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The Condominium v. Cooperative Puzzle: An Empirical Analysis of Housing in New York City

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Abstract

One of the enduring puzzles of New York City's housing market is the persistence of the housing cooperative, despite the prevailing wisdom that condominiums are more valuable than cooperatives. In this article, we examine the theoretical advantages and disadvantages of cooperatives and condominiums, and apply these theoretical insights to empirically test whether there is a price premium attributable to condominium housing. We then use our findings to speculate as to why the cooperative form remains dominant in New York City and whether its dominance is likely to continue in the future. The empirical analysis is based on hedonic models of house values and uses rich data on apartments sold in New York City between 1984 and 2002.

In most instances, theory suggests several reasons why the condominium may be a more efficient and desirable housing form than the cooperative. Unlike the case of cooperatives, condominium owners do not share liability on mortgage debt, they are free to transfer their apartments to whomever they choose, they are subject to fewer rules than cooperative apartment owners and, correspondingly, they need spend less time in internal governance. Our empirical findings confirm the theoretical prediction that legal form does indeed matter. With one important exception, condominium apartments are significantly more valuable than comparable cooperative apartments. The one exception suggests that for some owners, the benefits of restriction and exclusivity that the cooperative form offers, and which until recently seemed to be impossible to achieve through the condominium form, may be utility-maximizing. We speculate that, except for the segment of the market that seeks a socially exclusive residential environment, the continued dominance of cooperative housing in New York City is probably attributable to transaction costs and collective action problems which make switching to condominium form potentially difficult.

Keywords: Real estate, housing, condominiums, cooperatives

JEL Classifications: K11, R00, R31

One of the enduring puzzles of New York City's housing market, is the persistence of the housing cooperative. In recent years, common interest housing developments have grown tremendously in the United States; indeed according to the American Housing Survey, the number of condominiums and cooperatives increased by 227 percent over the past twenty-five years. Throughout the nation, the condominium has become the favored form for housing developments that share common amenities comprising nine out of ten of all such developments. Despite the fact that only 10 percent of the housing in common interest buildings in the United States are cooperative apartments, in New York City the proportion exceeds 80 percent.

Over the past decade, cracks have begun to appear in the foundation of cooperative housing dominance in New York. Most new shared interest developments that have been constructed or converted since the early 1990s have taken the form of condominiums. In addition, a small number of cooperative buildings have changed their legal status to condominiums.

In this article, we compare and contrast the theoretical advantages and disadvantages of cooperative and condominium housing. In most instances, theory suggests several reasons why the condominium may be a more efficient and desirable housing form than the cooperative. Unlike the case of cooperative apartments, condominium owners do not effectively share liability on mortgage debt, they are free to transfer their apartments to whomever they choose, they are subject to fewer rules than cooperative apartment owners and, correspondingly, they need spend less time in internal governance.

The theoretical advantages of condominiums generate hypotheses which we seek to test utilizing a hedonic price model that estimates the components of sales prices of condominiums

and cooperatives sold in New York between 1984 and 2002. Our empirical findings confirm the theoretical prediction that legal form does indeed matter. With one important exception, condominium apartments are significantly more valuable than comparable cooperative apartments. The one exception suggests that for some owners, the benefits of restriction and exclusivity that the cooperative form offers may be utility-maximizing.

In the first part of this paper, we describe the historical development of cooperative and condominium housing in the United States, as a whole, and in New York City, in particular. We then examine the theoretical arguments and empirical evidence regarding which type of housing is more valuable. In the third part, we apply these theoretical insights and estimate whether there is a price premium attributable to condominium housing. Finally, in the last part, we consider the implications of our finding that a sizable premium exists. In particular, we speculate as to why the cooperative form remains dominant in New York City and whether its dominance is likely to continue in the future. In the end, except for that segment of the market that seeks a socially exclusive residential environment, the continued dominance of cooperative housing is probably more a function of transaction costs and the cost of collective decisionmaking than the economic advantages offered by the legal form.

The Growth in Importance of Cooperative and Condominium Housing

Despite their physical resemblance, condominium and cooperative housing developments have very different legal structures. Both condominiums and cooperatives can be found in detached buildings, garden apartments or high rise towers. The owner of the condominium, however, possesses a different legal interest than the owner of the cooperative. The

condominium owner owns her unit in “fee simple absolute” and shares an undivided interest in the common elements (e.g. sidewalks, hallways, pools, clubhouse, storage place) as a tenant-in-common with the other condominium owners. In contrast, the owner of the building in a housing cooperative is the cooperative corporation. Each shareholder of the cooperative corporation is entitled to a proprietary lease granting him or her the right to occupy a unit within the building for a significant period of time (typically 99 years). Thus, the owner of a cooperative apartment is technically both the owner of shares in the cooperative corporation and a tenant of that corporation.

In the United States, cooperative housing predated the creation of condominiums. The first cooperative apartment buildings in the United States date from the mid- to late nineteenth century. Because of its higher density and the early acceptance by the middle and upper classes of apartment living, most of the early cooperative apartments were located in New York City. For example, according to one author (Siegler 1985), the first cooperative apartment in New York, The Randolph, was built on West Eighteenth Street in Manhattan in 1876 as a “home club” and cooperative apartments were “designed to provide people in high income brackets with the advantages and economies of individual home ownership without all the responsibilities.”

Although condominium housing has ancient roots in Europe, it was a much later transplant to the United States. Indeed, the earliest American condominium developments were located in Puerto Rico. Although some condominium developments were built in the mainland United States in the years immediately after World War II, their numbers were quite limited (Berger 1963). It was only with the passage of condominium enabling acts by the states and the provision of mortgage insurance by the Federal Housing Administration in 1961 that the tenure

form spread (Hansmann 1991). The first condominium project in Manhattan, The Saint-Tropez, was built in 1965 at 340 East 64 Street. It was not well received and took a while to sell (because people felt much more comfortable with the cooperative housing form).

Table 1 utilizes data from the American Housing Survey to show the growth of condominium and cooperative owner-occupied housing since 1976.[1] In 1976, there were 1,039,000 owner-occupied cooperative and condominium apartments in the nation, 106,000 of which were located in New York City. Thus, roughly one out of ten such apartments in the nation were located in New York. By 1999, the number of owner-occupied condominium and cooperative apartments in the nation had ballooned to 3,395,000 in the United States and 255,000 in New York City.[2]

Condominium and cooperative housing constitute a growing share of both the nation's and New York City's total owner-occupied housing stock. Across the nation, the proportion of owner-occupied housing composed of condominiums and cooperatives more than doubled between 1976 and 1999 from 2.2 percent to 4.9 percent. In New York City the share grew by a similar factor of two from 15 percent to 30.5 percent.

Although both the nation and the city experienced a similar increase in the share of owner-occupied housing comprised of condominiums and cooperative apartments, the form of

[1] The American Housing Survey is conducted periodically by the United States Census Bureau. In 1999, the national sample included over 58,000 observations; the New York City sample contained 2,468 observations. The small sample size of the New York City sample makes the survey a less than ideal source of data, but is used for comparability purposes in this section. Data from the New York City Housing and Vacancy Survey, a Census Bureau survey of over 17,000 housing units indicate that the number of owner-occupied cooperative and condominiums in 1999 was 352,947 (Lee 2002). These data suggest that the American Housing Survey underestimates the number of owner-occupied cooperative and condominium apartments.

[2] Because many cooperative and condominium apartments are rented and not owner-occupied, the data presented in Table 1 do not represent the full number of such dwellings. According to the American Housing Survey, there were a total of 5,026,000 condominium and cooperative housing units in the United States in 1999 and 415,100 in New York City.

the housing differs dramatically. In 1999, almost 9 out of 10 (89.2 percent) of these owner-occupied, common interest housing units were condominiums in the United States compared to fewer than 2 out of 10 (18.3 percent) in New York City. Thus, the predominance of cooperative housing in New York stands in marked contrast to the nation as a whole. Only one other city, Washington, D.C., has an unusually large proportion of cooperative housing and this share (24.2 percent) does not come close to matching that of New York City.

The primacy of the cooperative apartment in New York City has shown some signs of erosion in recent years. Table 2 demonstrates that most new multi-family housing constructed for the sales market takes the form of condominium apartments. According to filings with the New York State Office of the Attorney General from 1998 to 2001, 9,743 condominium units were built compared to only 349 cooperative apartments.[3] In addition, a small number of cooperative apartment buildings have converted to condominium ownership.

