The Impact of CDBG Spending on Urban Neighborhoods

U.S. Department of Housing and Urban Development
Office of Policy Development and Research

The Impact of CDBG Spending on Urban Neighborhoods

Prepared for:
U.S. Department of Housing and Urban Development
Office of Policy Development and Research
Washington, DC

Prepared by:
Chris Walker
Chris Hayes
George Galster
Patrick Boxall
Jennifer Johnson

The Urban Institute
Washington, DC

October 2002

ACKNOWLEDGMENTS

We wish to thank the following members of the National Neighborhood Indicators Partnership for the use of data resources: The Boston Foundation; the Center on Urban Poverty and Social Change (Cleveland); United Way of Central Indiana/Community Service Council (Indianapolis); the Urban Strategies Council (Oakland); and the Providence Plan. We also wish to thank community development and city planning officials in Boston, Cleveland, Columbus, Houston, Milwaukee and Washington, DC, for their cooperation in the verification of our results. At the Urban Institute, Noah Sawyer, Seon Joo Lee and Diane Hendricks provided valuable assistance.

FOREWORD

The largest of HUD's formula block grant programs, with an annual appropriation of approximately $5 billion, the Community Development Block Grant (CDBG) program is administered by more than 1,000 metropolitan cities and urban counties and 50 State governments, which have great discretion in how they spend their funds.

The study examines whether readily available data sources can be used to track the outcomes of activities funded with CDBG. The study concludes that two readily available data elements---median home loan amount and the number of businesses-hold some promise as tools for helping local communities measure the effects of concentrated CDBG expenditures, but that additional research is needed to verify the utility and clarify the limitations of this methodology. The study is likely to be of greatest interest to researchers and local communities interested in measuring the impact of concentrated CDBG (and other community development) investments at the neighborhood level.

Given the local flexibility afforded States and local governments under formula block grants such as CDBG, the impacts of such programs are difficult to measure, particularly at the national programmatic level. Different performance measures might be needed for different types of investments. Other factors complicating measurement of the effects of CDBG expenditures include the strong effects of such external factors as the economy and interest rates and the fact that neighborhoods are also affected by significant investments of non-CDBG funds.

The analysis presented in this study is a good first step in identifying a relationship between CDBG spending and measurable improvements in neighborhood quality, but this initial work does not support the use of this methodology as the basis for a national performance measure applicable to all CDBG programs. Even as HUD continues to refine its research in this area, the measures developed here may be useful to local communities interested in assessing their own community development performance and in furthering their understanding of the neighborhood effects of past CDBG investments.

Harold L. Bunce
Deputy Assistant Secretary for
Economic Affairs

TABLE OF CONTENTS

LIST OF EXHIBITS

EXECUTIVE SUMMARY
THE IMPACT OF CDBG SPENDING ON URBAN NEIGHBORHOODS

Background of the Study

In 1992, the United States Congress passed the Government Performance and Results Act (GPRA), which was intended to increase the effectiveness and accountability of Federal programs by requiring agencies to measure the results of their program expenditures. Throughout the government, agencies are obliged to devise performance indicators, benchmarks and targets and apply these to the programs they administer. This research was intended to help the Department of Housing and Urban Development develop and test a variety of performance measures for its flagship urban improvement program—the Community Development Block Grant Program (CDBG).

The CDBG Program allocates Federal funding to States, cities and urban counties according to a formula based on population, poverty, age of the housing stock and other needs factors. Established in 1974, the CDBG program departed from earlier, categorical models of federal government support for urban redevelopment because it "entitled" cities and urban counties to a block of funds, to be spent at local option, but within broad guidelines established by Congress. Because the Congress viewed cities and counties as the best judges of their own community development priorities and the best designers of the best ways to pursue these priorities, the program has left almost all program decision-making up to local governments.

The program design allows HUD little influence over local choices of goals and strategies (although it requires HUD to exercise some oversight over local government capacity to administer community development programs). Nevertheless, GPRA obliges HUD to specify performance goals for all of the programs it administers, including CDBG. These goals can be found in HUD's five-year strategic and annual performance plans. Strategic Objective 4.2 of the Department's FY 2000 – 2006 Strategic Plan reflects one commonly pursued community development goal: "Disparities in well-being among neighborhoods are reduced." Many localities use CDBG funds to accomplish this goal, and to help determine whether this overall objective had been achieved, the FY 2001 Annual Performance Plan specified Outcome Indicator 4.2.1.7 - "Neighborhoods with substantial levels of CDBG investment will show improvements in such dimensions as household income, employment, business activity, homeownership and housing investment." This research aimed to test one reasonable approach to developing these and other indicators and using them to assess CDBG program performance.

Valid, reliable, and commonly accepted measures of neighborhood "improvement" or "substantial investment" are not easily derived. The dimensions of improvement specified in the Outcome Indicator

are reasonable ones, but not the only ones that community development practitioners might adopt. In addition, the Department recognizes that in many instances, neighborhood improvement is the product of myriad inter-related factors, of which CDBG spending is only one. Community development practitioners understand that large-scale investments over a long period of time often are necessary to overcome decades of residential and commercial market decline. But some neighborhoods may respond much more readily than others to public investment; e.g., those that continue to hold some attraction for investors of private capital because of unique locational advantages or a stable cadre of moderate-income residents.

Recognizing that development of valid, reliable, and generally accepted performance indicators was not straightforward, and to help it meet its obligations under GPRA, HUD requested this study to examine the extent to which CDBG investments were correlated with outcomes measurable through generally-available data sources. Specifically, HUD requested that the study

- Develop a methodology for determining "substantial" investment of CDBG funds;
- Identify specific neighborhoods with substantial investments of CDBG resources between 1995 and 2000;
- Develop a methodology to track changes in neighborhood characteristics over a similar time period as the investment; and,
- Report on progress made in these neighborhoods.

Central to the request is that the study use readily available data, and that the methodology be replicable every two to three years.

Research Approach

We intended this research to accomplish four primary goals. The first goal was to develop a small number of readily available, generally accepted and easily replicable indicators of neighborhood quality of life suitable for an assessment of CDBG impacts. Our analysis strategy was to identify the few indicators that *were* valid, reliable, and routinely collected and to see if these were correlated with (or were related to) other indicators that were good measures of neighborhood quality, but were *not* readily available. If we found strong relationships between these two groups of variables, we would feel confident in using the former set as proxy indicators of neighborhood quality.

Our second goal was to develop a definition of "substantial" CDBG investments in a neighborhood to allow development of performance standards that could be fairly applied to neighborhoods expected to show some neighborhood result. We aimed to create a definition grounded in analysis, avoiding arbitrary assignment of a performance standard pegged to expenditure levels or a statistical standard of relative spending across census tracts. We planned to do this by identifying CDBG investment thresholds, above which spending produces significantly greater improvements in neighborhood outcomes (Threshold levels are defined for different neighborhood and city socio-economic conditions).

Our third goal was to recommend alternative standards or benchmarks against which to assess the performance of neighborhoods that have received substantial levels of CDBG investments. We wanted to develop a set of standards tied to different city and neighborhood conditions because we should not expect that the same level of CDBG investment would have the same effect on neighborhood quality in a stable, moderately distressed neighborhood as would be needed in a severely blighted and worsening neighborhood.

Our fourth goal was to compare the study's results with local informant's understanding of the impact of CDBG on their neighborhoods in the late 1990's. This involved testing the reasonableness of our proposed categorization of neighborhoods or tracts into "out-performing" and "under-performing" with local officials and neighborhood representatives in four of the 17 cities including in this study.

Overall Results

In general, we found that larger CDBG investments are linked to improvements in neighborhood quality in the 17 cities studied for this project. Additionally, we found that two indicators – one reflecting residential mortgage lending activity and the other reflecting business and employment – are good proxy measures of some (but not all) dimensions of neighborhood quality. The data underlying these measures – median loan amount from Home Mortgage Disclosure Act data and number of businesses from Dun and Bradstreet – are readily available for all CDBG grantees, are inexpensive compared to other comparable sources of information, and are strongly related to aspects of neighborhood quality uncovered through extensive analysis of numerous other indicators.

Our finding of an overall relationship between CDBG spending and neighborhood quality improvements in the study sites is encouraging given the substantial gaps in our information about the effects of the CDBG program. But this initial study was not broad enough to conclusively prove that CDBG investments are positively correlated with specified measurable results. Among other issues, the study does not reflect a nationally representative sample of jurisdictions. It also does not account for the effects of other public investments, including earlier CDBG investments. Most neighborhoods receiving CDBG funding between 1994 and 1996 had been funded in earlier years, potentially including all of the years since program inception in 1974. We did not measure this spending, but the changes in neighborhood

quality we observed could have resulted from this earlier spending *in addition to* the later spending we could measure. Moreover, rarely is CDBG spending the only public investment in neighborhoods, which could include other HUD programs (HOME, most notably), other Federal programs (Low-Income Housing Tax Credits, for example), and numerous sources of State, county, and local government programs to fund infrastructure and other investments and deliver public safety and other programs.

In the course of developing the performance measure described in this report, a number of decisions were made that might affect the results. For example, we used CDBG spending *per poor resident* as a measure of CDBG investment, thus tying CDBG spending to the size of the target population in each neighborhood. We could have adopted some other measure—for example, CDBG spending per low-and-moderate income person, or CDBG spending per capita -- that might have changed our results. We also excluded neighborhoods receiving less than the $86,737 average level of annual CDBG spending between 1994 and 1996 across the 17 cities. (This is roughly the price of a single renovated housing unit.) We could have adopted a more or less restrictive standard than this one, which also might have changed the results.

Our conversations with four cities included in our analysis yielded somewhat mixed results. Local informants were not able to resoundingly endorse or completely refute any of the proposed performance measures. In fact, local informants agreed with just 27 percent of our categorizations of neighborhood performance.

Although the aggregate verification results of the local site visits are mixed, they do reveal that the performance measures based on the median loan amount indicator are more likely to conform to the views of local practitioners than the performance measures that use the number of businesses in a tract. In other words, from the local informants' perspective, the median loan amount indicator does a better job overall of capturing the impact of the program than does the number of businesses indicator.

Conclusions and Recommendations

The analysis presented here is a good first step in identifying a relationship between CDBG spending and measurable improvements in neighborhood quality. The performance measures we developed have the considerable virtue of simplicity, ready availability, and intuitive plausibility. Moreover, the performance standards we developed require the analysis of only two variables—CDBG spending and one of two performance indicators (either median loan amount or number of businesses).

As with any performance measure or set of measures, however, they are subject to endemic problems of data suitability, arbitrary specifications of standards, and inability to account for all factors that affect the relationship between community development investments and neighborhood outcomes. A follow-up research project could address some of these problems through the following modifications:

- *Inclusion of all entitlement grantees (and therefore, many more neighborhoods to analyze) and measurement of both CDBG spending and neighborhood change over a longer period of time*. This analysis might result in a non-arbitrary cut-off for inclusion of neighborhoods into the performance system, rather than the above-average investment standard used here. This cut-off could be established through more sophisticated statistical techniques that would identify a point where CDBG investments produce accelerated improvements to neighborhood quality.

- *Continued improvements and upgrades to HUD's management systems to allow better tracking of CDBG expenditures.* The Department already has plans to complete IDIS data cleaning and update of user protocols, ensuring more complete geographic coverage of the system. HUD also is improving the quality of the data it collects. (It should be noted that, by block grant standards, HUD's IDIS data system already is quite good; information on the community services block grant is paltry, by comparison.)

- *Increasing the numbers of neighborhoods that fall into each of the neighborhood categories constructed to yield more statistically significant relationships between CDBG expenditures and neighborhood quality indicators*. This would allow construction of neighborhood-appropriate standards for many more classes of neighborhoods than we could produce in this research.

- *Inclusion of expenditures under Federal HOME program, Low-Income Housing Tax Credit, and HOPE VI programs.* Including other expenditures of community development funding in a neighborhood in addition to CDBG investments would constitute a more realistic (if still incomplete) measure of community development investments.

Even an enhanced performance measurement system would face problems in measurement and application, however. For example:

- Any use of CDBG data will require adoption of decision-rules to allocate spending to neighborhoods, which will risk misallocation of spending to: (a) a single neighborhood when it benefits multiple census tracts, (b) multiple neighborhoods when it benefits a single tract, primarily, and (c) an entire tract when it benefits only a small portion within it.

- No system would be able to take account of the local expenditures on infrastructure, police and fire protection, public education, or other municipal services that certainly contribute to neighborhood quality.

- Only a far more complex and data-dependent system than constructed here could take account of the multiple objectives CDBG administrators pursue and which are not reflected in measures of

neighborhood quality. Most problematic are investments intended to preserve or expand the supply of affordable housing in neighborhoods experiencing rapid increases in home prices and rents. In this example, CDBG investments are expected to help *suppress* increases in median loan amount—one of our best indicators of neighborhood quality.

In view of these limitations, perhaps the best way to think about the design and use of a performance measurement system such as that developed here would be as a tool to help communities interested in assessing their own community development performance.

Local administrators contacted for this study expressed considerable interest in the goals of the research. Although they would resist the application of a Federal standard that might entail sanctions for "poor" performance in relation to a specific statistical standard that limits the range of objectives for their block grant funds, they nevertheless would welcome a process of setting benchmarks by which they could assess their own progress in improving low-income neighborhoods. This is an area of public investment that has not, to our knowledge, ever developed such benchmarks. What are reasonable expectations for neighborhood change? How much investment is required to produce it, and under what circumstances? And where have neighborhoods performed better than expected and what can we learn about the strategies and supporting factors that produced this result? This research only begins to answer these questions, but we are convinced that it is a promising beginning.

CHAPTER 1
STUDY PURPOSES AND RESEARCH METHODOLOGY

Background of the Study

In 1992, the US Congress passed the Government Performance and Results Act (GPRA), intended to increase the effectiveness and accountability of Federal programs by requiring agencies to measure the results of their program expenditures. Throughout the government, agencies are obliged to devise performance indicators, benchmarks and targets and apply these to the programs they administer. This research was intended to help the Department of Housing and Urban Development design and test several performance measures for its flagship urban improvement program—the Community Development Block Grant Program (CDBG).

The CDBG Program allocates Federal funding to States, cities and urban counties according to a formula based on population, poverty, age of the housing stock and other needs factors. Established in 1974, the CDBG program departed from earlier, categorical models of federal government support for urban redevelopment because it "entitled" cities and urban counties to a block of funds, to be spent at local option, but within broad guidelines established by Congress. Because the Congress viewed cities and counties as the best judges of their own community development priorities and the best designers of the best ways to pursue these priorities, the program has left almost all program decision-making up to local governments.

The program design allows HUD little influence over local choices of goals and strategies (although it requires HUD to exercise some oversight over local government capacity to administer community development programs). Nevertheless, GPRA obliges HUD to specify performance goals for all of the programs it administers, including CDBG. These goals can be found in HUD's five-year strategic and annual plans, and the Department's Strategic Objective 4.2 reflects one commonly pursued community development goal: "Disparities in well-being among neighborhoods are reduced." Many localities use CDBG funds to accomplish this goal, and to help determine whether this overall objective had been achieved, HUD specified Outcome Indicator 4.2.1.7 - "Neighborhoods with substantial levels of CDBG investment will show improvements in such dimensions as household income, employment, business activity, homeownership and housing investment." This research aimed to test one reasonable approach to developing these and other indicators and using them to assess CDBG program performance.

Purpose of the Research

Valid, reliable, and commonly accepted measures of measures of neighborhood "improvement" or "substantial investment" are not easy to arrive at. The dimensions of improvement specified in the

Outcome Indicator are reasonable ones, but not the only ones that community development practitioners might adopt. In addition, the Department recognizes that in many instances, neighborhood improvement is the product of myriad inter-related factors, of which CDBG spending is only one. Community development practitioners understand that large-scale investments over a long period of time often are necessary to overcome decades of residential and commercial market decline. But some neighborhoods may respond much more readily than others to public investment; e.g., those that continue to hold some attraction for investors of private capital because of unique locational advantages or a stable cadre of moderate-income residents.

Recognizing that development of valid, reliable, and generally accepted performance indicators was not straight-forward, and to help it meet its obligations under GPRA, HUD requested this study to:

- Develop a methodology for determining "substantial" investment of CDBG funds;
- Identify specific neighborhoods with substantial investments of CDBG resources between 1995 and 2000;
- Develop a methodology to track changes in neighborhood characteristics over a similar time period as the investment; and,
- Report on progress made in these neighborhoods.

Central to the request is a provision that the study use readily available data, and that the methodology be replicable every two to three years. In this chapter, we discuss our overall approach to the research as well as the individual steps we took to develop and test candidate performance measures. In the following chapters, we describe these steps in more detail. In the discussion, we adhere to the following definitions:

Performance indicator. A variable used to measure neighborhood outcomes likely to be influenced by the expenditure of CDBG funds. Examples from this research include median residential mortgage loan amount or number of business establishments.

Performance. (or comparison) group. A group of neighborhoods held to be similar in some way for purposes of comparing relative performance within the group. An example includes neighborhoods with declining real estate prices in cities with declining employment levels. We establish comparison groups to ensure that performance standards reflect the relative difficulty of achieving

	community development outcomes in different city and neighborhood contexts.
Performance standard.	The benchmarks or break points that allow analysts to distinguish among neighborhoods that "out-perform," "under-perform" or meet expected levels of performance. For example, in this research, we establish performance standards in relation to the expected increase in median residential home mortgage amounts in a census tract given an annual average level of CDBG spending in the tract, for tracts with "substantial" amounts of CDBG spending.
Performance measure.	The performance indicators, comparison groups, and standards that allow analysts to assess the relative performance of neighborhoods for monitoring, evaluation, or technical assistance purposes.
Performance measurement System	The performance standards and procedures for acquiring information, constructing and applying performance measures, and communicating results to decision-makers.

The overall goal of this research was to develop and test several performance measures that might form the basis for a future performance measurement system.

Research Approach

We intended this research to accomplish three primary goals. First was to develop a small number of powerful, easily replicable indicators of neighborhood quality of life suitable for an assessment of CDBG impacts. Some candidate indicators perform better than others, but there are tradeoffs in their use. For example, some indicators are readily available for all neighborhoods but may not be particularly good proxies for other indicators (or groups of indicators) that are less easily available, but are generally accepted measures of change. Other indicators may work well for some types of communities and neighborhoods, but not others.

Second, we aimed to develop a definition of "substantial" CDBG investments in a neighborhood to allow development of performance standards that could be fairly applied to neighborhoods expected to show some neighborhood result. We aimed to create a definition grounded in analysis, avoiding arbitrary assignment of a performance standard pegged to expenditure levels or a statistical standard of relative spending across census tracts. We planned to do this using a special type of analysis ("spline" regression analysis) that would fix a point beyond which CDBG expenditures begin to show demonstrably greater effects on neighborhood outcomes than spending short of that point.

Third we aimed to recommend alternative standards of performance for neighborhoods where substantial CDBG investments had taken place. We wanted to develop a set of standards tied to different comparison groups defined by city and neighborhood conditions. We did this because we should not expect that the same level of CDBG investment would have the same effect on neighborhood quality in a stable, moderately distressed neighborhood as would be needed in a severely blighted and worsening neighborhood.

Detailed Description of Study Methods

Our methodology consisted of the following steps:

1. Select 17 cities for analysis, classified by the richness (and availability) of the data that can be assembled for their neighborhoods, and develop and assess a parsimonious, robust set of indicators covering the period from 1994 to 1999.

2. Define "substantial" CDBG investments in a neighborhood between 1994 and 1996 by using statistical techniques (spline regression analysis) to identify CDBG investment *thresholds*, above which spending produces significantly greater improvements in neighborhood outcomes. (Threshold levels will be defined for different neighborhood and city socio-economic conditions.)

3. Establish performance standards based on the statistical analysis of the relationship between CDBG spending and neighborhood outcomes, then conduct field investigations in 6 of the 17 cities to check the validity and appropriateness of the standards.

Each of these steps is explained in detail below.

Step 1: Select 17 cities for analysis, classified by the richness (and availability) of the data that can be assembled for their neighborhoods, and develop and assess a parsimonious, robust set of indicators covering the period from 1994 to 1999.

Federal performance standards and repeated application of these standards in a performance measurement system must rely on indicators that are **universally available, reliably and frequently collected, and generally accepted as valid** measures of neighborhood quality. Unfortunately, most potential indicators, however valid as measures of neighborhood quality, are of uneven quality and are not consistently collected across cities. For example, each city's government and nonprofit agencies collect statistics on crime, public health, education, real estate values, or other aspects of community social and economic condition. As shown by growing participation in the Urban Institute's National Neighborhood Indicators

Project, local universities, city governments and nonprofit organizations are becoming increasingly active in their attempts to acquire, combine and analyze these data.[1]

But the data are not collected and stored in the same way in each city, although they have the considerable virtue of including many factors that contribute to neighborhood health. The US Census Bureau collects information on many of these same indicators (but not, for example, on crime) but this is done infrequently. Other data, such as the home mortgage lending data reported to the Federal government by financial institutions, *are* consistently collected and reported each year, but they do not cover all transactions and include only one aspect of neighborhood change.

Therefore, our first task was to identify indicators that passed tests of **universal availability, reliable and frequent collection, and general acceptance** and that could be used to construct a performance measure. Our analysis strategy was to identify the few indicators that *were* valid, reliable, and routinely collected and to see if these are correlated with (or were related to) other indicators that were good measures of neighborhood quality, but were *not* readily available. If we found strong relationships between these two groups of variables, we would feel confident in using the former set as proxy indicators of neighborhood quality.

To accomplish this result, we established two groups of cities: five Type I Cities—those with the largest number of indicators currently available, but only at considerable expense[2] and 12 Type II cities—those with limited number of indicators currently available with little expense for all cities. Type I cities contain all of the data in the Type II cities, but with the addition of data drawn from the National Neighborhood Indicators Partnership (NNIP) communities—those participating in an Urban Institute-managed effort to assemble local area data, often in real-time and from administrative records to support new kinds of neighborhood analysis.

---

[1] The National Neighborhood Indicators Partnership (NNIP) is a collaborative effort by the Urban Institute and local partners to further the development and use of neighborhood-level information systems in local policymaking and community building. NNIP is described in greater detail in Chapter 2.

[2] We initially identified a third group of six cities—those participating in the 1999 prototype American Community Survey (data available in late 2000)—but unfortunately tract-level data was not available from the ACS in time for this project, and it is unclear how reliable any neighborhood indicators from the ACS will be, since multi-year averages will be used to produce small-area estimates.

Exhibit 1.1
Classification of Cities By Type of Small-Area Data Available

Type of City	Types of Data Available
Type 1: "Data Rich" Cities Boston, Cleveland, Oakland, Indianapolis, Providence	National Neighborhood Indicators Partnership (NNIP) data on welfare use, building permits, health conditions, fertility rates, crime, and other data from administrative records acquired and maintained by members of NNIP. Coverage and quality varies by community. Most data available at address level, in real-time.
Type II: "Generic Data" Communities Birmingham, Charlotte, Columbus, Denver, Fort Lauderdale, Houston, Long Beach (CA), Los Angeles, Milwaukee, Portland, Tulsa, Washington, DC	Home Mortgage Disclosure Act (HMDA) data on mortgage loan amounts, number of applications, loan approval rates, percent loans for home purchase. Data Quick, Inc. data on home sales prices Dun & Bradstreet data on number of businesses and their number of jobs, total annual sales.

Our selections of Type I sites was constrained by the number of NNIP cities with good quality data for the time period of interest. We had considerable latitude in sampling Type II sites. For this group, we wanted a range of grantee sizes to fairly test prototype performance indicators, and a wide range of neighborhood contexts to test the robustness of our operational definition of "substantial" CDBG spending thresholds.

In the five Type I cities we augmented the administrative data forming the core of the NNIP databases with home mortgage data (from HMDA), property sales (from DataQuick) and number of establishments, jobs, and sales (from Dun and Bradstreet). We then conducted factor analyses on each of the resulting

Type I city databases to find out whether any of the indicators available in Type I cities might capture significant variation in key dimensions of quality of life. In other words, we sought to find indicators that are currently available at little expense for all cities that serve as good proxies to more comprehensive sets of indicators currently available only at significant expense and for a few cities. These are our parsimonious, robust indicators.

Step 2: Define "substantial" CDBG investments in a neighborhood between 1994 and 1996 by identifying CDBG investment *thresholds*, above which spending produces significantly greater improvements in neighborhood outcomes. (Threshold levels are defined for different neighborhood and city socio-economic conditions.)

Congress authorized creation of the CDBG program to accomplish a variety of community development objectives, including more rational utilization of land, reduction of the isolation of income groups, improvement of the quantity and quality of public services, and others specified in the Housing and Community Development Act of 1974. Many, if not most, local policymakers and community development practitioners have understood the variety of these objectives in terms of neighborhood improvement: an increase in the overall quality of neighborhoods as experienced by those who reside within them, and as measured by various demographic, economic, and social indicators. It is worth emphasizing, however, that the enabling legislation does not specify that CDBG expenditures are required to "improve neighborhoods."

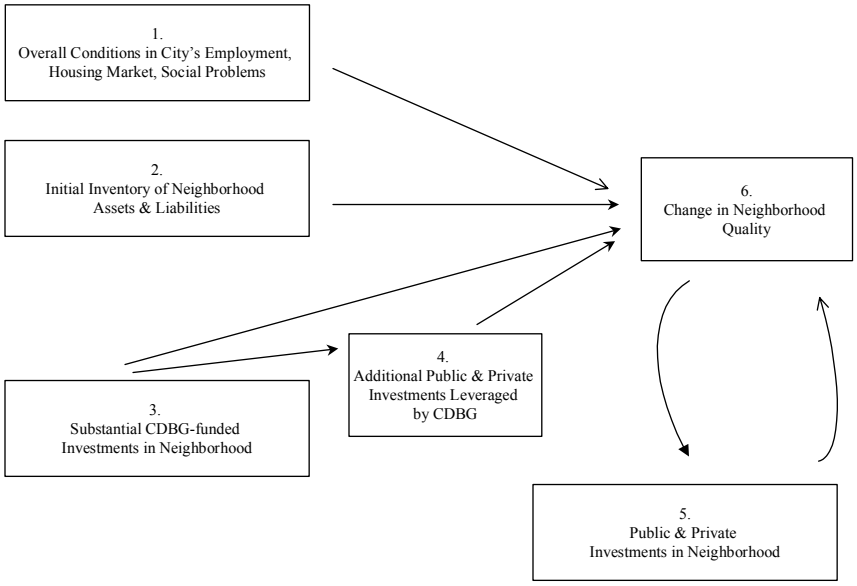
CDBG investments can produce neighborhood improvements directly and indirectly. CDBG investments improve neighborhoods *directly* by renovating the housing stock, creating or upgrading community facilities and public infrastructure, and other activities that immediately create value in neighborhoods. CDBG spending improves neighborhoods *indirectly* by investing in one or a series of projects that encourage private investors to view CDBG-funded neighborhoods as places where favorable economic returns can be generated. Many community development practitioners argue that a "critical mass" of improvements is needed to trigger changes in the perception of investment prospects, but that once critical mass is achieved, the pace of neighborhood improvement accelerates. Neighborhoods undergoing rapid gentrification are extreme examples of this phenomenon. (Much the same happens in rapidly declining neighborhoods, only in reverse.)

This critical mass of investment represents a threshold or trigger point, after which relationships between CDBG investment and neighborhood improvement alters dramatically for the better. This notion of thresholds has been explored in a variety of other settings, including racial transition (Schelling), neighborhood crime (Wilson) and other fields where "tipping points" have been observed (Gladwell). These thresholds are difficult, but not impossible, to measure empirically. For example, spline regression

analysis, described in more detail below, has been used in previous research to identify trigger points in other relationships. (Johnston, 1984; Galster and Quercia, 2000; Galster, Quercia, and Cortes, 2000).[3]

Figure 1.2 illustrates how the concept of a trigger point or threshold applies to CDBG investments. It depicts a model of the relationships that influence changes in neighborhood quality (box 6), including the direct influence of CDBG-funded investments (boxes 3 and 4) and their indirect effect on other public and private investments (box 5). In other words, in the best case, CDBG investments indirectly trigger a virtuous cycle in which other public and private investments improve neighborhood quality, which induces further public and private investment and so on. We expect, however, that the "productivity" of CDBG investments is affected by overall conditions in the city (box 1) and initial neighborhood conditions (box 2).

