



Will they stay or will they go: Predicting subsidized housing opt-outs



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ABSTRACT

Over the past 30 years, the share of renters in the United States spending over 30% of their income on rent, and thereby qualifying as rent burdened, has increased. This trend has particularly affected low-income families. At the same time, owners of thousands of privately owned, publicly subsidized rental housing units have left, or “opted out,” of subsidy programs across the country. The efforts of local governments to preserve these properties as affordable housing are handicapped by a lack of understanding of the underlying factors that drive owners’ decisions to opt out. This paper employs a unique dataset on subsidized properties in New York City and uses hazard models to explore why property owners in the Mitchell-Lama program, a New York State affordable housing program, choose to opt out. Our results suggest that properties located in neighborhoods with high property value growth, those with for-profit owners, and those past the affordability restrictions on all subsidies, are more likely to opt out. While our study focuses on Mitchell-Lama properties, the findings have broader implications for properties around the country that receive supply-side rental subsidies.

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1. Introduction

Over the past 30 years, the share of renters in the United States spending over 30% of their income on rent, and thereby qualifying as rent burdened by the U.S. Department of Housing and Urban Development (HUD), has increased. This trend has particularly affected the lowest-income

families. At the same time, many of the privately-owned, publicly-subsidized rental properties across the country have reached the end of subsidy restriction periods and therefore are no longer required to be maintained as “affordable.”¹ Owners of subsidized rental properties have chosen not to renew their affordability commitments (“opt

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¹ Throughout this paper we define “affordable” as a property with below market rents. These rents may be well below market; however the difference between the “affordable” rent and market rent varies by whether the property receives a government subsidy, the type of subsidy, and the rents in the market where the property is located.

out”) and to convert thousands of units to market rate, further reducing the affordable rental stock. Furthermore, fiscal pressures have reduced capital funding for new affordable housing at all levels of government, which has limited the resources available to “preserve” the affordability of these rental units. Preservation efforts have also been compromised by a lack of data on these properties, and a lack of empirical evidence as to why owners choose to leave subsidy programs. This paper contributes to understanding the decisions of subsidized multifamily owners by testing six hypotheses about why owners leave subsidized housing programs. We find that ownership structure, local price appreciation, and the expiration of all affordability requirements are the three main determinants of property opt outs.

Housing affordability has been identified as a major issue for some time. Quigley and Raphael (2004) find the share of income spent on rent increased across all income groups between 1970 and 2000; this was particularly salient for the poorest renters, with the median renter household below the poverty line spending 64% of income on rent in the year 2000. They further estimate that as of 2000 there were 5.1 million renters who received a rental subsidy, yet there were 7.3 million renters below the poverty line. Macpherson and Sirmans (2003) go so far as to argue that housing affordability for the lowest-income renters in the United States was the number one housing problem at the time.

The number of low-income renters facing high rent burdens has only increased since the early 2000s. A report by the Joint Center for Housing Studies (2011) finds that there was an 11.2% increase in the number of severely rent burdened households between 2007 and 2009.² The report estimates that there were 16.3 million households with incomes between 30% and 50% of their local area median income (considered “very low-income”), but only 12 million subsidized and unsubsidized affordable units across the U.S. in 2003. By 2009, that number increased to 18 million very-low income renters but only 11.6 affordable rental units. There are several factors contributing to this increased gap, including the demolition and filtering of some units, reduced funding for the development of new affordable rental housing, and an increased number of properties exiting affordable housing programs.

Federal, state, and local governments financed the development of millions of units of affordable rental housing throughout the 1960s and 1970s. Many of these units were financed with multiple subsidies, each with its own oversight, financing terms and affordability restrictions. The complex layering of subsidy programs makes it difficult to fully quantify how many subsidized rental units exist across the country. More importantly, it makes it extremely difficult to understand when a property is eligible to convert to market rate, or why an owner would choose to leave, or “opt out,” of a subsidy program. In the mid-1980s, the affordability restrictions on these properties began to expire. Since then, thousands of subsidized rental units converted to market

rate. Achtenberg (2002) estimated that nationwide, 40,000 subsidized rental units converted to market rate between October 1996 and April 1999. The Furman Center for Real Estate and Urban Policy (2011) found that between 1986 and 2011 there were 62,334 rental units located in properties where the owner decided not to renew their subsidy in New York City alone. In addition, they find that there were 38,790 additional units in properties where the owner is currently eligible, or will be eligible, to convert their property to market rate in the next five years.

Governments have been consistently thwarted by limited knowledge about the financing on these properties and the economic incentives of owners. Owner reservation prices are unknown and governments overpay to keep them in these programs, which has resulted in preservation programs that are unnecessarily costly (Khadduri, 2007). There is also a long-standing debate about whether the government should even focus its resources on supply-side housing programs. Olsen (2003) argues that demand-side responses are a better approach from a cost/benefit standpoint. Schwartz et al. (2006), however, find that investments in place-based housing deliver a potential tax benefit to New York City that exceeds the costs of providing subsidies. Further research into the true costs and benefits of preserving supply-side housing is required. One thing is clear, however: thousands of subsidized units have filtered up in recent years, and governments are trying to preserve the remaining units as affordable housing with limited tools and data.

Currently, little is known about the factors that lead owners to leave an affordable housing program. While it might seem that this decision would be based on a private owner’s desire to maximize the return on investment, there are examples of owners who have decided to opt out based on other grounds (Econometrica and Abt Associates, 2006). Existing studies analyze the decision to opt out of the major federal supply-side subsidy programs, most notably the project-based Section 8 program and the Low Income Housing Tax Credit (LIHTC) programs, but none have been able to include all of the layers of federal and local subsidies on each property in their analyses. We contribute to this literature by adding this key missing component to our analysis. It is important to include all subsidy layers in any analysis because these layers can affect whether and when an owner chooses to leave any, or all, of the subsidy programs (Reina and Williams, 2012) and omitting such information biases any results. This is particularly true because owners may have already made a decision about whether or not to opt out of a supply-side subsidy program by the time the next layer expires. In this paper we focus on one program, the Mitchell-Lama program, because it allows us to fill existing gaps in the literature about an owner’s decision to opt out of affordable subsidy programs.

New York State, much like other states across the country, developed a variety of its own programs to finance affordable housing. One such program, the Mitchell-Lama housing program, was launched in 1955 and provided

² In this report, they define severely rent-burdened households as those spending more than half of their pre-tax household income on rent and utilities, between the age of 25 and 64 with two or more earners.

subsidies to construct rental and cooperative apartments for middle-income families.³

We chose to focus our study on properties financed through the Mitchell-Lama program for several reasons. First, the Mitchell-Lama program provided financing to properties that contain nearly one-third of all privately owned rental units with a local and/or national subsidy ever developed in New York City, which is more than any other supply-side affordable rental program. Second, properties financed through the Mitchell-Lama program are often layered with local, state, and federal subsidies. This allows us to explore why properties opt out of a local program, and how that decision is affected by the presence of other subsidies, including national ones. In addition, most Mitchell-Lama properties are past their affordability restrictions and are eligible to opt out. This is because the Mitchell-Lama program is older than most subsidy programs, and the programmatic affordability period is only 20 years, therefore the Mitchell-Lama affordability requirements are usually the first to expire. Thus, we are able to model an owner's behavior when the first affordability restriction expires, as well as model an owner's subsequent decisions of whether to opt out, or remain in a subsidy program, when all other affordability restrictions expire. For this paper, we developed a unique dataset that includes all of the subsidy layers on Mitchell-Lama rental properties in New York City, and therefore allows us to analyze an owner's decision to opt out without omitting any of these important variables. There were only 171 Mitchell-Lama rental properties ever developed, which allows us to include crucial but difficult-to-obtain details such as: the affordability restriction referenced only in legal documents, as well as ownership information and debt levels. Such a level of detailed local data is essential to any analysis on the decision to opt out.