According to the prevailing wisdom of the real estate industry, both in the nation as a whole, and increasingly in New York City, condominium housing is more valuable than cooperative apartments. This increment in value appears to drive both the dominance of condominium housing in virtually every part of the country other than New York City and that dominance of condominiums even in New York City in new construction. Much of the reason for this apparent difference in value is attributable to the different legal status of condominium and cooperative housing and the different governance structures created by each form of housing.

The different legal status of condominiums and cooperatives (fee simple ownership v.

[3] Similarly, 1,389 rental apartments were converted to condominiums between 1998 and 2001 compared to 1,043 cooperatives.

ownership of shares in a corporation) is accompanied by different financing structures. The purchaser of a condominium unit typically borrows money to finance the acquisition and grants its lender a mortgage secured by the real property. The purchaser of a cooperative unit also typically borrows money, but because she is purchasing shares in a corporation, the mortgage is secured by a pledge of her shares in the cooperative corporation. Most cooperative corporations also borrow money secured by a mortgage on the real property. Thus the owner of a cooperative apartment typically makes periodic payments on two separate debt obligations– her own mortgage and her ratable share of the building's mortgage, whereas the condominium owner pays only one mortgage loan. Interest on all of the mortgage loans (including the pledge of the cooperative corporation shares) is deductible from income taxes under the Internal Revenue Code.[4]

A cooperative unit owner makes a monthly "maintenance" payment to the cooperative corporation for her share of the underlying building mortgage payments, real property taxes and the costs of operating the building. A condominium owner, on the other hand, pays a monthly carrying charge which typically only covers the operating costs of the building and common elements. Property tax bills are also sent by the relevant taxing authority to each owner in their individual capacities as owners of the real property.

Both condominium associations and cooperative corporations enact rules that govern the behavior of their residents. Typically, the rules of a condominium association do not restrict who an owner may sell her apartment to although the association may maintain a seldom used

[4] The Internal Revenue Code allows owner occupants of homes to deduct interest on a maximum indebtedness of $1,100,000 (including $1,000,000 of acquisition indebtedness and $100,000 of home equity indebtedness).

preemptive right of first refusal to purchase the apartment.[5] A cooperative corporation, on the other hand, typically requires a prospective owner to apply to the Board of Directors before a sale can be consummated. The Board will require the proposed purchaser to submit detailed financial statements and letters of recommendation and attend an interview. Cooperative corporations will also frequently limit the amount of debt an owner may secure with her shares. Condominium owners, on the other hand, are generally free from these rules. Although practices vary among cooperative buildings, rejections of proposed purchasers are not uncommon. Courts will seldom upset the decisions of cooperative corporation boards of directors which are shielded by the "business judgment rule."[6] Importantly, the rules governing financing and restrictions on sales are not dictated by law. Instead, they are consensual in the sense that they are found in the governing documents of the housing development and can be changed by super-majorities if the residents of the buildings so wish.

The Difference in Value between Cooperative and Condominium Housing: Theory and Existing Evidence

The different characteristics of condominium and cooperative housing, both those legally mandated and those consensually agreed to by the owners, generate alternative hypotheses regarding which type of housing might be more valuable. Because of the existence of a blanket

[5] A condominium may adopt rules that are similar to those of the cooperative (see page 34). Because a condominium is considering real property, however, restraints on alienation are subject to a test of reasonableness. See, e.g., Four Bros. Homes v. Gerbino, 262 A.D.2d 279 (2d Dep't 1999) (condominium leasing requirement not an unreasonable restraint on alienation); Shorewood West Condominium Assoc. v. Sadri, 92 Wash. App. 752 (1998) (same); Seagate Condominium Assoc. v. Duffy, 330 So.2d 484 (Fla. App. 1976) (same). The decisions of cooperative boards of directors are usually reviewed under the more deferential business judgment rule. See, e.g., 40 West 67th St. v. Pullman, 100 N.Y.2d 147 (2003) ("business judgment rule prohibits judicial inquiry into Board actions that, presupposing good faith, are taken in legitimate furtherance of corporate purposes.").

[6] Decisions on prospective purchases are subject to the Fair Housing Act as well as state and local antidiscrimination laws. Nevertheless, the vast majority of rejected purchasers will find it impossible to prove illegal discrimination.

mortgage loan on the building, one would expect that the sales price of a given cooperative apartment would be lower than the sales price of a hypothetical identical condominium apartment. This is because the purchaser of the cooperative apartment will implicitly be taking on the obligation of paying her proportionate share of the underlying mortgage loan which will be capitalized into the price paid.

Even after this capitalization of the underlying mortgage is taken into account, it is still likely that the value of condominiums and cooperative apartments would differ. Each shareowner of a cooperative corporation bears a portion of the risk that one of her fellow shareowners will default on a financial obligation to the cooperative corporation. For example, if a shareowner were to default on her maintenance payments, the other shareowners of the building would, in practice, be required to make up the amount in question.[7] This is because failure to pay in full the underlying mortgage would lead to default and the threat of foreclosure with respect to the entire building.[8] Similar dynamics would affect property tax payments. In the case of condominiums, since all mortgage loan and property tax payments are the sole responsibility of individual owners, this shared risk of default does not exist.

Although the underlying mortgage of a cooperative corporation may create greater risks for owners of cooperative corporations relative to condominium owners, it does have some countervailing advantages. The ability of cooperative owners to use tax deductible debt to finance building-wide improvements is more advantageous than the typical method used by

[7] Also, in mixed use buildings, where some of the space is used for commercial purposes, cooperative owners are at risk of rental defaults or inability to rent.

[8] Some of the risk of maintenance payment default by shareowners is reduced by the fact that the cooperative corporation is typically entitled to place a lien on the shares of an owner for unpaid maintenance. Thus, the corporation would be able to make itself whole upon the sale of the apartment's shares. Nevertheless, there is still the risk that the price would be too low to fully reimburse the corporation and that the sale would take place only after the expenditure of significant legal costs and the passage of time.

condominiums of assessing individual apartment owners. Even though the individual owners of a condominium could each borrow to pay for these capital improvement assessments, the transactions costs of individual mortgage loans would be much greater than the one borrowing by the cooperative corporation.

The cooperative corporation is also in a stronger position vis-à-vis defaulting shareowners than a condominium association. Typically, the cooperative corporation's lien for unpaid maintenance is superior to that of a shareowner's mortgage lender. For a condominium, however, the relative priority of the condominium association is reversed. In addition, because the occupant of a cooperative apartment is a tenant, the corporation can make use of summary process to evict a rule-breaking shareowner. A condominium association, however, would have to go through the more cumbersome legal process of ejectment.

Restrictive rules governing approval of applicants and allowable financing may negatively affect the relative values of cooperative apartments compared to condominiums by reducing demand. Many potential purchasers may avoid buying cooperative apartments because they do not want to disclose their financial situation to the Board. In addition, buildings which severely restrict the amount of debt an owner can secure with the shares of her stock may cause potential buyers with little cash to go elsewhere. Rules that restrict subletting, prevalent in many cooperatives, will also make these apartments less desirable for persons who wish to purchase the units as investments. In addition, households who wish to travel for long periods of time (e.g. college professors expecting sabbaticals) or those subject to temporary job transfers may decide to purchase condominiums so as to be able to sublet their apartments while they are away.

The greater utilization of restrictive rules on the part of cooperative corporations also

suggests that greater time and energy would be required on the part of owners to operate the housing as compared to condominiums. Board members must review financial statements, evaluate prospective purchasers and reach agreement concerning admission.

Nevertheless, the effect of these restrictive rules on the relative value of cooperative apartments is ambiguous. The fact that so many of the buildings have these rules suggests that they may be value-enhancing. Most clearly, financing restrictions and Board approval requirements may be designed to protect other shareowners from the risk that they might have to step in to make up for the shortfall in maintenance payments attributable to defaulting purchasers. Restrictions on debt would have the effect of limiting the likelihood that prospective purchasers take on debt obligations that they could not afford.

Perhaps more subtle, but every bit as important, restrictions on debt as well as the corporation's control over admission to the cooperative enables existing and future shareowners to maintain a community with certain desired characteristics. For example, the residents of some buildings may wish to maintain their exclusivity by only allowing in people who meet certain income and wealth thresholds. Others may wish to avoid having as neighbors people who are in certain "undesirable" professions or who may bring notoriety to the building.[9] The greater control that a cooperative corporation typically has over who lives in the building may thus enhance value, rather than diminish it, at least for some buildings.