Exhibit 1.2
Paths of Possible CDBG Impact on Neighborhood Quality



Not all CDBG investments can be expected to produce *either* direct or indirect effects. In view of the myriad other factors that inhibit neighborhood improvement or further neighborhood decline, and the distressed condition of many low-and-moderate income neighborhoods, most community development practitioners do not expect that small amounts of CDBG dollars could be expected to induce *any* neighborhood change, let alone jump start a cycle of private market renewal. For this reason, the

[3] Rarely do researchers investigate phenomena that do not conform to a simple mathematical function. However, in this case, spline is the ideal method for investigating unknown threshold relationships.

Department requested us to specify a "substantial" level of investment, above which its effect on neighborhoods could be fairly tested. In pursuing this analysis, we aimed to define "substantial" as the "threshold level" of CDBG investment that is required to accelerate the pace of neighborhood change possible from a given amount of CDBG spending.

To operationalize "substantial," we set out to identify a statistical threshold—the point where the relationship between two variables changes dramatically (Quercia and Galster, 1997; Galster and Quercia, 2000). In this case, our threshold was the point at which the relationship between increasing CDBG expenditures and improving neighborhood outcomes (e.g., as measured by residential property values) turns sharply positive compared to a previously established trend. Put another way, we sought the trigger point at which neighborhood quality "takes off" with increased levels of CDBG expenditure.

Any other cutpoint, threshold, or standard of "substantial" (e.g., expenditures more than twice the mean expenditure) would necessarily be arbitrary. We wished to avoid setting an arbitrary point because it would be more difficult to defend from criticism that we set the point too low, thereby including neighborhoods with little prospect of improvement given the meager amounts of CDBG funds invested, or that we set it too high, thereby failing to apply a standard to many (if not the majority) of neighborhoods in which CDBG investments took place.

We also sought to define "substantial" in terms of particular types of neighborhoods and cities, on the expectation that declining cities or neighborhoods might require larger amounts of CDBG expenditures to produce an observable affect on neighborhood quality than would growing-cities or already-improving neighborhoods. In other words, "substantial" can only be operationalized contingently, i.e., for a particular neighborhood, city and metropolitan-wide context.

Step 3: Develop performance standards or benchmarks against which to assess the performance of neighborhoods that have received substantial levels of CDBG investment.

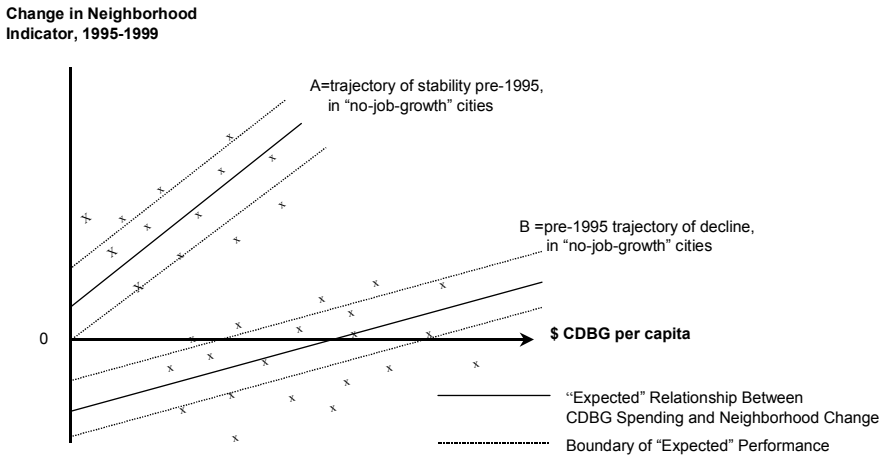
Our final step in the analysis is to use the relationships established in step 2 to develop performance standards that can then be applied program-wide (for the moment, in the 17 cities) and to individual cities (based on the performance of neighborhoods within cities). We suggest alternative performance standards, pegged to different city and neighborhood socio-economic conditions at the beginning of the study period. They are low enough to permit some percentage of neighborhoods to "pass" the performance test, but not so low as to permit most or all neighborhoods to do so.

As the report will describe, we could not identify statistical thresholds that could be used as a basis for establishing a performance standard. As an alternative, we used the relationships between CDBG spending and neighborhood quality to define a standard for three classes of neighborhoods in three types of cities to define standards for each. These standards were based on the difference between a census

tracts "expected" value given the amount of CDBG investment it received, based on the statistical model, and its actual value. Neighborhoods (census tracts) that exceeded the expected value by a specified amount were declared to "out-perform" the group, those falling short of the expected value by a specified amount were declared to "under-perform" the group, and the remainder were taken to have performed as expected.

To illustrate, Figure 1.3 shows how neighborhoods in two cities (represented by an X) might be plotted according to the amount of CDBG spending per capita that went into the neighborhood and the change in a neighborhood indicator. A regression procedure will, of course, fit a line through these plotted points, and the slope of the line will minimize the sum of the squared differences from the line to each neighborhood observation. Thus, the line will represent how the "average" city in each category performs in translating CDBG resources into improvements in the indicator. The boundary lines we draw around the average, then, represent our "standard"—the points above which, and below which, we declare neighborhoods to be out-performing or under-performing their counterparts in the same category.

Exhibit 1.3
Procedure for Defining Performance Standards



To test the reasonableness of this approach for individual cities, we conducted conversations with local informants in four CDBG communities. We used these interviews to determine whether the "high-performing" and "low-performing" neighborhoods we identified through regression analysis were so-viewed by people with on-the-ground perspectives of how these neighborhoods had changed. We also were interested in any alternative measures that local officials and other community development practitioners would propose. Finally, and for those neighborhoods that passed both statistical and local

intuitive tests of high or low performance, we wanted to elicit information on the factors that produced these results.

CHAPTER 2
SOURCES OF DATA ON CDBG INVESTMENTS AND NEIGBHORHOOD CHANGE

Analysis of the influence of CDBG spending on neighborhoods requires, obviously, measures of CDBG spending on the one hand and neighborhood indicators on the other. This section describes the sources of data used for each of these categories of data. We explain the strengths and limitations of the CDBG data in some detail, because the selection of communities for this analysis and the analysis results were sensitive to the quality of the CDBG data drawn from HUD's automated management system.

Selection of Cities for Analysis

Because of the cost of CDBG and neighborhood quality data acquisition and preparation, we conducted this analysis on 17 cities, selected to ensure the widest possible range of data availability, cover all US regions, ensure differences across cities in metropolitan area job growth (a proxy for overall economic health) and include larger cities with some variation in CDBG investments across census tracts within cities.

To select communities, we constructed a matrix consisting of (1) four census regions and (2) four categories of metropolitan area job growth between 1994 and 1997. Using data from the HUD's State of the Cities 2000 report, potential cities were considered "no-growth, "low-growth," "moderate-growth" or "high-growth" based upon the percentage change in number of jobs from 1994 to 1997. Broken into quartiles, no-growth cities had a reported job growth of between –11.8% and 1.5%, low-growth cities had a reported job growth between 1.7% and 6%, moderate-growth cities had a reported job growth between 6.1% and 10.2%, and high-growth cities had a reported job growth of 10.4% or greater.

Our sample frame is shown in Exhibit 2.1. For each city we also report CDBG allocations for 2000. Some cities for which data quality was high were chosen with certainty. For example, five cities were selected because of the availability of data from the NNIP datasets (Providence, Indianapolis, Boston, Cleveland and Oakland). Initially, we assumed that four additional cities (Fort Lauderdale, Columbus, Houston and Portland) would have high quality data because they were test sites for the American Community Survey. Although ACS data was not available for these cities at the time of analysis, they were retained in the sample.

The remaining eight cities were selected to fill in gaps in the survey frame, based on the availability of CDBG data, level of CDBG spending and geographic location. When a city was selected for the sample from an underrepresented cell, preference was given for cities with higher CDBG allocations, although some were dropped because of problems with home price data (most Texas cities, for example). On that

basis, Washington, Los Angeles, Birmingham, Milwaukee, Denver, Long Beach, Tulsa and Charlotte were selected. Because of data problems, Fort Lauderdale was dropped from the sample just before the selection process; however, the problems were resolved and we were able to include it in the analysis.

Exhibit 2.1
City Sampling Frame
City and 2000 Entitlement Allocation by Census Region and Job Growth Quartile

Quartiles % Change Jobs, City	**Northeast**	**CDBG $** (millions)	**Midwest**	**CDBG $** (millions)	**South**	**CDBG $** (millions)	**West**	**CDBG $** (millions)
Quartile 1	Philadelphia	69.1	Detroit	51.2	Baltimore	29.7	*Los Angeles*	89.8
No growth/	Buffalo	21.1	*Milwaukee*	22.2	*Washington*	23.5	Honolulu	13
decline	Rochester	11.7	Cincinnati	16.7	New Orleans	19.8	Salt Lake City	4.8
-11.8 to 1.5	**Providence**	**7.3**	St. Paul	10	Miami	12.7	Riverside	3.5
	Worcester	5.7	Toledo	9.7	Richmond	6	Cheyenne	0.6
	Hartford	4.9	Akron	8.4	Shreveport	3.8		
	Burlington	1.1	Dayton	8.2	Columbia	1.5		
			Des Moines	5.1	*Fort Lauderdale*	**2.7**		
			Grand Rapids	4.8				
Quartile 2	Pittsburgh	21.2	Fort Wayne	3.3	El Paso	12.4	*Denver*	11.6
Low growth	**Boston**	24.8	Chicago	107.5	Louisville	11.9	*Long Beach*	9.3
1.7 - 6.0	New York	220.9	Kansas City, KS	3.3	*Birmingham*	8.3	Stockton	5
			St. Louis	27.5	Jackson	3.6	Spokane	4.6
			Minneapolis	17	Mobile	3.4	San Bernardino	3.9
			Cleveland	**30.1**	Arlington, TX	2.9	Tacoma	3.4
			Kansas City, MO	11.4	Montgomery	2.9	Modesto	2.5
					Arlington, VA	2.2	Anchorage	2.3
					Charleston	1.4	Boise City	1.3
							Billings	
Quartile 3	Portland, ME	2.5	Omaha	6.3	*Houston*	*35*	**Oakland**	**10.3**
Moderate growth	Manchester	2.2	Wichita	3.8	Dallas	19.1	Fresno	8.2
6.1 - 10.2	Newark	11.4	Lincoln	2.2	Atlanta	12.1	Tucson	7.6
					Memphis	11.1	San Francisco	24.9
					Jacksonville	8.5	Seattle	14.8
					Fort Worth	7.7	San Diego	18.2
					Norfolk	6.9	Albuquerque	5.3
					Baton Rouge	5.8		
					Nashville-Davidson	5.8		
					Corpus Christi	4.9		
					Tulsa	4.8		
					Lubbock	3.2		
					Lexington-Fayette	2.7		
					Knoxville	2.5		
					Newport News	2.1		
Quartile 4	Jersey City	8.5	Fargo	0.85	San Antonio	20.1	Santa Ana	8.2
High growth			Sioux Falls	1.0	Austin	8.1	*Portland, OR*	11.8
10.4 - 48.8			Madison	2.5	Oklahoma City	6.3	Bakersfield	2.8
			Columbus, OH	**8.5**	Tampa	4.8	San Jose	12.6
			Indianapolis	**11.8**	*Charlotte*	4.7	Anaheim	4.7
					Virginia Beach	3.0	Phoenix	15.3
					St. Petersburg	3	Colorado Springs	3.1
					Wilmington	3	Mesa	3.5
					Columbus, GA	2.7	Las Vegas	4.1
					Orlando	2.4		
					Raleigh	2.4		
					Little Rock	2.2		
					Greensboro	2		

Note: City names in bold were pre-selected for the sample based on data quality; names in italics completed the sample.
Source: HUD's State of the Cities 2000; HUD CDBG Data Tracking System

Characteristics and Quality of CDBG Data from HUD Data Systems

The success of any system to assess CDBG program performance at the neighborhood level rests in large part on accurate depiction of the amounts and location of CDBG spending. The study's critical first step was to examine the quality of the CDBG data available from HUD's automated systems, particularly as it pertained to spatial distribution of CDBG expenditures. We then identified the steps required to update, correct, or otherwise amend these data using records obtained directly from CDBG grantees.

Despite our best efforts, the CDBG data used in this analysis contain errors that undermine, but not seriously, our ability to construct performance measures. Several limitations in HUD's administrative data systems impeded this effort, including uneven data coverage across the study years and a lack of information on the geographic location of particular CDBG activities. The impact of these shortcomings on our analysis, and the general utility of HUD administrative data for the proposed performance measures, will be examined further below and is one subject of our on-site validation. There follows here a brief review of the measures of CDBG activity developed for this research, and a description of the approach used to construct a database including these measures.

Data Sources and Coverage

We used HUD's Integrated Disbursement and Information System (IDIS), other administrative data maintained by HUD, and, as necessary, direct contact with CDBG grantees to construct a database of CDBG neighborhood expenditures. In this section, we discuss the quality of data used to construct one of the principal variables used in this analysis — annual CDBG spending from 1994 – 1996 but also show subsequent years to inform any future use of these data for performance measurement purposes. Years 1994 – 1996 were selected to be sufficiently prior to our outcome indicators to take into account lag effects; multiple years were selected to fill in gaps in both CDBG spending and reporting.

The Integrated Disbursement and Information System (IDIS) data system is used by State and local governments to draw down funds and report activities under several Office of Community Planning and Development (CPD) grant programs, including CDBG. The system resides on HUD's mainframe computer and consists of numerous relational data tables, several of which were employed for this project, including: the Drawdown Transaction table indicating the date and amount of funds requested by grantees for CDBG activities; the Activity table with top-level information about CDBG activities including program eligibility, national objective, and address; and the CDBG Area Census Tract and Block Groups table with specific tract location information for low and moderate income area benefit activities. IDIS was phased-in starting in 1996; however, most CDBG grantees did not go on-line with IDIS until the 1997 program year.

Prior to the phase-in of IDIS, HUD compiled information on CDBG program activities from electronic or hard copy versions of the Grantee Performance Report (GPR). Like IDIS, the GPR database contained information on the eligibility, national objective, and location of CDBG activities. It also contained summary financial information on the amount of funds spent on each activity during each annual reporting period, and cumulatively.

Our principal measure of neighborhood CDBG spending was the annual average of program expenditures 1994 through 1996, by census tract. We preferred a three-year lag between the CDBG investment and our outcome indicator (1999), and expenditures were averaged over three years to help ensure significant investments were captured. The measure was developed for census tracts in each of the 17 sampled entitlement communities and included expenditures on activities that directly benefit low- and moderate-income families such as housing rehabilitation, service provision, or economic development, as well as area-wide activities such as infrastructure improvements and public facilities.[4] The measure excluded general program administration and planning expenditures, since this type of spending cannot be associated with particular neighborhoods. The study period was defined by program year, which sometimes starts midway through the calendar year, depending on the grantee.

Database Construction

Three main steps were involved in developing the database of CDBG expenditures for this research: compiling data from different administrative data sources, geocoding activities' locations, and attributing expenditures to particular tracts. There follows a brief description of each of these steps.

Compiling program data. One of the major challenges with any analysis of the CDBG program for the years covered by the study is the problem of missing data. No single data system has comprehensive information on CDBG expenditures for 1994 through 2000 due to the implementation of IDIS midway through this period. IDIS data are available for the entitlement communities selected for this research starting in program year 1996; however, in some instances automated program data are not available until 1998 due to the timing of the new system's phase-in. HUD compiled CDBG expenditure data through program year 1995 in the Grantee Performance Report (GPR) database; however, data on several of the sampled grantees did not appear in the GPR database for 1994 or 1995.

Most important for the current study, 7 of the 17 cities in the analysis did not have complete data for the 1994 – 1996 period used in this analysis

As **Exhibit 2.2** indicates, we compiled data for this research from both IDIS and GPR. We supplemented information as necessary by acquiring and coding hard-copy GPRs that did not appear in the GPR

[4] While expenditure categories were tracked, direct benefit vs area-benefit expenditures were not explicity separated**.**

database. Despite our exhaustive efforts, including direct contact with the sampled grantees, a number of holes remained in the final study database. All but two of the sampled grantees (Fort Lauderdale and Tulsa) lacked program data for the period immediately preceding their transition onto IDIS, with the gap ranging from 3 to 18 months.

Exhibit 2.2
CDBG Data Source and Data Coverage by Program Year

	Years Used in Study					
Grantee	1994	1995	1996	1997	1998	1999
Birmingham	GPR	GPR	IDIS[1]	IDIS	IDIS	IDIS
Boston	GPR	GPR		IDIS[1]	IDIS	IDIS
Charlotte	GPR	GPR		IDIS[1]	IDIS	IDIS
Cleveland	GPR	GPR	GPR	IDIS[1]	IDIS	IDIS
Columbus	GPR	GPR	GPR		IDIS	IDIS
Denver	GPR	GPR	GPR[1]	IDIS[1]	IDIS	IDIS
Fort Lauderdale	GPR	GPR	GPR	IDIS	IDIS	IDIS
Houston	GPR	GPR	IDIS[1]	IDIS	IDIS	IDIS
Indianapolis	GPR	GPR	GPR		IDIS[1]	IDIS
Long Beach	GPR	GPR	GPR	IDIS[1]	IDIS	IDIS
Los Angeles	GPR	GPR	GPR[1]	IDIS[1]	IDIS	IDIS
Milwaukee	GPR	GPR	GPR	IDIS	IDIS	IDIS
Oakland	GPR	GPR	GPR	IDIS[1]	IDIS	IDIS
Portland	GPR	GPR	GPR	IDIS[1]	IDIS	IDIS
Providence	GPR	GPR		IDIS[1]	IDIS	IDIS
Tulsa	GPR	GPR	GPR	IDIS	IDIS	IDIS
Washington, DC	GPR	GPR	GPR		IDIS	IDIS

Source: Compiled from Grantee Performance Report (GPR) and Integrated Disbursement and Information System (IDIS).

Notes: 1) Data not complete due to transition in management systems.

Geo-locating CDBG activities. IDIS and the GPR both provide a range of geographic data at the activity level. Grantees can report activities' census tract location; however, such information is sometimes missing for area benefit activities, and generally is not available for direct benefit projects. Instead, geographic information can consist of specific street addresses or general indicators of eligible service areas, such as "citywide" or a named target area. We extracted all geographic information from the IDIS and GPR systems, and, as necessary, used address information to geocode activities' census tract location.

Exhibit 2.3 summarizes the outcome of this geocoding process. The first column presents each grantee's total program expenditures from 1994 to 2000 (excluding spending on administration and planning and from years entirely or partially absent from the database). Our goal was to determine the census tract

location of *all* of a grantee's expenditures; however, as indicated by the next two columns, our ability to do so varied from a high of 93 percent geocoded in Cleveland to lows of 43 percent in Portland, OR and just 27 percent in Charlotte. (These are shown in bold on Exhibit 2.3.)

Exhibit 2.3

Summary of Gecoded Expenditures, 1994-2000

Grantee	Total Expenditures	Final Geocoded Expenditures[1]	Final Percent Geocoded	Prorated Expenditures[1]	Percent Prorated
Birmingham	$52,177,693	$41,437,183	79%	$6,532,641	16%
Boston	$146,764,238	$111,507,028	76%	$9,245,786	8%
Charlotte	$36,265,621	**$9,876,320**	**27%**	$1,711,398	17%
Cleveland	$199,051,325	$184,892,236	93%	$38,780,594	21%
Columbus	$53,266,519	$33,310,538	63%	$2,998,798	9%
Denver	$79,209,930	$54,391,463	69%	$6,152,373	11%
Fort Lauderdale	$17,931,705	$11,473,557	64%	$3,612,229	31%
Houston	$173,497,474	$128,390,348	74%	**$56,989,619**	**44%**
Indianapolis	$46,232,163	$31,936,031	69%	$8,495,256	27%
Long Beach	$64,706,695	$51,627,443	80%	**$18,196,611**	**35%**
Los Angeles	$482,643,221	$420,655,332	87%	$37,133,292	9%
Milwaukee	$145,161,347	$111,598,947	77%	$27,395,345	25%
Oakland	$64,522,919	$43,404,786	67%	$1,951,830	4%
Portland	$95,681,094	**$40,768,612**	**43%**	$5,247,342	13%
Providence	$33,439,226	$30,697,294	92%	$2,763,253	9%
Tulsa	$31,375,393	$20,809,218	66%	$5,397,145	26%
Washington, DC	$153,429,025	$91,918,589	60%	$14,389,620	16%
Totals	$1,875,355,588	$1,418,694,925	76%	$246,993,132	13%

Source: Compiled from GPR and IDIS.

Notes: 1) Total expenditures that could be geolocated by tract, following the geocoding of address information.

The balance of the grantees' spending (that is, the difference between the total and the final geocoded expenditures) was put into two categories: "citywide" expenditures, generally spending under direct benefit activities that serve eligible persons across a jurisdiction without regard to location; and residual expenditures, spending on activities for which a census tract location could not be identified.[5]

Attributing expenditures to particular tracts. While some CDBG activities occur in a single census tract and can be assigned to a specific neighborhood location, other activities are more difficult to attribute to a particular neighborhood because they span across census tract boundaries. For example, area benefit activities such as the rehabilitation of a commercial establishment might have had a service area that

[5] In some instances, most notably Portland, geographically targeted expenditures were put in the "residual" category because there was insufficient information in IDIS or the GPR to determine the census tracts encompassed by the named target area(s).

encompasses more than one neighborhood. Similarly, direct benefit activities such as housing rehabilitation might involve property improvements in more than one tract. Moreover, direct benefit activities such as the provision public services or job creation can be expected to have two different types of neighborhood impact—in the neighborhood where the investment is made and in the neighborhood (or neighborhoods) in which the direct beneficiaries reside.

A full accounting of the location of CDBG expenditures would have required a separate survey, which was beyond the scope of the current study (and probably beyond the scope of any performance assessment system HUD might adopt). We therefore used the following procedures for assigning expenditures to particular census tracts.

- Expenditures for area and direct benefit activities that occurred inside a single census tract were assigned entirely to that tract, even if the activities' direct beneficiaries did not necessarily reside in the same tracts.

- Expenditures for area benefit and direct benefit activities that occurred in more than one, identifiable census tract were divided or prorated equally between each tract. Therefore, if a housing rehabilitation activity involved investments in properties located in three different tracts, total spending for that activity was divided evenly between the three tracts. **Exhibit 2.3** also shows the *extent to which expenditures were prorated* in each of the sampled communities. As indicated, prorated expenditures accounted for between 4 and 44 percent of the grantees' total geocoded spending (that is, spending for which a tract location was available). The two communities for which the largest share of spending had to be prorated — Houston and Long Beach — are shown in bold on the exhibit.

- We assigned "citywide" expenditures that grantees targeted to eligible persons across their jurisdiction in proportion to the level of "demand" in each tract, as indicated by a tract's share of the jurisdiction's 1990 poverty population. Therefore, if a tract accounted for 3 percent of a community's poverty population, it was assigned 3 percent of the grantee's "city-wide" expenditures.

- Finally, residual expenditures, from activities that lacked sufficient information to determine a census tract location, were not assigned to particular census tracts. Effectively, therefore, these expenditures were excluded from the analysis of the program's neighborhood impact.

One of the defining characteristics of CDBG is the discretion local grantees have in deciding what projects to pursue from a range of **eligible activities**, how to qualify those activities under the program's **national objectives**, and when to fund particular activities. Therefore, while the study aimed to measure neighborhood-level program performance without regard to the specific use of CDBG funds, we anticipated that the characteristics of funded activities might have an important bearing on the nature of

the program's impact. We developed several supplementary measures of CDBG neighborhood investments to differentiate neighborhood spending according to these important program dimensions:

- *Spending by Activity Category.* We determined CDBG expenditures at the census tract level in five categories of eligible activities—housing, economic development, social services, public facilities and improvements, and property acquisition and disposition.

- *Spending by National Objective Category.* We calculated CDBG expenditures at the census tract level in two national objective categories—area benefit spending (that is, spending qualified under the low and moderate income and slum and blight elimination area benefit objectives), and spending with direct beneficiaries (that is, spending qualified under all other national objectives).

- *Spending by Time Period.* Since there is likely to be a time lag between a CDBG investment and any neighborhood impact that would register in secondary data on neighborhood quality of life, we measured total census tract spending in two periods—spending in program years 1994 through 1996 for use in this analysis, and those that occurred in years 1997 through 2000 to assess the strengths and weaknesses of data that could be used in the future to construct a performance measurement system.

While it was necessary to adopt several methodological compromises to compile CDBG data for this study, *subsequent HUD analysis of CDBG's neighborhood impact will benefit from more complete, and better quality program data*. An assessment of CDBG's neighborhood performance in later years will not require the use of GPR data, which is not fully compatible with information from IDIS. Furthermore, the Department is in the process of cleaning the data contained in IDIS and updating the IDIS user protocols, which should improve the geographic data available for future CDBG activities. Therefore, data limitations that impeded the compilation of program information for this research will not necessarily handicap HUD's implementation of a performance assessment methodology.

Neighborhood Indicators from "Data Rich" Communities: National Neighborhood Indicators Partnership Local Data Sets

The Urban Institute, as a part of the National Neighborhood Indicators Partnership (NNIP) program, has gathered local data sets from participating NNIP communities. The National Neighborhood Indicators Partnership (NNIP) is a collaborative effort by the Urban Institute and local partners to further the development and use of neighborhood-level information systems in local policymaking and community building.

In recent years all NNIP partners have built advanced information systems with integrated and recurrently updated information on neighborhood conditions in their cities. Creation of this capacity, which did not

exist in any U.S. city a decade ago, represents an important technical and institutional breakthrough. To succeed, NNIP partners needed to overcome the resistance of local public agencies to sharing administrative data and, because of major cost reductions made possible through new information technologies, they have shown that such systems can be operated on an ongoing basis at a level that can be locally self-sustaining. Their indicators cover topics such as births, deaths, crime, health status, educational performance, public assistance, and property conditions.

These systems facilitate the direct use of information by local government and community leaders to build the capacities of distressed urban neighborhoods. The Annie E. Casey Foundation and the Rockefeller Foundation sponsor current NNIP activities. Current partners are Atlanta, Baltimore, Boston, Cleveland, Denver, Indianapolis, Miami, Milwaukee, Oakland, Philadelphia, Providence, and Washington.

Exhibit 2.4
Indicators Available from National Neighborhood Indicator Cities

Welfare Usage Rate (C, P)	Food Stamp Usage Rate (O, P)
Violent Crime Rate (B, C, O)	Property Crime Rate (B, C, O)
% Parcels Non-Residential (B, C)	% Res. Parcels Single-Family (B, C)
% Parcels Tax-Delinquent (C)	% Commercial Parcels Vacant (C)
% Residential Parcels Vacant (C)	Residential Home Price (P)
% Birth Mothers w/ < HS Diploma (C)	% Birth Mothers w/ No Prenatal (C, O, P)
% Birth Mothers Not Married (C)	% Females Age 10-14 Giving Birth (C)
% Females Age 15-19 Giving Birth (C, I, O)	% Births w/ Low Weight (C, I, O, P)
% Births to Black Mothers (O)	% Births to White Mothers (O)
% Births to Asian Mothers (O)	% Births to Hispanic Mothers (O)
% Births to Teen Mothers (O)	% Births to Mothers age 15-17 (P)

Note: B – Boston, C – Cleveland, I – Indianapolis, O – Oakland, P – Providence

From special administrative databases available in Boston, Cleveland, Indianapolis, Oakland, and Providence we created numerous census tract annual indicators. These databases were assembled as part of the Urban Institute's National Neighborhood Indicators Partnership. These databases allowed us to operationalize indicators like welfare usage rates, percentages of births to unmarried women, percentages of babies born of low weight, percentages of structures that are single-family homes, percentages of

parcels that are tax delinquent, percentages of parcels that have non-residential uses, and property and violent crimes rates. Most of the five administrative databases used contained similar information, although there were some inconsistencies in availability. However, the indicators (among others) available from the cities in our sample are shown in **Exhibit 2.4**.

