

# The Cost-Effectiveness of the Low-Income Housing Tax Credit Relative to Vouchers: Evidence from Six Metropolitan Areas

**Lan Deng**

*University of Michigan*

## *Abstract*

How expensive is the Low-Income Housing Tax Credit (LIHTC) program relative to vouchers? Are there any market conditions under which the supply-based LIHTC could be more cost-effective than demand-based vouchers? This article examines these questions in six metropolitan areas—Boston, New York, San Jose (CA), Atlanta, Cleveland, and Miami. Controlling for family income and unit size, I compare the development subsidies of new-construction LIHTC projects with the alternative 20-year voucher cost in each area.

In general, the LIHTC is found to be more expensive than vouchers. The premium, however, varies significantly by voucher payment standard and local housing market. Assuming a payment standard of 100 percent of fair market rent, the LIHTC is only 2 percent more expensive than vouchers in San Jose, but more than twice as expensive as vouchers in Atlanta. Many factors account for these regional variations. This study emphasizes two: local market conditions and program administration.

**Keywords:** Federal government; Housing assistance programs; Low-income housing

## **Introduction**

How should limited government housing subsidies be directed, via supply-side investment programs or demand-side support? The basic tenet of U.S. housing policy over the past 20 years has been that demand subsidies are always superior to supply subsidies due to their lower cost, greater consumer freedom, and ability to leverage private production. On the basis of this conventional wisdom, the federal government has significantly cut funding for housing production programs and terminated both the public housing and the

project-based Section 8 programs.<sup>1</sup> Meanwhile, it has rapidly expanded its demand subsidy program, the voucher program, into the largest single federal low-income housing assistance program.<sup>2</sup> In fiscal year 2005, about \$16.9 billion has been allocated to serve almost 2 million U.S. households (U.S. Government Accountability Office (GAO) 2005).<sup>3</sup>

The supply-based approach, however, has not been completely eliminated from the nation's housing agenda. As part of the Tax Reform Act of 1986, Congress created a new housing production program, the Low-Income Housing Tax Credit (LIHTC), to alleviate the adverse impacts resulting from the elimination of many tax benefits for the construction of multifamily housing. This program has rapidly grown into the largest federal housing production program. The U.S. Department of Housing and Urban Development (HUD) estimates that as of 2001, over 1 million LIHTC units have been placed in service (2004a).

Despite their magnitude and the fact that the LIHTC and the voucher program now compete ideologically and programmatically, surprisingly little is known about their relative efficiency. According to the conventional wisdom, the voucher program is cheaper than any production program. Most of the evidence to support this view was generated by the Experimental Housing Allowance Program (EHAP) in the 1970s and 1980s and is therefore quite old. More than two decades of economic growth have passed, and recent housing data suggest that many markets are much tighter today than they were during the EHAP era. Without reexamination, it is hard to say whether the major conclusions of EHAP still hold today.

Not only are most earlier studies out of date, they compared the voucher program with now-discontinued production programs like public housing or the project-based Section 8 program. It is questionable whether their performance is representative of today's production programs. Learning from the past, new production programs have tried to improve project design and promote neighborhood integration. For example, the LIHTC program has been specifically tailored to bring the efficiency and discipline of the private

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<sup>1</sup> Except for replacing existing units, the federal government no longer builds and operates new housing projects through the two programs.

<sup>2</sup> For most of its history, the voucher program was known as the tenant-based Section 8 program. It was established in 1974 and had two components, the voucher program and the certificate program. There were only minor differences in payment rules between the two. In 1998, Congress combined the two into a single program, the Housing Choice Voucher Program.

<sup>3</sup> The U.S. General Accounting Office changed its name to the Government Accountability Office in 2004. The abbreviation GAO in this article applies to both.

market to the process of producing affordable housing. By purchasing federal tax credits, private investors become the legal owners of LIHTC properties and are thus responsible for their development and operation. The competition for tax credits has also enabled state governments to select the projects that best match their policy goals. These accountability provisions are designed to ensure the development of high-quality projects and avoid repeating past mistakes.

However, even if housing vouchers are cheaper on average than production programs, might there be specific market types and conditions under which production programs would work more efficiently than vouchers? This is a question that has long been raised, but has not yet been addressed (Olsen 2003). Since housing markets are local or regional, might we not expect the performance of government housing programs to depend on local economic conditions as well as the institutions that regulate the local market (Hårsman and Quigley 1991)?

This article answers these questions by evaluating the cost-effectiveness of the federal LIHTC program relative to the voucher program in six U.S. metropolitan areas. Three of them—the San Jose (CA) primary metropolitan statistical area (PMSA), the New York PMSA, and the Boston PMSA—are identified as “tight” housing markets. The other three—the Miami PMSA, the Cleveland PMSA, and the Atlanta MSA—are “balanced” housing markets. As will be discussed later, a tight housing market is one where the rental housing vacancy rate is low and new housing construction lags behind job growth. By contrast, in a balanced market, housing construction keeps pace with job growth, and housing supply and demand are relatively balanced.

For each area, I compare the total development subsidies of recent new LIHTC projects with the estimated costs of providing vouchers to the households that would occupy these units if the voucher alternative were adopted. The voucher cost is estimated for three levels of payment standards: 90, 100, and 110 percent of fair market rent (FMR). In general, the LIHTC is indeed more expensive than vouchers over a 20-year period. But the premium is sensitive to voucher payment standards and also varies significantly by local market. Assuming a payment standard of 100 percent of FMR, the premium for the LIHTC is 2 percent in San Jose, 12 percent in Miami, 40 percent in Cleveland, 75 percent in New York, 115 percent in Boston, and 133 percent in Atlanta. Further investigation shows that such a pattern not only results from local market conditions, but also is greatly affected by local program administration.

This article begins by reviewing the literature on the efficiency of government housing programs. The next section describes the case study MSAs, research data, and subsidy-counting methodology and is followed by a section

that examines the development subsidies for the sample 9 percent LIHTC projects in each MSA. These development subsidies are then compared with 20-year voucher subsidies. Although this study is focused on 9 percent LIHTC projects, the final section also briefly discusses the cost-effectiveness of 4 percent LIHTC projects relative to vouchers. The difference between 9 percent and 4 percent LIHTC projects lies in the size of the tax credits that are awarded. Investors in a 9 percent LIHTC project can claim an annual tax credit of roughly 9 percent of the project's eligible development cost for 10 years, while investors in a 4 percent LIHTC project can claim an annual tax credit of roughly only 4 percent of its eligible development cost for the same period.

### **Literature review**

The last time the economic efficiency of government housing programs was a major research topic was more than 20 years ago. Then, the main motivation for such research was to identify the comparative advantages of the newly introduced tenant-based Section 8 program versus alternative production programs. Olsen (2000) provides an excellent review of five important housing-cost studies conducted in the late 1970s and early 1980s. All found that tenant-based housing certificates and vouchers provide housing at a much lower cost than production programs.

The influence of these earlier studies cannot be exaggerated. They provided the justification for the government's expanding the voucher/certificate program as well as terminating public housing and the project-based Section 8 program. Moreover, since their findings are now widely accepted as a sort of conventional wisdom, they continue to influence housing policy. Nevertheless, nearly all these earlier studies suffer from some methodological limitations or measurement problems (Olsen 2000). This section identifies four important issues associated with these earlier studies and examines recent studies to see how these issues have been addressed.

#### *The life-cycle evaluation for housing production programs*

The first critique raised about those earlier studies is their lack of emphasis on the different time paths of costs and benefits between demand-based and supply-based subsidy programs. For a voucher program, all government costs and tenant benefits occur at the same time and can be easily measured. For a production program, however, governments spend huge up-front subsidies to produce a capital asset that may have a useful life of 40 to 50 years and be available for occupancy by succeeding numbers of low-income families (Nenno 1998). Due to this long service commitment, neither the costs nor the benefits

associated with a production program are evident at any one point in time. A conceptually correct methodology should therefore use a life-cycle approach.

Only one of the five 1970s studies reviewed by Olsen (2000) did so. According to this study, for the 11 public housing projects that were examined, it cost an average of \$1.17 to provide a dollar's worth of housing service (HUD 1974). Although the study is based on small samples, it is still interesting to see that the lifetime cost-benefit difference for the public housing program is much smaller than the conventional wisdom would predict. In a similar vein, Matulef's more recent (1989) evaluation of the long-term costs and benefits of new-construction public housing projects reveals a cost advantage over rent allowances beginning in the 16th year.

### *The choice between cost-benefit and cost-effectiveness analysis*

The second issue in evaluating government housing programs is whether to perform a cost-benefit or a cost-effectiveness analysis. Although the cost-benefit analysis can present a complete framework of economic efficiency, this approach is often constrained by the availability of data or technical problems in measuring intangible costs or benefits. Thus, a cost-effectiveness analysis may become a good alternative for investigating a program's cost efficiency while holding benefits constant.

Earlier studies commonly used cost-benefit analysis. For each housing program, these studies compare the government's cost with the estimated market rent for subsidized housing units (HUD 1974; Mayo et al. 1980; Olsen and Barton 1983; Wallace et al. 1981). Market rents are thus the indicator of consumer benefits generated by these programs.<sup>4</sup> Unfortunately, because of data constraints, the hedonic price models used to estimate market rents often do not include enough variables. For example, several studies use American Housing Survey data. Although this survey collects detailed data about the structural characteristics of housing units, it has very limited information about neighborhood conditions apart from some subjective measurements. This limitation puts into question the accuracy of the estimated market rent and thus the cost-benefit ratio calculated for subsidized units.

The cost-benefit approach faces more serious challenges if it is applied in a life-cycle evaluation. To estimate all of the lifetime benefits generated by a production program, researchers must predict not only the changes in housing unit conditions, but also the changes in local market conditions over time.

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<sup>4</sup> These studies do not consider external benefits and costs to neighborhoods surrounding the subsidized units.

Given such difficulties, many earlier studies conducted the cost-benefit analysis for a single year. The estimated value is then influenced by the market conditions at the time the hedonic price model was devised. For this reason, Apgar (1990) argues that the depressed rental housing market in the late 1970s may have partially contributed to the observed cost advantage that demand-side subsidies hold over supply-side interventions.

Recent studies tend to avoid these problems by using a cost-effectiveness approach instead (GAO 2002; McClure 1998; Shroder and Reiger 2000). The report issued by the GAO in 2002 compares the total lifetime costs of developing and operating a unit for six active housing programs. Nationally, the total per unit costs for housing production programs are found to be 32 to 59 percent greater than they are for vouchers in the first year and 12 to 27 percent greater over 30 years. Thus, although production programs may bring additional services or benefits to tenants and local communities, the voucher program costs the government less in terms of meeting the goal of providing affordable housing for the poor (GAO 2002).