Thus, the question of whether cooperative apartments are more or less valuable than condominiums is, in the end, an empirical one. Several pieces of evidence suggest that they may

[9] For example, in recent years, cooperative corporations in Manhattan have rejected well-known would-be purchasers such as the performer, Madonna and former President Richard M. Nixon (Co-op Board Hell 1995).

be less valuable. First, the twin facts that condominium housing dominates cooperative housing in every part of the United States other than New York and that even in New York, most new housing is being built as condominiums suggests that the condominium form may be superior. Second, several members of the real estate community have suggested that conversions of cooperative apartments to condominiums would generate immediate and substantial increases in value of up to 25 percent (Avidon 1998, Grover 2000, Weiss 1997).[10]

The two econometric studies that have examined the relative value of cooperative apartments and condominiums find evidence of a "co-op discount." Goodman and Goodman (1997) specify hedonic equations for both condominiums and cooperative apartments to calculate differences in bundle prices. Using a pooled sample from the 1987 American Housing Survey, they find that a premium did exist for condominiums of approximately 11.6 percent. The authors also estimate a model for New York City and find results that while statistically insignificant, suggest a somewhat smaller premium. This study, while suggestive, has several limitations. First, the price of housing is clearly sensitive to location. Because the data for the hedonic equation come from the American Housing Survey and the sample size is fairly modest (n=860 condominiums; 235 cooperative apartments), the authors are limited to regional controls (e.g. Northeast, Midwest, etc.). In addition, while the American Housing Survey contains more housing attributes than most databases, it is missing certain relevant characteristics such as the height, square footage, view and any indication of rule restrictiveness. The American Housing Survey also does not contain data on the sales price of units; the authors are therefore required to utilize owner estimations of value. Kelly (1998) analyzes the impact of financing terms on sales

[10] Indeed, a company that serves as a consultant for cooperatives seeking to convert to condominiums advertises on its webpage that a conversion will "[i]ncrease the dollar value of your unit by as much as 300 percent." See

price and, in the process, also compares the valuation of similar cooperative and condominium units. Using a hedonic price model and a sample of sales for two buildings (one cooperative and one condominium) in Washington, DC, he finds a condominium premium of 9 percent. While this study improves on Goodman and Goodman (1997) in several ways (use of sales prices, location controls and controls for financing terms), it also has some significant drawbacks. The estimation sample is even smaller than that of Goodman and Goodman (1997) and its representativeness is very weak given that it only covers two buildings. Moreover, the regression specification does not allow for differences in hedonic coefficients between cooperatives and condominiums, and it includes a very limited set of housing characteristics. Lastly, neither study is able to account for the amount of cooperative maintenance fees and/or a building's underlying mortgage which should have a large effect on the results.

Methodology

The centerpiece of this research is a hedonic model in which property values are modeled as a function of the characteristics of the housing unit, building and neighborhood. We employ separate hedonic models for condominiums and cooperative apartments, described by the following equations:[11]

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http://www.roahutton.com/

[11] An alternative, more simplistic application of the hedonic method is to estimate a single model based on the pooled sample of condo and cooperative sales,

$$V_{int} = \alpha + \beta_X X_{int} + \beta_W W_n + \rho I_t + \beta_C C_{in} + \varepsilon_{int},$$

where C_{in} represents the ownership type (condo or cooperative), and the coefficient β_C captures the differential effect of ownership type (i.e., holding all else constant). This specification, however, has three limitations: 1) it assumes that the impact of ownership type is independent of the other housing characteristics, 2) it assumes that the set of condominium attributes that matter to the consumer is identical to the set of relevant cooperative attributes, and 3) it restricts the hedonic coefficients to be constant across ownership types. In addition, F-tests performed in preliminary work rejected the hypothesis that the hedonic coefficients are similar for condominiums and cooperatives. Therefore, a two-model strategy, which relaxes these constraints, is more appropriate for the present

$$(1a)\quad V_{int}^{condo} = \alpha^{condo} + \beta_X^{condo} X_{int}^{condo} + \beta_W^{condo} W_n^{condo} + \rho^{condo} I_t^{condo} + \varepsilon_{int}^{condo}$$

$$(1b)\quad V_{int}^{co\text{-}op} = \alpha^{co\text{-}op} + \beta_X^{co\text{-}op} X_{int}^{co\text{-}op} + \beta_W^{co\text{-}op} W_n^{co\text{-}op} + \rho^{co\text{-}op} I_t^{co\text{-}op} + \varepsilon_{int}^{co\text{-}op},$$

$$i=1,\ldots,I;\ n=1,\ldots,N;\ t=1,\ldots,T.$$

where V_{int} represents the logarithm of the value of housing unit i in neighborhood n at time t; X_{int} is a vector of property-related characteristics; W_n are a series of census tract fixed effects; I_t are year indicators, and ε_{int} represents an error term with the usual properties. The coefficients to be estimated are α, β_X, β_W, and ρ.

Below, we describe in more detail the variables included in the hedonic models, as well as the interpretation of the model coefficients. We also present a method to calculate the market value differential for physically and locationally similar condominium and cooperative units, based on the estimates of the hedonic coefficients.

The Dependent Variable: Valuing Condominium and Cooperative Housing

All previous studies that have employed hedonic models to analyze various aspects of condominium and/or cooperative valuation have used either sales price or the owner's estimate of how much the unit would sell for as the dependent variable. However, neither variable is likely to fully capture the value of condominium and cooperative housing. For these housing types, the bundle of attributes that the consumer purchases includes not only the unit and neighborhood characteristics but also a proportionate share of the common elements of the condominium/cooperative building (e.g., the roof, hallway, driveway, on-site laundry room, concierge, door man, swimming pool, gym). Thus, we calculate the total value of the housing

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analysis.

unit as the sum of the sales price for the unit – which reflects the consumer's valuation of the unit and neighborhood attributes – and the value of the unit's share of the services provided by the common elements. This approach, however, presents a series of complications. Among these difficulties are the absence of a straightforward method to take into account the services provided by the building's common elements and relationship between a cooperative building's underlying mortgage and the price of individual units. We discuss these issues below, together with our solutions.

First, estimating the market value of the unit's share of the services provided by the common elements is complicated by the fact that common elements are not sold in the open market.[12] Our strategy is to utilize the present value (PV) of the stream of periodic (monthly) maintenance fees that the condominium and cooperative owners are required to pay for the operation and replacement of the common elements. This is not, of course, a perfect solution, since higher maintenance fees may reflect inefficiencies in the operation of a building as well as higher levels of service. It is, however, the only feasible alternative, given the available data.[13]

Second, for cooperative apartments in buildings with outstanding blanket mortgage balances, part of the value of the housing bundle is reflected in the unit's proportionate (or *pro-rata*) share of the outstanding debt. Therefore, for units in such buildings, this share of the debt should be added to the sales price and the present value of maintenance charges attributable to

[12] Miller (2002) notes that occasionally, and more often in recent years, cooperative boards and condo associations have sold parts of the common area to in-house residents who seek to fulfill an immediate housing need.
[13] Miller (2002) suggests a methodology based on the relationship between actual common area sales and apartment sales within the same building. The data requirements for this method, however, are daunting given the scarcity of common area transactions and the very limited release of information on such transactions. In addition, the estimated value reflects only one of the many characteristics of the common area – its size.

operation of the building to arrive at the total apartment value.[14]

Third, limitations of the available data as well as the special nature of cooperative and condominium organization require us to make certain assumptions when computing the various components of housing value. One set of assumptions pertain to the calculation of the value of the common building elements. Unlike condominium carrying charges, not all cooperative maintenance fees are used for the operation and replacement of the common elements of the building. More specifically, cooperative maintenance fees usually also cover payments for the cooperative blanket mortgage and property taxes. Therefore, for valuation purposes, we need to subtract real estate taxes and mortgage payments from maintenance.

