.703	.999	.557	-.062
34	6.	FAIRFIEL	D	-.063	-2.018	.320	-.733	-.139
35	6.	FREMONT		-.984	-1.436	-.844	-.125	.085
36	6.	FRESNO		.596	.067	-.442	-.472	1.113
37	6.	FULLERTO	N	-1.010	-.855	-.139	-.891	.420
38	6.	GARDEN G	ROVE	-1.054	-1.468	-.170	-.090	.377
39	6.	GLENDALE		-.812	.245	.686	-.917	.204
40	6.	HAWTHORN	E	-1.065	-1.419	1.325	-.413	.538
41	6.	HAYWARD		-.655	-1.243	-.129	.038	.992
42	6.	HUNTINGT	ON BEACH	-1.016	-1.118	-.610	-.761	.373
43	6.	INGLEWOO	D	-.967	-.618	1.502	-.707	1.340
44	6.	LOMPOC		.015	-1.390	.169	-1.055	.217
45	6.	LONG BEA	CH	-.478	.185	.633	-.652	.808
46	6.	LOS ANGE	LES	-.041	-.587	.971	-.179	1.490
47	6.	MODESTO		-.536	-.219	-.477	-.072	1.135
48	6.	MONTEREY		-.980	-.185	.588	-1.068	1.228
49	6.	MOUNTAIN	VIEW	-.865	-1.054	1.283	-1.832	.440
50	6.	NAPA		-.667	-.113	-.478	-.865	.033

Table H.6 Per Capita Need Scores for 435 Entitlement Cities

CASE-NO	STATCODE	NAME1	NAME2	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
51	6.	OAKLAND		.295	.426	.794	.163	2.200
52	6.	ONTARIO		.007	-.835	-.469	.508	.405
53	6.	ORANGE		-.931	-.960	-.176	-.760	.289
54	6.	OXNARD		.296	-2.079	.112	.627	.767
55	6.	PALO ALT	O	-.995	.011	.021	-1.669	.673
56	6.	PASADENA		-.382	.496	.592	-.614	1.499
57	6.	POMONA		.076	-.901	-.099	.005	.647
58	6.	REDONDO	BEACH	-.776	-1.263	1.075	-.091	.721
59	6.	REDWOOD	CITY	-1.010	-.626	.269	-.895	.548
60	6.	RICHMOND		.071	-.806	-.285	.497	1.954
61	6.	RIVERSID	E	-.427	-.422	-.569	-.416	1.153
62	6.	SACRAMEN	TO	.203	-.017	-.406	-.392	.803
63	6.	SALINAS		-.214	-1.309	.245	.544	.507
64	6.	SAN BERN	ARDINO	.360	-.472	-.549	.394	1.651
65	6.	SAN DIEG	O	-.248	-.589	.072	-.600	.604
66	6.	SAN FRAN	CISCO	-.167	.611	2.288	-.038	1.123
67	6.	SAN JOSE		-.505	-1.075	-.194	-.313	.416
68	6.	SAN LEAN	DRO	-1.055	-.391	-.346	-.212	.756
69	6.	SAN MATE	O	-.998	-.487	.411	-1.004	.601
70	6.	SANTA AN	A	-.207	-1.609	.433	.510	.175
71	6.	SANTA BA	RBARA	-.169	.461	.449	-1.239	.682
72	6.	SANTA CL	ARA	-.955	-1.189	.275	-.593	.436
73	6.	SANTA CR	UZ	-.168	1.790	-.477	-1.017	1.128
74	6.	SANTA MA	RIA	-.035	-1.245	.041	-.083	.218
75	6.	SANTA MO	NICA	-.635	.212	1.914	-1.370	1.493
76	6.	SANTA RO	SA	-.591	.620	-.746	-1.048	.878
77	6.	SEASIDE		.504	-2.272	.944	-.228	.439
78	6.	SOUTH GA	TE	-.728	-.145	.578	-.084	.699
79	6.	STOCKTON		.550	-.046	-.137	.344	1.121
80	6.	SUNNYVAL	E	-1.075	-1.261	.121	-1.013	.148
81	6.	TORRANCE		-1.240	-1.281	.280	-.828	.441
82	6.	VALLEJO		-.307	-.244	-.133	-.294	.905
83	6.	VENTURA	&SAN BUE	-.770	-.363	-.269	-.720	.717
84	6.	WEST COV	INA	-1.144	-1.335	-.780	-.371	.390
85	6.	WESTMINS	TER	-.843	-1.592	-.396	.030	-.005
86	6.	WHITTIER		-1.016	-.378	-.062	-.907	.392
87	8.	AURORA		-.899	-1.164	-.361	-1.162	.285
88	8.	BOULDER		-.516	.358	.444	-2.430	.446
89	8.	COLORADO	SPRINGS	-.138	-.122	-.285	-1.081	.344
90	8.	DENVER		.053	.444	.242	-.644	1.326
91	8.	PUEBLO		.289	-.354	-.279	.507	-.413
92	9.	BRIDGEPO	RT	-.194	.078	1.286	1.239	.596
93	9.	BRISTOL		-1.111	-.485	-.392	1.223	-.812
94	9.	DANBURY		-.784	-.121	-.413	.825	-.589
95	9.	HARTFORD		.612	.114	1.972	.713	.866
96	9.	MERIDEN		-.799	-.003	-.187	1.116	-.570
97	9.	MILFORD		-1.075	-.417	-1.061	.784	-.442
98	9.	NEW BRIT	AIN	-.676	.110	.783	.991	-.348
99	9.	NEW HAVE	N	.507	.693	1.265	.292	1.077
100	9.	NEW LOND	ON	-.050	.770	.640	-.064	.224

Table H.6 Per Capita Need Scores for 435 Entitlement Cities

CASE-NO	STATCODE	NAME1	NAME2	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
101	9.	NORWALK		-.770	-.402	.054	.423	-.216
102	9.	NORWICH		-.334	.908	-.353	.677	-.532
103	9.	STAMFORD		-.636	-.528	.353	.045	-.147
104	9.	WATERBUR	Y	-.451	.186	.328	1.324	-.305
105	9.	WEST HAV	EN	-.779	.032	.025	.165	-.415
106	10.	WILMINGT	ON	1.172	1.304	-.161	.921	2.153
107	11.	WASHINGT	ON	.530	-1.104	2.603	.219	2.368
108	12.	BOCA RAT	ON	-1.279	-.235	-1.283	-.179	.398
109	12.	CLEARWAT	ER	-.547	.566	-1.154	-.068	.719
110	12.	DAYTONA	BEACH	1.082	1.306	-.835	-.719	1.995
111	12.	FORT LAU	DERDALE	-.484	-.222	-.556	.020	1.475
112	12.	FORT MYE	RS	.807	.092	-.780	.201	.322
113	12.	GAINESVI	LLE	.746	.346	-.065	-2.251	1.028
114	12.	HIALEAH		-.548	-2.927	.653	1.739	.040
115	12.	HOLLYWOO	D	-.962	.050	-1.154	.390	1.009
116	12.	JACKSONV	ILLE	.768	-.160	-1.148	-.309	.467
117	12.	LAKELAND		.775	.908	-.954	-.844	.469
118	12.	MELBOURN	E	-.094	-.747	-1.332	-.158	.111
119	12.	MIAMI		.901	-1.828	2.215	1.339	1.104
120	12.	ORLANDO		.838	.055	-.611	-.320	1.441
121	12.	PENSACOL	A	1.538	.218	-.800	-.367	.243
122	12.	ST PETER	SBURG	-.208	1.394	-1.383	-.132	1.016
123	12.	TALLAHAS	SEE	.690	-.091	.165	-2.131	.200
124	12.	TAMPA		.724	.545	-.937	-.231	1.070
125	12.	TITUSVIL	LE	-.898	-1.065	-1.014	-.237	.528
126	12.	WEST PAL	M BEACH	.261	.515	-.343	-.025	1.113
127	13.	ALBANY		2.238	-1.283	.141	-.240	-.769
128	13.	ATLANTA		1.042	-.449	.525	.020	1.690
129	13.	AUGUSTA		2.638	.459	.287	-.221	.157
130	13.	COLUMBUS		1.226	-.429	-.400	-.565	.064
131	13.	MACON		1.635	-.186	-.293	.107	.296
132	13.	SAVANNAH		2.147	.238	-.026	-.382	.775
133	16.	BOISE CI	TY	-.506	.203	-.599	-.899	-.183
134	17.	AURORA		-.753	-.316	.418	.751	-1.054
135	17.	BERWYN		-1.184	.982	.689	.517	-.947
136	17.	BLOOMING	TON	-.347	.964	.024	-.327	-.750
137	17.	CHAMPAIG	N	-.095	.571	.557	-2.124	-.224
138	17.	CHICAGO		.455	-.237	2.223	.604	.045
139	17.	DECATUR		-.355	.429	-.649	.551	-.371
140	17.	DES PLAI	NES	-1.272	-.917	-.578	-.309	-.548
141	17.	EAST ST	LOUIS	3.289	-.158	-.180	1.735	1.823
142	17.	ELGIN		-1.066	.291	.117	.508	-.577
143	17.	EVANSTON		-.948	.306	1.645	-.760	-.045
144	17.	JOLIET		-.527	.051	.114	.856	-.560
145	17.	MOLINE		-.674	.488	-.286	.051	-.597
146	17.	PEORIA		-.197	.606	-.320	.051	.013
147	17.	ROCKFORD		-.498	.258	-.240	.279	-.213
148	17.	SPRINGFI	ELD	-.237	.511	-.067	.076	-.719
149	17.	URBANA		-.036	.054	1.072	-1.820	-.977
150	17.	WAUKEGAN		-.495	-.788	.324	.544	-.391

Table H.6 Per Capita Need Scores for 435 Entitlement Cities

CASE-NO	STATCODE	NAME1	NAME2	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
151	18.	ANDERSON		-.390	.192	-.734	.706	-.592
152	18.	EAST CHI	CAGO	.472	-.815	1.451	1.848	.341
153	18.	EVANSVIL	LE	-.213	.426	-.440	.618	-.236
154	18.	FORT WAY	NE	-.547	.285	-.543	.508	.153
155	18.	GARY		.580	-1.445	.521	1.759	1.036
156	18.	HAMMOND		-.769	-.575	-.026	1.176	-.714
157	18.	INDIANAP	OLIS	-.279	-.380	-.244	.361	-.219
158	18.	LAFAYETT	E	-.685	.274	-.174	.049	-.708
159	18.	MUNCIE		-.023	.657	-.142	.347	-.433
160	18.	SOUTH BE	ND	-.494	.469	-.697	.691	.099
161	18.	TERRE HA	UTE	.036	1.318	-.521	.245	-.984
162	19.	CEDAR FA	LLS	-.633	.184	-.492	-1.368	-1.018
163	19.	CEDAR RA	PIDS	-.654	.107	-.387	-.448	-1.119
164	19.	COUNCIL	BLUFFS	-.085	.016	-.835	1.124	-.949
165	19.	DAVENPOR	T	-.287	.280	-.418	.160	-.916
166	19.	DES MOIN	ES	-.349	.500	-.343	-.231	-.469
167	19.	DUBUQUE		-.496	-.089	-.084	.901	-1.714
168	19.	SIOUX CI	TY	-.233	.766	-.576	.255	-1.164
169	19.	WATERLOO		-.113	.147	-.777	.127	-.923
170	20.	KANSAS C	ITY	.250	.213	-.651	.667	.240
171	20.	OVERLAND	PARK	-1.362	-.870	-.851	-1.467	-.010
172	20.	TOPEKA		-.362	.267	-.434	-.371	.093
173	20.	WICHITA		-.126	-.236	-.388	-.550	.104
174	21.	ASHLAND		.232	1.120	-.723	-.408	-1.029
175	21.	COVINGTO	N	.531	.418	.491	2.207	-1.160
176	21.	LOUISVIL	LE	.661	.354	.109	.629	.338
177	21.	OWENSBOR	O	.194	-.060	-.282	-.030	-1.079
178	22.	ALEXANDR	IA	2.909	.419	-.601	-.805	-.161
179	22.	BATON RO	UGE	.801	-.392	-.200	-.715	.777
180	22.	LAFAYETT	E	1.670	-.739	-.533	-.408	-.676
181	22.	LAKE CHA	RLES	1.525	-.651	-.654	-.244	-.262
182	22.	MONROE		2.907	-.116	-.647	-.696	-.685
183	22.	NEW ORLE	ANS	2.205	-.260	.476	.431	.980
184	22.	SHREVEPO	RT	1.489	-.091	-.625	-.364	-.062
185	23.	LEWISTON		.002	1.149	-.067	.592	-1.196
186	23.	PORTLAND		.371	1.178	.356	-.227	-1.128
187	24.	BALTIMOR	E	.776	.370	.967	.915	1.717
188	25.	BOSTON		.262	.677	2.129	.419	.525
189	25.	BROCKTON		-.509	.213	.066	.760	-.782
190	25.	CAMBRIDG	E	-.349	1.037	2.859	-.364	.562
191	25.	CHICOPEE		-.789	-.385	.072	1.145	-.868
192	25.	FALL RIV	ER	.042	1.467	.561	1.354	-.426
193	25.	FITCHBUR	G	-.418	1.017	-.008	.764	-.778
194	25.	HAVERHIL	L	-.497	1.289	-.194	.868	-.809
195	25.	HOLYOKE		.191	1.102	.484	.862	.015
196	25.	LAWRENCE		-.231	1.008	1.471	.810	-.860
197	25.	LEOMINST	ER	-.722	.049	-.248	1.190	-1.042
198	25.	LOWELL		-.140	.682	.756	.933	-.967
199	25.	LYNN		-.326	.908	.777	.958	-.136
200	25.	MALDEN		-.660	.805	1.129	.462	-1.046