Our findings have direct implications for the 32,900 rental units in properties that still receive Mitchell-Lama financing and either are, or will be, eligible to opt out. To put that in perspective: there are more units in properties that remain in the Mitchell-Lama program than there are LIHTC units in any city in the country aside from New York City, and the LIHTC is the largest supply-side program currently used to finance affordable housing units.⁴ As we will discuss later in the paper, our findings also have important implications for owner behavior in other supply-side subsidy programs.

Through discussions with practitioners and a review of related literature, we identified six primary factors that might affect the probability that an owner will choose to leave the Mitchell-Lama housing program. First, and most obviously, we expect that owners will be more likely to

leave as soon as their affordability restrictions expire. Second, we suspect that properties located in areas with high market rents will be more likely to opt out. Third, properties with low debt levels will be more likely to leave the program. Fourth, properties with mortgage insurance from HUD will be more likely to opt out. Fifth, we hypothesize that for-profit owners will be more likely to exit the program than nonprofit owners. Finally, we hypothesize that those properties in the best physical conditions are most likely to opt out. We will explain these hypotheses in more detail below.

We use data from the Furman Center for Real Estate and Urban Policy's Subsidized Housing Information Project (SHIP) to test these predictions about what might affect an owner's decision to leave the Mitchell-Lama program. The SHIP database has detailed property-level information on all of the Mitchell-Lama properties developed in New York City, and includes all federal and local government financing on these properties. We use a longitudinal dataset that has limited data starting in 1983, the year the first Mitchell-Lama property was eligible to leave the program, and a more detailed longitudinal dataset covering the period from 1998 through 2009.

2. Overview of the Mitchell-Lama housing program

The New York State Legislature created the Mitchell-Lama program in 1955 to promote the development of safe and sanitary housing for middle-income families. There were 271 properties, containing 139,428 units, developed in New York City through the Mitchell-Lama program, including 171 rental properties with 67,896 units. Currently, only 78 rental properties in New York City, containing 32,900 units, remain in the Mitchell-Lama program.⁵

The Mitchell-Lama program offered developers three main subsidies to develop rental and cooperative ownership properties: low-cost city-owned land, exemption from property taxes, and a subsidized mortgage that covered up to 95% of project costs. The property owners who entered the program were required to agree to 20-year restrictions on the rent that could be charged, tenant incomes, and a maximum 6% return on their investment⁶

All Mitchell-Lama properties are regulated by the government agency that provided the Mitchell-Lama subsidy. Currently, the New York City Department of Housing Preservation and Development (HPD) or the New York State Homes and Community Renewal (HCR) are the two main agencies providing oversight. These agencies regulate rental increases and capital reserves, conduct physical inspections on the properties, monitor waiting lists for affordable units, and process owner applications to exit the program

³ The program was authorized under Article II of the New York State Private Housing Finance Law. There were 271 Mitchell-Lama properties developed in New York City, 171 of which were rental properties, comprising 67,896 units. These properties are only required to remain affordable and in the Mitchell-Lama program for 20 years, but additional subsidy layers on these properties often extend this affordability restriction period. As of 2008, 95 rental properties had left the Mitchell-Lama program, but 18 of these properties remained affordable through another subsidy program.

⁴ Based on data from [Been et al., 2012](#).

⁵ This paper focuses solely on assessing factors that impact the opt-out decision of owners of Mitchell-Lama rental properties. We chose to focus on rental properties because there are nearly two million privately-owned, publicly-subsidized rental units in the country, and the analysis of Mitchell-Lama rentals will allow us to provide insight on why rental property owners leave subsidy programs.

⁶ The original Mitchell-Lama restriction period was 40 years but was reduced to 20 in 1956. The first Mitchell-Lama rental property developed in 1962, therefore all Mitchell-Lama rentals have only a 20-year affordability restriction. N.Y. Priv. Hous. Fin. Law § 35(2).

(New York City Department of Housing Preservation and Development, 2010).

Mitchell-Lama owners often layered other affordable rental financing programs on their properties after the property was developed: nearly 60% of Mitchell-Lama properties received additional HUD financing and insurance, project-based rental assistance, or Low Income Housing Tax Credit (LIHTC) subsidies.⁷ In many cases, this funding came with additional restrictions and required joint oversight between agencies. For example, properties that received a HUD Section 236 mortgage subsidy are subject to a 40-year affordability commitment and joint oversight by HUD and the supervising agency.

Each subsidy layer has implications for property rents. The agency that supervises the property determines the rent levels for each Mitchell-Lama property and reviews requests for rent increases based on property revenue and costs, the need for the developments to remain affordable, and the ability to offer the owner a 6% annual return on their investment. However, the rent the owner receives may be higher if the property has HUD project-based rental assistance, where HUD pays the difference between the tenant payment, which is set at 25–30% of renter income depending on the program, and the actual market rent.

Tenant income requirements also vary by the oversight agency. The standard requirement through the Mitchell-Lama program is that household income cannot exceed the greater of the HUD-determined area median income (AMI) for the metropolitan area, or seven times the annual rent for families with fewer than three dependents, and eight times the annual rent for families of three or more dependents.⁸ Properties that receive a HUD subsidy are subject to additional restrictions based on HUD's AMI for the New York City.

The Mitchell-Lama program has never officially been discontinued, however, the state stopped allocating capital funding for this program in the late 1970s, and no new developments have been financed through this program in over 30 years. Current Mitchell-Lama properties still receive their original property-tax abatement. Owners can refinance their original mortgage and obtain other forms of public or private financing, but must receive approval from the supervising agency and maintain the Article II ownership structure in order to receive the property tax-exemption.

Owners must go through a formal opt-out process prior to leaving the program if they choose to leave the program after the 20-year restriction period. An owner choosing to opt out must notify both the supervising agency and tenants 365 days prior to the actual date the owner plans to leave. The owner is not allowed to benefit from any Mitchell-Lama subsidy after opting out, and therefore must

prepay any existing mortgage subsidized through the Mitchell-Lama program. Owners also will no longer receive the program's real estate tax-abatement. Finally, properties built before 1974 are subject to rent stabilization, which means these units are not required to remain affordable, but rent increases are restricted by the city. The opt-out process for the Mitchell-Lama process is similar to other national supply-side affordable rental programs. For example, HUD does not offer new project-based Section 8 rental assistance contracts however existing owners make the decision whether to renew their contract with HUD or formally opt out at the end of the property's affordability restriction period.

There is large variation in both the size and location of Mitchell-Lama properties. The average development includes almost 400 units. The vast majority of properties financed through the Mitchell-Lama program were newly constructed, rather than rehabilitated. These properties are located in all five boroughs, but are largely concentrated in Brooklyn, Manhattan, and the Bronx. Brooklyn currently has the most Mitchell-Lama properties (26 with over 14,000 units), however the most Mitchell-Lama properties were developed in Manhattan (62 with over 24,000 units). Queens and Staten Island currently, and historically, have fewer Mitchell-Lama properties. This is not surprising because these two boroughs tend to be lower density.

3. Data and methods

One of the key impediments to studying the preservation of affordable properties has been the dearth of data available on the properties, owners, tenants, subsidy layers, and other factors that may lead owners to leave the affordability program. Researchers performing a similar analysis at the University of Florida's Shimberg Center for Housing Studies noted, for example, that while they were unable to successfully predict opt-outs with their data, "such a model might be possible if more data were available" (Shimberg, 2008). In this paper we employ an extensive dataset on Mitchell-Lama properties, which accounts for every subsidy layer and includes additional property and neighborhood information to predict opt-outs. By studying the characteristics of properties that have opted out, and comparing them to those of properties that have remained in the program during the period prior to the decision to opt out, we can assess the most important predictors of opt out.