The problem with this is that we do not have direct information on property taxes and mortgage payments. We do know, however, what proportion of an apartment's maintenance fee is deductible from taxes and therefore attributable to property taxes and interest on the blanket mortgage. Since we have data on the percentage of maintenance fees that are tax deductible,[15] we can easily compute the nondeductible portion of the fees.[16] Thus, the nondeductible portion of the maintenance fees should provide us with a good approximation of the amount of cooperative maintenance that is attributable to operating and maintaining the common elements and services.[17]

To compute the present value of these monthly maintenance fees, we assume that the

[14] A small number of buildings finance improvements with special assessments rather than mortgage loans. Unfortunately, our data will not allow us to control for this.
[15] Data on the percentage of maintenance fees that are tax deductible is available for about 60 percent of the cooperative buildings. For the buildings for which this information is not available, we impute it with the average of the non-missing percentages.
[16] Approximately 98 percent of the cooperative buildings with blanket mortgages in our sample have balloon payments.
[17] Given that most blanket mortgages have balloon payments - which usually require only interest payments – it is reasonable to assume that the mortgage payment is largely an interest payment

common building elements represent an indestructible asset providing a stream of services over an infinite time horizon. Thus, the present value formula is the same as the one used, for example, to convert rents to land prices:

$$(2)\ PV\_maint = \frac{Mth\_mfee}{\frac{1}{12}(i - g)},$$

where *Mth_mfee* represents the monthly carry charges for condominium units and the nondeductible portion of the maintenance fee for cooperative units, i is the annual discount rate, and g is an expected annual growth rate in the fees. We assume that i = 7.6 percent, the average annual interest rate for the 30-year treasury bond over the study period, and g = 3.2 percent, the average inflation rate over the study period.[18]

Finally, we must make an assumption about the change over time in the cooperative building's outstanding blanket mortgage balance. Such an assumption is required because this balance is reported only at one point in time in our data and yet we have to compute the unit's *pro rata* share of the outstanding balance each time when the unit sells. We assume that this balance grows at a rate equal to the average inflation rate over the study period. The positive growth reflects the overlapping of two usual features of cooperative financing: first, the widespread use of successive balloon mortgages means that the mortgage principal is paid off very slowly; and second, most cooperatives will refinance their underlying mortgage and, in the process, will wrap in an existing credit line, a second mortgage or a one-time outlay for capital improvements – which, in effect, will increase the mortgage balance. The unit's *pro rata* share of

[18] The assumption that the fees grow with inflation (that is, remain constant in real terms) is based both on opinions of real estate practitioners and on empirical evidence from our sample. A regression of log real monthly fees on housing characteristics and a set of year dummy variables yields statistically insignificant real changes in fees over time (as measured by the year dummy variable coefficients) for constant quality housing.

the mortgage balance is calculated according to the formula:

$$(3) \qquad Mbal\_unit = Mbal \frac{Shares\_unit}{Shares\_tot},$$

where *Mbal* is the outstanding balance of the underlying mortgage, *Shares_unit* is the number of shares allocated to the subject unit, and *Shares_tot* is the total number of shares in the building.

To sum up, the total value of a condominium unit (our dependent variable) for the condominium model is:

$$(4a) \qquad V_{condo} = P_{condo} + PV\_maint_{condo}$$

and the total value of a cooperative apartment is:

$$(4b) \qquad V_{coop} = P_{coop} + PV\_maint_{coop} + Mbal\_unit,$$

where *P* denotes the sale price.

Building-level Independent Variables

In each of our models, property-related characteristics, X_{it}, include both building-specific characteristics and unit-specific characteristics. Building characteristics include: design, number of elevators, year built, building lot size (in sq. ft.), materials for exterior wall and roof, fuel type, existence of ground rent, lot shape, original use of the building and years elapsed since conversion, topography type, zoning type, presence of doorman, total number of units, number of investor/sponsor units, number of commercial units, and parking type. Some of these building features – especially some that are specific to condominium and cooperative buildings - have not been previously used in hedonic models of property values and, thus, deserve further elaboration.

1. *Original use of the building, number of investor/sponsor units and years elapsed since conversion*: A development can be built as a condominium or a cooperative building. Alternatively, an existing development – usually, a rental building - can

be converted into a condominium or cooperative. When a building is converted into a cooperative or condominium, New York State law makes it difficult to evict rent regulated tenants, many of whom have been living in the building for years. Therefore, unlike buildings that were built as cooperatives or condominiums, converted buildings typically have many units that are either owned by the sponsor, and rented to tenants who chose not to purchase their apartments at the time of conversion, or are owned by tenants who purchased at concessionary "insider" prices.

Thus whether or not a building was built as a cooperative or condominium or was converted might have several effects on the value of an apartment in that building. First, if a large share of apartments are rented or owned by investors, lenders may be wary of making mortgage loans to purchasers in those buildings. This is attributable to the risk that the sponsor could encounter financial difficulties in making its maintenance or carrying charge payments since frequently the rent he or she receives is less than the amount of the fees. Second, a large share of sponsor units may create difficulties in managing the building since the sponsor's interests may at times be different from the resident owners. Lastly, to the extent that many tenants purchased units at concessionary prices as part of a conversion, it is possible that the incomes of these original tenant-purchasers and more recent purchasers would diverge. This could generate differences of opinion on operational issues as well as reduce the appeal of a building to potential purchasers who desire income homogeneity.

For these reasons, we would expect that apartments in buildings that were converted would be less valuable than units in buildings that were built as cooperatives or condominiums. To account for this difference, we include in each model two dummy variables indicating conversions from rental buildings and conversions from other types of buildings, respectively. In addition, the percentage of sponsor/investor units should be negatively related to price. To capture the extent of sponsor and investor ownership in the building, our models include a dummy variable which takes a value of one if the building has 20 percent or more investor and sponsor units.[19, 20]

It is also likely that price would be positively related to the time that has elapsed since a building was converted or built. Many conventional lenders prefer that a condominium or cooperative building be in existence for a period of time before

[19] The choice of the 20 percent threshold is based on Himali (2002) who states that "If a building has more than 20 percent investors some banks will not lend into that building". The results, however, are not very sensitive to small variations in this threshold. A polynomial function of the percentage of investor/sponsor units was not feasible to estimate due to multicollinearity problems induced by the high degree of correlation between the polynomial terms. Besides, the dummy variable specification used in the paper is more consistent with the behavior of lenders (as described by Himali) than a continuous function.

[20] In an alternative specification, we used separate dummy variables for sponsor and investor ownership but the difference in their coefficients was not statistically significant.

they make loans to purchasers. This allows the building to develop a stable financial history and reduces the risk of default.[21]

2. *Number of commercial units:* Buildings may include commercial units, some of which may be owned by the cooperative corporation or condominium association. To the extent that the units are owned by the condominium or cooperative corporation, the rent they generate may be used to cover part of the common building expenses, thus reducing maintenance fees and carrying charges. However, commercial units might also represent a nuisance for the building's inhabitants due to potential noise and possible loss of privacy. Additionally, they may increase the risk to the shareholder of down markets. Both these considerations warrant the inclusion of the number of commercial units as an additional regressor in our models, although the sign of its coefficient is ambiguous.

3. *Zoning*: Lots in New York City are assigned to one of three basic zoning districts: residential, commercial or manufacturing. Development within these districts is regulated by restrictions on use, building bulk, parking regulations, and/or other characteristics. It is expected that many purchasers of apartments would prefer to live in residential districts to avoid the negative externalities of noise and traffic. To account for this, we include a dummy variable which is equal to one for buildings located in non-residential districts.

4. *Existence of ground lease*: The existence of a ground lease means that the land on which a building is located is not owned by the cooperative corporation or the condominium owners.[22] Instead, a third party leases the land to the development typically for long increments of time. A purchaser of a cooperative apartment or condominium which is built on leased land is therefore buying a different and more limited bundle of housing services than the typical purchaser. Therefore, a condominium or cooperative apartment built on owned land is likely to be more valuable than an otherwise identical apartment constructed on leased land.[23] To capture this difference in our specification, we include a dummy variable which takes on value one if the building has a ground lease. We expect a negative coefficient on the ground rent dummy variable.

5. *Financing Restrictions and Flip Taxes:* In addition to the building-level characteristics described above which are common to both cooperatives and

[21] For converted buildings, we capture this relationship by adding the number of years since conversion interacted with an indicator for converted buildings. For buildings constructed as cooperatives or condominiums, we cannot isolate this relationship from the effect of wear and tear due to aging, both of which are captured in the coefficient of the age variable.

[22] The ground rent is passed through to shareowners in the maintenance fees.

[23] The existence of a ground lease may also affect value because a ground lease frequently substitutes for a mortgage loan. Ground rent payable to the owner of the land is not tax deductible to the owners of the condominium or cooperative apartments whereas interest on a mortgage is deductible.

condominiums, we include in the cooperative housing model a set of variables that capture certain elements of the corporation's financial governance. For example, we include a set of dummy variables corresponding to various degrees of restrictiveness of mortgage financing and a dummy variable indicating the existence of flip taxes (i.e., taxes on profits from re-sale of shares).[24] For the reasons suggested earlier in this paper, the relationship between the variable measuring permissible debt and price is ambiguous. On the one hand, restrictions on debt may reduce demand; on the other hand they may allow a cooperative to maintain its exclusivity and fiscal stability. Similarly, it is unclear whether flip taxes would reduce value because of the fact that they tax gains on resale or increase value because they allow the cooperative corporation to raise funds without assessing members or increasing maintenance.

Unit-level Independent Variables

Unit characteristics include: size (in sq. ft.), number of bedrooms, number of baths, air-conditioning type, view rating and type, floor number, number of levels, overall condition rating, and existence of amenities features such as loft areas, balconies, fireplaces, gardens, terraces, patios, roof rights and thermo-insulated windows.