Table H.6 Per Capita Need Scores for 435 Entitlement Cities

CASE-NO	STATCODE	NAME1	NAME2	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
201	25.	MEDFORD		-.880	.860	.443	.532	-1.056
202	25.	NEW BEDF	ORD	.375	1.683	.267	.784	-.469
203	25.	NEWTON		-1.298	.821	-.341	.256	-.026
204	25.	PITTSFIE	LD	-.665	.727	-.339	.373	-.915
205	25.	QUINCY		-.849	.502	.288	.752	-.466
206	25.	SOMERVIL	LE	-.538	.530	2.698	1.262	-.925
207	25.	SPRINGFI	ELD	-.102	.665	.163	.769	.497
208	25.	WALTHAM		-.784	.102	.690	.193	-1.101
209	25.	WORCESTE	R	-.508	1.065	.344	.868	.241
210	26.	ANN ARBO	R	-.634	.132	.706	-1.867	.769
211	26.	BATTLE C	REEK	.252	1.614	-.900	.534	1.129
212	26.	BAY CITY		-.335	1.014	-.805	1.335	-.686
213	26.	DEARBORN		-1.150	.219	-.942	.621	-.192
214	26.	DEARBORN	HEIGHTS	-1.346	-1.646	-.943	1.153	-.603
215	26.	DETROIT		-.064	.589	.235	1.886	2.542
216	26.	EAST LAN	SING	-.564	-.247	1.472	-2.912	-.274
217	26.	FLINT		-.171	-.171	-.508	1.621	1.122
218	26.	GRAND RA	PIDS	-.090	.972	-.626	.551	.185
219	26.	JACKSON		.051	1.247	-.328	.826	-.429
220	26.	KALAMAZO	O	-.247	1.182	-.177	-.333	.515
221	26.	LANSING		-.421	.130	-.578	.679	.664
222	26.	LINCOLN	PARK	-1.209	-1.102	-.735	1.777	-.305
223	26.	LIVONIA		-1.493	-1.556	-1.430	.667	-.380
224	26.	MUSKEGON		-.202	.913	-.720	1.467	.632
225	26.	PONTIAC		-.306	-.327	-.579	3.046	1.904
226	26.	ROSEVILL	E	-1.167	-1.904	-.712	1.966	-.682
227	26.	ROYAL OA	K	-1.348	-.703	-.297	.202	-.260
228	26.	SAGINAW		.221	.293	-.382	1.454	.556
229	26.	ST CLAIR	SHORES	-1.437	-1.736	-.746	1.375	-.721
230	26.	STERLING	HEIGHTS	-1.390	-1.182	-1.394	.280	-.009
231	26.	TAYLOR		-1.107	-1.901	-1.242	2.131	-.429
232	26.	WARREN		-1.399	-1.483	-1.027	1.210	-.321
233	26.	WYOMING		-.937	-.612	-1.346	1.073	-.638
234	27.	BLOOMING	TON	-1.262	-1.779	-.570	-.505	-.642
235	27.	DULUTH		-.268	1.437	-.550	-.067	-1.079
236	27.	MINNEAPO	LIS	-.356	1.243	.563	-.080	.094
237	27.	MOORHEAD		-.618	-.643	.183	-.826	-.670
238	27.	ROCHESTE	R	-.659	.140	.028	-1.327	-1.080
239	27.	ST CLOUD		-.557	.019	-.117	.115	-1.312
240	27.	ST PAUL		-.582	.669	.228	.366	-.121
241	28.	BILOXI		.722	-.923	.581	-.515	-.967
242	28.	GULFPORT		.998	-.185	-.647	-1.013	-.794
243	28.	JACKSON		2.003	-.826	-.385	-.830	-.105
244	29.	COLUMBIA		-.138	.276	.338	-2.527	-.458
245	29.	FLORISSA	NT	-1.261	-2.231	-.512	.653	-1.242
246	29.	INDEPEND	ENCE	-.866	-.211	-.857	-.183	-.713
247	29.	KANSAS C	ITY	.004	.550	-.366	.113	.768
248	29.	ST JOSEP	H	.151	1.227	-.589	.472	-1.124
249	29.	ST LOUIS		1.008	.346	1.205	1.757	.885
250	30.	BILLINGS		-.195	.101	-.246	-.766	-.173

Table H.6 Per Capita Need Scores for 435 Entitlement Cities

CASE-NO	STATCODE	NAME1	NAME2	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
251	30.	GREAT FA	LLS	-.256	-.197	.013	-.235	-.771
252	31.	LINCOLN		-.623	.484	-.110	-1.140	-.599
253	31.	OMAHA		-.235	-.025	-.023	.046	-.369
254	32.	LAS VEGA	S	-.544	-1.139	-.209	-.472	.555
255	33.	MANCHEST	ER	-.369	.760	.208	.486	-1.274
256	33.	NASHUA		-.672	-.267	-.064	.235	-1.510
257	34.	ATLANTIC	CITY	.690	2.110	.308	.586	3.800
258	34.	BAYONNE		-.376	.261	1.841	.533	-1.443
259	34.	BLOOMFIE	LD	-1.093	.480	.728	.427	-.832
260	34.	CAMDEN		1.190	.805	.003	1.814	1.786
261	34.	CLIFTON		-1.271	.344	-.071	.327	-.715
262	34.	EAST ORA	NGE	-.355	.237	3.163	-.023	1.452
263	34.	ELIZABET	H	-.094	-.048	1.719	.846	-.397
264	34.	IRVINGTO	N	-.863	.856	2.379	.494	-.335
265	34.	JERSEY C	ITY	.339	-.063	2.764	1.187	-.927
266	34.	LONG BRA	NCH	.050	.086	.917	-.004	.330
267	34.	NEWARK		1.584	-.756	2.674	1.853	1.719
268	34.	PASSAIC		.347	.204	2.352	1.341	.145
269	34.	PATERSON		.623	-.206	2.279	1.717	.184
270	34.	PERTH AM	BOY	.128	.486	1.054	.644	-.845
271	34.	SAYREVIL	LE	-1.328	-.896	-.886	.507	-.849
272	34.	TRENTON		.519	.906	.958	1.364	1.284
273	34.	UNION CI	TY	-.247	-.285	5.404	1.796	-1.851
274	34.	VINELAND		-.347	-.091	-.914	1.181	-.239
275	35.	ALBUQUER	QUE	.295	-.920	-.412	-.730	1.248
276	36.	ALBANY		.087	1.402	.751	-.373	-.408
277	36.	BINGHAMT	ON	-.250	1.575	.483	.043	-.684
278	36.	BUFFALO		.085	1.554	.949	.912	.538
279	36.	ELMIRA		.475	1.730	.099	.004	-.910
280	36.	MOUNT VE	RNON	-.477	-.211	2.744	.713	-.050
281	36.	NEW ROCH	ELLE	-.724	.006	1.089	-.016	-.298
282	36.	NEW YORK	CITY	.155	-.460	3.554	.849	.675
283	36.	NIAGARA	FALLS	-.415	.537	-.103	1.365	.165
284	36.	POUGHKEE	PSIE	-.006	1.239	1.038	-.071	-.432
285	36.	ROCHESTE	R	-.059	1.110	.725	.654	-.025
286	36.	ROME		-.420	.148	-.253	.452	-1.165
287	36.	SCHENECT	ADY	-.453	1.502	.613	-.028	-.853
288	36.	SYRACUSE		.064	1.194	.708	-.213	-.135
289	36.	TROY		.121	1.604	.780	-.178	-1.091
290	36.	UTICA		.062	1.598	.260	.303	-1.063
291	36.	WHITE PL	AINS	-.806	.114	1.207	-.412	-.298
292	36.	YONKERS		-.808	-.207	1.774	.120	-.428
293	37.	ASHEVILL	E	.456	1.169	-.746	.005	.421
294	37.	BURLINGT	ON	-.284	-.144	-.561	.332	-.903
295	37.	CHARLOTT	E	.340	-.529	-.172	-.186	1.259
296	37.	DURHAM		1.093	.104	.166	-.729	.769
297	37.	FAYETTEV	ILLE	1.919	-.406	-.518	-.900	.700
298	37.	GASTONIA		.288	-.426	-.457	1.028	-.412
299	37.	GREENSBO	RO	-.035	-.488	-.272	-.352	.660
300	37.	HIGH POI	NT	.321	-.265	-.287	.506	-.447

Table H. 6 Per Capita Need Scores for 435 Entitlement Cities

CASE-NO	STATCODE	NAME1	NAME2	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
301	37.	RALEIGH		.115	-.230	.108	-1.054	.432
302	37.	WILMINGT	ON	1.933	.833	-.637	-.655	1.075
303	37.	WINSTON-	SALEM	.568	.072	-.402	-.041	1.256
304	38.	FARGO		-.505	.161	.500	-.835	-1.460
305	39.	AKRON		-.203	.815	-.405	.434	.550
306	39.	CANTON		-.057	.967	-.166	.576	-.324
307	39.	CINCINNA	TI	.690	.319	.898	.393	.073
308	39.	CLEVELAN	D	.742	.807	.908	.525	.979
309	39.	CLEVELAN	D HEIGHT	-1.114	1.195	.009	-.160	-.348
310	39.	COLUMBUS		.097	.178	.112	-.498	.499
311	39.	DAYTON		.028	.371	.365	.591	1.262
312	39.	ELYRIA		-.664	-.318	-.472	.532	-.615
313	39.	EUCLID		-1.189	-.578	.185	-.593	-.619
314	39.	KETTERIN	G	-1.282	-.777	-.666	-1.037	-.328
315	39.	LAKEWOOD		-1.059	.784	1.617	-.400	-1.149
316	39.	LIMA		-.096	.544	-.357	1.191	-.049
317	39.	LORAIN		-.196	-.580	-.353	1.134	-.332
318	39.	MANSFIEL	D	-.135	.619	-.510	.247	-.059
319	39.	MIDDLETO	WN	-.312	.253	-.454	.628	-.200
320	39.	PARMA		-1.293	-.549	-1.127	-.061	-.491
321	39.	SPRINGFI	ELD	.035	.776	.065	.254	-.655
322	39.	STEUBENV	ILLE	.180	1.381	-.299	-.392	-.143
323	39.	TOLEDO		-.326	.694	-.429	.559	.139
324	39.	WARREN		-.462	.147	-.301	.577	.130
325	39.	YOUNGSTO	WN	.034	1.037	-.541	1.062	.624
326	40.	LAWTON		.892	-.701	-.637	-.763	.314
327	40.	NORMAN		-.085	.404	-.419	-1.963	-.335
328	40.	OKLAHOMA	CITY	.325	.142	-.873	-.734	-.070
329	40.	TULSA		.007	.028	-.863	-.838	.211
330	41.	EUGENE		-.371	.622	-.179	-1.753	.646
331	41.	PORTLAND		-.298	1.445	-.276	-.369	.697
332	41.	SALEM		-.618	.730	-.463	-.805	.241
333	41.	SPRINGFI	ELD	-.503	-.387	-.773	.079	.100
334	42.	ALLENTOW	N	-.561	1.386	-.217	.258	-.691
335	42.	ALTOONA		.198	1.888	-.559	.377	-1.267
336	42.	BETHLEHE	M	-.511	.865	-.461	.010	-.706
337	42.	CHESTER		1.021	.724	.568	1.154	1.564
338	42.	EASTON		.369	1.868	.144	.081	-.859
339	42.	ERIE		-.190	.756	.084	.170	-.857
340	42.	HARRISBU	RG	1.104	1.857	.484	-.591	.779
341	42.	HAZLETON		-.350	1.649	.031	.163	-1.464
342	42.	JOHNSTOW	N	.430	1.614	.697	.038	-1.444
343	42.	LANCASTE	R	.174	1.824	.278	.248	-.453
344	42.	PHILADEL	PHIA	.336	.833	.820	.648	.183
345	42.	PITTSBUR	GH	.229	1.176	.680	.527	.291
346	42.	READING		-.116	2.004	.167	.575	-.777
347	42.	SCRANTON		-.246	1.660	.114	.579	-1.126
348	42.	WILKES-B	ARRE	.027	1.868	.412	.326	-1.352
349	42.	WILLIAMS	PORT	.263	1.835	.244	-.141	-1.131
350	42.	YORK		.175	1.876	.466	.421	-.399