### *The impact of rental market inflation*

Without applying the life-cycle approach, many earlier studies also cannot identify the impact of rental market inflation on the economic efficiency of government housing programs. This is a serious issue given the fact that such inflation often varies widely from market to market. McClure (1998), for example, argues that production programs could provide a better hedge against inflation risk, while the voucher program is subject to full inflation pressure. Taking this factor into consideration, he compares the 15-year government subsidy cost for the Section 8 New Construction (NC)/Significant Rehabilitation (SR) program and the Section 8 voucher/certificate program in Kansas City (MO) and St. Louis and finds that the production program is about 40 percent more expensive than vouchers. The premium, he argues, would further decline in a tight housing market with high inflationary pressure (McClure 1998).

Shroder and Reiger (2000), by contrast, point out that without controlling for the population being served, government subsidies spent through different programs may not be comparable. A Section 8 NC/SR project may look cheaper simply because its tenants have higher incomes than voucher families. To avoid such bias, these authors compare the mean gross rent, the sum of both the government subsidy and the family contribution, for the two programs. The results show that project-based Section 8 assistance remains considerably more expensive than tenant-based assistance in most housing markets, even 15

to 20 years after construction. Thus, they argue, the federal government cannot use construction subsidies to preempt rent inflation. It is interesting to note that this study does reveal some regional variations. In three of the most inflated housing markets selected, San Jose, Stamford-Norwalk (CT), and San Francisco, apartments with two or more bedrooms in Section 8 NC/SR projects turn out to be more cost-effective than those in the certificate program.

### *Second-round costs and benefits*

Government housing subsidy programs, whether supply or demand based, are by their very nature interventions in the private housing market. Thus the market responses to these interventions can generate some second-round costs or benefits. Apgar (1990), for example, argues that depending on households' consumption decisions and developers' production decisions, demand-side subsidy programs may push up market rent and hurt unassisted low-income households.

The magnitude of these demand effects has been examined in EHAP studies, which conclude that a demand-based housing allowance program generates only a small increase in demand and thus a limited increase in prices. Nevertheless, some scholars argue that EHAP's limited duration may have understated consumers' responsiveness to a permanent program (Bradbury and Downs 1981). In comparing data from the Freestanding Voucher Demonstration Program in 1986 with data from the EHAP, Apgar (1990) finds that the 1986 program achieved a higher participation rate and induced a greater increase in housing expenditures.

Another reason to be cautious about the earlier EHAP conclusion comes from the diversity of the nation's housing markets. In a study of households' reactions to housing allowance requirements, Hanushek and Quigley (1981) find these reactions differ markedly across case study metropolitan areas. These variations, they suspect, are due to the fact that households in different markets have distinctly different tastes or make choices subject to different constraints such as the characteristics of existing housing stock. Whatever the reason, those variations highlight the importance of local conditions in shaping consumption decisions. Thus, in a country as diverse as the United States, we might expect the demand effects triggered by a permanent, nationwide voucher program not only to be larger in magnitude, but also to vary from region to region.

There would be no need to worry about demand effects if housing supply could expand quickly enough to accommodate them. The EHAP Supply Experiment finds evidence that landlords are willing to improve their substan-

ard units to meet the quality standards of the housing program. Additionally, low-income housing supply could also be expanded through the downward filtering of high-quality units or through new construction.

It is not clear whether these supply responses are elastic enough to absorb all of the induced demand. However, as the dominant mechanism for the private market to supply low-income housing, the filtering process may not function as well as expected in certain regions because of racial discrimination or local housing shortages (Smith-Heimer 1990). In a very tight housing market, we might even see the phenomenon of “filtering-up,” in which low-cost housing units are occupied by higher-income households, further diminishing the supply of low-income housing.

With an inelastic supply of low-income housing, the price effects triggered by the voucher program would not be negligible. A recent study by Susin (2002) tests this notion and finds that as of 1993, vouchers are associated with a rent increase of 16 percent in the 90 largest metropolitan areas. “Considered as a transfer program, this result implies that vouchers have caused an \$8.2 billion increase in the total rent paid by low-income non-recipients, while only providing a subsidy of \$5.8 billion to recipients, resulting in a net loss of \$2.4 billion to low-income households” (Susin 2002, 109).

If a demand-based subsidy program pushes up market rent, will a supply-based subsidy program help reduce it? In the short run, production programs may expand housing supply and reduce rent inflation, but the benefits may not be sustained over the long run if subsidized housing construction eventually replaces private production. Apgar (1990) argues that the replacement effects depend on the location and nature of the subsidized properties. As long as housing programs target market niches neglected by private developers, such as inner-city neighborhoods or units for large families, they should act to expand the aggregate housing supply. Struyk (1990), however, points out that since today’s affordable housing developments tend to look more like market-rate developments, the likelihood of replacement may be higher than we thought.<sup>5</sup>

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<sup>5</sup> A recent study by Malpezzi and Vandell (2002) finds no significant relationship between LIHTC construction and the size of housing stock at the state level, which seems to suggest a high rate of substitution. However, as the authors acknowledge, this study is not powerful enough to exclude all possibility of a lower substitution rate.

### *The economic efficiency of the LIHTC program*

Despite these issues, existing studies have documented in great detail the inefficiency of the old housing production programs relative to the voucher program. Knowledge about the LIHTC is, however, surprisingly scant. Because of the complexity involved in structuring financial deals for LIHTC projects, the program is often criticized for being excessively expensive (Cummings and DiPasquale 1999; Olsen 2000; Stegman 1991). Nevertheless, because of data constraints, this line of argument is offered as an extension of experience with previous production programs or is based on evidence collected during the early stages of the LIHTC program.

To my knowledge, only one study, the GAO (2002) report mentioned earlier, has directly compared the cost-effectiveness of the LIHTC with that of vouchers. According to this study, the average 30-year cost of the LIHTC program is 19 percent higher than the cost of vouchers for one-bedroom units in metropolitan areas. For three-bedroom units in such areas, LIHTC units cost just 4 percent more (GAO 2002).

This report has made a significant contribution to our understanding of current housing programs, especially given the previous 20 years of silence on this topic. Even so, it may have overestimated the cost of the LIHTC program by relying on a database in which all the projects were placed in service between 1987 and 1997, mostly before 1995.<sup>6</sup> As the LIHTC has become more widely used and the price of tax credits has continued to increase, the program's economic efficiency has been improving. Therefore, we would expect projects built in the late 1990s to be less costly than the earlier ones.

The GAO (2002) study also compares the total costs (both government costs and tenant payments) of developing and operating a unit across different housing programs. Although this methodology has the advantage of accounting for total social costs, it is equally important to know how much the government cost is for each program. The estimated government cost should not only control for household income, since families with higher incomes require fewer subsidies, but should also control for unit size, since construction costs and rents tend to vary by unit size. The present study meets this need by applying a methodology that controls for both family income and unit size and compares the subsidy cost of the LIHTC program and the voucher program on an equal basis.

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<sup>6</sup> This database is the same one used in Cummings and DiPasquale's LIHTC study (1999).

## Case study metropolitan areas and research data

### *Case study metropolitan areas*

The six case study metropolitan areas are located throughout the four census regions. The San Jose PMSA, the New York PMSA, and the Boston PMSA are tight markets, while the Miami PMSA, the Atlanta MSA, and the Cleveland PMSA are balanced markets.<sup>7</sup> The tightness of the markets is determined on the basis of the rental housing vacancy rate. As shown in table 1, rental vacancy rates in both 1990 and 2000 were significantly lower in the three tight markets than in the three balanced ones. All of the tight housing markets grew even tighter in the 1990s, but Atlanta and Miami also experienced considerable market pressure from rapid employment and population growth. In Atlanta, the rental vacancy rate dropped dramatically from 14.7 percent in 1990 to only 6.7 percent in 2000.

For further comparison, table 1 also lists the ratio of job growth to housing permits to indicate the elasticity of housing construction to new housing demand resulting from job creation (Landis, Elmer, and Zook 2002). There is a large difference in this ratio between the two types of markets. In Boston, New York, and San Jose, one housing permit was issued for each three or four new jobs. Job growth and housing construction were more balanced in Miami, Cleveland, and Atlanta, with one permit for each one or two new jobs.

The six markets are distinguished by other factors as well (table 2). Whereas Cleveland did not grow much at all during the 1990s, the population

**Table 1.** Housing Market Profiles in the Case Study MSAs

Type	MSA	Census Region	Rental Vacancy Rate (%)		Ratio of Job Growth to Housing Permits (1991 to 2000)
			1990	2000	
Balanced market	Atlanta	South	14.7	6.7	1.66
	Cleveland	Midwest	8.8	9.0	2.42
	Miami	South	9.1	5.9	1.09
Tight market	Boston	Northeast	6.4	2.9	4.36
	New York	Northeast	4.2	3.4	3.31
	San Jose	West	4.6	1.9	3.96

*Source:* Tabulations of 1990 and 2000 census data (U.S. Bureau of the Census 1990a, 1990b, 2000a, 2000b).

*Note:* Job growth data come from HUD's (2005b) *State of the Cities Data System*, extracted from the U.S. Bureau of the Census's County Business Patterns. Housing permit data also come from HUD's (2005a) *State of the Cities Data System*, extracted from the U.S. Bureau of the Census's Building Permits Survey.

<sup>7</sup> Each MSA's geographic coverage is based on the 1990 census definition.

**Table 2.** Social and Economic Characteristics of the Case Study MSAs

Type	MSA	Population in 1990 (Millions)	Population Growth, 1990 to 2000 (%) <sup>a</sup>	Median Family Income in 1990 (\$)	Income Growth, 1990 to 2000 (%) <sup>b</sup>	Median Age of the Housing Stock in 2000 (Years)
Balanced market	Atlanta	2.8	45.0	41,618	43.0	18
	Cleveland	1.8	2.0	37,140	35.0	43
	Miami	1.9	16.0	31,113	29.0	27
Tight market	Boston	2.9	19.0	49,266	39.0	48
	New York	8.5	9.0	37,515	24.0	50
	San Jose	1.5	12.0	53,670	52.0	30

*Source:* Tabulations of the 1990 and 2000 census data (U.S. Bureau of the Census 1990a, 1990b, 2000a, 2000b).

<sup>a</sup> The calculated population growth rate reflects not only an MSA's intensified development, but also its outward expansion, particularly in metropolitan Atlanta, whose boundary expanded dramatically from 1990 to 2000.

