Present Realities, Future Prospects: Chicago's Low Income Housing Tax Credit Portfolio

Research Analysis 2002

Chicago Rehab Network

PRESENT REALITIES, FUTURE PROSPECTS: CHICAGO'S LOW INCOME TAX CREDIT PORTFOLIO

Chicago Rehab Network and the Chicago Housing Partnership, an association of housing stakeholders involved with the development and preservation of the LIHTC portfolio, commissioned this analysis of 1998 LIHTC project audits. The study compiles information on operating expenses, incomes, cash flows, and reserves, and looks closely at trends that determine overall project performance. The findings will be released in three documents—a database manual, a research analysis, and a summary report.

Chicago Rehab Network thanks the Chicago Housing Partnership (CHP) for its generous support of the database manual and the research analysis. The third document, a summary report, is an essential companion to the longer treatments and is solely the work of CRN.

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Chicago Housing Partnership

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Bank of America
Brinshore Development
Chicago Department of Housing
Chicago Equity Fund
Chicago Housing Authority
Community Investment Corporation
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Federal Home Loan Bank
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Chicago Community Loan Fund

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I. Introduction

A sound affordable housing stock is one of the city's most important investments: it is the base from which families and individuals hold jobs, attend school, raise families and realize their full potential as members of their communities and the city at large. The most significant tool we currently have for creating new affordable housing is the Low Income Housing Tax Credit (LIHTC). Roughly 16,000 units of affordable housing in Chicago depend on it.

In 2002, affordability agreements will begin to expire on the first of Chicago's LIHTC projects. Recent studies show tight regional rental market with a 4.2% vacancy rate, a deficit of over 182,000 affordable units for low-income families, and thousands of Section 8 units at risk of conversion to market rate housing. In this context, it is essential that we make preparations to preserve the LIHTC stock. The study data should serve as a guide for preserving existing properties and sustaining new ones.

The Chicago Rehab Network and the Chicago Housing Partnership, an association of housing stakeholders involved with the development and preservation of the LIHTC portfolio, commissioned this analysis of 1998 LIHTC project audits. The study compiles information on operating expenses, incomes, cash flows, and reserves, and looks closely at trends that determine overall project performance. The findings will be released in three documents—a database manual, a research analysis, and a summary report. This document contains the research analysis, which considers the financial condition of LIHTC housing developments in Chicago and begins to identify factors that make LIHTC projects sustainable.

A. LIHTC Projects in Chicago

Congress created the federal Low Income Housing Tax Credit program as part of the Tax Reform Act of 1986 as a method to encourage private investment in new affordable housing development. Tax credits are awarded to developers who then sell them to raise equity for a housing development project. The equity raised by tax credits themselves typically covers only about 30 to 40 percent of project costs—the rest is pasted together from layers of debt and public subsidy. The program is complex and, in the early years, each dollar of tax credit spending raised as little as 50 cents on the dollar for housing development. But as developers and investors gained confidence in the program, the credits have grown more efficient—they currently draw more than 75 cents on the dollar—and the federal government has raised its tax-dollar commitment to the program several times.

Today, that commitment represents a $4 billion annual investment, and leverages the creation of about 62,000 units of affordable housing every year.[1] With the steady extinction of other federal housing programs, the Low Income Housing Tax Credit has become the most important federal program there is for creating new affordable housing. Yet very little is understood about the performance of Chicago's existing tax credit housing stock, or the factors that impact it.

Information about existing tax credit units is scattered among developers, investors and the state and city housing agencies. The limitations this poses for understanding the viability of the city's LIHTC housing stock first became apparent in the mid-1990s, when the failures of several large LIHTC portfolios took Chicago by surprise. No one was sure what caused projects to

[1] Kathrine Collignon, *Expiring Affordability of Low-Income Housing Tax Credit Properties: The Next Era of Preservation* (Neighborhood Reinvestment Corporation/Joint Center for Housing Studies, Oct. 1999).

succeed or fail: some investors blamed bad management; many developers believed they had been set up to fail by unrealistic underwriting. Developer concerns were seconded by the National Council of State Housing Authority's Housing Credit Task Force, which identified inaccurate operating expense and vacancy rate projections at underwriting as a significant cause of project distress. But all parties lacked comprehensive information that would allow them to find answers.

This study represents the first attempt by members of Chicago's affordable housing community to pool information about individual LIHTC portfolios. The Chicago Rehab Network and the Chicago Housing Partners have collected information about real operating costs of existing projects, supplemented by information about income and vacancies, cash flow and reserves.

Ideally such a pool of information can prove an invaluable reference tool—one that developers and funders can use to guide them as they underwrite new projects, and that property managers can refer to as they monitor the performance of existing ones.

However, having assembled the first comprehensive database and analysis of the LIHTC in Chicago, it is important to clarify that *Present Realities, Future Prospects* is a snapshot of how things currently are, not necessarily how they ought to be. While the data may serve as a useful reference for practitioners, the numbers cannot be viewed as a guide to best practices.

For instance, the study reveals average LIHTC operating costs to be $351 per unit per month (not including debt service) for family projects—a figure that is lower than the figure typically used in underwriting new projects. It is $75 lower than comparable averages compiled by the Family Housing Fund in Minneapolis/St. Paul for the same year.[2]

Our $351 figure is more likely to reflect budgets squeezed to fit within yesterday's optimistic projections than an ideal per unit figure. In fact, 56% of the units in the sample are operating at a deficit, and an analysis of the close connections between costs, incomes and reserve accounts suggests that false projections can set whole budgets off track: Underestimating operating costs can lead to deferred maintenance and low reserves, which will eventually contribute to high vacancies and make it difficult to realize project rent increases, which will only make it more difficult to meet operating costs in the future.

B. Policy Framework and Assumptions

The Chicago Rehab Network and the Chicago Housing Partners undertook this study at a time when the nation faces an affordable housing crisis. While the LIHTC Program has had a recent increase in allocation levels, the overall federal commitment to affordable housing has decreased significantly in the past two decades. At the same time, the cost of housing over the last decade has increased nation-wide at a rate significantly greater than either the rate of inflation or the rate of wage growth. In Chicago, the housing situation is further complicated by the shrinkage of its public housing stock and the loss of older government-assisted housing (such as project-based Section 8) as the use restrictions of these projects expire and developers convert them to private market uses. All of these factors have placed an added burden on the LIHTC program to meet the nation's growing affordable housing shortage in ways unforeseen when the program was created.

[2] Family Housing Fund, *Twin Cities Low-Income Housing Analysis*, 1998.

The context of the growing affordability gap helps define the overarching principles that guide this study. These principles are supported by recent documents released by the Chicago Department of Housing and by the National Council of State Housing Authorities.[3]

The first principle is grounded in the assumption that the value of a multi-billion dollar public investment in housing lies in its ability to meet needs the market cannot. Our goal in using the LIHTC should not be simply to create sustainable housing, but to create sustainable housing that expands housing choice and meets the needs of low and very low income Chicago residents.

Second, the conclusions of this study do not indicate what kind of housing ought to be built, but how to build it better. Because low income housing tax credit projects meet needs the market does not, projects are not always built under optimal operating conditions. While particular community conditions, physical characteristics, or local clientele may well have an impact on the operating efficiency of properties, it does not follow that LIHTC projects should be limited to those areas, physical arrangements, or populations that maximize these efficiencies.

Third, we must anticipate the fact that the first round of the 15 year affordability agreements for LIHTC projects will begin expiring this year – presenting an opportunity for limited partners to exit their obligations, and forcing us to implement preservation strategies. Many of these expiring projects will require substantial resources to stabilize and correct for mistakes made under old underwriting criteria.

Finally, as we create new projects and preserve old ones, funders and developers should actively evaluate the underwriting needs of LIHTC projects by studying factors that make LIHTC projects more or less vulnerable to financial distress. This analysis is a starting point for that process.

C. Nature of the Data

Total Properties in the Data Set

Our data set includes 8,704 units of housing in 123 LIHTC projects located in Chicago. Based on information acquired from the Illinois Housing Development Authority (IHDA) and the City of Chicago Department of Housing (DOH) regarding projects that have received approval for LIHTC funding, we estimate that there is a total of about 15,664 units in 233 LIHTC projects in the City of Chicago.[4] Our data set therefore contains a large percentage of the city's tax credit projects.

Sources of Data

The financial data for this report was derived from reviewed or audited FY 1998 financial statements, which include detailed information regarding revenues and operating expenses for individual LIHTC properties. In most cases, the Chicago Equity Fund (CEF), the National Equity Fund (NEF), the Illinois Housing Development Authority (IHDA) or the Chicago Department of

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[3] City of Chicago Department of Housing, *Housing Opportunities in the Next Century, Affordable Housing Plan, 1999-2003* (1998) and *Chicago's Housing Strategy: Our Shared Challenge* (May 1999). NCSHA, "Consistency Among State Housing Credit Allocating Agencies: Recommended Practices in Compliance Monitorying, Capital Needs Assessment, Operating Cost Database, and Accountant Opinion Letters," (1998).

[4] Since our analysis is based on 1998 audits we are only counting LIHTC projects that were placed in service before 1998.

Housing (DOH) supplied us with this financial data upon receipt of a waiver from the general partner. In cases of missing audits or financial statements, arrangements were made with the general partners of the properties in question to collect the needed information. To ensure that the data set contained only fully operational projects, we have included only projects that were fully rented by December 31, 1997 and therefore had a full year of operations prior to the FY 1998 audits. In addition, information on specific project characteristics was obtained by sending a data collection form to the developers and/or managers of each property in the database. This often required intensive follow-up to ensure the most complete response rate possible.

It should also be noted that the study in its present form is limited to a cross-sectional comparison of LIHTC properties at one point in time. Because operating revenues and expenses may vary from one year to the next, a longitudinal or trend analysis over several years would give a more realistic and accurate picture of the state of tax credit properties. We envision pursuing such an analysis as part of an ongoing study, with the present report serving as the foundation to a more detailed and extensive understanding of LIHTC projects in subsequent years.

Classification of Data

One of the difficulties we faced in our analysis was to standardize the manner in which project-operating expenses are classified. Appendix B summarizes the costs attributed to each expense category. It also explains the rationale for our particular classification of expense items. In particular, it should be noted that security and marketing and leasing have been added as major categories given their increased importance in the management and operation of low-income housing properties. In addition, we believe bad debt is best considered independently in a discussion of operating revenues rather than expenses, although it is regularly categorized as an administrative expense in the financial audits.[5] Appendix D contains a further definition and description of terms as they are employed throughout this study.

D. Research Questions

The analysis has been guided by the following questions, which are central to understanding the performance and future needs of LIHTC projects:

- What is the overall financial condition of Chicago's LIHTC projects?
- What factors are significant "predictors" of a project's financial health?
- How do assumptions made at underwriting impact project viability? In particular,
    - What is the significance of debt service for overall project well being?
    - How essential are rent subsidies to the affordability and success of tax credit properties?
    - What is the relationship between reserves and project health?
- What impact does project management and ownership have on project income and/or operating expenses?
- What effect do neighborhood characteristics, such as poverty, property values and unemployment, have on project income and operating expenses?
- What is the effect of building characteristics, such as age, size, and physical configuration, on project performance?
- What is the overall condition of expiring LIHTC projects, and what preservation strategies best meet their needs?

[5] While we have excluded bad debt expenses, we have included under administration any tax or insurance expense other than property taxes and insurance, including payroll taxes, health insurance, workman's compensation, and miscellaneous taxes and insurance.

Each of these questions entails a different method of analysis ranging from data listings, tabulations, and descriptive and comparative statistics to more complex statistical analysis. In all cases, a statistical program called SPSS has been used for data analysis. We further discuss issues of research methodology in appendix C to this report.

E. Overview of the Research Data Set

Table 1 compares some basic characteristics of the projects in our data set with the inventory of LIHTC projects developed by Abt Associates, a firm funded by the U.S. Department of Housing and Urban Development (HUD) to collect data on LIHTC projects placed in service nation-wide between 1995 and 1998.[6] Overall, the average project size for our data set is comparable to that of Abt's national sample of LIHTC projects. The average size of projects in our data set is 71 units, with properties ranging in size from 10 to 350 units. The average project size varies by project type, with SROs containing an average of 111 units, compared to average project sizes of 82 for senior and 65 for family projects in our data set. The relatively small number of senior projects in our data set prevents us from making generalizations about this segment of the LIHTC housing population, however. Our data set also suggests a trend towards larger projects in recent years, with the average project size among projects placed in service before 1990 and after 1995 increasing from 58 to 87 units. While this is due it part to the fact that SRO's are over-represented among newer LIHTC projects, this trend persists even when we factor out SRO projects and look only at family and senior properties.

Table 1. Project Characteristics Comparing CRN Research Data Set with Abt Inventory

	CRN Research (Chicago, 1998)		Abt (1995-98)
	Total	*Non-SRO*	*(Central City)*
Average Project Size (Units)	71	66	74
Average Number of Bedrooms	1.4	1.6	2.0
Distribution of Units by Size			
SRO	12.4%		NA
0 Bedrooms/Efficiency	16.7%		7%
1 Bedroom	21.1%		28%
2 Bedrooms	30.6%		42%
3 Bedrooms	16.0%		20%
4+ Bedrooms	3.2%		3%
Construction Type			
New Construction	14%	9.4%	47%
Rehab	86%	90.6%	50%
Both	NA	NA	3%

[6] Abt Associates Inc., *Updating the Low Income Housing Tax Credit (LIHTC) Database Final* Report (1999), p. 27. Although the Abt inventory contains data on LIHTC projects in both metro and non-metro areas, our particular focus (for obvious reasons) is on properties located in the central city.

As table 1 also indicates, the average unit size in our data set is smaller than that of projects in the Abt inventory. This is due to the fact that our data set contains a larger percentage of SRO and efficiency units. When SRO projects are factored out, the average unit size in our data set is 1.6 compared to 2.0 in the Abt inventory. About 16 percent of the projects and 23 percent of the units in our data set are intended for special needs populations and the elderly. Clearly, however, the largest percentage of projects (84 percent) serve families, with 50 percent of the units having two or more bedrooms.

A large percentage of the projects in our data set consist of rehabbed units (86 percent), most of them placed in service after 1990 (76 percent) and containing over 40 units (65 percent). Over half (54.5 percent) of the LIHTC projects are only one building, and over three-fourths (78 percent) are made up of three buildings or less.

II. General Overview of LIHTC Performance

This section contains detailed information on the performance of Chicago's LIHTC projects as indicated by our data. Specifically, we consider four overall questions:

- What are the characteristics of the neighborhoods in which housing opportunities are being provided?
- What are the average revenues, expenses, and debt service burdens for family, senior, and SRO projects?
- How financially healthy is Chicago's stock of tax credit projects?
- What are the significant "predictors" of project sustainability?

A. Characteristics of Communities With LIHTC Projects

Map 1 shows the distribution of tax credit properties in different sections of the City. Of the projects in our data set, 25.2 percent are located in the north, 33.3 percent are located in the west, and 41 percent are located in the south. This suggests that LIHTC projects are widely distributed throughout the City. By looking at the racial and income characteristics of the communities where the LIHTC projects in our data set are located, we can get a further sense of the nature of the local markets where the program is providing housing opportunities.

Race

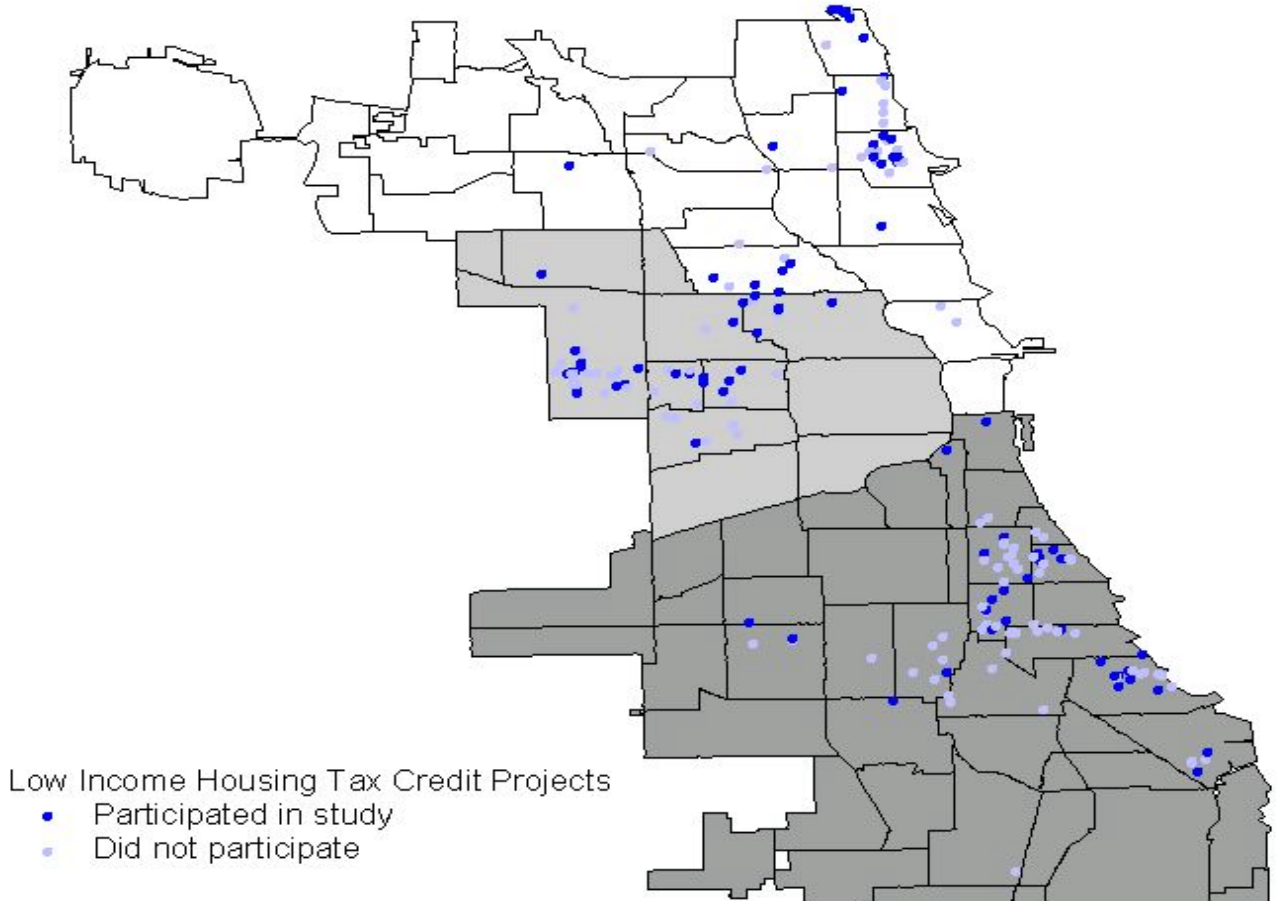
Based on 1998 population estimates,[7] neighborhoods that house the LIHTC projects in our data set are 30 percent white, 66.5 percent black, and 17.4 percent Hispanic. Half of the neighborhoods (51 percent) with LIHTC projects are at least 90 percent nonwhite, and 57 percent are at least 80 percent nonwhite. Only 6.5 percent of the projects in our data set are located in neighborhoods in which whites make up over 90 percent of the population. This pattern of racial concentration is similar to that of other cities with tax credit projects.[8] However, it is also worth noting that about one third (35 percent) of our LIHTC projects are in neighborhoods that can be characterized as racially mixed or integrated.[9]

[7] Applied Real Estate (AREA), Inc.; City of Chicago Department of Planning and Development.

[8] Cf. Jean L. Cummings and Denise DiPasquale, "The Low-Income House Tax Credit: An Analysis of the First Ten Years," *Housing Policy Debate* (1998), p. 268.

[9] Following Cummings and DiPasquale a racially integrated neighborhood is defined as one that has a population that is between 10 percent and 50 percent black. Using this criterion they found that 30 percent of LIHTC projects are in racially integrated communities. Ibid., p. 268.

Map 1. Location of Chicago's Low Income Housing Tax Credit Properties



Income

Following Cummings' and DiPasquale's national study of LIHTC projects, we identified the percentage of projects that are located in neighborhoods with median incomes as a percentage of 1990 HUD-adjusted Section 8 median family (HAMFI) limits. These are the income limits used for Section 8 and related programs.[10] As table 2 shows, 19.8 percent of the projects for which we have information are located in neighborhoods with median incomes at or below 40 percent of the 1990 median income of $36,302 for Chicago's Primary Metropolitan Statistical Area (PMSA).[11] Another 39.7 percent of the projects are in communities with median incomes between 40 and 60 percent of area median income, and 38 percent are located in communities with median incomes in the 60 to 80 percent of AMI income category. Only 2.5 percent of our projects are located in higher income neighborhoods with 1990 median incomes that are at or above 80 percent of the median income for the Chicago metropolitan region. This distribution of tax credit projects by neighborhood income group is similar to the distribution of tax credit projects in other cities as described by Cummings and DiPasquale. For the most part, our data is consistent with their conclusion that LIHTC most projects are concentrated in low-and-moderate income neighborhoods.[12]

Table 2. Distribution of Projects by Neighborhood Income Categories

	1990 Community Median Household Income/HUD Section 8 Limits			
	<40%	40 to 60%	60 to 80%	80 to 100%
Percent	19.8%	39.7%	38%	2.5%
Number	(24)	(48)	(46)	(3)

Sources: 1990 Census; HUD.

However, as an important qualification to the above observation, a large percentage of these neighborhoods have undergone significant demographic, physical, and economic changes over the past decade. About 41 percent of the tax credit projects for which we have information are located in communities that are either fully gentrified or have experienced varying levels of economic "revitalization" in recent years.[13] Although many of the newly revitalizing communities still have substantial pockets of unemployment and poverty, some have seen significant increases in income levels since 1990. Among communities represented in our data set that were considered "moderate-income" based on the 1990 census, there are three neighborhoods (Uptown, West Town, and Kenwood) that experienced an estimated increase in average income of 11 to 30 percent in real dollars, and one (Edgewater) that saw an estimated increase in average real income of over 30 percent between 1990 and 1998.[14] The 2000

[10] Ibid., p. 269.

[11] This represents communities with median incomes below $14,521 in 1990 dollars. More recent census data was not available at the community level at the time of this report.

[12] Low-and-moderate income neighborhoods are defined as those with median household incomes below 80 percent of the household median income of Chicago's primary metropolitan statistical area (PMSA), which in 1990 was $29,042.

[13] Cf. Metropolitan Planning Council and University of Illinois, Chicago, *For Rent: Housing Options in the Chicago Region: A Regional Rental Market Analysis Summary Report,* (Chicago, 1999). Following this report we identify the following as "revitalizing" or partially revitalizing neighborhoods: Edgewater, Uptown, Rogers Park, West Town, Humboldt Park, Logan Square, the Near North Side, Near West Side, Near South Side, Kenwood, Grand Boulevard, and Lower West Side.. (p. 44). Fully "gentrified" neighborhoods include the following: Lincoln Square, Lakeview, Lincoln Park, Hyde Park, and the Loop.

[14] These percentages are based on Claritus estimates of 1998 average income among Chicago's 77 communities.

census figures will undoubtedly reveal that most, if not all of these communities, no longer qualify as moderate-income neighborhoods.[15]

B. Project Type and LIHTC Revenues, Expenses, and Debt Service

In this section we give a breakdown of revenues, expenses and debt service among LIHTC properties in our data set based on differences in project type: family, senior, and SRO. Senior housing is marketed and limited to elderly renters, usually with restrictions on age and household size. SRO housing is a special purpose housing for single adults that typically has studio apartments with small square-footage and links various social service programming to residency in the project. Family housing comprises the remainder of the housing stock. The averages presented here are based on audited financial statements for 1998 and provide a "base line" of current revenue and operating expenses for evaluating the significance of other findings in this study.

LIHTC Revenues and Project Type

Table 3 gives the breakdown of average monthly revenues by project type. It shows that family LIHTC projects in our dataset had an average monthly *gross residential billable rent*[16] of $556.14/unit in FY 1998, which was affordable to households earning approximately $22,245. The average monthly *billable rent* for SRO units of $362.27 per unit in FY 1998 was affordable to individuals earning about $14,490. The audits did not provide sufficient information for us to determine the average billable rents for senior LIHTC projects in our data set.

Table 3. Average Monthly Revenues per Unit of LIHTC Projects, 1998[17]

	Family (103)	Senior (7)	SRO (13)
Gross Potential Rent	$419.73	NA	$326.22
Potental Rent Subsidy	$136.33	NA	$36.05
Billable Rent	$556.14	NA	$362.27
Vacancy	($63.78)	NA	($14.55)
Residential Rent Collected	$491.46	$464.07	$347.71
Other Income	$23.66	$25.45	$35.57
Total Income	$515.12	$489.52	$383.28
Bad Debt	($25.21)	($.13)	($4.05)
Effective Gross Income	**$491.78**	**$489.39**	**$379.24**

Losses from residential vacancy and bad debt among family projects in 1998 were 11.5 percent and 4.5 percent of *billable rent* respectively. The average monthly residential rent collected was $491.46 per unit, with rental subsidies making up 24.5 percent of *billable rent*. The monthly *effective gross income*[18] was $491.78 per unit, or about 85 percent of the *gross potential income*,[19] including both *residential billable rent* and *other income* (e.g., rent collected from commercial units, interest, miscellaneous income, etc.). Income sources other than residential

[15] All together, these communities house about 28 percent of the projects in our data set.
[16] Gross residential billable rent refers to the residential rent chargeable to tenants in accordance with tax credit regulations and includes base rents and rental subsidies.
[17] The numbers may not always add up due to either missing data or discrepancies in some of the audits.
[18] Effective gross income is all revenue actually received by a project, or the gross potential income minus losses from vacancy and bad debt.
[19] Gross potential income refers to all potential income including the billable rent and income from other sources.

rent receipts made up about 5 percent of *effective gross income* among family LIHTC projects in our dataset.