Table H.6 Per Capita Need Scores for 435 Entitlement Cities

CASE-NO	STATCODE	NAME1	NAME2	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
351	44.	CRANSTON		-1.094	.399	-.983	.916	-.395
352	44.	PAWTUCKE	T	-.378	1.011	.525	1.096	-.662
353	44.	PROVIDEN	CE	.420	1.797	.864	.658	.694
354	44.	WARWICK		-1.088	-.192	-1.376	1.132	-.256
355	45.	CHARLEST	ON	2.277	.194	.293	-.705	.858
356	45.	COLUMBIA		.746	.048	-.059	-.663	.907
357	45.	GREENVIL	LE	1.164	.225	-.155	-.165	.730
358	45.	SPARTANB	URG	1.410	.218	-.243	.022	.438
359	46.	SIOUX FA	LLS	-.467	.120	-.241	-.464	-1.047
360	47.	CHATTANO	OGA	1.651	.738	-.285	-.299	.801
361	47.	KINGSPOR	T	.501	.500	-1.026	-1.060	-.891
362	47.	KNOXVILL	E	.750	.749	-.573	-.886	-.078
363	47.	MEMPHIS		1.489	-.803	-.269	-.208	.138
364	47.	NASHVILL	E-DAVIDS	.160	-.113	-.589	-.354	.195
365	48.	ABILENE		.452	-.416	-.724	-.728	-.617
366	48.	AMARILLO		-.020	-.363	-.784	-.622	-.225
367	48.	ARLINGTO	N	-1.015	-.923	-.413	-1.080	.052
368	48.	AUSTIN		.568	-.497	.266	-1.512	-.123
369	48.	BEAUMONT		.983	.040	-.682	-.401	-.003
370	48.	BROWNSVI	LLE	6.268	-2.700	-.280	1.514	-2.609
371	48.	BRYAN		1.556	-.179	-.564	-1.063	-.739
372	48.	CORPUS C	HRISTI	1.398	-1.538	-.397	.126	.128
373	48.	DALLAS		.277	-.811	.003	-.286	.985
374	48.	EL PASO		1.829	-2.014	.205	.699	-.665
375	48.	FORT WOR	TH	.252	-.556	-.455	-.008	.212
376	48.	GALVESTO	N	1.255	.289	.205	.093	1.172
377	48.	GARLAND		-1.027	-1.478	-.884	-.014	-.478
378	48.	GRAND PR	AIRIE	-.451	-1.612	-.547	.352	-.399
379	48.	HARLINGE	N	5.189	-1.454	-1.117	.103	-1.755
380	48.	HOUSTON		.454	-1.045	.130	-.287	.585
381	48.	IRVING		-.810	-1.451	-.262	-.559	-.554
382	48.	KILLEEN		1.081	-1.247	.295	-1.606	-.292
383	48.	LAREDO		6.099	-2.419	-.080	1.988	-2.926
384	48.	LUBBOCK		.871	-1.012	-.509	-.648	-.269
385	48.	MC ALLEN		5.051	-1.815	-.556	.545	-2.288
386	48.	MESQUITE		-.954	-1.705	-.966	.309	-.828
387	48.	MIDLAND		.364	-1.165	-.865	-1.062	-.589
388	48.	ODESSA		.415	-1.522	-.532	-.040	-1.037
389	48.	PASADENA		-.671	-1.559	-.296	-.251	-.836
390	48.	PORT ART	HUR	1.166	.031	-.894	.604	.402
391	48.	SAN ANGE	LO	1.068	-.065	-.854	-.428	-.653
392	48.	SAN ANTO	NIO	1.836	-1.424	-.124	.828	-.032
393	48.	SHERMAN		-.482	.462	-.704	-.214	-.318
394	48.	TEMPLE		.830	.225	-.843	-.433	-.510
395	48.	TEXARKAN	A	.871	.677	-.725	-.367	.015
396	48.	TEXAS CI	TY	.005	-1.260	-.697	.229	-.206
397	48.	TYLER		.106	-.054	-.466	-.642	.027
398	48.	WACO		1.032	.704	-.830	-.745	.564
399	48.	WICHITA	FALLS	.237	-.043	-.528	-.714	-.563
400	49.	OGDEN		-.001	.103	-.336	.104	-.304

Table H.6 Per Capita Need Scores for 435 Entitlement Cities

CASE-NO	STATCODE	NAME1	NAME2	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5
401	49.	OREM		.113	-1.978	-.715	-.030	-1.306
402	49.	PROVO		.580	-.102	.569	-2.107	-1.396
403	49.	SALT LAK	E CITY	.039	.753	-.036	-.432	.416
404	51.	ALEXANDR	IA	-.565	-.783	1.717	-1.687	.698
405	51.	CHESAPEA	KE	.629	-.660	-1.222	.216	-.792
406	51.	HAMPTON		-.028	-.750	-.458	-.416	.077
407	51.	LYNCHBUR	G	.209	.897	-.290	-.145	-.299
408	51.	NEWPORT	NEWS	.443	-.693	-.326	-.386	.501
409	51.	NORFOLK		.789	-.380	.439	-.342	.980
410	51.	PETERSBU	RG	1.972	-.179	.602	.347	-.692
411	51.	PORTSMOU	TH	1.142	-.329	-.296	.133	.662
412	51.	RICHMOND		.747	.381	.138	-.065	1.385
413	51.	ROANOKE		.224	1.023	-.556	-.124	.364
414	51.	VIRGINIA	BEACH	-.173	-.833	-1.044	-.792	.018
415	53.	BELLEVUE		-1.239	-.935	-.723	-1.609	.256
416	53.	EVERETT		-.348	.724	-.678	-.122	.174
417	53.	RICHLAND		-.824	-.962	-.903	-1.430	-.434
418	53.	SEATTLE		-.635	.855	.183	-.569	.732
419	53.	SPOKANE		-.072	1.252	-.715	-.506	-.252
420	53.	TACOMA		-.139	.891	-.749	-.098	.191
421	53.	YAKIMA		.270	1.496	-.798	-.270	.778
422	54.	CHARLEST	ON	.546	1.405	-.174	-1.138	-.017
423	54.	HUNTINGT	ON	.657	1.862	-.275	-.665	-.309
424	54.	WEIRTON		-.745	-.163	-1.024	.592	-.890
425	54.	WHEELING		.207	1.724	-.188	-.105	-.812
426	55.	APPLETON		-.880	-.271	-.285	.256	-1.267
427	55.	GREEN BA	Y	-.555	-.351	-.347	.448	-1.487
428	55.	KENOSHA		-.506	-.209	-.040	.933	-1.199
429	55.	LA CROSS	E	-.215	1.263	-.254	-.549	-1.151
430	55.	MADISON		-.355	.060	.629	-1.741	-.801
431	55.	MILWAUKE	E	-.106	.136	.742	.329	-.353
432	55.	OSHKOSH		-.596	1.217	-.062	-.175	-1.242
433	55.	RACINE		-.376	-.034	.096	.840	-.465
434	55.	SUPERIOR		.136	1.538	-.699	-.114	-1.041
435	55.	WEST ALL	IS	-1.136	-.141	-.058	.502	-1.044

Appendix I

CORRELATIONS BETWEEN PER CAPITA AMOUNTS AND NEED SCORES AND NEED VARIABLES BY POPULATION SIZE

In Tables I.1 to I.7, we present coefficients of correlation between formula amounts and need scores and need variables by city size. Within each population group, each city receives an equal weight of one. The five factor scores refer to those scores derived and listed Appendix H; the factors are interpreted by the following variables:

	Dimension	Need Variables Defining Dimension
FACTOR 1	Poverty	Poverty variables (PYUTHPOV, PPOORPER, PFEMALHP, PNW), percent of overcrowded houses, percent of houses without plumbing.
FACTOR 2	Age of Housing stock	Percent of houses built before 1939, percent of population aged over 65
FACTOR 3	Density	Percent of owner-occupied houses (negative), population per square mile.
FACTOR 4	Crime and Unemployment	Crime rate, percent unemployed
FACTOR 5	Lack of Economic Opportunity	Percent of population without a high school education

Table I.1 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 72 Entitlement Cities, Population less than 50,000

	HH	PRESENT	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	ALT8
FACTOR1	-.0321	.9823	.8533	.7556	.7820	.6626	.4488	.3113	.3487	-.0922
FACTOR2	.1899	-.1306	.3019	.4910	.3754	.5829	.6752	.7848	.7710	.8477
FACTOR3	.2883	-.0842	.0532	.0625	.0997	.1013	.1984	.2038	.1953	.2699
FACTOR4	.1306	.0191	.2377	.1974	.3226	.2547	.4330	.3933	.3827	.4620
FACTOR5	.0631	-.0201	-.0190	.0208	-.0330	.0175	-.0216	.0058	.0070	-.0068
P65AGED	.1608	.1016	.4027	.5146	.4482	.5667	.6056	.6532	.6498	.6246
PCRIME	.1088	.2107	.3189	.3312	.3341	.3404	.3427	.3273	.3312	.2569
PNW	.0394	.8345	.6776	.5440	.6217	.4599	.3052	.1582	.1894	-.1692
PWOHSED	.2464	.3777	.6119	.5973	.6667	.6282	.6990	.6455	.6489	.5494
PFEMALHP	.0981	.8192	.8074	.7661	.7628	.7069	.5437	.4499	.4790	.1156
PYUTHPOV	-.0336	.9686	.8138	.7042	.7398	.6075	.3941	.2515	.2889	-.1462
PPOORPER	-.0220	.9780	.8912	.8264	.8206	.7399	.5165	.3985	.4356	-.0106
POCRWD	-.1011	.7608	.5031	.3075	.4445	.2121	.0816	-.0938	-.0642	-.3813
PWOPLUMB	.0764	.6925	.7266	.6667	.7129	.6307	.5486	.4507	.4721	.1927
PUNEMP75	-.0670	.0584	.0835	.0955	.0827	.0957	.0836	.0852	.0869	.0598
DENSITY	.2671	-.0412	.1959	.2623	.2487	.3151	.4000	.4335	.4252	.4750
POWNOCCH	-.3061	-.1539	-.2653	-.2881	-.2815	-.3010	-.3077	-.3036	-.3058	-.2529
PMULTI	.3542	-.2183	.0697	.1500	.1458	.2268	.3720	.4262	.4098	.5495
PAGE1939	.2738	-.1083	.3841	.5160	.4979	.6282	.8170	.8844	.8660	.9838
PNEWSTR	-.2165	-.1272	-.5178	-.6106	-.5981	-.6851	-.7958	-.8239	-.8167	-.8173
PCINC72	.0407	-.5323	-.5311	-.4847	-.5120	-.4503	-.3704	-.2964	-.3140	-.0914
MEDINC	-.0230	-.7967	-.7906	-.7553	-.7471	-.6985	-.5377	-.4493	-.4776	-.1230

Table I.2 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 140 Entitlement Cities, Population Between 50,000 and 75,000

	HH	PRESENT	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	ALT8
FACTOR1	.1555	.9826	.9063	.8495	.8555	.7847	.6123	.4964	.5308	.0605
FACTOR2	.3119	-.0555	.2775	.4586	.3220	.5325	.5887	.7205	.7056	.7998
FACTOR3	.0231	-.0186	.1622	.1744	.2197	.2236	.3517	.3614	.3493	.4523
FACTOR4	.1127	.1423	.2541	.1638	.3206	.1972	.3614	.2864	.2790	.3349
FACTOR5	-.0353	-.0502	-.1694	-.1482	-.2157	-.1807	-.2874	-.2684	-.2610	-.3187
P65AGED	.2431	.0572	.3421	.4493	.3939	.5125	.5967	.6676	.6559	.7187
PCRIME	-.0163	.2568	.1539	.1198	.1201	.0823	-.0041	-.0478	-.0343	-.1912
PNW	.0385	.8438	.7045	.6139	.6523	.5427	.3864	.2574	.2898	-.1279
PWOHSED	.2363	.5264	.6675	.6240	.7072	.6406	.7031	.6314	.6370	.4967
PFEMALHP	.2208	.8884	.8498	.8181	.8065	.7657	.6105	.5195	.5496	.1286
PYUTHPOV	.1565	.9726	.8750	.8023	.8238	.7340	.5656	.4392	.4739	.0070
PPOORPER	.1717	.9778	.9218	.8839	.8707	.8229	.6450	.5428	.5767	.1076
POCRWD	-.0312	.7958	.6188	.4500	.5869	.3796	.2938	.1133	.1426	-.2216
PWOPLUMB	.1501	.8054	.8153	.7795	.7941	.7451	.6470	.5595	.5834	.2318
PUNEMP75	.1969	.2910	.3550	.3070	.3816	.3150	.3665	.3100	.3128	.2432
DENSITY	-.0077	-.0690	.0987	.1063	.1559	.1549	.2875	.2978	.2847	.4072
POWNOCCH	-.1638	-.2211	-.3753	-.4138	-.4019	-.4404	-.4739	-.4837	-.4826	-.4397
PMULTI	.1247	-.1755	.0754	.1374	.1446	.2082	.3610	.4180	.3986	.5823
PAGE1939	.3383	.0541	.4462	.5549	.5339	.6475	.8127	.8847	.8658	.9896
PNEWSTR	-.2700	-.1911	-.4978	-.5666	-.5657	-.6332	-.7541	-.7874	-.7767	-.8140
PCINC72	-.2108	-.7219	-.7213	-.6759	-.7043	-.6439	-.5641	-.4763	-.4977	-.1860
MEDINC	-.2465	-.8350	-.8622	-.8462	-.8377	-.8128	-.6997	-.6237	-.6485	-.2796