<sup>b</sup> The income growth rate is simply the result of dividing median family income in 2000 by median family income in 1990. It is not adjusted for inflation.

of metropolitan Atlanta expanded by nearly 50 percent. Population growth in the other four PMSAs was more similar, ranging from about 10 percent to 20 percent.

Economic growth, although not differing as dramatically as population growth, also varied. San Jose, the wealthiest of the six areas in 1990, grew even wealthier by 2000. Miami, the poorest in 1990, remained so in 2000. Market tightness and income change are not necessarily correlated. Median family incomes in New York and Cleveland were comparable, despite a huge difference in vacancy rate.

A final distinction that can be made among the case study MSAs is in the sequence of urban development. The last column in table 2 lists the median age of the housing stock. As of 2000, almost half of the existing stock in Boston, Cleveland, and New York was built nearly 50 years ago. By contrast, housing in Atlanta, Miami, and San Jose was completed mostly in the 1970s and 1980s. These regional variations have led state tax-credit allocation agencies to set very different funding priorities. In the three old MSAs, most of the tax credits were allocated to rehabilitation projects to eliminate blighted sites and revitalize urban communities. By contrast, in Atlanta, Miami, and San Jose, new-construction projects were favored to expand housing supply for rapidly growing populations.

It needs to be noted that none of these MSAs was selected randomly and therefore cannot be said to be representative in a formal sense. However, since this study is intended to provide an updated evaluation of the performance of today's two most important housing programs by accounting for particular

local market conditions, diversity is a more important criterion than representation.

### *Research data*

I collected all of the LIHTC data used in this study from the individual state agencies responsible for allocating tax credits in the six MSAs (table 3). A wide range of information about each LIHTC project is required to conduct the proposed cost-effectiveness evaluation. Given the difficulty of collecting complete data sets for earlier projects, the analysis is limited to new-construction projects placed in service after 1995. This not only made data collection easier, it also helped ensure that the financing and syndication provisions of the sample projects were the most comparable.

**Table 3.** State Tax-Credit Allocation Agencies Providing LIHTC Data

Case Study MSAs	State Agencies
Atlanta MSA	Department of Community Affairs
Cleveland PMSA	Ohio Housing Finance Agency
Miami PMSA	Florida Housing Finance Corporation, formerly the Florida Housing Finance Agency
Boston PMSA	Department of Housing and Community Development
New York PMSA	Division of Housing and Community Renewal
San Jose PMSA	California Tax Credit Allocation Committee

Project documents that were used to extract data varied from state to state; the most common one was the form that serves to certify a project's final development expenses and sources of funding.<sup>8</sup> All six state allocation agencies now require LIHTC developers to submit this form after a project is placed in service. Otherwise, the agencies will not issue Form 8609, which is required for investors to claim tax credits from the Internal Revenue Service (IRS).

Normally, the cost-certification form contains detailed information about a project's development cost and permanent funding sources, such as the allocated tax-credit amount, the syndication proceeds, the principal, the interest rate, and the term of permanent mortgages.<sup>9</sup> But occasionally this form may

<sup>8</sup> The name of the form may vary slightly from state to state. For example, it is called the Certification of Actual Cost and Opinion in Georgia.

<sup>9</sup> New York is the only state where the Division of Housing and Community Renewal has entered the permanent funding sources into a database for each allocated project. However, this database does not track mortgage interest rates. Such information was still extracted from the cost-certification forms.

not be complete and must be supplemented by other documents. In California, for example, I also used the Tax Credit Allocation Committee's project evaluation worksheets to extract mortgage interest rates and terms for some projects. Eventually, these financial data enabled me to calculate the development subsidies for each sample project.

Besides these data, I collected data about a LIHTC project's unit composition, targeted family income, and/or maximum allowable rent.<sup>10</sup> Documents used to extract such data include the Credit Underwriting Report in Miami, the Cost-Certification Form in Cleveland, the Staff Report for Placed-in-Service Projects in San Jose, the One-Stop Affordable Housing Finance Application File in Boston, the Core Application Form and Project Evaluation for Final Allocation in Atlanta, and an electronic database provided by New York's Division of Housing and Community Renewal (DHCR).

My original intention was to include all new-construction projects completed after 1995 in the six MSAs. Subsequently I had to scale back this goal because of practical challenges in data collection. Foremost among these was the fact that state tax-credit allocation agencies could not locate some of the documents for certain projects. For example, although agencies keep careful records on permanent funding sources, documents listing targeted family income or maximum allowable rent are often missing. And because many documents are not standardized, the data that can be extracted from the same type of document tend to vary from project to project. As a result, the projects included in this study were not randomly drawn, but instead were selected for completeness of data.

Table 4 summarizes the number of sample projects and units in each MSA for which complete data are available. Altogether, the six MSAs include 12,964 units in 113 sample projects. The small number of sample projects in Cleveland, New York, and Boston reflects not only data collection difficulties, but also state agencies' preference for rehabilitation projects that have limited the number of new developments.<sup>11</sup> With their greater emphasis on new construction, San Jose, Miami, and Atlanta include 79 projects and 10,996 units, versus only 34 projects and 1,968 units in New York, Boston, and Cleveland.

Table 5 compares the basic characteristics of the sample projects and units in this study with all of the new-construction projects and units allocated

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<sup>10</sup> If the targeted family income for a LIHTC unit is known, the maximum allowable rent can be easily calculated as 30 percent of that income, and vice versa.

<sup>11</sup> A study of the total LIHTC development portfolios in the six MSAs shows that new-construction units account for less than 30 percent of all the LIHTC units in Cleveland, New York, and Boston, but their share rises up to about 60 to 70 percent in Atlanta, Miami, and San Jose.

**Table 4.** Number of Sample LIHTC Projects and Units in Case Study MSAs

	Atlanta	Cleveland	Miami	Boston	New York	San Jose	Total
Sample projects	20	17	26	9	8	33	113
Year of allocation <sup>a</sup>	1995 to 2000	1995 to 1999	1995 to 2000	1994 to 1999	1994 to 1998	1995 to 2000	
Total units	2,458	1,002	4,607	556	410	3,931	12,964
Total LIHTC units <sup>b</sup>	2,011	1,002	4,516	463	403	3,216	11,611

*Source:* Author's calculations.

*Note:* Total units and LIHTC units are different because of the existence of some mixed-income projects containing units that are not qualified for LIHTC. However, such developments are not common: 90 percent of the units produced by the sample projects are LIHTC units.

<sup>a</sup> Year of allocation refers to the year the project was initially selected for tax-credit allocation, found through its state identification number. Once projects are selected, developers must finish them within two years. Several sample projects received their tax-credit allocation in 1994 but were placed in service in 1995 or 1996.

<sup>b</sup> All of the sample projects in Atlanta, Cleveland, Boston, and New York are 9 percent projects. The sample projects in Miami comprise fourteen 9 percent (1,847 LIHTC units) and twelve 4 percent projects (2,669 LIHTC units). The sample projects in San Jose comprise twenty 9 percent (1,616 LIHTC units) and thirteen 4 percent projects (1,600 LIHTC units).

during the same period. These comparisons suggest that the sample is quite representative of all new developments, as measured by project and unit size, sponsor status, and location. In fact, in all the case study MSAs except for Boston and New York, the sample database covers over half of their total new developments. Table 5 also reveals distinct development characteristics across the six MSAs: Atlanta, Miami, and San Jose have mostly large-scale developments, while in Cleveland, Boston, and New York, projects are more likely to be small or medium sized.

## Methodology

This section discusses the methodology used to calculate the development subsidies directed to the sample LIHTC projects, as well as the comparable subsidy if those same units were provided through the voucher program. In particular, it compares the present value of all government subsidies in a 20-year period, assuming that each program helps the same low-income families live in the same-sized units.

The appropriate comparison period between the LIHTC and vouchers is a topic worthy of discussion. Under the LIHTC program, government subsidies pay for development and construction costs, while private investors own the properties and often hire a third party to manage them. The owners are responsible for ensuring project solvency and for seeing that tenant income and rent

**Table 5.** Comparing the Sample Projects with All New-Construction Projects Allocated during the Same Period

	Sample Projects		All New-Construction Projects		Sample Projects		All New-Construction Projects		Sample Projects		All New-Construction Projects	
	Projects	Units	Projects	Units	Projects	Units	Projects	Units	Projects	Units	Projects	Units
Number of observations	20	2,458	38	4,776	17	1,002	23	1,448	26	4,607	46	7,875
Project size (units)												
Less than 20	0%	0%	0%	0%	0%	0%	0%	0%	8%	1%	5%	0%
20 to 49	0%	0%	8%	3%	59%	35%	57%	32%	4%	1%	5%	1%
50 to 99	40%	22%	29%	16%	24%	25%	26%	27%	15%	7%	14%	6%
100+	60%	77%	63%	81%	18%	40%	17%	41%	73%	92%	76%	93%
Number of bedrooms												
Efficiency	NA	0%	NA	0%	NA	0%	NA	0%	NA	0%	NA	0%
1	NA	20%	NA	20%	NA	0%	NA	0%	NA	17%	NA	18%
2	NA	51%	NA	52%	NA	28%	NA	24%	NA	44%	NA	45%
3	NA	28%	NA	27%	NA	41%	NA	43%	NA	35%	NA	34%
4+	NA	1%	NA	2%	NA	32%	NA	33%	NA	4%	NA	3%
Nonprofit developer	16%	17%	16%	14%	94%	85%	95%	90%	27%	16%	32%	25%
Location												
Central city	44%	51%	50%	58%	88%	79%	90%	82%	11%	14%	12%	14%
Suburban	56%	49%	50%	42%	12%	21%	10%	18%	89%	86%	88%	86%

*Continues*

**Table 5. Comparing the Sample Projects with All New-Construction Projects Allocated during the Same Period** *Continued*

	All New-Construction			All New-Construction			All New-Construction					
	Sample Projects		Projects	Sample Projects		Projects	Sample Projects		Projects			
	Units	Projects		Units	Projects		Units	Projects				
	Boston			New York			San Jose					
Number of observations	9	556	23	1,582	8	410	25	1,241	33	3,931	45	5,489
Project size (units)												
Less than 20	11%	2%	10%	2%	13%	4%	16%	4%	6%	1%	4%	1%
20 to 49	33%	18%	24%	11%	25%	19%	48%	32%	6%	1%	7%	2%
50 to 99	44%	58%	52%	53%	63%	77%	28%	36%	42%	29%	36%	24%
100+	11%	23%	14%	34%	0%	0%	8%	28%	45%	68%	53%	74%
Number of bedrooms												
Efficiency	NA	5%	NA	4%	NA	3%	NA	2%	NA	8%	NA	13%
1	NA	29%	NA	39%	NA	53%	NA	40%	NA	47%	NA	43%
2	NA	32%	NA	33%	NA	27%	NA	42%	NA	28%	NA	29%
3	NA	31%	NA	20%	NA	16%	NA	13%	NA	15%	NA	15%
4+	NA	4%	NA	4%	NA	2%	NA	3%	NA	1%	NA	1%
Nonprofit developer	44%	28%	43%	29%	NA*	NA	NA	NA	53%	44%	51%	43%
Location												
Central city	67%	72%	50%	62%	88%	83%	84%	90%	55%	64%	61%	69%
Suburban	33%	28%	50%	38%	13%	17%	16%	10%	45%	36%	39%	31%

Source: Author's calculations. Percentages may not total 100 percent because of rounding.