Our Mitchell-Lama data is from the SHIP database, which contains property-level financial and physical information on nearly 235,000 units of privately-owned subsidized affordable rental properties in New York City that were developed with financing and insurance from the HUD, HUD project-based rental assistance, New York City or State Mitchell-Lama financing, or Low-Income Housing Tax Credits (LIHTC). The SHIP database also accounts for all legal covenants that mandate affordability in Mitchell-Lama rentals properties. For example, some Mitchell-Lama properties were developed on city-owned land, and the owners agreed to maintain that property

⁷ Some Mitchell-Lama properties also rent units to tenants with tenant-based Section 8 vouchers, which is a demand-side subsidy. In this paper we focus solely on supply-side subsidies, and do not account for vouchers because renting a unit to a tenant with a voucher does not mandate that the owner maintain that unit, or the larger property, at a certain rent level for more than one year.

⁸ Landlords who own a property supervised by HCR have more flexibility on the tenant income requirements N.Y. Comp. Codes R. & Regs. tit. 9, § 1727-1.3(h)(1) (2011).

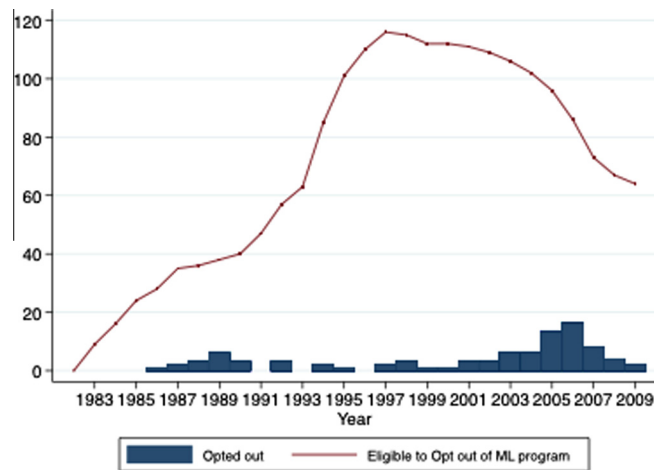


Exhibit 1. Number of Mitchell-Lama properties where owner opted out and cumulative number of properties where owner is eligible to opt out by year.

as affordable for a term longer than the one mandated by the Mitchell-Lama program, in order to acquire the land when the subsidized property was first developed. We combined this database with detailed market and neighborhood data collected by the Furman Center to create a limited longitudinal dataset for all Mitchell-Lama rental properties from 1983, which is the earliest year a property was eligible to opt out of Mitchell-Lama, and a more detailed longitudinal dataset from 1998 to 2009, which shows all forms of financing and affordability restrictions on each property. While it would be preferable to have more data for the pre-1998 period, the majority of properties that opted out left the program after 1998. [Exhibit 1](#) shows the number of properties that opted-out of the Mitchell-Lama program compared to the cumulative number of properties eligible to leave the Mitchell-Lama program by year.

In [Exhibit 2](#) we can see that 129 of the 171 Mitchell-Lama rental properties in our database received at least one other form of public subsidy for some period of time during program participation. Each of these subsidies requires its own affordability period, and sometimes targets a different income band. For example, a property receiving the LIHTC that was placed in service after 1990 is required to make 40% of its rental units affordable to resident at or below 60% of area median income, or 20% at 50%, for a 30-year term. Thus, an owner able to leave the Mitchell-Lama program after 20 years still may be subject to longer-term affordability restrictions due to additional layers of subsidies.

We have data on the 171 Mitchell-Lama rental properties developed in New York City. As of 2009, there were 12 Mitchell-Lama properties required to remain in the program, 48 properties that chose to remain in the program and receive other subsidies, 23 properties that chose to remain in the program without any additional affordability-restricting subsidy, two properties that opted out of the Mitchell-Lama program but still received another form of subsidy, and 93 properties that opted out

of Mitchell-Lama and no longer receive any form of subsidy.⁹

We use a proportional hazard model to test whether the six hypotheses previewed earlier significantly affect the relative risk of opting out of a program. For this model, each property enters our database when an owner is first eligible to opt out of the Mitchell-Lama program, and properties are no longer in our database once they leave the program. As a result, our data start in 1983, when the first Mitchell-Lama property was eligible to opt out. Between 1983 and 2009, 155 Mitchell-Lama properties became eligible to opt out of the program and 95 formally opted out. Some data, such as debt levels and metrics for physical conditions, only date back to 1998. In order to address this, we run two versions of our models; one for the period from 1983 through 2009, and another from 1998 to 2009. During the later period, 127 Mitchell-Lama properties were eligible to leave the program, and 67 of them had actually opted out by 2009.

4. Opt-out hypotheses

Existing studies have been hampered by their inability to include all subsidy layers in their analyses. This is important because we expect that owners will leave subsidy programs as soon as all of the affordability restrictions on the property expire, not just the Mitchell-Lama program restrictions, because this is a clear point where the owner can convert the entire property to market rate. Owners could opt out of the Mitchell-Lama program even though other restrictions still apply; however, we believe that they will choose to remain in the Mitchell-Lama program when other restrictions are present because they cannot yet realize the full market potential of the property. Our variable, the affordability end date, reflects the first year in which an owner can choose to convert their

⁹ In our analyses, we exclude four opted out properties for which we have incomplete subsidy end date data.

Exhibit 2

Mitchell-Lama public subsidy layers.

LIHTC	HUD Insurance	HUD Project Based Rental Subsidy	Tax Abatement	New York City Bond Financing	New York State Bond Financing	City Loan	# of properties	# of units
<i>Mitchell-Lama plus one other subsidy</i>								
	x						2	370
		x					27	19,471
				x			7	2,686
						x	3	834
			x				14	6707
Total with one other subsidy							53	30,068
<i>Mitchell-Lama plus two other subsidies</i>								
x				x			2	2,100
x		x					4	1,509
	x	x					1	69
			x	x			5	2,456
			x				2	440
		x		x			4	2,296
	x	x					10	2,903
	x					x	1	215
		x					1	534
	x		x				32	7,584
Total with two other subsidies				x			62	20,106
<i>Mitchell-Lama plus three other subsidies</i>								
x	x	x					2	250
	x	x		x			10	4,591
	x	x				x	1	547
Total with three other subsidies							13	5,388
<i>Mitchell-Lama plus four other subsidies</i>								
x	x	x		x			1	460
Total with four other subsidies							1	460
Total with additional subsidy							129	56,022
Total with no additional subsidy							42	11,874
Totals (N)							171	67,896

This exhibit shows how many subsidies, and all of the combinations of local, state, and federal subsidies outside of the Mitchell-Lama program that are on Mitchell-Lama properties. Each layer of subsidy comes with its own affordability requirements. Mitchell-Lama properties received financing from one of several public sources outside of the Mitchell-Lama program: the federal LIHTC program, a HUD mortgage insurance program, any HUD project-based rental assistance program, a New York City tax abatement program, a New York City or State bond financing program, or an additional loan from New York City.

units to market rate after affordability restrictions from all subsidies have expired. This means that if the property only has a Mitchell-Lama subsidy, then the overall affordability end date would be the first point it could leave the Mitchell-Lama program. If a property receives multiple forms of subsidy, then the affordability end date would be the date at which all subsidy affordability restrictions expire.

When we look at the descriptive data for this variable we find that 83% of properties that opted out of the Mitchell-Lama program did so immediately after becoming eligible to leave all affordability requirements. As seen in [Appendix A](#), a simple *t*-test comparing the means between opt-outs and non-opt-outs suggests that properties where all affordability restrictions have expired are more likely to opt out. This implies that most owners choose to stay in the Mitchell-Lama program when they are still subject to other affordable subsidy restrictions, but choose to opt out of the Mitchell-Lama program when they can opt out

of all subsidies. This also highlights the importance of using layered databases such as the one in this study, and could explain why some previous studies were unable to model an owner's decision to opt out.