Table I.3 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 72 Entitlement Cities, Population Between 75,000 and 100,000

	HH	PRESENT	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	ALT8
FACTOR1	.4591	.9554	.8204	.7507	.7557	.6837	.5456	.4731	.4941	.2357
FACTOR2	.3247	.1372	.5905	.7445	.6229	.7864	.7853	.8566	.8527	.8646
FACTOR3	.1241	-.0067	.2333	.2610	.2770	.2968	.3663	.3758	.3696	.4260
FACTOR4	.3810	.3397	.4703	.3668	.5192	.3859	.4930	.4164	.4149	.4168
FACTOR5	.2326	.3581	.1156	.0554	.0615	.0040	-.0898	-.1313	-.1191	-.2533
P65AGED	.3806	.2306	.6574	.7622	.6973	.8024	.8273	.8673	.8639	.8694
PCRIME	.3520	.4814	.3060	.2051	.2752	.1643	.1207	.0491	.0599	-.0662
PNW	.3079	.7031	.4360	.3117	.3795	.2465	.1540	.0631	.0803	-.1193
PWOHSED	.4849	.6102	.7406	.6943	.7490	.6879	.6898	.6363	.6430	.5416
PFEMALHP	.5377	.9242	.8349	.7670	.7818	.7091	.5928	.5212	.5403	.3025
PYUTHPOV	.4733	.9596	.7639	.6640	.6971	.5915	.4600	.3715	.3931	.1321
PPOORPER	.5130	.9531	.8673	.8210	.8045	.7584	.6159	.5557	.5762	.3201
POCRWD	.2233	.6339	.3109	.0963	.2822	.0409	.0326	-.1066	-.0932	-.2422
PWOPLUMB	.2790	.3811	.6242	.6324	.6512	.6492	.6769	.6604	.6614	.6249
PUNEMP75	.3721	.2238	.3516	.3367	.3720	.3474	.3784	.3578	.3579	.3427
DENSITY	.0726	-.0567	.1813	.2059	.2291	.2448	.3251	.3346	.3273	.3983
POWNOCCH	-.2608	-.1853	-.3877	-.4405	-.4005	-.4546	-.4507	-.4686	-.4688	-.4493
PMULTI	.2271	-.0535	.3241	.4017	.3822	.4549	.5353	.5716	.5625	.6446
PAGE1939	.4069	.2045	.7043	.7883	.7707	.8457	.9266	.9535	.9464	.9911
PNEWSTR	-.4588	-.4224	-.7458	-.7594	-.7662	-.7862	-.8342	-.8170	-.8166	-.7894
PCINC72	-.4261	-.7062	-.6401	-.5531	-.6140	-.5150	-.4643	-.3892	-.4021	-.2398
MEDINC	-.4784	-.8225	-.8224	-.7855	-.7837	-.7432	-.6472	-.5949	-.6105	-.4092

Table I.4 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 94 Entitlement Cities, Population Between 100,000 and 250,000

	HH	PRESENT	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	ALT8
FACTOR1	.2935	.9514	.8118	.7484	.7360	.6719	.4865	.4088	.4362	.0979
FACTOR2	.4340	.0860	.5099	.6772	.5476	.7302	.7400	.8252	.8199	.8301
FACTOR3	.3126	.1252	.3628	.3492	.4224	.3901	.4980	.4758	.4698	.5100
FACTOR4	.2666	.0782	.2341	.1478	.3049	.1863	.3423	.2802	.2724	.3442
FACTOR5	.2030	.3817	.2367	.2030	.1862	.1561	.0468	.0136	.0274	-.1320
P65AGED	.2119	.1230	.3922	.4620	.4263	.4969	.5295	.5580	.5548	.5583
PCRIME	.3508	.3330	.3827	.3440	.3888	.3389	.3408	.3001	.3052	.2277
PNW	.1703	.8056	.5710	.4289	.5121	.3544	.2366	.1201	.1433	-.1298
PWOHSED	.4317	.5180	.6393	.5778	.6609	.5788	.6047	.5391	.5455	.4396
PFEMALHP	.4151	.8809	.7957	.7510	.7313	.6868	.5215	.4568	.4812	.1740
PYUTHPOV	.3069	.9292	.7531	.6744	.6753	.5944	.4119	.3271	.3545	.0209
PPOORPER	.3320	.9553	.8636	.8223	.7910	.7517	.5650	.4992	.5260	.1891
POCRWD	-.0458	.6287	.3394	.1214	.3090	.0582	.0308	-.1227	-.1058	-.2920
PWOPLUMB	.2500	.4400	.6419	.6622	.6568	.6717	.6633	.6490	.6543	.5546
PUNEMP75	.3476	.1045	.2808	.2877	.3173	.3148	.3740	.3676	.3642	.3803
DENSITY	.2744	.0459	.3089	.3123	.3737	.3605	.4778	.4689	.4606	.5267
POWNOCCH	-.4285	-.3251	-.5210	-.5330	-.5455	-.5496	-.5698	-.5558	-.5579	-.5008
PMULTI	.4454	.0505	.3634	.3924	.4305	.4463	.5593	.5644	.5557	.6215
PAGE1939	.5606	.1264	.6201	.7124	.7039	.7877	.9060	.9406	.9303	.9914
PNEWSTR	-.4789	-.3394	-.7014	-.7434	-.7565	-.7872	-.8539	-.8522	-.8500	-.8239
PCINC72	-.3325	-.5831	-.6043	-.5645	-.5663	-.5387	-.4789	-.4271	-.4399	-.2672
MEDINC	-.3426	-.7960	-.8000	-.7823	-.7540	-.7368	-.6027	-.5555	-.5757	-.3111

Table I.5 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 31 Entitlement Cities, Population Between 250,000 and 500,000

	HH	PRESENT	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	ALT8
FACTOR1	-.0590	.9141	.7261	.5632	.6391	.4345	.2793	.0807	.1118	-.2103
FACTOR2	.3429	-.5660	-.1206	.2467	-.0611	.3565	.3486	.5837	.5674	.7041
FACTOR3	.2108	.4795	.7132	.6317	.7578	.6406	.7262	.5963	.6036	.4986
FACTOR4	.1893	.4138	.7072	.6582	.7642	.6835	.7827	.6741	.6789	.5961
FACTOR5	.1948	.3193	.2551	.2558	.2067	.2012	.0886	.0493	.0627	-.0772
P65AGED	.0725	-.1092	.2827	.4263	.3553	.5059	.5873	.6451	.6368	.6889
PCRIME	.2804	.3869	.5012	.4880	.4999	.4688	.4457	.3746	.3850	.2602
PNW	-.1085	.9218	.7262	.4766	.6640	.3602	.2881	.0437	.0713	-.2137
PWOHSED	.2525	.5532	.7895	.7974	.7993	.7823	.7594	.6657	.6797	.5030
PFEMALHP	.3206	.7092	.7197	.7062	.6593	.6230	.4674	.3593	.3842	.1111
PYUTHPOV	.0506	.8496	.6960	.5723	.6120	.4528	.2909	.1190	.1487	-.1599
PPOORPER	-.0375	.9356	.7921	.6552	.7069	.5296	.3653	.1735	.2054	-.1290
POCRWD	-.2489	.8893	.6523	.3158	.6095	.2089	.2127	-.0693	-.0456	-.2842
PWOPLUMB	.0663	.4240	.6284	.5792	.6599	.5826	.6336	.5309	.5385	.4342
PUNEMP75	.1548	.2423	.4882	.5469	.5140	.5637	.5702	.5463	.5509	.4752
DENSITY	.2787	.2631	.6160	.6465	.6784	.6905	.7760	.7254	.7266	.6774
POWNOCCH	-.3196	-.4792	-.7048	-.6809	-.7289	-.6780	-.7004	-.6014	-.6115	-.4774
PMULTI	.3896	.2738	.6379	.6904	.6952	.7319	.7978	.7563	.7585	.6967
PAGE1939	.4336	-.1248	.4372	.6731	.5286	.7781	.8561	.9503	.9409	.9886
PNEWSTR	-.3495	-.0512	-.5177	-.7067	-.5810	-.7759	-.8095	-.8623	-.8598	-.8412
PCINC72	-.0220	-.6758	-.6237	-.5191	-.5782	-.4414	-.3550	-.2092	-.2306	-.0020
MEDINC	-.0157	-.8643	-.7465	-.6146	-.6737	-.5030	-.3644	-.1832	-.2119	.0914

Table I.6 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 21 Entitlement Cities, Population Between 500,000 and 1,250,000

	HH	PRESENT	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	ALT8
FACTOR1	.0094	.9591	.7337	.6004	.6512	.4943	.3318	.1862	.2149	-.1052
FACTOR2	.3581	-.3286	.1768	.4208	.2460	.5116	.5611	.7033	.6892	.8078
FACTOR3	.8201	.1690	.5275	.5591	.5969	.6127	.7134	.7017	.6969	.7152
FACTOR4	.3089	.5488	.7172	.6652	.7386	.6613	.6825	.6002	.6085	.4897
FACTOR5	.5257	.1980	.2912	.2910	.3008	.2931	.2967	.2759	.2788	.2348
P65AGED	.5613	-.0347	.4620	.6060	.5425	.6866	.7763	.8385	.8286	.8951
PCRIME	.6050	.2108	.4704	.5096	.5082	.5381	.5758	.5690	.5688	.5432
PNW	.3493	.7836	.6182	.4524	.5758	.3790	.3145	.1631	.1834	-.0441
PWOHSED	.0767	.6704	.7157	.6777	.6912	.6358	.5599	.4802	.4965	.2969
PFEMALHP	.3316	.8586	.8529	.8058	.8043	.7389	.6099	.5115	.5344	.2615
PYUTHPOV	.0041	.9560	.7221	.5865	.6383	.4793	.3158	.1695	.1984	-.1217
PPOORPER	.1497	.9711	.8440	.7446	.7741	.6519	.4978	.3658	.3934	.0772
POCRWD	-.0108	.8828	.5762	.3493	.5114	.2487	.1615	-.0263	-.0015	-.2684
PWOPLUMB	.3400	.1041	.3914	.4606	.4338	.4990	.5402	.5579	.5551	.5581
PUNEMP75	.3873	.0691	.3547	.3989	.4081	.4440	.5178	.5245	.5197	.5471
DENSITY	.7606	.0781	.5058	.5917	.5806	.6582	.7532	.7765	.7693	.8090
POWNOCCH	-.7612	-.2564	-.5795	-.6137	-.6323	-.6522	-.7157	-.6996	-.6985	-.6762
PMULTI	.6701	.1253	.5466	.6276	.6181	.6896	.7772	.7939	.7881	.8124
PAGE1939	.6930	.0769	.6041	.7559	.6816	.8319	.9050	.9608	.9536	.9856
PNEWSTR	-.7191	-.2155	-.6991	-.8272	-.7633	-.8863	-.9354	-.9682	-.9653	-.9504
PCINC72	.2056	-.5328	-.4573	-.4365	-.4055	-.3788	-.2563	-.2029	-.2198	-.0275
MEDINC	-.0970	-.8927	-.7667	-.6830	-.6973	-.5947	-.4405	-.3239	-.3499	-.0528

Table I.7 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 26 Entitlement Cities, Population Greater than 500,000