Losses from vacancy and bad debt were considerably lower among SROs, with vacancies making up 4 percent and bad debt comprising just 1 percent of *billable rent* respectively. Rental subsidies made up about 9.6 percent of residential billable rent, and the average monthly residential rent collected was $347.71/unit. The monthly *effective gross income* was $379.24/unit—about 95 percent of *gross potential income*. Other sources of income besides residential rental receipts accounted for about 9.4 percent of *effective gross income*, which is almost twice that of family LIHTC projects in our dataset.

LIHTC Expenses by Project Type

In FY 1998, the average monthly total operating expenses were $350.85 per unit for family LIHTC projects, $345.88 per unit for senior projects, and $300.69 per unit for SRO projects. The percentage of *effective gross income* consumed by total operating expenses[20] (or the *operating ratio*) was about 71.3 percent for family projects, 70.7 percent for senior projects, and 91 percent for SROs.

Table 4. Monthly Operating Expenses per Unit by Project Type, 1998

	Family (103)	Senior (7)	SRO (13)
Administrative	$88.60 (25%)	$123.02 (35.5%)	$156.33 (52%)
Marketing and Leasing	$2.40 (1%)	$1.30 (0%)	$1.96 (1%)
Maintenance	$115.62 (32%)	$64.19 (18%)	$49.75 (17%)
Security	$10.72 (3%)	$1.71 (.5%)	$6.65 (2%)
Utilities	$67.58 (19%)	$58.82 (17%)	$37.12 (12%)
Property Tax	$48.52 (14%)	$84.22 25%)	$30.61 (10%)
Property Insurance	$20.77 (6%)	$13.75 (4%)	$17.08 (6%)
Total Operating Expense[21]	**$350.85**	**$345.88**	**$300.69**

Among family LIHTC projects, maintenance costs made up the largest percentage of operating expenses (32 percent), followed by administrative costs (25 percent), utilities (19 percent), and the property tax (14 percent). Based on information at our disposal, average monthly administrative payroll expenses were $25.52 per unit in FY 1998, and accounted for about 27.7

[20] Total operating expense consists of the total cost of operating a project, including administration, marketing and leasing, maintenance, security, utilities, property taxes, and property insurance.

[21] Security and marketing and leasing costs that are not specifically itemized in the audits have been treated as missing data, resulting in fewer observations and somewhat higher averages for these expense categories. Consequently, the sum total of all expense categories may not be equivalent to the averages for total operating expenses that are derived from the audits.

percent of total administrative expenses. The average monthly maintenance payroll cost was $32.30 per unit, and comprised about 28 percent of total maintenance expenses.

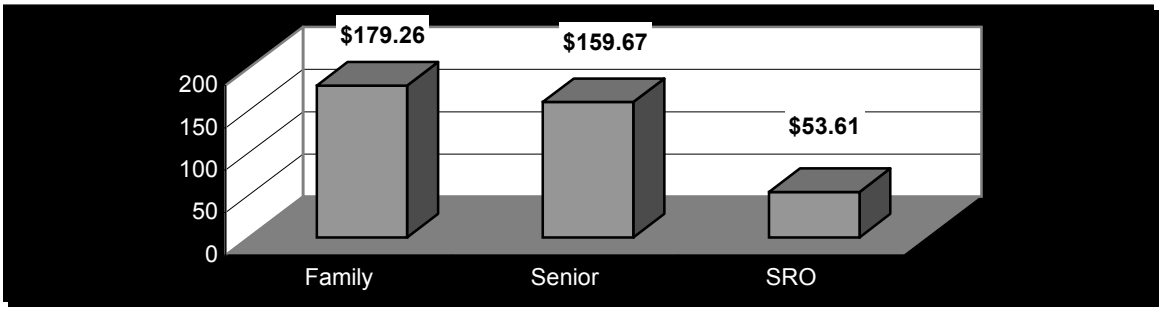
Among senior LIHTC projects, on the other hand, administrative expenses made up the largest percentage of operating expenses (36 percent). Property taxes made up a larger percentage of total operating expenses (25 percent) than either maintenance (18 percent) or utilities (17 percent). Average monthly administrative payroll expenses were $37.92 per unit, or about 30.8 percent of total administrative costs. The average monthly maintenance payroll expense was $48.19 per unit, or about 75 percent of total maintenance expenses[22].

The highest expense category for SROs was administration, which accounted for 52 percent of total operating expenses. The average monthly administrative payroll expense, which includes salaries for desk clerks, was $88.05 per unit, or 56.3 percent of total administrative expenses.[23] The next highest expense categories as a percentage of total expenditures were maintenance (17 percent), utilities (12 percent), and the property tax (10 percent).

Debt Service and Project Type

Figure 1 shows the average per unit debt service burdens among family, senior, and SRO projects in our dataset. On the whole, family projects faced the highest debt service burden in terms of both absolute numbers and percentage of effective gross income (EGI). SROs were the least burdened by debt service obligations. On average, debt service consumes 36.45 percent of effective gross income (EGI) among Family LIHTC projects, compared to 32.6 percent for senior projects, and just 13.3 percent for SRO projects in our data set. When total debt service obligations are taken into account, total average monthly cash outflows[24] in FY 1998 were $530.11 per unit for family projects, $505.55 per unit for senior projects, and $345.30 per unit for SROs.

Figure 1. Average Total Debt Service per Unit by Project Type



Conclusions

It is apparent that there are significant areas of difference in average per unit revenues, expenses, and debt service burdens between family, senior, and SRO LIHTC projects. Family housing projects tend to be more dependent on rental income, but also have higher vacancy rates and bad debt expenses on average when compared to SRO projects. Looking at categories of expense, we can make the general observation that SRO and senior housing tend to have higher per unit administrative expenses, which are offset by lower maintenance, and utility expenses. Both family and senior projects have significantly higher debt service

[22] Given the relatively low number of observations for senior projects in our dataset, these figures may not be indicative of the entire population of senior LIHTC projects in Chicago.
[23] We could not determine exactly how much of administrative payroll costs consist of salaries for desk clerks since the audits do not always distinguish between desk clerk salaries and other administrative payroll expenses.
[24] Total cash outflow is total debt service plus total operating expense.

obligations on average than SRO projects in our data set. However, it should be kept in mind that factors other than project type per se may be affecting a number of these findings.

C. The Financial Condition of Chicago's LIHTC Portfolio

To understand the financial condition of the LIHTC projects in the study, we chose to look at three proxy measures of financial stability among our data set: cash flow ratios, vacancy rates and reserve levels. Each of these indicators is important to the day-to-day performance of a project. The cash flow ratio gives an overall snapshot of whether a project has sufficient cash flow to cover operating expenses and debt service at a given point in time. Vacancy rates indicate how well a project is doing in rent collection, the major source of income for meeting the property's operating costs. Reserve levels are an important indication of how well prepared a given project is for meeting future contingencies, including both regular capital improvements and unanticipated emergencies.

Cash Flow and Project Health

Generally speaking, the cash flow of a project is comprised of four main factors: 1) gross potential income (including billable rents and other income); 2) vacancy and bad debt; 3) operating expenses; and 4) debt service. In combination, these factors determine whether a project has a positive or negative cash flow.

Previous studies have used ratios comparing a project's total cash outflows (operating expenses plus total debt service[25]) with its effective gross income to indicate degrees of health or distress.[26] We will use similar criteria: a project with a positive ratio is considered healthy, a project with a negative ratio of less than 115 percent is considered moderately troubled, and a project with a negative ratio that equals or exceeds 115 percent is considered severely troubled.[27]

Approximately 44 percent of the projects in our data set had positive cash flows in 1998, meaning that less than half had sufficient income to cover both expenses and debt service. About one third of the projects (32.5 percent) have moderate cash flow difficulties. But almost one fourth (23.5 percent) of the projects in our data set fit the description of severely troubled properties, meaning that total cash outflows equal or exceed 115 percent of effective gross income. Our study is concerned with identifying those factors that contribute to the cash flow problems of troubled properties.

Vacancies and Cash Flow

The vacancy rate is the percentage of gross billable rent that goes uncollected because units are not occupied for one reason or another. The overall vacancy rate for the 118 projects for which we have vacancy data is 11 percent, [28] which is significantly higher than the estimated vacancy rate of 4.5 percent for Chicago's rental units as a whole.[29] The national rental vacancy rate is about 7.6 percent.[30] Based upon this national statistic, we assume for purposes of this

[25] Total debt service includes payments on interest, principal, and mortgage insurance.
[26] Cf. Cummings and DiPasquale, op.cit., p. 277. It should be noted that our criteria for project health differs somewhat from that used by Cummings and DiPasquale's study, which does not include payments on mortgage principal or mortgage insurance in estimating total cash outflows. Mortgage principal and insurance payments increase total cash outflows by about 4.7 percent among projects in our dataset. In most cases, this does not significantly affect the overall assessment of project well-being.
[27] This terminology is ours and will be used throughout this study in comparing projects.
[28] This percentage may be inflated given the relatively large percentage of older projects in our data set.
[29] As reported in *For Rent,* op. cit. p. 12.
[30] See Cummings and DiPasquale, op.cit., p. 267.

study that rent collections below 92 percent of gross billable rent indicate serious difficulties. In 1998 approximately 42.4 percent of the projects in our data set had vacancy rates in excess of 8 percent of gross billable rental income. As our forgoing survey of family, senior, and SRO projects would indicate, the problem of high vacancies is most acute among family projects. About 53 percent of family projects in our data set have vacancy rates of over 8 percent. Vacancy rates may reflect lack of demand, though considering the tight rental market across the city as a whole, they may also reflect the affordability of the units, or other factors, such as deferred maintenance resulting in unrentable units and a high level of tenant turnover.

In fact, there is a clearly a strong relationship between vacancy rates and project condition, as table 5 shows.[31] Over three fourths of the properties with moderate vacancy rates (8 percent or less) had a positive cash flow, and almost 58 percent of the projects with high vacancy rates (over 8 percent) had a negative cash flow in 1998. However, of the 56 percent with negative cash flows, 43 percent have low to medium vacancy rates. For these projects, at least, factors other than vacancy rates are affecting cash flows.

Table 5. Project Condition and Vacancy Rates

Cash Flow	Vacancy <=8%	Vacancy >8%	Total
Negative	28 (43.4%)	38 (57.6%)	66 (100%)
Positive	40 (77%)	12 (23%)	52 (100%)
Total	68 (57.6%)	50 (42.4%)	118 (100%)

Cash Flow and Reserves Among LIHTC Projects

Project health also appears related to ability to fund operating and replacement reserves. About 43 percent of the projects for which we have data reported no replacement reserves, and approximately 73 percent had no operating reserves. Among family projects in our data set, 47 percent had no replacement reserves, 56 percent had a replacement reserve level of less than the recommended level of $300[32] per unit, and about 81 percent had no operating reserves.[33] Not surprisingly, inadequate reserves are generally consistent with a pattern of negative cash flows and high operating ratios.[34] Properties with a negative cash flow make up approximately 71 percent of the projects with no replacement reserves and 66 percent of the projects with no operating reserves.[35] In addition, projects with no replacement reserves have an operating ratio of 83 percent, which is 20 percent higher than that of projects with replacement reserve levels of $300 or more per unit. These figures indicate that many of the projects that are straining to meet basic expenses are either not making deposits into their reserve accounts, or are withdrawing funds from those accounts.

[31] A Pearson Chi-Square test shows this relationship to be significant at the .01 level.

[32] The level of replacement reserves required by the National Equity Fund and the Chicago Equity Fund varies depending upon the type of project, whether it involves new construction or rehab (and the extent of rehab), and the percentage of 3 to 4 bedroom units. Based on conversations with those in the field we assume for purposes of this analysis that non-SRO projects in our data set (most of which are rehabbed family units) should have a reserve level of at least $300/unit. Since there are only 3 senior project for which we have information, we have not given percentages for senior projects.

[33] Figures for replacement and operating reserves are based on amounts in accounts as of December 31, 1998 as indicated by the financial audits.

[34] The operating ratio is the percentage of effective gross income (EGI) consumed by total operating expenses.

[35] These correlations are statistically significant based upon a Pearson Chi-Square coefficient of less than .01.

D. "Predictors" of LIHTC Project Sustainability

The fact that 56 percent of the projects in our data set are operating at a deficit prompts us to inquire into the factors that most affect the long term "sustainability" of these projects. To begin, we conducted two types of analysis. First, we performed a difference of means "*t* test" to identify areas of performance where projects with deficits significantly differ from projects with budget surpluses. Second, we conducted a multiple regression analysis to identify those factors that appear to be the strongest "predictors" of positive or negative cash flow among LIHTC projects in our data set. While both of these analyses are tentative they give some insight into the variables that are most important in assessing the future viability of LIHTC projects.

Comparing Properties with Positive and Negative Cash Flows

What can we tell about where financially troubled projects start to go wrong? Is their poor performance due to higher operating expenses per unit, lower per unit income, or a combination of both of these factors? The answer indicated by a comparison of healthy, moderately troubled and severely troubled projects depends upon the size of the deficit. Since SROs generally have lower per unit operating expenses, we have limited our comparison to family and senior projects.

Table 6 compares the operating revenues of projects in our data set that are severely troubled (with an operating ratio over 115%) with those of healthy projects with a budget surplus. Projects that perform poorly receive much lower income per unit on average (whether in terms of rent collected, total income, or effective gross income) than those that are successful, and these income differences stem in large part from higher vacancy rates and bad debt expenses. Based on data gathered from 1998 audits, those tax credit projects in our data set that experience severe cash flow problems have on average about $129 less in effective gross income per unit, and have vacancy rates and bad debt expenses that are almost three times higher, than projects with a positive cash flow. All of these differences in averages are statistically significant.[36]

Table 6. Average Monthly Revenues per Unit of Healthy & Severely Troubled Projects[37]

	Financially Healthy	Severely Troubled
Billable Rent	$550.44	$525.26
Vacancy**	($37.77)	($102.43)
Residential Rent Collected*	$511.92	$422.81
Other income	$32.01	$15.37
Total Income**	$543.93	$438.18
Bad Debt**	($15.65)	($39.32)
Effective Gross Income**	**$527.98**	**$398.82**

Note: Asterisks denote significant difference at .05 (*) and .01 (**) levels.

These same properties also differ markedly in operating expenses, with severely troubled projects hampered by per unit total operating expenses that are more than 18 percent higher on

[36] The concept of "statistically significant difference" is used in this context to indicate the confidence one has in concluding, based on observed variations within the data set, that there really is a difference in averages between two populations with respect to some characteristic.

[37] The numbers may not always add up due to missing data or discrepancies in some of the audits.

average than those of financially healthy projects. Higher average per unit maintenance and utility expenses as well as higher property taxes among this group of troubled properties largely account for this disparity in total operating expenses. Per unit maintenance expenses are almost 50 percent higher, property taxes are 30.4 percent higher, and utilities are 26.4 percent higher on average among severely troubled projects as compared to financially healthy LIHTC properties. It is also worth noting that average per unit administrative and maintenance payroll expenses are about 46 percent lower among severely troubled properties in our data set. It is possible that budgetary constraints force many of these properties to either trim staff or rely on volunteer workers to perform necessary day-to-day operations.

Table 7. Average Monthly Expenses per Unit of Healthy & Severely Troubled Projects[38]

	Financially Healthy	Severely Troubled
Administrative*	$98.30	$78.64
Marketing and Leasing**	$2.72	$.86
Maintenance***	$94.13	$140.24
Security	$7.75	$11.48
Utilities**	$59.43	$75.12
Property Tax**	$43.71	$57.09
Property Insurance	$18.77	$21.28
Total Operating Expense**	**$322.23**	**$381.42**

Note: Asterisks denote significant difference at .10 (*), .05 (**) and .01*** levels

When we compared financially healthy projects with moderately troubled projects we found income disparities to be less important than operating expenses in explaining differences in overall performance. Although losses from residential vacancy are higher among moderately troubled projects, there is little difference in other income categories. The average effective gross income per unit of moderately troubled projects is virtually identical to that of financially healthy projects, as table 8 shows.

Table 8. Average Monthly Revenues per Unit of Healthy & Moderately Troubled Projects[39]

	Financially Healthy	Moderately Troubled
Billable Rent	$550.44	$574.66
Vacancy*	($37.77)	($58.91)
Residential Rent Collected	$511.92	$513.30
Other Income	$32.01	$25.90
Total Income	$543.93	$539.20
Bad Debt	($15.65)	($21.27)
Effective Gross Income	**$527.98**	**$517.92**

Note: Asterisk denotes significant difference at .05 level

There is a statistically significant difference in total operating expenses between the two groups of projects, although the disparity is less pronounced than with severely troubled projects. As table 9 shows, most of the difference in total operating expenses is again attributable to higher

[38] Due to missing data, particularly for marketing and leasing and security costs, the sum total of all operating expenses may not be equivalent to the averages for total operating expenses that are derived from the audits.

[39] The numbers may not always add up due to missing data or discrepancies in some of the audits.

average per unit maintenance and utility expenses and a larger property tax burden among moderately troubled projects. These three expense categories account for over $40 of the difference in monthly per unit expenses between healthy and moderately troubled projects. Average per unit maintenance and utility expenses are 20 percent and 17.5 percent higher respectively, and per unit property taxes are 25 percent higher among moderately troubled projects as compared to healthy projects in our data set.

Table 9. Average Monthly Expenses per Unit of Healthy & Moderately Troubled Projects[40]

	Financially Healthy	Moderately Troubled
Administrative	$106.03	$107.64
Marketing and Leasing	$2.72	$2.84
Maintenance**	$94.13	$112.88
Security	$7.75	$12.20
Utilities*	$59.43	$69.83
Property Tax*	$43.71	$54.58
Property Insurance	$18.77	$21.43
Total Operating Expense**	**$322.23**	**$360.54**

Note: Asterisks denote significant differences at .10 (*) and .05 (**) levels.

These observations warrant several tentative conclusions: 1) Both income shortfalls and high operating expenses are important for understanding why severely troubled projects perform more poorly than financially healthy projects. 2) Projects with more moderate cash flow difficulties differ from projects with positive cash flows in operating expenses, but not in total or effective gross income. 3) Differences between severely troubled projects and moderately troubled projects are most pronounced in the amount of income they generate and are less significant when it come to total operating expenses. On average, both moderately and severely troubled projects are more costly to operate than financially healthy projects, but severely troubled projects have higher operating expenses than moderately troubled projects.

Identifying Important Predictors of Variations in Cash Flow

Our investigation thus far leads us to explore the relative importance of income-related factors such as vacancy rates, expense-related factors such as property taxes and debt service, property characteristics (i.e., age and project size), and neighborhood conditions as determinants of cash flow among tax credit projects in our data set. Multiple regression analysis allows us to explore such factors. This analysis cannot account for all of the possible factors that account for variations in cash flow between projects. Nonetheless, it is helpful in isolating the relative significance of different variables for understanding why some properties are more financially stable than others.

Regression 1 in table 10 shows that the vacancy rate explains about 16 percent[41] of the total variation in cash flows between projects in our data set. Of the variables tested, it is the most important determinant of project stability, and is statistically significant at the .01 level. Regressions 2 and 3 show that the effect of vacancy rates is constant despite the introduction of two new variables, property taxes and debt service. The coefficients for these two variables are negative and statistically significant at the .01 level, indicating that as vacancy rates, property taxes, and debt service increase, cash flow/unit decreases. Property taxes and debt service

[40] Due to missing data, particularly for marketing and leasing and security costs, the sum total of all operating expenses may not be equivalent to the averages of total operating expenses that are derived from the audits

[41] Based upon an R square of 16.3

account for another 8 percent of total change in cash flow per unit, meaning that the three variables tested thus far (vacancy rates, property taxes, and debt service) explain about 31 percent of the differences in cash flow per unit in our data set.

We expected that project characteristics such as age, project size and neighborhood conditions would also have an impact on cash flow, and so introduced these variables in regression 4. Table 10 shows that the coefficient for age is negative and statistically significant. On average, per unit cash flows decrease as the age of properties increases. Contrary to our expectations, the effect of project size on cash flows per unit was not statistically significant. Nor did we find the effects of neighborhood conditions on per unit cash flows to be statistically significant. The regression model as a whole explains about 34 percent of the variation in cash flows in our data set.

Table 10. Regression Results of Vacancy, Property Tax, Debt Service, and Age on Cash Flow per Unit of Non-SRO Projects

	Regression Model			
	Regression 1	*Regression 2*	*Regression 3*	*Regression 4*
Vacancy Percentage	-.403**	-.508**	-.493**	-.431**
Mo/Unit Debt Service		-.296**	-.242**	-.206*
Mo/Unit Property Tax			-.267**	-.213*
Age				-.190*
R Square	.163	.241	.309	.339

Asterisk denotes significance level of .01 (**) and .05 (*).

Conclusions

The finding that vacancy rates, property taxes, debt service, and age have the greatest effect on per unit cash flows does not necessarily mean that other factors are unimportant, or do not have an effect on other aspects of project performance. But it is an important preliminary indication that the financial difficulties facing many LIHTC projects are influenced by structural factors that can complicate the tasks of even the most capable sponsors and their managers. Developing a comprehensive strategy for the stabilization and preservation of LIHTC projects requires a detailed examination of how decisions made during underwriting, from debt commitments to rent structures, impact long-term project sustainability. It also requires that we examine factors related to property management, and consider how building characteristics and neighborhood conditions may lead to additional costs or lower revenues that must be realistically factored in to the operating budget.

III. Factors that Impact Project Performance: Underwriting

A. Debt Service and Sustainability

The goal of the LIHTC program is to leverage private dollars with public financing incentives in order to provide affordable housing to low-income households. State and local governments typically want to use the smallest subsidies possible to make a project viable, so that their subsidy dollars can build more projects. However, LIHTC projects cannot reach the poorest households and remain financially viable by leveraging private dollars alone. To do so requires additional public subsidies, either through rental subsidies, low cost debt, or a combination of both. This subsection considers several key questions about how private dollars, and particularly private debt, impact project stability, including:

- What percentage of first mortgages do private lenders provide?
- How much of the long-term debt is covered by various types of "gap financing" as opposed to conventional first mortgages; and how many projects benefit from city or state sources of low cost financing such as zero percent or low interest loans?
- How important is the amount of debt service and the way it is structured for the overall performance and viability of a given LIHTC project?

First Mortgage Loans

While private-sector lenders are an important source of first mortgages for LIHTC projects across the nation, they are particularly important among projects within our data set. Among those for which we have information, private banks provide about 79 percent of first mortgages, compared to 40 percent nationwide.[42] The City of Chicago's Department of Housing (DOH) provides 11 percent of first mortgages, the Illinois Housing Development Authority (IHDA) provides 9 percent, and the Federal Housing Administration (FHA) provides 1 percent of the remaining first mortgages. Almost all of these public sources of financing are subsidized mortgages that are either interest-free or carry below-market interest rates.

The size and frequency of private first mortgages varies with the age of the project. Significant changes in underwriting of LIHTC projects occurred after 1989, and first mortgages with private lenders are more common among projects placed in service before 1990. About 96.5 percent of pre-1990 projects, compared to 72 percent of those placed in service afterwards, use private banks for first mortgages. Private first mortgages also cover a significantly larger percentage of total long-term debt among older projects. On average, first mortgages from private lenders comprise 53.4 percent of the total debt of LIHTC projects that were placed in service before 1990, compared to just 32.8 percent for newer projects.

The source of first mortgage loans also tends to vary by the type of project and whether it has a for-profit or nonprofit sponsor. On the whole, nonprofit developments tend to be less reliant upon private sources of financing for first mortgages than for-profit sponsored projects, with private lenders providing 66 percent (or two-thirds) of the first mortgages on projects developed by nonprofits, compared to 86 percent of the first mortgages on projects sponsored by for-profits. But this difference is due in part to the fact that SROs (most of which are developed by nonprofits) are much less likely than either senior or family projects to use private banks for first

[42] Cumming and DiPasquale, op.cit., p. 282

mortgages. In our data set just 31 percent of the first mortgages on SROs, as opposed to 85 percent of first mortgages on family and senior projects, come from private lenders.[43]

Gap Financing

The term "gap financing" is used to refer to low-cost loans or grants provided by government agencies that fill the gap between the level of private debt the project can afford to support and remaining project costs. Approximately 93 percent of the LIHTC projects in our data set have some form of gap financing. About 65 percent (or almost two-thirds) of all long-term debt among projects for which we have data consists of gap financing, with 44 percent coming from the Chicago Department of Housing (DOH) and another 18 percent provided by the Illinois Housing Development Authority (IHDA). About 53 percent of the LIHTC projects for which we have information have city or state zero-percent loans. Another 38 percent of our projects have city or state low interest loans, which range from one to four percent. Without these zero-percent and low-interest loans, many LIHTC projects would have greater difficulty surviving in Chicago's poorest neighborhoods.