Most the data acquired for this project were available from 1995-1997, although we had coverage through 1998 or 1999 for some indicators.

To supplement the NNIP data, we extracted a wide range of 26 indicators from 1990 census tract data, STF-4. Even though annual updates of such indicators were not available during the 1990s, we nevertheless thought it important to see how these indicators correlate with those from other data sources. Moreover, should the American Communities Survey be instituted later this decade, annually updated, five-year moving average data for census tracts will be available for operationalizing such indicators.

We selected a variety of standard socio-economic indicators from the 1990 Census to test the robustness of our potential outcome indicators. The indicators selected and the results of the tests are described in Chapter 4. They include such things as: female household headship and marriage rates, racial, immigration, and demographic characteristics, incomes and unemployment, education and occupational status, and housing stock ages, vacancy rates, values, and structure types.

According to our original research design, we were also planning to use Census indicators from the American Community Survey, an inter-census instrument tested by the Census Bureau in a few communities during the 1990s. However, the Census Bureau decided not to make data at the tract level available.

"Generic Data" Available for All Communities

Business Directories

Business directories provide a selected listing of area businesses. One provider, Dun and Bradstreet, produces a database containing information on 10 million business establishments nationwide, and can be used to group businesses into categories according to their Standard Industrial Classification and report characteristics (including number of employees) at the zip code level. Dun & Bradstreet conduct more than 10 million on-site, telephone and mail interviews each year. The company also collects information from public record sources, including public record filings with local, state, and federal agencies; Regional Bell operating companies; and annual 10K and 10Q reports. Each month, Dun & Bradstreet adds an average of 100,000 new businesses to the file, while removing around 800,000 each year.

We drew 3 indicators from 1995 and 1999 Dun & Bradstreet data at the zip code level: number of jobs, number of firms, and total dollar volume of sales annually. We converted the data to census tract values by approximating from zip code geography, using the MABLE/Geocorr Geographic Correspondence Engine available from the University of Missouri.

Home Price Data

Local property tax assessors and auditors maintain information regarding parcels of property in a community for the purpose of levying taxes on owners. On a local basis, this information can be obtained from the local municipality's tax assessor's or auditor's office. At a national level, there are several commercial sources that gather and sell this information, basing the cost on a per record basis. We purchased data from DataQuick, which seemed to be the only source of relatively complete historical sales records. No home price data were available for two of our sample cities, Indianapolis and Providence, and gaps in the data existed in Houston. Providence home price data were available from an NNIP database.

Because we encountered census tracts for which no sales were reported in 1994 or 1999, median sales price was calculated from 1993 and 1994 data combined, and 1998 and 1999 data combined. This practice reduced the number of tracts with no observations.

Home Mortgage Disclosure Act Data

In 1975, Congress enacted the Home Mortgage Disclosure Act (HMDA), which requires that depository institutions (banks, savings and loans, thrifts, credit unions and others) and for-profit, non-depository institutions (for example, mortgage companies) report information on all mortgage applications and originated mortgages purchased from other lending institutions.

Not all institutions are obliged to report. Exemptions include:

- Small depository institutions are exempt if they have assets below a certain threshold that is adjusted upward for inflation each year. This level, prior to 1997, was set at $10 million. After 1997, the level was increased to $28 million and subsequently increased to $29 million and $30 million in the following two years.

- Institutions that are located outside of an MSA, have not originated any home purchase or refinancing loans, or is either: 1) not federally insured or regulated; 2) the mortgage loan was not insured, guaranteed, or supplemented by a federal agency; or 3) the loan was not intended for sale to Fannie Mae or Freddie Mac.

- Non-depository, for-profit institutions if: 1) the percent of home purchase or refinance loans originated amounted to less that 10% of the total loan originations; 2) the office is located outside of an MSA or originated less than 5 percent of mortgages located within an MSA; or 3) their assets are less than $10 million or they originated less than 100 home purchase or refinance loans in the previous year.

Non-exempt financial institutions submit annual loan application data and loan purchase data to their respective regulator. Loan application information that lenders must submit includes the type of loan, purpose of loan, amount of loan, location of the property, occupancy, action taken, type of purchaser, reason for denial (optional), and the race, sex, and income of the applicant. Purchased loan information contained in HMDA is similar to the information for loan applications, but it does not include borrower's race, sex, or income.

HMDA data are available nationwide, but they underreport total market activity. It is most accurate in urban areas, where there is a high proportion of institutions that are required to report. Since small lenders and those outside of MSAs are not required to report HMDA data, HMDA data for rural areas is incomplete. This should not affect the impact analysis. HMDA data suffer from other shortcomings, as well, (e.g., data on the race and gender of applicants may be missing) but because we are not considering the demographic characteristics of applicants, these do not affect the impact analysis either.

Our analysis database contained a tract level summary of the 1993 and 1994 HMDA reports, and a similar summary for 1998 and 1999. We summarized tract level data for 1993 and 1994 together, and 1998 and 1999 data together to reduce problems associated with missing data in one year. We also excluded loans purchased from other institutions to arrive at a number of loan originations, and calculated the median loan amount over each two-year time period.

The final dataset includes one observation per tract in the city, with variables for the number of home purchase mortgage applications, approval rate, and median value of approved loans, and the percentages of all mortgage applications intended for home purchase and for home improvements. In preliminary work we also operationalized the percentage of home purchase mortgages that were eventually purchased by the secondary market, but this indicator never proved correlated with any of our dimensions of neighborhood quality of life, so it is dropped from the discussion.

CHAPTER 3
SELECTION OF NEIGHBORHOOD PERFORMANCE INDICATORS

The first major task of this research was develop a parsimonious, yet robust, set of easily replicable indicators of neighborhood quality of life suitable for an assessment of CDBG impacts. In this chapter we use factor analysis on the richest set of data we were able to assemble for Type I cities to identify six dimensions of neighborhood quality of life that were stable across cities and across time. We then found that several HMDA-based indicators prove to be especially strong, consistent predictors of four of these six dimensions, and that the Dun and Bradstreet-based indicators are highly predictive of a fifth. In other words, indicators based on readily available data sources proved to be robust proxies of important dimensions of neighborhood change.

Operationalizing Indicators of Neighborhood Quality of Life

To develop alternative indicators of neighborhood demographic, social, and economic conditions, we assembled **small-area** data for our five Type I cities, which have the richest array of data among our study sites (and represent the current state-of-the art among cities). For each city, we classified data into one of three categories, depending on the source (and hence, availability) of data:

- Administrative data on vital statistics, crime, and real estate characteristics, available annually during most years during the 1990s in our five cities, but not in most cities.

- Census data are now available only every ten years but for all cities.

- Generic data on home mortgage lending, home sales, and businesses are annually updated data sets available for most if not all cities, and are provided through private and public sources.

The list of indicators developed from NNIP administrative data and the cities for which they were available are presented in the middle panel of **Exhibit 3.1**. The census-based indicators we employed are presented in the first panel of Exhibit 3.1. Finally, we developed nine "generic" indicators from three small-area databases available for virtually all American cities. See the third panel of **Exhibit 3.1**.

Our approach to selecting indicators for analysis was largely opportunistic and exhaustive. That is, we drew upon every publicly available database in our five cities providing small-area information, then specified from each as many indicators as possible that we thought plausibly could measure some aspect of neighborhood conditions of potential importance. In total we specified between 37 and 49 indicators of neighborhood quality of life, depending on the idiosyncrasies of each city's administrative data. All five cities employed the full complement of 26 census indicators and nine generic indicators.

Exhibit 3.1

Neighborhood Quality of Life Indicators
Used to Construct Dimensions of Neighborhood Quality

Census Data Indicators	Adminstrative Data Indicators	Generic Data Indicators
% Female-Head Households w/Kids*	Welfare Usage Rate (C, P)	*HMDA-Based:*
% High School Dropouts 16-19 yrs.*	Food Stamp Usage Rate (O, P)	
% Population Age 0-9 yrs.*	Violent Crime Rate (B, C, O)	Mortgage Approval %**
% Population Age 10-19 yrs.*	Property Crime Rate (B, C, O)	Median Loan Amount**
Median Household Income*	% Parcels Non-Residential (B, C)	# Loan Applications**
Med. Value Owner-Occ. Homes*	% Res. Parcels Single-Family (B, C)	Home Improvement as % Orig.**
% No Vehicle Available*	% Parcels Tax-Delinquent (C)	Home Purchase as % Orig.**
% Persons Below Poverty Line*	% Commercial Parcels Vacant (C)	
% Population Black*	% Residential Parcels Vacant (C)	*Dun & Bradstreet-Based:*
% Population White*	% Birth Mothers w/ < HS Diploma (C)	
% Population Hispanic*	% Birth Mothers w/ No Prenatal Care (C, O, P)	Total # Businesses
% Population Other*	% Birth Mothers Not Married (C)	Total # Jobs
% Unemployed, Labor Force aged 16+*	% Females Age 10-14 Giving Birth (C)	Total $ Sales
% w/ College Degree, age 25+*	% Females Age 15-19 Giving Birth (C, I, O)	
% w/ No HS Diploma, age 25+*	% Births w/ Low Weight (C, I, O, P)	*Data Quik-Based:*
% Manage./Prof./Tech. Occ.*	% Births to Black Mothers (O)	
% Females age 15+ Married*	% Births to White Mothers (O)	Median Home Sales Price**
% Persons Foreign-Born*	% Births to Asian Mothers (O)	
% Persons Institutionalized*	% Births to Hispanic Mothers (O)	
% Housing Units Built Since 1970*	% Births to Teen Mothers (O)	
% Housing Units Built pre-1940*	% Births to Mothers age 15-17 (P)	
% Housing Units Owner-Occupied*		
% Housing Units Lacking Plumbing*		
% Aged 5+ In Same Unit 5+ Years*		
% Units in Single-Family Structures*		
% Housing Units Vacant*		

* 1990 Census data
** Two-year averages, 1993-94 or 1998-99 for generic indicators
Parenthetical terms after adminstrative data indicators show cities for which indicator is available:
B = Boston; C = Cleveland; I = Indianapolis; O = Oakland; P = Providence

Identifying Dimensions Of Neighborhood Quality Of Life

These indicators were included in factor analyses for each of our five cities using a principal components analysis with varimax rotation. This is a statistical technique for assessing common patterns of variation among subsets of variables within a larger set. Factor analysis allowed us to ascertain whether the dozens of individual indicators can be summarized in a smaller number of "factors" (weighted combinations of individual indicators) that, in turn, can be interpreted as dimensions of neighborhood quality of life. Of equal importance, the factor analysis tells us the degree to which a smaller number of indicators may sufficiently capture the essence of these dimensions.

We investigated this in three ways. (For ease of illustration in the following discussion, let X be a variable that is available in a Type II site.)

First, prior to conducting any factor analyses we generated simple, bivariate (Pearsonian) correlations among all indicators. From this correlation matrix we can ascertain the degree to which X is correlated

with indicators that only are available in Type I sites. Should this correlation prove to be strong, we will have more confidence that using X in the absence of a more complete set of indicators will have little empirical cost. Should this correlation not prove to be strong, however, it would imply the need to collect data on a variety of indicators to adequately measure multiple dimensions of the quality of life. This, in turn, would have implications for the cost of operationalizing this performance measurement system.

Second, we examined the factor analysis' output of "heavily weighted components" comprising the factor indices. We performed a principal components analysis using "varimax" rotation. This procedure is designed to produce orthogonal factors that will ease the substantive interpretation of the factors that emerge. For instance, it is likely (based on prior work with factor analyses of census tract indicators) that one factor will consist of indicators conceptually related to socioeconomic status of residents. Another may be closely related to housing conditions and prices. And so on. We examined how variables such as X contribute to the various factors that emerge as significant, and what the loadings for X prove to be. Indicator X is robust to the extent it proves to have high weights, and on several factors.

Third, we took each of the 6 major factors, and regressed them upon each indicator, to determine the indicator's explanatory value. A high R-square for indicator X would be a sign of its usefulness as a stand-in for that factor.

To test the generality of the foregoing factor analyses, we conducted the analyses for different subsets of the data, to assess the degree to which common patterns of cross-indicator relationships change across time and space. For each site we replicated the analysis with both 1995 and 1999 indicators developed from administrative and generic databases; indicators based on 1990 census data were employed in both cases. For example, we conducted the factor analysis twice for our Boston indicators: once including all our 1995 administrative and generic indicators, and our 1990 census data; and once including all our 1999 administrative and generic indicators, and our 1990 census data. Having performed the analysis twice for each city, we compared the outcomes (the factors identified and the indicators associated with them) between 1995 and 1999, and among the 5 cities.

Factor Analysis Results

The results displayed remarkable cross-sectional comparability, especially considering the wide range of city location, age, demographic composition, and economic base reflected by our five communities. Six common clusters of indicators emerged, each having Eigenvalues greater than unity and explaining three percent or more of the variance in the dataset.[6] Together, these six factors explained about two-thirds of the total variance (differing modestly by up to five percentage points depending on city and year).

[6] Eigenvalues represent the proportion of variance extracted by each factor.

Exhibit 3.2
Overview of Common Factors Extracted from Principal Components Analysis

	Proportion of Variance Explained, by City									
Neighborhood Dimension	**Boston**		**Cleveland**		**Indianapolis**		**Oakland**		**Providence**	
	1995	1999	1995	1999	1995	1999	1995	1999	1995	1999
1. Social Disadvantage	-		.13	.36	.12	.13	.37**	.39**	.07**	.14***
2. Housing Type & Tenure	0.17	0.29	.12	.33	.07	.09	.13	.15	.12	.15
3. Prestige	0.20	0.31	.08	.08	.41	.42	**	**	.34	.41
4. Business & Employment	0.06	0.06	.04	.05	.05	.06	.05	.06	.05	.08
5. Crime	0.03	0.08*	.03	.05	N/A	N/A	.04	.04	N/A	N/A
6. Housing Vacancy	0.04	0.05	.03	.04	.05	.05	.03	.04	****	****
Total	0.50	0.79	0.43	0.91	0.70	0.075	0.62	0.68	0.58	0.78

* separate factors for violent and property crimes
** includes dimensions of prestige in social disadvantage factor
*** social disadvantage split into two factors; proportion shown is sum of both
**** includes housing vacancy in housing type and tenure factor

N/A - Not Applicable because crime data not available for analysis

The most heavily weighted indicators in each factor suggest a label for the underlying dimension of neighborhood quality of life. We label these six factors: Social Disadvantage, Housing Type and Tenure, Prestige, Business and Employment, Crime, and Housing Vacancy. This listing corresponds to the general rank ordering of factors by explanatory power evinced in most cities (see **Exhibit 3.2**). The table also displays the proportion of variance explained for each of our five cities.

Appendix Tables A3-1- A3-6 present all the indicators that have a factor loading of .50 or more, for each of the six factors and each of our Type I cities (a factor loading is the correlation between each variable and the factor). In each table the indicators are grouped according to the database of origin: administrative, census, and generic. The six factors and their composition are:

1. Social Disadvantage, which heavily weights indicators like female headship rates, teen birthrates, welfare usage, and percentages of black and (negatively) white populations.

2. Housing Type and Tenure, which consists predominantly of the percentages of structures that are single-family homes and that are owner-occupied.

3. Prestige, loads heavily on percentages with college degrees and those in managerial, professional, or technical occupations, and median home values.

4. Business and employment, which is heavily comprised of the number of businesses and number of jobs, and less so on the volume of sales.

5. Crime, which involves typically both property and violent crime rates, though such data are only available for three of our five cities.

6. Housing Vacancy, which loads heavily on residential vacancy rates in all cities, though in several it also involves the percentage of units lacking some minimal plumbing.

For each city, there is remarkable stability in the indicators' factor loadings between the two years – 1995 and 1999.

Validity of the Factors

A principal components analysis merely identifies common patterns of variation within sets of variables; it does not guarantee that the resultant factors have any theoretical or behavioral meaning. We believe that the factors identified above have strong intuitive appeal as dimensions of neighborhood quality of life. CDBG expenditures might plausibly try to affect several of these dimensions.

Three types of past research supports use of these factors as valid measures of neighborhood quality: (1) statistical studies of residential satisfaction; (2) focus group studies of ideal neighborhood characteristics; and (3) factorial ecology studies of social relations.

To anticipate: the evidence consistently suggests the validity of the factors we produced through our principal components analysis. Resident satisfaction related to building maintenance and behaviors of neighbors are bound up in their strong expressed preference for owner-occupants nearby, which is captured in our Housing Type and Tenure factor 2. We suspect that the important variation in civility as shown by factorial ecology also is closely tied to our Social Disadvantage factor 1 and Prestige factor 3, which heavily weight neighborhood education and occupational status profiles, welfare usage, and teen motherhood. Resident satisfaction with safety and accessibility are clearly related to the crime rate (factor 5) and number of businesses and jobs nearby (factor 4), respectively. Finally, factorial ecology studies have revealed a wide variety of neighborhood perceptions and social processes that are closely related to the demographic characteristics captured in our factors 1 and 3, and the housing tenure characteristics measured in factor 2.

Statistical studies of residential satisfaction are based upon surveys of households in a variety of settings. In the surveys the respondents are asked to rate how satisfied they are with specific dimensions of the residential environment (such as "safety of the neighborhood," "features of the home," "accessibility of shopping") and with their overall residential situation. The overall rating scores are then regressed on the

scores of the various component dimensions to assess the salience of each. There is at least a thirty-year history of such studies, and a wide variety of households have been the subject of analyses, from upper-income homeowners to lower-income residents of public housing. Yet, a notable consistency of findings has emerged.[7] Neighborhood satisfaction is typically most highly related to subjective ratings of: upkeep of homes, friendliness of neighbors, quality of public services and outdoor spaces, crime, and household homogeneity. [8]

Focus group studies of ideal neighborhood characteristics involve facilitated discussions with small groups of households on "What are the most important things that make for a 'good neighborhood'?" [9] Discussants have ranged from white and black residents of public housing to white, black, and Latino homeowners in various income groups. Both public housing and homeowner respondents emphasized: (1) safe, drug-free environment; (2) friendly, helpful, well behaved neighbors; (3) clean, well-maintained buildings and grounds; and (4) accessibility to shops and basic services (especially the elderly). The two elements of a "good neighborhood" mentioned most often by almost all the groups were safety and good upkeep of properties. Mentioned almost as frequently was a cluster of characteristics related to good neighbors (known, friendly, watching out for each other, cohesive as a group), quality schools, accessibility, and a high rate of owner-occupancy.

Factorial ecology studies of social relations are based on a combination census tract data and information gleaned from spatially concentrated, in-person interviews about attitudes, perceptions, and relationships within neighborhoods. The latter variables are aggregated to obtain neighborhood-wide scores, and then regressed on the census tract indicators (often expressed as factor scores), with a goal of identifying major correlates. Several studies have identified strong connections between tract-level indicators of disadvantage, such as poverty, unemployment, and female headship rates, and: perceived neighborhood quality (Coulton, Korbin, and Su, 1999) and assessments of social disorder (Kohen, Brooks-Gunn, Leventhal, and Hertzman, 2000; Coulton, Korbin, and Su, 1999). Measures of neighborhood stability (typically related to home ownership rates) have proven predictive of: collective efficacy (Sampson, Raudenbush, and Earls,1997); perceptions of neighborhood violence and youth delinquency (Sampson, Raudenbush, and Earls,1997; Sampson, 1997); and social process variables such as "intergenerational

[7] ; for reviews, see Galster (1987: ch. 6).

[8] (Lansing, Marans, and Zehner, 1970; Galster and Hesser, 1981; Ahlbrandt and Cunningham, 1979).

[9] The Urban Institute has generated a significant number of such focus group discussions in the context of several other HUD-sponsored contract research projects conducted since 1996. Specifically, associated with instituting the Allegheny County (PA) Housing Authority's *Sanders* desegregation consent degree, 16 focus groups were conducted in 1996 with black and white residents of ACHA public housing and people on their waiting list (Galster, Herbig and Smith, 1996). In 1998, four focus groups with black and white homeowners in various classes of neighborhoods were conducted in Baltimore County (MD) in conjunction with a study of the neighborhood impacts of Section 8. The same study conducted six such groups in Denver (CO) related to scattered-site public housing impacts (Galster, Santiago, Smith, and Tatian, 1999). Finally, ten focus groups involving black, white and Latino homeowners of various income levels were conducted in Denver as part of a study of supportive housing facilities' impacts (Galster, Pettit, Santiago, 2000). All groups began by posing the question in the text above.

closure" [degree to which adults and children in community are linked] and reciprocated exchange" [intensity of inter-family and –adult interaction with respect to child rearing] (Sampson, Morenoff and Earls, 1999). Neighborhood indicators associated with affluence and prestige, like percentages who are college-educated and in profession/managerial/technical occupations are predictive of "intergenerational closure" and reciprocated exchange" (Sampson, Morenoff and Earls, 1999).

Perhaps most telling is the work of Cook, Shagle, and Degirmencioglu (1997), who measured at the tract level a comprehensive array of subjective scales related to "social process," ranging from social control and cohesion, to neighborhood resources, satisfaction, and participation rates. They found that they were able to use tract demographic variables to predict "very high percentages of the neighborhood-level variation in social process." [p. 109-110]

Robust Indicators From Generic Data Sources

Can commonly available indicators serve as proxies for these six common, valid dimensions of neighborhood quality of life? Our experiments suggest that five indicators based on generic data sources offer robust proxies for the Social Disadvantage, Prestige, and Business and Employment factors of neighborhood quality of life: mortgage approval rate, median loan amount, median sales price of homes, and number of businesses and of jobs. Moreover, the number of mortgage loan applications offers a modestly robust proxy for the Housing Type and Tenure factor. We did not find strong proxies for either the housing vacancy or crime factors.

To arrive at these results, we regressed each factor produced for a particular city and period on each of the generic indicators. The resultant R-squared values provide an easily interpretable measure of how well each indicator explains the variation in the six factors. Average r-squared values across cities and years are presented in **Exhibit 3.3**. (R-squared values by factor, city, and year are presented in Appendix Table A3-7.)

The consistent and often remarkably strong predictive power of HMDA-based indicators for four of the six dimensions of neighborhood quality of life is the most important finding here. As shown in Exhibit 3.3 (and Appendix Table A3-7):

- the mortgage approval rate seems most robust, being predictive of the Social Disadvantage and Prestige factors at R-squared values of .38 and .45, respectively, on average (see Table 3.3), and reasonably predictive of the Crime factor 5 as well (average R-squared of .22);[10]

[10] though this is somewhat misleading because the average is strongly influenced by the results from only one city, as explained below.

- the median dollar amount of mortgages issued proves to be a strong predictor of the Prestige factor 3 (average R-squared of .74) and Social Disadvantage factor 1 (average R-square of .28);

- the number of loan application records (LARs) is the only generic indicator that is modestly predictive of Housing Type and Tenure (average R-squared of .27);

- the share of mortgages intended for home purchase or the share for home improvements are modestly predictive of the Social Disadvantage and Prestige factors (average R-squared values of .22 and .28, respectively), but in both cases the explanatory power is less than that provided by the mortgage approval rate indicator.

Exhibit 3.3

Proportion of Variance in Factor Explained by Various Generic indicators

Averages across five cities and both 1994, 1999

	Factor:					
	Social Dis	Hsg Type	Prestige	Business	Crime	Hsg Vacancy
Indicators						
Mtg. Approval Rate	**0.38**	0.08	**0.45**	0.06	0.22	0.12
# LARs	0.07	0.27	0.12	0.04	0.08	0.07
Med. Loan Amt.	0.28	0.09	**0.74**	0.07	0.15	0.10
Home Purch. % Orig.	0.22	0.06	0.08	0.03	0.04	0.07
Home Imp. % Orig.	0.19	0.03	0.28	0.05	0.17	0.07
Median Home Price	0.25	0.11	**0.72**	0.04	0.13	0.06
# Businesses	0.03	0.03	0.10	**0.95**	0.04	0.03
# Jobs	0.03	0.02	0.07	**0.94**	0.03	0.03
$ Sales	0.02	0.05	0.09	0.42	0.03	0.03

Factor Codes: 1 = social disadvantages; 2 = housing types and tenure;
3 = prestige; 4 = business & employment; 5 = crime; 6 = housing vacancy

The Data-Quick-based indicator of mean sales price (value) of single-family homes proves to be a good predictor of the Social Disadvantage and Prestige factors 1 and 3. The average R-squares are .25 and .72 respectively (see Exhibit 3.3). However, as amplified below, it performs virtually identically (though with slightly less explanatory power) in this and other regards to the median mortgage amount indicator. *Thus, mean home sales prices appears to be a redundant indicator to median mortgage amounts, a more readily available indicator*.

The Dun and Bradstreet-based indicators of business or jobs (and, to a much lesser extent, sales volume) are extremely predictive of the Business and Jobs factor 4, with R-squares typically exceeding .95. This is not surprising, given that these two indicators are typically the only two heavily loaded constituents of the factor. However, it is noteworthy that no other generic indicator apart from those based on Dun and Bradstreet explain more than 15 percent of its variance, and typically much less than 10 percent.

The Crime factor 5 is typically not well explained by generic indicators. The average R-squares do not exceed .22 (see Exhibit 3.3). Only in Boston is there an exception, with the mortgage approval rate explaining between 45 and 56 percent of the variance in Crime, and the home purchase mortgage percentage explaining between 33 and 47 percent. In Cleveland and Oakland, no generic indicator explains more than 18 percent of the Crime factor. Thus, it appears that proxies from HMDA, Data-Quick, and Dun and Bradstreet provide poor substitutes for more direct measures of crime.

The Housing Vacancy factor is typically not well explained by generic indicators. The average R-squares do not exceed .12 (see Exhibit 3.3). The one possible exception is Indianapolis in 1994, where several generic indicators explain between a fourth and a third of its variation. Otherwise, no other R-squared value exceeds .21 in any one of our five cities and typically they are in the single digits. Thus, as in the case of crime, generic indicators do not generally serve well as proxies for direct measures of housing vacancy rates.

Robust Indicators From Census Data

Because we do not currently collect census data for small areas on an annual basis, the usefulness of census-based indicators is attenuated. However, should plans for an ongoing American Community Survey materialize, annually updated information about census tracts based on five-year moving averages will become available. How would indicators based on census tract data be expected to perform as proxies for our six dimensions of neighborhood quality of life?

We subjected our 1990 census indicators to the same sorts of regression tests as we did the indicators based on generic data sources. Resultant R-squares are reported for individual cities (all using 1993-94 data to operationalize administrative and generic indicators) in Appendix Table A3-8, and averages across five cities in **Exhibit 3.4**.

In overview, four of the quality of life dimensions—Social Disadvantage, Housing Type and Tenure, Prestige, and Housing Vacancy—have three or more census indicators providing 20 percent or more explanatory power. The Crime factor only has one such indicator, and the Business and Employment factor has no census indicator providing even a modicum of explanatory power.

Three census indicators provide rather widespread explanatory power. The percentage of households with children headed by females, the percentage of housing units with no vehicle available, and the unemployment rate yield at least 20 percent of explained variance for three factors. Collectively these three indicators provide decent explanatory power for the Social Disadvantage, Housing Type and Tenure, Prestige, Crime, and Housing Vacancy factors (see Exhibit 3.4).