Location and Time

Census tract fixed effects (W_n) control for unobserved, time-invariant features of different neighborhoods (e.g., location, amenities such as parks or mass transit).[25] The year indicators, I_t,

[24] Another set of restrictive rules is not present in our database—the existence of rules that limit or forbid subletting.
[25] The Census Bureau originally defined census tracts to capture cohesive neighborhoods, and researchers typically use tracts to proxy for neighborhoods. Although census tracts in New York City are relatively small (due to the high population density), they are large enough that there may still be significant within-tract variation in time-invariant characteristics that census tract level fixed effects would not capture, potentially biasing the results. In the end, only individual property-specific fixed effects would fully eliminate this possibility. Notice, however, that a specification with property-specific fixed effects is, essentially, a repeat sales model (since property-specific fixed effects can only be estimated in a model with more than one observation for each property) and potentially plagued by the selection issues inherent in repeat sales analysis. That is, properties that sell multiple times may be systematically different from those that do not. In addition, the repeat sales model doesn't estimate the impacts of the time-invariant housing characteristics, which is a serious drawback in the context of this research.

are included to capture borough-wide temporal variations in the pure value of housing (holding housing characteristics constant).

Interpretation of Coefficients

The coefficients β_X represent the marginal impacts of housing characteristics on house values (also called the implicit prices of housing attributes) (Rosen 1974). The coefficients on the census tract fixed effects can be interpreted as a location premium attributable to neighborhood time-invariant characteristics. We interpret the coefficients on the time dummy variables (I_t) as the pure value of housing (holding housing characteristics constant). The magnitudes of the time coefficients are determined by demand and supply factors, such as income and construction costs, as well as by temporal variations in neighborhood characteristics such as government services, crime, and quality of public schools that are common for all neighborhoods.[26]

With housing values entered as logarithms, as shown, the coefficient of a continuous independent variable, multiplied by 100, is interpreted as the percentage change in value resulting from an additional unit of the independent variable.[27] The coefficient of a dummy variable is equal to the difference in log value between properties that have the attribute and those that do not. As shown in Halvorsen and Palmquist (1980) and Kennedy (1981), the

[26] Estimating the impact of specific time-variant neighborhood characteristics (e.g., crime rates, school quality) on house values is beyond the scope of this paper. Therefore, we do not explicitly include such characteristics in the model. It is worth noting, however, that in preliminary work we found little difference in the temporal patterns of these factors across the Manhattan neighborhoods in which condos and cooperatives are located. Thus, the specification used here may be appropriate regardless of the research goal.

[27] If the independent variable is expressed in logs, its coefficient can be interpreted as an elasticity, i.e., the percentage change in house value corresponding to a one percentage change in the independent variable.

percentage effect of a difference in logs, *b*, is given by $100(e^b - 1)$. We use this more intuitive representation of a dummy variable effect throughout the paper.

Comparing the Valuation of Similar Condominium and Cooperative Units

The coefficient estimates from our hedonic regression equations (1a) and (1b) can be used to assess the market value differential for physically and locationally similar condominium and cooperative units. This is achieved by obtaining two predictions of the value of a given attribute bundle – one based on the condominium coefficients and one based on the cooperative coefficients – and then computing the difference between the two predicted values. Since there is no best bundle choice, the predictions are performed for three bundles of attributes: (1) the average value of attributes for condominiums, (2) the average value of attributes for cooperative apartments and (3) the average value of attributes for the pooled condominium-cooperative sample.[28] Since the set of census tracts with condominium sales is slightly different from the set of tracts with cooperative sales, we define the three average bundles using only sales in tracts with both condominium and cooperative sales.[29] This approach is used to ensure that the predicted values for condominiums and cooperatives are based on similar spatial distributions of the two housing types.

The predicted values of a given attribute bundle - e.g., the bundle of pooled sample means - based on the two sets of coefficients are computed with the following formulas:

$$(5a)\ \hat{V}^{condo} = \exp(\hat{\gamma}^{condo}\overline{Z}^{pooled})$$

$$(5b)\ \hat{V}^{co-op} = \exp(\hat{\gamma}^{co-op}\overline{Z}^{pooled}),$$

[28] This estimation technique was also used in Goodman and Goodman (1997).
[29] Only about 10 percent of all sales were eliminated in the process.

where $\overline{Z}^{pooled}$ is the vector of mean values of attributes from the pooled sample, and $\hat{\gamma}^{condo}$ and $\hat{\gamma}^{co-op}$ are the vectors of estimated condominium and cooperative coefficients, respectively.

Data

New York City is a particularly attractive place for a comparative study of the value of condominium and cooperative housing because of the large number of condominiums and, especially, cooperatives. To undertake the analysis outlined above, we have obtained, under an exclusive arrangement with Miller Samuel Inc., a database which contains sales transaction prices and detailed unit and building characteristics for over 100,000 sales, an estimated 85 percent of all condominium and cooperative apartments sold in Manhattan over the period 1984-2002. The information on the unit-specific characteristics (including maintenance fees) is collected each time when a sale of that unit occurs – so, any changes in these features between sales are captured in our data. By comparison, building characteristics pertain to one point in time. Most building characteristics were initially recorded between 1986 and 1990, and then updated on an ongoing basis as new or more reliable information was becoming available. Thus, these characteristics correspond to the time of the last update. Cooperative financial characteristics (i.e., outstanding blanket mortgage balance, maximum percentage mortgage financing allowed, and existence of flip taxes) pertain to the year of the latest available financial statement.[30]

In the raw data, some variables had missing values. For most of these variables, the

[30] The sample mean for the year of the latest available financial statement is 1999.3, meaning that, for most cooperatives, the financial information is relatively recent.

number of missing values was small (5 percent or less of all observations). We deleted all observations with missing data for the variables with few missing values. For several variables, however, the data was missing for a relatively large number of observations. Rather than deleting these sales from our data set, we opted to keep them in the interest of maintaining sample size and avoiding the introduction of a source of sample selection bias. For the variables with many missing values and which play an explanatory role in the regression models, we construct missing value indicators (=1 for missing values, and =0 otherwise) to be included as additional regressors.[31] For cooperative maintenance fees and condominium common charges – two variables with up to 20 percent missing values and which are constituents of the dependent variable - we impute missing values using the so-called "first-order approach" pioneered by Gourieroux and Monfort (1981). This method involves regressing the known values of the maintenance fee on the independent variables and replacing the missing observations by the fitted values of the regression.[32]

In addition to eliminating observations with missing values, we also eliminated properties with values of less than $5,000 and those with square footages less than 50 square feet. Our final sample includes 99,490 sales, spread across 183 census tracts and 12 community districts.[33] Over two-thirds of the sales (68,907) are in cooperative apartment buildings with the rest in condominiums.

[31] Alternatively, we could have imputed the missing values. However, our main goal is to obtain good house value predictions and prediction is likely to be more accurate when is not based on imputed values of the explanatory variables.
[32] The coefficient estimates from the maintenance models are available upon request from the authors.
[33] The final sample size represents almost 85 percent of the raw sample size.

Summary Statistics

Table 3 shows summary statistics for the sample of sales used in the study. The first column shows the characteristics of condominium sales; the second column shows the characteristics of cooperative sales; and the third column shows the characteristics of the pooled sample. Cooperative apartments tend to be older than condominiums, to be larger, to be located in smaller buildings, and to have fewer commercial units and smaller shares of investor units. They are less likely to use non-oil fuel, much more likely to be located in converted buildings, less likely to be located in non-residential areas, less likely to have private parking, less likely to have balcony, more likely to have fireplace, and less likely to have excellent view. Not surprisingly, cooperative conversions occurred earlier, on average, than condominium conversions.

Looking at cooperative-specific restrictions on mortgage financing, 45 percent of the cooperative sales are in buildings that allow 60-79 percent financing, and almost one third are in projects that allow at least 80 percent financing. 2.1 percent of the cooperative sales have rules prohibiting financing. Almost half of the cooperative sales are in developments that impose flip taxes.

Turning to the dependent variable and its various components (all expressed in constant 2001 dollars), the average total value of condominium units is higher by about $59,000 or 8 percent as compared to cooperative apartments ($786,137 vs. $727,378). For cooperative apartments, the average per-unit share of the cooperative blanket mortgage is $37,266.

As shown in Table 4, the spatial distributions of condominium and cooperative sales are,

with few exceptions, similar. Approximately 64 percent of the condominium sales and 77 percent of the cooperative sales are located in three community districts: Stuyvesant Town / Turtle Bay, Upper East Side and Upper West Side. There are very few sales of either condominiums or cooperatives in the four districts of Northern Manhattan.