Again, however, the relative benefits of gap financing vary with the age of the project. From table 11 it is evident that older (pre-1990) projects are much less likely to benefit from zero-percent or low-interest loans, and gap financing covers a significantly smaller percentage of their total debt service burden as compared to newer projects. Our data indicates that by far the greatest disparity between older and newer LIHTC projects occurs with state as opposed to city funding. Table 11 shows that while the portion of total long-term debt covered by city loans is about the same for older and newer projects, loans from the state comprise only about 2.4 percent of the total debt among older projects, compared to about 23.6 percent of the long-term debt of newer projects. There are at least two reasons for this disparity. First, the establishment of the LIHTC program antedates the formation of the Illinois Affordable Housing Trust Fund in th elate 1980s, which serves as the primary source of state-subsidized affordable housing loans for the Illinois Housing Development Authority (IHDA). And second, until recently, the Illinois Affordable Housing Trust Fund placed a limit of $500,000 on all low-interest loans for affordable housing development.

Table 11. Gap Financing and Placed in Service Date

Placed in Service Date	***Percent With IHDA/DOH Loans***		***Percent of Long-Term Debt Covered by Gap Financing***		
	Zero Percent	*Low Interest*	*Total*	*IHDA*	*DOH*
Before 1990	50% (13)	39% (7)	46.4% (28)	2.4% (28)	42.6% (28)
1990 & After	56% (39)	41.4% (29)	71.8% (73)	23.6% (73)	44.4% (73)

Debt Service and Project Performance

Our regression analysis indicated that debt service is an important "predictor" of overall financial stability among non-SRO projects. The relationship between a LIHTC project's debt service obligations and its financial performance is further indicated by the differences in the total debt service burden as a percentage of effective gross income between severely troubled, moderately troubled, and healthy projects. Severely and moderately troubled projects have higher debt service burdens that consume a higher percentage of effective gross income (EGI) than do healthy projects with positive cash flows, as table 12 clearly demonstrates. These

[43] When SROs are factored out, 87.5 percent of for-profit and 76 percent of nonprofit sponsored projects use private lenders for first mortgages.

figures tend to support the contentions of developers that expensive debt service makes for tighter budgets, giving owners less room to respond to unanticipated expenses.

Table 12. Project Condition and Debt Service Burden as a Percentage of EGI

	Average Debt Service/Unit/Mo	Average Effective Gross Income/Unit/Mo	Debt Service as % of EGI
Healthy	$160.50 (44)	$527.98	30.4%
Moderately Troubled	$196.79 (37)	$517.92	38%
Severely Troubled	$180.68 (28)	$398.82	45.3%

Note: SROs have been excluded

Not surprisingly, there is also a strong correlation between the size of a project's debt service burden and the amount of total long-term debt that is covered by loans from conventional lenders.[44] On the whole, projects with private first mortgages are more likely to have negative cash flows than projects with non-conventional first mortgages. Clearly, then, there are limits to how much private debt a project can absorb and remain financially viable in the long run. While the amount of private debt that is appropriate may vary somewhat from one development to the next, recent trends suggest some general guidelines. Among LIHTC projects in our data set that were placed in service after 1995, conventional loans make up about 17 percent of total long-term debt on average; only 29 percent of the new developments have a conventional debt to total debt (CD/TD) ratio of over 20 percent.

Using a CD/TD ratio of 20 percent as our baseline, we compared the performance of LIHTC projects in our data set based on the extent of their reliance on conventional financing. Given the changes in underwriting after 1989, we chose to limit our analysis to non-SRO projects with a placed in service date of 1990 or later. Table 13 shows that projects fare considerably worse when private mortgages exceed 20 percent of total long-term debt. Projects with a CD/TD ratio of more than 20 percent have a higher average per unit debt service burden that consumes over 10 percent more of effective gross income. They also have an average monthly cash flow that is about $41/unit lower than that of projects with a CD/TD ratio of 20 percent or less.[45] Projects with a higher CD/TD ratio are significantly more likely to have negative cash flows (63%) than are projects that are less reliant on conventional mortgages (39%).[46] Debt coverage ratios are also lower on average among those projects in our data set that are more reliant on conventional mortgages. Only about 31.5 percent of these projects have a recommended debt coverage ratio of 1.15 or higher, compared to 52 percent of projects with a CD/TD ratio of 20 percent or less.[47]

[44] The Pearson Correlation Coefficient indicates that this correlation is significant at the .01 level.
[45] Projects with a CD/TD ratio of more than 20 percent and those with a CD/TD ratio of 20 percent or less are
very similar in both total operating expense and EGI per unit, indicating that, overall, the variation in cash flow is due to the difference in debt service burdens between these two groups of projects. Based on a difference of means "*t* test," the differences in average cash flow and debt service are significant at the .10 and .05 levels respectively.
[46] Based on Chi-Square this association between CD/TD ratio and cash flow is significant at the .10 level.
[47] A DCR of 1.15 is the industry standard.

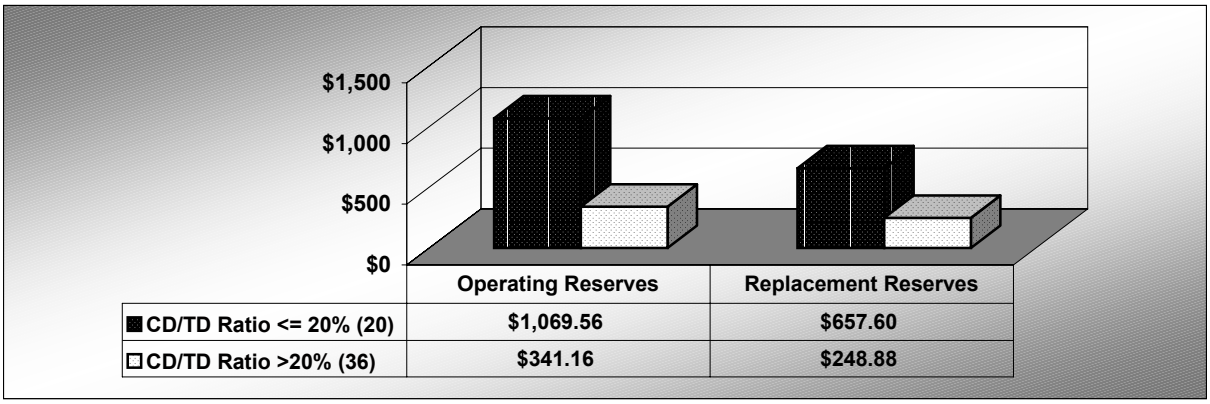
Table 13. CD/TC Ratio and Project Performance

CD/TD Ratio	Average Cash Flow/Unit/Mo	Average Debt Service/Unit/Mo	Debt Service as % of EGI	DCR
20% or Less	$5.52 (23)	$127.07	37.6%	1.12
Above 20%	($35.72) (38)	$171.50	27.1%	.84

Note: Comparisons involve non-SRO projects placed in service after 1989.

Projects with more private debt to sustain ongoing activities are further compromised by lower reserves. This is evident from figure 2, which shows that both operating and replacement reserves are considerably lower among those projects in which over 20 percent of long-term debt is covered by conventional mortgages.[48] While over 61 percent of the projects with a low CD/TD ratio have a replacement reserve level of at least $300 per unit, only about 31 percent of the projects that are more reliant on conventional loans have replacement reserves at the same levels.[49]

Figure 2. CD/TD Ratio and Reserves



Note: Figures are for non-SRO projects placed in service after 1989.

Conclusions and Recommendations

For many projects in our data set, the level of debt service is an important factor that stands between a negative and positive cash flow. Older projects tend to be the most vulnerable to financial difficulty,[50] yet are also more likely to have high levels of debt service. And severely and moderately troubled projects have higher debt service burdens that consume a higher percentage of effective gross income (EGI) than healthy projects with positive cash flows.

Private debt is an important source of financing for many LIHTC projects in our data set, but it is also expensive. Comparing projects whose ratio of conventional debt to total debt exceeds 20 percent to those with lower ratios, we found that projects that are more reliant on private mortgages have higher debt service burdens that lead to lower per unit cash flows on average. They are also less likely to have recommended debt coverage ratios and replacement reserves levels, two key indicators of project sustainability.

[48] Figures for replacement and operating reserves are based on the amount in reserve accounts as of December 31, 1998. Based on the difference of means "*t* test" this difference in averages is significant at the .05 level and persists when we control for project age.

[49] Based on Chi-Square this association between the CD/TD ratio and replacement reserve levels is significant at the .01 level.

[50] This is indicated by our previous regression analysis. The effect of age on project performance will be discussed in greater detail later in this report.

These findings lead to the following recommendations. First, we recommend less reliance upon private sources of financing for tax credit deals. Significant progress has been made in this area in recent years, but more must be done. While projects may vary in the amount of conventional private debt they can afford, our data suggests a limit of about 20 percent of total debt. We further recommend that both moderately and severely troubled projects be financially restructured to allow immediate cash flow relief, and to allow for future changes in cash flow as the project ages. Because the economic condition of tax credit projects can change so significantly over time, debt should be structured to rely primarily on government sources that allow for flexibility of payments based upon cash flows. New LIHTC projects should also be underwritten with a flexible debt service plan that recognizes that cash flows will vary significantly over the life of the project. Another option would be to allow deferment of principal payments when cash flows fall below a certain level. Underwriting should also assure that there is sufficient cash flow to maintain replacement reserves, and funders should work with owners to assure ongoing capitalization of reserves.

B. Rents, Affordability, Subsidies, and Sustainability

The LIHTC program places a ceiling on rents for units that earn tax credits, defined as 30 percent of the maximum income that qualifies for a tax credit unit.[51] The maximum income is set at 60 or 50 percent of the HUD adjusted median family income (HAMFI) limits for the area. The owner of a qualified low-income project has the option of renting at least 40 percent of the units to households earning incomes at or below 60 percent of the area median income or renting a minimum of 20 percent of the units to households at or below 50 percent of the area median income. Within these limits LIHTC rents can vary depending upon the availability of rental subsidies, local market conditions, and the revenue needed to cover costs. This introduces a number of questions:

- How affordable is the typical rent of LIHTC projects in our data set?
- What percentage of eligible households can afford the average LIHTC rent without rental subsidies?
- How important are rental subsidies to overall project viability?

The Affordability of LIHTC Projects

Table 14 shows the 1999 median rents for different size projects in the three subareas among LIHTC projects in our data set. Based on our data, median rents range from $340 for a studio in the west subarea to $844 for a four-bedroom apartment in the south subarea.

Table 14. Median LIHTC Rents by Location, 1999

Location	Studio	1 Bdrm	2 Bdrm	3 Bdrm	4 Bdrm
North	$411 (6)	$544 (12)	$606 (13)	$702 (10)	$771 (4)
West	$340 (7)	$496 (28)	$576 (33)	$670 (29)	$776 (10)
South	$358 (12)	$505 (32)	$610 (33)	$715 (28)	$844 (8)

[51] Cummings and DiPasquale, op.cit., p. 274

To determine the affordability of LIHTC rents in our data set we estimated the income level that would be required to pay the 1999 median rent for different size units if 30 percent of household income were paid for rent. We then converted these amounts into percentages of the Chicago Area Median Income (AMI) to determine the affordability of the typical rent for households in different income categories. Generally, the income needed to afford the median rent for a one bedroom apartment is highest in the north subarea, while the income required to afford the median rent for a two, three, or four bedroom apartment is generally the highest in the south. But, on the whole, the affordability of LIHTC rents in our data set does not seem to vary a great deal from one geographic area of the city to another.

Table 15. Income Needed to Afford Median LIHTC rents, 1999

	1 Bdrm	2 Bdrm	3 Bdrm	4 Bdrm
North	$21,760	$24,240	$28,080	$30,840
West	$19,840	$23,040	$26,800	$31,040
South	$20,200	$24,400	$28,600	$33,760

Note: Figures are based on payment of 30 percent of household income on rent

The U.S. Census estimates the 1999 Area Median Income (AMI) for the Chicago Metropolitan Region to be $63,800 for a family of four. After making adjustments for family size, the median rent paid in our data set of tax credit projects for units with one or more bedrooms implies a household income of between 39 and 46 percent of AMI, as indicated by table 16.[52] This means that the median rents of LIHTC projects in our data set are well within the income limits of 50 and 60 percent of AMI established by the LIHTC program.

Table 16. Affordability of Median LIHTC Rents as Percentage of AMI, 1999

	1 Bdrm	2 Bdrm	3 Bdrm	4 Bdrm
North	42.7%	42.2%	44%	41.7%
West	38.9%	40.1%	42%	41.9%
South	39.6%	42.5%	44.8%	45.6%

To get a better sense of what is happening at the community level, we also selected a group of five communities in the north, west, and south subareas with the heaviest representation of LIHTC projects. Table 17 shows the median rents for a three-bedroom apartment among LIHTC projects in these communities and the household income level that would be required, again assuming that 30 percent of household income is paid in rent. The income for a household paying the median LIHTC rent for a three bedroom apartment in these neighborhoods ranges from a low of $25,600, or about 40 percent of AMI, in West Town to a high of $29, 880, or almost 47 percent of AMI, in South Shore. These percentages are again within the LIHTC program limits, but they also show a relatively significant variation in rent levels between different community areas.

[52] The bedroom and family size adjustments that we have used are as follows: 1 bedroom = 2 persons (AMI of $51,000); 2 bedroom = 3 persons (AMI of $57,400); 3 bedroom = 4 persons (AMI of $63,800); 4 bedroom = 6 persons (AMI of $74,000).

Table 17. Affordability of Median Rent for 3 Bdrm Unit in Five Community Areas, 1999

Community	Median Rent (3 Bdrm)	Income Needed	Percent of AMI (1999)
Uptown	$696	$27,840	43.6%
West Town	$640	$25,600	40.1%
Austin	$705	$28,200	44.2%
Grand Boulevard	$652	$26,080	40.9%
South Shore	$747	$29,880	46.8%

Note: Figures are based on payment of 30 percent of household income on rent

Median rents may be misleading, since many of the rents charged by LIHTC projects are below the median rent. The low rents among projects in our data set are typically between $20 and $60 less than the median rent. Assuming a household can afford to pay 30 percent of its income in rent, these rents would still require an average income of between 38 to 44 percent of AMI to afford units with one or more bedrooms. Without additional subsidies, even most low rents in our data set are clearly not affordable for households earning less than 30 percent of AMI. Of course, a number of households may actually pay more than 30 percent of their income in rent, so our estimates of household incomes indicated by typical rents may be somewhat inflated. The lowest rent for a two-bedroom apartment in our data set's rent distribution is $275 per month, which is affordable to a household earning $11,000, or about 19 percent of AMI. But this is clearly not characteristic of most projects in the data set.

Ability of LIHTC Projects to Meet the Needs of Lowest Income Groups

While it is generally recognized that the income limits under the LIHTC program result in rents that are beyond the means of many poor households, we wanted to know how many eligible renter households in a given geographic area are unable to pay the lowest LIHTC rent without additional subsidies. Table 18 shows the estimated distribution of households in the City's north, west, and south sides by percentage of Area Median Income (AMI). The percentages of AMI indicated in this table generally correspond to the income limits specified by HUD for housing assistance programs. While the exact number of renter households in each income category is currently not available, we can safely assume that a large percentage of the households in the extremely low and very low-income categories (i.e., 0-30 percent and 30-50 percent of AMI) are renter households.[53]

[53] The UIC and Regional Rental Market Analysis summary report, *For Rent: Housing Options in the Chicago Region*, estimates that about 63 percent of extremely low-income and 78 percent of very low-income households in the entire Chicago metropolitan region are renter households. Renters make up an estimated 46.5 percent of households earning 50 to 80 percent of AMI, 26 percent of households in the 80 to120 percent of AMI income category, and 12.5 percent of households with incomes at 120 percent or more of AMI. These estimates are based on the *1995 American Housing Survey*. (op. cit., p. 30)

Table 18. Distribution of Households by Percentage of Area Median Income, 1999

Subarea		0 to 30% of AMI (Up to $20,000)	30 to 50% of AMI ($20,000 to $30,000)	50 to 80% of AMI ($30,000 to $45,000)
North	HHLDS	88,700	44,300	85,300
	%	22%	11%	21.1%
West	HHLDS	79,700	31,400	54,600
	%	31.6%	12.5%	21.6%
South	HHLDS	123,200	50,100	82,200
	%	31%	12.6%	20.7%

Source: *For Rent: Housing Options in the Chicago Region*

These figures give us some sense of what proportion of renter households earning less than 50 percent of AMI in each geographic area of the City is unable to afford even the lowest rents of LIHTC projects in our data set.[54] Assuming that a minimum income of at least 30 percent of AMI is needed to pay the average low rent among projects in our data set, we estimated an "affordability gap" – that is, the percentage of renter households who are eligible to live in LIHTC housing, but cannot afford LIHTC rents—of about 62 percent in the north, 67 percent in the west, and 67 percent in the south subareas of the City.[55] These percentages are generally consistent with Cummings' and DiPasquale's finding that of the 53 percent of renter households in the nation that were eligible for LIHTC units based upon an eligibility requirement of 60 percent of the applicable area median income, 67 percent could not afford the median LIHTC rent in 1996 of $436.[56]

Further comparisons at the community level demonstrate the inability of the very poor to pay LIHTC rents without substantial rental assistance even more graphically. Table 19 shows the estimated number and percentage of households in our five representative community areas that earned less than $25,000 per year in 1998, or the income needed to afford a rent of $625 per month.[57] This is close to the median rent for a three-bedroom LIHTC apartment in West Town, which has the lowest rents of our five neighborhoods. The percentages range from 43 percent of households in Uptown to 79.6 percent in Grand Boulevard. In Grand Boulevard, about 65 percent of the households earned less than $15,000 in 1998, or enough income to afford a rent of $375 per month without rental assistance. Again, it can be assumed that a high proportion of these households are renter households.[58]

[54] The LIHTC program of course has two options for income eligibility; units must be affordable to renters earning either 50 or 60 percent of AMI. While most LIHTC units use the 60 percent of AMI eligibility requirement we do not have current data on the percentage of renter or owner households that earn 30 to 60 percent of AMI.

[55] This "affordability gap" is derived from the estimated percentage of renter households that earn less than 30 percent of AMI and is based on the further assumption that the distribution of renters by income category in the City of Chicago is roughly the same as the distribution of renters in the entire region.

[56] Cummings and DePasquale, op.cit., p. 278. (The estimate uses 1990 incomes inflated to 1996 dollars.)

[57] Based on payment of 30 percent of income on rent.

[58] In 1990, 71 percent of all households in Grand Boulevard were renter households. This compares to 74 percent in Uptown, 65 percent in West Town, 51% in Austin, and 66 percent in South Shore. Again, in general, renters are more heavily concentrated in the low and very low-income categories.

Table 19. Distribution of Households Earning Less than $25,000 in 1998

Community		<$15,000	$15,000 to $24,999	Total
Uptown	HHLDS	16,095	9,330	25,425
	%	27.25%	15.79%	43.07%
West Town	HHLDS	11,119	5,900	17,019
	%	32.26%	17%	49.26%
Austin	HHLDS	9,272	4,508	13,780
	%	28.5%	13.84%	42.34%
Grnd Blvd	HHLDS	6,461	1,465	7,926
	%	64.9%	14.7%	79.6%
South Shore	HHLDS	7,597	4,004	11,601
	%	32.9%	17.27%	50.27%

Source: Applied Real Estate Analysis (AREA) Inc., City of Chicago Department of Planning and Dev.

Rents, Subsidies, and Cash Flow Squeeze

Because most LIHTC projects operate with very tight budgets, we expected that the amount of rental subsidies they receive would be related to overall project well being, because rental subsidies make apartments affordable to more prospective tenants, while keeping rents at levels that cover costs. Generally, this appears to be the case with the projects in our data set.

Rent Subsidies, Vacancy Rates, and Revenues

About 37 percent of the family and senior projects in our data set were slated to receive rental subsidies from Section 8 and/or the Low Income Housing Trust Fund.[59] Rental subsidies can make it easier to keep rental units occupied and can help raise billable rents to generate much-needed additional revenue. Our data confirms a strong relationship between low rental subsidies per unit and high vacancy rates.[60] Projects with vacancy rates of greater than 8 percent have an average potential rental subsidy of $71.59 per unit, compared to an average of $185.68 among LIHTC projects with vacancy rates of 8 percent or less. Higher vacancy rates and lower rental subsidies combine to produce significantly lower rental income to cover costs, as table 20 indicates.

Table 20. Vacancy Rates, Rental Subsidies, and Rental Income[61]

	Vacancy Percentage	
	<=8%	***>8%***
	(56)	***(49)***
Rent Subsidy	$185.68	$71.59
Billable Rent	$575.07	$522.29
Vacancy	($22.12)	($108.14)
Residential Rent Collected	$555.83	$417.50

Note: SROs have been excluded; all figures are reported on a monthly per-unit basis.

Lower rental subsidies also result in lower billable rents overall, as shown in table 21**,** which compares average per unit gross potential rent, rent subsidy and billable rent among healthy, moderately troubled and severely troubled projects. It is evident that the very low average

[59] This figure is based on reported gross potential rental subsidies in the 1998 audits. Since the audits may not always report rental subsidies, the percentage of projects actually receiving rental subsidies may be higher.

[60] This relationship is significant based on Pearson Correlation Coefficient and a significance level of .01.

[61] The numbers do not add up due to either missing data or discrepancies in some of the audits.

effective gross income per unit among severely troubled projects is due in large part to lower average rental subsidies, which are related to lower billable rents per unit, as well as to very high vacancy losses. Significantly, *even at full occupancy* their billable rents would be insufficient to cover total cash outflows.[62]

On the other hand, while LIHTC projects with more moderate cash flow problems have significantly higher average billable rents per unit, they are also more dependent upon unsubsidized income, as indicated by their average gross potential rent per unit. Generally, because these projects charge higher rents to cover total cash outflows they are less affordable to tenants without rental subsidies. These projects also have a relatively high average vacancy rate of 10.5 percent.

So it appears that the level of rental subsidies is important to a project's financial well-being. Projects with a positive cash flow receive on average $50.60 per unit more in rental subsidies per month than LIHTC projects with severe cash flow problems. In part because of these higher rental subsidy levels, healthy projects are less reliant on unsubsidized rental income, experience lower vacancy loss, and are better able to keep billable rents at a level sufficient to cover their operating expenses and debt service obligations.[63]

Table 21. Project Performance and Monthly Per Unit Rental Subsidies and Rents[64]

	Healthy	Moderately Troubled	Severely Troubled
Potential Rent	$397.98	$441.01	$423.44
Rent Subsidy	$152.40	$133.53	$101.80
Billable Rent	$550.44	$574.66	$525.28
Vacancy	($37.77)	($58.91)	($102.43)
Residential Rent Collected	$511.92	$513.30	$422.81

Note: SROs have been excluded

Ability of LIHTC Projects to Raise Rents

Some have suggested that LIHTC projects with a cash flow squeeze might raise rents modestly as a way of strengthening cash flows.[65] Can LIHTC projects with negative cash flows in our data set raise rents and remain competitive in the marketplace? A comparison of the average 1998 LIHTC billable rents with average market-rate rents[66] in the north, west, and south subareas of the city suggests that LIHTC projects in the north could raise their rents without

[62] Including "other" income, the average total potential monthly income for these properties is $540.60/unit. Total monthly cash outflows (consisting of total operating expenses and total debt) are $561/unit.

[63] While healthy projects also benefit from lower average cash outflows per unit than troubled projects, these differences are due in part to higher debt service and property taxes among troubled projects. Average monthly expenses for these two expense categories are $237.77/unit for projects with significant cash flow difficulties, $251.37/unit for projects with moderate cash flow problems, and $204.21/unit for projects with positive cash flow.

[64] The numbers do not always add up due to either missing data or discrepancies in some of the audits.

[65] See Benson Roberts and Barton Harvey, "Comment on Jean L. Cummings and Denise DiPasquale's 'The Low Income Housing Tax Credit: An Analysis of the First Ten Years', " *Housing Policy* Debate (1998), p.312.

[66] Based on 1999 estimates by UIC regional rental market analysis. Rents have been adjusted based upon an estimated increase of rents by 3.6 percent region wide between 1998 and 1999. See *For Rent*, op.cit., pp. 9 and 14.

necessarily jeopardizing demand. (See Table 22) Severely troubled projects in the west and south subareas also have average billable rents that are lower than average-market rents. But the income characteristics of community areas where these projects are located limit the pool of potential renters at higher rent levels. Between 41 and 45 percent of the residents in these neighborhoods earn less than 30 percent of AMI and over 11 percent are unemployed,[67] factors that, in combination with age, probably contribute to the high vacancy rates of these projects.[68] The local market thus limits the ability of severely troubled projects to raise rents sufficiently to cover operating costs and debt service. In addition, raising rents would undermine their mission of providing housing for residents that are least able to afford rental housing.