Exhibit 3.4

Proportion of Variance on Factor Explained by Various Census Indicator Variables
Five-City Average, 1990

	Factor:					
	Social Dis	Hsg Type	Prestige	Business	Crime	Hsg Vacancy
Indicator						
% Female Head HHs w/ Kids	0.59	0.18	0.24	0.07	0.27	0.19
% HS Dropouts, 16-19	0.13	0.07	0.16	0.02	0.03	0.09
% Units w/ No Vehicle	0.30	0.42	0.17	0.07	0.04	0.20
% Unemployed	0.47	0.10	0.28	0.07	0.17	0.23
% Units Owner-Occupied	0.07	0.93	0.05	0.06	0.06	0.19
% Single-Family Structures	0.01	0.94	0.06	0.04	0.05	0.12
% w/ College Degree	0.27	0.06	0.83	0.08	0.08	0.07
% Man/Prof/Tech Occup.	0.26	0.06	0.85	0.08	0.10	0.10
% Units Vacant	0.17	0.27	0.10	0.04	0.11	0.75

Factor Codes: 1 = social disadvantages; 2 = housing types and tenure;
3 = prestige; 4 = business & employment; 5 = crime; 6 = housing vacancy

Other census indicators are, not surprisingly, only predictive of the factor on which they load most heavily. The percentages of housing units that are owner-occupied and that are single-family structures are highly predictive of the Housing Type and Tenure factor. The percentage of adults with college degrees and the percentage employed in managerial, professional, or technical occupations provide a great deal of explanatory power for the Prestige factor. The percentage of housing units vacant is, of course, a prime predictor of the Housing Vacancy factor.

A Parsimonious Set of Generic Indicators

Further analysis shows that a somewhat smaller set of robust indicators might suffice to provide roughly the same power in explaining variance of the six neighborhood quality dimensions as does the larger set of indicators. This is true whether the indicators are generic or census-based.

We identified indicators providing redundant information by correlating each indicator with all others, using all census tracts with available information from our entire sample of 17 cities. This is shown for the generic indicators in **Exhibit 3.5**. Exhibit 3.5 reveals that two pair of indicators are clearly redundant: median loan amount - median home sales price, and number of businesses – number of jobs. Both pairs are highly correlated in both years, .95 for the former and .86 for the latter. As noted above, however, median home sales prices and number of jobs provide slightly less explanatory power for neighborhood quality of life dimensions than their correlated counterpart, so they will not be considered further.

Exhibit 3.5

Correlation Among Generic Indicators
All Sample Cities, 1994 and 1999

1994 Generic Indicator	1	2	3	4	5	6	7	N
1. Mtg. Approval Rate	1.00							3300
2. # LARs	0.34	1.00						3333
3. Median Loan Amt.	0.09	0.34	1.00					3333
4. Home Purch. % Orig.	0.38	0.05	-0.21	1.00				3301
5. Median Home Price	-0.01	0.39	**0.95**	-0.31	1.00			1992
6. # Businesses	0.12	0.21	0.25	0.12	0.23	1.00		3173
7. # Jobs	0.12	0.12	0.16	0.13	0.11	**0.86**	1.00	3174
1999 Generic Indicator								
1. Mtg. Approval Rate	1.00							3320
2. # LARs	0.27	1.00						3352
3. Median Loan Amt.	0.47	0.20	1.00					3352
4. Home Purch. % Orig.	0.31	0.08	0.04	1.00				3323
5. Median Home Price	0.44	0.24	**0.95**	0.16	1.00			2354
6. # Businesses	0.21	0.24	0.23	0.30	0.26	1.00		3191
7. # Jobs	0.20	0.14	0.15	0.25	0.14	**0.86**	1.00	3194

N = # observations of census tracts with valid data for given indicator in all sample cities

Factor Codes: 1 = social disadvantages; 2 = housing types and tenure;
3 = prestige; 4 = business & employment; 5 = crime; 6 = housing vacancy

By contrast, three HMDA indicators, mortgage approval rate, number of mortgage loan applications, and median mortgage loan amount do not prove, in our opinion, to be sufficiently correlated to render any one redundant. See Exhibit 3.5. Thus, we conclude that our parsimonious set of robust indicators based on generic data sources consist of the following variables:

- Mortgage approval rate
- Number of mortgage loan applications
- Median mortgage loan amount
- Number of businesses

To buttress our contention that they represent meaningful measures of a wide variety of meaningful phenomena related to community development, we correlate this parsimonious set of robust generic data indicators with the aforementioned census indicators. **Exhibit 3.6** shows that the three HMDA-based indicators are strongly negatively associated with problematic conditions in neighborhoods (female headship rates, dropout rates, units with no vehicle, unemployment rates, housing vacancy rates) and strongly positively associated with desirable conditions (owner-occupancy rates, single-family home

rates, percentages with college degree, in professional occupations)[11]. The number of businesses indicator shows the same general pattern, but with substantially weaker correlations.

The fortuitous feature of this parsimonious set of robust indicators is that they can be obtained for virtually every American city annually at relative low cost, three from HMDA and one from Dun and Bradstreet.

Exhibit 3.6

Correlation Among Selected Census and Generic Indicators
All Sample Cities, 1990/1994*

	Selected 1994 Generic Indicators			
1990 Census Indicators	Mortg. Approval Rate	# Loan Applications	Median Loan Amt.	# Businesses
1. % Female-Head HHs w/ kids	-0.47	-0.44	-0.40	-0.24
2. % HS Dropouts, 16-19	-0.30	-0.28	-0.22	-0.05
3. % Units w/ No Vehicle	-0.39	-0.48	-0.23	-0.11
4. % Unemployed, 16+	-0.55	-0.39	-0.31	-0.17
5. % Units Owner-Occupied	0.30	0.47	0.09	0.00
6. % Single-Family Structures	0.13	0.35	-0.02	-0.10
7. % w/ College Degree	0.52	0.38	0.55	0.28
8. % Man./Prof./Tech. Occup.	0.53	0.41	0.55	0.27
9. Units Vacant	-0.23	-0.26	-0.26	0.03

* = census indicators measured in 1990, generic indicators in 1994

Of course, the aforementioned four indicators do not provide robust measures of the Housing Type and Tenure, Housing Vacancy, and, perhaps, the Crime factors. But to obtain administrative data related to such factors may prove quite costly and beyond the financial and technical capabilities of many cities. Were the American Community Survey to be instituted, it would remove several of these barriers.

Finally, **Exhibit 3.7** shows that two pairs of census indicators, percentages with college degrees - employed in managerial, professional, or technical occupations, and percentages of homes owner-occupied - in single-family structures involve redundant indicators. The inter-correlations among the trio of widely robust indicators, percentages of households with children headed by females, percentage of units with no vehicle available, and percentage unemployed, are in the high range of .65-.68. However, because these three seem to provide quite different explanatory superiority for different factors we would not consider any redundant, and would be useful as performance indicators in a future measurement system[12].

[11] The last owner-occupancy and single-family census variables were not highly correlated with the median loan amount, however.

[12] If Census long form indicators become available from the American Community Survey.

Exhibit 3.7

Correlation Among Selected Census Indicators
All Sample Cities, 1990

1990 Census Indicators	1	2	3	4	5	6	7	8	9	N
1. % Female-Head HHs w/ kids	1.00									3316
2. % HS Dropouts, 16-19	0.24	1.00								3317
3. % Units w/ No Vehicle	0.68	0.32	1.00							3331
4. % Unemployed, 16+	0.66	0.39	0.65	1.00						2628
5. % Units Owner-Occupied	-0.45	-0.32	-0.64	-0.37	1.00					3330
6. % Single-Family Structures	-0.29	-0.25	-0.49	-0.17	0.88	1.00				2629
7. % w/ College Degree	-0.48	-0.44	-0.36	-0.57	0.17	-0.01	1.00			3332
8. % Man./Prof./Tech. Occup.	-0.47	-0.46	-0.39	-0.60	0.24	0.04	0.93	1.00		3330
9. Units Vacant	0.38	0.25	0.25	0.33	-0.31	-0.28	-0.17	-0.19	1.00	2629

N = # observations of census tracts with valid data for given indicator in all sample cities

CHAPTER 4
THE EFFECT OF CDBG EXPENDITURES ON NEIGHBORHOOD CHANGE

To find a non-arbitrary way to establish a definition of "substantial" CDBG investment, above which a performance test could be fairly applied, we attempted to locate CDBG "threshold effects" on neighborhood quality. These are points after which increased CDBG expenditures trigger an acceleration in the pace of neighborhood improvement. Analysis did not find such non-arbitrary thresholds, although we backed into a definition of "substantial" after several trials of our statistical model produced an increasingly clear pattern of relationships between CDBG investments and neighborhood quality across different types of indicators and neighborhoods.

Our analysis shows that CDBG spending has a generally positive effect (meaning improvements in indicators of neighborhood quality) on neighborhood quality. We found significant positive relationships between CDBG expenditures and neighborhood quality for three of our four indicators: median loan amount, loan approval rate, and numbers of business establishments. We found a negative relationship between CDBG spending and our fourth indicator: number of loan applications. Chapter 5 uses information about these relationships to develop sample performance standards for two indicators and four different types of neighborhoods.

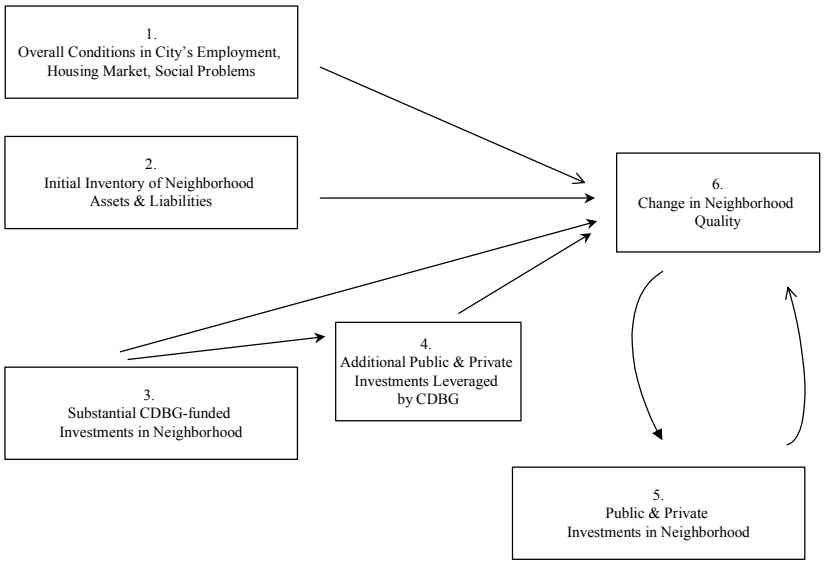
Expected Relationships Between CDBG Spending and Neighborhood Change

Empirical estimation of CDBG investment thresholds faces several challenges. These challenges are portrayed schematically in **Exhibit 4.1** (seen previously as Exhibit 1.2). Recall from the discussion in Chapter 1 that substantial CDBG-funded investments in a neighborhood (box 3) are likely to positively change neighborhood indicators (box 6) both directly (in tandem with leveraged investment in box 4) and indirectly by influencing public and private perceptions of neighborhood economic prospects, thereby inducing new investment from these actors (box 5).

But additional factors also may influence these neighborhood indicators, independently of CDBG activity. Depending on their initial inventory of assets and liabilities (box 2), neighborhoods may respond quite differently to the same intensity of CDBG investments. Analogously, CDBG investments are less likely to produce improvements in neighborhoods located in cities where the larger economic, demographic and social stimuli (box 1) are weaker, e.g., where unemployment, out-migration, and crime are increasing city-wide. Finally, neighborhood indicators may be influenced by *exogenous* investments from public and private sources that may have no connection to CDBG or may be influenced indirectly by it (box 5, again). These factors are extremely difficult to measure and analyze; indeed, there are no known cross-city data sources that would allow us to measure public investment from non-Federal sources (e.g., local spending on water and sewer infrastructure, streets, public safety, parks and openspace, or other

municipal services). Neither does IDIS contain data on private or public funding directly leveraged by CDBG project expenditures.

Exhibit 4.1
Paths of Possible CDBG Impact on Neighborhood Quality



Our methodology responded to these challenges as follows. The confounding factors represented by boxes 1 and 2 are substantially reduced by sample stratification, as described below. The precise statistical controlling for box 5 extraneous investments (i.e., those not leveraged by CDBG) is beyond the scope of this study because data on such investments is lacking. Instead, we operated under the untested assumption that these investments are not correlated with observed CDBG spending.

In view of the myriad factors that influence neighborhood change, and the distressed condition of many low-and-moderate income neighborhoods, community development practitioners do not expect that small amounts of CDBG dollars could be expected to induce measurable neighborhood change. For this reason, the Department requested us to specify a "substantial" level of investment, above which its effect on neighborhoods could be fairly tested. In pursuing this analysis, we hoped to define "substantial" as the "threshold level" of CDBG investment required to accelerate the pace of neighborhood change possible from a given amount of CDBG spending.

However, there are several reasons why finding *any* relationship between CDBG spending and neighborhood outcomes should prove to be difficult:

- Not all CDBG expenditures, even in "threshold" amounts, were invested in ways intended to produce an overall neighborhood improvement effect. For example, investments to the underground infrastructure (water and sewer lines, for example) may be critically important to sustaining urban services to a poor neighborhood, but may be unobservable to private investors. We have no way of distinguishing between these investments and others (say, in urban parks and commercial strip facades) that might have an obvious and positive effect on investor perceptions.

- Our proxy indicators of neighborhood quality are not perfect. Our factor analysis identified six dimensions of neighborhood quality that "explained" 65 percent of the variance among our collection of neighborhood indicators. These factors are, in turn, proxied by indicators that explain only a portion of the variance of the factors.

- We have no measures of other public or private investment that could complement CDBG spending in some neighborhoods, but not in others. The schematic of CDBG effects presented in Exhibit 4.1 shows that CDBG spending leverages other public and private dollars — e.g., through investments in affordable housing projects in which the private sector provides a substantial share of the investment — but not all CDBG expenditures do this. Furthermore, there are no widely available measures of municipal or other government spending in neighborhoods, or of private investment.

- Measures of supportive or inhibiting neighborhood, city, or metropolitan area-wide social, economic, and demographic influences on neighborhood quality have not been measured and applied for this analysis, except as they pertain to our classification of neighborhoods, described below.

- The quality of CDBG data available for this analysis is not perfect. As noted in Chapter 2, information on CDBG spending for some years for nearly all cities is incomplete or missing entirely, and our procedures for allocating CDBG expenditures across neighborhoods, however reasonable, is only approximate.

- The analysis annualizes only three years of CDBG spending — 1994 – 1996 —thereby ignoring many previous years of possible investment in these same neighborhoods. This omission is not damaging so long as these previous expenditures were on roughly the same scale as the ones we did measure, in which case the relative annual average across neighborhoods is an adequate proxy for earlier years' spending.

Definition Of Neighborhood Types

Because we expected neighborhood and city conditions to influence the productivity of CDBG investments, we believed it important to specify different performance standards for different classes of city and neighborhood characteristics. For example, one would expect that the critical mass required to

trigger accelerated neighborhood improvement would be much larger in a poor, declining neighborhood located in a city with no overall economic growth than in a moderate-income, stable neighborhood in a city with strong regional growth.

For our combined sample of 17 cities, we stratified neighborhoods (i.e., census tracts) into nine categories according to their earlier trajectory of change in the given quality of life indicator from 1990-1994[13] and the amount of job growth in the city as a whole between 1994-1997, to reflect current conditions (1999 job growth data was not available at the time). These are proxy measures of the factors contained in boxes 1 and 2 of Figure 4.1. The stratification categories are:

- Growth in city employment between 1994-1997. Because excluding low-expenditure tracts in our final models eliminated many tracts in the moderate- and high-growth cities, final model runs combined the two categories into a new "high-growth" category.

- 1990-1994 trend in home prices to categorize each tract into three equal groups, "price decline," "price stable," or "price increase." Tracts in which the median sale price declined by 21% or more fell in the "price decline" category, tracts for which the change was 8.8% or greater fell into the "price increase" category, and all those between were considered "price stable." The price trend measure is very sensitive to differences in conditions among the sample cities.

The resulting nine-cell classification of census tracts, with numbers of tracts and the percentage of the total number of tracts in the 17 cities is shown in **Exhibit 4.2**.

Note that we do not stratify neighborhoods by levels of each quality of life indicator, but rather, only on the basis of change in the indicator. This is because the initial, 1994, value for each neighborhood is included in our statistical model together with the amounts of CDBG investment over the period. (The reason for this will become clearer in our discussion of performance standards in the next section.)

It is worth noting that the neighborhoods included in this analysis are not necessarily low- and moderate-income neighborhoods as defined by statute and regulation. We expect that the preponderance of neighborhoods are, indeed, low-mod tracts given the amounts of funding qualified as area-benefit (although even these are not guaranteed to be in low-mod neighborhoods as defined by census tracts) expenditures, the relatively small share of direct benefit expenditures that had to be apportioned to tracts, some of which doubtless were low-mod, and the exclusion of below-mean-expenditure tracts from the ultimate analysis.

[13] In other words, the trend prior to the CDBG investment being investigated.

Exhibit 4.2

Classification of Census Tracts in 17-City Sample
(Number of Tracts)

Change in City Employment 1994 - 1997	**Change in Neighborhood House Prices 1990 - 1994**			
	Decline	Stable	Increase	Total
Decline or No Growth	112	101	25	238
	53%	61%	25%	50%
Low Growth	67	34	37	138
	32%	20%	37%	29%
High Growth	31	31	37	99
	15%	19%	37%	21%
Total	210	166	99	475
	100%	100%	100%	100%

Method for Estimating Effects of CDBG Expenditures on Neighborhood Outcomes

To assess the effects of CDBG expenditures on neighborhood types, we performed multi-variate regression analysis on the full set of data from the 17 sample cities. All models tested and described in this chapter used the following equation:

$$Y99 = a + b_1(CDBG\ ) + b_2(CDBG^2) + b_3(CDBG^3) + b_4(Y94)$$

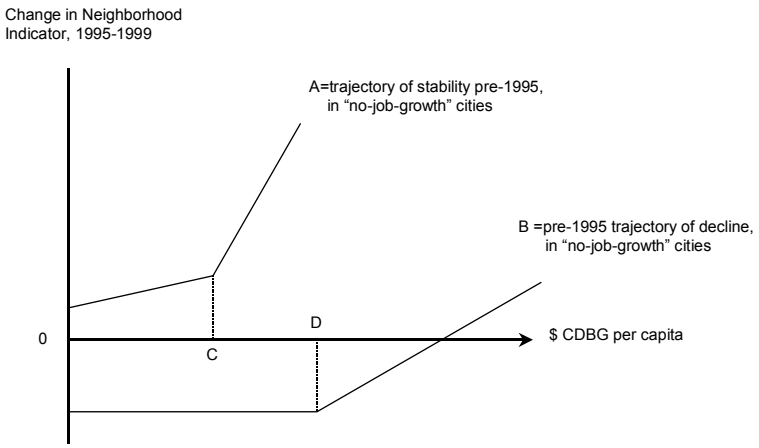
Where: a = intercept
b = coefficient
Y99 = 1999 value for the outcome indicator
Y94 = 1994 value for the outcome indicator
CDBG = annual average CDBG expenditures, 1994 – 1996

$CDBG^2$ and $CDBG^3$ were included in the equation to test for non-linear relationships.

Our planned analysis sequence called for an inspection of the results from the initial model runs for each neighborhood type and for each neighborhood quality indicator to determine whether the significance and sign of the $CDBG^2$ and $CDBG^3$ coefficients indicated any non-linearity. If non-linearity was indicated, we would go on to conduct a spline regression to identify thresholds, or trigger points, where CDBG investments begin to generate accelerated neighborhood payoffs.

Spline regression analysis has been used in previous research to identify trigger points in other relationships. (Johnston, 1984; Galster and Quercia, 2000; Galster, Quercia, and Cortes, 2000).[14] Essentially, the procedure allows the analyst to specify break points at which the slope of the regression line is allowed to change.[15] Standard t-tests are employed to assess whether the data warrant a new spline at each potential break point. We do not allow the intercept of the line to vary at each break point; for full details see Galster, Quercia, and Cortes (2000). Hypothetical results of this spline analysis are portrayed in **Exhibit 4.3**.

Exhibit 4.3
Illustration of Thresholds Between Neighborhood Indicators and CDBG Spending in Alternative Contexts



In this figure, the vertical axis measures change in the neighborhood indicator, and the horizontal axis measures CDBG spending per capita. It shows that, for neighborhoods with high initial assets, a trajectory of stability prior to 1995, and embedded in "strong" local economies, a particular key indicator of neighborhood quality of life might well be positively but linearly related to CDBG spending per capita 1995-1999 if the latter remains below C dollars. See line A. At low levels of CDBG spending neighborhood A shows increasing improvements in its indicator over time. However, past threshold point C the relationship may show much more programmatic payoff from subsequent marginal increases in

[14] Rarely do researchers investigate phenomena that do not conform to a simple mathematical function. However, in this case, spline is the ideal method for investigating unknown threshold relationships.

[15] We had intended to use a SAS nonlinear curve fitting program, LOWESS, as a preliminary step to guide specifying break points for the spline.

CDBG investments. In this neighborhood/city context, C would become the operational definition of "substantial" CDBG investment in terms of this indicator.

Results of Regression Analysis of Neighborhood Outcomes on CDBG Spending for All Tracts

For all dependent variables and all measures of CDBG spending and for all categories of neighborhood, we were unable to identify a threshold using the procedure described here. *In other words, we could not identify a threshold level of CDBG spending—the best possible basis for defining what constitutes a substantial CDBG investment—thereby requiring us to specify an arbitrary standard based on linear relationships between CDBG spending and neighborhood quality.*

We applied the regression model above for each category of neighborhood and for all tracts taken together (or "pooled") and found no evidence of non-linearity, therefore rendering any further investigation for threshold effects moot.

However, across the 17 cities in our analysis sample, pooling data from all tracts, we found a statistically significant and positive relationship between CDBG spending and changes in neighborhood quality for three of our four indicators. In doing so, we arrived at a working definition of "substantial" investment that we use in developing performance standards discussed in Chapter 5.

In our sequence of linear regression models, we found that the results were highly sensitive to our specification of the independent variable—CDBG expenditures. Through repeated iterations of the model, we arrived at a specification with the best predictive power across the entire sample and which produced significant relationships between CDBG spending and neighborhood quality for the largest number of tract categories and outcome measures. *This specification—CDBG Expenditures Per Poor Resident[16]—produced good results if the analysis sample were limited to census tracts with average annual expenditures of $86,737 or more.* (This is the mean expenditure if extreme high expenditure tracts—those more than three standard deviations from the mean—are excluded.) *This average annual expenditure becomes, in effect, our standard for defining "substantial" CDBG investment.*

To arrive at this result, we specified three basic regression models and ran them in sequence, each producing better results than the previous one. In each model, we used a two-tailed t-test, as we were interested in significant negative results as well as positive. These models and their results were:

[16] We considered expenditures per poor as a reasonable expression of the relative impact of CDBG upon the target population.

Model 1 – CDBG Expenditures, Tracts with No Spending Excluded

Expenditures were calculated as the mean yearly expenditure in each tract between 1994 and 1996. We used only those observations of census tracts with non-zero values of CDBG spending during the period.[17] While significant relationships were discovered for some indicators for a few neighborhood types, the results were spotty, and some relationships were negative.[18]

Model 2 – CDBG Expenditures Per Poor Resident, Tracts with No Spending Excluded

Expenditures were calculated as mean yearly expenditures per poor resident (from the 1990 Census), thereby scaling investment to the size of the target population. This produced a sharp improvement in the performance of our regression model, but once again there was no evident pattern.

Model 3 – CDBG Expenditures Per Poor Resident, Tracts Below the Mean Expenditure Excluded

Expenditures were calculated as mean yearly expenditures per poor resident, but model runs included only those tracts where CDBG expenditures exceeded the mean. This value -- $104,675 – was adjusted by excluding extremely high outlying values; those more than three standard deviations from the mean. The recalculated average expenditure came to $86,737.[19]

If we measure CDBG expenditures in terms of spending per poor resident, and exclude tracts below the mean level of per-tract expenditure (in effect, declaring the mean as the criterion for "substantial" investment), expenditures were found to have a significant impact on five of six outcome indicators. (See the bottom row of **Exhibit 4.4**.) These five were median loan amount, percent of loans for home purchase, loan approval rate, numbers of jobs and number of businesses. (The relationship was negative for number of loan applications.)

[17] This restriction is appropriate because we are asking the question, "Given that CDBG monies were spent in a tract, what was the result of differing amounts of spending?", as opposed to, "How is variation in CDBG spending in a tract correlated with results there?" For cities in which we felt we had an incomplete picture of CDBG spending, expenditures in tracts with no data were considered missing, rather than 0.

[18] Median loan amount was the most likely to be significantly affected by CDBG expenditures, in six of the twelve neighborhood types, but half of these cases indicated that CDBG had a negative impact. Furthermore, we observed no real pattern across outcome indicators.

[19] We also conducted tests with expenditures corrected for the local consumer price index, to reflect the impact of differing costs across cities. This variation had only a minor impact upon outcomes.

In Exhibits 4.4 and 4.5, a "+" indicates that expenditures had a significant positive impact upon the outcome indicator, and "-" indicates that expenditures had a significant negative impact. A blank indicates that no significant relationship was found. Dependent variables are as labeled in the charts, and as more fully described in Chapter 3.[20]

Exhibit 4.4
Significance of Relationship Between CDBG Spending and Selected Performance Indicators
By Type of CDBG Expenditure
(+ Indicates Significant Positive Relationship
- Indicates Significant Negative Relationship)

Expenditure Category	N	Median loan amount 1998-99	Loan applications 1998-99	Loan approval rate 1998-99	Number of businesses 1999
Acquisition and Clearance	56				
Economic Development	176	+	-	+	+
Housing Related	230	+		+	
Public Service	247	+		+	
All Tracts	475	+	-	+	+

* N for median loan amount. Number of valid tracts varies slightly with different outcome indicators.
Independent variable is Annual Average CDBG Spending (1994-96) Per Poor Resident.
Analysis excludes tracts with below-mean average expenditures ($86,737).

The reasonableness of this overall result is supported by the relationship between CDBG expenditures and spending category (still not grouping by neighborhood type):

- Economic development expenditures were significantly correlated with three of four indicators, although that relationship was negative for number of loan applications. Important for the credibility of these results, economic development expenditures are the only ones that are

[20] Based upon the close relationship we found between median sales price from commercial databases and median loan amount from HMDA, we used median loan amount as a substitute for home price data when commercial data was not available. Some tracts were missing both HMDA and commercial data. Tracts for which home price data was missing were not included in the analyses by neighborhood type, but are included in all other analyses.

significantly and positively correlated with neighborhood employment (not shown) and business formation.

- Housing related and public service expenditures were positively correlated with median loan amount and loan approval rates, and negatively correlated with number of loan applications.

We found in these three expenditure categories a significant positive impact upon the outcome indicators more often than not, and a negative impact only upon loan applications. The negative impact most likely relates to increases in multifamily or renter-occupied dwellings in higher CDBG-expenditure areas (if as the result of support for programs that increase rental rehabs and/or new rental construction, it does not actually represent a negative outcome).

Results of Regression Analysis of Neighborhood Outcomes on CDBG Spending for Categories of Census Tracts

Although we found that the relationship between CDBG spending and neighborhood quality indicators was positive for most indicators if we pooled tracts, we could not establish significant relationships for all types of neighborhoods across any given indicator, nor for all indicators across any given neighborhood type. (See **Exhibit 4.5**.)

Moreover, we found that the results of our models were highly sensitive to specification of the dependent variable and the definition of substantial we adopted. Although we achieved consistently stable results (either positive, negative, or no relationship) where the numbers of tracts in a neighborhood category were large, results were unstable where the numbers were small. Because our definition of substantial investment had the effect of excluding large numbers of tracts from certain neighborhood categories, the results were sensitive to where the cut-off for "substantial" was pegged. We expect that results would be more stable if the models were applied to a larger number of communities than the 17 available for this analysis; this conclusion would be worth testing in future research.

Overall, we found two outcome indicators, median loan amount and number of businesses, which are somewhat reliably affected by CDBG expenditures above the threshold, but only for certain types of neighborhoods. (In fact, median loan amount and loan approval rates appear to be reliably affected whether expenditures were above the threshold or not).