NA = Not applicable.

\* The database provided by the New York DHCR does not track developer status.

restrictions are met throughout the 15-year compliance period. Once the project is placed in service, no additional public subsidies should be spent. This does not preclude the possibility that government agencies may intervene to provide funds needed to preserve the affordable housing stock if a project should experience financial trouble. This is not an obligation; however, in this case, the IRS is entitled to recapture previous tax credits and impose penalties on the owners.

After the 15-year compliance period is over, most LIHTC properties will maintain their low-income use, since the Omnibus Reconciliation Act of 1989 extended the compliance period from 15 to 30 years.<sup>12</sup> As the property ages, however, the need for major physical improvements increases and additional public subsidies may be provided. The magnitude of such improvement subsidies may vary from property to property, depending on cash flows and capital replacement reserves. Nevertheless, experience with old production programs like public housing or project-based Section 8 seems to show that such subsidies can be substantial. Thus, it can be argued that initial development subsidies alone will rarely provide affordable housing for 30 years.

Refinancing and the infusion of new capital subsidies may come quite early for some properties, for example, right at the end of the 15-year compliance period. Yet it seems inappropriate to cut off affordable housing service for LIHTC properties at only 15 years. Despite the need for improvement, the assets funded by initial development subsidies often have significant value at the end of 15 years and would continue to serve low-income families during the extended-use period.<sup>13</sup> Limiting the comparison period to 15 years would completely ignore the remaining asset value. As a compromise, I assume that the development subsidies directed to LIHTC projects could provide affordable housing service for 20 years<sup>14</sup> and use that period to compare the LIHTC with vouchers.

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<sup>12</sup> The second 15 years is called the extended-use period. Property owners, however, are allowed to sell or convert the project to conventional market housing if they apply to the state tax-credit allocation agency and the agency cannot find a buyer (presumably a nonprofit) willing to maintain the project as low-income housing for the extended period. This, hopefully, would not be common. First, most state housing agencies would make an effort to preserve affordable housing. Second, many LIHTC properties are also subject to additional restrictions through the leverage of other public funds. Third, given the high demand for tax credits, many state agencies have imposed additional affordability requirements. In Florida, for example, LIHTC allocation agencies give preference to projects that waive the option of converting LIHTC units to market housing.

<sup>13</sup> The size of the residual value is determined by market conditions and the remaining mortgage balance. Since LIHTC properties use significant equity financing, the remaining mortgage balance should not be very large.

<sup>14</sup> It can still be argued that comparing the LIHTC's up-front development subsidy with a 20-year voucher subsidy excludes any improvement subsidy spent within the 20 years. But this

*Step 1: Estimating the total development subsidy for LIHTC projects*

Development subsidies to LIHTC projects come from three sources: equity subsidies raised by selling tax credits, loan subsidies provided through below-market-rate mortgages, and grants.

*Equity subsidies.* In return for their equity investment, private investors in LIHTC projects enjoy generous government tax subsidies. The most important one is the allocated federal tax credits that will be claimed in equal installments over a 10-year period. For projects eligible for 9 percent credits, the present value of all of the 10-year tax credits cannot exceed 70 percent of the qualified development cost. For projects eligible for 4 percent credits, the present value of the 10-year tax credits cannot exceed 30 percent of the qualified development cost. If the project is located in a qualified census tract or in a difficult-to-develop area, qualified development cost can be increased by 30 percent. The IRS requires that each state allocation agency distribute only the minimum tax credits needed for project financing (e.g., to fill the gap after subtracting all supportable debt and other financing from total development cost). Consequently, tax-credit allocations vary from project to project.

Since the tax credit provides a dollar-for-dollar reduction in property owners' income tax liability, the forgone tax revenue can be calculated by using a 6 percent rate to discount the 10-year tax credits. According to 1999 data published by the Office of Management and Budget, the 6 percent rate is a proxy for the federal government's cost of funds (GAO 2002).

In addition to federal tax credits, some sample projects in San Jose and Atlanta were also awarded state tax credits. These were claimed over 4 years in San Jose and over 10 years in Atlanta. The present value of these credits was also estimated using a 6 percent discount rate.

Although LIHTC investors benefit from the favorable depreciation deduction schedule, the forgone tax revenue from such tax treatment is not unique to LIHTC properties and thus is not included as a development subsidy. Given current tax law, the owners of any rental property, including both LIHTC and voucher properties, can claim the depreciation deduction as long as their holding time has not exceeded the tax life.

*Loan subsidies.* I used the historic 30-year conventional mortgage rate from the Federal Reserve Bank to benchmark the implicit loan subsidy that LIHTC

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comparison also omits any residual value the property may have at the end of the 20 years. Although the magnitudes are unknown, these two factors can somewhat offset each other, and any possible underestimate or overestimate would be reduced.

projects receive from favorable mortgage contracts.<sup>15</sup> If the interest rate on a permanent loan is higher than this benchmark rate, I assume that there is no subsidy. If it is lower, I use the 6 percent rate to estimate and discount all of the reduced monthly payments throughout the 20-year period.<sup>16</sup>

Adding together the present value of all equity subsidies, all loan subsidies, and any grants yields the total development subsidy for each LIHTC project.

### *Step 2: Estimating the comparable 20-year voucher cost for each LIHTC project*

The methodology used in this study measures the subsidies for LIHTC projects, but does not measure the subsidy cost of the vouchers that are actually issued. Rather, voucher costs are hypothetical and are calculated by assuming that the same families occupying the LIHTC projects would otherwise use vouchers to occupy comparable units. This method yields an alternative 20-year voucher cost for every sample LIHTC project, which can then be compared with the project's total development subsidy. In essence, this method allows for the comparison to be done on an equal basis.

*Estimating the comparable first-year voucher cost for LIHTC tenants.*<sup>17</sup> In 1998, Congress passed the Quality Housing and Work Responsibility Act, which combined the existing Section 8 voucher and certificate programs into the Housing Choice Voucher Program (HCVP). The HCVP's payment rules, which were slightly modified from the previous two programs, are applied to estimate the voucher cost for each sample LIHTC project.

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<sup>15</sup> The Federal Reserve Bank's conventional mortgage rates are derived from single-family fixed-rate first mortgages, which are usually lower than the interest rates on mortgages underwritten for investment properties, particularly low-income rental properties. Thus, using this series may underestimate the development subsidy for LIHTC projects. However, mortgage rates for rental properties specifically are not easily available. Previous studies, including Cummings and DiPasquale's LIHTC study (1999) and the GAO study (2002), have used the rates on 30-year constant maturity treasuries (CMT). These rates are even lower than the series used in this study and would cause a larger underestimate. Besides, the CMT rates are no longer reported since the federal government stopped issuing 30-year treasuries in 2001.

<sup>16</sup> Another possible underestimate of the LIHTC development subsidy arises from the application of this mortgage rate series to all subordinate loans, since they normally would demand higher rates than primary mortgages. Some subordinate loans can also be viewed as soft loans that owners are not required to pay back as long as the property continues to serve low-income families. But in general, loans account for only a small portion of the total development cost for 9 percent LIHTC projects, so any such underestimate should be small.

<sup>17</sup> The first-year voucher cost is the subsidy the targeted tenants would otherwise receive in the first year the LIHTC project is placed into service, given FMRs and the income limits HUD sets for that year. Future voucher costs would then be projected on the basis of the first-year cost and a chosen annual growth rate, as will be discussed later.

Under the HCVP, families receive voucher assistance equal to the difference between the total tenant payment (TTP) and a public housing authority (PHA)-determined payment standard, or the gross rent for the unit, whichever is lower. The TTP is defined as the minimum amount a family has to contribute regardless of unit. It is the largest of the following: 30 percent of monthly adjusted income, 10 percent of monthly income, the welfare rent, or the PHA minimum rent. To simplify the analysis, I assume that the TTP is 30 percent of monthly adjusted income, which is the case for most assisted families. Participating families may voluntarily choose a unit with a higher rent than the payment standard. If they do, the assistance stays the same and the family's contribution must increase to pay the difference, but may not exceed 40 percent of monthly adjusted income (HUD 2002).

Thus, to estimate the alternative voucher subsidy that occupants of LIHTC units would receive if they were living in comparable Section 8 housing, we first need to know the rents for these units in the private market and whether such rents are higher or lower than the local payment standard. If the rent is lower than the payment standard, this lower rent, instead of the payment standard, should be used to calculate the voucher subsidy.

To simplify the analysis, I assume that the HCVP units comparable to LIHTC units, all new construction, would have market rents that approximate or even exceed the voucher payment standard set for similar-sized units during the 20 years. Under this assumption, the alternative voucher subsidy would be the difference between the local payment standard and the TTP. This is also consistent with the Section 8 voucher program before 1998.

How valid is this assumption? As in previous studies, data limitations prevent me from estimating directly the market rents that LIHTC units would command on the private market and comparing them with the payment standard. The assumption, however, can be justified if we believe that LIHTC units provide comparable or even better housing service than similar-sized voucher units in the same market, since the quality of the voucher units measures what can be purchased on the private market with a given payment standard.<sup>18</sup>

Several reasons can explain why this might be the case. First, if age can be used as an indicator of the structural condition of housing units, LIHTC units, being newly constructed and normally maintained, would be in better condition in their first 20 years than voucher units. Nationally, the median age of

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<sup>18</sup> The HCVP provides the incentive for families to rent units as expensive as the payment standard allows. Experience with previous voucher and certificate programs also confirms this: Almost all recipients receive subsidies close to their maximum eligible amount—the difference between the payment standard and the TTP (Cutts and Olsen 2002).

voucher properties is about 35 years, ranging from about 65 in the Northeast to about 30 in the West (GAO 2002).