	HH	PRESENT	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	ALT8
FACTOR1	.0374	.9431	.7026	.5716	.6141	.4639	.2979	.1620	.1896	-.1135
FACTOR2	.3943	-.3327	.1724	.4305	.2319	.5127	.5338	.6785	.6667	.7636
FACTOR3	.4696	.1594	.4986	.4901	.5723	.5427	.6647	.6327	.6274	.6560
FACTOR4	.2034	.4173	.6384	.6195	.6660	.6282	.6559	.6028	.6077	.5287
FACTOR5	.3714	.1249	.1857	.1863	.1905	.1868	.1863	.1740	.1759	.1480
P65AGED	.5114	-.0385	.4740	.6146	.5534	.6924	.7765	.8337	.8248	.8841
PCRIME	.4095	.1788	.3517	.3582	.3777	.3744	.4051	.3869	.3874	.3642
PNW	.3031	.7440	.6010	.4455	.5612	.3786	.3219	.1843	.2024	.0001
PWOHSED	.0852	.5895	.7017	.6946	.6845	.6649	.5973	.5416	.5549	.3879
PFEMALHP	.3299	.8417	.8396	.7976	.7863	.7295	.5956	.5059	.5280	.2685
PYUTHPOV	.0203	.9478	.7099	.5781	.6220	.4706	.3056	.1688	.1964	-.1073
PPOORPER	.1689	.9614	.8214	.7241	.7441	.6283	.4670	.3436	.3705	.0672
POCRWD	-.0584	.8773	.5583	.3171	.4948	.2193	.1471	-.0400	-.0170	-.2611
PWOPLUMB	.3240	.1235	.3656	.4211	.3956	.4471	.4685	.4783	.4776	.4640
PUNEMP75	.1936	-.0126	.2359	.2931	.2778	.3322	.3830	.4043	.3997	.4319
DENSITY	.3729	.0617	.4597	.5103	.5349	.5728	.6796	.6849	.6779	.7229
POWNOCCH	-.4562	-.2534	-.5225	-.4974	-.5773	-.5310	-.6202	-.5747	-.5733	-.5629
PMULTI	.3699	.1401	.5219	.5458	.5963	.6027	.7138	.6990	.6934	.7220
PAGE1939	.5925	.0606	.6131	.7642	.6906	.8391	.9088	.9621	.9554	.9856
PNEWSTR	-.6027	-.1751	-.6799	-.8096	-.7442	-.8688	-.9162	-.9507	-.9476	-.9396
PCINC73	.1188	-.5001	-.4371	-.4398	-.3805	-.3827	-.2479	-.2123	-.2284	-.0463
MEDINC	-.1598	-.8532	-.7098	-.6384	-.6312	-.5471	-.3802	-.2797	-.3047	-.0238

Appendix J

EVALUATION OF ADDITIONAL FORMULAS: ALTERNATIVE 8 TO ALTERNATIVE 14

In Appendix J we present the statistical analysis for seven additional, alternative formulas. Three of the formulas include without plumbing as a formula factor. As baselines for comparison, the correlations examined in Chapter 5 and 6 for the present formula, Alternative 1, Alternative 2, and Alternative 4 are reproduced in the below tables. The variables and weights for the formulas are as follows:

	Population	Poverty	Overcrowded Housing	Pre-1939 Housing	Without Plumbing
Alternative 8 (ALT8)				1.	
Alternative 9		1.			
Alternative 10		.30		.70	
Alternative 11	.15	.30	.20	.25	.10
Alternative 12		.40		.40	.20
Alternative 13		.50		.30	.20
Alternative 14		.40	.20	.30	.10
Present	.25	.50	.25		
Alternative 1	.20	.40	.20	.20	
Alternative 2	.25	.50		.25	
Alternative 4		.60		.40	

The correlations of formula amounts with need scores and need variables are given in Table J.1, and with two measures of tax effort, in Table J.2. In both tables, we used the weighing system that determines the importance of a particular city on the basis of the percentage of total entitlement city population accounted for by the grouping within which the city is located. The five factors (FACTOR 1 to FACTOR 5) in Table J.1 refer to those factor scores listed in Appendix F and derived from the factor analysis explained in Chapter 4. The factors (dimensions) are defined as follows:

Table J.1	Dimension	Need Variables Defining Dimension
FACTOR 1	Poverty	Poverty variables (PYUTHPOV, PPOORPER, PFEMALHP, PNW), percent of overcrowded houses, percent of houses without plumbing
FACTOR 2	Age of Housing Stock	Percent of houses built before 1939, percent of population aged over 65
FACTOR 3	Density	Percent of owner-occupied houses (negative), population per square mile
FACTOR 4	Crime and Unemployment	Crime rate, percent unemployed
FACTOR 5	Lack of Economic Opportunity	Percent of population without a high school education

Table J.1 Coefficients of Correlation Between (1) Per Capita Formula Amounts and (2) Per Capita Need Scores and Need Variables, 435 Entitlement Cities, ALT8 to ALT14

	PRESENT	ALT1	ALT2	ALT4	ALT8	ALT9	ALT10	ALT11	ALT12	ALT13	ALT14
FACTOR1	.9504	.7866	.7160	.6297	.0315	.9733	.2661	.6641	.5181	.6456	.6757
FACTOR2	.0239	.4541	.6279	.6947	.8628	.1695	.8434	.5733	.7455	.6624	.5849
FACTOR3	.2016	.3565	.2795	.3124	.4024	.0605	.3889	.3701	.2965	.2526	.3572
FACTOR4	.0979	.1649	.1546	.1646	.1749	.0725	.1802	.1386	.1114	.0960	.1418
FACTOR5	.0463	.1543	.0872	.1182	.2471	-.0807	.2101	.1843	.1350	.0930	.1695
P65AGED	.1006	.4335	.5332	.5849	.7032	.1680	.6947	.5236	.6236	.5599	.5276
PCRIME	.3804	.4404	.3877	.3845	.2724	.3178	.3306	.4100	.3336	.3408	.4063
PNW	.7975	.6683	.5417	.4813	.0526	.7128	.2223	.5463	.3601	.4472	.5482
PWOHSED	.5534	.7112	.6892	.6918	.5324	.5257	.6229	.6962	.6392	.6426	.6984
PFEMALHP	.8537	.8278	.8000	.7438	.2709	.8945	.4695	.7311	.6291	.7146	.7457
PYUTHPOV	.9386	.7850	.7061	.6241	.0492	.9450	.2756	.6614	.5080	.6289	.6717
PPOORPER	.9536	.8528	.8080	.7315	.1579	.9982	.3896	.7479	.6273	.7426	.7612
POCRWD	.7901	.5526	.3352	.2653	-.1585	.5976	-.0020	.4484	.2007	.3020	.4323
PWOPLUMB	.5044	.5802	.5847	.5684	.3431	.5349	.4491	.6845	.7060	.7466	.6717
PUNEMP75	.1318	.3000	.3221	.3473	.3896	.1303	.3940	.3208	.3339	.3018	.3225
DENSITY	.2078	.4549	.4209	.4671	.5869	.1067	.5716	.4812	.4438	.3824	.4738
POWNOCCH	-.3823	-.5687	-.5235	-.5469	-.5299	-.2965	-.5648	-.5772	-.5178	-.4904	-.5713
PMULTI	.1961	.4843	.4656	.5193	.6643	.1055	.6434	.5413	.5281	.4586	.5317
PAGE1939	.1251	.5944	.7051	.7836	.9894	.1736	.9621	.7113	.8244	.7250	.7137
PNEWSTR	-.2711	-.6439	-.7222	-.7750	-.8517	-.3101	-.8673	-.7193	-.7859	-.7217	-.7232
PCINC7a	-.5109	-.4632	-.4623	-.4192	-.0942	-.5680	-.2258	-.4150	-.3725	-.4383	-.4246
MEDINC	-.7882	-.7415	-.7266	-.6680	-.2020	-.8484	-.3942	-.6671	-.5891	-.6790	-.6799

Table J.2: Coefficients of Correlation Between (1) Tax Effort and (2) Per Capita Formula Amounts, ALT8 to ALT14

	TAX1INC[a]	TXEFFORT[b]
PRESENT	.28	.37
ALT1	.50	.56
ALT2	.47	.55
ALT4	.51	.58
ALT8	.55	.57
ALT9	.21	.33
ALT10	.56	.60
ALT11	.51	.56
ALT12	.47	.53
ALT13	.43	.50
ALT14	.51	.56

a. TAX1INC equals non-education taxes (1974) divided by personal income (1972).

b. TXEFFORT equals non-education taxes (1974) divided by the market value of the property tax base (1972).

Table J.3 presents the correlation analysis for 435 entitlement cities using equally weighted cases. Tables J.4 to J.10 present correlations between formula amounts and need scores and need variables by city size. In Tables J.3 to J. 10, the five factors refer to those factor scores derived from Appendix H. These factors are defined as follows:

Table J.3	Dimension	Need Variables Defining Dimension
FACTOR 1	Poverty	Poverty variables (PYUTHPOV, PPOORPER, PFEMALHP, PNW), percent of overcrowded houses, percent of houses without plumbing
FACTOR 2	Age of Housing Stock	Percent of Houses built before 1939, percent of population aged over 65
FACTOR 3	Density	Percent of owner-occupied houses (negative), population per square mile
FACTOR 4	Lack of Economic Opportunity	Percent of population with a high school education, UNEMP75
FACTOR 5	Crime	Crime rate

Table J.3 Coefficients of Correlation Between (1) Per Capita Formula Amounts and (2) Per Capita Need Scores and Need Variables, 435 Equally Weighted Cases; ALT8 to ALT14

	PRESENT	ALT1	ALT2	ALT4	ALT8	ALT9	ALT10	ALT11	ALT12	ALT13	ALT14
FACTOR1	.9708	.8612	.7914	.7155	.0546	.9754	.3347	.7730	.6488	.7625	.7792
FACTOR2	-.0391	.3488	.5373	.6075	.8129	.1391	.7868	.4461	.6294	.5374	.4630
FACTOR3	.0619	.2553	.2493	.2925	.4447	.0190	.4138	.3037	.3092	.2518	.2960
FACTOR4	.1453	.2996	.2208	.2591	.3943	.0166	.3668	.3461	.2889	.2383	.3268
FACTOR5	.1402	.0592	.0537	.0266	-.1362	.1605	-.0782	-.0356	-.0807	-.0444	-.0210
P65AGED	.1051	.4111	.5143	.5674	.6881	.1938	.6883	.4840	.5845	.5161	.4910
PCRIME	.3085	.3064	.2698	.2554	.0915	.2834	.1667	.2549	.1929	.2147	.2584
PNW	.8026	.6431	.5218	.4510	-.0965	.7325	.1251	.5345	.3671	.4703	.5346
PWOHSED	.5121	.6708	.6341	.6458	.5051	.4706	.6010	.6853	.6369	.6275	.6796
PFEMALHP	.8695	.8319	.7924	.7359	.1787	.8930	.4246	.7488	.6527	.7389	.7591
PYUTHPOV	.9589	.8258	.7408	.6621	.0019	.9463	.2778	.7242	.5833	.7002	.7300
PPOORPER	.9695	.8956	.8488	.7786	.1292	.9986	.4100	.8072	.7009	.8071	.8174
POCRWD	.7557	.5256	.3283	.2534	-.2540	.5912	-.0607	.4379	.2201	.3280	.4216
PWOPLUMB	.6685	.7204	.6925	.6681	.3149	.6735	.4856	.7911	.7710	.8152	.7781
PUNEMP75	.1740	.2797	.2685	.2846	.2852	.1512	.3059	.2876	.2716	.2517	.2856
DENSITY	-.0072	.1954	.2026	.2505	.4427	-.0393	.3949	.2448	.2637	.1992	.2388
POWNOCCH	-.2646	-.4301	-.4513	-.4720	-.4385	-.2815	-.4847	-.4440	-.4520	-.4276	-.4471
PMULTI	-.0524	.2358	.2873	.3526	.6108	-.0443	.5478	.3163	.3832	.2957	.3128
PAGE1939	.0594	.5087	.6216	.7105	.9886	.1286	.9451	.6324	.7580	.6414	.6332
PNEWSTR	-.2322	-.5770	-.6440	-.7034	-.8164	-.2732	-.8292	-.6540	-.7202	-.6444	-.6551
PCINC72	-.6360	-.6316	-.5883	-.5544	-.1838	-.6285	-.3521	-.5846	-.5072	-.5602	-.5876
MEDINC	-.8089	-.8207	-.8005	-.7569	-.2665	-.8442	-.4910	-.7590	-.6881	-.7566	-.7690

Table J.4 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 72 Entitlement Cities, Population less than 50,000, ALT8 to ALT14