Currently, 24 properties with 6,805 units are eligible to opt out of the Mitchell-Lama program and are not bound by any other affordability restrictions but have chosen to remain in the program. Most of these properties have been eligible to opt out for quite some time; the median first year of opt-out eligibility for these properties was 1994. Later in the paper we analyze the descriptive statistics of these 24 properties to explore why they remain in the Mitchell-Lama program despite having no other affordability restrictions.

Second, we suspect that properties located in areas with higher rents will be more likely to opt out. Property owners determine their reservation price by evaluating alternative uses of the land ([Leung et al., 2012](#)). While there are several different potential uses for the land, one clear alternative is

to convert existing units to market-rate rentals, otherwise known as filtering up. For profit-driven owners who are thinking about opting out of affordability programs, potential revenues would be a key factor. As a result, owners may choose to leave the Mitchell-Lama program because of the large differential between the Mitchell-Lama rents and the actual or perceived market rents. Unfortunately, actual market rents are difficult to identify in New York City at the neighborhood-level, and the market was especially unpredictable between 2002 and 2009. Further, owners may have been making decisions based on perceived future rent growth potential, or the ability to convert their property to market rate condos. As a result, we assume that the actual, and perceived future, market rents are capitalized into multifamily property values, which we measure using a repeat-sales index of properties with two or more units within the same community district.¹⁰

Specifically in our analysis, we use the percent change in the local housing price index over the prior five years as our measure of housing market growth. Prior research argues that owners are more likely to convert properties to market rate in high-demand rental markets with low-vacancy rates (Recapitalization Advisors, 2002; Abt and Viva, 2012), and that properties with rents below fair market rent are more likely to opt out (Econometrica and Abt Associates, 2006). Our descriptive statistics in Exhibit 3 show that opt-out properties are indeed in community districts with high average housing growth. An initial *t*-test again shows a strong difference across means for the properties that have opted out and those that have not. Ultimately, support for this hypothesis would provide insight into how owners react to changes in their local housing market.

Mitchell-Lama properties sometimes have balloon mortgages that must be paid off upon sale. Balloon mortgages do not fully amortize over the term, which leaves a large balance due at loan maturity. The need to pay off these large balances may deter owners from opting out because high levels of debt limits the ability of the owner to make a profit upon sale. Various government officials we interviewed argued that owners of Mitchell-Lamas burdened with high levels of debt would realize little profit from leaving the program. As a result, owners with more debt may be more likely to remain in the program because they can receive government subsidies to help service this debt and still receive a certain level of profit. Conversely, properties with low levels of debt can more easily prepay the outstanding loan balance and convert to market rate. Government officials believed that the use of balloon mortgages provides them leverage in negotiating with owners when affordability restrictions expire; if a high level of debt burdens the property then owners will need to work with these officials to address this debt before they can opt out. We developed a variable that calculates the mortgage

per unit for all of the Mitchell-Lama properties from 1998–2009, which allows us to examine whether properties with less debt are more likely to opt out of the program. As we see in Exhibit 3, the mean mortgage per unit for properties that remain in the program is \$41,228 where it is only \$22,524 for properties that opt out. An initial *t*-test suggests this difference in means is significant.

Fourth, the presence of an additional rent subsidy may influence the risk of opt out. When a property has a HUD project-based rental assistance contract, HUD pays the difference between tenant monthly rent payments, set at 25–30% of renter income, and the actual market rent. We argue that properties with a rental subsidy may be more likely to remain in the Mitchell-Lama program because these subsidies enable owners to raise rents to market level, which is well above the rent limits mandated by the Mitchell-Lama program. As a result, properties with HUD project-based rental assistance contracts have rents that are closer to market rents. As Exhibit 3 shows, 21% of properties that opted out had some form of HUD project-based rental assistance, whereas 60% of those that are still in the program have these subsidies. Again, a simple *t*-test shows a significant difference between these means.

Additionally, we argue that properties with HUD mortgage insurance will be more likely to opt out than those without this form of financing because the mortgage insurance, absent a project-based rental assistance contract, does not allow owners to raise rents to market-level, yet still requires HUD oversight. A Government Accounting Office report (2007) argues that some property owners get “HUD-fatigue,” which means they choose to opt out of HUD programs because they become tired of the paperwork required to receive HUD subsidies. As a result, owners may suffer from HUD-fatigue when there is HUD mortgage insurance because there are additional oversight requirements but fewer financial benefits. The descriptive statistics in Exhibit 3 show that 34% of properties that have opted out of the Mitchell-Lama program had mortgage insurance, whereas 39% that remain in the program have HUD mortgage insurance. An initial *t*-test suggests the difference in means is not significant. These results run contrary to our theory; however we feel that it is worth exploring this variable in our full model.

All Mitchell-Lama properties are owned by limited-profit housing companies; yet, the primary owner within that company may be for- or nonprofit. Given that one of the main benefits of opting out is the potential for rent increases and higher profits, we hypothesize that for-profit owners will be more likely to opt out of the program than nonprofit owners. For-profit owners view their properties as investments and therefore will choose to leave the program when doing so maximizes their return. A mission-driven, nonprofit organization, by contrast, may want to maintain the property as affordable housing over the long run. This is consistent with the findings of other studies (Econometrica and Abt, 2006; GAO, 2007; Melendez et al., 2008; Shimberg, 2008; Abt and Viva, 2012). Again, Exhibit 3 shows that 15% of the properties that have opted out have been owned by a nonprofit, whereas 31% of the properties that remain in the program are owned by nonprofits. An initial *t*-test suggests this difference in means is significant.

¹⁰ For this measure, we rely on the Furman Center's Index of Housing Price Appreciation, restricted to repeat-sales of properties with two or more units at the community district-level. To create this index, the Furman Center uses data from the New York City Department of Finance. A community district is a political unit unique to New York City. Each of the city's 59 community districts has a community board that is assigned a number within its borough.

Exhibit 3

Descriptive characteristics of Mitchell-Lama properties that remained in the program versus opted out of the program as of 2009.

	In Program	Opted Out
Mean unit count	433	368
Mean year entered program	1973	1970
% With all affordability restrictions expired	30%	83%
Mean 5-yr community district multifamily HPI % Δ (2004–2009)	8%	18%
Mean mortgage per unit (1998)	41,228	22,524
% with HUD project-based rental subsidies	60%	21%
% with HUD mortgage insurance	39%	34%
% with Nonprofit ownership	31%	15%
Mean open C violations count (2000–2009)	40.7	24.6
N	76	95

Finally, we expect that the physical conditions of a building will affect the likelihood that an owner will opt out. Other studies have found that properties that opted out had slightly worse physical ratings (Econometrica and Abt Associates, 2006). We argue that owners of properties with better physical ratings will be more likely to leave subsidy programs because they will profit more from opting out than owners of properties in poor physical condition. Properties in need of serious capital maintenance will sell at discounted values due to the costs associated with rehabilitation and the lower rent potential prior to repair. In addition, poor physical ratings suggest overall owner negligence or indifference and that these owners may prefer to maintain their current status rather than work through the bureaucratic process of opting out and make the repairs necessary to receive a better return on sale. There are various ways to measure the physical condition of a property. We chose to use the number of open building code violations that fall into the “C” category, which is the most severe, as a metric for physical distress. These violations are on public record, and therefore may directly affect the perceived market and rental value of the property. An owner may address a C violation and have it removed from the record; therefore an open violation suggests owner negligence to either address the violation, or report that it was corrected and have it removed from public record. In Exhibit 3 we see that properties that remain in the Mitchell-Lama program have a higher mean number of open C violations than those that have opted out, and our initial *t*-test suggests this difference is significant, which supports the theory that properties in better physical condition may be more likely to leave the program. Discussions with practitioners also suggested that properties that leave have fewer units. While this is not one of our key theories, we do control for unit counts in our models because there may be disparate financing or exit opportunities for small versus large properties. In addition, Mitchell-Lama properties tend to have more units than properties financed through other supply-side programs, thus controlling for unit count allows our findings to be more applicable to other subsidized rental programs.