Table 22 further indicates that moderately troubled LIHTC projects located in the west and south subareas already have average billable rents that are virtually equivalent to market-rate rents for the same area. It is doubtful that these projects could raise rents further without increasing their vacancy rates. The fact that many of these properties already have billable rents that are higher than those of healthy projects is further indication that raising rents may not mitigate cash flow problems.

Table 22. Average Billable Rents of LIHTC Projects and & Market-Rate Rents

	Average LIHTC Billable Rents			Average Market-Rate Rents[69]
	Healthy	***Moderately Troubled***	***Severely Troubled***	
North	$506.62 (12)	$444.32 (5)	$484.82 (5)	$796
West	$547.65 (16)	$606.12 (12)	$537.52 (8)	$599
South	$594.33 (13)	$591.04 (18)	$532.24 (15)	$599

Source: For Rent; Housing Options in the Chicago Region

Conclusions and Recommendations

Affordability indicates how well a project meets community needs; it also has implications for overall project stability. We looked at three factors in affordability of the units in our data set: 1) the income characteristics of potential renters, 2) the local housing market, and 3) the level of rental subsidies. Consistent with other research, we estimate that approximately two-thirds of eligible renters are unable to afford the typical LIHTC rent in our data set. In most cases, then, LIHTC rents are beyond the reach of many poor households without substantial rental assistance.

The implications of the affordability gap extend beyond the plight of low-income renters themselves. Severely troubled projects have the lowest average rental subsidy per unit—and the lowest level of billable rents. Even at 100 percent occupancy, many would still have a negative cash flow. Though their average billable rents are lower than market rate rents, their ability to raise rents appears to be hampered by the income characteristics of the potential

[67] These figures are based on estimates of 1998 income distributions within Chicago's community areas by AREA (Applied Real-estate Analysis, Inc.), City of Chicago Department of Planning and Development and 1990 census data on unemployment rates.

[68] The effect of these factors on vacancy rates is discussed later in this report.

[69] These figures are based upon a 3.6 percent increase in rents for the Chicago region between 1998 and 1999. See *For Rent*, op. cit. p. 9.

renters in their communities, as well as by their existing high vacancy rates. Moderately troubled projects in the same areas have rent levels at or near market rates—they would also risk increasing vacancies if they were to raise their rents.

If the LIHTC is to remain the centerpiece of our subsidized housing production system, policies must be formulated to enable the program to serve low-income households without placing projects at financial risk.[70] Rental subsidies can improve affordability, cut vacancies, raise billable rents and enhance project stability. The city and state should develop programs that mix rental subsidies with tax credits to meet the needs of residents whose income is too low to afford typical tax credit rents. We might also consider changing the tax credit allocation formula, permitting a bigger tax credit for projects with a mission to house poorer people.[71]

C. Reserves and Project Performance

Budgeting for regular deposits into reserve accounts is just as essential to long term project stability as using realistic income and expense projections, and sustainable debt. Although the tax credit program is almost fifteen years old, there remain important questions about the preparedness of LITHC projects to either 1) cover unanticipated increases in operating expenses and/or shortfalls in revenues; or 2) make substantial capital infusions from replacement reserves for improvements and system replacements. In this subsection we address three questions as they pertain to projects in our data set:

- To what degree is a project's financial condition related to its ability to maintain adequate reserve levels?
- What effect do high vacancy rates have on replacement reserves?
- What are the implications of low or non-existent replacement reserve levels for housing quality and long-term sustainability?

Reserves and Project Condition

About 54 percent of the family and senior projects in our data set have replacement reserves and 22 percent have operating reserves.[72] There is a wide variation in reserve levels even among projects with reserves, with replacement reserves ranging from $10 per unit to $4,524 per unit, and operating reserves ranging from $28 per unit to $3,012 per unit.[73]

Generally, troubled family and senior properties in our data set are substantially less well off than healthy projects when it comes to both replacement and operating reserves. Operating reserves among troubled projects represent about 4 percent of total operating costs, compared to 15 percent for healthy projects. And 88 percent of troubled projects (compared to approximately 55 percent of the healthy projects) reported having no operating reserves at all.[74] Lack of operating reserves among financially troubled projects is largely a function of age.[75] Troubled projects make up three quarters (75 percent) of the developments placed in service before 1990, none of which reported having any operating reserves in their accounts. Some have suggested that reserve structures can be used to mitigate cash flow difficulties among

[70] Michael Stegman, "Comment on Jean L. Cummings and Denise DiPasquale's 'The Low Income Housing Tax Credit: An Analysis of the First Ten Years': Lifting the Veil of Ignorance," *Housing Policy* Debate (1998), p. 327.
[71] Ibid., p. 331.
[72] These percentages are based on 93 total observations.
[73] These are amounts in reserve accounts as of Dec. 31, 1998.
[74] Chi-Square indicates that this relationship between project condition and operating reserves is significant at the .05 level.
[75] ANOVA indicates that age has an independent effect on operating reserves controlling for cash flow and based on a .01 significance level.

LIHTC projects.[76] It is evident that this is not an option for most financially troubled projects in our data set, since they apparently have either spent their reserves or never had them in the first place.[77]

Funding of replacement reserves at adequate levels is another critical issue facing projects in our data set. In the short term a project may be able to get by with substandard replacement reserve levels. But no project can escape the march of time and the daily wear-and-tear on items such roofs, boilers, and kitchen appliances. Unfortunately, most troubled projects in our data set are critically lacking in their ability to make significant infusions of capital for repairs and replacements that are unaccounted for in the operating budget. Table 23 indicates that average per unit replacement reserves are relatively high for both moderately and severely troubled projects in our data set. But this is largely due to the fact that a small minority of projects with negative cash flows had very high replacement reserve levels. Most troubled projects had little or no replacement reserves. Only 47 percent of moderately troubled projects and 37 percent of the severely troubled projects in our data set reported having any replacement reserves in their accounts. And just 36 of all troubled projects had replacement reserves of at least $300 per unit. By contrast, 71 percent of healthy projects had at least some replacement reserves, and 53 percent had replacement reserve levels of $300 per unit or more.[78]

Table 23. Reserves and Project Condition

	Replacement Reserves		Operating Reserves	
	Percent With Reserves	***Average Amount***	***Percent With Reserves***	***Average Amount***
Healthy	71%	$614.40	44.7%	$556.08
Moderately Troubled	46.9%	$534.72	11.8%	$129.84
Severely Troubled	37%	$298.20	14.2%	$206.88

Notes: SROs excluded. Average reserve amounts include projects with no reserves.

Replacement Reserve and Vacancy Rates

Among projects in our data set, there is a strong association between lower replacement reserves and high vacancy rates.[79] Table 24 shows that projects with vacancy rates of over 8 percent have substantially lower per unit replacement reserve levels on average and are less likely to have replacement reserves at all, than projects with lower vacancy rates.[80] High vacancy losses increase the pressure on managers to either postpone planned deposits into reserve funds or draw down existing reserves. This is particularly true of financially troubled projects, which
are much more likely than healthy projects to have high vacancy rates.[81] Only about 22 percent of all troubled projects with high vacancy rates have any replacement reserves, and just 16.7 percent have replacement reserves of at least $300 per unit.

[76] Roberts and Harvey, op. cit., p. 312.
[77] Earlier LIHTC projects were expected to fund operating reserves out of their cash flows. This obviously contributed to inadequate operating reserve levels among many of these projects.
[78] Chi-Square indicates that this relationship between project condition and replacement reserves is significant at the .05 and .10 levels.
[79] Based on Pearson correlation coefficient and a .05 significance level.
[80] These relationships are significant based on Chi-Square and ANOVA and a .01 significance level.
[81] About 71.4 percent of severely troubled projects and 52.8 percent of moderately troubled projects compared to 24.4 percent of healthy projects have vacancy rates of over 8 percent. Chi-Square indicates that this relationship between vacancy rates and project condition is significant at the .01 level.

Table 24. Vacancy Rates and Replacement Reserves

	Vacancy Rates <=8%		Vacancy Rates >8%	
	Percent With Reserves	***Average Reserves***	***Percent With Reserves***	***Average Reserves***
Healthy	80%	$683.28	37.5%	$329.44
Moderately Troubled	64.3%	$906.72	27.7%	$245.28
Severely Troubled	87.5%	$776.76	15.8%	$96.72

Notes: SROs have been excluded. Average reserve amounts include projects with no reserves.

Replacement Reserves, Age, and Project Sustainability

When replacement reserves are too low or non-existent, then preventive maintenance and repairs, which over time could increase occupancy levels or slow the rise in operating costs, cannot be made. This can lead to even further problems down the road as buildings physically deteriorate and units become progressively less attractive to tenants. In our data set, aging (pre-1990) projects with severe cash flow difficulties and no replacement reserves have an average vacancy rate of over 25 percent and an average maintenance cost of almost $190/unit. For these projects in particular, an inability to fund replacement reserves appears to be linked with a cycle of vacancy losses and accelerating maintenance expenses that threatens their long-term physical and financial viability.

Conclusions and Recommendations

Replacement and operating reserves are essential to a building's ability to make regular systems replacements and to absorb the cost of unexpected ones. Yet 44% of the projects in our data set have no replacement reserves and 73% have no operating reserves. Properties with negative cash flows are even less likely to have reserves—which suggests the obvious, that budget deficits get in the way of their ability to make deposits into their reserve accounts.

Without reserves, buildings are more vulnerable to slip into a cycle of deferred maintenance, rising vacancy rates, and higher operating costs in the future. In fact, we found a strong association between lower replacement reserves and high vacancy rates and skyrocketing maintenance costs in older projects: ageing projects with severe cash flow problems and no replacement reserves also have vacancy rates of 25% and maintenance costs of $190 per unit.

Based on these findings, we recommend that public debt should amortize only after reserves are fully funded. We should also be aware that substantial resources may be required for funding the reserves of aging projects.

IV. Factors Impacting Project Performance: Property Management and Ownership

In this section we investigate on the extent to which revenues and operating expenses vary with differences in management style and ownership, including in house vs. contracted management, utilities, for profit vs. non profit ownership, payment of utilities and property tax status.

A. In House vs. Contracted Management

A recent national survey of property owners of tax credit properties found that seven of every ten properties are managed by the general partner, with for-profit businesses somewhat more likely than nonprofits to manage their own properties.[82] Among projects in our data set for which we have information,[83] 78 percent are managed by the general partner, with 84.4 percent of for-profit owners, compared to 60.8 percent of nonprofit owners, managing their own properties. Table 25 shows that management style also varies with the size and type of the property among projects in our data set. SROs and small-to-medium size family and senior projects are somewhat more likely to be characterized by in-house as opposed to contracted management styles. The number of units owned by the general partner is often a basis for evaluating property management operations. Projects with too few units may not be able to financially support or attract a reputable property management firm, while larger multifamily complexes—typically those with 50 or more units—can benefit from a management company on site.

Table 25. Property Management Style and Project Size/Type.

	Project Type		Project Size (non-SRO)		
	SRO	***Non-SRO***	***Large (100+)***	***Medium (40-99)***	***Small (<40)***
In-house	92.3% (12)	76% (76)	48.3% (14)	87.8% (36)	74.3% (26)
Contracted	7.7% (1)	24% (24)	41.7% (10)	22.2% (5)	25.7% (9)

Note: SROs have been excluded

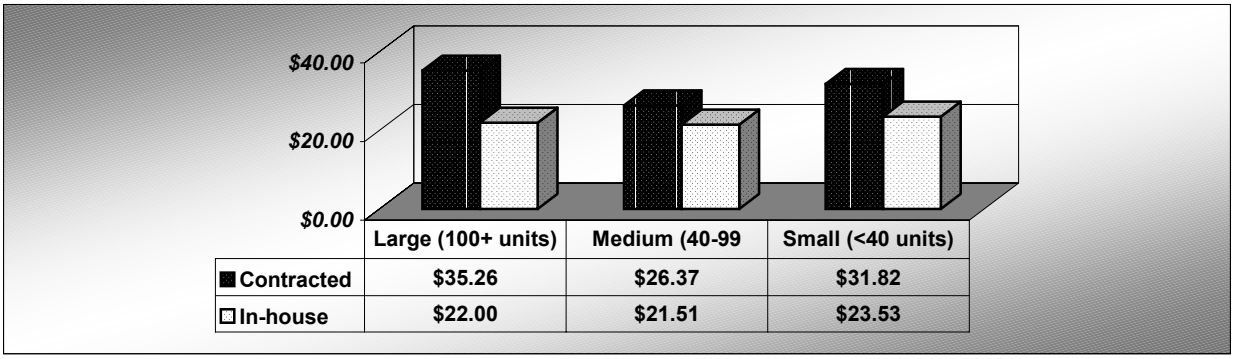
Our data suggests several conclusions with respect to the relationship between property management, project design, and the performance of LIHTC projects in our data set:

- *Contracted management can be significantly more costly for LIHTC projects and consumes a higher percentage of effective gross income than in-house management*.[84] This disparity in costs between management styles is greatest for large projects of at least 100 units, with projects that contract with a management agent paying 60 percent more per unit on average in management fees than projects whose management operations are in-house. But the percentage of collected rent that is consumed by the management fees is the highest (6.2

[82] Urban Institute, *The Low-Income Housing Tax Credit Program: A National Survey of Property Owners* (October, 1999), p. 28.
[83] These percentages are based on 100 total observations.
[84] A difference of means "*t* test" indicates that the difference in average management fees per unit between contracted management and in-house management styles is significant at the .01 level.

percent) for projects of less than 40 units that contract for management services, suggesting that the contracted management style is the least cost efficient for small projects.

Figure 3. Average Monthly Management Fees Per Unit, Project Size & Management Style



	Large (100+ units)	Medium (40-99	Small (<40 units)
Contracted	$35.26	$26.37	$31.82
In-house	$22.00	$21.51	$23.53

Note: SROs have been excluded

- *Project size is related to the ability of LIHTC projects to cover the costs of management operations, particularly for projects with an operating deficit.* On average, the management fees among large tax credit projects are twice as large as those of mid-size projects and over 4 ½ times as large as those of small projects in our data set. With this difference, larger projects can hire better-trained and more specialized staff.[85] Small-to midsize projects with negative cash flows may be particularly limited in their ability to cover the salaries of needed staff. As table 26 shows, these projects have significantly lower property management fees on average than similar size projects with positive cash flows. On average, the total annual property management fee is about 72 percent lower among small-to-midsize projects that are financially troubled as compared to small-to-midsize projects that are financially healthy. These lower property management fees may limit the ability of property managers to over-see their project's day-to-day activities.[86]

[85] Cf. Bratt, et. al., op. cit., p. 45.

[86] The Pearson Correlation Coefficient indicates that the correlation between project cash flow and management fees is significant at the .01 level. ANOVA indicates that management fees both influence and are influenced by a projects financial condition, based on a .05 significance level and controlling for project age and size.

Table 26. Property Management Fees by Projects Size and Condition

		Monthly Per Unit Property Management Fee	Total Annual Property Management Fee
Large (100+ units)	***Financially Healthy***	$28.76	$36,788
	Financially Troubled	$28.62	$53,781
Medium (40-99 units)	***Financially Healthy***	$31.24	$24,805
	Financially Troubled	$18.89	$14,375
Small (<40 units)	***Financially Healthy***	$31.44	$12,521
	Financially Troubled	$24.83	$8,908

Note: SRO projects have been excluded

- *On the whole, projects with multiple buildings are more costly to manage than single building projects.* As table 27 indicates, projects consisting of multiple buildings have higher monthly per unit and total annual management fees than single building projects, regardless of project size.[87] This is understandable, given the increased time spent in traveling between and overseeing several entrances (and other systems) of projects with more than one building.[88] Our data indicates that the disparities in management fees between multiple building and single building projects are the greatest for large and small projects in our data set.

Table 27. Property Management Fees by Project Size and Number of Buildings

		Monthly Per Unit Property Management Fee	Total Annual Property Management Fee
Large (100+ units)	***Multiple Buildings***	$32.57	$64,728
	Single Building	$24.15	$26,939
Medium (40-99 units)	***Multiple Buildings***	$25.15	$18,195
	Single Building	$21.04	$14,383
Small (<40 units)	***Multiple Buildings***	$34.66	$12,856
	Single Building	$21.04	$7,684

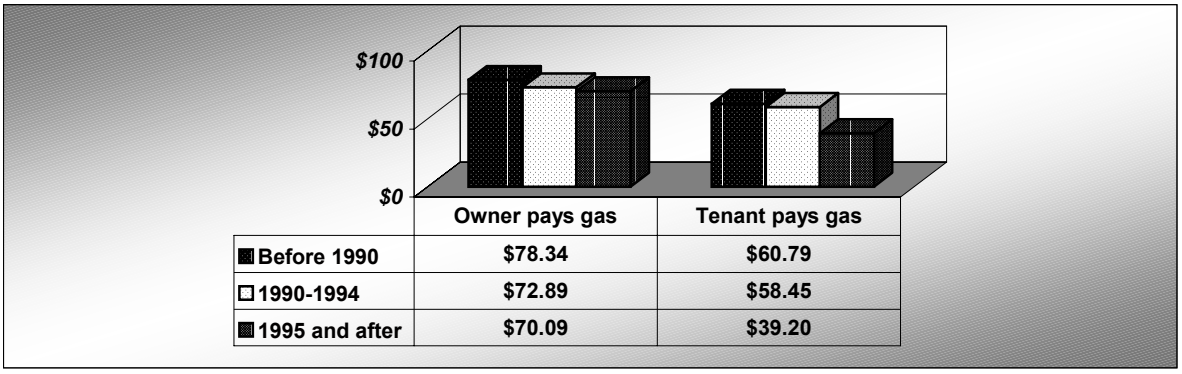
Note: SROs have been excluded

[87] Based on ANOVA, the number of buildings has as an independent effect on management fees based upon a significance level of .05 and controlling for project size.
[88] Cf. Rachael Bratt, et. al., "The Status of Nonprofit-Owned Affordable Housing; Short-Term Successes and Long-Term Challenges," *APA Journal* (Winter 1998), p,. 45.

B. Utility Costs

In our breakdown of expenses we found that utility costs typically make up about 17 percent of the total per unit operating expenses of family and senior projects in our data set. To get a further sense of factors that influence utility costs in these projects we compared LIHTC projects based on the method of utility payments. Since an apartment's heating and gas bill comprises the largest utility cost, we distinguished between projects where the owner pays this part of utility costs and those projects that pass this particular expense on to the tenant. The per unit utility costs of projects where the owner pays an apartment's gas bill are typically about $19.27 (or 35.2 percent) more than those of projects that require the tenant to pay this utility expense. However, as figure 4 shows, newer (post 1994) projects in which tenants pay their apartment's gas bill achieve the greatest savings overall.[89]

Figure 4. Average Monthly Utility Costs Per Unit by Age and Method of Utility Payment



	Owner pays gas	Tenant pays gas
Before 1990	$78.34	$60.79
1990-1994	$72.89	$58.45
1995 and after	$70.09	$39.20

Note: SROs have been excluded

C. Nonprofit vs. For-Profit Ownership

Previous studies have raised the question of whether nonprofit tax credit projects have higher operating costs and greater inefficiencies than tax credit projects developed by for-profit developers. [90] To determine if this is indeed the case, we addressed three questions:

- Are there significant differences in key indicators of project performance between for-profit and nonprofit sponsored projects, and do projects developed by nonprofits cost significantly more to operate than those developed by for-profit developers?
- Do nonprofit projects differ from for-profit projects in relevant characteristics such as average age, project size, or size of units?
- Are nonprofit developments more often located in difficult development areas—that is, neighborhoods characterized by lack of economic development, or high poverty and unemployment rates?

It should be pointed out that we have not examined other areas where there may be important differences between for-profit and nonprofit developers. For example, we do not have sufficient data to compare developers in terms of the amount of support services they provide, or

[89] We could not determine from our data why projects in which tenants pay the gas bill do not achieve a greater savings in their utility bills overall, or why older projects achieve must less savings than newer projects.

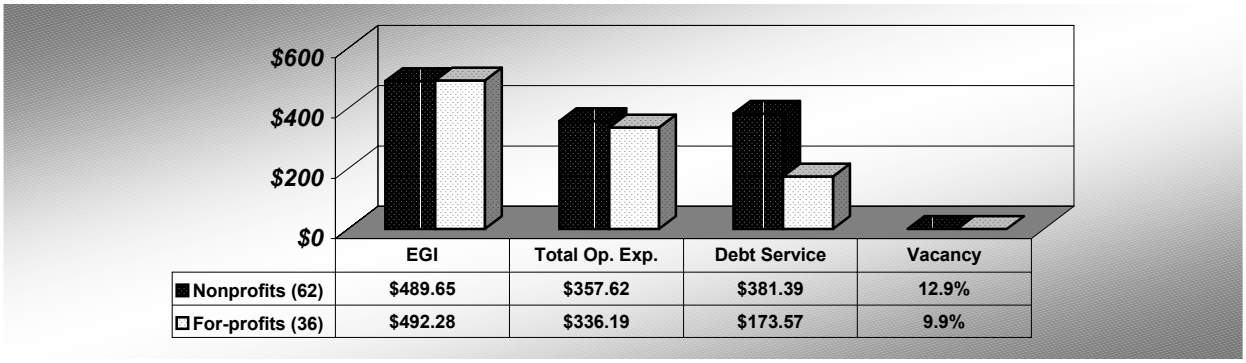
[90] Cf. Cummings and DiPasqualee, op.cit., pp. 263-4 and 319.

extensiveness of rehabilitation of existing housing—two factors that obviously have an impact on operating expenses, but do not show up in annual financial audits.

Comparison of Performance Measures

On virtually all measures of overall performance,[91] nonprofit family developments in our data set appear to be as cost efficient and effective as their for-profit counterparts.[92] As figure 5 shows, nonprofits in our data set have slightly higher vacancy rates and a higher debt service burden than for-profit developments. But these differences are not statistically significant. While nonprofit sponsored projects in our data set are somewhat more costly to run overall, this difference in total operating expenses is largely due to the fact that the typical housing unit in nonprofit developments is about 24 percent larger on average than that of for-profit developments.[93]

Figure 5. Performance of For-profit and Nonprofit Developments



	EGI	Total Op. Exp.	Debt Service	Vacancy
Nonprofits (62)	$489.65	$357.62	$381.39	12.9%
For-profits (36)	$492.28	$336.19	$173.57	9.9%

Note: Figures are for family projects

The only expense categories with statistically significant differences in averages between nonprofits and for-profits are property insurance and marketing and leasing. (See table 3 in appendix A) While nonprofits spend about 27 percent more on property insurance, for-profit developers spend about two-and-one-half times more per unit on marketing and leasing. The difference in marketing and leasing expenses might be explained by the fact that nonprofit developers tend to rely more on word of mouth and various community connections in advertising their units than do their for-profit counterparts. However, our research data does not allow us to make any definitive statements as to how these differences arise.

As figure 6 indicates, nonprofits do receive higher average rental subsidies per unit. The average monthly rental subsidy is about $166 per unit for family nonprofit developments while for-profit sponsored projects receive an average rental subsidy of about $79 per unit. This difference in averages is statistically significant. While replacement reserve levels are virtually identical, there is also a significant difference in operating reserves between for-profits and

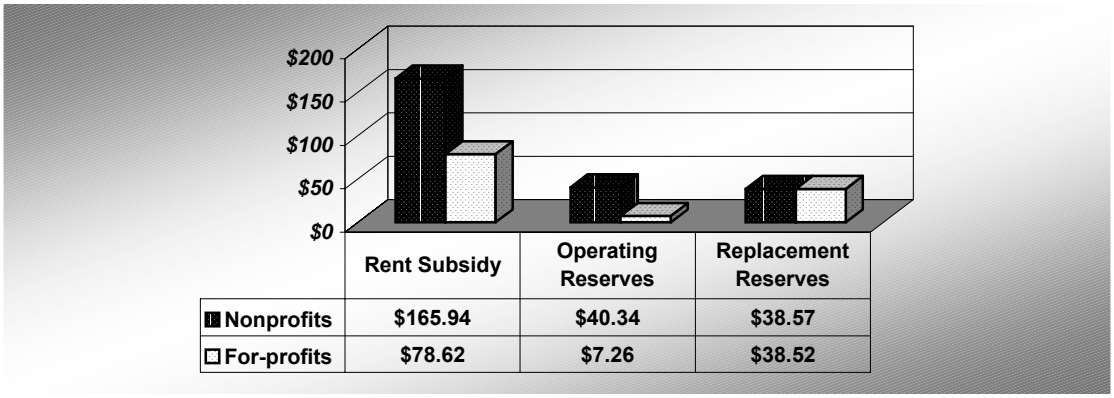
[91] There are 30 projects in our dataset where control of the property has been transferred from the original developer to a new general partner. In these cases, comparisons were made on the basis of the whether the original developer was a nonprofit or for-profit entity. However, this information was not available for 5 projects in our data set.

[92] In our comparison of averages we have, again, looked only at family projects.