	PRESENT	ALT1	ALT2	ALT4	ALT8	ALT9	ALT10	ALT11	ALT12	ALT13	ALT14
FACTOR1	.9823	.8533	.7556	.6626	-.0922	.9684	.2066	.7576	.6090	.7429	.7608
FACTOR2	-.1306	.3019	.4910	.5829	.8477	.0187	.8158	.4113	.5979	.4777	.4262
FACTOR3	-.0842	.0532	.0625	.1013	.2699	-.1066	.2254	.1034	.1289	.0769	.0972
FACTOR4	.0191	.2377	.1974	.2547	.4620	-.0739	.4190	.3299	.3253	.2502	.3098
FACTOR5	-.0201	-.0190	.0208	.0175	-.0068	.0295	.0025	-.0778	-.0682	-.0648	-.0621
P65AGED	.1016	.4027	.5146	.5667	.6246	.1972	.6569	.4662	.5681	.5024	.4763
PCRIME	.2107	.3189	.3312	.3404	.2569	.2245	.3139	.2954	.2845	.2747	.3026
PNW	.8345	.6776	.5440	.4599	-.1692	.7664	.0716	.5999	.4357	.5558	.5936
PWOHSED	.3777	.6119	.5973	.6282	.5494	.3469	.6306	.6827	.6769	.6415	.6720
PFEMALHP	.8192	.8074	.7661	.7069	.1156	.8412	.3665	.7331	.6407	.7283	.7419
PYUTHPOV	.9666	.8138	.7042	.6075	-.1462	.9432	.1473	.7072	.5462	.6846	.7101
PPOORPER	.9760	.8912	.8264	.7399	-.0106	.9984	.2938	.7914	.6668	.7923	.8008
POCRWD	.7608	.5031	.3075	.2121	-.3813	.6254	-.1740	.4085	.1935	.3267	.3940
PWOPLUMB	.6925	.7266	.6667	.6307	.1927	.6701	.3882	.7982	.7518	.8095	.7805
PUNEMP75	.0584	.0835	.0955	.0957	.0598	.0743	.0798	.0746	.0778	.0782	.0783
DENSITY	-.0412	.1959	.2623	.3151	.4750	-.0048	.4524	.2706	.3475	.2785	.2706
POWNOCCH	-.1539	-.2653	-.2881	-.3010	-.2529	-.1755	-.2951	-.2611	-.2684	-.2533	-.2667
PMULTI	-.2183	.0697	.1500	.2268	.5495	-.1898	.4674	.1510	.2462	.1431	.1515
PAGE1939	-.1083	.3841	.5160	.6282	.9838	-.0429	.9271	.5333	.6862	.5393	.5330
PNEWSTR	-.1272	-.5178	-.6106	-.6651	-.8173	-.1826	-.8366	-.6201	-.7176	-.6226	-.6215
PCINC79	-.5323	-.5311	-.4847	-.4503	-.0914	-.5199	-.2456	-.4528	-.3646	-.4153	-.4661
MEDINC	-.7967	-.7906	-.7553	-.6985	-.1230	-.8233	-.3681	-.7011	-.6081	-.6922	-.7133

Table J.5 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 140 Entitlement Cities, Population Between 50,000 and 75,000, ALT8 to ALT14

	PRESENT	ALT1	ALT2	ALT4	ALT8	ALT9	ALT10	ALT11	ALT12	ALT13	ALT14
FACTOR1	.9826	.9063	.8495	.7847	.0605	.9848	.3945	.8481	.7513	.8441	.8511
FACTOR2	-.0555	.2775	.4586	.5325	.7998	.1028	.7558	.3545	.5320	.4334	.3725
FACTOR3	-.0186	.1622	.1744	.2236	.4523	-.0437	.3923	.2166	.2464	.1799	.2105
FACTOR4	.1423	.2541	.1638	.1972	.3349	.0092	.3048	.2879	.2207	.1756	.2687
FACTOR5	-.0502	-.1694	-.1482	-.1807	-.3187	.0004	-.2869	-.2506	-.2642	-.2194	-.2348
P65AGED	.0572	.3421	.4493	.5125	.7187	.1370	.6946	.4083	.5178	.4336	.4163
PCRIME	.2568	.1539	.1198	.0823	-.1912	.2506	-.0857	.0942	.0354	.0878	.0986
PNW	.8438	.7045	.6139	.5427	-.1279	.8076	.1636	.6237	.4940	.5947	.6241
PWOHSED	.5264	.6675	.6240	.6406	.4967	.4705	.6098	.6813	.6335	.6138	.6742
PFEMALHP	.8864	.8498	.8181	.7657	.1286	.9091	.4297	.7930	.7191	.7950	.7997
PYUTHPOV	.9726	.8750	.8023	.7340	.0070	.9581	.3371	.8082	.6951	.7926	.8099
PPOORPER	.9778	.9218	.8839	.8229	.1076	.9997	.4421	.8611	.7785	.8665	.8676
POCRWD	.7958	.6188	.4500	.3796	-.2216	.6635	.0294	.5551	.3699	.4680	.5398
PWOPLUMB	.8054	.8153	.7795	.7451	.2318	.8051	.4867	.8541	.8197	.8691	.8448
PUNEMP75	.2910	.3550	.3070	.3150	.2432	.2322	.2992	.3497	.2980	.2888	.3439
DENSITY	-.0690	.0987	.1063	.1549	.4072	-.1002	.3322	.1474	.1725	.1065	.1412
POWNOCCH	-.2211	-.3753	-.4138	-.4404	-.4397	-.2503	-.4824	-.4000	-.4330	-.3987	-.4035
PMULTI	-.1755	.0754	.1374	.2082	.5823	-.1608	.4689	.1568	.2423	.1459	.1541
PAGE1939	.0541	.4462	.5549	.6475	.9896	.1122	.9300	.5505	.6753	.5513	.5530
PNEWSTR	-.1911	-.4978	-.5666	-.6332	-.8140	-.2243	-.8106	-.5714	-.6480	-.5596	-.5725
PCINC72	-.7219	-.7213	-.6759	-.6439	-.1860	-.7065	-.4115	-.6862	-.6138	-.6610	-.6868
MEDINC	-.8350	-.8622	-.8462	-.8128	-.2796	-.8583	-.5481	-.8205	-.7660	-.8162	-.8274

Table J.6 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 72 Entitlement Cities, Population Between 75,000 and 100,000, ALT8 to ALT14

	PRESENT	ALT1	ALT2	ALT4	ALT8	ALT9	ALT10	ALT11	ALT12	ALT13	ALT14
FACTOR1	.9554	.8204	.7507	.6837	.2357	.9684	.4142	.7027	.5777	.6815	.7138
FACTOR2	.1372	.5905	.7445	.7864	.8646	.3566	.8644	.6897	.8277	.7837	.7019
FACTOR3	-.0067	.2333	.2610	.2968	.4260	.0075	.3914	.2720	.2991	.2512	.2712
FACTOR4	.3397	.4703	.3668	.3859	.4168	.1845	.4193	.5046	.4137	.3951	.4829
FACTOR5	.3581	.1156	.0554	.0040	-.2533	.3306	-.1641	-.0288	-.1296	-.0649	-.0144
P65AGED	.2306	.6574	.7622	.8024	.8694	.3801	.8736	.7377	.8267	.7840	.7449
PCRIME	.4814	.3060	.2051	.1643	-.0662	.3896	.0193	.1940	.0636	.1184	.1967
PNW	.7031	.4360	.3117	.2465	-.1193	.6099	.0158	.2847	.1174	.2078	.2905
PWOHSED	.6102	.7406	.6943	.6879	.5416	.5859	.6158	.7485	.6865	.7091	.7421
PFEMALHP	.9242	.8349	.7670	.7091	.3025	.9304	.4675	.7226	.6002	.6905	.7331
PYUTHPOV	.9596	.7639	.6640	.5915	.1321	.9295	.3114	.6231	.4677	.5761	.6326
PPOORPER	.9531	.8673	.8210	.7584	.3201	.9994	.4978	.7513	.6444	.7422	.7663
POCRWD	.6339	.3109	.0963	.0409	-.2422	.3850	-.1428	.2022	-.0209	.0572	.1848
PWOPLUMB	.3811	.6242	.6324	.6492	.6249	.4077	.6556	.7417	.7646	.7627	.7259
PUNEMP75	.2238	.3516	.3367	.3474	.3427	.2076	.3562	.3515	.3266	.3153	.3503
DENSITY	-.0567	.1813	.2059	.2448	.3983	-.0538	.3535	.2128	.2369	.1823	.2125
POWNOCCH	-.1853	-.3877	-.4405	-.4546	-.4493	-.2706	-.4667	-.3977	-.4306	-.4158	-.4067
PMULTI	-.0535	.3241	.4017	.4549	.6446	.0219	.5945	.4134	.4948	.4274	.4131
PAGE1939	.2045	.7043	.7883	.8457	.9911	.3052	.9697	.8250	.9084	.8443	.8220
PNEWSTR	-.4224	-.7458	-.7594	-.7862	-.7894	-.4521	-.8152	-.7912	-.7906	-.7657	-.7889
PCINC72	-.7062	-.6401	-.5531	-.5150	-.2398	-.6502	-.3527	-.5862	-.4742	-.5373	-.5829
MEDINC	-.8225	-.8224	-.7855	-.7432	-.4092	-.8576	-.5503	-.7582	-.6776	-.7490	-.7660

Table J.7 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 94 Entitlement Cities, Population Between 100,000 and 250,000, ALT8 to ALT14

	PRESENT	ALT1	ALT2	ALT4	ALT8	ALT9	ALT10	ALT11	ALT12	ALT13	ALT14
FACTOR1	.9514	.8118	.7484	.6719	.0979	.9633	.3317	.6748	.5406	.6618	.6906
FACTOR2	.0860	.5099	.6772	.7302	.8301	.2897	.8354	.6214	.7781	.7186	.6340
FACTOR3	.1252	.3628	.3492	.3901	.5100	.0852	.4899	.4327	.4294	.3798	.4201
FACTOR4	.0782	.2341	.1478	.1863	.3442	-.0647	.3000	.2897	.2258	.1751	.2663
FACTOR5	.3817	.2367	.2030	.1561	-.1320	.3858	-.0245	.1217	.0446	.1111	.1364
P65AGED	.1230	.3922	.4620	.4969	.5583	.2041	.5641	.4621	.5278	.4890	.4642
PCRIME	.3330	.3827	.3440	.3389	.2277	.2994	.2843	.3578	.3006	.3134	.3570
PNW	.6056	.5710	.4289	.3544	-.1298	.6980	.0558	.4200	.2253	.3363	.4235
PWOHSED	.5180	.6393	.5778	.5788	.4396	.4581	.5188	.6381	.5587	.5692	.6304
PFEMALHP	.8809	.7957	.7510	.6868	.1740	.9073	.3875	.6796	.5691	.6733	.6951
PYUTHPOV	.9292	.7531	.6744	.5944	.0209	.9210	.2503	.6001	.4504	.5743	.6158
PPOORPER	.9553	.8636	.8223	.7517	.1891	.9946	.4232	.7378	.6239	.7384	.7558
POCRWD	.6287	.3394	.1214	.0582	-.2920	.3979	-.1685	.2188	-.0198	.0708	.2028
PWOPLUMB	.4400	.6419	.6622	.6717	.5546	.4851	.6313	.7525	.7795	.7874	.7401
PUNEMP75	.1045	.2808	.2877	.3148	.3803	.1014	.3749	.3152	.3206	.2877	.3118
DENSITY	.0459	.3089	.3123	.3605	.5267	.0207	.4891	.3776	.3903	.3285	.3679
POWNOCCH	-.3251	-.5210	-.5330	-.5496	-.5008	-.3478	-.5474	-.5504	-.5483	-.5359	-.5499
PMULTI	.0505	.3634	.3924	.4463	.6215	.0577	.5855	.4660	.5096	.4433	.4553
PAGE1939	.1264	.6201	.7124	.7677	.9914	.2120	.9642	.7631	.8626	.7729	.7577
PNEWSTR	-.3394	-.7014	-.7434	-.7872	-.8239	-.3866	-.8540	-.7890	-.8239	-.7787	-.7846
PCINC73	-.5831	-.6043	-.5645	-.5387	-.2672	-.5750	-.3897	-.5586	-.4839	-.5313	-.5621
MEDINC	-.7960	-.8000	-.7823	-.7368	-.3111	-.8433	-.4974	-.7192	-.6430	-.7219	-.7334

Table J.8 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 31 Entitlement Cities, Population Between 250,000 and 500,000, ALT8 to ALT14

	PRESENT	ALT1	ALT2	ALT4	ALT8	ALT9	ALT10	ALT11	ALT12	ALT13	ALT14
FACTOR1	.9141	.7261	.5632	.4345	-.2103	.9542	-.0015	.5430	.2763	.4456	.5506
FACTOR2	-.5660	-.1206	.2467	.3565	.7041	-.3617	.6235	.0415	.3960	.2633	.0711
FACTOR3	.4795	.7132	.6317	.6406	.4986	.3509	.5741	.7463	.6424	.6502	.7364
FACTOR4	.4138	.7072	.6582	.6835	.5961	.2907	.6583	.7809	.7204	.7114	.7702
FACTOR5	.3193	.2551	.2558	.2012	-.0772	.4154	.0137	.1257	.0433	.1056	.1453
P65AGED	-.1092	.2827	.4263	.5059	.6889	-.1083	.6637	.4373	.5911	.5089	.4395
PCRIME	.3869	.5012	.4880	.4688	.2602	.3934	.3456	.4863	.4274	.4631	.4908
PNW	.9218	.7262	.4766	.3602	-.2137	.8424	-.0293	.5581	.2354	.3895	.5513
PWOHSED	.5532	.7895	.7974	.7823	.5030	.5668	.6256	.7733	.7047	.7405	.7835
PFEMALHP	.7092	.7197	.7062	.6230	.1111	.8293	.2920	.5717	.4309	.5409	.5959
PYUTHPOV	.8496	.6960	.5723	.4528	-.1599	.9169	.0407	.5141	.2790	.4349	.5268
PPOORPER	.9356	.7921	.6552	.5296	-.1290	.9967	.0889	.6056	.3506	.5163	.6179
POCRWD	.8893	.6523	.3158	.2089	-.2842	.6978	-.1312	.5214	.1592	.3042	.4966
PWOPLUMB	.4240	.6284	.5792	.5826	.4342	.3443	.5084	.7666	.7433	.7745	.7465
PUNEMP75	.2423	.4882	.5469	.5637	.4752	.2612	.5312	.5118	.5245	.5148	.5212
DENSITY	.2631	.6160	.6465	.6905	.6774	.1956	.7185	.6974	.7061	.6697	.6961
POWNOCCH	-.4792	-.7048	-.6809	-.6780	-.4774	-.4371	-.5717	-.7015	-.6230	-.6417	-.7047
PMULTI	.2738	.6379	.6904	.7319	.6967	.2350	.7464	.7150	.7360	.7031	.7177
PAGE1939	-.1248	.4372	.6731	.7781	.9886	-.0738	.9702	.6215	.8438	.7335	.6342
PNEWSTR	-.0512	-.5177	-.7067	-.7759	-.8412	-.1152	-.8644	-.6369	-.7873	-.7192	-.6523
PCINC73	-.6758	-.6237	-.5191	-.4414	-.0020	-.6876	-.1521	-.5189	-.3405	-.4477	-.5234
MEDINC	-.8643	-.7465	-.6146	-.5030	.0914	-.9059	-.1066	-.5939	-.3625	-.5128	-.6020