Clearly, housing quality is not determined just by the physical condition of the units. Also important are their locations and neighborhood conditions. Given the portable nature of vouchers, it is generally believed that they provide more opportunities for low-income families to live in quality neighborhoods than production programs do. Such advantages, however, may be limited, given the various locational constraints voucher families often face, such as a tight housing market, the lack of affordable housing in quality neighborhoods, and racial discrimination (Feins et al. 1997; Pendall 2000). Unfortunately, to my knowledge, no empirical studies have directly compared the neighborhood conditions of LIHTC and voucher units. A related study was conducted by Newman and Schnare (1997), who include earlier LIHTC units as part of privately owned assisted units. As a group, these units are indeed found to be more likely than voucher units to be located in the most economically and socially distressed neighborhoods, but the difference is small.<sup>19</sup> Since vouchers are not successful in promoting moves to significantly more integrated living environments, the improvement in neighborhood conditions relative to those of the privately owned assisted units appears to be modest.

In addition to creating new, high-quality housing, most LIHTC developments also provide their residents with amenities and services such as recreational space, child care, and job training that are not often found in voucher housing (National Council of State Housing Agencies 2002). The fact that these additional services can be particularly important to low-income families again supports the assumption that the LIHTC provides housing service at a level comparable to, or even beyond, what vouchers can purchase in the private market.

Given these facts, it is reasonable to calculate the voucher alternatives that LIHTC occupants could otherwise receive as the difference between the payment standard and the TTP. The question now becomes how to choose the payment standard. Under the HCVP, local PHAs may set the payment standard between 90 and 110 percent of FMR and may vary the standard by neighborhood as long as it remains within this range.<sup>20</sup> Such flexibility means that

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<sup>19</sup> One important reason that some LIHTC projects are located in distressed neighborhoods is the policy objective of promoting community revitalization. Although no studies have evaluated whether this goal is effectively achieved, anecdotal evidence seems to show that LIHTC investment does make a difference in many neighborhoods, which, presumably, would improve future neighborhood conditions.

<sup>20</sup> PHAs are also allowed to set the local payment standard higher or lower than the basic range, but they need to get special approval from HUD.

an assisted family could rent a unit with a higher rent in a more expensive neighborhood.

With this flexibility, the exact payment standard used by local PHAs cannot be known. Instead, I estimate subsidies in a range. The high end is achieved when a local PHA sets the standard at 110 percent of FMR; the low end is obtained when the standard is 90 percent of FMR. A midpoint is estimated by assuming a standard exactly equal to FMR.

Thus, the voucher alternative the same LIHTC tenant would receive is the difference between a chosen payment standard and the TTP. Because both the TTP in the voucher program and the maximum allowable rents in the LIHTC program are charged as 30 percent of monthly family income, they have the same value. A simple example can explain the process of calculating the alternative voucher subsidy.

If a two-bedroom LIHTC unit in Miami is designated for a family with 30 percent of area median income (AMI), the maximum rent that can be charged under the LIHTC program must not exceed 30 percent of targeted family income, or \$301 per month in 2000. The property owner can charge a lower rent, but he or she is not obligated to do so. In practice, the actual rent is usually very close to this threshold value. The assumption is that a unit comparable to the LIHTC unit would have a market rent comparable to or even higher than the payment standard. Thus the alternative voucher subsidy the targeted LIHTC family could receive to live in such unit is the difference between the payment standard and the TTP, also \$301.<sup>21</sup> With a payment standard of 100 percent of FMR, which was \$712 for a two-bedroom unit in Miami in 2000, the monthly voucher subsidy would be \$712 minus \$301, or \$411. By calculating this way, the estimated alternative voucher subsidy for LIHTC tenants attempts to control for the size of the housing unit and for family income.

Although this study is intended to evaluate the two housing programs on an equal basis by controlling for family income, it should be noted that they often do not serve the same clients. Congress mandated that at least 75 percent of new recipients of tenant-based vouchers and certificates have incomes lower than limits based on 30 percent of AMI, but allowed a much higher income target for the LIHTC (about 50 or 60 percent of AMI, depending on unit selection). The actual income targeting of individual LIHTC projects can vary widely, as determined by the allocation preference of state housing finance

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<sup>21</sup> It should be noted that 30 percent of monthly family income is used as the TTP to calculate the voucher subsidy. The actual family contribution must be higher since the unit is assumed to rent above the payment standard.

agencies and the amount of subsidies. In Cleveland, for example, most of the LIHTC projects target families with incomes from 30 to 40 percent of AMI, while in Miami many projects serve families with 60 percent of AMI.

*Determining the annual growth rate of voucher cost.* To support low-income families living in voucher units comparable to the sample LIHTC units over 20 years, subsidies must be raised annually. As discussed previously, I calculate the voucher subsidy as the difference between the local payment standard and 30 percent of family income. How the local payment standard and family income change each year determines the growth rate of the subsidy. Using HUD’s historic FMR data for two-bedroom units and HUD adjusted median family income (HAMFI) for a four-person family, I calculate historical annual growth rates for FMRs and family incomes in each MSA (table 6).

Table 6 shows that although historically FMR and median family income did not grow at exactly the same rate in each MSA, the differences tended to be small. On the basis of these trends, I chose an annual voucher growth rate of 4.7 percent in Atlanta, 4.2 percent in Cleveland, 2.5 percent in Miami, 5.8 percent in Boston, 5.3 percent in New York, and 6.2 percent in San Jose. These growth rates are used to increase the voucher subsidies annually. All future subsidies are then discounted to the present by using a 6 percent rate. The use of a single annual growth rate may serve to underestimate the subsidy if the rate of income growth for a particular MSA falls behind the growth in FMR. As indicated in table 6, this underestimate seems more likely to occur in tight housing markets than in balanced ones.

This projection method assumes that original income targeting for LIHTC properties would be maintained throughout the 20 years. However, it is possible that the depth of the targeting may erode over time for some properties. Owners could raise the rent from a level affordable to families with 40 percent

**Table 6.** Historic Annual Growth Rate of FMR and HAMFI in Case Study MSAs

	Balanced Markets			Tight Markets		
	Atlanta	Cleveland	Miami	Boston	New York	San Jose
Annual growth rate for FMR (%) <sup>a</sup>	4.7	4.2	2.5	5.8	5.3	6.2
Annual growth rate for HAMFI (%) <sup>b</sup>	4.6	3.7	2.1	4.0	4.5	5.3

Source: HUD 2005c, 2005d.

<sup>a</sup> The annual growth rate for FMR is calculated based on HUD’s historic FMR for two-bedroom units from 1985 to 2002. This long period is used to control for the impact of different economic cycles.

<sup>b</sup> The annual income growth rate is calculated based on HAMFI from 1990 to 2002.

of AMI to the maximum allowable rents (affordable to families with 50 or 60 percent of AMI) and would not be seen as being in violation of federal regulations. No evidence so far indicates how common this is. State tax-credit allocation agencies select properties that have demonstrated the capacity to maintain the original income targeting for a considerable length of time. Moreover, many agencies ensure compliance with the original rent and income restrictions for at least 15 years by writing the requirement into the regulatory agreement property owners must sign.<sup>22</sup> Another reason properties can make such a commitment is that large development subsidies, such as a significantly reduced debt service amount, must have been involved.

*Estimating the HCVP's administrative fee.* In addition to the voucher subsidy paid to individual families, the federal government pays local PHAs a monthly fee to administer the program. This fee, which is published annually by HUD for each PHA,<sup>23</sup> is higher for the first 600 units and then falls for the remainder. Since all PHAs in this study manage a large number of voucher units, I used the lower fee and adjusted it by the rate of change in local government-employee compensation. On the basis of historical records, I assume an annual inflation rate of 3 percent. Adding the present value of the 20-year fee to the 20-year subsidy yields the total government cost of the voucher program.

Although I do not specifically calculate administrative fees for the LIHTC program, part of the agency cost of administering it is included in the calculation of project development subsidies. In each state, LIHTC developers are required to pay application, reservation, and monitoring fees. For example, the Massachusetts Department of Housing and Community Development (2002) charges a processing fee of 4 to 8 percent of the annual credit amount and an annual compliance monitoring fee of \$25 per low-income unit. Since these fees are included in the development budget, they are implicitly subsidized.

The appendix presents an example of how to calculate the comparable 20-year voucher cost for a sample LIHTC project. Again, the voucher cost estimated here measures only the amount of government subsidy allowed by this program, which will be used as a benchmark to evaluate the cost efficiency of the LIHTC program. This methodology does not account for the possibility that even with a voucher in hand, some low-income families may not be able to find a qualified unit in the private market. Anecdotal evidence suggests that

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<sup>22</sup> The Florida Housing Finance Corporation, for example, requires compliance for 30 years.

<sup>23</sup> The fee omits the government cost of administering the program at local and national HUD offices.

in certain regions, voucher units are getting harder to find as landlords withdraw from the program.

*Step 3: Comparing development subsidies with the alternative 20-year voucher cost for sample LIHTC projects*

For each project in the sample, I have calculated its total development subsidy under the LIHTC program and the alternative 20-year voucher cost, controlling for family income and the size of the unit. Before comparing the two subsidies, one important issue needs to be clarified: that is, how the joint use of vouchers in some LIHTC projects would affect the evaluation.

As mentioned earlier, although each LIHTC unit has to set a targeted family income, families with lower incomes can also live there with the help of housing vouchers. In a study conducted by Abt Associates, Inc., over half of the LIHTC properties studied had at least some residents with Section 8 certificates or vouchers (Burton et al. 2000). This should not affect the results. By focusing on the costs of delivering affordable housing to the families targeted by LIHTC units, the comparison is made on an equal basis without regard for the additional subsidy needs of individual families.

Although the use of vouchers or certificates by individual households is not an issue, the use of project-based vouchers in some LIHTC properties may bias our results. As a component of the HCVP, a PHA can attach up to 20 percent of its voucher assistance to specific housing units if the owner agrees to either rehabilitate or construct the units or agrees to set aside a portion of the units in an existing development (HUD 2004b). Normally a PHA enters into an assistance contract with the owner for specified units and for a specified term, and it then refers families from its waiting list to the owner to fill vacancies.<sup>24</sup> This option provides housing authorities with the flexibility to provide low-income housing in neighborhoods where traditionally it is not available (Sard 2004).