5. Analysis

We test our six factors through two main empirical models. Properties were eligible to leave the Mitchell-Lama program as early as 1983. While most

properties that opted out did so post-1998, there were some properties that opted out prior to this date for which we have less data. Therefore, we estimate models of opt out both for the full 1983–2009 period but also for the shorter 1998–2009 period for which we have more data. We include calendar-year fixed effects for each year to control for national and intra-city economic and cultural changes that might affect all properties in a given year; such as lowered borrowing costs or a new mayoral regime. This also means we will be relying on within-city variation across properties in each year to establish our estimates.

For each time period, we estimate hazard models, where the dependent variable is a binary variable representing whether or not the owner opted out during the period since the prior year.¹¹ Hazard models are the most appropriate for this analysis because they allow us to assess the conditional risk of opt out in each year based on our hypotheses, incorporating both changes in these variables over time as well as each property's overall duration in the Mitchell-Lama program. The survival curve for these data is displayed in Exhibit 4, where *t* is measured in cumulative years since the first eligible opt-out date¹² for the property through 2009. Properties remain in this program for a median of 14 years after their required commitment period ends. The survival function reflects a steady decrease over time, with a more rapid decrease in recent years, consistent with what we expect from these data.

We use a semi-parametric Cox proportional hazard model for our empirical analyses, which allows for a flexible underlying baseline hazard. We test the appropriateness of the proportionality assumption for the time-varying covariates using likelihood-ratio tests. Given the nature of our data, we employ two separate hazard models: the first version of the model starts in 1983, the first year any property is eligible to opt out of Mitchell-Lama, and tests the limited variables for which we have data from 1983 through 2009; the second model starts in 1998 and tests all of our variables on Mitchell-Lama opt outs from 1998 through 2009. The hazard function is specified as:

$$\lambda(t) = \lim_{\Delta t \rightarrow 0} \Pr[(t \leq T < t + \Delta t) | T \geq t] / \Delta t$$

¹¹ We also perform an analysis using linear probability models with standard errors clustered at the property-level as a robustness check, and have similar findings. These results are included in Appendix B.

¹² The first property in our database is eligible to opt out in 1983.

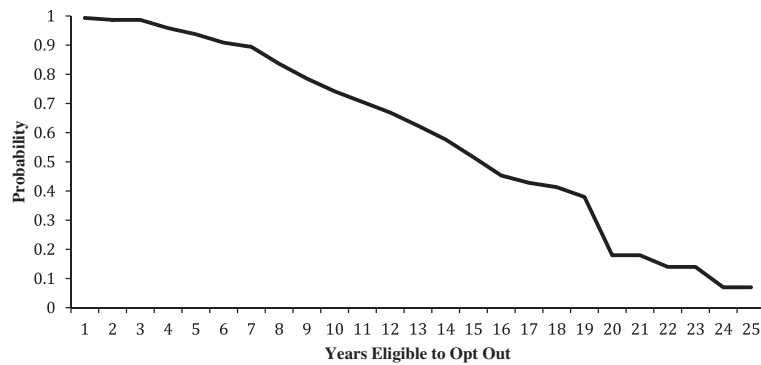


Exhibit 4. Survival curve for properties, based on years eligible to opt out of Mitchell-Lama program.

And the semi-parametric Cox proportional hazard model is specified as:

$$\lambda(t|\mathbf{x}, \beta) = \lambda_0(t)\phi(\mathbf{x}|\beta)$$

Where $\lambda_0(t)$ is the baseline hazard with an unspecified functional form; and $\phi(\mathbf{x}|\beta)$ is fully specified as¹³:

$$\lambda_i(t) = \lambda_0(t) \exp(\beta_1 x_{i1} + \beta_2 x_{ik} + \dots + \beta_k x_{ik})$$

Again, in these models the dependent variable is a dichotomous variable indicating whether a property has opted out since the prior year. Time (t) in these models is measured as the duration in years since the property first became eligible to opt out of the Mitchell-Lama program. Once a property leaves the Mitchell-Lama program, it is dropped from the dataset. The covariates in our model follow our hypotheses, and are represented as:

$$\ln(\lambda_i(t)/\lambda_0(t)) = \beta_{1\Delta} H_{ict} + \beta_2 O_i + \beta_3 U_i + \beta_4 A_i + \beta_5 M_i + \beta_6 R_i + Y_t + \varepsilon_i$$

in the limited model, and:

$$\ln(\lambda_i(t)/\lambda_0(t)) = \beta_{1\Delta} H_{ict} + \beta_2 O_i + \beta_3 U_i + \beta_4 A_{it} + \beta_5 M_{it} + \beta_6 R_{it} + \beta_7 V_{it}^* T_t + \beta_9 B_{it} + Y_t + \varepsilon_i$$

in the fully specified model. Where: ΔH_{ict} represents the appreciation in Community District property values over the past 5 years for property i in CD c , and year t ; O_i is a dummy variable flagging nonprofit ownership for property i ; U_i represents the unit count for property i ; A_{it} is a dummy variable flagging whether property i is past the end date of its affordability restrictions in year t ; M_{it} represents the presence of HUD mortgage insurance on property i in year t ; R_{it} represents the presence of any rental subsidies at property i in year t ; V_{it} is the outstanding total of C violations at property i in year t ; $\beta_8 V_{it}^* T_t$ is the interaction between the current outstanding violations and a dichotomous variable indicating whether the year is post-2003;¹⁴ B_{it} is the outstanding mortgage balance per unit for property i in year t ; Y_t represents calendar-year fixed effects; and ε_i represents standard errors.

¹³ Cameron, A. Colin, and Pravin K. Trivedi (2008).

¹⁴ In 2003 New York City's violation reporting system changed significantly, which resulted in a higher instance of violations being reported, we include the interaction to control for this change in reporting.

First, we run the model using the limited variables for which we have data starting in 1983. These variables include: the percent change in the local housing price index over the prior five years, whether the property has a non-profit owner, the total unit count, the end date of affordability based on all property subsidies, the presence of HUD mortgage insurance, and the presence of any HUD rental subsidies. We also include calendar-year fixed effects, as discussed above. The results from this hazard model are included in Exhibit 5.¹⁵

We do find support for some of our hypotheses of an owner's decision to opt out: properties that are past all affordability restrictions, those that are owned by for-profit entities, and those that are in a high growth neighborhood (relative to other neighborhoods in a given year) are at the highest risk of opting out, all else being equal. Specifically, we find that a one unit (100 percentage point) increase in the percent change in neighborhood property appreciation over the past five years¹⁶ increases the hazard rate of opt out by 242%. In addition, nonprofit owners have a 59% smaller hazard rate of opt out than for-profit owners, and being past the end of affordability restrictions increases the hazard rate of opt out by quite a large amount: these properties have a hazard that is 14 times higher than properties not yet past their affordability end dates. On the other hand, we find no evidence that the size of the property, or the types of additional subsidies, change the risk of opting out.

In the second version of the hazard model, we use only data from 1998 to 2009, and include the additional variables for which we have data only post-1997. Thus, this analysis is limited to properties that were still in the Mitchell-Lama program as of 1998. The additional

¹⁵ We are worried that the incidental parameters problem renders biased and inconsistent estimates in our 1998-2009 model: this problem arises from using fixed effects in hazard models for panel data with a small T (Greene, 2002). However, Greene suggests that in models with a slightly larger T ($T = 8$), the fixed effects estimator bias is preferred when compared to pooled sample bias. We also estimate a version of these models without fixed effects (the pooled version), and find similar results. Although this model will be biased as well, the bias will be in the opposite direction as that of the fixed effect estimator (Greene, 2002). These results are included in Appendix C.