Table J.9 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 21 Entitlement Cities, Population Between 500,000 and 1,250,000, ALT8 to ALT14

	PRESENT	ALT1	ALT2	ALT4	ALT8	ALT9	ALT10	ALT11	ALT12	ALT13	ALT14
FACTOR1	.9591	.7337	.6004	.4943	-.1052	.9642	.1082	.4980	.2392	.3804	.5167
FACTOR2	-.3286	.1768	.4208	.5116	.8078	-.1583	.7380	.4094	.6618	.5720	.4133
FACTOR3	.1690	.5275	.5591	.6127	.7152	.1286	.7116	.6269	.6351	.5876	.6194
FACTOR4	.5488	.7172	.6652	.6613	.4897	.4948	.5753	.6983	.5816	.6056	.6967
FACTOR5	.1980	.2912	.2910	.2931	.2348	.1970	.2671	.2246	.1717	.1671	.2362
P65AGED	-.0347	.4620	.6060	.6866	.8951	.0260	.8613	.6941	.8424	.7752	.6839
PCRIME	.2108	.4704	.5096	.5381	.5432	.2201	.5669	.5313	.5371	.5192	.5306
PNW	.7836	.6182	.4524	.3790	-.0441	.6933	.1079	.4011	.1357	.2273	.4113
PWOHSED	.6704	.7157	.6777	.6358	.2969	.6951	.4344	.5857	.4394	.5025	.6032
PFEMALHP	.8586	.8529	.8058	.7389	.2615	.9131	.4477	.6721	.4871	.5836	.6967
PYUTHPOV	.9560	.7221	.5865	.4793	-.1217	.9599	.0915	.4710	.2060	.3461	.4916
PPOORPER	.9711	.8440	.7446	.6519	.0772	.9993	.2902	.6447	.4140	.5448	.6638
POCRWD	.8828	.5762	.3493	.2487	-.2684	.7570	-.0927	.3495	.0384	.1666	.3513
PWOPLUMB	.1041	.3914	.4606	.4990	.5581	.1354	.5628	.6307	.7316	.7248	.6071
PUNEMP75	.0691	.3547	.3989	.4440	.5471	.0569	.5353	.4904	.5383	.5039	.4785
DENSITY	.0781	.5058	.5917	.6582	.8090	.0868	.7921	.6577	.7284	.6700	.6507
POWNOCCH	-.2564	-.5795	-.6137	-.6522	-.6762	-.2441	-.6993	-.6316	-.6196	-.5889	-.6321
PMULTI	.1253	.5466	.6276	.6896	.8124	.1352	.8060	.6694	.7217	.6667	.6662
PAGE1939	.0769	.6041	.7559	.8319	.9856	.1562	.9760	.7778	.8968	.8316	.7784
PNEWSTR	-.2155	-.6991	-.8272	-.8863	-.9504	-.2923	-.9718	-.8363	-.9147	-.8715	-.8392
PCINC7a	-.5328	-.4573	-.4365	-.3788	-.0275	-.6027	-.1568	-.3251	-.2164	-.2951	-.3443
MEDINC	-.8927	-.7667	-.6830	-.5947	-.0528	-.9338	-.2527	-.5898	-.3868	-.5126	-.6075

Table J.10 Coefficients of Correlation Between (1) Per Capita Amounts and (2) Per Capita Need Scores and Need Variables, 26 Entitlement Cities, Population Greater than 500,000, ALT8 to ALT14

	PRESENT	ALT1	ALT2	ALT4	ALT8	ALT9	ALT10	ALT11	ALT12	ALT13	ALT14
FACTOR1	.9431	.7026	.5716	.4639	-.1135	.9554	.0877	.4818	.2385	.3809	.4988
FACTOR2	-.3327	.1724	.4305	.5127	.7636	-.1298	.7073	.3804	.6354	.5517	.3906
FACTOR3	.1594	.4986	.4901	.5427	.6560	.0656	.6442	.5722	.5465	.4916	.5626
FACTOR4	.4173	.6384	.6195	.6282	.5287	.3836	.5872	.6195	.5399	.5395	.6232
FACTOR5	.1249	.1857	.1863	.1868	.1480	.1263	.1683	.1208	.0808	.0741	.1318
P65AGED	-.0385	.4740	.6146	.6924	.8841	.0209	.8543	.6886	.8292	.7599	.6810
PCRIME	.1788	.3517	.3582	.3744	.3642	.1632	.3837	.3944	.3823	.3735	.3910
PNW	.7440	.6010	.4455	.3786	.0001	.6561	.1352	.3905	.1416	.2217	.4015
PWOHSED	.5895	.7017	.6946	.6649	.3879	.6349	.5037	.5880	.4775	.5209	.6084
PFEMALHP	.8417	.8396	.7976	.7295	.2685	.9063	.4447	.6619	.4893	.5833	.6873
PYUTHPOV	.9478	.7099	.5781	.4706	-.1073	.9587	.0943	.4684	.2163	.3552	.4885
PPOORPER	.9614	.8214	.7241	.6283	.0672	.9993	.2704	.6279	.4092	.5414	.6466
POCRWD	.8773	.5583	.3171	.2193	-.2611	.7282	-.1010	.3469	.0365	.1613	.3442
PWOPLUMB	.1235	.3656	.4211	.4471	.4640	.1561	.4782	.5981	.6903	.6984	.5737
PUNEMP75	-.0126	.2359	.2931	.3322	.4319	-.0004	.4152	.3018	.3473	.3056	.3022
DENSITY	.0617	.4597	.5103	.5728	.7229	.0286	.7008	.5521	.5816	.5146	.5488
POWNOCCH	-.2534	-.5225	-.4974	-.5310	-.5629	-.1696	-.5760	-.5655	-.5141	-.4834	-.5581
PMULTI	.1401	.5219	.5458	.6027	.7220	.0816	.7109	.6244	.6315	.5756	.6157
PAGE1939	.0606	.6131	.7642	.8391	.9856	.1397	.9763	.7672	.8813	.8101	.7713
PNEWSTR	-.1751	-.6799	-.8096	-.8688	-.9396	-.2525	-.9553	-.7975	-.8760	-.8239	-.8042
PCINC72	-.5001	-.4371	-.4398	-.3827	-.0463	-.6014	-.1684	-.3175	-.2365	-.3137	-.3367
MEDINC	-.8532	-.7098	-.6384	-.5471	-.0238	-.9165	-.2117	-.5467	-.3690	-.4967	-.5645

Appendix K

COMPARISON WITH OTHER STUDIES

In this appendix we compare our methodology and results with those of other researchers and, where possible, evaluate each formula allocation using their techniques. Included are studies by (1) the Institute For the Future, (2) Richard DeLeon and Richard LeGates on the equity of CDBGs in California, and (3) Richard Nathan on central city hardship.

Institute for the Future Study

In its study of the allocation formula for general revenue sharing, the Institute for the Future constructed an evaluation index which measured a city's need for revenue sharing funds by considering its service requirements, its tax effort, and its fiscal capacity.[1/] The general form of the evaluation index was

$$\frac{\text{Service Requirements} \times \text{Tax Effort}}{\text{Ability}}$$

Each of the three components was expressed in index form; the service requirements index was a composite of per capita need indexes for six categories of public expenditure.

In this section we examine for 77 entitlement cities, the distribution of per capita amounts under hold harmless, the present formula, and the seven alternative formulas in terms of seven indexes developed by the Institute for the Future. The correlations are presented in Table K.1. Abbreviations and definitions are as follows:

EVALINDX	evaluation index = (SRINDEX x TAXEFORT) / ABILITY
ABILITY	index of fiscal capacity based on per capita sales value of taxable property
TAXEFORT	tax effort index based on per capita non-education taxes

1/ Schmid, G., Lipinski, H. and Palmer, M. An Alternative Approach to General Revenue Sharing: A Needs-Based Allocation Formula, Institute for the Future, June, 1975.

Table K.1: Coefficients of Correlation Between (1) Indexes Developed by the Institute For The Future and (2) Per Capita Amounts under Hold Harmless, the Present Formula, and Eight Alternative Formulas, 77 Entitlement Cities

	Hold Harmless	PRESENT	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7
EVALINDX	.47	.51	.66	.64	.68	.65	.67	.62	.62
ABILITY	-.26	-.44	-.51	-.52	-.50	-.50	-.45	-.42	-.43
TAXEFORT	.30	.16	.33	.33	.38	.36	.44	.42	.42
SPINDEX	.48	.82	.88	.82	.88	.79	.75	.65	.67
SSINDEX	.50	.86	.94	.91	.93	.88	.81	.72	.74
HEALTHI	.40	.77	.79	.74	.77	.70	.63	.54	.56
CRIMEI	.45	.68	.72	.65	.72	.62	.60	.50	.52
RECI	-.01	.67	.37	.19	.31	.10	.00	-.15	-.13

SRINDEX	service requirements index which is a composite of need indexes for six public expenditure categories: social service, health, crime, transportation, environment, and recreation. Factor analysis was used to develop each of the six public need indexes.
SSINDEX	social service index based on a factor analysis of PPOORPER, POCRWD, PWOHSED, PYUTHPOV, POVAGE65, PFEMALHP, and other measures of social service recipients.
HEALTHI	health index based on a factor analysis of variables that indicate a high demand for public health services (e.g., P65AGED, PYUTHPOV).
CRIMEI	crime index based on a factor analysis of total serious crimes and variables associated with high crime such as PNW, PWOHSED, and PFEMALHP.
RECI	recreation index to measure relative variation in terms of the demand for parks and other recreation facilities. Need variables input into the factor analysis included P65AGED, MEDINC, DENSITY, and POCRWD.

In general, the hold harmless correlations shown in the first column of Table K.1 are higher than those reported in Tables 5.9 and 5.10 of Chapter 5; however, only with tax effort does hold harmless show a higher correlation than the present formula and all of the alternatives completely dominate hold harmless. The case for choosing one of the alternative formulas to replace the present formula is given support by the correlations for EVALINDX; in fact, ALT1 dominates the present formula in all cases except RECI. Somewhat surprising are the higher absolute correlations of some alternatives with both ABILITY and SSINDEX as compared with those of the present formula. Despite these differences, the correlations reported in Table K.1 are quite consistent with our earlier results.

Redistribution Effects of CDBGs in California

Richard DeLeon and Richard LeGates conducted a cross-sectional analysis of the redistribution effects of the change from the categorical to the CDBG system for 79 California cities. [2/] They begin by discussing six types of need that should be addressed by CD assistance. First, their deprivation theory argues for channeling subsidies to the oldest and most physically deteriorated cities with the highest concentrations of poverty, substandard houses, and social problems. Their minority enrichment theory views urban problems as race problems and would channel CD funds to areas of greatest minority concentration. Their growth support theory would direct CDBGs to growth centers in need of infrastructure support. Their triage theory would concentrate CDBGs in viable, but declining areas rather than those best off or beyond hope. Their fiscal equalization and resource redistribution theories focus upon disparities in fiscal capacity and would reward those cities with the lowest capacity and greatest tax effort. Finally, their dispersal theories argue that aid should be distributed to relatively affluent, suburban communities to underwrite costs of their absorbing a more equitable share of low income housing. In their analysis of how well the CDBG system matches resources to areas of need as compared with the categorical system, the authors emphasize race, economic and housing deprivation, growth, and fiscal capacity and effort.