Because of the additional rental income guaranteed by project-based vouchers (the contract is often signed during the development stage), these projects can target families with even lower incomes than the use of tax credits alone would allow. This practice is particularly common in the Boston MSA,

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<sup>24</sup> Project-based vouchers are different from the old Section 8 NC/SR in two aspects. First, under the NC/SR program, the housing subsidy went directly to landlords through long-term contracts, while for project-based vouchers, the housing subsidy goes to PHAs first as vouchers, which were then converted at the PHA's discretion to create hard units through contracts with private landlords. Second, funding for project-based vouchers has always been subject to appropriations, although the landlords and lenders are usually confident enough to make long-term agreements because of the historically steady growth of the voucher program (Sard 2004).

where seven out of nine sample projects receive project-based voucher contracts from the Boston Housing Authority. For these projects, the alternative voucher subsidies are adjusted down by subtracting any project-based voucher subsidies, and the remaining subsidies are then comparable to the LIHTC development subsidy.<sup>25</sup>

With all these caveats in mind, a simple cost-effectiveness ratio can be calculated to compare LIHTC and vouchers.

$$\text{cost-effectiveness ratio} = \frac{\text{total development subsidy under the LIHTC program}}{20\text{-year voucher cost for equivalent targeted families}}$$

If this ratio is more than 1.0, it means that the 20-year cost of subsidizing the same family through the LIHTC program is higher than it would be for the voucher program. A ratio of less than 1.0 indicates that the LIHTC is more cost efficient than comparable vouchers. As noted earlier, for every sample project, alternative voucher subsidies are estimated for three types of payment standards—110 percent, 100 percent, and 90 percent of FMR. Consequently, three cost-effectiveness ratios are calculated for each project.

### **The 20-year development subsidy for LIHTC projects**

Before I compare the two programs, I will examine the LIHTC projects in greater detail. LIHTC projects draw equity subsidies, loan subsidies, and grants. Because grants must be deducted from each project's qualified basis before credits are awarded, developers often prefer subsidized loans to grants. Thus, only a very small number of the sample projects have development grants.

Table 7 presents the mean, maximum, and minimum total development subsidy per LIHTC unit in the six MSAs. The 20-year development subsidy is the cost to society—mostly the public sector—to build these units. These subsidies do not include in-kind subsidies such as property tax abatement and donation of land.

LIHTC projects require enormous subsidies. The average development subsidy per unit ranges from about \$60,000 in Miami to about \$170,000 in

<sup>25</sup> The adjustment is also applied to three sample projects in Atlanta. No sample projects in Cleveland or Miami were found to receive project-based voucher subsidies. In San Jose, the two projects with this subsidy are excluded from analysis since the subsidy amount is unknown. In New York, it cannot be determined whether a project receives a project-based subsidy because New York DHCR's database does not track this information.

**Table 7.** Total Development Subsidies per Unit for 9 Percent LIHTC Projects by MSA (2000 Dollars)

Type	MSA	Number of Projects		Development Subsidies per 9 Percent LIHTC Unit <sup>a</sup>	Percentage in Total Development Cost <sup>b</sup>
Balanced market	Atlanta	20	Mean	63,447	70
			Maximum	110,318	153
			Minimum	30,208	39
	Cleveland	17	Mean	74,543	70
			Maximum	91,736	77
			Minimum	32,107	58
	Miami	14	Mean	60,297	66
			Maximum	83,001	84
			Minimum	43,853	47
Tight market	Boston	9	Mean	122,182	61
			Maximum	160,007	79
			Minimum	72,023	44
	New York	8	Mean	168,798	86
			Maximum	239,923	92
			Minimum	108,843	74
	San Jose	20	Mean	84,463	65
			Maximum	125,663	87
			Minimum	58,620	51

*Source:* Author's calculations.

*Note:* Development subsidies spent in different years are adjusted to 2000 dollars using the R.S. Means Historic Construction Cost Index (2002).

<sup>a</sup> Development subsidies per unit result from dividing a project's total development subsidies by the number of LIHTC units.

<sup>b</sup> Percentage in total development cost is the percentage of total development subsidies in total development cost, excluding the cost of producing non-LIHTC units.

New York. The high development subsidy in New York includes both federal tax credits and substantial loan subsidies from state and local governments. With one exception, all of the sample projects in New York are heavily subsidized through mortgages provided by the New York State Housing Trust Fund with interest rates as low as 1 percent. In Boston, four projects, all of which are different phases of a development package called Orchard Garden, are jointly funded by the LIHTC and HOPE VI (Housing Opportunities for People Everywhere) programs, which push up the MSA's average development subsidy to over \$120,000 per unit. Netting out these projects, the average development subsidy in Boston falls below \$100,000 per unit.

The variations are also the result of differences in funding utilization efficiency. As noted earlier, some sample projects in San Jose and Atlanta are also funded by state tax credits. Because Georgia's state tax credits were enacted only recently and were available for the first time in 2000, they were sold at a discount to the federal and California credits. For example, the Columbia High Point project in Atlanta was awarded annual federal credits in the amount of \$724,408 and state credits in the same amount. The federal credit was sold at about 74 cents per dollar, while the state credit was sold at only 20 cents per dollar. As a result, the total implicit subsidy through the two types of tax credits exceeds \$100,000 for each Columbia High Point unit. Amazingly, this is 53 percent higher than the total development cost per unit. By contrast, the California credits, enacted as early as 1987, are used much more efficiently, with one tax-credit dollar sold at about 70 to 80 cents.

These variations notwithstanding, subsidies account for an average of 60 to 70 percent of project costs in all MSAs except New York, reflecting the simple fact that large subsidies are required to build affordable housing in all markets, regardless of land and construction costs. Still, higher development costs do elevate subsidy needs. The LIHTC program addresses this somewhat by allocating 30 percent more tax credits in designated difficult-to-develop areas or in qualified census tracts. Even so, this adjustment is not always enough in high-cost areas, where developers must find additional subsidies, thus increasing the complexity and transaction cost in project financing. In Boston, for example, a typical LIHTC project has three or four mortgages in addition to tax-credit equity.

In New York, development subsidies account for an average of 86 percent of project costs, a higher share than in any other case study MSA. Are New York projects so expensive because they are particularly difficult to develop or because they are targeted to extremely low income families? The sample data are too limited to provide a conclusive answer.

### **Comparing the cost effectiveness of the 9 percent LIHTC program and the HCVP**

This section compares the total development subsidy received by the sample LIHTC projects with their alternative 20-year voucher cost. Table 8 presents the mean cost-effectiveness ratios for all six MSAs at the three payment standards. Again, the higher the ratio, the more expensive LIHTC is relative to vouchers. In addition to the mean ratios, table 8 also reports the number of sample projects in each MSA with ratios below 1, to see how many individual projects are more cost-effective than vouchers.

**Table 8.** The 20-Year CE Ratio for 9 Percent New-Construction LIHTC Projects at Three Voucher Payment Standards

Type	MSA	Number of Projects	Number of LIHTC Units	Voucher Payment Standard					
				110 Percent of FMR		100 Percent of FMR		90 Percent of FMR	
				Mean CE Ratio	Projects with Ratio <1	Mean CE Ratio	Projects with Ratio <1	Mean CE Ratio	Projects with Ratio <1
Balanced market	Atlanta	20	2,011	1.42	8	2.33	5	6.49	1
	Cleveland	17	1,002	1.08	4	1.40	1	1.85	0
	Miami	14	1,847	0.88	9	1.12	6	1.57	2
Tight market	Boston	9	463	1.71	2	2.15	1	2.93	1
	New York	8	403	1.40	1	1.75	0	2.36	0
	San Jose	20	1,616	0.77	16	1.02	13	1.66	8

Source: Author's calculations.

CE = cost-effectiveness.

*The cost-effectiveness of the LIHTC program, compared with vouchers, varies by MSA and by payment standard*

Table 8 shows a common pattern across the six MSAs. Regardless of the payment standard, cost-effectiveness ratios for San Jose and Miami are always low. At the opposite extreme, Atlanta and Boston both have high cost-effectiveness ratios. This implies that the LIHTC program is more cost-efficient in San Jose and Miami than it is in Atlanta and Boston.

Within each MSA, the cost-effectiveness of the LIHTC program is sensitive to how the voucher program is administered and especially to how local PHAs set their payment standard. As noted earlier, under the HCVP, local PHAs have the flexibility to set their payment standard anywhere from 90 percent to 110 percent of FMR. The lower the payment standard, the more cost-effective the voucher program in relation to the LIHTC program.

A lower payment standard makes vouchers more cost-effective than the LIHTC because the maximum voucher subsidy that a low-income family can receive is always the difference between the payment standard and a predefined tenant payment—30 percent of monthly family income (HUD 2002). When the payment standard is lowered, the subsidy the same family receives is reduced. But LIHTC development subsidies remain the same. As a result, vouchers become more cost-effective to the government than the LIHTC. This, however, considers only the savings to the government and ignores the consequences to the assisted family. To stay in a voucher unit of comparable quality, the family must increase its rental contribution (which may not exceed 40

percent of income) to compensate for the reduced subsidy. A family choosing not to do so must move into a cheaper unit, which presumably would provide lower-quality housing.

Assuming that local PHAs adopt the lowest payment standard—90 percent of FMR—for a 20-year period, the average cost-effectiveness ratio is greater than 1 in all six MSAs, making the LIHTC less attractive than vouchers. But the regional variation is dramatic: at 90 percent of FMR, LIHTC projects are six times as expensive as vouchers in Atlanta, but only 57 percent more expensive in Miami. The cost-effectiveness of *individual* LIHTC projects also varies widely in each MSA. Even with this lowest payment standard, 2 out of 14 Miami projects and 8 out of 20 San Jose projects cost less than comparable vouchers.

Not all local PHAs adopt the lowest payment standard or keep it for 20 years. HUD requires that local payment standards be set high enough to permit a selection of units in a range of neighborhoods, especially neighborhoods with lower concentrations of poor and minority households (2002). In 2001, HUD raised FMRs in four of the six case study MSAs (Atlanta, Miami, Cleveland, and San Jose) from the 40th to the 50th percentile of rents charged for standard rental housing. While FMRs have not been raised in Boston and New York, both are under pressure to adopt higher payment standards. These PHAs currently set their payment standards as high as 110 percent of the HUD-approved FMR (Boston Housing Authority 2004; New York City Housing Authority 2004). In view of the difficulty of locating qualified units, some Boston PHAs have asked HUD to approve an even higher “success rate” or exception payment standard (Citizens’ Housing and Planning Association 2001).