Exhibit 4.5
Significance of Relationship Between CDBG Spending and Selected Performance Indicators
(+ Indicates Significant Positive Relationship
- Indicates Significant Negative Relationship)

		Performance Indicator			
Performance Category	**Number of Tracts***	Median loan amount 1998-99	Loan applications 1998-99	Loan approval rate 1998-99	Number of businesses 1999
No growth price decline	112	+		+	+
Low growth price decline	67	+			+
High growth price decline	31				-
No growth price stable	101				
Low growth price stable	34	+			+
High growth price stable	31				
No growth price increase	25				
Low growth price increase	37			+	
High growth price increase	37	+			+
All tracts	512	+	-	+	+

* N for median loan amount. Number of valid tracts varies slightly with different outcome
Independent variable is Annual Average CDBG Spending (1994-96) Per Poor Resident.
Analysis excludes tracts with below-mean average expenditures ($86,737).

We aimed to produce a performance measure that would apply across different comparison categories, thereby ensuring that any neighborhood's performance would be assessed only in relation to a standard set by other, similar, neighborhoods. We wished to avoid setting a too-easy standard for neighborhoods advantaged by location in a growing city or with a price trend that had previously been rising, or a too-onerous standard for neighborhoods in declining cities and with previously falling prices.

Failing to establish such a standard for all nine types of neighborhoods, we sought to combine neighborhood categories to produce standards for broader categories of census tracts. Specifically, we separately ran the regression model for each of the three categories of city job change and the three categories of neighborhood price trend. The result is shown in **Exhibit 4.6**.

Exhibit 4.6
Significance of Relationship Between CDBG Spending and Selected Performance Indicators
By City Job Change and Neighborhood Price Trend Categories
(+ Indicates Significant Positive Relationship
- Indicates Significant Negative Relationship)

		Performance Indicator			
City Job Change Category	**N***	**Median loan amount 1998-99**	**Loan applications 1998-99**	**Loan approval rate 1998-99**	**Number of businesses 1999**
No Growth	238	+		+	+
Low Growth	138	+		+	+
High Growth	99				+
Neighborhood Price Trend	**N***	**Median loan amount 1998-99**	**Loan applications 1998-99**	**Loan approval rate 1998-99**	**Number of businesses 1999**
Price decline	210	+		+	+
Price stable	166			+	
Price increase	99	+		+	+

* N for median loan amount. Number of valid tracts varies slightly with different outcome indicators.
Independent variable is Annual Average CDBG Spending (1994-96) Per Poor Resident.
Analysis excludes tracts with below-mean average expenditures ($86,737).

Collapsing neighborhood categories to produce significant relationships between CDBG spending and neighborhood quality indicators for each category did not eliminate the gaps for which we could not produce a standard. As shown in the top panel of Exhibit 4.6, we established a significant and positive CDBG – neighborhood outcome relationship for each neighborhood category for two indicators — number of businesses by city job change categories, and loan approval rate by neighborhood price trend. For other indicators, we obtained a significant relationship for two out of three categories of

neighborhood. A test of the variance between the regressions for each of the two types of neighborhood categories and the regression for all tracts combined, indicated that the categories (city job growth and neighborhood price trend) did in fact improve the explanatory power of the model.[21] As the collapsed categories left fewer un-testable neighborhoods, we use them for our example of a performance measurement system in Chapter 5.

[21] F-tests demonstrated significant results at the .05 level of confidence for all four indicators.

CHAPTER 5
CREATION AND TESTING OF PERFORMANCE STANDARDS

This chapter simulates how a performance measure might be applied across a large number of communities by establishing several performance standards and applying the resulting measures across the cities in our analysis sample. In Chapter 6, we report the results of discussions with local community development officials testing the reasonableness of our simulation. Practical implications of the performance measure are covered in Chapter 7.

As an example of how our results could be used to create a performance standard, we pay particular attention to the two indicators that produced the best empirical results as "proxy" indicators in Chapter 3 and which also correlated well with CDBG expenditures in Chapter 4. These performance indicators are median loan amount and number of businesses.

We adopted a performance standard that calculates the difference between a census tract's statistically-predicted level on a performance indicator and its actual level. (This value is the tract's *residual* value.) If this residual value is within a two-thirds standard deviation of the mean value (as an arbitrary cut-off) for all residuals in a tract's performance group, we declare the tract to be performing as expected. Residual values outside this parameter lead us to declare them to be out-performing their group (if in a positive direction) or under-performing their group (if in a negative direction). We construct four performance measures based on two indicators — median loan amount and number of businesses — and two performance categories — city job change and neighborhood price change.

These performance measures can be applied to the analysis sample as a whole, or to individual cities within the sample. If we apply the measure based on median loan amount for different categories of neighborhood price change, 20.1 percent of all tracts in the 17-city sample "out-perform" their performance (comparison) group; 60.5 percent perform as expected; 19.4 percent "under-perform" their performance group. We also apply the measure city-by-city, adopting a standard that a city's percentage of out-performing or under-performing tracts must be more than double (as an arbitrary standard) the corresponding sample average to allow us to judge the city as itself out-performing or under-performing other cities in the sample. On this measure, Boston, Denver, and Portland out-perform the group; Birmingham and Tulsa under-perform the group.

These overall results do not change materially if we adopt a modified version of this measure, which as applied excludes price-stable tracts from consideration (because no significant statistical relationship between CDBG spending and median loan amount obtained for this group). The modified version applies the price-decline standard to the price-stable group; in other words, the price stable tracts are expected to perform at least as well as, but only as well as, the price-decline tracts. The result appears to

be a promising basis for constructing a performance measurement system, although susceptible to challenge from administrators of local CDBG programs.

Introduction

The goal of this project was to examine the effects of CDBG investments on neighborhood quality for the purpose of developing performance measures. These measures would apply to neighborhoods with "substantial" levels of CDBG investment. In Chapter 4, we arrived at a reasonable (although arbitrary) definition of "substantial expenditures," as the mean annual average expenditure across all census tracts where CDBG funds had been spent in the 17 cities. We also established a statistical relationship between CDBG spending and a variety of performance indicators for some, but not all, categories of neighborhoods.

Although our research aimed for a less arbitrary basis for defining a "substantial investment" level that would trigger a performance test for tracts that exceeded this level, and to do so for all nine categories of neighborhood, we can make use of the results we did get to simulate how a performance measure might be applied across a large number of communities.

As we noted in Chapter 1, performance is measured according to some benchmark or standard. In this instance, the standard pertains to the expected level of a performance indicator given a specified level of CDBG investment in a tract. As briefly described in Chapter 1, we established this expected performance level through regression analysis, which allows us to plot the expected value of any tract given its 1994 value for an indicator and its level of CDBG investment between 1994 and 1996. We then take the actual value and compare it to the expected value. If the difference between the actual value and the expected value falls above or below a pre-set range of expected performance (few actual values would match the predicted values exactly) then the tract can be considered as out-performing or under-performing relative to other tracts. The usefulness of the performance standard depends on how reasonable the expected value is.

This method of predicting expected values requires us to use the coefficients found in the tables in the Appendix, as produced by the model discussed in Chapter 4. Each coefficient represents the relative effect of the independent variables — including CDBG spending — on each performance indicator. Because the standard is derived relative to the behavior of all the tracts in the performance category, it can be considered as reasonable.

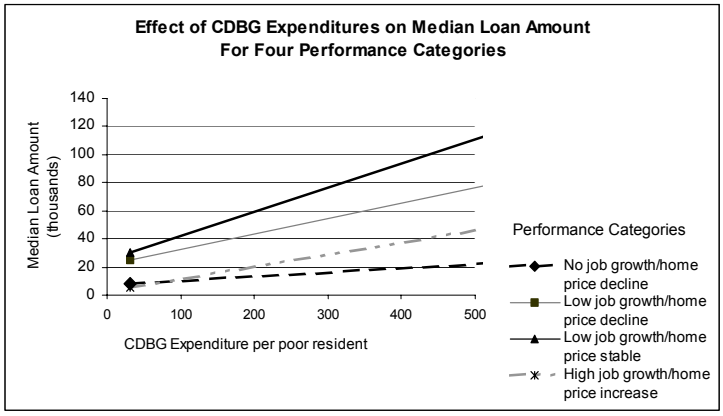
Recap of Results of Statistical Models

As discussed in Chapter 5, we could not find a statistically significant relationship between CDBG spending and performance indicators for all of the nine performance categories defined by city job change

and neighborhood price change. For the purpose of testing performance standards in this chapter, we concentrate on two performance indicators that proved to be strong proxies for selected dimensions of neighborhood change (as discussed in Chapter 3) and were better related to CDBG spending than were some other indicators (as shown in Chapter 4). These indicators are median loan amount and number of businesses.

To begin the discussion, we examine the statistical relationship between median loan amount and CDBG spending. **Exhibit 5.1** plots the regression lines for the four types of neighborhoods in which we found CDBG expenditures to have a significant effect on median loan amount. For each neighborhood type (performance category) the model predicts that a given level of CDBG expenditures per poor person would correlate with the 1999 tract median loan amount where the two axis values intersect along the plotted line. (The loan amount also depends upon the value of median loan amount in 1994, not shown in the chart).

Exhibit 5.1



Note that the slope of each of the four lines is positive, as we would expect, indicating that higher expenditures per poor person have a greater impact upon the outcome indicator. The least effect (flattest line) is registered in the no growth/price decline tracts, while the greatest effect is shown in the low growth/price stable neighborhoods. However, with significant relationships in only 4 of the 9 neighborhood types, these models give us performance standards for only half of the 475 tracts with substantial CDBG expenditures in the 17–city sample.

As discussed in Chapter 5, many of the neighborhood categories contained relatively few numbers of tracts remaining after excluding expenditures below the mean annual average CDBG expenditure. While the lack of significant results for those categories indicated no statistical relationship, we expected that aggregations of neighborhood types, by providing a larger sample in each performance category, would yield significant results. We combined the nine neighborhood types into two sets of classifications: city

job growth – high, low and no growth; and home price trend – price decline, price stable, and price increase.

Using these combinations, we detected significant relationships for median loan amount and number of businesses for "no growth" and "low growth" cities, and "price decline" and "price increase" neighborhoods[22]. **Exhibit 5.2** shows the regression line for the two neighborhood categories, **Exhibit 5.3** shows the regression line for the two city job change categories.

Exhibit 5.2

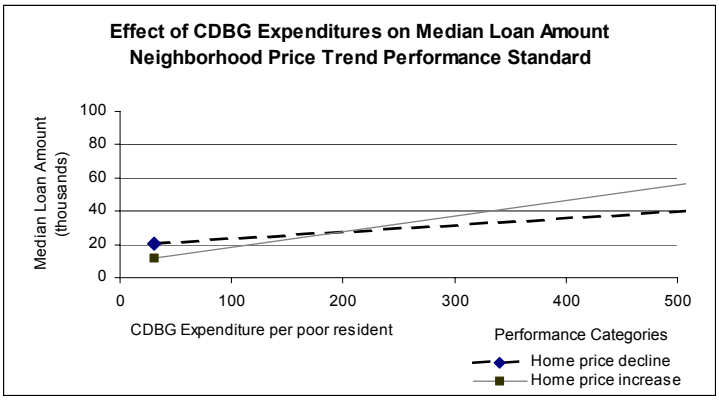
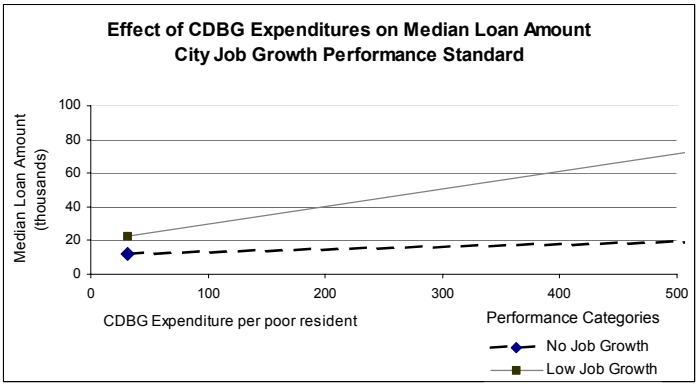


Exhibit 5.3



The neighborhood price trend covers 65% of the tracts in our study, and the city job growth standard covers 80% of the tracts. The first model leaves us without a standard for "price stable" neighborhoods, and the second model leaves us without a standard for "high growth" cities. **Exhibit 5.4** shows the percentage of tracts in our sample and the percentage of cities that would be covered under each of the

[22] Expenditures had a significant impact on number of businesses in high growth cities.

performance measures. Only one measure captures 100% of both, number of businesses using the city job growth category. Unfortunately, while the number of businesses is a useful indicator, its applicability may be thought to be limited because it is related only to economic development spending, not other kinds of CDBG investment. (See Exhibit 4.4 in Chapter 4.)

Exhibit 5.4
Number and Percentage of Tracts and Cities Included in Tests of Four CDBG Performance Measures

Indicator / Performance Category	Number of Tracts	Number of Cities
Performance Measure 1		
Indicator: Median Loan Amount	309	17
Category: Neighborhood Price Change	65.1%	100%
Performance Measure 2		
Indicator: Median Loan Amount	378	10
Category: City Job Change	79.6%	58.8%
Performance Measure 3		
Indicator: Number of Businesses	475	17
Category: City Job Change	100%	100%
Performance Measure 4		
Indicator: Number of Businesses	301	17
Category: Neighborhood Price Change	65.1%	100%

Use of Statistical Results to Create Performance Measures

We used the statistically significant relationships we could produce under our aggregated performance categories to create four performance measures. These measures are:

Measure 1: Median loan amount for categories of neighborhood price change
Measure 2: Median loan amount for categories of city job change
Measure 3: Number of businesses for categories of city job change
Measure 4: Number of businesses for categories of neighborhood price change

We set the performance standard for each measure by calculating the difference between expected values and actual values for each census tract. This difference is known as a *residual.* As described at the beginning of Chapter 5, if a tract's residual value was within a two-thirds (67 percent) standard deviation

from the mean of all residuals for the tract's performance category, we declared that tract to be performing as expected. If a tract's residual value was more than a two-thirds (67 percent) standard deviation from the mean in a positive direction, we declared that tract to be "out-performing" its group; if in a negative direction, we declared it to be "under-performing" its group.

These measures can be applied in two ways: to all 17 cities taken as a group and to individual cities within the group. These are discussed in turn.

Performance Measures Applied to All 17 cities

One way of using performance measures is to consider the CDBG program as a whole and to assess its performance nationwide in terms of the thousands of census tracts across the nation in which CDBG funds are spent. Going forward from some baseline, HUD might do all it can to encourage movement of tracts from the "expected performance" to the "out-performing" category, and to encourage movement of tracts from the "under-performing" to the "expected performance" category. The Department could remain indifferent to which cities in which these tracts were located (although some type of targeted technical assistance effort would obviously want to take account of concentrations of under-performing tracts in particular communities).

For each of the four performance measures we created, **Exhibit 5.5** shows the results of the analysis. The exhibit shows the numbers of census tracts in the 17 cities that fall into each performance category. For example, under Performance Measure 1, using the median loan amount indicator for two of the three categories of neighborhood price change, and applying the two-thirds standard deviation performance standard, 20 percent of census tracts are defined as out-performing tracts, 60.5 percent are performing as expected and 19.4 percent are under-performing. Similar results are obtained for performance measure 2, but performance measures 3 and 4 (pertaining to numbers of businesses) have fewer percentages of tracts in the out-performing and under-performing categories than do the other two measures. (This difference reflects the different underlying distributions of the two indicator variables.)

Exhibit 5.5
Tract Performance Under Four Alternative CDBG Performance Measures

Performance Measure	Tract Performance Relative to Measure			
	High	In Range	Low	Total
Performance Measure 1				
Indicator: Median Loan Amount	62	187	60	309
Category: Neighborhood Price Change	20.1%	60.5%	19.4%	100.0%
Performance Measure 2				
Indicator: Median Loan Amount	64	244	69	378
Category: City Job Change	17.0%	64.6%	18.4%	100.0%
Performance Measure 3				
Indicator: Number of Businesses	46	363	66	475 **
Category: City Job Change	9.7%	76.4%	13.9%	100.0%
Performance Measure 4				
Indicator: Number of Businesses	30	224	47	301
Category: Neighborhood Price Change	10.0%	74.4%	15.6%	100.0%

** Only Standard Applicable to All Tracts in 17 Cities

In other words, using the same performance categories and standards, but different indicators, assigns different numbers and percentages of census tracts to each of the out-performing, expected performance, and under-performing categories.

Performance Measures Applied to Individual Cities

Performance measures also can be applied to individual cities as an alternative to, or in addition to, their application to all communities taken as a group. Exhibits 5.6 – 5.9 show the result of applying each of performance measures 1 through 4 to the 17 cities in this analysis. Each city's performance is assessed according to the percentage of tracts within the city that fall into each of the under-performing, expected performance, and out-performing categories.

As a somewhat arbitrary standard, we declared that any city with a percentage of out-performing tracts more than twice the 17-city average would be considered a good performer. Conversely, a poor performer would have more than twice the 17-city average percentage of under-performing tracts. The remaining cities would be considered to be performing as expected. For example, in **Exhibit 5.6**, Milwaukee has 1 tract in the "out-performing" column, 21 tracts with expected performance, and 6 tracts in the "under-performing" column. A relatively low percentage of tracts, therefore, fall outside the expected range, 4% high and 21% low, compared to the totals for the whole sample, which are 20% and 19% respectively. By our standard, Milwaukee is performing as expected.

Exhibit 5.6
Tract Performance By City On Performance Measure 1
Median Loan Amount by Neighborhood Price Change
(Number of Tracts)

	Tract Performance				Percent Tracts	
Entitlement City	Out-Peforming	Expected Performance	Under-Performing	TOTAL	Out-Performing	Under-Performing
Birmingham	0	2	2	4	0%	**50%**
Boston	27	14	1	42	**64%**	2%
Charlotte	1	2	1	4	25%	25%
Cleveland	5	22	4	31	16%	13%
Columbus	0	6	3	9	0%	33%
Denver	5	5	0	10	**50%**	0%
Ft. Lauderdale	0	2	0	2	0%	0%
Houston	3	20	6	29	10%	21%
Indianapolis	0	6	1	7	0%	14%
Long Beach	2	12	3	17	12%	18%
Los Angeles	10	50	22	82	12%	27%
Milwaukee	1	21	6	28	4%	21%
Oakland	0	5	0	5	0%	0%
Portland	5	5	0	10	**50%**	0%
Providence	1	8	2	11	9%	18%
Tulsa	0	0	4	4	0%	**100%**
Washington	2	7	5	14	14%	36%
Totals	62	187	60	309		
Average	20.1%	60.5%	19.4%	100.0%		

Note: Excludes price-stable tracts, for which this performance measure could not be applied

Note: Figures in **Bold** are cities that exceed twice the national average for their number of high-positive or high-negative tracts according to this performance measure.

In Boston, 27 tracts, or 64%, are high positives, more than double the 20 percent of all tracts in the sample that fall into that category; Boston, therefore, can be considered a good performer. Denver and Portland would also be considered good performers by that same criterion. Conversely, Birmingham and Tulsa would be considered poor performers – although neither have many tracts in which expenditures met our definition of "substantial" CDBG expenditures.

Exhibits 5.7 through **5.9** repeat this exercise for the other three performance measures in this analysis.

Unfortunately, except for Performance Measure 3, these measures exclude the performance of some tracts or entire cities from consideration, as shown in Exhibit 5.4, above. Given the intuitive appeal of median loan amount as a performance indicator, and its empirical relationship to other indicators of neighborhood

quality, the loss of this measure for some categories of neighborhoods (Stable price trend tracts, and high growth cities) is particularly distressing. It could not be used in any performance measurement system without creating clear inequities — some tracts in some cities would be held to a performance standard; others would not.

Exhibit 5.7
Tract Performance By City On Performance Measure 2:
Median Loan Amount by City Job Change Category
(Number of Tracts)

	Tract Performance				Percent Tracts	
Entitlement City	Out-Peforming	Expected Performance	Under-Performing	TOTAL	Out-Performing	Under-Performing
Birmingham	0	1	3	4	0%	**75%**
Boston	22	27	5	54	**41%**	9%
Charlotte						
Cleveland	0	28	10	38	0%	26%
Columbus						
Denver	6	12	2	20	30%	10%
Fort Lauderdale	0	4	0	4	0%	0%
Houston						
Indianapolis						
Long Beach	0	9	13	22	0%	**59%**
Los Angeles	24	94	28	146	16%	19%
Milwaukee	2	40	1	43	5%	2%
Oakland						
Portland						
Providence	2	9	1	12	17%	8%
Tulsa						
Washington	8	19	6	33	24%	18%
Total Tracts	64	244	69	378		
Average	17.0%	64.6%	18.4%	100%		

Note: This performance measure could not be applied to cities in italics because there is no significant relationship between CDBG spending and median loan amount for high-job-growth cities.

Note: Figures in **Bold** are cities that exceed twice the national average for their number of high-positive or high-negative tracts according to this performance measure.

To arrive at a universally applicable performance measure that uses median loan amount as an indicator, we opted to apply the most conservative standard available to neighborhoods for which no specifically applicable standard could be created. In the case of Measure 1, for which no standard could be developed for price-stable neighborhoods, we applied the price-decline standard. In other words, we expect price-stable neighborhoods to perform at least as well as price-declining neighborhoods with the same levels of CDBG investment. By the same token, we refrain from holding price-stable

neighborhoods to the standard set by price-increasing neighborhoods, which as shown by the slope of the regression line plotted in Exhibit 5.2, is substantially higher than the one set for price-decline tracts.

Exhibit 5.8
Tract Performance By City On Performance Measure 3:
Number of Businesses by City Job Change Category
(Number of Tracts)

	Tract Performance				Percent Tracts	
Entitlement City	Out-Peforming	Expected Performance	Under-Performing	TOTAL	Out-Performing	Under-Performing
Birmingham	3	1	0	4	**75%**	0%
Boston	5	45	4	54	9%	7%
Charlotte	2	4	0	6	**33%**	0%
Cleveland	2	35	1	38	5%	3%
Columbus	1	11	2	14	7%	14%
Denver	1	15	4	20	5%	20%
Fort Lauderdale	0	4	0	4	0%	0%
Houston	1	39	6	46	2%	13%
Indianapolis	0	8	1	9	0%	11%
Long Beach	0	12	10	22	0%	**45%**
Los Angeles	24	99	23	146	16%	16%
Milwaukee	1	37	5	43	2%	12%
Oakland	0	5	3	8	0%	**38%**
Portland	2	8	2	12	17%	17%
Providence	0	9	3	12	0%	25%
Tulsa	0	4	0	4	0%	0%
Washington	4	27	2	33	12%	6%
Total Tracts	46	363	66		475	
Average	9.7%	76.4%	13.9%		100%	

Note: Figures in **Bold** are cities that exceed twice the national average for their number of high-positive or high-negative tracts according to this performance measure.

Exhibit 5.9
Tract Performance By City On Performance Measure 4:
Number of Businesses by Neighborhood Price Change
(Number of Tracts)

	Tract Performance				Percent Tracts	
Entitlement City	Out-Peforming	Expected Performance	Under-Performing	TOTAL	Out-Performing	Under-Performing
Birmingham	1	2	0	3	**33%**	0%
Boston	2	36	3	41	5%	7%
Charlotte	4	0	0	4	**100%**	0%
Cleveland	2	28	1	31	6%	3%
Columbus	4	3	2	9	**44%**	22%
Denver	0	7	3	10	0%	30%
Ft. Lauderdale	0	2	0	2	0%	0%
Houston	1	21	5	27	4%	19%
Indianapolis	0	6	1	7	0%	14%
Long Beach	0	10	7	17	0%	**41%**
Los Angeles	13	54	13	80	16%	16%
Milwaukee	0	25	2	27	0%	7%
Oakland	0	3	2	5	0%	**40%**
Portland	3	6	1	10	**30%**	10%
Providence	0	8	3	11	0%	27%
Tulsa	0	2	2	4	0%	**50%**
Washington	0	11	2	13	0%	15%
Totals	30	224	47		301	
Average	10.0%	74.4%	15.6%		100.0%	

Note: Excludes price-stable tracts, for which this performance measure could not be applied

Note: Figures in **Bold** are cities that exceed twice the national average for their number of high-positive or high-negative tracts according to this performance measure.

Applying this method to the 17-city sample does not alter our estimate of how each city performs. **Exhibit 5.10** shows the result. No city is dropped from or added to the "good performer" or "poor performer" list (although Charlotte comes perilously close to the latter). This adapted measure 1 allows us to test performance in 100% of tracts. Compared to the "un-adapted" measure 1 on which the new measure is based, lower percentages of tracts overall fall into the under-performing or over-performing categories. By implication, the price-stable tracts now included in the performance measure are more likely to fall into the expected range than the tracts already included in measure 1, a desirable result from the standpoint of the measure's acceptability to those cities with large numbers of price-stable tracts.

Exhibit 5.10
Tract Performance By City On Modified Performance Measure 1
Median Loan Amount by Neighborhood Price Change
Declining Tract Standard Used for Stable Tracts
(Number of Tracts)

	Tract Performance				Percent Tracts	
Entitlement City	Out-Peforming	Expected Performance	Under-Performing	TOTAL	Out-Performing	Under-Performing
Birmingham	0	2	2	4	0%	**50%**
Boston	35	18	1	54	**65%**	2%
Charlotte	1	3	2	6	17%	33%
Cleveland	6	28	4	38	16%	11%
Columbus	1	10	3	14	7%	21%
Denver	14	6	0	20	**70%**	0%
Ft. Lauderdale	0	4	0	4	0%	0%
Houston	6	29	11	46	13%	24%
Indianapolis	0	8	1	9	0%	11%
Long Beach	2	16	4	22	9%	18%
Los Angeles	12	105	29	146	8%	20%
Milwaukee	2	34	7	43	5%	16%
Oakland	0	7	1	8	0%	13%
Portland	7	5	0	12	**58%**	0%
Providence	1	9	2	12	8%	17%
Tulsa	0	0	4	4	0%	**100%**
Washington	5	20	8	33	15%	24%
Totals	92	304	79		475	
Average	19.4%	64.0%	16.6%		100.0%	

Note: No performance standard could be set specifically for price-stable tracts because there is no statisical relationship between CDBG spending and median loan amount for that performance category. Therefore, the price-decline tract standard has been used for price-stable tracts.

Note: Figures in **Bold** are cities that exceed twice the national average for their number of high-positive or high-negative tracts according to this performance measure.