[93] This calculation is based on average number of bedrooms not square footage. Based on ANOVA, unit size has an independent effect on total operating expenses at the .05 level controlling for project ownership.

nonprofits, with nonprofits having an average operating reserve level of about $484/unit compared to about $87/unit among for-profit developers.[94]

Figure 6. Nonprofits and For-profits: Average Subsidies and Reserves per Unit



Note: Figures are for family projects. Averages are calculated on a per month basis.

Differences in Project Characteristics

Some have suggested that for-profit developers tend to produce larger projects than nonprofit developers and that this may contribute to lower per unit costs.[95] However, there is little indication from our data that the projects developed by nonprofits are significantly smaller on average than those developed by for-profit developers. The average project size among nonprofit sponsored projects is 67 units, compared to an average of 78 units among projects developed by for-profits. This difference in averages is not statistically significant. Looking only at family projects, the average project size among nonprofits (61.5 units) is only slightly lower than that of for-profit developers (69.7 units).[96] As table 28 shows, the proportionate distribution of large, medium, and small sized projects among nonprofits is also comparable to that of for-profits.

Table 28. Percentage of Projects of Different Size Developed by For-profits and Nonprofits

Developer Status	Project Size		
	Large (100+ Units)	***Medium (40 to 99 Units)***	***Small (Less than 40 Units)***
Nonprofit	25.8%	34%	40.2%
For-profit	22.2%	47.2%	30.6%

Note: Figures are for family projects

There remain the questions of whether nonprofit and for-profit developments differ significantly in age or average unit size. Overall, they are similar in age. In 1998, the average age of nonprofit sponsored family and senior projects was 6.9 years, compared to an average age of 6.1 years among for-profit projects. This difference is not statistically significant. There are,

[94] These are the total amounts per unit in reserve accounts as of December 31, 1998. Based on a difference of means "*t* test," the differences in average subsidies and operating reserves per unit between for-profit and nonprofit developments are significant at the .05 level.

[95] Bratt et. al., op.cit., p. 263.

[96] There is a significant difference in size between for-profit and nonprofit SRO projects. SROs developed by for-profits have an average size of 160 units compared to an average size of 90.1 units for nonprofit sponsored SROs.

however, significant differences in the average number of bedrooms, as table 29 indicates. While virtually identical in the average percentage of two bedroom units, nonprofit developments have a higher concentration of units with 3 or more bedrooms, while for profit developments have a higher percentage of studio and 1-bedroom units. Looking only at family projects, nonprofit developments have an average unit size of 1.98, compared to an average unit size of 1.6 among for-profit developments.[97] As we have noted, this difference in average unit size largely explains the relatively higher average operating costs among nonprofit sponsored projects in our data set.

Table 29. For-Profit/Nonprofit Projects and Number of Bedrooms

Developer	SRO	Studio	1 Bdrm	2 Bdrm	3 Bdrm	4 & 5 Brdrm
Nonprofit	16.4%	11.7%	20.5%	29.9%	18.6%	4%
For-profit	8.7%	25.7%	24.2%	30.4%	10.3%	1%

Location of Nonprofit and For-profit Developments

Nonprofit and for-profit developers in our data set differ somewhat in the proportion of units that are located in communities with a high percentage of extremely low-income households, lower property values, and/or moderate to high unemployment rates. Approximately 60 percent of nonprofit, compared to 50 percent of for-profit, family developments are located in communities where at least 40 percent of the households earn less than 30 percent of AMI, and might therefore be classified as high poverty areas.[98] And about two-thirds (67 percent) of nonprofit sponsored developments, compared to 51 percent of for-profit sponsored projects, are located in neighborhoods with average property values of less than $130,000. For-profit sponsored family projects in our data set are also more likely to be found in areas with low unemployment rates while a higher percent of nonprofit development projects are located in communities with moderate to high unemployment rates, as table 30 shows.[99] While we cannot say definitively that these differences among projects in our data set are indicative of all tax credit properties, these findings coincide with other research that suggests that nonprofit developers are more commonly found in poorer neighborhoods.[100]

Table 30. Distribution of Nonprofits/For-profits by Level of Unemployment

Unemployment Rate	Low (<6%)	Moderate (6% to 8.9%)	High (9%+)
Nonprofit	9.7%	21%	69.3%
For-profit	17.6%	14.7%	67.7%

Notes: Figures are for family projects. *Source:* 1990 U.S. Census

[97] Based on a difference of means "*t* test" this difference in average unit size between nonprofit and for-profit developments is significant at the .10 level.

[98] Based on 1998 estimates of Applied Real Estatae Analysis (AREA), Inc., City of Chicago Department of Planning and Development.

[99] Looking at all projects, about 64.4 percent of nonprofit compared to 53.5 percent of for-profits are located in high poverty areas, 60 percent of nonprofits and 51 percent of for profits are located in communities with lower property values, and 90.5 percent of nonprofits compared to 81 percent of for-profits are located in neighborhoods with moderate to high unemployment rates.

[100] Cf. Roberts and Harvey, op.cit., p. 317.

D. Property Taxes, Class 9, and Sustainability

Concern over the impact of property tax burdens on LIHTC projects, and the importance of "tax fairness" in the context of affordable housing, prompted us to look at the effect of Cook County's Class 9 program on projects in our data set. Class 9 is a property tax incentive program for affordable rental housing that is unique to Cook County. Property taxes are a particular burden in Illinois because the state relies upon this particular tax as the primary source of funding for education and municipal services. Thus property taxes are often one of the largest operating expenses borne by multifamily rental buildings. The Class 9 program reduces the multiplier applied by the county assessor to the market value of real property in order to arrive at the assessed value.

We wanted to know if Class 9 status is having the intended effect of significantly reducing the real estate tax burden for affordable housing developments, and whether this effect is uniform across all projects in our data set. We also wanted to assess the relative importance of Class 9 status and a project's real estate tax burden for its overall financial stability. To answer these questions we compared the performance of LIHTC projects with and without Class 9 status, accounting for other variables that might have some bearing on its effectiveness in individual instances. Three questions are addressed:

- Are there significant differences in average income and expenses between Class 9 and non-Class 9 projects?
- Do the effects of Class 9 vary with differences in location or project characteristics?
- Calculated as a percentage of effective gross income (EGI), how much "savings" do projects with Class 9 status achieve in comparison with non-Class 9 projects?

Comparison of Overall Performance

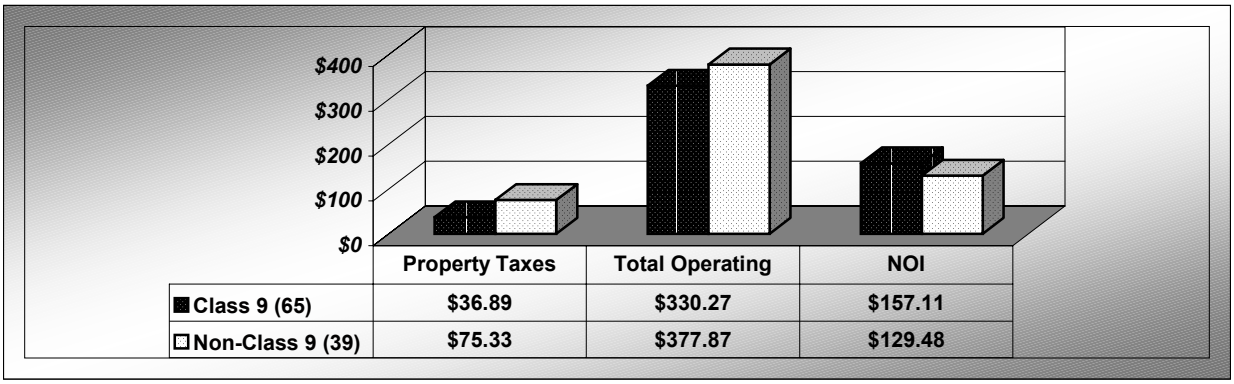
Our analysis demonstrates the significance of Class 9 status for Chicago's LIHTC projects. A comparison of average tax liability, total operating expenses, and net operating income based on tax status reveals that LIHTC projects with Class 9 status fare better, on the whole, than those without Class 9 status. Average property taxes and total operating expenses are significantly lower, and net operating income[101] is higher, among projects with Class 9 status.

Figure 7 shows Class 9 reduces property tax cost by over 50 percent among projects in our data set. The average monthly property tax rate of $36.89 per unit for non-SRO projects with Class 9 status is $38.44 per unit less than the average real estate tax burden of $75.33 per unit among non-Class 9 properties. For the data set as a whole, projects with Class 9 status also have average total operating expense that is $47.60 per unit or 12.6 percent lower than that of projects without Class 9 status. And projects with Class 9 also have a monthly per unit NOI that is $27.67 per unit or 21.4 percent higher on average than that of non-Class 9 projects in our data set[102].

[101] The net operating income (NOI) is the balance of revenues after operating expenses but before total debt service.

[102] The difference of means "*t* test" indicates that the differences in averages for property taxes and total operating expenses are statistically significant at the .05 level.

Figure 7. Comparison of Averages for Class 9 and Non-Class 9 Projects



	Property Taxes	Total Operating	NOI
Class 9 (65)	$36.89	$330.27	$157.11
Non-Class 9 (39)	$75.33	$377.87	$129.48

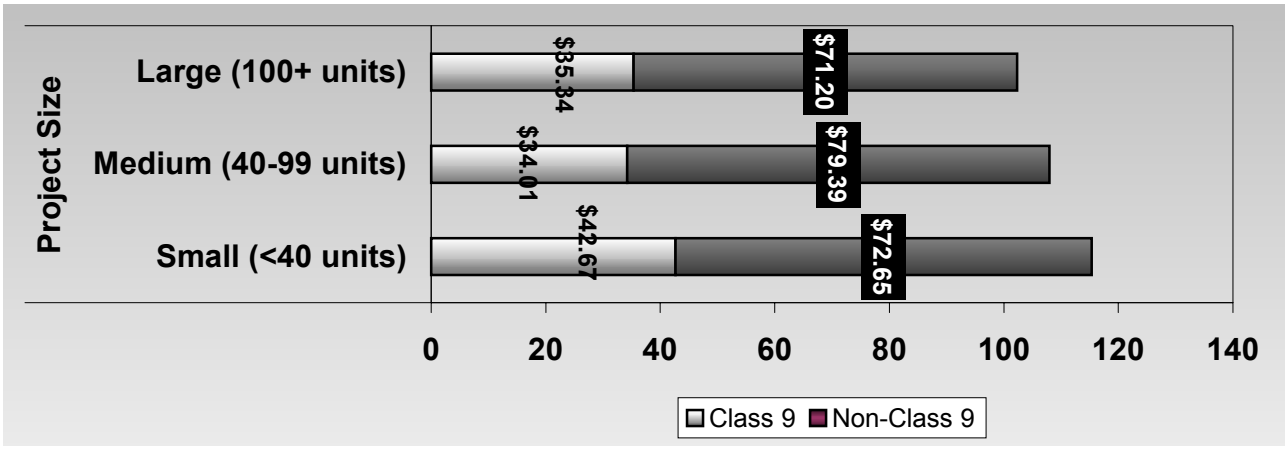
Note: SROs have been excluded

These statistics do not necessarily mean that all tax credit projects benefit equally from Class 9 status or that Class 9 status translates into better performance in every case, however. In the following sections we consider the effect of Class 9 on project performance and overall project sustainability, controlling for other variables that may intervene to enhance or limit its benefits in individual cases.

Class 9, Location, and Project Characteristics

When we controlled for project size and age we found that Class 9 consistently results in lower property taxes for qualifying LIHTC housing projects. We estimate that 38-42 percent of the total differences in property taxes among LIHTC projects in our data set can be explained by the presence or absence of Class 9 after accounting for the effects of these other variables.[103] However, as figures 8 and 9 show, there are some disparities in the size of the reduction in property taxes achieved among projects in our data set. Figure 8 indicates that, on the whole, small to mid-size projects tend to pay higher taxes per unit than large LIHTC projects. And small projects with Class 9 status pay higher taxes than larger LIHTC projects with the same tax status. However, since these differences in averages between projects in our data set are not statistically significant they are not necessarily indicative of all tax credit projects.[104]

Figure 8. Class 9, Property Taxes, and Project Size



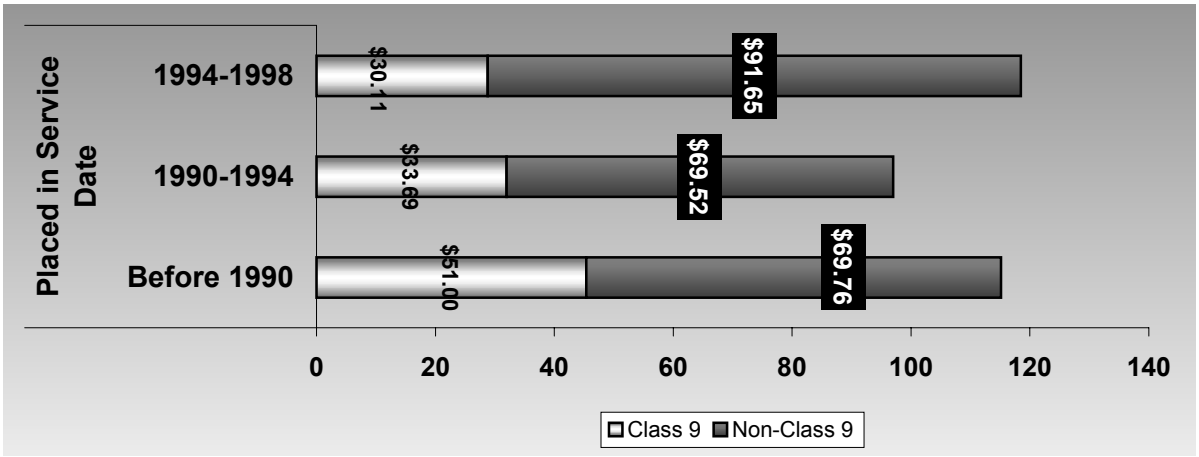
Note: SROs have been excluded

[103] Based on ANOVA and significance level of .05

[104] A difference of means "*t* test" did not show these differences in averages to be statistically significant at the .05 level. ANOVA does not indicate a significant "interaction" between tax status and project size.

Figure 9 shows that the amount of change in average property tax liability that accompanies Class 9 status varies the most with the age of the project, the estimated benefits of Class 9 being the lowest for projects placed in service before 1990 and the highest for LIHTC projects that were placed in service after 1995. LIHTC projects with Class 9 status that were placed in service before 1990 still face an average property tax burden of $51 per unit compared to an average property tax of $30.11 per unit among those with a placed in service date of 1995 or later. On the other hand, newer non-Class 9 projects that were placed in service after 1994 also have an average tax rate that is higher than that of older LIHTC projects. Class 9 is therefore the most effective—that is, realizes the greatest cost savings—for newer projects. Taxes on new Class 9 projects represent a savings of 67.1 percent over comparable non-Class 9 projects, while older projects realized a relative savings of 26.9 percent.[105]

Figure 9. Class 9 Status and Property Taxes by Date Placed in Service*



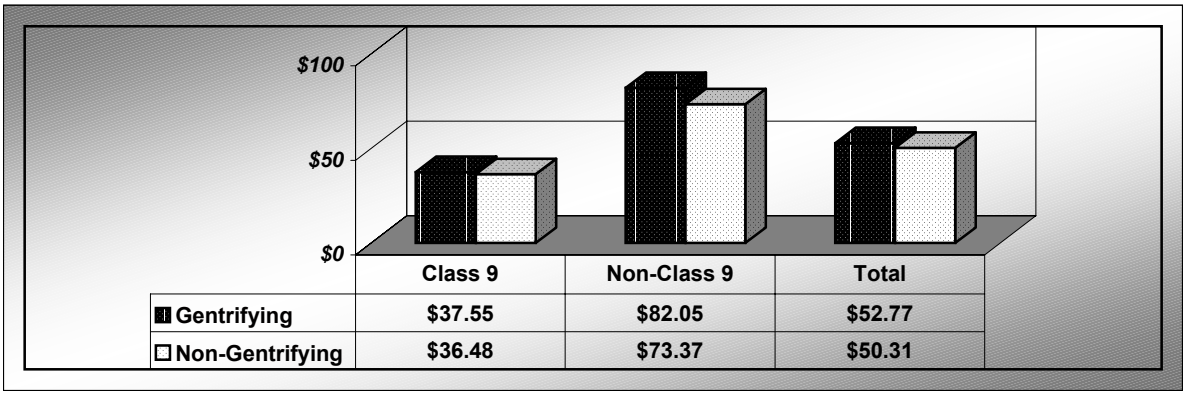
Note: SROs have been excluded

Class 9 and LIHTC Projects in Gentrifying Neighborhoods

Overall, we found little difference in average property tax rates between LIHTC projects located in gentrifying and non-gentrifying communities. This reflects the practice of the Cook County Assessor's Practice of reaching a tax valuation based on income generated rather than the costs of constructing the building. Of equal importance is our finding that the average savings generated by Class 9 status are about the same for LIHTC projects in gentrifying communities as for those located in non-revitalizing, low-to-moderate income communities. In both cases, as figure 10 shows, Class 9 reduces a project's property tax liability by about half.

[105] ANOVA indicates that there is as significant "interaction effect" between age and tax status based upon a significance level of .05, indicating that the influence of Class 9 status on property taxes varies considerably with the age of the project.

Figure 10. Class 9 and Property Taxes in Gentrifying and Non-Gentrifying Areas*



	Class 9	Non-Class 9	Total
Gentrifying	$37.55	$82.05	$52.77
Non-Gentrifying	$36.48	$73.37	$50.31

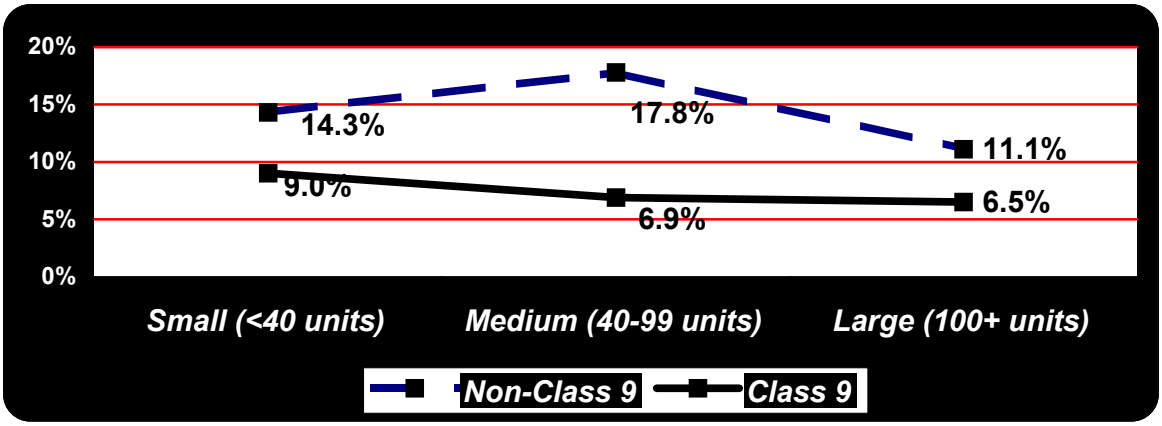
Note: SROs have been excluded

Property Taxes, Class 9, and Income

Within our data set, property taxes make up an average of 9.7 percent of a LIHTC project's effective gross income (EGI). But this percentage varies significantly depending upon a building's tax status. Real estate taxes comprise 7.4 percent of EGI among projects with Class 9 status, compared to 14.9 percent for non-Class 9 buildings. This obviously represents a significant savings overall for LIHTC projects, many of which are tightly run, with operating revenues barely covering operating expenses.

For Class 9 as well as non-Class 9 LIHTC projects in our data set, the percentage of effective gross income that is consumed by property tax tends to vary with differences in project size and age.[106] Figure 11 shows the relative importance of the property tax as a percentage of effective gross income based on tax status and the size of the LIHTC project. On average, the effect of Class 9 on property taxes as a percentage of EGI is the greatest for mid-size projects and less pronounced for small projects of less than 40 units.

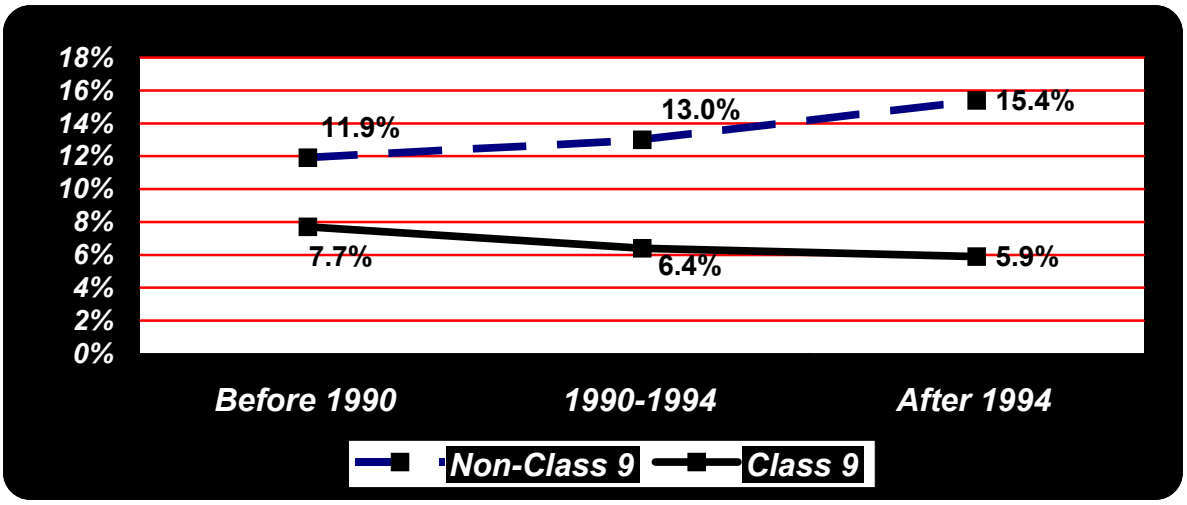
Figure 11. Property Tax as a Percentage of EGI by Tax Status & Project Size



[106] These differences between projects of different size and age remain even if we exclude SROs. Among non-SRO projects, the percentage of EGI consumed by property taxes is 12.2 percent for non-Class 9 and 6.6 percent for Class 9 projects of at least 100 units; 16.7 percent for non-Class 9 and 7.3 percent for Class 9 project with between 40 and 99 units; and 14.3 percent for non-Class 9 and 9 percent for Class 9 projects with less than 40 units. The portions of EGI consumed by property taxes for non-Class 9 and Class-9 non-SRO projects of different ages are 14.4 percent and 7.6 percent among pre-1990 projects; 14.6 percent and 7.3 percent for projects placed in service between 1990and 1994; and 16.1 percent and 6.7 percent for projects placed in service after 1994.

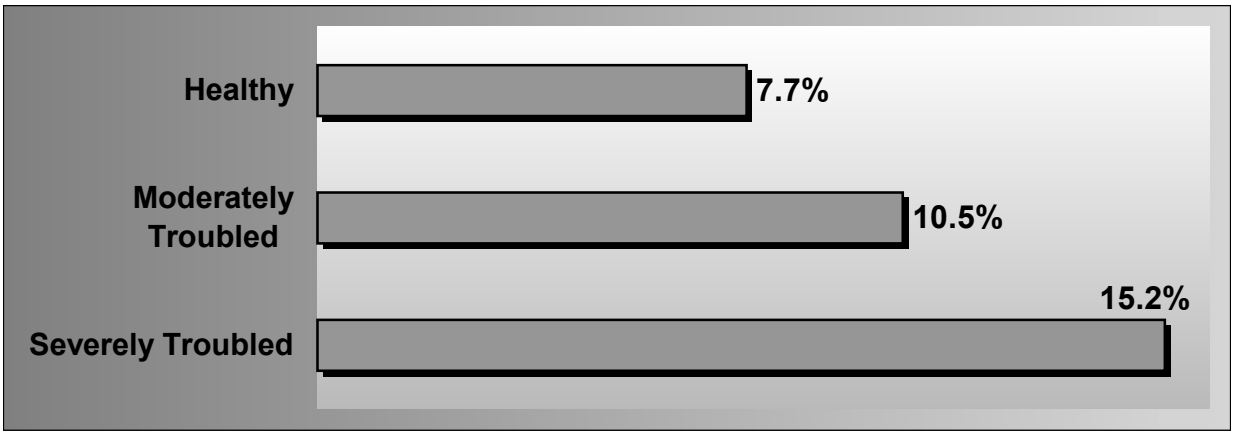
As we have previously discussed, however, age appears to be more significant than project size in moderating the positive effects of Class 9 status. As figure 12 indicates, the relative benefit of Class 9 is least pronounced for projects placed in service before 1990 and the greatest for projects with a placed in service date of 1995 or later. The percentage of effective gross income consumed by property taxes is only about 4 percent less for aging Class 9 projects when compared to non-Class 9 projects in the same age category. By contrast, new Class 9 projects spend 9.5 percent less of their EGI on property taxes as compared to new projects without Class 9.