The authors first divide the 79 cities into new phase-in cities (HH equals zero), other phase-in cities, and phase-down cities, and compute, for each group of cities, average percentages for socioeconomic variables that reflect the type of need being considered. For example, poverty, aged housing, and overcrowded housing were used to characterize cities according to economic and housing deprivation. This is the method we used in Table 5.6 of Chapter 5 when we compared the present CDBG system with the displaced categorical system in terms of gainers and losers. From their analysis of average percentages for need variables, the authors conclude that the present CDBG formula fails to match resources to need as defined under any of the theories outlined above; with respect to economic and housing deprivation they state that "needs as defined by deprivation theory are not met as the formula disfavors older, more overcrowded, poorer areas with high composite measures of housing deprivation." However, as we emphasized in Chapter 5, the fact that phase-down cities or losers under the present formula are more needy than phase-in cities does not necessarily mean that the present system is inequitable, or less equitable than the categorical system. To reach any equity con-

2/ DeLeon, R. and LeGates, R. Redistribution Effects of Special Revenue Sharing for Community Development, April, 1976.

Table K.2: Correlation Coefficients Between Selected Variables and CD Assistance, 68 California Cities

	(1) Total HH	(2) Total Present Formula	(3) Per Capita HH[a]	(4) Per Capita Present Formula	(5) Per Capita ALT1[b]	(6) Per Capita ALT2[c]
PPOORPER	.34	.21	.55	.95	.95	.91
POCRWD	.12	.09	.36	.69	.42	.17
PAGE1939	.44	.26	.30	.43	.74	.85
PAGE1949	.38	.23	.36	.48	.74	.81
PCINC70	.30	.06	-.31	-.61	-.36	-.20
MEDINC	-.18	-.09	-.43	-.84	-.78	-.71
UNEMP75	.27	.18	.31	.67	.61	.53
PWOHSED	.14	.09	.30	.67	.55	.39
PFEMALHP	.34	.22	.56	.92	.84	.74
PWOPLUMB	.57	.29	.32	.47	.67	.70

a. A correlation analysis of the 56 cities with positive hold harmless (HH) amounts yielded similar results.

b. ALT1 formula weights are: .2 POP, .4 POORPER, .2 AGE1939, and .2 OCRWD.

c. ALT2 formula weights are: .25 POP, .5 POORPER, and .25 AGE1939.

clusions, one has to examine the distribution of funds over all cities and, in the case of the categorical system, justify the wide range in per capita amounts. In Chapter 5, we concluded that the large differences in per capita assistance to these three groups of cities under the categorical system could not be justified on the basis of differences in need variables and that the redirection of CD assistance from the more needy, phase-down cities was necessary in order to properly recognize the need that exists in the less needy, phase-in cities. In other words, under the categorical system, the gap between the per capita amounts of phase-in and phase-down cities was too large. On the other hand, we did mention that such gainer/loser comparisons may identify important dimensions of CD need (e.g., aged housing) that are not included in the existing formula.

DeLeon and LeGates also used correlation analysis to compare the present formula system with the categorical system in terms of matching CD assistance to areas of need. They correlate several percentage and per capita need variables with total assistance under both the categorical system and the CDBG formula system. Their most important conclusion was "in comparative terms the CDBG system does a poorer job of matching resources to needs than did the categorical assistance." Coefficients of correlation between need variables (expressed in either percentage or per capita terms) and total aid under the categorical system were consistently stronger than those obtained under the CDBG formula system. Their conclusion is the opposite of that we reached in Chapter 5 based on the correlation coefficients reported in Tables 5.9 and 5.10. They obtain different results because they correlate percentage variables with total amounts instead of with per capita amounts. This is shown clearly in Table K.2 which gives correlations between (1) need variables expressed in percentage form and (2) both total and per capita levels of CD assistance for the 68 California cities included in our entitlement city file. The pattern of correlation coefficients in columns (1) and (2) of our Table K. 2 is similar to that reported by DeLeon and LeGates in their Table 7 for variables that reflect economic and housing deprivation and for per capita income. The conclusion that the CDBG system does a poorer job of matching need to levels of assistance follows from the lower correlation coefficients in column (2) of Table K.2.

We think that if the need variables used in the correlation analysis are expressed in either percentage or per capita terms, then the assistance amounts should be in per capita terms instead of being expressed in total amounts as is done by DeLeon and LeGates and in columns (1) and (2) of Table K.2. Extended to its extreme, the reasoning behind correlating percentage need variables with total aid amounts would support allocating to Anniston, which has a population of 31,533, a larger CDBG amount than to New York City, which has a population of 7,895,563, simply because Anniston has a higher poverty percentage than New York City. In columns (3) and (4) of Table K.2, we compare the categorical with the present system in terms of correlations between percentages of need variables and per capita amounts and the results are completely opposite to those obtained by DeLeon and LeGates and those reported in columns (1) and (2). The coefficients show the present formula (column 4) to be more responsive to need than the categorical system (column 3). This agrees with our conclusion in Chapter 5. In fact, except for aged housing and without plumbing, the correlations under the present formula are all above 0.5. The correlations given in columns (5) and (6) for ALT1 and ALT2 show how the correlations change if pre-1939 housing is added to the formula.

Hardship Cities

Richard Nathan chooses to compare cities on the basis of differences in the severity of social problems within the city's own boundaries in relation to the adjacent suburbs. 3/ Nathan uses data for 58 large SMSA's to identify those central cities that have a high city-to-suburb hardship ratio and are also politically and fiscally isolated. A city is considered to be politically and fiscally isolated if the suburbs are large in relation to the central city and no structural reform measures exist to spread the central city burden to the suburbs. The city-suburb hardship ratios are constructed so that an index figure over 100 denotes that the central city is disadvantaged in relation to the balance of its SMSA, the higher the figure the greater the disadvantage. Hardship ratios are computed for six measures: unemployment, dependency, education, income, crowded housing, and poverty. For example, the central city is disadvantaged relative to the suburbs if the city's unemployment rate is greater than that of the suburbs. For per capita income, where a higher amount is a desirable characteristic, the suburban amount was divided by the central city amount. Nathan found some comparative disadvantage in three-fourths of the fifty-eight cities examined. Many of the most disadvantaged central cities were located in the northeast and midwest and the better off central cities were located in the south and far west.

Our ranking of cities by levels of distress was based on measurements for individual cities as compared with each other. Nathan, on the other hand, tries to identify those disadvantaged

3/ Nathan, Richard. "The Record of the New Federalism: What It Means for the Nations' Cities," report submitted to PD&R, Dept of HUD September 30, 1974.

Table K.3: Correlation Coefficients Between Nathan's Hardship Ratios and Selected Variables, 58 Central Cities[a]

	(1) Composite Central City Disadvantage index[b]	(2) Rate of Unemployment	(3) Dependency ratio[c]	(4) Limited education ratio[d]	(5) Crowded Housing ratio[e]	(6) Low-income family ratio[f]	(7) Per Capita income (balance of SMSA as percent of central city)	(8) Population ratio[g]
DENSITY	.48	.36	-.01	.51	.45	.56	.48	-.24
PAGE1949	.46	.44	.04	.56	.13	.59	.44	-.45
PPOORFAM	.41	.37	.19	.21	.53	.34	.43	.03
PPOORPER	.40	.36	.18	.24	.49	.34	.41	.00
POCRWD	.35	.24	.29	.13	.59	.19	.37	.18
PNW	.55	.47	.36	.29	.69	.40	.53	.06
PWOHSED	.65	.55	.43	.44	.52	.60	.67	-.15
PUNEMP75	.31	.23	.15	.24	.16	.37	.38	-.45
PCINC70	-.44	-.35	-.40	-.28	-.32	-.28	-.55	-.06
PYUTHPOV	.48	.42	.36	.24	.56	.38	.46	.15

a. Hardship ratios are from Table 1 and Table A of Nathan's article. The hardship ratios in columns (2)-(6) are each computed by dividing the central city figure by the figure for the SMSA balance.
b. This central city disadvantage ratio is a composite of the six hardship ratios
c. Persons less than eighteen or over sixty-four years of age as percent of total population
d. Percent of persons twenty-five years of age or older with less than twelfth grade education
e. Percent of occupied housing units with more than one person per room.
f. Percent of families below 125 percent of low-income level
g. Central city population divided by total SMSA population

central cities where a flight to the suburbs and political isolation would prevent the city from spreading its fiscal burden and doing something about its social problems. In this section we evaluate the different formula distribution in terms of the hardship ratios developed by Nathan. A positive correlation between per capita funds and hardship ratios is desirable because, in this case, CDBGs will be directed to those cities that are under a constant threat of a flight to the subsurbs. However, first we attempt to determine whether or not a high percentage for a need variable is associated with a high hardship ratio for that need variable; in other words, within this group of our largest central cities, does an above average poverty percentage automatically mean an above average hardship ratio, defined as the percentage of poverty in the central city divided by that percentage for the balance of the SMSA. If the distribution of each need or formula variable is positively and strongly correlated with the distribution of the corresponding hardship ratio, there is no need to re-evaluate the formulas in terms of Nathan's hardship ratios. On the other hand, if the individual city measurements are not associated with hardship ratios, and if we assume that distributing CDBGs according to Nathan's hardship ratios is one objective of the CDBG program, then it is necessary to evaluate each formula in terms of the distribution of hardship ratios as well as in terms of the distribution of city need variables. In this latter case, one criterion for selecting new formula variables would be a significant correlation with the set of hardship ratios. In Table K.3 we present the correlation coefficients between need variables and Nathan's hardship ratios. A positive correlation between a need variable and a hardship ratio indicates that cities with above average percentages for the need variables tend to have above average hardship ratios. For example, the 0.69 correlation coefficient in column (5) indicates that for this group of central cities, an above average percentage of nonwhites is associated with an above average overcrowded housing ratio. Somewhat surprising in Table K.3 is the rather low correlation (0.34) of PPOORPER with the low-income family ratio; this means that the poverty percentage cannot be used to predict the extent to which a central city is disadvantaged relative to its suburbs with respect to low-income families. An examination of the 58 cities on a regional basis indicated that central cities in the South had higher poverty percentages but lower hardship ratios than central cities in other regions. In other words, with respect to poverty, central cities in the South are more similar to their suburbs than are central cities in the other regions.

Column (1) presents correlations between the need variables and a composite of the six hardship ratios. The five variables exhibiting the highest correlations are PWOHSED (0.65), PNW (0.55), PYUTHPOV (0.48), DENSITY (0.48), and PAGE1949 (0.46). Column (8) presents correlations between the need variables and the population ratio, defined as the central city population divided by the total SMSA population. According to Nathan, a low population ratio indicates that the central city is politically and fiscally isolated. The worst situation for a central city is a set of high hardship ratios coupled with a low population ratio; in this case, the central city will not have the political strength to attempt regional solutions to its problems and any city solutions will encourage a flight to the suburbs. For our purposes the most important point in column (8) is the high negative correlation (-0.45) between PAGE1949 and the population ratio. [4/] This means that central cities with the highest percentages of housing units built before 1949 also tend to be the most politically and fiscally isolated. Coupled with the 0.46 correlation between PAGE1949 and the composite index in column (1), this also means that age of housing stock is a good proxy for both of the conditions that Nathan uses to identify high levels of central city distress--high hardship ratios and a low population ratio. An examination of the 58 cities indicated that most of the cities with low population ratios were located in the Northeast and North Central regions, both of which are characterized by an aged housing stock.

Table K.4 shows the correlation coefficients between Nathan's hardship ratios and per capita allocations under the present formula and the seven alternatives. As shown in column (1) of Table K.4, the coefficient for each alternative formula is greater than the 0.42 for the present formula. This means that, compared to the present formula, each alternative allocates higher per capita amounts to those cities with above average hardship ratios. The coefficients in column (8) indicate that each alternative formula is more highly correlated than the present formula with political and fiscal isolation, as defined by a low percent of total SMSA population living in the central city. In this case, the 0.03 correlation coefficient for the present formula is insignificant.

4/ A data error required our using PAGE1949 instead of PAGE1939

Table K.4: Correlation Coefficients Between Nathan's Hardship Ratios and Per Capita Formula Allocations, 58 Central Cities[a]

	(1) Composite Central City Disadvantage Index	(2) Rate of Unemployment	(3) Dependency ratio	(4) Limited education ratio	(5) Crowded Housing ratio	(6) Low-income family ratio	(7) Per Capita Income (balance of SMSA as percent of central city)	(8) Population ratio
PRESENT	.42	.35	.20	.22	.60	.33	.43	.03
ALT1	.57	.50	.19	.46	.54	.56	.57	-.25
ALT2	.53	.50	.14	.49	.37	.57	.53	-.36
ALT3	.58	.51	.18	.49	.52	.58	.58	-.30
ALT4	.52	.49	.12	.52	.32	.58	.52	-.41
ALT5	.57	.51	.15	.55	.41	.61	.57	-.42
ALT6	.46	.44	.07	.53	.17	.56	.45	-.50
ALT7	.47	.44	.08	.53	.18	.56	.46	-.49

a. See Footnotes at end of Table K.3