Performance Measures Tested in Particular Cities

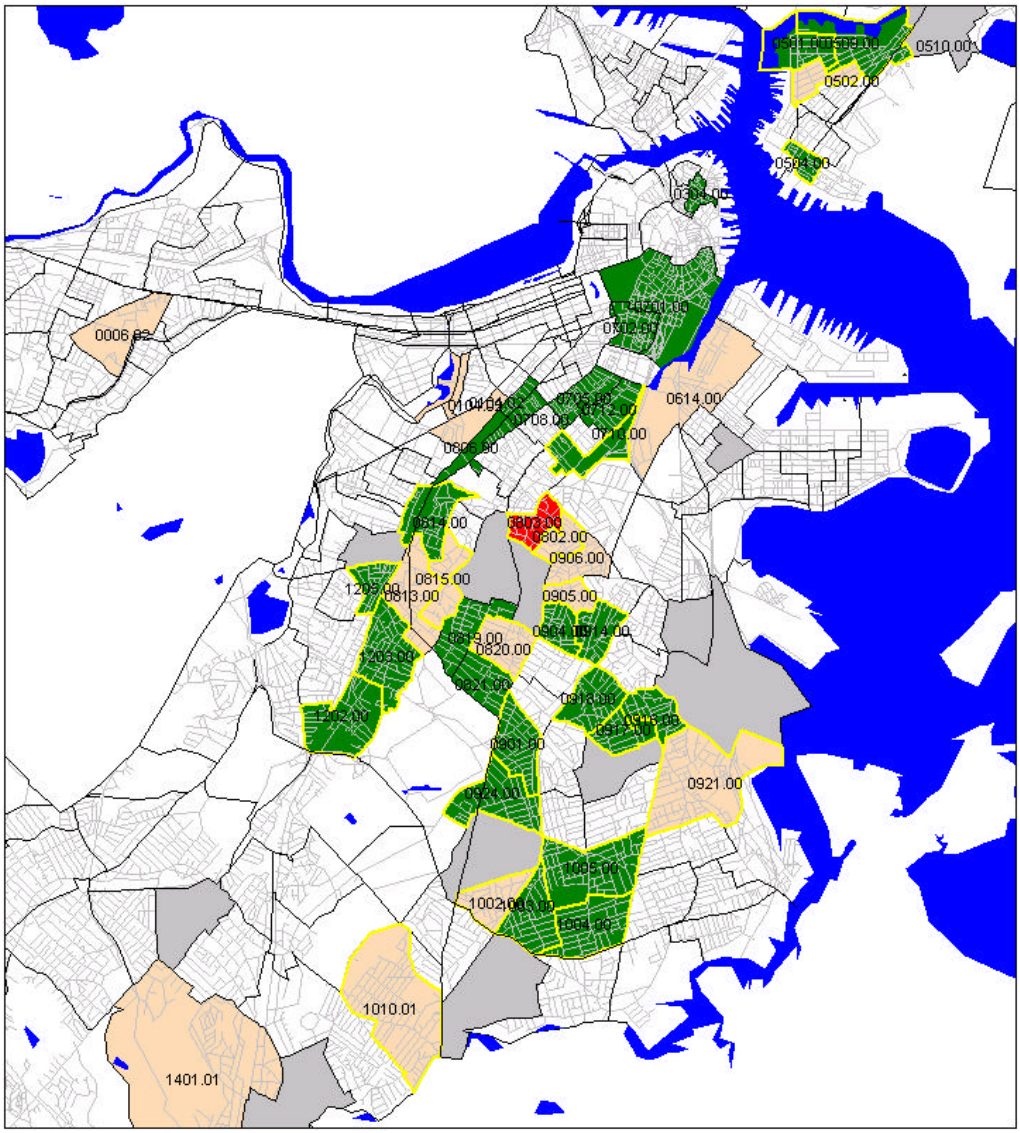
These results have been generated by a straightforward application of common statistical methods, but this alone does not guarantee their acceptance among those to whom the performance measures would be applied. The last stage of the analysis, as discussed in Chapter 6, was to consult with community development practitioners (city officials, community development intermediary staff, and others) to find out whether the results for particular cities appear plausible to those most invested in the measures' application.

As an example, **Exhibit 5.11** shows the performance of each tract in Boston that received more than an annual average $86,737 between 1994 and 1996 (according to HUD's administrative systems and using the pro-ration methods discussed in Chapter 2). Graphic display of the neighborhoods lets us, and local community development officers, identify neighborhood boundaries and clusters of similar-performing tracts, and compare performance across indicators and performance categories. In this example, tracts performing better than expected are green, tracts performing worse than expected are red, and tracts performing as expected are tan. Tracts with no color had either no CDBG expenditures or CDBG expenditures below the mean amount — our definition of "substantial" investment.

Grey tracts are price-stable tracts that could not be assessed under the original performance measure 1. **Exhibit 5.12** shows how Boston tract performance changes with application of our modified measure. The modified measure 1 (which applies the price-decline standard to price-stable tracts) adds eight additional tracts to the "out-performing" category.

Generally speaking, the results of this exploratory analysis suggest a promising set of performance measures. However, the assumptions behind the standard and gaps in tracts covered do leave the standard subject to challenge. The next chapter tests whether the method is indeed workable, and the last chapter discusses some of the implications of our results.

Exhibit 5.11



Boston

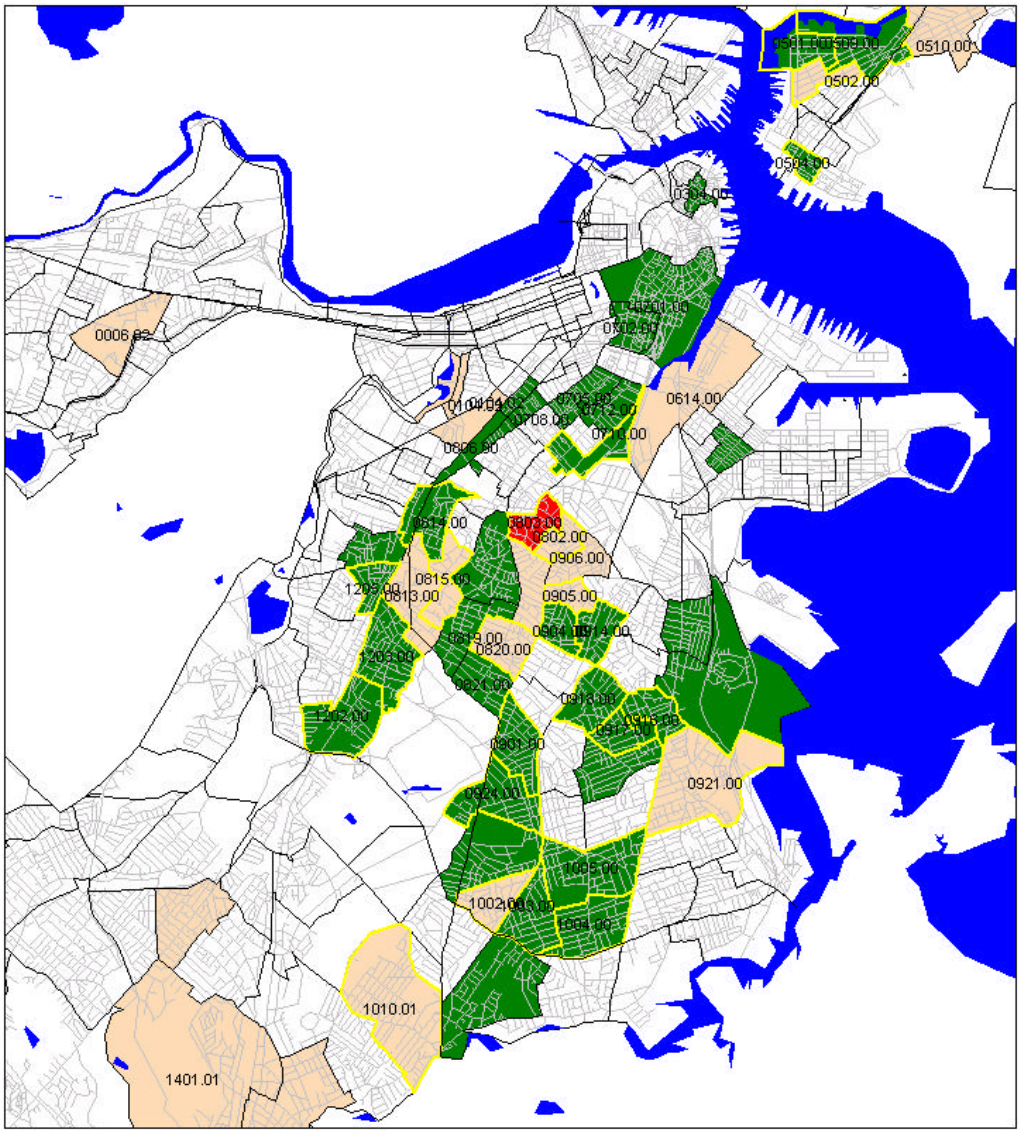
Performance Indicator: Median Loan Amount

Performance Category:
Neighborhood Price Trend

Price decline tracts outlined
"Substantial" investment tracts only

- High impact
- Low impact
- Expected impact
- Not significant

Exhibit 5.12



Boston

Performance Indicator: Median Loan Amount

Performance Category:

Neighborhood Price Trend

Price stable tracts using price decline standard

Price decline tracts outlined

"Substantial" investment tracts only

- High impact
- Low impact
- Expected impact

CHAPTER 6
TESTING THE PERFORMANCE MEASURES

To test the reasonableness of the proposed performance system, we conducted conversations with local community development informants in four of the 17 CDBG communities included in this research.

This chapter reports the findings from these interviews, which compared the study's results with local informants' intuitive understanding of the CDBG program's impact on their communities in the late 1990s. Focusing on "out-performing" and "under-performing" neighborhoods, local informants were asked whether the proposed performance system had accurately depicted the program's impact and, if not, why not. To the extent grantees confirmed the classification of "out-performing" or "under-performing" tracts, they also were asked to explain why the program had such an impact. Finally, verification gave the local informants an opportunity to highlight any issues that they would like HUD to consider as it refines and ultimately implements a performance measurement system.

While this portion of the research was limited by the number of grantees contacted and the number of informants who could be interviewed at each site, it does illustrate the kinds of challenges HUD is likely to encounter in the implementation of a performance assessment system.

To begin with, it should be noted that each of the grantees expressed concern about how a system to measure the neighborhood impact of CDBG might be used to assess the performance of, and potentially sanction, individual grantees. The principal objective of this research was to develop a methodology HUD might use to assess the performance of the program nationwide; however, as noted elsewhere in the report, there are compelling reasons why HUD might want to apply the system at a grantee level to identify communities that can serve as best practice models and grantees that would benefit most from technical assistance. From the perspective of the local informants interviewed for this research, though, any performance system that attempts to enforce nationwide performance standards at the individual grantee level would seriously undermine the flexibility grantees have to tailor local investment strategies to address local needs, within the program's broad national objectives.

In addition to concerns about the potential impact on local flexibility, the grantees questioned several specific aspects of the proposed performance measurement system. To varying degrees, grantees voiced concerns about HUD's ability to accurately assess the spatial distribution of CDBG investments; about the validity of the indicators selected for the performance assessment test; and about the ability of any performance measurement system to adequately account for factors beyond the control of local program administrators. In fact, because of the myriad of compounding and confounding factors that can influence the change in neighborhood conditions over time, some interviewees openly questioned HUD's ability to measure CDBG's impact on neighborhoods, at all.

Due to these reservations, the neighborhood-by-neighborhood verification process revealed a mixed picture regarding the accuracy and adequacy of the proposed performance measurement system. The assessment did suggest, however, that overall the median loan indicator is a more reliable measure of CDBG's neighborhood impact, and that there was little distinction between the neighborhood price trend and city job growth performance measures.

The following discussion details the findings from the verification effort, and is divided into three sections. The first summarizes the procedures used in conducting the verification, and presents the overall test results. The second section examines the verification of the tract performance results in each of the four cities visited—Boston, Houston, Columbus and Milwaukee, respectively. And, the last section recaps the major concerns grantees voiced about the implementation of a performance measurement system.

Overall Verification of "Under-Performing" and "Out-Performing" Tracts

The main issue examined in this portion of the study was the degree to which local informants agreed with the outcomes of the proposed performance measurement system. In other words, does the proposed performance assessment system do a reasonable job of portraying the CDBG program's impact on the quality of life in different neighborhoods, or does it contradict local informants' intuitive impressions about the program's impact?

Verification was conducted in four cities representing each of the city job growth categories used in the proposed performance assessment system, including one "no growth" grantee (Milwaukee), one "low growth" city (Boston), and two high growth cities (Columbus and Houston).[23] The test examined the neighborhood impact of the CDBG program according to four of the different performance measures described in Chapter 5:

- Modified Measure 1 – median loan amount by neighborhood price change, with the "price decline" tract standard applied to stable tracts
- Measure 2 – median loan amount by city job growth category
- Measure 3 – number of business by city job growth category
- Measure 4 – number of business by neighborhood price change

[23] Verification was planned for a second grantee in the "no growth" and "low growth" categories (Washington, D.C. and Cleveland, respectively), but data collection in these cities did not occur in time to be included in this version of the report.

Maps were generated for each of these measures showing "out-performing" and "under-performing" neighborhoods in each city, and this information was forwarded to each of the grantees along with a data sheet indicating the level of CDBG investment, starting indicator values, and actual indicator outcomes. Interviews were conducted in-person with a mix of local community development and planning personnel, and, in one instance, personnel from a local university conducting research on neighborhood conditions.

The overall results of the verification effort for each of the performance measures are summarized in **Exhibit 6.1**. The exhibit shows the number of "out-performing," "under-performing," and combined "out-performing" or "under-performing" census tracts across all of the grantees, and the number of tracts that fell into three verification categories: verified, disputed, and unconfirmed.

Verified tracts are those that local informants were able to confirm as neighborhoods in which CDBG investments had a greater (or smaller) impact relative to other tracts in the same performance group. In other words, local informants agreed that these were "out-performing" or "under-performing" tracts.

Disputed tracts are those for which local informants had some specific reason to question the validity of the tract's categorization according to the proposed performance measure. In other words, local informants disagreed that these were "out-performing" or "under-performing" tracts.

Unconfirmed tracts are those for which local informants could neither verify nor explicitly dispute the performance measurement results. In other words, the local informants indicated that the categorization of these tracts was reasonable, but informants could not verify or explain why the impact from CDBG was greater (or smaller) than similar tracts that received a similar level and mix of investment that were not classified as "over-performing" or "under-performing."

Exhibit 6.1
Overall Verification of Tract Performance
By Performance Measure

	Out-Performing Tracts				Under-Performing Tracts				Out- or Under-Performing Combined			
	Verified	Disputed	Unconfirmed	TOTAL	Verified	Disputed	Unconfirmed	TOTAL	Verified	Disputed	Unconfirmed	TOTAL
Measure 1 (Modified) Median Loan Amount by Neighborhood Price												
Number of Tracts	23	4	17	44	1	13	7	21	24	17	24	65
Percent	52%	9%	39%	100%	5%	62%	33%	100%	37%	26%	37%	100%
Measure 2 [1] Median Loan Amount by City Growth												
Number of Tracts	10	3	11	24	1	4	1	6	11	7	12	30
Percent	42%	13%	46%	100%	17%	67%	17%	100%	37%	23%	40%	100%
Measure 3 Number of Businesses by City Job Growth												
Number of Tracts	1	6	1	8	1	7	9	17	2	13	10	25
Percent	13%	75%	13%	100%	6%	41%	53%	100%	8%	52%	40%	100%
Measure 4 [2] Number of Businesses by Neighborhood Price												
Number of Tracts	0	4	3	7	0	5	7	12	0	9	10	19
Percent	0%	57%	43%	100%	0%	42%	58%	100%	0%	47%	53%	100%

Notes:
[1] Excludes tracts in high job growth cities (Houston and Columbus), for which this performance measure could not be applied.
[2] Excludes tracts in price-stable tracts, for which this performance measure could not be applied.

The aggregate verification results reveal a number of interesting patterns regarding the relative utility of the different measures—see Exhibit 6.1.

To start, local informants were not able to resoundingly endorse or completely refute any of the proposed performance measures. In fact, the share of the combined "out-performing" and "under-performing" tracts that was "unconfirmed" exceeded the share of tracts in both the verified and the disputed categories for all but one of the performance measures.

Although the aggregate verification results are mixed, they do reveal that the performance measures based on the median loan amount indicator (Measures 1 and 2) are more likely to conform to the views of local practitioners than the performance measures that use the number of businesses in a tract (Measures 3 and 4). In other words, from the local informants' perspective, the median loan amount indicator does a better job overall of capturing the impact of the program than does the number of businesses indicator. Local informants verified more than one-third (37 percent) of the over-performing or under-performing tracts identified by Measures 1 and 2. By contrast, local informants verified just 8 percent of the "over-performing" or "under-performing tracts identified using Measure 3, and none of the tracts identified using Measure 4.

The flipside of this pattern is the extent to which local informants disputed the performance of tracts as determined by the median loan amount and number of businesses indicator. While about one-fourth of the "out-performing" and "under-performing" tracts identified by the median loan amount indicator were

disputed, local informants disputed the rating for approximately one-half of the tracts identified using the number of businesses indicators.

While the verification results reveal a preference for the median loan amount indicator over the number of businesses, it is worth noting that there is not a similar disparity in the results between the two types of performance group—that is city job growth and neighborhood price trend categories. In fact, the results for the two types of performance group, as reported in Exhibit 6.1 are nearly identical.

City Level Verification of Tract Performance

The following discussion examines the verification of the tract performance results in each of the four cities visited—Boston, Houston, Columbus and Milwaukee.

Boston

The local informants in Boston generally agreed with the results of the performance assessment and, in broad terms, considered the proposed approach a valid means for HUD to assess nationwide performance of the program. Since Boston was one of only three cities that were identified in Chapter 5 as citywide "good performers," this reaction is not surprising. Of the grantees visited as part of the verification effort, Boston had the greatest number and share of tracts classified as "out-performing" tracts. However, as described below, even in Boston the verification process revealed a number of common problems with the proposed performance measures.

As **Exhibit 6.2** shows, Measures 1 and 2 were the source of a large number of tracts for the verification effort in Boston, with 35 and 22 "out-performing tracts" identified by the two measures, respectively. Local informants were able to verify the performance of approximately one half of these tracts, for a variety of reasons.

Exhibit 6.2
Verification of Tract Performance in Boston
(Number of Tracts)

	Out-Performing Tracts				Under-Performing Tracts			
	Verified	Disputed	Unconfirmed	TOTAL	Verified	Disputed	Unconfirmed	TOTAL
Measure 1 (Modified) Median Loan Amount by Neighborhood Price	17	1	17	35	0	1	0	1
Measure 2 Median Loan Amount by City Growth	10	1	11	22	1	3	1	5
Measure 3 Number of Businesses by City Job Growth	1	3	1	5	1	1	2	4
Measure 4 [1] Number of Businesses by Neighborhood Price	0	1	1	2	0	2	1	3

Notes:
[1] Excludes tracts in price-stable tracts, for which this performance measure could not be applied.

Many of the "out-performing" tracts identified under Measures 1 and 2 overlap with the parts of the city that, historically, has seen the greatest level of CDBG investment, including the South End, Jamaica Plain, Roxbury and Mattapan. Moreover, in several areas long-term CDBG investment had by the late 1990s spurred significant private investment. Equally important, however, was a CDBG program that spanned the mid-1990s, the Neighborhood Partnership Program. This initiative, which aimed to solidify the relationship between the City and community development corporations with the express goal of developing a more efficient and predictable model for making neighborhood investments, involved an explicit targeting of CDBG in 13 different areas of the city. It was therefore not surprising to the City staff that almost all of the target areas were identified as "out-performing" neighborhoods.

While a large number of the "out-performing" tracts identified using the median loan amount indicator could be verified, almost an equal number were "unconfirmed." The main reason for categorizing tracts this way was that they did not overlap with the Neighborhood Partnership Area, nor was there any other reason that could be identified (at least within the timeframe available for the verification) to explain why they performed better than adjacent tracts that received the same kinds of CDBG investments.

In contrast to the large number of "out-performing" tracts identified using the median loan amount indicator, only 5 tracts were classified according to the same performance measures as "under-performing." Local informants verified just one of these tracts. The City targeted this tract through the Neighborhood Partnership Areas program in the mid-1990s; however, unlike the many partnership initiatives that resulted in an "out-performing" score, in this area the community development corporation

failed to deliver services at the expected rate, in part due to organizational problems and in part because the neighborhood lacked an adequate supply of vacant lots on which to construct infill housing.

The City staff disputed the classification of three other "under-performing" tracts because the median loan amount indicator did not appear to be a good short-term measure of the program's impact. In one of the tracts, for example, there had admittedly been significant CDBG investment without a commensurate increase in the median loan amount, but this was due to the nature of the CDBG spending. The CDBG investment here was for acquisition and clearance activities that were part of the early phase of a major redevelopment. In the other two tracts, CDBG investments had been made primarily into housing for a more sustained period. Nevertheless it was still too early in the redevelopment process here to expect the impacts of investment to be revealed in HMDA. Most of the housing in the neighborhood was being developed with public financing and subsidies, and in the absence of a private market for housing (and mortgages) the local informants were not surprised that the change in the median loan amount was relatively flat, despite the significant level of CDBG investment.

As shown by Exhibit 6.2, the number of "out-performing" and "under-performing" tracts identified using the number of businesses indicator is much more modest (and more like the number of tracts identified for other grantees).

The one "out-performing" neighborhood that the local informants verified was a tract in the city's South End where long-term CDBG investment played a significant role in creating the right climate for an influx of private investment in restaurants, specialty stores, and other small businesses. In other words, the relatively high impact accomplished through CDBG investments in this area is the product of a long-term, sustained commitment on the part of the city, not just the three years' worth of investment captured explicitly by the performance measures.

The classification of a number of "out-performing" tracts was disputed, largely because there was some question about whether the number of business indicators could satisfactorily measure the impact from the kinds of investments being made with CDBG. For example, in one census tract encompassing Northeastern University, the only major place-based investment over the investment period employed for this research was a Single Room Occupancy (SRO) facility. Here it is clear that the growth in businesses in not as result of the CDBG investment.

Houston

As indicated by **Exhibit 6.3**, the proposed performance measures generated relatively few "out-performing" or "under-performing" tracts in Houston.

Exhibit 6.3
Verification of Tract Performance in Houston [1]
(Number of Tracts)

	Out-Performing Tracts				Under-Performing Tracts			
	Verified	Disputed	Unconfirmed	TOTAL	Verified	Disputed	Unconfirmed	TOTAL
Measure 1 (Modified) Median Loan Amount by Neighborhood Price	5	1	0	6	1	3	6	10
Measure 3 Number of Businesses by City Job Growth	0	1	0	1	0	1	5	6
Measure 4 [2] Number of Businesses by Neighborhood Price	0	1	0	1	0	0	5	5

Notes:
[1] Excludes Measure 2, which could not be applied to high job growth cities.
[2] Excludes tracts in price-stable tracts, for which this performance measure could not be applied.

The median loan amount performance measure identified six "out-performing" tracts, five of which the City staff were able to verify. These verified tracts are located to the south and west of the downtown area in the Fourth, Fifth, and Sixth Wards and have received sustained CDBG investment over time, including a mix of facilities, parks and recreation, and housing investment in the period covered by the study. The neighborhoods also have benefited from a number of other factors that have contributed to the impact achieved by CDBG. In one of the Sixth Ward neighborhoods, for example, the City has worked with a community development corporation that has facilitated the rehabilitation of housing units in-place as well as the relocation of units onto vacant lots. Community development corporations have been less active in the other "out-performing" neighborhoods, but each of the neighborhoods benefited in the late 1990s due to a resurging interest in housing close to downtown. With this increased demand has come private housing investment and gentrification especially on the fringe of what is historically a low-income community.

The median loan performance measure generated ten "under-performing" tracts dispersed outside the city's inner beltway, Interstate 610. The location of many of these under-performing tracts also made sense to the local informants, since most of these areas are low-cost neighborhoods that saw little CDBG housing investment in the mid-1990s except for emergency rehabilitation due the City's policy of targeting resources inside the Interstate. However, just one tract was actually verified as an "under-performing" tract. This tract is located next to the Port of Houston and is subject to frequent flooding. As a result, it is not an area in which the City would expect CDBG to have a major impact on median loan amounts. While the expected impact from CDBG was not much greater in the other tracts, six of these neighborhoods were classified as "unconfirmed" because the local informants could not explain why the

program's performance should be any worse here than in nearby tracts, with similar neighborhood conditions and the same mix and level of CDBG funding.

For a variety of reasons, the City staff disputed the classification of the remaining tracts identified both under the median loan amount performance measure and the number of businesses measures. As in Boston, the classification of certain tracts was rejected because the investment mix did not appear to match the indicator, or because the level and nature of the CDBG investment was not significant in comparison to (and not related to) the area's private investment. For example, the median loan amount performance measure identified the neighborhood containing Rice University and parts of the University of Texas Medical Center as an "out-performing" tract, when the CDBG investment in the tract was not relevant to the overall shift in the neighborhood's condition.

In addition to these familiar problems, Houston illustrates the potential pitfalls involved with assessing the spatial distribution of CDBG expenditures from HUD's administrative records. Two of the tracts identified as "under-performing" neighborhoods according to the median loan amount performance measure were incorrectly classified because investments made by two subrecipients were reported in a single tract (at the organizations' office location) instead of citywide. Since the performance measurement test for these two tracts was based on vastly over-estimated CDBG investment figures, the predicted change in the neighborhood indicator was over-estimated, too. Moreover, since the subrecipients in question administered the City's major housing and economic development initiatives, the misallocation of these funds will have had a detrimental impact on the overall performance results for Houston by falsely reducing the level of CDBG expenditures in other tracts. This error may have resulted in an over-estimate of the performance for certain tracts, and may have prevented other tracts from being assessed, at all, because they failed to meet the threshold for a substantial level of investment. This may in part explain why so many Houston tracts had to be categorized as "unconfirmed."

Columbus

In Columbus, as in Houston, a large amount of funds was incorrectly reported in a single tract location instead of citywide due to the administrative treatment of certain citywide programs. The downtown tract that is the location for the city's neighborhood development department was listed as the location for the city's major housing rehabilitation program, which means that the City's largest single program area was excluded from the performance test. As in Houston, there is a strong possibility that this error may have undermined the results in the remainder of the City. In fact, this misallocation of funds might explain why, with a couple of exceptions, the neighborhoods that have traditionally been the focus of the City's CDBG program did not even appear in the model as having a substantial level of investment.

As indicated by **Exhibit 6.4**, the Columbus staff could only verify the performance assessment for one tract. This tract to the north of the downtown area has seen long-term investment of CDBG since the late

1970's, predominantly along the corridor that forms the tract's eastern border. Intuitively, this is a neighborhood in which the City staff would expect to see a high CDBG impact; though, they questioned whether there was a causal link between the expenditures in this tract the mid-1990s, and the changes in the median loan indicator. Rather, long-term CDBG investment in the commercial strip, in the businesses along the strip, in housing nearby or on the corridor (including HOME investments during the study period) has created a climate that has facilitated private housing investment.

Exhibit 6.4
Verification of Tract Performance in Columbus [1]
(Number of Tracts)

	Out-Performing Tracts				Under-Performing Tracts			
	Verified	Disputed	Unconfirmed	TOTAL	Verified	Disputed	Unconfirmed	TOTAL
Measure 1 (Modified) Median Loan Amount by Neighborhood Price	1	0	0	1	0	2	1	3
Measure 3 Number of Businesses by City Job Growth	0	1	0	1	0	0	2	2
Measure 4 [2] Number of Businesses by Neighborhood Price	0	2	2	4	0	1	1	2

Notes:
[1] Excludes Measure 2, which could not be applied to high job growth cities.
[2] Excludes tracts in price-stable tracts, for which this performance measure could not be applied.

In a number of tracts the City staff disputed the performance measurement results, including tracts where the CDBG investment was outstripped by unrelated private investment and tracts where the type of CDBG investment did not appear to be closely related to the performance indicator. For example, the city staff questioned whether a tract outside the City's main CDBG investment area, which saw a modest investment in economic development through the business development fund, should be classified as an "under-performing" tract according to the median loan amount performance measure. The investment in this area was not expected to have a major impact on neighborhood housing values, in part because of the type and scale of the CDBG investment but also because the major residential portion of the tract is not even inside the City of Columbus limits. Moreover, the City staff disputed the same area's classification as an "out-performing" tract under the number of businesses measures since the City's CDBG investment is unrelated to the development of a shopping center, which has driven the observed increase in the number of businesses.

Milwaukee

In Milwaukee, as in the other communities contacted for the verification effort, there were a number of perceived problems with the accuracy and adequacy of the data elements used in developing the proposed performance measurement systems.

For example, the Milwaukee informants indicated that the price categories used in the neighborhood price category measures (Measures 1 and 4) misrepresented the true condition of the Milwaukee neighborhoods that were included in the performance assessment test.

The Milwaukee informants also seriously questioned the utility of the indicators selected for the performance measurement test. The use of the HMDA median loan amount is, according to the Milwaukee informants, inherently flawed because it is being used to measure conditions in neighborhoods that have traditionally been underserved by the private lending industry. Since the neighborhoods in which CDBG investments are being made are unlikely to have a large number of approved loans, it is unrealistic to expect the HMDA statistic to accurately portray the status of these neighborhoods. Furthermore, the local informants questioned the degree to which home mortgage data can validly capture the impact of non-housing investments.