Figure 12. Property Taxes as a Percentage of EGI by Tax Status and Age



The significance of property taxes for overall project sustainability becomes apparent when we property taxes as a percentage of effective gross income (EGI) among severely troubled, moderately troubled, and healthy projects in our data set. On the whole, troubled projects pay higher taxes that consume a higher percentage of effective gross income than healthy projects. This is particularly true of severely troubled projects. As figure 13 shows these projects have a property tax burden as a percentage of EGI that is about twice as high (15.2 percent) as that of healthy projects (7.7 percent).

Figure 13. Average Property Taxes per Unit as Percentage of Effective Gross Income



E. Conclusions and Recommendations

Our data indicates that a project's financial condition is strongly related to its ability to keep management fees at a sufficient level to cover the costs of qualified on-site personnel and services. This indicates that and fees for property management should be realistically factored into the operating budget to ensure that management quality is adequate to meet the long-term needs and goals of the project.

Contrary to assumptions that nonprofit sponsored developments may be less cost effective than for-profit developments, we found no significant differences in operating efficiencies between nonprofit and for-profit controlled projects in key areas such as vacancy rates, effective gross income, or total operating expenses. Location, age, taxes, debt service, and lack of rental subsidies all have a greater bearing on a project's health than ownership status. The fact that nonprofit and for-profit owners appear equally likely to build successful, or troubled, projects warrants placing a priority on retaining non profit general partners – with their community and mission driven orientation – in the event of restructuring.

Property tax is one of the largest expense items within budgets of multi-family rental properties. We found that on average, Cook County's Class 9 program helped projects in our data set achieve a 51 percent reduction in property taxes when compared with non-Class 9 properties. The overall effectiveness of the program argues for the use of Class 9 whenever and wherever possible. The recent expansion of Class 9 into all parts of Cook County is certainly a step in the right direction. Class 9 should be mandated for all future projects. And current LIHTC projects without Class 9 status should consider rehab, which would make them eligible for that status, as part of any restructuring.

V. The Influence of Community Characteristics on Income/Expenses

The characteristics of the neighborhoods in which LIHTC projects are located cannot be ignored when operating budgets are negotiated. But how much effect do neighborhood characteristics have on project performance? And what specific income and expense categories are most influenced by these factors? In this section we examine the possible effects of poverty/unemployment and property values on project revenues and operating expenses.[107] Since family projects significantly differ from both SRO and senior developments in a number of expense categories, such as administration, maintenance, and property insurance, we looked at the effect of community characteristics only on family projects in our data set.

We began with a number of hypotheses. For example, we expected that family LIHTC projects in communities with rising or higher property values would have lower vacancy rates and lower operating expenses. Conversely, we expected that higher unemployment and/or poverty rates would contribute to lower income, due to higher vacancy rates and increased bad debt, and to higher operating costs in categories such as security, utilities, and maintenance.

To test these hypotheses, we compared average project cash flows between neighborhoods with different social or economic characteristics. Accounting for differences in project characteristics, we also examined the relationships between particular aspects of project performance and specific "indicators" of social/economic well being and change in Chicago's neighborhoods. We supplemented unemployment information from the 1990 census with 1998 estimates of households earning less than 30 percent of median income for the Primary Metropolitan Statistical Area (PMSA) and percent changes in total employment by ZIP Code between 1994 and 1998.[108] We also looked at 1998 median housing costs and the percent change in housing costs between 1993 and 1999.[109]

A. Property Values and Income/Expenses

To make project comparisons based on the property values of the neighborhoods in which they are located, we used two benchmarks: 1.) the 1998 median housing cost citywide of $130,000 and 2.) a 50 percent increase in housing costs between 1993 and 1999. Of the community areas represented in our data set that have been identified in this report as "gentrifying" (or fully gentrified), approximately 89 percent have median housing costs in excess of $130,000, and 92 percent experienced an increase in median housing costs of at least 50 percent between 1993

[107] Anecdotal evidence suggests that crime rates also influence project revenues and expenses (particularly security costs). Unfortunately, the crime data is available only by police districts, which in some instances cover several community areas. Since the crime rates can vary significantly within a given police district, we were unable to adequately assess the effect of crime on the performance of projects in our data set.

[108] Estimates on percentage of households earning less than 30 percent of AMI again come from Applied Real Estate Analysis (AREA), Inc., City of Chicago Department of Planning and Development. Data on changes in total employment come from the Illinois Department of Employment Security publication, *Where Workers Work in the Chicago Metro Area*, May 2000.

[109] The source for this data is the Chicago Association of Realtors.

and 1999. Housing values therefore appear to be a significant indicator of neighborhood revitalization. [110]

Revenues

Our data indicates that property values influence vacancy rates but have little effect on other income categories. While per unit rent subsidies and billable rents tend to be higher among family LIHTC projects that are located in communities with lower or less significant changes in property values, these differences ceased to be significant when we controlled for other project characteristics. However, we found a significant relationship between median housing costs and vacancy rates when we controlled for project age, size and number of buildings. Overall, LIHTC projects located in communities with median single family housing costs of less the $130,000 in 1998 have vacancy rates that are over 4 percent higher than those that are located in neighborhoods with higher property values.[111]

Operating Expenses

We expected that most operating expenses, including maintenance, utility and security costs, would be significantly higher among LIHTC projects that are located in neighborhoods with lower or more modest increases in property values. But we did not find this to be the case. Nor did we find a statistically significant relationship between these expense categories and housing costs, or changes in property values. However, as figure 14 indicates, two expense categories—administrative payroll and property insurance—are impacted by property values. On average, properties that are located in neighborhoods with median single family housing costs of less than $130,000 pay $3.73 more in property insurance costs per unit but spend about $6.75 less on administrative salaries per unit than projects that are located in neighborhoods with median housing costs of at least $130,000.[112]

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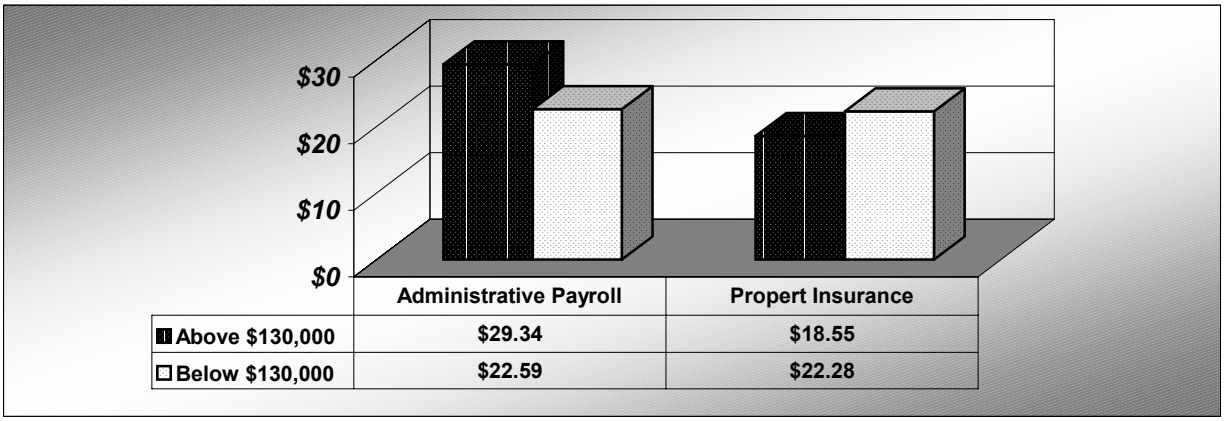
[110] Cf. *For Rent,* op.cit., p. 44. We realize, of course, that there are many other economic factors associated with gentrification. Examination of all of these factors is beyond the scope of this study.

[111] Citywide, the median cost for a detached single-family home was $130,000 in 1998. (Chicago Association of Realtors) Family projects that are located in communities with 1998 median housing costs of less than $130,000 had an average vacancy rate in 1998 of 14.1 percent compared to an average vacancy rate of 9.7 percent for projects in community areas with 1998 median housing costs over more than $130,000 . Based on the difference of means "*t* test" this difference in average vacancy rates is significant at the .05 level. Using ANOVA we found that both age and housing costs have an independent effect on vacancy rates based on significance level of .05. Aging projects in community areas with low property values have an average vacancy rate of 18.1 percent. Median housing costs also have an independent effect on vacancy rates after controlling for project size and number of buildings, based on a significance level of .10. However, we did not find a significant relationship between vacancy rates and changes in property values. The following community areas represented in our data set had median housing costs in 1998 of less than $130,000: 23, 25, 26, 27, 29, 31, 36, 38, 40, 42, 43, 46, 63, 66, 67 and 68.

[112] A difference of means "*t* test" indicates that these differences in averages are significant at the .05 level. Using ANOVA we found that variations in administrative payroll and property insurance costs based on a community's housing costs are statistically significant at the .05 level after controlling for project age, size, and number of buildings.

Figure 14. 1998 Median Housing Costs & Monthly Administrative Payroll and Property Insurance per Unit



Note: Figures are for family projects

B. Poverty/Unemployment and Income/Expenses

General Overview

To consider the impact of poverty and unemployment on project performance, we used 1990 census data on poverty and unemployment rates and 1998 estimates of the percentage of households earning less than 30 percent of the Area Median Income (AMI) within Chicago's 77 community areas. To test whether high poverty and unemployment rates have an impact on LIHTC project performance, we compared the performance of LIHTC projects using We also looked at total employment change by ZIP Code as disclosed by the Illinois Department of Employment Security. The poverty line in 1998 was $16,500 for a family of four—about 25 percent of the AMI, [113] and a community is considered high poverty if more than 30 percent of households are below the poverty level.

According to a recent national survey of tax credit projects, 33 percent of LIHTC units in central city locations are located in neighborhoods of high poverty (based on 1990 census data), compared with only 5 percent in the suburbs and 13 percent in non-metro areas. Nationally, only 12 percent of all U.S. census tracts are classified as high poverty areas.[114] Among LIHTC projects in our data set for which we have information:

- 43 percent are located in neighborhoods of high poverty;
- 40.5 percent are located in communities in which at least 40 percent of households are extremely low-income (earning below 30 percent of AMI);
- 64.6 percent of projects in our data set are in neighborhoods with unemployment rates in 1990 of at least 9 percent[115]; and
- 74 percent are located in zip code areas that experienced a decline in employment over the five-year period between 1994 and 1998.

Comparison of Project Performance

When we compared the performance of family projects relative to these economic indicators, we found that unemployment appears to have a greater effect on the performance of the LIHTC projects in our data set than does poverty, as indicated by both 1990 poverty data and 1998

[113] *For Rent*, op.cit., p. 21.
[114] Abt Associates Inc., op. cit., p. 33.
[115] The following community areas represented in our data set had unemployment rates of at least 9 percent: 23, 25, 26, 27, 28, 29, 33, 36, 38, 39, 40, 42, 43, 46, 66, 67, and 68.

estimates of household earning less than 30 percent of AMI. While we did not find unemployment rates to have a significant effect on income categories such as billable rents, effective gross income, bad debt or most operating expenses, unemployment rates of 9 percent or higher are consistently associated with higher vacancy rates and higher security costs, controlling for other project characteristics.[116]

Significantly, vacancy rates are particularly high if a LIHTC project is housed in an area that has a high concentration of extremely low-income households and has experienced a net loss in jobs in recent years. Looking at family LIHTC projects that are located in neighborhoods where at least 40 percent of the households earn less than 30 percent of AMI and also experienced a decline in employment over the five-year period between 1994 and 1998, losses due to vacancy make up an average of 16.5 percent of billable rent. On the other hand, vacancy losses tend to be lower for those projects that are located in areas that have experienced job growth in recent years, even if the neighborhood contains a high concentration of extremely poor households.[117] These figures indicate that a project is most likely to have difficulty keeping its units occupied if the local residents lack sufficient employment opportunities, particularly if the neighborhood is very poor to begin with.[118]

C. Conclusions and Recommendations

In sum, it appears that property values and unemployment do influence certain aspects of project performance. Lower property values are associated with higher per unit property insurance expenses, lower per unit administrative payroll costs, and higher vacancy rates. High unemployment rates are consistently associated with higher vacancies and per unit security expenses. [119] Declining job opportunities for local residents appears to complicate the task of keeping units occupied, particularly if the neighborhood already contains a high percentage of extremely low-income households.

The purpose of the LIHTC is to create housing to meet needs that the market does not—a purpose which may often mean building in locations that do not necessarily present optimal operating conditions. These conclusions about the impact of neighborhood characteristics on revenues and expenses should not dictate where projects are built, but they should inform how they are underwritten. To ensure long term sustainability of the project, a realistic estimate of the impact of neighborhood characteristics should be taken into consideration when operating budgets and management fees are negotiated.[120]

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[116]Based on a difference of means "*t* test" and a significance level of .05; and ANOVA and a significance level of .05 controlling for age and project size. High unemployment rates also have an independent effect on vacancy rates at the .10 level controlling for number of buildings.

[117] The average vacancy rates of projects that are located in areas of job growth is 8.8 percent compared to an average vacancy rate of 13.9 percent for projects that are located in areas experiencing job loss. Projects that are housed in areas with a high concentration of extremely poor households but have experienced a net increase in jobs have an average vacancy rate of only 6 percent. According to William Julius Wilson, "high rates of neighborhood poverty are less likely to trigger problems of social organization if the residents are working." See *When Work Disappears; The World of the NewUrban Poor* (New York, Vintage Books, 1996), p. 23.

[118] ANOVA indicates that job growth/decline has an independent effect on vacancy rates controlling for income distribution and based on a .05 significance level. The interaction effect between job growth/decline and income distribution is also significant at the .10 level indicating that the effect of job growth/decline on vacancy rates varies depending upon the income characteristics of the neighborhood.

[119] We are somewhat less confident in the conclusion the security costs are influenced by community characteristics given limitations in the data available to us. Of 110 total non-SRO projects in our data set, 80 actually itemize security costs in their audits. For various reasons, small projects are the least likely to identify the total costs of security in their audits.

[120] Rachael Bratt, et. al., op.cit, p. 46.

VI. The Influence of Project Characteristics on Income/Expenses

A comprehensive strategy for preserving Chicago's LIHTC housing stock and for establishing appropriate underwriting guidelines will include a careful assessment of whether physical characteristics play in influencing project performance. Specifically, we address two questions:

- What effect does age have on project revenues and expenses?
- Do differences in project design have an effect on revenues or the cost of managing a project? In particular, are "economies of scale" associated with differences in physical size and configuration?

These questions are not necessarily mutually exclusive. Indeed, these factors appear to interact to affect the performance of the projects in our data set.

A. Age and Income/Expenses

There are at least four reasons why it is important to consider age as a variable in an examination of revenues and operating expenses of LIHTC projects. The first three factors pertain to the effect of age on operating efficiency. The final factor has nothing to do with physical characteristics based on age per se, but rather reflects changes in underwriting standards after 1990.

- Older systems are generally less efficient than more modern systems.
- As systems age they face problems of physical deterioration, which may add to the costs of physically maintaining the property.
- Older buildings often had less extensive rehab, which requires more extensive repair and maintenance in the long run.
- Early projects developed through 1989 were characterized by low rates of investment requiring high rates of return.[121] Subsequent changes in underwriting and lessons learned from the experiences of earlier projects may well be factors in explaining variations in performance between LIHTC projects.[122]

Based on these considerations we divided the projects in our data set into three age categories: 1) projects placed in service before 1990; 2) those placed in service from 1990 to 1994; and 3) those with a placed in service date of 1995 or later. Since family projects differ from both SRO and senior developments in a number of expense categories such as administration, maintenance, and property insurance, family projects and SROs are considered separately.[123]

Comparison of Family Projects

Project Revenues

Because they receive significantly higher average rental subsidies per unit, aging (i.e., pre-1990) projects have per unit billable rents that are about 11percent higher on average than those of projects placed in service in 1995 or later. But LIHTC projects placed in service before 1990 also have average vacancy rates that are twice as high and bad debt expenses that are

[121] Kate Collignon, op. cit., p. 12.

[122] Variations in debt service due to changes in underwriting after 1990 have a direct impact on cash flow, as we have observed in part three of this report. But less cash flow can also have an indirect effect on income and expenses as projects have fewer resources to put into reserves and less ability to keep up with necessary repairs.

[123] There were too few senior projects in our data set to conduct a separate analysis of these properties.

about three times as high as those of projects with placed in service in or after 1995.[124] As a result of these higher vacancy rates and bad debt expenses, pre-1990 projects have an average per unit effective gross income that is virtually identical to that of new LIHTC projects.

Table 31. Monthly Revenues per Unit and Placed in Service Date[125]

	Before 1990	1990 to 1994	1995 and After
Potential Rent	$412.36	$447.67	$392.22
Rent Subsidy	$185.68	$82.43	$146.41
Billable Rent	$598.04	$530.17	$538.86
Vacancy	($81.99)	($64.49)	($37.65)
Residential Rent Collected	$520.92	$460.98	$501.21
Other Income	$23.87	$27.52	$22.46
Total Income	$544.79	$488.50	$523.67
Bad Debt	($40.27)	$20.81	($13.43)
Effective Gross Income	**$504.52**	**$467.66**	**$509.60**

Note: Figures are for family projects

Operating Expenses and Project Comparison

The average per unit operating expense of projects placed in service before 1990 is 16.6 percent higher than that of LIHTC projects placed in service between 1990 and 1994, and 15 percent higher than that of projects with a placed in service date of 1995 or later. Aging projects spend more on property tax, and an average of $47.71 per month more on maintenance costs per unit than new projects. But projects placed in service after 1995 spend on average $22.62/unit more on administrative expenses and over $5/unit more on marketing and leasing per month than aging projects placed in service before 1990.[126] The significance of age will become more evident as we consider this variable in relation to other physical characteristics that potentially affect project performance.

Table 32. Monthly Expenses per Unit and Placed in Service Date[127]

	Before 1990	1990 to 1994	1995 and After
Administrative	$78.44	$88.45	$101.06
Marketing and Leasing	$.44	$1.82	$5.81
Maintenance	$139.76	$109.83	$92.05
Security	$11.74	$7.95	$13.09
Utilities	$73.69	$66.50	$61.49
Property Tax	$63.32	$37.45	$44.58
Property Insurance	$21.91	$20.89	$18.18

[124] ANOVA indicates that age has an independent effect on rent subsidies of family projects based on a .10 significance level and on vacancy rates and bad debt expenses based on a .05 significance level controlling for project size and number of buildings.

[125] The numbers may not always add up due to either missing data or discrepancies in some of the audits.

[126] Based on ANOVA age has an independent effect on administration (including administrative payroll) and total operating expenses at the.10 level and on property taxes and maintenance, and marketing and leasing, and property taxes at the .05 level, controlling for project size. Controlling for number of buildings, age has and independent effect on total operating expenses, including maintenance, property taxes, and marketing and leasing.

[127] Due to missing data, particularly for marketing and leasing and security costs, the sum total of all operating expenses may not be equivalent to the averages of total operating expenses that are derived from the audits

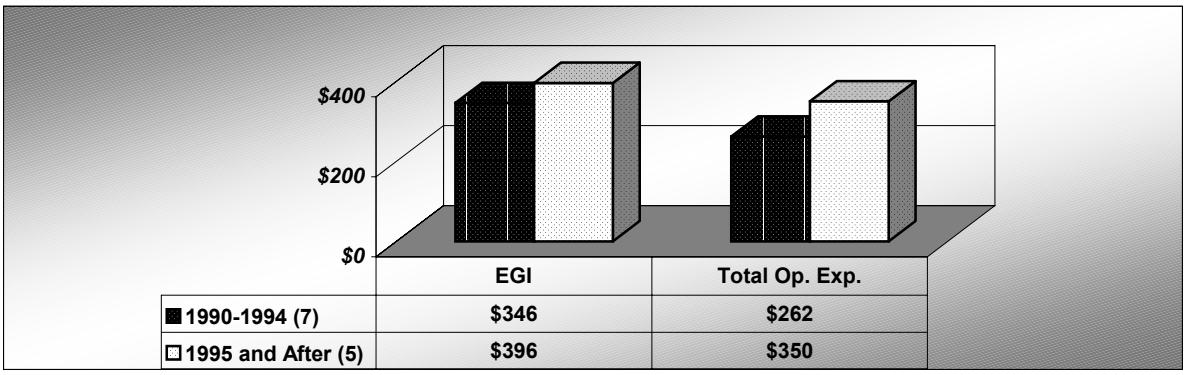
Total Operating Expense	**$385.18**	**$330.25**	**$334.99**

Note: Figures are for family projects

Performance of SRO Projects

Because of their unique characteristics, SROs warrant separate consideration. Unfortunately, the relatively small number of observations limits the number of comparisons we can make with respect to this particular type of tax credit project. Overall, there are differences in both income and operating expenses between older and newer SROs in our data set. Lower billable rents and somewhat higher vacancy rates contribute to a significantly lower average effective gross income per unit among SROs that were placed in service between 1990 and 1994 as compared to that of SROs with a placed in service of 1995 or later. By the same token, higher average property taxes and administrative, maintenance, and security expenses result in per unit total operating expenses among newer SROs that are 33.7 percent higher than those of older SROs. These findings are tentative, but suggestive of age related differences among SRO LIHTC projects.[128]

Figure 15. Performance of SROs and Placed in Service Date



B. Project Design and Income/Expenses

It has been argued that there is an "economy of scale" associated with large single-site developments which makes them less costly and easier to manage on the whole than either small or scattered-site projects.[129] To test this assumption, we compared the per unit revenues and operating expenses of family projects based on differences in project size, number of buildings, and configuration. In addition, we made comparisons based other physical characteristics, such as building type (i.e., elevator vs. non-elevator) and average size of dwelling units. We intended to compare projects based on differences in construction type, but the very low number of new as opposed to rehabbed units in our dataset prevented us from making any such comparisons.

Project Size

To examine the role of project size in project performance, we compared the per unit revenues and operating expenses of projects in three different size categories: 1) large projects with 100 or more units, 2) medium-size projects of between 40 and 99 units, and 3) small projects with less than 40 units. Within each category, projects were further divided based on age and number of buildings.

[128] Based on a difference of means "t test" the difference between older and newer SROs in average maintenance and total operating expenses is significant at the .05 level.

[129] Cf. Rachael Bratt, et. al., op.cit., pp. 45-46.

Project Size and Operating Efficiency

A similar investigation of LIHTC projects by the New York Equity Fund found that economies of scale come into play in a number of expense categories, including utilities, insurance, and administrative costs.[130] Our data indicates that size does play in important role in operating efficiency.[131] Projects with less than 40 units have higher operating costs in several expense categories, including maintenance, utilities, and property insurance. Overall, projects of less than 40 units have per unit maintenance expenses that are 13 percent higher, utility costs that are 17.7 percent higher, and property insurance costs that are 32.9 percent higher than those of projects with at least 100 units.[132] The difference in maintenance expenses cannot be attributed to higher payroll expenses, since average expenses for maintenance personnel are actually higher for large projects. Higher insurance costs among small projects can be largely attributed to higher per unit replacement costs.[133]

Administrative Costs. We found that project age generally has more of an effect on administrative expenses than project size.[134] Small projects placed in service after 1995 spend almost $19 per unit more per month on administrative expenses than large projects in the same age category. But small projects placed in service before 1990 spend about $18 per unit less for administrative expenses than large projects of similar age.

Maintenance Costs. Figure 16 shows that differences in average maintenance expenses per unit between large and small projects vary with both project size and whether or not a project consists of more than one building. While projects with multiple buildings tend to have higher maintenance costs per unit overall, our data suggests that project size may be a more important determinant of maintenance costs, particularly among smaller projects.[135] Single building projects with less than 40 units have average per unit maintenance costs that are 39.2 percent higher than single building projects of at least 100 units. These differences in maintenance expenses may be partially explained by the fact that the small family projects tend to be older than the larger family projects in our data set.[136] However, since the variations in maintenance costs between small and large projects persist among newer projects, it is apparent that the lower cost efficiencies among small projects are not simply a function of age.

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[130] New York Equity Fund, *A Report on the Performance of Low Income Housing Tax Credit Projects in New York City* (New York,1996), p. 15

[131] It should be noted that our basis of comparison differs somewhat from that of the NYEF study. The NYEF study divides projects into three categories: projects with more than 20 units per building, those with 10 to 20 units per building, and those with fewer than 10 units per building. Based on the information at our disposal we were unable to determine the exact number of units in each building of the projects in our data set. The basis for our comparison is therefore the total number of units in a given project not the number of units in each building.

[132] It should be pointed out, however, that the difference in utility costs is may be influenced more by who pays for utilities (i.e., owner or tenant) than project size per se, as we discuss later in this report.