Locational similarity of condominium and cooperative sales is also evident in Figures 1A and 1B, which show the distribution of sales at the tract level. Seventy percent of the sample tracts include both condominium and cooperative sales. The tracts which contain sales of only one of the two housing types account for only 10 percent of all sales.

Results

Table 5 shows the coefficients, their "percentage effect" interpretation, and their standard errors for the condominium and cooperative models in equations (1a) and (1b). Overall, both models perform remarkably well – most of the coefficients on the hedonic variables have the expected signs and the regressions explain over 90 percent of the variation in condominium and cooperative values. We review below some of the more interesting results.

Building-level Characteristics

The positive coefficients on all building design variables[34] indicate that walk-up buildings, the reference design category, are less valued than all the other categories.[35] Units in

[34] Building design variables include indicators for whether the building is high-rise (more than 6 stories, with elevator), low-rise (4-6 stories with elevator), walk-up (4-6 stories without elevator), and townhouse (1-3 stories).
[35] To give a concrete example, units in elevator buildings with 1 elevator are valued between 4.5 and 10.4 percent more than walk-up units, with smaller differences among condominiums. The average valuation difference between townhouses and walk-ups, although positive, is not statistically significant. At least for the condominium model, this may be an artifact of the small number of townhouse sales, which is responsible for the large standard error of the townhouse coefficient.

high-rises and low-rises appear to be similarly valued in both models. For cooperatives, elevator building units are significantly more valuable than townhouse units; for condominiums, however, there are no statistically significant differences between these design categories.[36],

The coefficient on the loft building dummy variable is relatively large and statistically significant in both models but has contradictory signs – it is negative for condominiums and positive for cooperatives.[37]

As expected, pre-war buildings command a substantial premium over the post-war ones, due to their high level of architectural detail, large rooms and thick walls.[38] Controlling for whether the apartment is in a pre-war or post-war building, the age of a unit has a predictably negative relationship with price.[39]

The existence of a ground lease is associated with a reduction in value for condominiums (as expected), but does not affect the cooperative value. Also, as hypothesized, cooperative apartments in buildings that were converted were less valuable than apartments that were built was cooperatives. Surprisingly, however, for condominiums the opposite relationship is exhibited. For both types of housing, however, value increased as time from the date of conversion elapsed.

[36] The statistical insignificance of these differences may be, again, caused by the large standard error of the townhouse coefficient.
[37] The negative coefficient in the condominium model is somewhat surprising. Loft apartments are considered fashionable, with their usually large open spaces, high ceilings and big windows, and thus one would expect higher valuation associated with the loft status.
[38] Pre-war cooperative units are valued 12.4 percent more than their post-war counterparts; this premium is substantially larger (30.7 percent) for condominiums.
[39] This may reflect the greater need for rehabilitation, the lack of modern conveniences or the gradual deterioration of heating and plumbing in these older units.

Apartments located in areas zoned for non-residential uses were worth less than those located in residential districts. The existence of commercial units, however, had small, but different effects: negative for cooperative apartments, and positive for condominiums.

The existence of a lobby attendant contributed significantly and positively to value.[40] Apparently, the greater the number of units in a building, the less an apartment's value although the magnitude of the impact is very small.

High proportions of sponsor- or investor- owned apartments (greater than 20 percent) had a negative, albeit small impact on condominium prices. For cooperative buildings, the coefficient was statistically insignificant.

Financing Restrictions and Flip Taxes

To control for the restrictiveness and exclusivity of different cooperative buildings, we include in the cooperative model additional variables for financing restrictions and for the existence of a flip tax.

According to our results, financing restrictions add value. Compared to an apartment in a building that allows between 60-79 percent financing, an apartment in a building that permits 100 percent financing is worth 2.5 percent less. The more restrictive the financing rule the greater the increment to value. Indeed, apartments in buildings that allow no debt at all to be secured by the shares of the corporation are worth an astounding 48.3 percent more than buildings that permit 60 to 79 percent financing.

Flip taxes also appear to be value-maximizing. The existence of a flip tax is associated

[40] This positive effect is 13.3 percent for cooperatives and 11.6 percent for condominiums.

with a 1.9 percent increase in value.

Unit-Level Characteristics

As expected size matters in terms of apartment value.[41] Moreover, controlling for square feet, additional bedrooms and bathrooms add significantly to value.[42] Outdoor and indoor amenities also usually generate value.[43] Height (floor number of the apartment) matters, too.[44] Finally, better views and better condition of the apartment are associated with significantly higher values.[45]

Comparing the Values of Similar Condominium and Cooperative Apartments

Using the simulation method described in the Methodology section we can estimate the condominium and cooperative valuations, and the corresponding valuation differential for a variety of attribute bundles. Results from the bundle comparisons are shown in Table 6. Since the findings vary little across different bundles, we discuss below only the results based on the bundle of pooled sample means – perhaps the single most representative bundle. The first two rows of column 1 show predicted values of typical condominium and cooperative apartments

[41] A 10 percent increase in square footage is associated with a 6.1 percent increase in the value of a cooperative apartment and a 7.8 percent increase for condominiums.
[42] For cooperative apartments, each bedroom adds 15.3 percent to the value of an apartment. For condominiums, the value of a bedroom is much lower—7.1 percent. Each bathroom in a cooperative contributes approximately 13.3 percent whereas for a condominium the increment is 10.5 percent.
[43] Terraces add between 10.7 and 17.5 percent to value, gardens 4.4 to 12.3 percent, balconies 0.9 to 5.2 percent, and patios, 7.5 percent for cooperatives (but no statistically significant relationship for condominiums). Among indoor amenities, a fireplace is associated with 9.7 percent increase in value for both cooperatives and condominiums; and central air conditioning is about 2 percent more valuable than a window unit for both housing types.
[44] For cooperatives, each additional floor adds 1 percent to the value of an apartment; for condominiums each floor increases value by 0.6 percent.
[45] For cooperative apartments, a good (versus average) evaluation of the condition of the apartment is associated with an 9.1 percent increment in value compared to a 3.9 percent increment for condominiums. Similarly, an excellent (versus an average) view is worth 11.3 percentage points for cooperatives and 8.4 percentage points for

based on the coefficients from our regressions and the average values for the variables from our pooled sample. The predicted value of a typical cooperative apartment is $527,275 in 2001 dollars compared to a value of $573,527 for a typical condominium. Thus the typical premium for condominium apartments is 8.8 percent.

The above predicted value for cooperative apartments combines apartments in buildings with very different financing rules. According to our regression results, cooperatives with different financing restrictions are likely to be valued very differently, conditional on their physical and locational characteristics. Therefore, the condominium premium varies widely when the typical condominium is compared to cooperatives with various financing rules. The typical condominium is 13.4 percent more valuable than a comparable cooperative apartment with no financing restriction and no flip tax (i.e. a cooperative apartment with rules that most resemble condominiums). For cooperative apartments with the most usual financing restriction (60-79 percent financing permitted), the condominium premium shrinks to 10.6 percent. For cooperative apartments in buildings that allow no financing at all, however, the condominium premium disappears and becomes a discount of 25.4 percent.

Discussion

Legal form does indeed matter. Importantly, however, legal form interacts with rules adopted by the owners of the housing developments, themselves, to determine value. Our results suggest that the much-discussed condominium premium may exist, but it certainly does not apply to all apartments. To the contrary, the relationship between cooperative and condominium values varies in ways that are apparently predictable and consistent.

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condominiums.

According to our results, the typical condominium apartment is 8.8 percent more valuable than the typical cooperative apartment. This premium is notably lower than the estimates offered by many real estate agents, but only slightly lower than that derived by Goodman and Goodman (1997), and very similar to that estimated by Kelly (1998). When the typical condominium is compared with a cooperative apartment with the most usual financing restriction (60 to 79 percent) the premium grows to 10.6 percent. Nevertheless, this condominium premium is transformed into a sizable *discount* when the typical condominium is compared to a cooperative apartment with strict financing prohibitions.[46]

Armed with this result, we now turn to the puzzle that motivated our study—why do cooperative apartment buildings vastly outnumber condominium buildings in New York City, a pattern that is in direct contrast to what exists in other parts of the United States. Certainly, part of the answer is the fact that until the 1960s, the housing cooperative was the only legal form available for common interest homeownership in the city. Nevertheless, with the advent of the condominium and diffusion of knowledge and familiarity with the condominium form, why do cooperative apartment buildings persist in light of the sizable premium value our results suggest is associated with condominiums? This concluding section will discuss three possible answers to

[46] There is the possibility that our results may be influenced by endogeneity. Clearly, the existence of a financing restriction is likely to affect the amount someone is willing to pay for a cooperative apartment. At the same time, it is possible that the reason some apartments institute these restrictions in the first place is because they are high-priced residences. However, we expect the endogeneity problem to be of limited impact on our results. To the extent that buildings on the same block are fairly homogeneous in unobserved "luxury" characteristics, the inclusion of block fixed effects is likely to remove correlations between the error term and the financing restriction, and, thus, provide a satisfactory solution for the endogeneity problem. Therefore, in preliminary work, we estimated a cooperative model with block fixed effects (instead of census tract fixed effects). We obtained a coefficient estimate on the "no financing" restriction that was nearly identical to the one presented here. This similarity seems to suggest that the endogeneity problem is not a serious concern in our case.

this question: (1) social exclusivity, (2) monetized transaction costs and (3) collective decisionmaking costs.