Questions also were raised about the utility of the number of businesses indicator, since the number of establishments in a tract is by itself not a good measure of neighborhood condition. In certain Milwaukee neighborhoods, for example, the eradication of "nuisance" businesses such as liquor stores or payday loan operations is seen as a positive step. On the other hand, the development of new businesses such as home-based childcare businesses may be an enormous neighborhood asset that cannot be adequately measured with a simple count of business establishments.

Due to these and other concerns about the validity of the proposed performance measurement system, the Milwaukee local informants indicated that it was impossible to assess the accuracy of the findings of the performance measurement test. Therefore, every tract in Milwaukee was recorded as "disputed" for the purposes of the neighborhood-by-neighborhood verification effort (see **Exhibit 6.5**).

Exhibit 6.5
Verification of Tract Performance in Milwaukee
(Number of Tracts)

	Out-Performing Tracts				Under-Performing Tracts			
	Verified	Disputed	Unconfirmed	TOTAL	Verified	Disputed	Unconfirmed	TOTAL
Measure 1 (Modified) Median Loan Amount by Neighborhood Price	0	2	0	2	0	7	0	7
Measure 2 Median Loan Amount by City Growth	0	2	0	2	0	1	0	1
Measure 3 Number of Businesses by City Job Growth	0	1	0	1	0	5	0	5
Measure 4 [1] Number of Businesses by Neighborhood Price	0	0	0	0	0	2	0	2

Notes:
[1] Excludes tracts in price-stable tracts, for which this performance measure could not be applied.

Concerns About the Implementation of a Performance Measurement System

The preceding section highlighted many of the problems that the grantees who participated in the verification effort identified, including concerns about the performance indicators, the performance categories, and the ability of HUD to accurately portray the spatial distribution of CDBG investments.

In summing up, however, it is worth recapping the grantees overall concern about the implementation of neighborhood performance system for CDBG. While all of the grantees expressed a good deal of interest in the performance measurement test, and two of the grantees visited either already have or are developing a local system to assess changes in neighborhood condition that will inform CDBG decision-making, all four of the grantees voiced concern about the implementation of a system that would reduce CDBG's flexibility. Since CDBG's legislatively mandated flexibility is one of the most important features of the program, the local informants' indicated that it would be unreasonable to hold cities to particular neighborhood performance standard. In short, the grantees were reluctant to see the performance system applied in a fashion that would potentially sanction non-performers.

CHAPTER 7
SOME IMPLICATIONS FOR A CDBG PERFORMANCE MONITORING SYSTEM

In this section, we draw out some of the implications of the results of the research for design and implementation of performance monitoring systems going forward. We emphasize that the recommendations are based only on the results of this study, which identified a small group of indicators and several approaches to assessing neighborhood outcomes in relation to CDBG spending. Alternative performance systems may be worth testing, which may lead to a different set of conclusions.

Overall Results

Some of the performance measures developed here have the considerable virtue of simplicity, ready availability, and intuitive plausibility. Although the HMDA performance indicator we tested most thoroughly — median loan amount — does not tap all dimensions of neighborhood change, it closely tracks neighborhood property values, which generally are taken as a good indicator of relative neighborhood quality.[24] Like the Dun and Bradstreet indicators, HMDA data are widely available and commonly used in the research community.

Further, the performance standards we developed do not require complicated multi-variate analysis; the regression model we use requires only two variables — CDBG spending and whichever performance indicator is being used to develop the performance measure. The most serious complication we found is that the independent variable, CDBG spending, needs to be averaged over three years to smooth out peaks and valleys in CDBG expenditures in particular tracts, and median loan amount from HMDA needs to be averaged over two years to collect enough observations in each tract.

Finally, our test of the model and the tactical responses we adopted to address some of its limitations — e.g., the use of above-mean average annual expenditures to define "substantial" investments and use of the most conservative available standard where statistical results suggest no better one — appeared to produce reasonable results, although, as discussed in Chapter 6, community development practitioners at each of the four cities visited disputed some of our findings and expressed some reservations about the application of a national performance standard for the CDBG program. We have attempted to respond to some of these concerns in the discussion that follows.

As with any performance measure or set of measures, our standards are susceptible to problems of data suitability, arbitrary specifications of standards, and inability to account for all factors that affect the

[24] Refer to the discussion in Chapter 3.

relationship between community development investments and neighborhood outcomes. The following are specific observations and reflections on these issues.

Comments on Specific Performance Measurement Issues

The Department must continue to upgrade its management systems to allow better tracking of CDBG expenditures. The Department already has plans to complete IDIS data cleaning and update of user protocols, ensuring more complete geographic coverage of the system. HUD also is improving the quality of the data it collects. (It should be noted that, by block grant standards, HUD's IDIS data system already is quite good; information on the community services block grant is paltry, by comparison.)

In addition to these improvements to data systems and quality, performance measurement activities going forward stand to gain from the accumulation of CDBG expenditure information for periods after the three-year period covered in this analysis. An unavoidable flaw of the present study is its constricted time period, which falls well short of the period most community development practitioners believe to be needed to accomplish neighborhood-wide improvements. Together with the extension of future efforts to a larger number of communities, this addition may well allow analysts to discover the thresholds that eluded researchers on this study.

Other sources of Federal aid should be included in the research. This prescription pertains most obviously to the HOME program, which in important respects related to assessment of community development performance, is nearly indistinguishable from the CDBG program. Like CDBG, HOME funds physical improvements to blighted neighborhoods through investments in affordable housing. HOME also invests in promotion of individual home purchases in many of these same neighborhoods, which also furthers community development objectives. And like CDBG, HOME expenditures are recorded in IDIS. The latter makes it particularly easy to add HOME investments to the performance measurement system, not true of low-income housing tax credits, the other major housing program that invests in construction and renovation of properties and likely to convey clear community development benefits. To the extent available, other federal, state, local and private resources should be included.

There are limits to the Department's ability to improve CDBG management information systems to better support performance measurement. Generally, these limits are placed by the nature of the program itself, which as a community development program, aims to improve broad community areas, not just definable housing units, block faces, or other discrete spatial units. As a result, some estimation of benefit will be required on the part of future program managers as they:

- Allocate CDBG expenditures across the multiple census tracts that may benefit from a single program expenditure; e.g., a community center that draws patrons from three different neighborhoods. This is problematic where the distribution of patronage across neighborhoods is unknown.

- Allocate CDBG expenditures to whole census tracts, even though they benefit only a portion of the tract; e.g., a pocket park that primarily serves a four-block area within a twenty square-block neighborhood. To avoid this problem, HUD would have to require local program administrators to report area benefit expenditures by block groups, not census tracts. Service area is defined by the grantees; some grantees do report by block group.

Even if these problems were resolvable, a portion of CDBG expenditures in some (if not most) cities could not be reasonably allocated because individuals throughout the city are intended beneficiaries. The best example may be fair-housing enforcement activities, intended to ensure that racial minorities, physically and mentally handicapped, and other protected classes are accorded fair treatment as they rent or buy housing throughout a city or urban county.

These performance measures are more easily applied at the national than local level, although there are obvious reasons why a national performance system would naturally lead to its local application. Expected to take steps to improve national program performance, HUD would retain an obvious interest in identifying cities with large numbers or percentages of under-performing neighborhoods, as they would cities that appear to be performing well. By highlighting the example and lessons from the latter to instruct the former, HUD would intend to improve national performance as a result. But any local application of the standard, as found in Chapter 6 for example, would engender criticism among those cities that appeared to fall below standards of expected performance.

As developed in this study, there are several aspects of the CDBG performance measurement system that are arbitrary, potentially inappropriate to local circumstances, and reliant on information that may not be accurate for particular communities (however useful it may be if used nationally). Obviously, the task before future implementers is to reduce these unwanted aspects as much as possible. To recapitulate, these arbitrary elements include:

- A definition of "substantial" investment as the mean expenditure across all census tracts in the 17 city sample (excluding outliers with extremely high levels of expenditure). The value was chosen because expenditure above the mean was more likely to show positive effects on performance indicators, and it is possible that choosing a higher or lower cut-off would produce a different result. This is one area worth future exploration.

- By not considering expenditures below the mean, the number of tracts in which performance can be measured is greatly reduced. Some cities, as shown in our sample, will have very few tracts in which this "substantial" level of expenditure is achieved. Conceivably, a city may purposefully allocate funds in such a way as to avoid application of performance measures altogether (although we suspect that "gaming" the system in this way would prove difficult).

- Low tract counts produced by a high "substantial" investment definition have had the probable effect of reducing the number of neighborhood categories for which a unique standard can be determined. A test on a larger scale would likely overcome this problem.

The neighborhood classification system cannot capture every nuance of neighborhood health and activity. Community development officers may object to performance measures that do not comport with local definitions of neighborhood quality. Our model attempts to capture citywide economic performance during the performance period (job growth), the trend in neighborhood quality of life prior to the performance period (price trend), and quality of life at the beginning of the performance period (initial value of the outcome indicator). All three are shorthand for a much more complicated picture, and take no account of other investments in the neighborhood during the performance period.

Perhaps the best way to think about the design and use of a performance measurement system as developed here is as a tool for communities interested in assessing their own community development performance.

Local administrators contacted for this study expressed considerable interest in the goals of the research. Although they would resist the application of a Federal standard that might entail sanctions for "poor" performance in relation to a statistical standard, they nevertheless welcomed a process of setting benchmarks by which they could assess their own progress in improving low-income neighborhoods. This is an area of public investment that has not, to our knowledge, ever developed such benchmarks. What are reasonable expectations for neighborhood change? How much investment is required to produce it, and under what circumstances? And where have neighborhoods performed better than expected and what can we learn about the strategies and supporting factors that produced this result? This research has only been a beginning to answer these questions, but we are convinced that it is a promising beginning.

REFERENCES

Ahlbrandt, Roger and James Cunningham (1979) *A New Public Policy for Neighborhood Preservation*. New York: Praeger.

Cook, Thomas D., Shobha C. Shagle, and Serdar M. Degirmencioglu (1997) "Capturing Social Process for Testing Mediational Models of Neighborhood Effects." Pp. 94-119 in Jeanne Brooks-Gunn, Greg J. Duncan, and Lawrence Aber, eds. *Neighborhood Poverty: Policy Implications in Studying Neighborhoods*, v. 2. New York: Russell Sage Foundation.

Coulton, Claudia J., Jill E. Korbin, and Marilyn Su (1999) "Neighborhoods and Child Maltreatment: A Multi-Level Study," *Child Abuse and Neglect* 23 (11): 1019-1040.

Elliott, Delbert S., William Julius Wilson, David Huizinga, Amanda Elliott, Bruce Rankin (1996) "The Effects of Neighborhood Disadvantage on Adolescent Development" *Jl of Research in Crime and Delinnquency* 33 (4): 389-426.

Galster, George (1987) *Homeowners and Neighborhood Renvestment*. Durham, NC: Duke University Press.

Galster, George, Carla Herbig, and Robin Smith (1996) *The Analysis of Attitudes Related to the Residential Desegregation of Public Housing in Allegheny County, PA*. Washington, DC: Urban Institute report to HUD.

Galster, George, Kathryn Pettit, Peter Tatian, Anna Santiago, Sandra Newman (2000) *The Impacts of Supportive Housing on Neighborhoods and Neighbors*. Washington, DC: Urban Institute report to HUD.

Galster, George, Anna Santiago, Robin Smith, Peter Tatian (1999) *Assessing Property Value Impacts of Dispersed Housing Subsidy Programs*. Washington, DC: Urban Institute report to HUD.

Kohen, Dafna E., Jeanne Brooks-Gunn, Tama Leventhal, and Clyde Hertzman (2000) "Neighborhood Income and Physical and Social Disorder in Canada: Associations with Young Children's Competencies." Unpublished paper, Dept. of Health Care and Epidemiology, University of British Columbia, Vancouver.

Lansing, John, Robert Marans, and Robert Zehner (1970) *Planned residential Environments.* Ann Arbor, MI: Institute for Survey Research, University of Michigan.

Galster, George and Garry Hesser (1981) "Residential Satisfaction: Contextual and Compositional Correlates," *Environment and Behavior* 16: 737-758.

Sampson, Robert J. and W. Byron Groves, (1989) "Community Structure and Crime: Testing Social Disorganization Theory," *American Journal of Sociology* 94 (4): 774-802.

Sampson, Robert J., Stephen W. Raudenbush, Felton Earls (1997) "Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy." *Science* 277: 918-924.

Sampson, Robert J. (1997) "Collective Regulation of Adolescent Misbehavior: Validation results for Eighty Chicago Neighborhoods," *Jl of Adolescent Research* 12 (2): 227-244.

Sampson, Robert J., Jeffrey D. Morenoff, Felton Earls (1999) "Beyond Social Capital: Spatial Dynamics of Collective Efficacy for Children," *American Sociological Review* 64 (Oct.):633-660.

APPENDIX

Table A3-1

Principal Components of Social Disadvantage Factor # 1
Factor Loadings, by City and Year

Boston			Cleveland			Indianapolis		
Indicator	1994	1999	Indicator	1994	1999	Indicator	1994	1999
	[No factor for social disadvantage]		Welfare Usage Rate	.54		Welfare Usage Rate	N/A	.72
			% Births Unmarried Females	.70	.68	Food Stamp Usage Rate	N/A	.66
			% Parcels Tax Delinquent	.87	.86			
			% Female-Headed Households*	.83	.81	% Female-Headed Households*	.80	.85
			% Female 15+ Married*	-.70	-.67	% Females 15+ Married*	-.66	-.70
			% Pop. Foreign Born*	-.51	-.61	% No Vehicle Available*	.58	.61
			% Pop. Black*	.92	.93	% Below Poverty Line*	.58	.64
			% Pop. White*	-.95	-.95	% Pop. Black*	.96	.93
			% Pop. Age 10-19*	.51		% Pop. White*	-.96	-.94
			% Unemployed*	.58		% Unemployed*	.58	.60
			Mortgage Approval**	-.72	-.53	Mortgage Approval**	-.59	
			Med. Loan Amount**	-.63		Home Purchase % Orig.**	-.57	
			Home Purchase % Orig.**	-.70	-.59	Home Improve % Orig.**	.53	
			Home Improve % Orig.**	.84				
Sample N	133	126	Sample N	143	170	Sample N	165	167

Note: Only loading > I .50 I shown
Note: ' = separate social disadvantage factor

* 1990 Census data
** Two-year averages, 1993-94 or 1998-99 for generic indicators

Table A3-1 Cont.

	Oakland			Providence	
Indicator	1994	1999	Indicator	1994	1999
Welfare Usage Rate	.84	.87	Welfare Usage Rate'	.81	.82
% Births Black Mothers	.62	.63	Food Stamp Case Load'	.79	.83
% Births White Mothers	-.87	.90	% Births Low Weight		.63
% Births Teen Mothers	.65	.56	% Birth Mothers 15-17 yrs.		.81
Food Stamp Usage Rate	.83	.86			
% Female-Headed Households*	.69	.68	% HS Dropouts 16-19 yrs.*		.76
% HS Dropouts 16-19 yrs.*	.53		% Pop. Institutionalized*		.85
% Pop. Age 0-9 yrs.*	.76	.68	% Units Built Since 1970*		.75
% Pop. Age 10-19 yrs.*	.79	.75	% Units Built Pre - 1940*		-.67
Median Income*	-.69	-.71	% No Vehicle Available*		.67
Med. Value Owner-Occ.*	-.69	-.71			
% No Vehicle Available*	.57	.60			
% Below Poverty Line*	.69	.67			
% Pop. Black*	.80	.82			
% Pop. White*	-.95	-.96			
% Unemployed*	.78	.78			
% w/ College Degree*	-.93	.94			
% w/ No HS Diploma*	.81	.83			
% Manage./Prof./Tech. Occ.*	-.90	-.92			
Mortgage Approval %**	-.70	-.77	# LARs'		.57
Median Loan Amount**	-.75	-.75			
Median Home Sales Price**	-.78	-.78			
Home Improve % Orig.**		-.57			
Sample N	87	87	Sample N	35	37

Note: Only loading > I .50 I shown
Note: ' = separate social disadvantage factor

* 1990 Census data
** Two-year averages, 1993-94 or 1998-99 for generic indicators

Table A3-2
Principal Components of Housing Type and Tenure Factor # 2
Factor Loadings, by City and Year

	Boston			Cleveland	
Indicator	1994	1999	Indicator	1994	1999
% Structures Single-Family	.90	.90	Med. Assessed Value	.62	.68
			% Nonresidential Parcels	-.51	-.51
			% Structures Single-Famliy	.88	.88
% Females 1st Married*	.68	.70	% Females 15+ Married*	.52	.56
Med. Income*	.58	.59	Med. Value Owner-Occ.*	.50	.57
% No Vehicle Available*	-.78	-.79	Med. Income*	.69	.73
% Owner-Occ. Dwellings*	.89	.90	% No Vehicle Available*	-.64	-.69
% Below Poverty Line*	-.53	-.53	%Owner-Occ. Dwellings*	.92	.93
% Living Same Unit 5+ Yrs.*	.61	.62	% Below Poverty Line*	-.51	-.60
% Structure Single-Famliy*	.94	.94	% Living Same Unit 5+ Yrs.*	.52	
			% Structures Single-Family	.93	.93
			% Units Lacking Complete Plumbing*		-.51
			% Units Vacant*		.53
Home Purchase % Orig.**		-.51			
Sample N	133	126	Sample N	143	170

* 1990 Census data
** Two-year averages, 1993-94 or 1998-99 for generic indicators

Table A3-2 Cont.

Indianapolis			Oakland			Providence		
Indicator	1994	1999	Indicator	1994	1999	Indicator	1994	1999
% Owner-Occ. Dwellings*	.89	.88	% Females 15+ Married*	.72	.71	% Females 15+ Married*	.72	.67
% Living Same Unit 5+ Yrs.*	.77	.80	Med. Value Owner-Occ.*	.66	.64	Median Income*	.72	.68
% Structures Single-Family*	.93	.93	% No Vehicle Available*	-.57	-.51	% No Vehicle Available*	-.63	-.59
			% Owner-Occ. Dwellings*	.93	.91	% Units Owner-Occupied*	.91	.89
			% Living Same Unit 5+ Yrs.*	.78	.75	% Structures Single-Famliy*	.84	.85
			% Structures Single-Famliy	.94	.91	% Same House 5+ Yrs.*	.72	.58
			Median Income*	.65	.62	% Units Lacking Plumbing*	-.58	
						% Below Poverty Line*	-.83	-.79
						% Units Vacant*	.55	
			# LARs**	.56		# LARs**	.73	.57
Sample N	165	167	Sample N	87	87	Sample N	35	37

* 1990 Census data
** Two-year averages, 1993-94 or 1998-99 for generic indicators

Table A3-3
Principal Components of Prestige Factor # 3
Factor Loadings, by City and Year

	Boston			Cleveland	
Indicator	1994	1999	Indicator	1994	1999
% w/ College Degree*	.75	.72	% w/ College Degree*	.90	.90
Med. Value Homes*	.72	.66	Med. Value Homes*	.57	.54
Median Income*	.53	.59	% w/ No HS Diploma*	.60	.62
% w/ No HS Diploma*	-.59	-.56	% manage./Prof./Tech. Occup.*	.94	.93
% Manage./Prof./Tech. Occup.*	.80	.76			
Med. Mortgage Amount**	.87	.88	Med. Mortgage Amount**	.57	.64
Mortgage Approval Rate**		.60	Med. Home Sales Price**	.57	.55
Med. Home Sales Price**	.87	.91			
Sample N	133	126	Sample N	143	170

* 1990 Census data
** Two-year averages, 1993-94 or 1998-99 for generic indicators

Table A3-3 Cont.

Indicator	Indianapolis 1994	Indianapolis 1999
% w/ College Degree*	.93	.88
Med. Value Homes*	.80	.80
Median Income*	.72	.73
% w/ No HS Diploma*	-.78	-.76
% Below Poverty Line*	-.50	
% Manage./Prof./Tech. Occup.*	.92	.87
% Unemployed*	-.51	
Sample N	165	167

Indicator	Oakland 1994	Oakland 1999
[Prestige Factor included in Social Disadvantage Factor]		
Sample N	87	87

Table 4.5 Cont.

Indicator	Providence 1994	Providence 1999
% Births w/ Prenatal Care	.51	.62
% Births to Hispanic Mothers		-.61
% w/ College Degree*	.92	.94
Med. Value Homes*	.83	.82
Med. Income*	.63	.64
% Pop. Under age 10	-.55	
% w/ No HS Diploma*	-.81	-.82
% Manage./Prof./Tech. Occup.*	.89	.91
Median Home Sales Price	.92	.93
Median Mortgage Amount**	.92	.94
Home Improve % Orig.**	-.66	-.52
Mortgage Approval Rate**	.72	.78
Sample N	35	37

* 1990 Census data
** Two-year averages, 1993-94 or 1998-99 for generic indicators

Table A3-4
Principal Components of Business & Employment Factor # 4
Factor Loadings, by City and Year

	Boston			**Cleveland**			**Indianapolis**	
Indicator	1994	1999	Indicator	1994	1999	Indicator	1994	1999
# Businesses**	.94	.93	# Businesses**	.94	.95	# Businesses**	.89	.87
# Jobs**	.86	.87	# Jobs**	.95	.87	# Jobs**	.93	.92
$ Sales**		.55	$ Sales**	.55	.31	$ Sales**	.59	.50
Sample N	133	126	Sample N	143	170	Sample N	165	167

** Two-year averages, 1993-94 or 1998-99 for generic indicators

	Oakland			**Providence**	
Indicator	1994	1999	Indicator	1994	1999
# Businesses**	.92	.97	# Businesses**	.94	.94
# Jobs**	.98	.97	# Jobs**	.98	.97
$ Sales**	.83	.57	$ Sales**	.66	.77
Sample N	87	87	Sample N	35	37

** Two-year averages, 1993-94 or 1998-99 for generic indicators

Table A3-5
Principal Components of Crime Factor # 5
Factor Loadings, by City and Year

	Boston			**Cleveland**	
Indicator	1994	1999	Indicator	1994	1999
Violent Crime	.74	.68	Property Crime Rate	.57	.53
			Violent Crime Rate	.93	.92
			% Parcels Non-Residential	.46	.58
% Female-Headed Households*	.54				
% Pop. Under Age 10*	.54	.52			
% Pop. Black*	.95	.94			
% Pop. White*	-.90	-.87			
Mortgage Approval Rate**	-.54	-.64			
Home Improve % Orig.**		.55			
Sample N	133	126	Sample N	143	170

* 1990 Census data
** Two-year averages, 1993-94 or 1998-99 for generic indicators

N/A = no crime data available

Table A3-5 Cont.

Indianapolis			Oakland			Providence		
Indicator	1994	1999	Indicator	1994	1999	Indicator	1994	1999
	N/A	N/A	Violent Crime Rate	N/A	.89		N/A	N/A
			Property Crime Rate	N/A	.96			
Sample N			Sample N	87	87	Sample N		

Table A3-6
Principal Components of Housing Vacancy Factor # 6
Factor Loadings, by City and Year

Boston			Cleveland		
Indicator	1994	1999	Indicator	1994	1999
% Units Vacant*	.92	.93	% Units Vacant*	.83	.77
% Units Lacking Plumbing*	.91	.91	% Units Lacking Plumbing*	.82	.77
Sample N	133	126	Sample N	143	170

* 1990 Census data

Indianapolis			Oakland			Providence		
Indicator	1994	1999	Indicator	1994	1999	Indicator	1994	1999
% Units Vacant*	.71	.76	% Units Vacant*	.67	.61	[Housing vacancy included		
% Units Lacking Plumbing*	.72	.75	% Rental Units Vacant*	.69	.86	in housing type and		
			% Units Lacking Plumbing*		.55	tenure factor]		
Sample N	165	167	Sample N	87	87			

* 1990 Census data

Table A3-7
Proportion of Variance in Factor Explained by Various Generic Indicators

	City: Boston			Year: 1994			**City: Cleveland**			Year: 1994		
Indicators	**Factor #: 1**	**2**	**3**	**4**	**5**	**6**	**Factor #: 1**	**2**	**3**	**4**	**5**	**6**
Mtg. Approval Rate	N/A	.03	.38	.11	.45	.05	.42	.06	.13	.03	.02	.15
# LARs	N/A	.20	.30	.05	.05	.08	.02	.09	.05	.02	.11	.08
Med. Loan Amt.	N/A	.01	.95	.11	.24	.01	.25	.05	.35	.06	.06	.17
Home Purch. % Orig.	N/A	.06	.00	.01	.00	.05	.39	.01	.00	.01	.00	.05
Home Imp. % Orig.	N/A	.01	.32	.11	.47	.03	.59	.00	.12	.04	.02	.14
Median Home Price	N/A	.05	.91	.09	.15	.00	.01	.08	.37	.03	.10	.17
# Businesses	N/A	.00	.11	.98	.08	.00	.02	.03	.02	.94	.01	.02
# Jobs	N/A	.02	.14	.89	.08	.01	.02	.02	.01	.93	.00	.02
$ Sales	N/A	.00	.25	.36	.04	.01	.02	.01	.01	.36	.02	.01
				Year: 1999						Year: 1999		
Mtg. Approval Rate	N/A	.00	.49	.10	.56	.01	.35	.03	.17	.05	.00	.06
# LARs	N/A	.16	.16	.06	.01	.05	.02	.26	.00	.01	.15	.12
Med. Loan Amt.	N/A	.00	.92	.14	.16	.00	.08	.06	.42	.06	.12	.12
Home Purch. % Orig.	N/A	.26	.09	.06	.14	.02	.42	.01	.08	.02	.05	.00
Home Imp. % Orig.	N/A	.11	.29	.14	.33	.00	.04	.00	.02	.01	.00	.01
Median Home Price	N/A	.02	.96	.13	.15	.00	.08	.07	.36	.05	.07	.11
# Businesses	N/A	.00	.15	.98	.07	.04	.04	.06	.03	.98	.00	.04
# Jobs	N/A	.03	.14	.94	.07	.09	.06	.05	.02	.86	.00	.03
$ Sales	N/A	.01	.11	.49	.03	.06	.03	.00	.00	.18	.05	.01

Factor Codes: 1 = social disadvantages; 2 = housing types and tenure;
3 = prestige; 4 = business & employment; 5 = crime; 6 = housing vacancy

N/A: No factor 1 produced by Boston Data

Table A3-7 Cont.
Proportion of Variance in Factor Explained by Various Generic Indicators

	City: Indianapolis			Year: 1994			**City: Oakland**			Year: 1994		
Indicators	**Factor #: 1**	**2**	**3**	**4**	**5**	**6**	**Factor #: 1***	**2**	**3***	**4**	**5**	**6**
Mtg. Approval Rate	.43	.00	.47	.07	N/A	.34	.52	.11		.06	N/A	.08
# LARs	.08	.10	.22	.12	N/A	.14	.10	.44		.00	N/A	.02
Med. Loan Amt.	.23	.01	.72	.14	N/A	.23	.61	.21		.00	N/A	.11
Home Purch. % Orig.	.40	.02	.07	.02	N/A	.26	.03	.03		.00	N/A	.00
Home Imp. % Orig.	.39	.02	.47	.12	N/A	.33	.03	.00		.06	N/A	.00
Median Home Price	N/A	N/A	N/A	N/A	N/A	N/A	.64	.22		.00	N/A	.10
# Businesses	.05	.02	.21	.90	N/A	.08	.02	.00		.90	N/A	.01
# Jobs	.05	.01	.13	.97	N/A	.05	.00	.03		.98	N/A	.01
$ Sales	.01	.00	.17	.48	N/A	.01	.01	.10		.66	N/A	.02
				Year: 1999						Year: 1999		
Mtg. Approval Rate	.35	.00	.53	.17	N/A	.21	.65	.04		.00	.09	.03
# LARs	.02	.14	.03	.04	N/A	.10	.04	.36		.01	.07	.00
Med. Loan Amt.	.19	.02	.68	.15	N/A	.15	.65	.23		.00	.18	.01
Home Purch. % Orig.	.35	.08	.28	.11	N/A	.10	.12	.10		.00	.01	.06
Home Imp. % Orig.	.07	.01	.19	.05	N/A	.01	.32	.04		.00	.01	.01
Median Home Price	N/A	N/A	N/A	N/A	N/A	N/A	.65	.23		.00	.18	.00
# Businesses	.09	.01	.23	.89	N/A	.07	.03	.01		.96	.02	.00
# Jobs	.08	.00	.10	.97	N/A	.03	.00	.01		.96	.00	.01
$ Sales	.02	.01	.14	.42	N/A	.00	.01	.07		.38	.02	.08