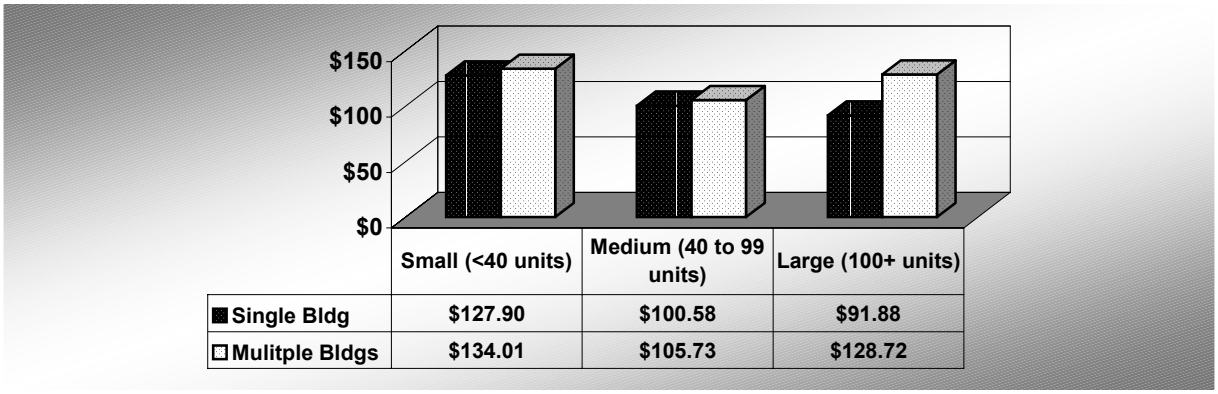
[133] NYEF study, op. cit., p. 15.

[134] This runs contrary to the NYEF fund study, which found that administrative expenses are influenced by project size. This study does not account for differences in age, however. We found that age (but not size) has an independent effect on administrative expenses based on ANOVA and a significance level of 10.

[135] Based on ANOVA, project size (but not the number of buildings) has an independent effect on maintenance costs at the.05 level.

[136] Small family projects of less than 40 units have an average age of 7.2 years, compared to 6 years for mid-size projects of 40 to 100 units, and 6.7 years for large projects of at least 100 units.

Figure 16. Monthly Maintenance Costs per Unit by Project Size & Number of Buildings



	Small (<40 units)	Medium (40 to 99 units)	Large (100+ units)
Single Bldg	$127.90	$100.58	$91.88
Mulitple Bldgs	$134.01	$105.73	$128.72

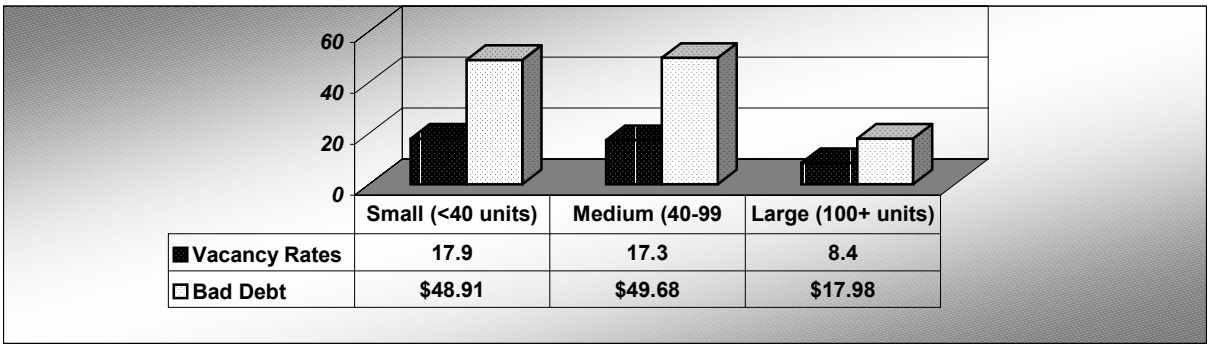
Note: Figures are for family projects

Security Costs. Our data indicates that small projects also tend to spend less on security than large non-SRO projects in all age categories. Overall, according to the financial data at our disposal, large family projects spend over five times as much on security costs per unit than small projects. However, differences in the way security expenses are accounted for, and the fact that actual security costs may, for various reasons, be under-reported in the audits of smaller LIHTC projects, may at least partially account for this disparity.

The Effect of Age and Size on Operating Revenues

Looking at projects placed in service before 1990, lower rental subsidies and significantly higher vacancy and bad debt expenses result in significantly lower billable rents and effective gross income among small to medium size projects as compared to large projects with at least 100 units. Vacancy rates are twice as high and bad debt expenses are over 2.5 times higher among older small projects as compared to older (pre-1990) large projects.[137] Small aging projects have both the highest average maintenance expense per unit and the highest average vacancy rate (18 percent) among projects in our data set, indicating a relationship between vacancy rates and maintenance costs among these projects.

Figure 17. Project Size and Average Vacancy Rates and Monthly Bad Debt per Unit



	Small (<40 units)	Medium (40-99	Large (100+ units)
Vacancy Rates	17.9	17.3	8.4
Bad Debt	$48.91	$49.68	$17.98

Note: Figures are for family projects placed in service before 1990

[137] These differences between older small and large projects are significant at the.05 level based on ANOVA.

Physical Configuration

To examine the role of physical configuration in project performance, we divided the projects in our data set into three categories: 1) scattered site projects, 2) projects with multiple buildings on a single site (i.e., contiguous), 3) and projects consisting of a single building. To further analyze distinctions between these categories, the LIHTC projects in our data set were further subdivided by age and project size.

Physical Configuration and Operating Expenses

The New York Equity Fund study found that building size tends to play a greater role in project performance than project configuration. Similarly, we did not find significant differences between projects of different physical configuration in most expense categories, including administration, utilities, and marketing/leasing – but we did find differences in a few, suggesting that project configuration is not inconsequential. In our data, for example, smaller single building projects have higher insurance costs across all age categories, and contiguous single site projects tend to have higher security costs overall.

We were somewhat surprised to discover that, on the whole, there is little difference in maintenance costs between scattered site, multiple building/ single site, and single building developments. But while project configuration does not seem to play a significant role in maintenance costs of small or medium size projects in our data set, it does appear to play a role among large projects. Large projects that are configured as scattered site developments have monthly per unit maintenance expenses that are 43.8 percent higher, and monthly total operating expenses that are 11 percent higher, than those of large single building projects, suggesting that large scattered site developments tend to be more costly to run than large single building projects.[138]

Physical Configuration, Vacancy Rates, and Operating Revenues

We did not find significant differences in most income categories between family projects of different physical configuration. But, again, differences do emerge when we compare large scattered site with large single building developments. In particular, the average monthly billable rents are $219.62 per unit higher, and the average per unit effective gross income is $140.59 higher, among large scattered site developments. At the same time, large scattered site projects have significantly higher vacancy rates on average (13 percent) than large single building projects (5.5 percent).

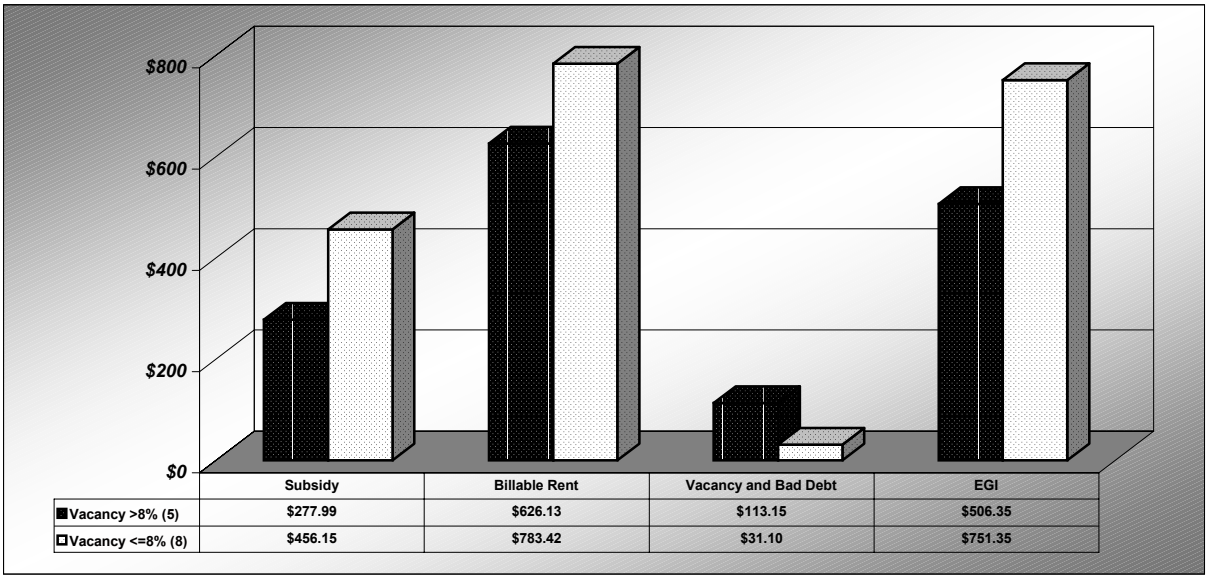
While large scattered site projects have higher per unit billable rents and effective gross income overall, our data indicates scattered site projects with very high vacancy rates have more trouble covering the higher costs associated with the management and maintenance of buildings in multiple locations.[139] As figure 18 shows, large scattered site projects with vacancy rates over 8 percent have monthly rental subsidy levels that are $178.16 per unit lower and

[138] While it has been argued that multiple buildings on a single site are also more costly, we did not have enough observations to determine if this is indeed the case among projects in our data set. (cf. Bratt, et. al., p. 46.)

[139] Other research indicates that, in addition to higher maintenance expenses, scattered site developments require higher management fees to cover the costs of necessary on-site personnel and services. (Ibid., p. 46.) However, in our data set large scattered site developments with high vacancy rates spend about $8 less per unit per month in management fees and generate $15,501 less in total annual management fees on average than similar type projects with low vacancy rates. Management fees are discussed in greater detail later in this report. Lower revenues may also contribute to a cycle of disrepair and income shortfalls as buildings become less attractive to tenants and more expensive to repair.

monthly billable rents that are $157.29 per unit lower, as well as monthly losses from vacancy and bad debt that are $82.05 per unit higher than similar projects with vacancy rates of less than 8 percent. As a result, large scattered site projects with high vacancy rates have an average monthly per unit effective gross income that is significantly less than that of similar type projects with lower vacancy rates.

Figure 18. Average Monthly Revenues Among Large Scattered Site Projects



	Subsidy	Billable Rent	Vacancy and Bad Debt	EGI
Vacancy >8% (5)	$277.99	$626.13	$113.15	$506.35
Vacancy <=8% (8)	$456.15	$783.42	$31.10	$751.35

Note: Figures are for family projects

Unit Size and Operating Efficiency

To determine if cost efficiencies vary with differences in average unit size, we broke family LIHTC projects into five categories based on of average unit size as shown in table 1 of appendix A. We further compared the performance of projects in these categories as indicated by the ratio of total operating expenses to gross billable rent (rent to cost) and to effective gross income (income to cost).

Table A-1 shows what one would expect, namely that per unit total operating expenses increase as unit size increases. On the whole, family projects with an average unit size of at least 2 ½ bedrooms cost about 41 percent more to operate per unit than family projects that have an average unit size of less than one bedroom. Expense categories with significant differences in averages between these two groups of projects include marketing and leasing, maintenance, utilities, and property insurance.

When we look at operating efficiency as indicated by rent-to-cost and income-to- cost ratios,[140] our data present a different picture, however. Because of higher billable rents, projects in our data set with a higher average unit size tend to be more cost-effective (in terms of both rent to cost and income to cost ratios) than projects with a smaller average unit size. As table 33 indicates, projects with an average unit size of 2.5 bedrooms or more are 13 percent more cost-effective (rent-to-cost) than projects with an average unit size of 1 to 1.5 bedrooms, and almost 8 percent more cost-effective than family projects with an average unit size of less than 1 bedroom. On the other hand, tax credit projects with the highest average unit size also have

[140] The rent to cost ratio refers to total operating expenses as a percentage of billable rent. The income to cost ratio is the percentage of effective gross income that is consumed by total operating expenses. Cf. Recapitalization Advisors, *The Low Income Housing Tax Credit (LIHTC) Effectiveness and Efficiency: A Presentation of the Issues* (May 2001), p. 28.

the highest vacancy rates[141], indicating that three and four bedroom units may be more difficult to occupy than apartments with fewer bedrooms.[142]

Table 33. Average Unit Size and Operating Efficiency

Average Bdrm Size	*Total Op. Exp. as % of Bill. Rent (Rent to Cost)*	*Total Op. Exp. as % of EGI (Income to Cost)*
<1	66%	75.1%
1 to 1.49	71.3%	87.1%
1.5 to 2	61.3%	70.9%
2 to 2.49	64.7%	70.1%
2.5+	58.3%	72.3%

Note: Figures are for family projects

Building Type and Operating Efficiency

Our final question is whether differences in building type (i.e., elevator vs. walk-up) play a role in operating efficiency. Table 2 of appendix A shows that there is virtually no difference in average per unit total operating expenses between family LIHTC projects with elevators and those that are exclusively walk-ups. Tax credit projects that are exclusively walk-up tend to have higher average maintenance expenses, while projects with elevators tend to have higher security costs. However, building type does not seem to have an independent effect on either maintenance or security costs, controlling for other project characteristics.[143] Similarly, we did not find that differences in building type are important in explaining variations in income-related aspects of project performance such as vacancy rates, bad debt, or effective gross income.

C. Conclusions and Recommendations

Our data indicates that physical characteristics can have a significant bearing on the operating income and expenses of LIHTC properties. Of all physical characteristics, age appears to have the greatest effect on project well-being. But project design is also a factor. For example, small projects and large scattered site developments appear to be more costly to operate than large single building projects. On the whole, projects with an average unit size of at least 2.5 bedrooms tend to be more cost effective than non-SRO projects with a smaller average unit size, although projects with a larger average unit size also have higher vacancy rates.

There are a variety of reasons developers may opt for a project design even if it tends to be less cost efficient. Small buildings may be preferable because they comprise most of the available housing stock in a given neighborhood, or can be acquired for lower prices. Scattered site developments, or projects with a larger percentage of one and two bedroom units, may be an essential part of long-range strategy for neighborhood revitalization. Finally, larger LIHTC developments are often more difficult to finance without a single, deep source of subsidy.[144] Any one of these factors may come into play in a decision to go ahead with a particular development deal. Once the decision has been made, the higher costs associated with developments of a particular size or configuration should be taken into consideration in the underwriting of the project to ensure its long-term sustainability.

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[141] The average vacancy rate for projects with an average units size of at least 2 ½ is 19.6 percent compared to an average vacancy rate of 10.3 percent for family projects that average less than 1 bedroom per unit.

[142] As a further qualification we should add that there were not enough observations to adequately control for other variables such as age that may influence the results.

[143] Based on ANOVA and a significance level of .10 controlling for age, size, and number of buildings.

[144] Bratt, et. al., op. cit., p. 46.

VII. The Performance of Expiring LIHTC Projects

Approximately 40 percent of the properties in our data set were placed in service between 1987 and 1991, which means that their tax credits are due to expire over the five-year period between 2002 and 2006. In this section we will examine the performance of properties and what needs to be done to preserve them as affordable housing. As other studies have pointed out, early projects developed through 1989 may not be representative of the larger tax-credit portfolio in either market characteristics or affordability protections. Consequently, preservation strategies that apply to these earlier projects may not necessarily apply to the larger stock of tax-credit properties.[145] With this in mind, we have examined the properties in two sets: 1) earlier projects that are due to expire between 2002 and 2004, and 2) those with an expiration date of 2005 to 2006.

A. The Condition of Expiring LIHTC Properties

Of the total number of non-SRO properties in our data set whose compliance periods end over the five-year period between 2002 and 2006[146], about 26.6 percent are financially healthy, 36.7 percent are moderately troubled and 36.7 percent are severely troubled.[147] On the whole, projects with earlier expiration dates are faring worse than projects whose tax credits expire later, as table 34 indicates. These differences in project condition are not overly significant, but neither are they entirely unique.

Table 34. Condition of Expiring Projects and Expiration Date

	Earlier (2002-2004)	Later (2005-2006)	Total
Healthy	8 (24%)	7 (39%)	15 (26.6%)
Moderately Troubled	12 (37%)	6 (33%)	18 (36.7%)
Severely Troubled	13 (39%)	5 (28%)	18 (36.7%)

Note: SROs have been excluded

Data from other studies indicates that a significant percentage of older tax credit projects across the nation face cash flow difficulties and incipient deterioration.[148] A comparison of revenues, expenses, reserves, and debt service obligations based on differences in project condition and expiration date gives us important insights into the performance of expiring LIHTC projects in our data set.

[145] Collignon, op. cit., p. 12.
[146] A total of 51 non-SRO properties in our data set a due to expire by 2006.
[147] Approximately 56 percent of the financially troubled expiring projects are no longer under control of the original general partner. Excluding these projects, about 14 percent of the expiring projects are severely troubled, 42 percent are moderately troubled, and 45 percent are financially healthy, indicating that the overall condition of expiring projects in Chicago's tax credit portfolio may be somewhat better than the above figures indicate.
[148] See Stegman, op.cit., p. 327. See also "Equity Prices show Small Rise, Project Restructuring Increases," *Affordable Housing Finance* (August, September 1998), p. 12; and "Draft Addresses Concerns Over LIHTC Allocations," *Affordable Housing Finance* (January 1998), p. 6.

B. Comparison of Operating Revenues

Table 35 compares the operating revenues of healthy, moderately troubled, and severely troubled LIHTC projects whose compliance periods will end by 2006. It shows that, on the whole, the disparities in average effective gross income per unit between financially healthy and troubled projects arise from a combination of lower rental subsidies, higher vacancies and bad debt expenses. This is particularly true of severely troubled expiring projects, which (on average) have the lowest per unit rental subsidy levels and billable rents, but the highest vacancies and bad debt expenses.

Table 35. Average Monthly Revenues per Unit of Projects Expiring by 2006[149]

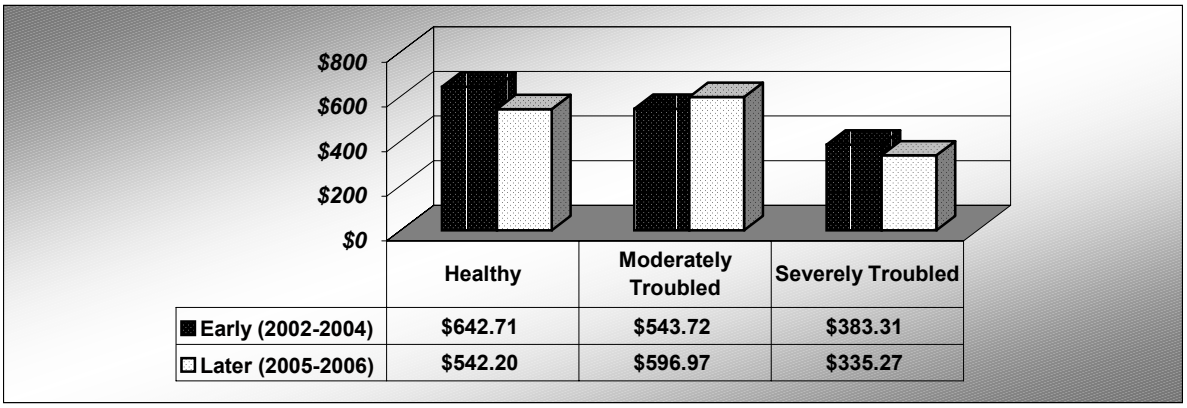
	Healthy	Moderately Troubled	Severely Troubled
Potential Rent	$407.76	$429.42	$436.16
Rent Subsidy	$227.71	$190.66	$83.23
Billable Rent	$635.47	$620.06	$519.39
Vacancy	($56.23)	($71.27)	($115.61)
Residential Rent Collected	$574.68	$557.73	$403.78
Other Income	$53.85	$33.60	$12.34
Total Income	$628.53	$591.33	$416.12
Bad Debt	($32.73)	($29.86)	($46.15)
Effective Gross Income	**$595.81**	**$561.47**	**$369.96**

Note: SROs have been excluded

A comparison of early and later expiring projects is further revealing. Figure 19 indicates that, while all severely troubled projects in our data set suffer insufficient revenues, the same is not necessarily true of all moderately troubled projects. Moderately troubled projects with earlier expiration dates have lower billable rents than healthy projects, due in part to significantly lower rental subsidy levels.[150] But when we look at projects that are due to expire in the years 2005 and 2006, moderately troubled projects actually average a higher per unit effective gross income than healthy projects. Higher rental subsidies are the main reason for this difference, despite the fact that moderately troubled projects suffer losses from vacancies that are $45.19/unit higher on average than those of projects with positive cash flows.[151]

[149] The numbers may not always add up due to either missing data or discrepancies in some of the audits.
[150] The average rental subsidy among moderately troubled projects with earlier expiration dates is $175.69/unit compared to an average of $336.50/unit for healthy projects.
[151] The average net operating income (NOI) among moderately troubled projects with later expiration dates is $215.30/unit compared to an average of $195.88/unit among healthy projects, indicating debt service is the primary factor explaining the differences in cash flow between moderately troubled and healthy projects.

Figure 19. Average Monthly EGI perUnit Among Projects Expiring by 2006



Note: SROs have been excluded

C. Comparison of Operating Expenses

A comparison of all non-SRO tax credit properties whose compliance periods will end by 2006 reveals that troubled projects cost about $30/unit more to operate a month than healthy projects. Higher maintenance costs and property taxes account for most of the difference between projects with positive and negative cash flows. Average per unit maintenance expenses are 41.3 percent higher and property taxes are 38.5 percent higher among financially troubled expiring projects as compared to expiring properties with a positive cash flow. At the same time, troubled projects spend an average of 30 percent less on administrative expenses per unit than healthy projects.

Table 36. Average Monthly Operating Expenses of Projects Expiring by 2006[152]

	Healthy	Moderately Troubled	Severely Troubled
Administration	$104.22	$88.01	$65.23
Maintenance	$102.70	$129.69	$158.50
Security	$12.07	$5.48	$9.79
Utilities	$70.55	$73.34	$81.27
Property Tax	$44.72	$63.50	$56.12
Property Insurance	$24.17	$22.52	$19.49
Total Operating Expense	**$352.16**	**$381.79**	**$387.94**

Note: SROs have been excluded

Further differences emerge when we compare tax credit projects based on their expiration dates. Though limited, our data indicates that severely troubled projects with earlier expiration dates are the most costly to operate, due in large part to higher per unit maintenance expenses. As table 37 indicates, average maintenance costs are almost $70 per unit higher among these projects as compared to financially healthy projects, presenting issues that would need to be addressed in any preservation effort. While severely troubled projects with later expiration dates also have higher average maintenance expenses per unit, lower per unit administrative

[152] Due to missing data, particularly for marketing and leasing and security costs, the sum total of all operating expenses may not be equivalent to the averages for total operating expenses that are derived from the audits.

expenses result in total operating expenses that are virtually identical to those of financially healthy projects.

Table 37. Average Monthly Expenses per Unit by Date of Expiration

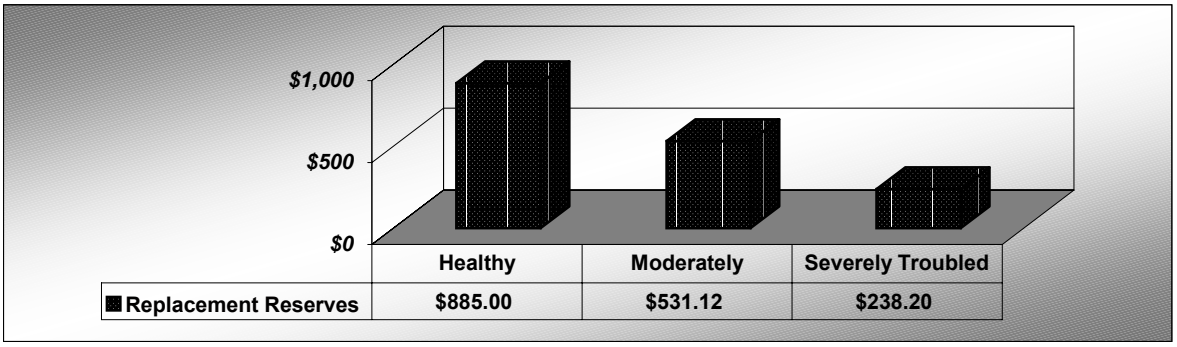
	Earlier (2002-2004)			Later (2005-2006)		
	Healthy	***Moderately Troubled***	***Severely Troubled***	***Healthy***	***Moderately Troubled***	***Severely Troubled***
Administration	$98.52	$85.55	$59.52	$110.74	$92.94	$80.07
Maintenance	$104.27	$130.07	$170.53	$100.89	$128.91	$127.24
Total Op. Exp.	**$357.26**	**$381.84**	**$406.43**	**$346.32**	**$381.69**	**$342.44**

Note: SROs have been excluded

D. Comparison of Reserves

A comparison of replacement reserves among expiring projects in our data set reveals that, as one would expect, reserve levels are significantly lower among projects facing severe cash flow shortages. Average replacement reserves among severely troubled expiring projects are about $354 per unit less than those of moderately troubled projects, and $647 per unit lower than those of healthy projects. But even these statistics can be misleading. Over 70 percent of the severely troubled projects and 66 percent of the moderately troubled projects for which we have information report no replacement reserves whatsoever. By contrast, about 36 percent of healthy projects lack replacement reserves. Overall, only about 37 percent of the projects in our data set that are due to expire by 2006 have replacement reserve levels of at least $300 per unit.