Hansmann (1991, 1996) suggests that the existence of both cooperative and condominium buildings may be partly explained by the desire for social exclusivity. A landlord of a building catering to affluent tenants might seek to charge monopoly rents to tenants for the privilege of living in this type of unique environment. Collective ownership—through cooperative or condominium form—would provide a way to avoid this type of exploitation.[47]

Indeed, our results showing that cooperative owners in buildings that prohibit mortgage financing enjoy a price premium relative to condominiums provides some support for this thesis. A large proportion (77.3 percent) of the apartment sales in buildings with rules prohibiting financing were also in the top quantile of cooperative apartment values. This suggests that affluent New Yorkers may be using the "no financing" restriction to maintain an affluent living environment and that the benefits of social exclusiveness, themselves, generate value for these purchasers.[48]

Of course, the social exclusivity thesis would explain the persistence of affluent cooperative buildings only if the condominium form, itself, could not be used to achieve the same ends. Two pieces of anecdotal evidence suggest that until very recently this may have been so. First, up until the last year or two, the only control condominium associations have had over

[47] In a recent article, Strahilevitz (2006) expands upon this thesis and suggests that the absence of a legal way to discriminate against racial minorities might also explain the growth of certain types of residential communities and buildings with expensive amenities. These amenities are designed to indirectly achieve discrimination and maintain social exclusivity.

[48] Further analysis of the data suggests that while the desire for exclusivity may provide a partial explanation for the positive effect of no financing rules, it does not provide a complete explanation. In a separate set of regressions (available from the authors), the sample of apartments was stratified into three categories based upon their value. The coefficient on the zero financing dummy was largest for the highest value apartments in the top quintile (0.25) as would be predicted if the rule was designed to promote exclusivity. Nevertheless, it was also positive for

alienation of units has been the right of first refusal. Indeed, a 2005 New York Times story reported as news the fact that condominiums for the first time were considering requiring prospective purchasers to submit to interviews (Lombino 2005). This change was partly in reaction to a 2005 decision by an appellate court in New York that allowed a condominium association to prohibit the sale of studio apartments to non-owners. The case, Demchick v. 90 East End Avenue Condominium, was greeted by one attorney with the observation that "[t]here is no question that this decision opens the door to condos being able to impose conditions on sales and leasing that are more akin to those typically imposed by co-ops." (Romano 2005).

While the state of the law prior to *Demchick* might explain the persistence of cooperative apartments in New York City for the affluent, it does not explain why the vast majority of cooperative apartments that serve non-affluent households continue to exist. One possible reason concerns the transaction or "switching"[49] costs of moving from one form of ownership to the other. Liquidation of the corporation and distribution to shareowners of interests in the real property could lead to a taxable event for the corporation, as well as for its shareholders.[50] Each shareholder would be required to contribute to the satisfaction of the blanket mortgage loan, renegotiate the terms of his or her individual cooperative share mortgage and have new financing documents prepared and recorded. The new condominium association would also probably need to take steps to arrange financing for owners whose credit may have deteriorated between the time they took out their share mortgages and the time of conversion or who cannot qualify for

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apartments in the middle three quintiles (0.20) and those in the lowest quintile (0.14).

[49] See Kahan and Klausner (1997).

[50] For a detailed discussion of the costs associated with cooperative to condominium conversion see Appendix.

the additional debt needed to pay off their shares of the underlying mortgage. A variety of other costs would be entailed including fees for real estate consultants and attorneys, closing costs and recording taxes.

To gain a better understanding of whether high transaction costs might explain the persistence of the housing cooperative in New York City despite the condominium premium we find in our earlier analysis, we perform a rudimentary calculation of the dollar value of these costs and compare them with the likely benefits of the conversion. Estimates for transaction costs were obtained from several attorneys familiar with the process and are set forth in detail in the Appendix. For the purpose of this analysis, we examine a hypothetical cooperative building with 200 units (roughly the average size from Table 3), each worth $530,000 (approximately the average value in Table 6) or $106 million in aggregate. Our estimate of the average condominium premium (8.8 percent) suggests that if the building were a condominium, the aggregate value would be $115.3 million. Thus, the benefit of conversion is a $9.3 million increase in the building value.

Table 7 in the Appendix presents the high and low estimates for various categories of costs associated with the conversion of our hypothetical cooperative into a condominium. We estimate that the total monetary transaction costs of conversion would range from $3.8 to $8.6 million. Taking the mid-point of this cost interval, the conversion of the typical cooperative in our sample to condominium status would cost $6.2 million, thus resulting in a net benefit of $3.1 million in the aggregate, or $15,500 per unit. Thus, transaction costs can be expected to eat up a substantial share of the gains from conversion.

Relatively high monetary transaction costs are compounded by what Hansmann (1996, 39) calls the "costs of collective decision making." Law and economics literature suggests that there are many barriers of a strategic nature to bargaining to an efficient outcome (in our case, the conversion), especially when the number of bargainers is greater than two (see, for example, Aivazian and Callen 1981, and Benoit and Kornhauser 2002). Given that a conversion involves tens or hundreds of people, it is easy to imagine them failing to reach an efficient outcome, even if the potential gains are very high.

This collective action problem is likely to be particularly severe in urban communities where residents are not homogenous. It is highly likely that not all cooperative owners have similar time horizons or financial characteristics. For example, households on a fixed income who wish to remain as occupants might prefer not to pay the high transaction costs of conversion for a speculative gain that would only be realized upon sale. In addition, some households with bad credit might find themselves in a situation in which they are unable to qualify for a condominium unit loan.

The problem of collective action is exacerbated by statutory and contractual supermajority requirements. For example, New York State law requires that the owners of at least two-thirds of the shares must approve a proposed dissolution and the bylaws of many cooperative corporations have thresholds as high as 80 percent (Saft 2001, Siegler 1997). Indeed, a 2006 New Jersey Superior Court decision, the first court case concerning a cooperative to condominium conversion, illustrates the problem. In Pressment v. Briarcliff Owners, Inc.,[51] the Board of Directors of the cooperative engaged a real estate consultant to help them convert

[51] C-112-06 (June 12, 2006).

the cooperative to a condominium. The by-laws of the cooperative required the affirmative vote of 80 percent of the shares for a dissolution of the corporation, but only a 67 percent majority to change the bylaws. Because they were unable to reach the 80 percent threshold, the Board sought to change the bylaws and managed to obtain the assent of a 68 percent of the shares. The minority shareholders filed a lawsuit challenging the maneuver as violative of their proprietary leases which also contained an 80 percent requirement for dissolution. The appellate court sided with the minority and invalidated the vote thereby scuttling the conversion.

In the end, despite the premium typically associated with condominium status, it is much too early to sound the death knell for the cooperative apartment, at least in New York. While it is likely that new apartment buildings will be built as condominiums to take advantage of the economic benefits of this legal form, problems of collective action combined with inertia and substantial transaction costs, suggest that at least for the foreseeable future the housing cooperative will remain a dominant feature of our nation's largest city.

Sources

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Appendix
Estimating Transaction Costs for a Cooperative-to-Condominium Conversion

Calculating the monetary transaction costs of a cooperative-to-condominium conversion is, like the conversion process itself, a complex undertaking. In this Appendix, we derive estimates based upon discussions with several real estate attorneys who are well-acquainted with process.[52]

We describe below, in detail, the potential monetary transaction costs associated with a conversion of a cooperative building to condominium status, and provide high and low estimates of these costs. Calculations are done for a hypothetical building with 200 units, each worth $530,000, which has an outstanding blanket mortgage at the time of conversion of $7.45 million, or $37,266 per unit (the average pro-rata share in Table 3). Additional assumptions are introduced below for the specific costs to which they are relevant:

1. Condominium Subdivision Plan. This document consists of cover sheet, survey sheet, site plan sheet, utility plan sheet, foundation plans, floor plans and cross sections of all units, and must be prepared by a professional surveyor or engineer. We estimate the cost to be $35,000 for a 200 unit building.