Factor Codes: 1 = social disadvantages; 2 = housing types and tenure;
3 = prestige; 4 = business & employment; 5 = crime; 6 = housing vacancy

* Dimensions of prestige factors included in social disadvantages factor
N/A: Crime data and home sales data not available for Indianapolis

Table A3-7 Cont.
Proportion of Variance in Factor Explained by Various Generic Indicators

City: Providence Year: 1994

Indicators	**Factor #: 1**	**2**	**3**	**4**	**5***	**6****
Mtg. Approval Rate	.16	.20	.65	.03		
# LARs	.13	.56	.18	.07		
Med. Loan Amt.	.19	.14	.95	.02		
Home Purch. % Orig.	.00	.05	.00	.03		
Home Imp. % Orig.	.10	.05	.53	.01		
Median Home Price	.11	.06	.88	.03		
# Businesses	.02	.12	.02	.97		
# Jobs	.05	.03	.00	.95		
$ Sales	.08	.10	.00	.33		
				Year: 1999		
Mtg. Approval Rate	.18	.29	.74	.00		
# LARs	.11	.40	.05	.01		
Med. Loan Amt.	.01	.13	.95	.00		
Home Purch. % Orig.	.03	.00	.14	.01		
Home Imp. % Orig.	.00	.05	.33	.00		
Median Home Price	.02	.13	.86	.02		
# Businesses	.00	.01	.02	.95		
# Jobs	.00	.00	.00	.96		
$ Sales	.00	.16	.00	.50		

Factor Codes: 1 = social disadvantages; 2 = housing types and tenure;
3 = prestige; 4 = business & employment; 5 = crime; 6 = housing vacancy

* No crime data available for Providence
** Housing vacancy factor included in housing type/tenure factor

Table A3-8
Proportion of Variance on Factor Explained by Various Census Indicator Variables

City: Boston Year: 1990

Indicator	**Factor #: 1**	**2**	**3**	**4**	**5**	**6**
% Female Head HHs w/ Kids	NA	.12	.22	.13	.49	.18
% HS Dropouts, 16-19	NA	.02	.09	.01	.02	.03
% Units w/ No Vehicle	NA	.57	.03	.00	.05	.13
% Unemployed	NA	.06	.25	.14	.32	.14
% Units Owner-Occupied	NA	.85	.05	.00	.05	.14
% Single-Family Structures	NA	.97	.01	.00	.01	.14
% w/ College Degree	NA	.02	.52	.21	.16	.01
% Man/Prof/Tech Occup.	NA	.00	.58	.17	.15	.01
% Units Vacant	NA	.15	.00	.00	.08	.99

NA = No factor 1 produced by Boston data

City: Cleveland

Year: 1990

Indicator	Factor # : 1	2	3	4	5	6
% Female Head HHs w/ Kids	.68	.08	.07	.02	.04	.21
% HS Dropouts, 16-19	.13	.08	.03	.01	.03	.03
% Units w/ No Vehicle	.19	.42	.06	.03	.03	.19
% Unemployed	.35	.12	.15	.03	.01	.25
% Units Owner-Occupied	.01	.95	.00	.04	.07	.27
% Single-Family Structures	.01	.93	.01	.01	.08	.24
% w/ College Degree	.03	.01	.87	.02	.00	.02
% Man/Prof/Tech Occup.	.00	.00	.95	.01	.04	.02
% Units Vacant	.04	.35	.02	.02	.13	.99

City: Indianapolis

Year: 1990

Indicator	Factor # : 1	2	3	4	5	6
% Female Head HHs w/ Kids	.66	.08	.23	.12	NA	.37
% HS Dropouts, 16-19	.00	.01	.25	.06	NA	.15
% Units w/ No Vehicle	.36	.05	.25	.09	NA	.45
% Unemployed	.43	.00	.38	.09	NA	.45
% Units Owner-Occupied	.05	.87	.01	.07	NA	.31
% Single-Family Structures	.00	.96	.03	.00	NA	.09
% w/ College Degree	.04	.01	.98	.15	NA	.10
% Man/Prof/Tech Occup.	.04	.01	.97	.15	NA	.11
% Units Vacant	.28	.15	.13	.08	NA	.99

NA: Crime data not available for Indianapolis

Table A3-8 Cont

City: Oakland

Year: 1990

Indicator	Factor # : 1	2	3*	4	5	6
% Female Head HHs w/ Kids	.59	.27		.00	NA	.00
% HS Dropouts, 16-19	.37	.07		.01	NA	.16
% Units w/ No Vehicle	.39	.53		.02	NA	.01
% Unemployed	.65	.12		.00	NA	.07
% Units Owner-Occupied	.13	.99		.01	NA	.04
% Single-Family Structures	.03	.92		.01	NA	.00
% w/ College Degree	.90	.15		.00	NA	.16
% Man/Prof/Tech Occup.	.83	.15		.01	NA	.24
% Units Vacant	.28	.29		.02	NA	.01

* Dimensions of prestige factor included in social disadvantage factor
NA = Crime data not available for Indianapolis

City: Providence

Year: 1990

Indicator	Factor # : 1	2	3*	4	5*	6**
% Female Head HHs w/ Kids	.44	.33	.45	.07		
% HS Dropouts, 16-19	.03	.17	.27	.03		
% Units w/ No Vehicle	.24	.51	.35	.21		
% Unemployed	.44	.19	.35	.07		
% Units Owner-Occupied	.08	.98	.15	.16		
% Single-Family Structures	.00	.91	.19	.17		
% w/ College Degree	.09	.13	.94	.03		
% Man/Prof/Tech Occup.	.15	.13	.88	.07		
% Units Vacant	.08	.43	.25	.07		

* No crime data available for Providence
** Housing vacancy factor included in housing type/tenure factor

Table A4-1
CDBG $ > $86737.03, outliers excluded

City	Mean Tract Pop. 1990	Poverty Rate 1990	Mean Annualized CDBG Expen. 1994-1996	Performance Indicators: Median Loan Amt. 1993/94	Median Loan Amt. 1998/99	No. of Jobs 1995	No. of Jobs 1999	No. of Bus. 1995	No. of Bus. 1999	Loan Appl. 1993/94	Loan Appl. 1998/99
Oakland	2,866	24.2	205,005.17	96.15	103.50	3,940	3,441	311	263	226	424
Portland	3,549	21.0	221,681.60	70.75	110.08	2,139	2,317	244	254	355	925
Providence	5,478	29.2	169,814.28	67.92	76.42	3,614	3,404	317	280	252	586
Fort Lauderdale	4,425	45.4	285,666.46	50.50	60.75	2,083	2,209	368	332	111	420
Boston	3,491	23.1	265,962.20	73.30	114.30	1,330	1,434	89	85	144	386
Denver	3,228	27.5	305,061.70	65.93	103.58	4,356	3,693	367	341	373	904
Cleveland	2,439	37.9	173,307.32	25.84	48.88	1,568	1,382	90	82	136	437
Long Beach	7,419	25.4	156,985.10	115.48	108.24	2,414	2,245	227	200	443	767
Los Angeles	5,519	28.4	294,311.72	130.08	131.98	2,060	1,918	197	176	281	460
Columbus	3,695	32.4	182,356.27	50.43	68.68	4,087	4,188	218	219	400	660
Birmingham	4,581	35.3	250,290.01	32.65	41.15	4,101	4,576	302	265	146	312
Milwaukee	2,831	36.8	180,148.53	21.56	37.37	846	777	72	55	146	359
Indianapolis	2,796	35.2	199,117.37	25.89	47.33	985	952	83	72	166	539
Charlotte	2,582	34.2	471,666.64	43.83	63.00	3,841	4,777	196	221	247	504
Tulsa	2,196	30.3	283,257.91	47.19	37.50	1,152	1,068	99	80	162	340
Houston	3,918	29.9	230,123.94	40.85	57.93	2,079	2,091	230	217	214	381
Washington DC	3,267	19.9	279,033.45	99.35	110.16	2,133	2,444	129	117	186	424

Table A4-2
CDBG $ > $86737.03, outliers excluded

Neighborhood Category	Mean Tract Pop. 1990	Poverty Rate 1990	Mean Annualized CDBG Expen. 1994-1996	Performance Indicators: Median Loan Amt. 1993/94	Median Loan Amt. 1998/99	No. of Jobs 1995	No. of Jobs 1999	No. of Bus. 1995	No. of Bus. 1999	Loan Appl. 1993/94	Loan Appl. 1998/99
No growth / hp decline	4,675	27.0	254,312.21	109.26	113.78	1,938	1,856	175	158	233	418
Low growth / hp decline	4,458	31.7	236,122.13	70.36	95.46	2,234	1,950	187	171	220	528
High growth / hp decline	2,701	40.1	280,963.65	34.23	55.32	2,734	2,878	181	174	136	331
No growth / hp stable	4,763	26.7	278,510.04	91.83	101.23	1,488	1,455	134	116	293	542
Low growth / hp stable	4,163	22.9	205,282.75	66.00	95.47	1,326	1,233	119	107	344	774
High growth / hp stable	3,312	30.7	224,198.40	49.34	69.84	1,825	1,881	193	177	221	426
No growth / hp increase	4,740	33.8	222,059.31	86.36	94.50	2,379	2,266	213	186	189	385
Low growth / hp increase	3,058	31.8	269,204.65	54.99	88.50	2,255	2,381	161	135	141	380
High growth / hp increase	4,376	22.4	199,145.59	60.74	77.27	2,522	2,622	254	253	398	760

TABLE A5-1

Regression Estimates for Relationship Between CDBD Expenditures/Poor and Neighborhood Indicators for All Tracts

[for sample of all census tracts with CDBG expenditures/poor individual > mean]

[standard errors shown parenthetically]

	Type of Neighborhood Quality of Life Indicator					
	Median Loan Amount	% Loans for Home Purchase	# Loan Applications	Loan Approval Rate	Number of Jobs	Number of Businesses
Independent Variables						
Neighborhood Indicator at Start of Period (1993-94)	0.81 [0.02]**	0.41 [0.05]**	1.40 [0.03]**	0.57 [0.04]**	1.07 [0.01]**	0.96 [0.01]**
CDBG $ / poor in tract (average/yr. 1994-1996)	0.02 [0.01]**	0.00 [0.00]	-0.08 [0.04]††	0.00 [0.00]**	0.55 [0.16]**	0.02 [0.01]**
[CDBG $ / poor in tract]**2 (average/yr. 1994-1996)	0.00 [0.00]††	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]††	0.00 [0.00]††
[CDBG $ / poor in tract]**3 (average/yr. 1994-1996)	0.00 [0.00]**	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]**	0.00 [0.00]**
Constant	24.24 [2.30]**	20.13 [1.72]**	169.19 [14.56]**	19.81 [2.23]**	-282.64 [54.56]††	-11.43 [1.89]††
Adjusted R-squared	0.75	0.17	0.78	0.37	0.94	0.99
Sample N	512	507	512	509	502	502
Dependent Variable Mean	94.11	35.31	476.72	56.17	34.81	163.21

Note: standard errors shown parenthetically; all regressions control for other factors as shown in text

* = p < .10; ** = p < .05; two-tailed tests, positive

† = p < .10; †† = p < .05; one-tailed tests, negative

TABLE A5-2
Regression Estimates for Relationship Between CDBD Expenditures/Poor and Neighborhood Indicators, by City Type
Price Decline Neighborhoods
[for sample of all census tracts with CDBG expenditures/poor individual > mean]
[standard errors shown parenthetically]

	Type of Neighborhood Quality of Life Indicator																	
	Median Loan Amount			% Loans for Home Purchase			# Loan Applications			Loan Approval Rate			Number of Jobs			Number of Businesses		
Independent Variables	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth
Neighborhood Indicator at Start of Period (1993-94)	0.90 [0.03]**	0.78 [0.05]**	0.84 [0.15]**	0.36 [0.08]**	0.88 [0.14]**	0.44 [0.23]*	1.44 [0.05]**	1.59 [0.10]**	1.42 [0.37]**	0.48 [0.10]**	0.78 [0.09]**	0.52 [0.22]**	1.04 [0.02]**	1.17 [0.03]**	1.05 [0.02]**	0.95 [0.10]**	0.93 [0.01]**	0.96 [0.02]**
CDBG $ / poor in tract (average/yr. 1994-1996)	0.04 [0.02]**	0.11 [0.02]**	-0.02 [0.04]	0.01 [0.01]	-0.06 [0.02]††	-0.03 [0.03]	-0.10 [0.08]	0.62 [0.24]**	0.58 [0.43]	0.02 [0.01]**	0.01 [0.01]	-0.01 [0.02]	0.36 [0.57]	0.41 [2.40]	-2.08 [0.81]††	0.04 [0.02]**	0.05 [0.02]**	-0.08 [0.04]††
[CDBG $ / poor in tract]**2 (average/yr. 1994-1996)	0.00 [0.00]†	0.00 [0.00]††	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]**	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]††	0.00 [0.00]	0.00 [0.00]††	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]**	0.00 [0.00]†	0.00 [0.00]†	0.00 [0.00]**
[CDBG $ / poor in tract]**3 (average/yr. 1994-1996)	0.00 [0.00]	0.00 [0.00]**	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]††	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]**	0.00 [0.00]	0.00 [0.00]*	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]††	0.00 [0.00]*	0.00 [0.00]*	0.00 [0.00]††
Constant	7.01 [4.40]	21.42 [5.88]**	30.18 [9.75]**	20.02 [3.03]**	7.19 [6.35]	33.07 [8.90]**	99.85 [19.14]**	75.53 [52.74]	90.90 [100.44]	25.01 [5.70]**	11.06 [6.14]*	22.13 [11.53]*	-237.92 [109.60]††	-539.82 [284.76]†	132.32 [175.64]	-15.09 [3.38]††	-11.43 [2.93]††	4.55 [8.09]
Adjusted R-squared	0.89	0.83	0.49	0.20	0.38	-0.01	0.88	0.82	0.40	0.38	0.53	0.09	0.96	0.96	0.99	0.99	1.00	0.99
Sample N	112	67	31	112	66	31	112	67	31	112	67	31	109	66	31	108	67	31
Dependent Variable Mean	113.78	95.46	55.32	34.37	35.59	43.21	417.51	527.90	330.84	58.38	59.69	50.47	1856.49	1950.05	2878.19	157.72	170.52	173.87

Note: standard errors shown parenthetically; all regressions control for other factors as shown in text
* = p < .10; ** = p < .05; two-tailed tests, positive
† = p < .10; †† = p < .05; one-tailed tests, negative

TABLE A5-3
Regression Estimates for Relationship Between CDBD Expenditures/Poor and Neighborhood Indicators, by City Type
Price Stable Neighborhoods
[for sample of all census tracts with CDBG expenditures/poor individual > mean]
[standard errors shown parenthetically]

	Type of Neighborhood Quality of Life Indicator																	
	Median Loan Amount			% Loans for Home Purchase			# Loan Applications			Loan Approval Rate			Number of Jobs			Number of Businesses		
Independent Variables	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth
Neighborhood Indicator at Start of Period (1993-94)	0.94 [0.02]**	0.72 [0.08]**	1.08 [0.05]**	0.06 [0.11]	0.34 [0.17]*	0.59 [0.17]**	1.55 [0.08]**	1.45 [0.13]**	1.28 [0.16]**	0.49 [0.11]**	0.72 [0.09]**	0.69 [0.13]**	1.10 [0.05]**	0.98 [0.09]**	1.02 [0.05]**	0.91 [0.01]**	0.91 [0.02]**	0.92 [0.02]**
CDBG $ / poor in tract (average/yr. 1994-1996)	0.01 p0.01]	0.17 [0.08]**	0.04 [0.04]	-0.02 [0.01]†	0.54 [0.05]	0.03 [0.05]	0.00 [0.16]	-1.37 [1.24]	0.24 [0.63]	0.00 [0.01]	0.05 [0.03]	0.01 [0.04]	0.93 [0.92]	1.33 [2.18]	0.63 [1.61]	-0.01 [0.01]	0.08 [0.04]*	-0.01 [0.06]
[CDBG $ / poor in tract]**2 (average/yr. 1994-1996)	0.00 [0.00]	0.00 [0.00]†	0.00 [0.00]	0.00 [0.00]**	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]
[CDBG $ / poor in tract]**3 (average/yr. 1994-1996)	0.00 [0.00]	0.00 [0.00]*	0.00 [0.00]	0.00 [0.00]†	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]
Constant	11.55 [2.93]**	24.81 [9.66]**	13.48 [5.65]**	32.18 [3.51]**	10.58 [8.15]	14.02 [8.81]	82.57 [41.49]**	451.12 [152.17]**	136.23 [94.61]	23.50 [6.41]**	6.52 [6.20]	8.59 [9.42]	-350.81 [189.10]†	-263.97 [259.04]	-64.95 [217.36]	-4.28 [2.22]†	-10.94 [5.00]††	0.05 [7.73]
Adjusted R-squared	0.94	0.78	0.95	0.03	0.09	0.34	0.80	0.80	0.67	0.21	0.71	0.51	0.82	0.81	0.93	0.99	0.99	0.99
Sample N	101	34	31	100	33	31	101	34	31	101	33	31	100	34	31	100	34	31
Dependent Variable Mean	101.23	95.47	69.84	31.51	31.29	37.69	542.00	773.94	426.35	52.75	60.89	55.65	1454.85	1233.08	1881.07	116.09	107.14	177.18

Note: standard errors shown parenthetically; all regressions control for other factors as shown in text
* = p < .10; ** = p < .05; two-tailed tests, positive
† = p < .10; †† = p < .05; one-tailed tests, negative

TABLE A5-4
Regression Estimates for Relationship Between CDBD Expenditures/Poor and Neighborhood Indicators, by City Type
Price Increase Neighborhoods
[for sample of all census tracts with CDBG expenditures/poor individual > mean]
[standard errors shown parenthetically]

	Type of Neighborhood Quality of Life Indicator																	
	Median Loan Amount			% Loans for Home Purchase			# Loan Applications			Loan Approval Rate			Number of Jobs			Number of Businesses		
Independent Variables	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth
Neighborhood Indicator at Start of Period (1993-94)	0.99 [0.06]**	1.27 [0.14]**	1.05 [0.11]**	0.41 [0.14]**	-0.05 [0.21]	0.79 [0.24]**	1.89 [0.25]**	2.39 [0.17]**	1.11 [0.10]**	0.62 [0.20]**	0.35 [0.15]**	0.97 [0.09]**	0.95 [0.25]**	1.13 [0.09]**	0.96 [0.05]**	0.87 [0.01]**	1.03 [0.03]**	1.07 [0.05]**
CDBG $ / poor in tract (average/yr. 1994-1996)	-0.02 [0.04]	0.03 [0.06]	0.09 [0.04]*	0.02 [0.02]	0.09 [0.04]**	-0.02 [0.04]	-0.15 [0.42]	-0.46 [0.28]	0.78 [0.78]	0.02 [0.03]	0.05 [0.03]*	0.01 [0.01]	-0.25 [0.94]	-1.09 [2.55]	1.22 [1.79]	0.05 [0.04]	-0.06 [0.04]	0.27 [0.15]*
[CDBG $ / poor in tract]**2 (average/yr. 1994-1996)	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]††	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]
[CDBG $ / poor in tract]**3 (average/yr. 1994-1996)	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]*	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]*	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]
Constant	10.91 [6.52]	7.51 [10.88]	2.70 [8.30]	17.86 [5.29]**	21.09 [8.59]**	13.70 [9.62]	52.92 [71.76]	127.83 [55.51]**	216.65 [120.15]*	13.34 [13.16]	26.99 [8.97]**	-8.33 [5.49]	33.15 [161.36]	-246.10 [518.45]	-48.88 [300.17]	-4.52 [7.10]	-1.69 [8.85]	-61.30 [24.81]††
Adjusted R-squared	0.92	0.76	0.79	0.39	0.08	0.22	0.74	0.86	0.79	0.21	0.35	0.82	0.99	0.84	0.93	0.99	0.98	0.95
Sample N	25	37	37	25	37	35	25	37	37	25	37	35	25	35	35	25	35	35
Dependent Variable Mean	94.50	88.50	77.27	32.91	33.56	41.42	385.40	379.51	759.73	54.33	57.81	56.96	2265.77	2380.85	2621.83	186.10	135.47	253.11

Note: standard errors shown parenthetically; all regressions control for other factors as shown in text
* = p < .10; ** = p < .05; two-tailed tests, positive
† = p < .10; †† = p < .05; one-tailed tests, negative

TABLE A5-5

Regression Estimates for Relationship Between CDBD Expenditures/Poor and Neighborhood Indicators, by Neighborhood Price Trend

[for sample of all census tracts with CDBG expenditures/poor individual > mean]

[standard errors shown parenthetically]

	Type of Neighborhood Quality of Life Indicator																	
	Median Loan Amount			% Loans for Home Purchase			# Loan Applications			Loan Approval Rate			Number of Jobs			Number of Businesses		
Independent Variables	Price Decline	Price Stable	Price Increase	Price Decline	Price Stable	Price Increase	Price Decline	Price Stable	Price Increase	Price Decline	Price Stable	Price Increase	Price Decline	Price Stable	Price Increase	Price Decline	Price Stable	Price Increase
Neighborhood Indicator at Start of Period (1993-94)	0.83 [0.02]**	0.88 [0.03]**	0.94 [0.06]**	0.47 [0.07]**	0.28 [0.07]**	0.31 [0.13]**	1.40 [0.05]**	1.50 [0.07]**	1.26 [0.07]**	0.62 [0.06]**	0.69 [0.06]**	0.59 [0.09]**	1.09 [0.02]**	1.07 [0.04]**	1.02 [0.04]**	0.94 [0.01]**	0.92 [0.01]**	1.01 [0.02]**
CDBG $ / poor in tract (average/yr. 1994-1996)	0.04 [0.01]**	0.01 [0.01]	0.09 [0.03]**	0.00 [0.01]	0.00 [0.01]	0.02 [0.02]	0.01 [0.07]	-0.04 [0.09]	0.14 [0.31]	0.01 [0.00]**	0.01 [0.00]*	0.03 [0.01]**	0.60 [0.35]*	0.69 [0.35]**	0.08 [1.13]	0.02 [0.01]*	0.00 [0.01]	0.12 [0.05]**
[CDBG $ / poor in tract]**2 (average/yr. 1994-1996)	0.00 [0.00]††	0.00 [0.00]	0.00 [0.00]††	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]††	0.00 [0.00]	0.00 [0.00]††	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]
[CDBG $ / poor in tract]**3 (average/yr. 1994-1996)	0.00 [0.00]**	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]*	0.00 [0.00]	0.00 [0.00]**	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]
Constant	19.58 [3.13]**	22.61 [2.59]**	8.51 [5.89]	19.64 [2.87]**	23.47 [2.48]**	21.40 [5.15]**	141.01 [21.19]**	143.63 [32.45]**	212.35 [54.08]**	17.96 [3.67]**	11.25 [3.62]**	14.10 [5.37]**	-343.11 [86.22]††	-268.81 [107.92]††	-140.36 [211.25]	-9.68 [2.28]††	-5.08 [1.71]††	-31.71 [10.40]††
Adjusted R-squared	0.85	0.88	0.75	0.19	0.14	0.06	0.76	0.77	0.79	0.38	0.50	0.41	0.96	0.84	0.90	0.99	0.99	0.96
Sample N	210	166	99	209	164	97	210	166	99	210	165	97	206	165	95	206	165	95
Dependent Variable Mean	99.31	94.19	85.82	36.06	32.64	36.23	439.93	567.91	523.10	57.63	54.92	56.61	2040.22	1489.23	2439.35	164.31	125.72	192.13

Note: standard errors shown parenthetically

* = p < .10; ** = p < .05; two-tailed tests, positive

† = p < .10; †† = p < .05; one-tailed tests, negative

TABLE A5-6

Regression Estimates for Relationship Between CDBD Expenditures/Poor and Neighborhood Indicators, by City Job Growth Category

[for sample of all census tracts with CDBG expenditures/poor individual > mean]

[standard errors shown parenthetically]

	Type of Neighborhood Quality of Life Indicator																	
	Median Loan Amount			% Loans for Home Purchase			# Loan Applications			Loan Approval Rate			Number of Jobs			Number of Businesses		
Independent Variables	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth	No Growth	Low Growth	High Growth
Neighborhood Indicator at Start of Period (1993-94)	0.92 [0.02]**	0.84 [0.04]**	0.95 [0.05]**	0.30 [0.06]**	0.53 [0.10]**	0.54 [0.11]**	1.50 [0.04]**	1.61 [0.07]**	1.20 [0.07]**	0.51 [0.07]**	0.64 [0.06]**	0.71 [0.08]**	1.04 [0.02]**	1.17 [0.03]**	1.03 [0.02]**	0.93 [0.01]**	0.94 [0.01]**	0.99 [0.02]**
CDBG $ / poor in tract (average/yr. 1994-1996)	0.01 [0.01]*	0.11 [0.02]**	0.00 [0.01]	0.00 [0.00]	0.00 [0.01]	0.00 [0.01]	-0.04 [0.06]	0.19 [0.16]	-0.03 [0.13]	0.01 [0.00]**	0.03 [0.01]**	0.00 [0.01]	0.77 [0.33]**	1.14 [0.97]	0.54 [0.32]*	0.02 [0.01]**	0.03 [0.01]*	0.04 [0.02]*
[CDBG $ / poor in tract]**2 (average/yr. 1994-1996)	0.00 [0.00]	0.00 [0.00]**	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]†	0.00 [0.00]	0.00 [0.00]††	0.00 [0.00]††	0.00 [0.00]	0.00 [0.00]††	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]††	0.00 [0.00]	0.00 [0.00]
[CDBG $ / poor in tract]**3 (average/yr. 1994-1996)	0.00 [0.00]	0.00 [0.00]**	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]**	0.00 [0.00]	0.00 [0.00]**	0.00 [0.00]**	0.00 [0.00]	0.00 [0.00]**	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]**	0.00 [0.00]	0.00 [0.00]
Constant	11.21 [2.50]**	19.07 [4.34]**	22.77 [3.69]**	22.88 [2.06]**	11.99 [4.50]**	21.16 [4.35]**	93.91 [17.47]**	159.13 [37.50]**	230.95 [39.03]**	21.97 [4.11]**	14.59 [4.16]**	10.46 [4.73]**	-267.33 [82.67]††	-561.28 [168.42]††	-143.64 [101.70]	-11.38 [1.92]††	-8.89 [2.73]††	-15.92 [7.45]††
Adjusted R-squared	0.90	0.76	0.78	0.12	0.17	0.20	0.84	0.82	0.77	0.30	0.46	0.50	0.93	0.93	0.96	0.99	1.00	0.96
Sample N	238	138	99	237	136	97	238	138	99	238	137	97	234	135	97	233	136	97
Dependent Variable Mean	106.43	93.60	68.07	33.01	33.99	40.80	466.97	548.73	521.04	55.57	59.47	54.47	1728.58	1881.17	2467.02	142.90	145.66	203.52

Note: standard errors shown parenthetically; all regressions control for other factors as shown in text

* = p < .10; ** = p < .05; two-tailed tests, positive

† = p < .10; †† = p < .05; one-tailed tests, negative

U.S. Department of Housing and Urban Development
HUD USER
P.O. Box 23268
Washington, DC 20026–3268

October 2002