At the opposite extreme, if local PHAs in San Jose and Miami were to apply the highest payment standard over 20 years, the sample LIHTC projects would on average become more cost-effective than comparable vouchers. With a payment standard of 110 percent of FMR, development subsidies for the sample LIHTC projects are only 77 percent as expensive as vouchers in San Jose and 88 percent as expensive in Miami. In Cleveland, LIHTC projects cost only 8 percent more, indicating a close match between the two programs. The most expensive MSA is Boston, where subsidies for the nine sample projects exceed voucher cost by 71 percent even under this highest payment standard. The premium associated with the LIHTC is about 40 percent in New York and Atlanta. The efficiency of individual projects, however, varies.

Consistently using 110 percent of FMR might also overestimate the alternative voucher subsidy. When setting the payment standard, local PHAs consider many issues. One important factor is local market conditions. When

market inflation is high, PHAs may increase the payment standard to ensure a certain level of affordability. But the standard would not always remain high since each local economy has boom and bust cycles. For example, although it raised its payment standard to 110 percent of FMR during the boom years of the 1990s, the Santa Clara County Housing Authority currently sets payment standards as low as 90 percent of FMR because of reduced demand for housing.

Even if market conditions do not change, local PHAs may also adjust the payment standard in accordance with different policy objectives. In some years, the PHA may be motivated to give more subsidy per household by setting a higher payment standard to increase neighborhood choice for voucher families. In other years, to serve more households, the PHA may want to reduce the subsidy per household by setting a lower payment standard.

A more realistic scenario is to assume that local PHAs set their payment standards at 100 percent of FMR so that the yearly fluctuations might even out.<sup>26</sup> In such a scenario, vouchers are cheaper than the LIHTC in all six MSAs. Still, regional variations persist: The LIHTC is twice as expensive as vouchers in Atlanta and Boston, 75 percent more expensive in New York, and 40 percent more expensive in Cleveland, but the premium drops to only 12 percent in Miami and to as little as 2 percent in San Jose. Why do these variations occur? The next section investigates specific contributing factors, assuming that the payment standard is set at 100 percent of FMR.

*Many factors contribute to regional variations in the cost-effectiveness of housing programs*

*Tight housing markets.* My stated hypothesis is that local market conditions affect the performance of government housing programs; more specifically, I expected that a production program like the LIHTC would show some cost advantages over vouchers in tight housing markets such as San Jose, Boston, and New York, where demand consistently exceeds supply. Assuming that a payment standard equals 100 percent of FMR, the sample LIHTC projects in San Jose cost nearly as much as the alternative 20-year vouchers. In terms of individual projects, 13 of 20 LIHTC projects in San Jose are cheaper than vouchers, versus only 1 of 9 projects in Boston and no projects at all in New York. It is surprising to see that the performance of the LIHTC program differs so much in the three tight markets that one would expect to be similar.

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<sup>26</sup> HUD's records show that the current national average is 104 percent of FMR (GAO 2005).

This observed discrepancy is partly due to regional differences in development cost, as well as different program objectives. As shown in table 5, most of the sample LIHTC projects in Boston and New York are located in the inner city, especially in distressed neighborhoods, to promote community revitalization.<sup>27</sup> This additional goal of community revitalization incurs significantly higher costs, such as demolition and relocation expenses, as well as the costs of constructing community facilities and meeting historic preservation requirements. Even assuming annual rent increases of 5.8 percent in Boston and 5.3 percent in New York, the 20-year voucher cost is still far behind the LIHTC subsidy cost.

By contrast, in a newly developed MSA like San Jose, the LIHTC program is administered to increase the supply of affordable housing. Community redevelopment needs are not as important as they are in Boston or New York, so they have a lower priority in funding allocation. Projects in San Jose also benefit from economies of scale, since they are typically much larger than those in New York and Boston (table 5). By avoiding some of the costs associated with community revitalization, the average development subsidy per LIHTC unit in San Jose is only half of what it is in New York and 70 percent of what it is in Boston.

Second, although San Jose, Boston, and New York are all tight housing markets, they still differ in the severity of their respective housing shortages. FMRs in San Jose are 20 percent higher than they are in Boston and New York, making vouchers comparatively less efficient than the LIHTC in San Jose.

Differences in family income also affect program cost. The AMI of a four-person family was at least \$10,000 lower in New York than it was in Boston throughout the 1990s, despite the fact that market rents in both places were comparable. The large gap between market rent and family income in New York increases voucher costs and reduces the premium for the LIHTC. For two similar LIHTC projects targeted to four-person families with 50 percent of AMI—one in New York and the other in Boston—the annual voucher cost would be \$1,500 more per unit in New York because family incomes are lower. Over 20 years, this difference adds up to \$17,204 per unit. So although New York's LIHTC projects are the most expensive when measured by dollar subsidy costs, they are actually more cost-efficient than Boston's when measured against the alternative voucher subsidy.

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<sup>27</sup> The two state tax-credit allocation agencies, the Massachusetts Department of Housing and Community Development and the New York State DHCR, have stated a strong preference for projects that can promote community revitalization in their Qualified Allocation Plan. But such language did not exist in the plan issued by the California Tax Credit Allocation Committee.

*Balanced housing markets.* The other side of my stated hypothesis predicts that it would be more cost efficient to use vouchers instead of production programs in balanced housing markets because they can provide adequate existing housing for voucher families. This is generally true in the three balanced markets considered in this study. The sample LIHTC projects are, on average, more than twice as expensive as vouchers in Atlanta, but the cost difference is only 40 percent and 12 percent in Cleveland and Miami, respectively, assuming a payment standard of 100 percent of FMR.

Some of the regional differences can also be attributed to program administration, particularly in Miami and Cleveland. Again, as shown in table 5, LIHTC projects in Miami are typically large and are located on suburban greenfield sites. Cleveland, by contrast, favors smaller, infill projects targeted toward neighborhood revitalization.<sup>28</sup> Accordingly, the average construction subsidies for LIHTC projects are 20 percent lower in Miami than in Cleveland.

How can we explain the striking difference between Miami and Atlanta? Many LIHTC projects in Atlanta are also large-scale new construction on suburban greenfield sites, but they are much more costly than their voucher alternatives. Again, the unique local economic and housing environment within which these programs operate makes the difference.

Although the overall housing market in Miami is viewed as balanced, this MSA does have significant affordability problems, particularly among renter households (Shimberg Center for Affordable Housing 2002). A cross-regional comparison of median gross rent as a percentage of family income reveals that renters in Miami paid about 30 percent of their income for rent in both 1990 and 2000. The comparable shares in all other MSAs were 25 to 27 percent. Miami's high rent burden was the result of both an inflated rental market and a poor economy. The supply of rental housing in Miami lagged behind its rapid population growth during the 1990s. In addition, many units were destroyed by a hurricane in 1991.

These factors combined to push FMRs up to a very high level. In 1995, the monthly FMR for a two-bedroom unit in Miami was \$742, versus \$501 for a similar unit in Cleveland, and \$588 in Atlanta. Despite the higher rents, family income in Miami has long lagged behind Cleveland or Atlanta. In 1995, the HAMFI for a four-person family was only \$35,700 in Miami, versus \$42,900 in Cleveland, and \$48,700 in Atlanta. With its tight rental market, poor local economy, and chronically high rent burdens, Miami has voucher costs that are much higher than Atlanta's or Cleveland's.

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<sup>28</sup> Compared with projects in other MSAs, projects in Cleveland were more likely to be developed on abandoned sites in inner-city neighborhoods, with land costing as little as \$1.

The difference in voucher cost between Miami and the other two MSAs abated somewhat in the late 1990s. Increased housing construction in Miami helped moderate future rent growth. More important, rents in both Cleveland and Atlanta began climbing because of substantial job growth. This was particularly true for Atlanta, where the housing market boomed after the 1996 Olympic Games. These changes have been incorporated into the study through the different projected rental inflation rates: 4.2 percent in Cleveland, 4.7 percent in Atlanta, and 2.5 percent in Miami. Despite a lower long-term growth rate, the estimated 20-year voucher costs exceed the development subsidies for Miami's six LIHTC projects.

Although the voucher program was expected to be more cost-effective than the LIHTC program in a balanced housing market like Atlanta, the magnitude of the premium associated with the program is surprising. The sample LIHTC projects in Atlanta are twice as expensive as vouchers when the payment standard is set at 100 percent of FMR and six times more costly when 90 percent is used.

This, however, is also a result of program choices and local market conditions. LIHTC projects in Atlanta tend to target families with the highest eligible incomes (50 or 60 percent of AMI). Given Atlanta's loose housing market, the minimum rent contributions these families make—30 percent of their income—are often higher than FMR. If payment standards were set at 100 percent of FMR (or at 90 percent), these families would not be eligible for a voucher since they could easily afford modest housing in the private market. Even so, the construction subsidies spent to build brand-new units for these families are still high. If a sample LIHTC project had *some* of its units targeted toward this “no-need-to-subsidize” population, the alternative voucher subsidy for these units would be zero, and the cost-effectiveness ratio would be extremely high. This is exactly the case in Atlanta, where the average cost-effectiveness ratio is elevated by the existence of such projects.<sup>29</sup> It highlights the difference in the clients being served by the two programs.

As the only other case study MSA where FMR is easily affordable to families with 50 percent of AMI, Cleveland has a soft housing market like Atlanta's. Unlike Atlanta, however, most of Cleveland's LIHTC projects are targeted toward very low income families instead of moderate-income families. Because

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<sup>29</sup> If all of a project's units were targeted toward this “no-need-to-subsidize” population, the cost-effectiveness ratio would be infinite because the denominator, the total voucher subsidy for all the units, would be zero. Such cases occur only when the payment standard is set at 90 percent of FMR in Atlanta and Cleveland, and they were excluded from the calculation of the mean cost-effectiveness ratio. There are two such projects in Atlanta and one in Cleveland.

these families also require large voucher subsidies, the sample LIHTC projects in Cleveland are only 40 percent more expensive than their voucher alternatives if the payment standard is set at 100 percent. Ironically, by targeting very low income families, Cleveland's LIHTC becomes relatively more cost-effective than Atlanta's.

Thus, although the pattern observed in this study differs from what was expected, local market conditions do affect the performance of government housing programs. Market tightness is a key factor local PHAs should consider in setting payment standards and their growth rate. That the LIHTC is as cost-efficient as vouchers in San Jose is also a direct consequence of the area's high rents and rapid rent inflation. Even in markets that seem affordable overall, there may be housing shortages in particular segments. The low premium associated with Miami's LIHTC program, which disappears if 110 percent of FMR is adopted as the payment standard, demonstrates the possible cost saving to the government when the production program is used in a tight low-income submarket. Given the affordability of existing housing in Atlanta and Cleveland's soft housing markets, however, LIHTC-subsidized new construction is quite costly.