Figure 20. Replacement Reserves Among Projects Due to Expire by 2006



Note: SROs have been excluded

E. Comparison of Debt Service

Table 38 compares the severely troubled, moderately troubled, and healthy expiring LIHTC projects in our data set in terms of: 1) the average monthly debt service per unit; 2) the percentage of effective gross income consumed by debt service; and 3) the percentage of long term debt covered by a conventional first mortgage. On the whole, expiring projects are heavily reliant on conventional loans as a source of project financing, regardless of their financial condition. For healthy, moderately troubled, and severely troubled projects alike, the conventional debt to total debt (CD/TD) ratio is about 50 percent. This is due in large part to the heavy emphasis placed by the City of Chicago on conventional financing in the early years of

the tax credit program. Financially healthy projects have an average per unit debt service burden that is actually higher than that of severely troubled projects, and only slight lower than that of moderately troubled projects. But when looked at as a percentage of effective gross income, debt service is more burdensome for the severely and moderately troubled projects.

Table 38. Debt Service and Financial Condition Among Expiring Projects

	Average Debt Service/Unit/Month	Debt Service as % of EGI	CD/TD Ratio
Healthy	$194.79 (15)	32.7% (15)	49% (12)
Moderately Troubled	$219.73 (18)	39.1% (18)	55.4% (11)
Severely Troubled	$147.70 (18)	39.9% (18)	51% (16)

The significance of debt service for understanding the overall performance of expiring projects becomes clearer when we compare LIHTC projects based on their expiration dates. Table 39 shows that although projects with earlier expiration dates tend to have high conventional debt to total debt (CD/TD) ratios, debt service is not a significant factor in distinguishing between the performance of financially healthy and troubled projects. A different picture emerges, however, when we look at projects whose tax credits will expire between 2005 and 2006. Here we find that the per unit debt service burden is highest among moderately troubled projects. The average net operating income (NOI) is the balance of revenues and expenses before debt service. Among moderately troubled projects with a later expiration date, the average NOI is $215.30 per unit compared to an average NOI of $195.88 per unit among healthy projects, indicating that debt service is the primary factor in explaining the differences in cash flow between moderately troubled and healthy projects. Although the total debt service burden per unit among severely troubled projects is virtually identical to that of healthy projects, debt service consumes a significantly higher percentage of effective gross income of both moderately and severely troubled projects.

Table 39. Debt Service, Project Condition, and LIHTC Expiration Dates

	Earlier (2002-2004)			Later (2005-2006)		
	Healthy	***Moderately Troubled***	***Severely Troubled***	***Healthy***	***Moderately Troubled***	***Severely Troubled***
Monthly Debt Service/Unit	$243.11 (8)	$206.84 (12)	$151.27 (13)	$139.58 (7)	$250.65 (5)	$138.42 (5)
Debt Service as % of EGI	37.8% (8)	38% (12)	39.5% (13)	25.7% (7)	42% (5)	41.3% (5)
CD/TD Ratio	54.3% (7)	52.8% (9)	55.5% (11)	41.6% (5)	NA*	40.6% (5)

Notes: SROs have been excluded. *The number of observations in this cell for moderately troubled projects expiring between 2005-2006 was too small to give a percentage.

F. Conclusion: Implications for Preservation Strategies

Expiring projects will require mechanisms to provide financing for necessary capital improvement, or to enable nonprofit and other organizations to purchase properties in cases where owners either choose to opt out of extended-compliance periods or wish to buy out the limited partner. Unfortunately, we do not have enough information to consider the needs for capital investment or exit tax relief among the LIHTC projects in our data set. However, based on the preceding analysis, we can at least make some preliminary observations about what types of preservation strategies are best suited to the needs of expiring LIHTC projects with financial difficulties.

Expiring LIHTC projects with severe cash flow problems obviously present the greatest challenge. In deciding whether or not to adopt a preservation plan for a LIHTC project with severe cash flow problems, the sponsor, along with the funders, may need to weigh the importance of the property on the one hand and the odds against its sustained fiscal stability on the other. This is particularly true of those older severely troubled projects whose tax credits will expire within the next few years. Since these projects already have relatively low per unit debt service burdens, a restructuring of debt service would not be an adequate solution for their problems. Insufficient rental subsidies, high vacancy rates, and high maintenance costs are the primary factors associated with their financial distress. Since many of these projects undoubtedly face problems of physical deterioration, an assessment of each project's physical condition and needs would be a necessary part of any plan for economic recovery. In cases where the decision is made not to preserve a given property, the current tenants must be offered similar affordable housing in other properties.

While severely troubled projects with later expiration dates may also face some problems of incipient deterioration, the lower maintenance costs and operating expenses overall among these projects indicate that these problems are more easily rectified. The underperformance of these projects is most directly related to inadequate revenues, which are associated with very low rental subsidy levels. For these projects in particular, increased rental subsidies could mean the difference between covering operating costs and continuing to run in the red.

The cash flow difficulties of moderately troubled projects will be easiest to address. For that reason they should be given priority in any long-term preservation strategy involving debt service relief and other forms of capital infusion. Given the high debt service burdens of the moderately troubled projects in our data set whose affordability agreements will expire in the years 2005 and 2006, these properties could benefit the most from a restructuring of their debt service to allow immediate cash flow relief.

For many expiring projects with cash flow problems, immediate debt relief and/or increased subsidies would also free up money that could be used to replenish depleted reserves. It is possible that many of the expiring projects in our data set have not yet required major capital repairs or replacements, especially those that are either moderately troubled, or whose tax credits expire between 2005 and 2006. But they might require such repairs in the very near future. Since a large percentage of these projects have no replacement reserves at all, adequate funding of reserves must be an integral part of any preservation strategy.

VIII. Final Conclusions and Recommendations

While the impact of individual variables on LIHTC project performance has been given separate consideration, it is important to keep in mind that they are often interrelated. As we have seen, aging projects are more likely to have higher debt service burdens, struggle with high vacancy rates and bad debt expenses, and face higher per unit operating costs, including higher maintenance and utility expenses. They also tend to have higher property taxes per unit and benefit less from Cook County's Class 9 program. Based on our regression analysis, vacancy rates also have a significant effect on project sustainability, and vacancy rates are in turn impacted by project age, neighborhood conditions, and project design (particularly project size and configuration).

It is the cumulative effect of these factors that presents the greatest challenge to projects in our data set. For example, high vacancy rates are highly correlated with lower rental subsidies and lower effective gross income. And these lower revenues mean less ability to fund replacement reserves. Projects with lower vacancy rates are able to maintain replacement reserves at four times the level as those of projects with vacancy rates of over 8 percent. Projects with very high vacancy rates also tend to spend considerably less on administrative costs, including administrative payroll and property management fees, indicating less ability to oversee the day-to-day operations of the projects. Finally, there is a high correlation between high vacancy rates and high per unit maintenance costs among small aging projects with negative cash flows, suggesting that the interaction of age, vacancy rates, and maintenance costs among these projects in particular feeds a cycle of project deterioration, deepening income shortfalls, and accelerating expenses.

Managers of projects with negative cash flows are sometimes criticized for failing to enact necessary rent increases. But our data indicates that LIHTC projects cannot address shortages in cash flow simply by raising rents. Non-SRO projects with negative cash flows (most of which have higher vacancy rates) are significantly more likely to be located in neighborhoods with high unemployment rates or a high concentration of extremely low-income households.[153] Over 78 percent of the troubled projects in our data set are housed in neighborhoods with an unemployment rate of at least 9 percent, and 54 percent are located in community areas where at least 40 percent of the households earn less than 30 percent of area median income (AMI). Troubled projects in these communities have an average vacancy rate of over 15 percent and bad debt expenses of over $30/unit. Absent additional rental subsidies, project managers can't raise rents if they are already having difficulty collecting rents and filling their units.

In addition, as recent studies have shown, the affordable housing shortage is greatest for the lowest income groups. In Chicago, as in the nation as a whole, the "gap" between the supply of affordable housing units and the number of households earning less than 30 percent of AMI has increased since 1990.[154] If LIHTC projects are to address this increased demand for affordable housing among extremely low income households and remain financially viable, they will obviously need more rental subsidies to make their rental units affordable and provide needed tenant support services. While our data is illuminating, more information is needed on what types of supportive services are currently being provided and/or are required, and at what cost, to get a better sense of the resource needs of LIHTC projects in communities with a high concentration of extremely low-income households.

[153] Based on Chi-Square and significance level of .10 for unemployment and .05 for communities with a high concentration of extremely low income households.
[154] Cf. Stegman, op.cit., p. 326; *For Rent*, op. cit., pp. 19-32.

On a more positive note, our data also indicates some steps that can be taken to intervene once a project shows signs of financial distress, or to prevent deterioration from happening in the first place. Projects that are financially stable are significantly more likely than troubled projects to be characterized by the following:

- A replacement reserve level of at least $300/unit;
- Management fees of at least $30/unit;[155]
- A conventional debt to total debt (CD/TD) ratio of 20 percent or less;
- Class 9 status or a monthly property tax burden of $35/unit or less;[156] and/or
- At least 50 percent of the units with a rental subsidy.[157]

Of the family and senior projects for which we have information, about 83 percent of the healthy properties, but just 43 percent of troubled projects, exhibit at least two of the above characteristics. About 55 percent of healthy projects (compared to 20 percent of troubled projects) benefit from some combination of lower property taxes, less reliance on conventional loans, and/or increased rental subsidies. And 53 percent of healthy projects (compared to 36 percent of troubled projects) maintain an annual replacement reserve level of at least $300/unit. None of these factors guarantees success, but they help to provide a financial cushion that guards against problems in the long run. [158]

This first formal analysis of Chicago's Low Income Housing Tax Credit portfolio is timely as 15-year affordability agreements begin expiring in 2002. As the study shows, many of these projects may require substantial resources to be stabilized. The program is complex, difficult to use, but sharing information can help all parties involved make projects work better. Some of the conclusions from this first round of information sharing include:

- There is no blanket operating cost. Individual neighborhood characteristics and project types must be taken into account during underwriting.

- Nonprofit LIHTC developments meet Chicago's housing needs by siting projects in less affluent communities, and by building larger units for families. It makes sense to prioritize nonprofits in distributing public funds for new affordable housing.

- Rent subsidies allow LIHTC projects to work better and allow projects to serve community residents. The LIHTC was never intended to cover all project costs or to meet the needs of very low-income households. Rent subsidies help projects meet needs of families earning lower incomes while achieving higher billable rents to cover costs thus ensuring ongoing stability.

- Debt service should not be allowed to jeopardize projects. Private debt should not constitute more than 20% of total debt. Consider minimizing debt service costs when stabilizing old projects and restructuring expiring ones.

[155] Healthy projects in our data set average about $30/unit in management fees, although this number can vary with differences in project design and management type.
[156] This is the average amount paid in property taxes by non-SRO projects with Class 9 status.
[157] This finding is based on the percentage of units with project or tenant based Section 8 and/or the Low Income House Trust Fund subsidies in 2000. Since these percentages can vary from year to year our figures may not be equivalent to the percentage of subsidized units in 1998.
[158] Based on Chi-Square shows that the relationship between these factors and project condition (i.e., positive or negative cash flow) is significant at the .01 level for CD/TD ratio and rent subsidies; the .05 level for Class 9 and management fees, and the.10 level for replacement reserves after excluding SROs.

- Operating and replacement reserves are worth extra investment. Public debt should amortize only after reserves are fully funded, and money to build up reserve accounts should be written into stabilization plans of existing projects.

- Public investments should not pay property tax. Property taxes are one of the largest single line items in project operating costs, and they grow for troubled properties. High tax burdens threaten the stability of a multi-million public investment and the health of our communities.

Our goal in using the Low Income Housing Tax Credit is both to ensure sustainable housing, and create housing that expands housing choice and meets the needs of low and very low income Chicago residents. Chicago's housing community will have much work to do to in the years ahead.

IX. Appendices

Appendix A: Other Tables

Operating Expense Tables for family projects

Table A-1. Monthly Expenses by Unit Size

		Average Unit Size					
		Less than 1	1 to 1.49	1.5 to 1.99	2 to 2.49	2.5 and Above	Total
Administration	Average	**$69.86**	**$59.38**	**$88.27**	**$103.48**	**$83.77**	**$86.97**
	Number	**12**	**10**	**31**	**29**	**12**	**94**
	Std. Deviation	**$33.60**	**$17.41**	**$38.14**	**$56.87**	**$30.24**	**$43.82**
Marketing and Leasing	Average	**$5.02**	**$2.13**	**$1.72**	**$2.86**	**$.46**	**$2.43**
	Number	**11**	**8**	**25**	**21**	**9**	**74**
	Std. Deviation	**$5.01**	**$2.45**	**$5.33**	**$6.36**	**$.90**	**$5.12**
Maintenance	Average	**$81.65**	**$133.33**	**$111.39**	**$115.26**	**$142.30**	**$115.07**
	Number	**12**	**10**	**31**	**29**	**12**	**94**
	Std. Deviation	**$41.18**	**$43.56**	**$30.62**	**$47.35**	**$94.60**	**$51.96**
Security	Average	**$11.52**	**$10.01**	**$8.92**	**$16.18**	**$7.65**	**$11.45**
	Number	**8**	**8**	**22**	**22**	**10**	**70**
	Std. Deviation	**$22.15**	**$16.08**	**$17.93**	**$24.68**	**$13.23**	**$19.84**
Utilities	Average	**$54.47**	**$76.82**	**$65.89**	**$59.06**	**$84.31**	**$65.84**
	Number	**12**	**10**	**31**	**29**	**12**	**94**
	Std. Deviation	**$10.97**	**$30.46**	**$22.90**	**$27.97**	**$36.60**	**$27.48**
Property Tax	Average	**$36.40**	**$55.65**	**$54.69**	**$46.84**	**$38.37**	**$47.95**
	Number	**12**	**10**	**31**	**29**	**12**	**94**
	Std. Deviation	**$17.07**	**$22.27**	**$27.91**	**$30.38**	**$18.71**	**$26.53**
Property Insurance	Average	**$12.54**	**$16.42**	**$23.43**	**$22.25**	**$22.37**	**$20.79**
	Number	**12**	**10**	**31**	**29**	**12**	**94**
	Std. Deviation	**$5.15**	**$7.20**	**$7.09**	**$9.78**	**$6.96**	**$8.55**
Total Operating Expense	Average	**$267.20**	**$351.27**	**$351.74**	**$361.26**	**$378.00**	**$347.19**
	Number	**12**	**10**	**31**	**29**	**12**	**94**
	Std. Deviation	**$62.43**	**$77.40**	**$70.77**	**$96.31**	**$117.98**	**$90.08**

Note 1: All figures reported on a per-unit basis; unit size is based on average number of bedrooms.

Note 2: Due to missing data, particularly for security and marketing and leasing costs, the sum total of all expense categories may not be equivalent to the averages for total operating expenses that are derived from the audits.

The averages represented here are only a reference point for affordable housing funders and providers and should be supplemented by other relevant data. Average expenses with a small number of observations and/or high standard deviation may be less reliable. Since averages are based on 1998 audits, adjust the numbers for inflation by increasing each average by 10%.

Operating Expense Tables for family projects

Table A-3. Monthly Expenses by Ownership

		For Profit and Not For Profit		
		Nonprofit	For Profit	Total
Administration	Average	**$88.73**	**$87.60**	**$88.31**
	Number	**62**	**36**	**98**
	Std. Deviation	**$45.29**	**$40.15**	**$43.27**
Marketing and Leasing	Average	**$1.17**	**$4.61**	**$2.42**
	Number	**47**	**27**	**74**
	Std. Deviation	**$3.93**	**$6.22**	**$5.13**
Maintenance	Average	**$119.12**	**$105.98**	**$114.29**
	Number	**62**	**36**	**98**
	Std. Deviation	**$56.39**	**$49.73**	**$54.15**
Security	Average	**$9.82**	**$10.59**	**$10.11**
	Number	**45**	**27**	**72**
	Std. Deviation	**$19.42**	**$16.13**	**$18.14**
Utilities	Average	**$70.58**	**$63.53**	**$67.99**
	Number	**62**	**36**	**98**
	Std. Deviation	**$28.53**	**$26.86**	**$28.00**
Property Tax	Average	**$48.77**	**$49.99**	**$49.22**
	Number	**61**	**36**	**97**
	Std. Deviation	**$24.30**	**$32.73**	**$27.57**
Property Insurance	Average	**$22.37**	**$17.66**	**$20.62**
	Number	**61**	**36**	**97**
	Std. Deviation	**$8.25**	**$8.65**	**$8.66**
Total Operating Expense	Average	**$357.62**	**$336.19**	**$349.74**
	Number	**62**	**36**	**98**
	Std. Deviation	**$88.97**	**$98.85**	**$92.80**

Note 1: All figures reported on a per-unit basis.

Note 2: Due to missing data, particularly for security and marketing and leasing costs, the sum total of all expense categories may not be equivalent to the averages for total operating expenses that are derived from the audits.

Appendix B: LIHTC Expense Categories

The purpose of the following description of expense categories is to isolate certain operating functions within the overall costs of operating an apartment building with a view to identifying key variables that affect operating costs for comparative purposes. Not all cost categories will logically follow a typical chart of accounts. The cost centers can be generally grouped as follows:

1. *Administrative*: any cost associated with the managing agent's overhead, office space or supplies, postage and telecommunications. Also included are costs related to legal, accounting, audit and compliance. The expense of the property manager (either on-site or off-site) is included here. Any insurance or bond cost that goes to the managing agent's professional liability is found here.

2. *Marketing*: This cost center is distinguished from administrative because of there is value in tracking it separately. Marketing cost go directly to the ability to successfully lease up. For example, a property with low marketing costs and high vacancy may need to increase its marketing; however, the same high vacancy building with high vacancy costs may point to factors outside the control of the leasing agent.

3. *Security*: Another new category that recognizes the realities facing many of our buildings. Security costs are isolated from other operating costs because they are variable to the location and use of the property.

4. *Utilities*: The categories follow the traditional breakdown.

5. *Property Insurance* & *Property Taxes*: The traditional accounting categories like to group all insurance and all taxes together. We, however, are looking at how insurance and taxes function. Real estate taxes (i.e. property taxes) are distinct from other types of taxes in that they are directly related to building size, use and value. In the same way, Property Insurance (also known as Fire & Casualty) is a function of the type, size and use of the property, while other types of insurance, such as professional liability & fidelity bonds, are administrative costs associated with the cost of doing business for the management agent. Taxes and Insurance that are a part of an employee benefit or fringe (FICA, Health, Workers Comp) are considered a personnel cost. Since we are only looking at the building's operating costs, taxes paid by investors are not considered here.

6. *Cleaning and Maintenance*: Cleaning and Maintenance are those costs associated with the routine maintenance of the physical plant. These costs are not capitalized as improvements and should not be paid out of the replacement reserves of the building. A further explanation of the subcategories:

    i. Distinction between Janitorial & Maintenance. *Janitorial* is cleaning and maintaining the appearance of the property (including landscaping and snow removal). Janitorial includes the

cost of personnel or contracted services that clean the property (including the on-site cost of housing such persons).

ii. *Maintenance* is the cost of maintaining the systems of the building in good working order. Maintenance includes minor repairs, the cost of maintenance contracts as well as the personnel cost of skilled trades persons who are either on payroll or contracted.

iii. *Personnel & Contracted Services*: A distinction is allowed for between costs associated with employees and costs associated with contracted services even if the functions are over-lapping.

iv. *Other routine expenses*: exterminating, waste (trash) removal and decorating are other routine cost centers that are identified.

v. *Different types of Maintenance*: Subcategories distinguish between different systems in the building that require maintenance: 1/ MEP (for Mechanical, Electrical, Plumbing- that is the major systems); 2/ Elevator (a unique cost for some buildings which represents a significant cost variable) and 3/ Other.

Appendix C: Additional Notes on Methodology

As we have indicated, the sources of our financial data consist of 1998 audits and financial statements for 123 projects in Chicago. Strictly speaking, our data is not based on a random sample of Chicago's tax credit projects. However, because our data set contains over half of the estimated total of 233 LIHTC projects in Chicago and since (unlike other types of affordable housing) there is a general uniformity in the manner in which LIHTC deals are structured, it is very likely that it is largely representative of the entire population of LIHTC projects in Chicago.

Information on specific project characteristics was obtained by sending a data collection form to the developers and/or managers of each property in the dataset. With intensive follow-up we achieved a high response rate. However, information for some variables was not always available, either from the audits or from the property managers or owners. Table C-1 provides a listing of the project variables employed in this study and the frequency for each variable in our data set.

Table C-1. Project Variables and Their Frequency in the Data Set.

Variable	Number of Observations	Percent of Total
Size	123	100%
Project Type	123	100%
Age	121	98.4%
Configuration	121	98.4%
Community Area	121	98.4%
Number of Buildings	120	97.6%
Non-profit vs. for-profit	118	95.9%
Class 9	117	95.1%
Unit Size	114	92.7%
Rents	114	92.7%
Building Type	113	91.9%
Management Type	113	91.9%
Utility Payment	113	91.9%
Subsidies	113	91.9%
Sources if Financing	111	90.2%

It should also be reiterated that averages for security, marketing and leasing, and administrative payroll are based on a smaller number of observation. In instances where these expense categories were not itemized in the audits we treated them as missing data. Because this resulted in fewer observations we are somewhat less confident about the representativeness of our data set for these expense categories.

To determine the factors that affect project performance we have relied primarily on a non-experimental research design that statistically controls for relevant variables where possible using various statistical techniques such as multiple regression, chi-square, and analysis of variance. In experimental designs the possible effect of a given variable "x" is tested through a random assignment of research subjects to "experiment" and "control" groups. This type of analysis was obviously not possible in this study. Chi-square, regression analysis, and analysis of variance are statistical methods that are used to test the possible effects of an independent variable on a dependent variable without the use of "experimental" or "control" groups. When appropriate, using a method

call an “independent-data set *t* test,” we have also conducted separate analyses to determine if the mean or average of a single variable in one group significantly differs from that in another. In this instance, the term “significant difference” refers to the confidence we have in asserting, based on observed variations with the data set, that there really is a difference in averages between two populations with respect to some characteristic.

Our examination the possible effects of neighborhood conditions on project performance was influenced by a combination of factors. First, because of the relatively large number of scattered site projects in our data set that are located in separate census tracts we chose to use community areas rather than census tracts as the basis of comparison. Second, the 2000 census data was not available when the analysis was conducted for this study. However, since our financial data had to do with the performance of LIHTC projects in 1998 and the years prior to that date use of 1990 census figures is not inappropriate. In addition, we used more recent data provided by a variety of sources including Claritus, AREA (Applied Real Estate, Inc.), and the Chicago Association of Realtors. Finally, while we also wanted to examine the influence of crime on project performance this was not possible given the nature of the crime statistics at our disposal. Anecdotal evidence suggests that high crime rates do affect aspects of project performance, particularly security costs and vacancy rates. Unfortunately, the crime data is available only by police districts, which in some instances cover several community areas. Since the crime rates can vary significantly within a given police district, we were unable to adequately assess the effect of crime on the revenues and operating expenses of projects in our data set.

Appendix D: Glossary

Analysis of Variance (ANOVA)
Refers to a statistical test used to determine the possible effects of an independent variable on a dependent variable.

Bad Debt
This category includes accounts receivable written off in accordance with the general partner's bad debt policy.

Cash Flow
This term refers to a project's final balance of revenues and payments at the end of the fiscal year

Cash Flow Ratio
This item refers to the ratio of total cash outflow to effective gross income (or effective gross income divided by total operating expenses plus total debt service).

Chi-Square
Refers to a statistical test used to determine if there is a significant association between two variables.

Comparison of Means T Test
Refers to a statistical test used to determine if a single variable for subjects in one population group differs from that in another

Conventional Debt/Total Debt Ratio
This term signifies the portion of total long-term debt that is covered by a conventional first mortgage.

Correlation
This term refers to the strength of a relation between two continuous variables.

Debt Coverage Ratio
This ratio is determined by dividing the net operating income (NOI) by total debt service.

Effective Gross Income
Included under this category is all revenue actually received by a project, or the gross potential income minus losses from vacancy and bad debt

Gross Potential Income
This term refers to all potential income including the billable rent and income from other sources.

Gross Residential Billable Rent
This terms refers to the residential rent chargeable to tenants in accordance with tax credit regulations and includes base rents and rental subsidies

Moderately Troubled
This term signifies projects with negative cash flow and a total cash outflow of less than 115% of EGI

Net Operating Income (NOI)
This term signifies balance of revenues after operating expenses but before total debt service.

Operating Ratio
This item refers to the percentage of effective gross income used to cover total operating expenses

Other Income
This category includes all sources of project revenue received except residential rent collected (e.g., commercial rent, interest income, and income from other sources such as laundry, etc).

Rent Collected
Included in this category is all residential rent collected over the course of a calendar year

Severely Troubled
This term signifies projects with a negative cash flow and total cash outflow that equals or exceeds 115% of effective gross income (EGI).

Total Cash Outflow
This term refers to the total cost of operating a project plus total debt service

Total Debt Service
Included in the category are payments on interest, principal, and mortgage insurance.

Total Operating Expenses
This category consists of the total cost of operating a project—including administration, marketing and leasing, maintenance, security, utilities, property taxes, and property insurance.

Vacancy Rate
This term refers to the percentage of billable rent not received due to the fact that rental units were unoccupied for one reason or another.

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