¹⁶ The inclusion of calendar year fixed effects makes this appreciation relative to the mean community district price appreciation for the city in a given year.

covariates included in this version of the model are: the outstanding total C violations, an interaction effect between C violations and whether the year is post-2003 (our measures of physical condition), and the outstanding mortgage balance per unit.

The second model has similar results to the more limited model, although the coefficients have smaller effect sizes. Again, we find that the increase in local property values, nonprofit ownership, and expired affordability restrictions are the key drivers of property opt-outs. This model shows that a one unit increase in property value appreciation above the mean appreciation for the city over the past five years increases the hazard of opt out by 183%, nonprofit ownership decreases the hazard of opt out by 62% compared to for-profit ownership, and expired affordability restrictions results in a hazard rate that is nearly seven times higher than those properties without expired restrictions. In this model we find no evidence that the size of the property, the type of additional subsidies, the physical condition of the property, or the amount of outstanding mortgage balance change the decision to opt out. The results from both models are included in Exhibit 5.

Both versions of the models provide strong confirmation for three of our hypotheses: properties that are past all affordability restrictions, in high-growth rent districts, and have for-profit ownership are all at risk of opting out of Mitchell-Lama in a given year. The risk is especially high for properties with expired affordability restrictions and those in areas experiencing above-average property value appreciation. The fact that owners are more likely to leave the Mitchell-Lama program when all affordability

restrictions have expired suggests that the decision to opt out of the Mitchell-Lama program is part of a larger decision by the owner to leave subsidized programs entirely. This specifically highlights the importance of knowing all of the subsidy layers, and affordability restrictions, on any property. As previously stated, this also could explain why some existing studies have had difficulty modeling opt-outs; the decision to opt out of one subsidy program, here the Mitchell-Lama subsidy, is linked to the decision to opt out of all subsidy programs. Ultimately this finding has implications for all supply-side rental programs because owners of properties with HUD or LIHTC financing likely also choose to remain in the program for only as long as they are required to maintain their property as affordable through their subsidy programs.

The fact that owners appear to be profit-driven and may leave subsidy programs when potential rents and sales prices are growing is also important. This implies that owners of supply-side subsidized properties in areas with high market growth may be at risk to leave their affordability programs. Government officials have less leverage in negotiating with owners of properties in areas with high market value growth, and will likely need to design subsidy programs that can compete with these market dynamics if their aim is to incentivize owners to remain in affordable housing programs. In the case of the Mitchell-Lama program, owners are allowed to receive a maximum 6% return in any given year. While other large subsidy programs, such as HUD project-based rental assistance and the LIHTC program do not have explicit caps on rates of return, the returns offered through those programs may be below what the private market offers in certain years, particularly in high growth areas. This dynamic is particularly important to consider as cities like New York rebound from the recent recession, and subsidy restrictions continue to expire across all supply-side subsidy programs at a time when property values are growing. The ultimate risk is that the subsidized properties that remain in these programs, as well as new properties being developed through supply-side programs, will all be located in the same areas with the least growth in value and lowest levels of access to resources.

Our finding that nonprofit owners are less likely to opt out also provides important insight for policymakers. Most notably, if government officials want to ensure that properties with supply-side rental subsidies remain in affordable housing programs, they should consider the ownership structure when designing programs aimed to promote the development of new, or preservation of existing, affordable housing.

The significance for our nonprofit variable raises an important question: what does being a nonprofit owner actually mean? In this study we looked at the profit status of the sub-entities that make up the Mitchell-Lama Article II ownership structure to determine if the owner is a for-profit or nonprofit. However, there is still variation within the nonprofit flag. For example, some properties are legally established as nonprofits, however, the actual owners range from nonprofit housing developers, to churches that own one property, to for-profit entities that established a nonprofit for legal reasons. One implication of this

Exhibit 5

Results from hazard models for property opt out.

	Hazard ratios			
	1983+	1998+		
%Δ 5 Yr community district HPI	3.4191 (.8445)	2.8275 (.8529)	***	***
Nonprofit	0.4124 (.1738)	0.3817 (.1755)	**	**
Unit count	1.0000 (.0003)	0.9998 (.0004)		
Expired affordability restrictions	14.3870 (5.3427)	6.5874 (2.1894)	***	***
HUD mortgage subsidy	0.9432 (.2900)	1.0095 (.2911)		
HUD project-based rental subsidy	0.8469 (.4048)	0.7464 (.3446)		
Running total of C violations		0.7729 (.1591)		
Mortgage balance per unit (000s)		0.9844 (.0106)		
Post-2003 Running total of C violations		1.2853 (.2644)		
Observations	1810	1139		
Robust standard errors clustered at the property-level in ().				

Models include calendar-year time fixed effects.

* Significant at 10%.

** Significant at 5%.

*** Significant at 1%.

dynamic is that the effect of being a mission-driven nonprofit may be even larger and more significantly associated with remaining in a subsidy program. The complex nature of the ownership structure is true across all subsidy programs. For example many properties developed in NYC through HUD's older finance programs are owned by Housing Development Fund Corporations (HDFCs). These HDFCs are technically nonprofit; however, there is variation in the nature of these nonprofits. We explore the nonprofit variable, and the potential policy implications, further in our robustness checks.

Both models fail to support several of our hypotheses. First, there is no evidence that the types of additional financing, either in the form of HUD mortgage insurance or project-based rental assistance, have a significant impact on an owner's decision to opt out of, or remain in, the Mitchell-Lama program. One would expect that if HUD-fatigue did exist, it would be quite salient in our analysis because owners in the Mitchell-Lama program already face a high level of regulatory oversight from the Mitchell-Lama program administrators, and any additional oversight from HUD, regardless of the benefit, would prove that much more burdensome. Our results suggest that there is no HUD-fatigue and the additional benefit gained from the HUD mortgage insurance is worth the additional oversight, so long as the property is required to remain affordable through another subsidy program.

The fact that properties with a project-based rental assistance contract are not statistically more likely to remain in the Mitchell-Lama program also provides important insights into the HUD rental subsidy. It is surprising that properties with HUD project-based rental assistance would not be more likely to remain in the Mitchell-Lama program. Project-based rental assistance programs, particularly the project-based Section 8 program, were modified to give owners the ability to increase their rents to market-levels to incentivize these owners to remain in these programs. Our findings suggest that a property with only HUD and Mitchell-Lama financing may wait until it reaches the end of its HUD affordability restriction period to exit both programs. As a result, these findings raise an important question about whether the ability to mark rents up to market levels actually entices owners to renew their rental assistance contract, or if current properties with a project-based rental subsidy only remain in the program because they are subject to affordability restrictions through another program. If that is the case, then is the ability to mark rents up to market a cost effective subsidy?

Neither of our models support the hypothesis that properties with higher levels of debt are less likely to opt out. This may highlight that markets with high levels of appreciation allow owners to easily repay their balloon mortgages and leave subsidy programs. The fact that this variable is not significant is important because government officials cited the use of balloon mortgages as a negotiation tool when subsidy restrictions expire; however, their perceived sense of influence may be overstated. This has implication for properties financed through other subsidy programs. For example, many LIHTC properties in NYC have a city-subsidized mortgage that is also structured as a non-amortizing balloon loan. Once an LIHTC property

reaches the end of its affordability restriction period the owner can choose to opt out of the program and repay that mortgage. Thus, our findings suggest that LIHTC properties in areas with the highest housing growth will be able to repay these balloon mortgages and potentially exit the program. On the other hand, properties in low housing growth areas may not be able to repay their balloon mortgage, so the government may have leverage in negotiating those future affordability restrictions.