Different local policy directions also contribute to regional variations in program outcomes. There is little question that a higher payment standard reduces the cost advantage of vouchers. The LIHTC also becomes relatively more expensive when it is used to support community revitalization projects, as in New York, Cleveland, and Boston. Despite their higher costs, these projects have the potential to bring about positive and dramatic neighborhood changes that could not be achieved by vouchers alone. The extent of the external neighborhood benefits (or costs) generated by these LIHTC new production projects is beyond the scope of this study.

### **Evaluating the cost-effectiveness of the 4 percent LIHTC program and the HCVP**

Table 9 presents the mean cost-effectiveness ratios for the 4 percent LIHTC projects at three payment standards. All of the samples are also new-construction projects placed into service after 1995. Because of data limitations, only Miami and San Jose are considered. As with the 9 percent analysis, the higher the payment standard, the more costly the voucher program.

Controlling for payment standards, the average cost-effectiveness ratios of the 4 percent projects are always much lower than those of the 9 percent projects in Miami and San Jose. A lower cost-effectiveness ratio indicates a more cost efficient LIHTC. With a payment standard of 100 percent, most of

**Table 9.** The 20-Year CE Ratio for 4 Percent New-Construction LIHTC Projects at Three Voucher Payment Standards

MSA	Number of Projects	Number of LIHTC Units	Voucher Payment Standard					
			110 Percent of FMR		100 Percent of FMR		90 Percent of FMR	
			Mean CE Ratio	Projects with Ratio <1	Mean CE Ratio	Projects with Ratio <1	Mean CE Ratio	Projects with Ratio <1
Miami	12	2,669	0.61	12	0.82	9	1.26	3
San Jose	13	1,600	0.50	13	0.75	11	1.03	5

*Source:* Author's calculations.  
CE = cost-effectiveness.

the 4 percent projects become more cost-effective than the voucher alternatives in the two MSAs. Even with the lowest payment standard, the 4 percent LIHTC is only 26 percent more expensive than vouchers in Miami and almost as cheap as vouchers in San Jose.

It is not clear why the cost efficiency of the 4 percent LIHTC projects is so much higher than the 9 percent projects in Miami and San Jose. But it is worth recalling from the previous analysis that Miami and San Jose are the two markets whose 9 percent LIHTC program is also more likely to be cost efficient than the four other MSAs. Compared with 9 percent projects, 4 percent projects use less equity and more debt financing. All of the sample 4 percent projects in this study were funded by multifamily mortgage bonds that were issued by state and local housing finance agencies and account for over half of the development cost. Equity raised by selling the 4 percent tax credits covers less than 30 percent of the development cost. The sample 4 percent projects also have simpler financial structures than the 9 percent projects.

Might government-backed bond financing be a more cost-effective way of raising capital than tax-credit equity financing? This study cannot answer that question. However, there are some other differences between 4 percent and 9 percent projects that might account for the observed cost efficiency. Because of the strict requirements on their debt servicing capacity, 4 percent projects are often targeted toward families with the highest eligible income (60 percent of AMI). They tend to avoid the high-cost and difficult-to-develop projects for which 9 percent credits are so widely used. Finally, nearly all of the 4 percent projects in the sample are much larger developments, with an average size of 174 units in San Jose and 230 units in Miami. It is interesting to note that the capital market also seems aware of the efficiency associated with the 4 percent

LIHTC, since it has been willing to pay a higher syndication rate to the 4 percent tax credits than to the 9 percent tax credits for the sample projects.

### **Conclusion and policy implications**

This study compares the development subsidies directed to recent new-construction LIHTC projects with 20-year voucher cost in six U.S. metropolitan areas. The voucher cost is calculated as the alternative government cost if the same low-income tenants were subsidized through vouchers, instead of the LIHTC program, to live in units of comparable quality. The basic range in setting the payment standard, 90 to 110 percent of FMR, is applied to indicate normal variations in voucher costs.

What can be learned from this study? First, in most of the scenarios examined, vouchers are indeed cheaper than the LIHTC, even in the three tight housing markets. This finding justifies using vouchers across most of the nation.

Behind this general pattern, the premium for the LIHTC varies widely by MSA. Assuming a payment standard of 100 percent of FMR, the LIHTC is only 2 percent more expensive in San Jose, but more than twice as expensive in Atlanta, providing support for the argument that local market conditions affect the cost of government housing programs. A regional housing shortage in San Jose has led to significant rent inflation and increased voucher costs. By contrast, the availability of modest, affordable housing in the Atlanta market serves to make vouchers much more attractive than LIHTC construction.

Policy makers, however, need to be careful about which market conditions to analyze when designing local housing strategy. In Miami, the cost difference between the LIHTC and vouchers is surprisingly small or even disappears, depending on the payment standard, suggesting that vouchers can be expensive in markets that do not appear especially tight. It is the shortage of low-income housing that drives up the cost. Thus, in addition to understanding the entire housing market, what matters to housing policy makers is supply and demand in the low-income housing submarket where programs are applied (McClure 2005).

Since state and local governments now have the flexibility to administer federal housing programs in ways that better address the housing needs in their jurisdictions, they should also be fully aware of how their choices might affect program cost. As this study indicates, the premium of the LIHTC over vouchers is very sensitive to payment standards. A higher standard reduces the cost advantage for vouchers. In Miami and San Jose, when 110 percent of FMR is used as the payment standard, vouchers are no longer the cheaper alternative.

However, the LIHTC remains far more expensive than vouchers in Boston and New York partly because state governments have chosen to layer other objectives, such as community revitalization, on top of the LIHTC program.

This study is not intended to discourage local PHAs from raising payment standards or state tax-credit allocation agencies from promoting community revitalization. Higher payment standards can be justified on the grounds that they expand families' neighborhood choices and improve access to employment and education. Also, the dramatic neighborhood improvements generated by LIHTC developments are invaluable to local residents and communities. Nevertheless, these additional policy objectives must be weighed against their increased costs, since they may make the current program far more costly than alternative approaches.

State and local housing agencies should also explore options to improve the cost efficiency of housing programs (DiPasquale, Fricke, and Garcia-Diez 2003). As revealed by this analysis, the cost-effectiveness of individual LIHTC projects compared with vouchers varies widely in the same market. Why was this so? Were some projects more cost-effective because they targeted extremely low-income families or large families that would require significant voucher subsidies to successfully rent qualified units in the private market? Were there excessive costs in the development process that could be contained?

Finally, further research is needed to determine why the 4 percent LIHTC is more cost efficient than the 9 percent LIHTC under similar circumstances. Addressing these issues would improve the targeting efficiency of state and local housing agencies and better distribute limited federal housing resources.

### *Appendix*

Here is an example of how to calculate the alternative 20-year voucher cost for a sample LIHTC project.

A 9 percent LIHTC project in Miami is placed in service in 2000: It has 20 two-bedroom units reserved for families with 30 percent of AMI and 30 three-bedroom units reserved for families with 50 percent of AMI. The monthly rents for these units, calculated as 30 percent of targeted family income, are \$301 for two-bedroom units and \$580 for three-bedroom units.<sup>30</sup> Table A.1 lists the LIHTC rents and comparable FMR for such units in 2000.

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<sup>30</sup> As required by the LIHTC program, rents cannot exceed 30 percent of imputed income based on 1.5 persons per bedroom (regardless of the actual family size). Given this example, the family size is 3 persons for a two-bedroom unit and 4.5 persons for a three-bedroom unit. In 2000, the HAMFI was \$40,100 for a 3-person family and \$46,400 for a 4.5-person family. Since

**Table A.1.** Family Income and Rent Information for a Sample LIHTC Project

Unit Type	Number of Units	Targeted Family Income (Percentage of AMI)	Monthly FMR (\$)	Monthly LIHTC Rent (\$)
Type A: two-bedroom unit	20	30	712	301
Type B: three-bedroom unit	30	50	977	580

*Source:* Author's calculations.

The 20-year voucher cost can be estimated from this information, assuming that the same LIHTC tenants received vouchers to live in market-rate units that were the same as the LIHTC units. The calculation posits that the local PHA sets the voucher payment standard exactly at FMR.

Assuming that the payment standard equals the FMR, the monthly voucher subsidy is

$$\text{Type A Units: } v_a = 712 - 301 = 411 \tag{1}$$

$$\text{Type B Units: } v_b = 977 - 580 = 397 \tag{2}$$

The first-year voucher subsidy ( $V_0$ ) for all units in this project is

$$V_0 = (v_a * 20 + v_b * 30) * 12 = (411 * 20 + 397 * 30) * 12 = 241,560 \tag{3}$$

With Miami's 2.5 percent annual voucher growth rate and 6 percent government discount rate, the present value of the 20-year voucher subsidy ( $V_{20}$ ) for this project is calculated as follows:

$$V_{20} = \sum_{i=1}^{20} \frac{V_0 * 1.025^{i-1}}{1.06^i} = 3,375,433 \tag{4}$$

The monthly administrative fee for the voucher program in Miami in 2000 was \$61 per unit; thus, the first-year administrative fee for all the units is

$$F_0 = 61 * 50 * 12 = 36,600 \tag{5}$$

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the two-bedroom units target families with 30 percent of HAMFI and the three-bedroom units target families with 50 percent of HAMFI, the gross rents being charged are \$301 for two-bedroom units and \$580 for three-bedroom units.

Assuming a 3 percent inflation rate for the administrative fee and a 6 percent discount rate, the present value of the 20-year fee ( $F_{20}$ ) is

$$F_{20} = \sum_{i=1}^{20} \frac{F_0 * 1.03^{i-1}}{1.06^i} = 532,952 \quad (6)$$

Adding the voucher subsidy and the administrative fee together yields the comparable 20-year voucher subsidy ( $CV_{20}$ ) for this project. This subsidy is the government cost of the voucher program when the payment standard is set at FMR:

$$\begin{aligned} CV_{20} &= \text{tenant subsidy} + \text{administrative fee} \\ &= 3,375,433 + 532,952 = 3,908,385 \end{aligned} \quad (7)$$

Similarly, one can calculate the total 20-year voucher subsidy when local PHAs set the payment standard at 90 percent or 110 percent of FMR. The resulting  $CV_{20}$  varies from a low of \$3,178,131 to a high of \$4,638,639.

### *Author*

Lan Deng is an Assistant Professor in the Program of Urban and Regional Planning at the A. Alfred Taubman College of Architecture and Urban Planning at the University of Michigan–Ann Arbor.

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