Our final hypothesis, which is that properties in the best physical condition are more likely to opt out, did not prove to be statistically significant when controlling for other variables. The lack of significance for our violations variable could either point to a lack of relationship between a property's physical condition and an owner's decision to opt out, or a flaw with using violations as a metric for determining a property's physical condition. Government officials in New York view the number of C violations as a useful indicator for financial distress, however even they will argue that it is not a panacea and a better metric is still needed to measure the physical condition of all subsidized properties.

6. Robustness checks

Given the limitations of our data, we run a number of robustness checks. First, given our reliance on the 1998–2009 subsample to test our full set of hypotheses, as a robustness check we run the limited version of the model that we used for the full sample on the smaller dataset for the years 1998 through 2009. The results from this specification are similar to the findings for the full sample, except the significance on the nonprofit variable dropped slightly to the 10% threshold. These results are included in [Appendix D](#).

Second, while it is practically unlikely that properties in our dataset opt out at the exact same time in a given year, in our analysis we are limited to annual observations on opt outs, and thus there are likely to be tied failures in our dataset. The Breslow method for ties is the primary method for dealing with ties in our models. This method treats each property in the exit "tie" as if they were all part of the full pool of properties as of $t-1$, and then calculates an exact marginal likelihood for each property as of time t . However, this method may be problematic if there are many ties in a given year. ([Stata Survival Analysis, 2011](#)) As a robustness check, we also estimate the models using the Efron method for ties, which weights the different potential samples of remaining properties when calculating the exact marginal likelihood of opt out. As a final robustness check for ties, we specify the models using the exact partial marginal likelihood method for handling ties, which is most appropriate for truly discrete data, and is equivalent to estimating repeated conditional logistic regressions using the remaining pools of properties. ([Stata Survival Analysis, 2011](#)) The results from these estimations are similar to the original models across all specifications, and are included in [Appendix E](#).

Finally, because one of our key findings is that local housing appreciation matters; and we hope to shed light

Exhibit 6

Hazard models for property opt out including nonprofit and housing price interactions.

	Hazard ratios	
	1983+	1998+
%Δ 5 Yr community District HPI	3.1696 (.8203)	2.8575 (.9018)
Nonprofit	0.4364 (.2298)	0.5323 (.2663)
Unit count	1.0001 (.0003)	0.9998 (.0004)
Expired affordability restrictions	15.0962 (5.6459)	6.5222 (2.1556)
HUD mortgage subsidy	1.0466 (.3393)	1.0362 (.2966)
HUD project-based rental subsidy	0.9325 (.4584)	0.7722 (.3560)
Nonprofit *+%Δ 5 Yr community district HPI	1.8803 (3.8233)	0.2195 (.3747)
Nonprofit*-%Δ 5 Yr community district HPI	0.2650 (.8660)	147.7849 (804.89)
Running total of C violations		0.7720 (.1614)
Mortgage balance per unit (000s)		0.9837 (.0106)
Post-2003* Running total of C violations		1.2867 (.2688)
Observations	1801	1131

Robust standard errors clustered at the property-level in (.). Models include calendar-year time fixed effects.

* significant at 10%.

** significant at 5%.

*** significant at 1%.

on owner behavior, we further test whether nonprofit ownership increases the probability of opting out during a high or low housing price growth period. Thus, we interact the percent change in positive or negative property appreciation with the type of ownership in our models. The coefficients are not significant, and thus we find no evidence that nonprofits are more or less likely to opt out during a period of positive or negative growth. Therefore, we cannot make any further inferences about the behavior of these nonprofit owners. These results are included in [Exhibit 6](#).

7. Why do owners remain in the program?

Variation is required in order to run a statistical model, which means that some owners remain in the Mitchell-Lama program despite being for-profit, and regardless of whether their property is past all affordability restrictions, or is located in an area with high price appreciation. In order to better understand property owner behavior for Mitchell-Lama participants, this section offers a closer examination of the characteristics of the remaining Mitchell-Lama properties.

As of 2009 there were 76 properties still in the Mitchell-Lama program, with 64 of these properties eligible to leave the program. Our empirical results suggest that these owners will likely remain in the Mitchell-Lama program until

all affordability restrictions expire on the property. Yet, as of 2009, 24 of these properties had no additional affordability restriction, which begs the question of: why do these owners remain in the Mitchell-Lama program?

Our findings suggest that the remaining owners may not have opted out because of nonprofit ownership and/or because they are located in areas with low house price appreciation. As of 2009, 14 of the 24 properties that had no affordability restrictions were owned by for-profits. Why, then, would a for-profit owner who is not required to keep their property affordable remain in the program? Our empirical findings suggest that one explanation is that these properties are in areas with low price appreciation, where it may be more profitable for them to remain in the subsidy program than to convert the property to market rate. This argument is supported by the characteristics of all but two of the remaining properties.

We find that as of 2009 there were only two Mitchell-Lama properties that were not required to remain in a subsidy program, were owned by for-profits, and were also in areas with above average price appreciation. This section has thus far shown that the current participating properties support our empirical findings. However, we are still left with the question of why those two properties remain in the Mitchell-Lama program or, for that matter, any subsidy program? A further look at the data reveals that one of the properties is a city-supervised Mitchell-Lama and the other is a state-supervised Mitchell-Lama. Both properties are large, with over 250 units, but well below the mean unit count of properties in the Mitchell-Lama program. Interestingly, one property has open housing code violations and delinquent liens. This could suggest that this property is in poor physical condition and has less value on the private market. Both properties have a mortgage per unit above the mean of properties that have opted-out, and one of the properties has a ratio more than three times that average. As we can see, there is idiosyncratic noise in ownership behavior, which means the question of why these two properties remain in the Mitchell-Lama program might be answered through interviews with the property owners. Nevertheless, our model, and this closer look at the remaining properties, highlights that ownership type, price appreciation, and affordability restrictions are the three main factors that drive an owner's decision to opt out. Our model explains much of the behavior of the remaining properties, but there are still other idiosyncratic factors affecting the decision to opt out, which are much more difficult to predict.

8. Conclusion

The rent burden for low-income renters has increased over the past 30 years in the United States, while the number of subsidized and unsubsidized affordable rental units has decreased. To date, little is known about what factors lead owners to opt out of subsidized housing programs, despite the fact that there are thousands of units of subsidized housing across the country reaching the end of affordability restriction periods, and federal and local

governments are spending scarce resources to preserve the affordability of these properties. This dynamic is partially due to the difficulty of knowing every subsidy layer on any given property and the lack of empirical research about owner behavior. This paper contributes to the existing literature through the use of a unique dataset on the Mitchell-Lama program to better understand the factors that lead owners to opt out of rental subsidy programs. We build on prior research on opt-out decisions, with additional data on property characteristics, ownership, property subsidies, physical condition, debt levels, and neighborhood property values.

All versions of our model yield findings that are consistent with both our theoretical expectations and findings from prior research. Across all models we find that properties located in neighborhoods with high property value growth, those with for-profit owners, and those past the affordability restrictions on all subsidies, are more likely to opt out. These findings highlight that a local government trying to preserve the existing subsidized housing stock can use detailed data to better target its efforts. Specifically, our analysis suggests that subsidized property owners leave programs once all their affordability restrictions have expired, rather than one program at a time, and therefore municipalities should know every subsidy on their subsidized properties and target ones where all affordability restrictions, not just a single restriction, are expiring. As properties are also at risk of leaving subsidized housing programs when there is increased neighborhood property value appreciation, municipalities should understand local property markets and may wish to focus on incentives

for property owners in high-growth areas. In addition, governments can further focus preservation efforts by accounting for ownership characteristics. Ultimately using these types of datasets would enable governments to more accurately monitor the existing subsidized stock, determine an owner's likelihood of opting out, and develop a preservation strategy well before the threat of opt-out.

Currently, there is a debate in the housing community about the correct affordability restriction period for properties that receive public subsidies, with many advocates calling for "permanent affordability" mandates. Our finding that owners have much higher odds of opting out when all affordability restrictions expire would suggest that if the policy goal is to ensure that owners of subsidized properties do not opt out, then affordability restrictions with longer terms may be a worthwhile policy tool. However, any decision about the length of affordability restriction should also consider the costs and benefits of developing new affordable properties and the possibility that extending affordability restrictions, or making such restrictions permanent, would affect developers' incentives to initially participate in a subsidy program or choose to extend their existing affordability restrictions.

Overall, this paper highlights key factors that practitioners and policymakers should consider when creating programs and policies geared towards the development and preservation of affordable housing. These findings also highlight the complexity of these programs, and the importance of using extensive local data to analyze subsidized housing.

Appendix A. T-Tables for opt-out hypotheses

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
<i>t-test, Past affordability restrictions</i>						
0	62	0.37097	0.06185	0.48701	.247291	.4946444
1	89	0.82022	0.04093	0.38618	0.73888	0.90157
Combined	151	0.63576	0.03929	0.48282	0.55813	0.7134
<i>t</i> = -6.3111						
Degrees of freedom = 149						
<i>t-test, Mortgage per unit</i>						
0	62	40.5190	4.2792	34.2338	31.9677	49.0704
1	89	21.9899	2.6219	24.8735	16.7803	27.1996
Combined	151	29.6903	2.4527	30.4367	24.8449	34.5358
<i>t</i> = 3.8914						
Degrees of freedom = 149						
<i>t-test, HUD Project-Based Rental Subsidies</i>						
0	62	0.59677	0.06281	0.49455	0.47118	0.72237
1	89	0.21348	0.04368	0.41209	0.12668	0.30029
Combined	151	0.37086	0.03944	0.48464	0.29293	0.44879

(continued on next page)

T-Tables for opt-out hypotheses (continued)

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
<i>t</i> = 5.1755						
Degrees of freedom = 149						
<i>t</i> -test, HUD Mortgage Insurance						
0	62	0.3871	0.06237	0.49106	.2623903	.511803
1	89	0.33708	0.05039	0.47539	0.23694	0.43722
Combined	151	0.35762	0.03913	0.48089	0.28029	0.43494
<i>t</i> = 0.6275						
Degrees of freedom = 149						
<i>t</i> -test, Nonprofit						
0	62	0.30645	0.05903	0.46478	.1884188	.424484
1	89	0.14607	0.03765	0.35517	0.07125	0.22089
Combined	151	0.21192	0.03337	0.41003	0.14599	0.27785
<i>t</i> = 2.4018						
Degrees of freedom = 149						
<i>t</i> -test, Running total C violations						
0	62	46.2	16.4	126.8	13.4	79.0
1	89	25.3	5.8	55.6	13.7	36.9
Combined	151	33.6	7.4	91.1	18.9	48.2
<i>t</i> = 1.38						
Degrees of freedom = 149						

*Note: This sample excludes 4 properties where the owner opted out due to lack of subsidy date data, and 16 properties with statutory opt-out dates past 2009.

Appendix B. Linear probability models for full period

	1983+		1998+	
%Δ 5 Yr Community District HPI	.0376	***	0.05132	***
	(.0110)		(.0136)	
Nonprofit	−0.0560	***	−.03731	***
	(.0113)		(.0142)	
Unit Count	4.68e−06		6.03e−06	
	(4.82e−06)		(4.38e−06)	
Expired Affordability Restrictions	0.1436	***	0.1267	***
	(.0169)		(.0189)	
HUD Mortgage Subsidy	−.0037		0.0243	**
	(.0087)		(.0194)	
HUD Project-Based Rent Subsidy	−.0230	**	−0.0006	
	(.0098)		(.0120)	
Running Total of C Violations			−0.0001	
			(.0005)	
Mortgage Balance per Unit (000s)			−0.0001	
			(.0001)	
Post-2003*Running Total of C Violations			0 .0001	
			(.0006)	
Constant	−0.1156		−0.04392	**
	(.0747)		(.0178)	
Observations	1,961		1,153	

Robust standard errors clustered at the property-level in ().
Models include calendar-year time fixed effects.

*Significant at 10%, **significant at 5%, ***significant at 1%.

Appendix C. Results from 1998 to 2009 Pooled Hazard model without fixed effects

	Hazard ratios			
	1983+		1998+	
%Δ 5 Yr Community District HPI	3.6190	***	2.302	***
	(.6936)		(.4904)	
Nonprofit	.3346	**	.4160	**
	(.1489)		(.1855)	
Unit Count	.9999		.9999	
	(.0004)		(.0004)	
Expired Affordability Restrictions	15.045	***	6.907	***
	(4.991)		(2.285)	
HUD Mortgage Subsidy	.7881		1.010	
	(.2486)		(.2885)	
HUD Project-Based Rent Subsidy	.6122		.8335	
	(.2303)		(.3549)	
Running Total of C Violations			.7799	
			(.1694)	
Mortgage Balance per Unit (000s)			.9854	
			(.01009)	
Post-2003*Running Total of C Violations			.7799	
			(.1694)	
Observations	1,810		1,139	

Robust standard errors clustered at the property-level in ().

*Significant at 10%, **significant at 5%, ***significant at 1%

Appendix D. Limited specification applied to the subsample of properties in 1998–2009

	Hazard ratios		
%Δ 5 Yr Community District HPI	3.7043		***
	(0.9547)		
Nonprofit	0.4566		*
	(0.2084)		
Unit Count	0.9999		
	(0.0003)		
Expired Affordability Restrictions	7.6598		***
	(2.7587)		
HUD Mortgage Subsidy	1.080		
	(0.3145)		
HUD Project-Based Rental Subsidy	0.7125		
	(0.3280)		
Observations	1,139		

Robust standard errors clustered at the property-level in ().

Models include calendar-year time fixed effects.

*Significant at 10%, **significant at 5%, ***significant at 1%.

Appendix E. Models using Efron method and partial method for ties

	1983		1998	
	Efron	Partial	Efron	Partial
%Δ 5 Yr Community District HPI	3.6852	***	4.1450	***
	(.9747)		(1.5369)	
Nonprofit	0.3443	**	.2991	***
			0.3513	**
			0.2633	***

(continued on next page)

Models using Efron method and partial method for ties (continued)

	1983		1998	
	Efron	Partial	Efron	Partial
Unit Count	(.1570) 1.0000 (.0004)	(.1083) 1.0001 (.0003)	(.1727) 0.9998 (.0004)	(0.1314) 1.0002 (0.0003)
Expired Affordability Restrictions	18.3048 (7.4469)	*** 24.1603 (8.6905)	*** 7.5569 (2.7032)	*** 17.5835 (7.9827)
HUD Mortgage Subsidy	0.9197 (.3200)	1.0985 (.3584)	0.9946 (.3188)	1.3574 (.5222)
HUD Project-Based Rental Subsidy	0.8543 (.4549)	0.9339 (.3749)	0.7524 (.3848)	0.9922 (.5120)
Running Total of C Violations			0.7717 (.1696)	0.7698 (.2477)
Mortgage Balance per Unit (000s)			0.9826 (.0119)	0.9641 (.0178)
Post-2003*Running Total of C Violations			1.2869 (.2828)	1.2974 (.4171)
Observations	1,810	1,810	1,139	1,139

Robust standard errors clustered at the property-level in ().

Models include calendar-year time fixed effects.

*Significant at 10%, **significant at 5%, ***significant at 1%.

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