2. Title Insurance. We assume that each shareowner would obtain a policy of title insurance to protect himself or herself as well as the financial institution making the unit loan. For a unit worth $530,000, we estimate the title insurance cost at $2,500, using the Title Rate Premium Calculator available at www.experttitle.com/calculator.htm, a website maintained by Expert Title Insurance Agency, LLC.

3. Legal Fees. Legal expenses cover several categories.

a. *Preparation of Condominium Documents*: Master Deed, Bylaws, Articles of Incorporation,

[52]These attorneys include Kenneth Jacobs of Smith, Buss and Jacobs, LLP, Gregory Gamalski of Cox, Hodgman and Giarmarco, P.C., Joel Miller of Miller and Miller, L.P., and Eliot Zuckerman of Hartman and Craven, LLP. Gamalski, a Michigan lawyer, maintains a website, www.coopsinthefuture.com/ConversionInfo.html, that provides very detailed information on the conversion process and many of the costs associated with it. We borrow much of the cost layout and descriptive cost information from this website. Where appropriate we inflate the numbers to reflect the costs in the New York metropolitan area based upon information from other attorneys or data from the Bureau of Labor Statistics.

Disclosure Statement, various notices, perhaps form purchase agreements for the "sale" of each unit to each tenant shareholder, escrow agreements with title company (if necessary) and all related documentation. We estimate this amount to be $22,000.[53]

b. *Plan of Dissolution*. Various documents would need to be prepared for the Plan of Dissolution including the proposed plan document, notices of meetings, ballots, and other corporate documentation. We estimate this amount to be $4,000.

c. *Meetings*. The conversion process requires the presence of the attorney at one or more meetings of the Association and individual members to discuss the concept and attempt to answer questions and concerns of the tenant shareholders. The estimate for these consultations is $15,000.

d. *Tax Planning*. The liquidation of the corporation and distribution to shareowners of interests in the real property could lead to a taxable event both at the corporate level and for the individual shareholders. Tax planning related to the conversion involves additional legal fees. While the law firm coordinating the conversion may have already undertaken detailed research on the tax issues related to the conversion in general, circumstances of each cooperative are different and thus a law firm should expect to undertake fact gathering and additional research specific to each cooperative. Moreover, an appraiser may be needed to assess the value of the property, and an accountant may be needed to prepare the final tax returns. Finally, given the rarity of cooperative-to-condominium conversions, the law firm would need to closely guide these outside players. The estimate for this expense is $24,000.

e. *Closing Documents and Closings on Transfers*. An array of documentation would be needed to close each individual unit. Each transfer of a newly created condominium unit to the tenant/shareholder is a separate real estate transaction and would require preparation of typical documents for such a closing (e.g., a closing statement, homestead exemption affidavits, property transfer affidavits, the deed). For the fees associated with the closing, we estimate $400 per closing, or $80,000 for the whole building.

4. Recording Fees. The Master Deed and the individual deeds would have to be recorded and tax certified. The estimate for the entire building is $21,000 ($1,000 for the Master Deed and $100 for each apartment).

5. Refinancing Costs. These are costs related to prepaying the blanket mortgage and originating new mortgages for each condominium owner. These costs can be split into several categories:

a. *Mortgage Taxes*. There is a mortgage recording tax imposed on mortgages recorded with the

[53] Specifically, we use an adjustment coefficient of 1.15, equal to the ratio of average annual wages for lawyers in the New York and Detroit Metropolitan Statistical Areas as published by the Bureau of Labor Statistics (at http://www.bls.gov/oes/current/oessrcma.htm) This adjustment seems appropriate since Gamalski's costs are specific to Michigan.

New York City Register. Assuming that each individual loan balance is $200,000[54] and adding the $37,266 pro-rata share of the blanket mortgage, the new individual mortgage would total $237,266. The corresponding mortgage tax rate is 2.05 percent and thus, the mortgage tax payment would be $4,864 per unit, or $972,800 for the whole building.

b. *Bank Fees*. We estimate that this will cost $1,200 per unit (including bank lawyers' fees), or $240,000 for the whole building.

c. *Prepayment Penalty on the Blanket Mortgage*. Most cooperative blanket mortgages carry a prepayment penalty. We assume a penalty of 2 percent of the outstanding mortgage balance, which translates into a $149,100 payment.

6. Transfer Taxes. Depending on the specific local real property tax laws, the conversion may or may not trigger a real estate transfer tax. In New York City, the exchange of stock for deeds is considered as a "mere change in form or identity of ownership where there is no change in beneficial interest" and thus is exempted from transfer taxes under Section 1405(b)6 of the Real Property Tax Law. However, there will be a transfer tax on the pro-rata share of the outstanding blanket mortgage. The combined New York City and New York State transfer tax rate for a value less than $500,000 is 1.4 percent. Thus, the transfer tax payment is $522 per unit or $104,400 in the aggregate.

7. Tax Consequences[55]. The liquidation of the corporation and distribution to shareowners of interests in the real property could lead to a taxable event for the corporation, as well as for the individual shareholders. Regarding the tax consequences for the corporation, IRC section 216(e) specifies that no gain on distribution by the cooperative corporation of deeds for stock should be recognized, provided that tenant-stockholders used the property as their principal place of residence for two years out of five before the date of distribution. Therefore, gain will be recognized at the corporate level with respect to any units which are not used as a principal residence (for the period defined above).

Regarding the tax consequences for the individual shareholders, the current tax law

[54] The $200,000 balance is based on several assumptions. First, we assume that the unit was worth $315,000 when it was bought by the current owner. This initial value is obtained by assuming that a current resident has been owning the unit for 13 years (the average length of housing tenure for Manhattan homeowners, according to the 2002 New York City Housing and Vacancy Survey), and the annual appreciation rate over that period was 4.1 percent (this rate reflects both the quality-controlled appreciation in constant-dollar values, obtained from the year dummy coefficients in the hedonic model, and the inflation rate). Second, we assume that the share loan had an 80 percent LTV ratio, meaning that the initial loan amount was just over $250,000. Third, we assume that $50,000 of the principal has been paid by the time of conversion, which leaves a $200,000 outstanding balance.

[55] Aside from the income tax consequences described here, an additional tax issue may arise if, for property tax assessments, condominiums are appraised at a higher value than similar cooperatives (Garbardine, 2000). In this case, a conversion will likely result in higher property tax payments. However, at least in New York City, both cooperatives and condominiums are valued by the Department of Finance (for property tax purposes) as if they are rental apartment buildings. This means that Finance's value estimate is not based on sales prices, but rather on an estimate of the rent that would be charged for the units in the cooperative and/or condominium building if the units were rental apartments. Thus, it is likely that the property tax assessments, and, consequently, the tax amount, wouldn't change as a result of the conversion.

specifies that individuals can exclude up to $250,000 in gain from the sale of a principal residence (or $500,000 for a married couple) if they have owned and lived in the residence for two out of the preceding five years (IRC section 121). Exchanging shares of stock in the cooperative for the condominium unit is basically no different than selling the cooperative apartment and using the proceeds to buy the condominium. Thus, cooperative shareholders should qualify for these exclusions. Moreover, even if a shareholder uses the apartment for investment purposes (e.g., rental or commercial use), the conversion is likely to be considered a "like kind exchange" and, thus, the individual may be able to avoid paying tax under IRC section 1031. In short, only shareholders for whom the apartment serves as a temporary (e.g.,vacation) residence or who bought the unit very recently will be taxed on gain realized from the conversion. Sponsor units might also be exposed to taxation but only if the sponsor is a dealer (in the business of buying/selling apartments).

To compute these income tax consequences, we need to know the taxable capital gains for the corporation and for the individual shareholder. Thus, we assume that the per-unit value of the cooperative at its inception was $160,000,[56] and that a unit was worth, on average, $315,000[57] when it was bought by the current resident. The former value is needed to assess the capital gains for the corporation, and the latter is used to estimate the capital gains for the individual shareholder. We also assume that 20 percent of the apartments will have no protection against being taxed on gain realized from the conversion, and the rest are fully protected, both from the shareholder's point of view and from the corporate point of view.[58,59]

a. Income Tax on Capital Gains for the Individual Shareholder. To compute this income tax, we use a taxable capital gain of $215,000 ($530,000-$315,000), and employ a personal income tax rate of 15 percent. The estimated tax from capital gains for an individual shareholder is then $32,250, or in the aggregate $1,290,000 ($32,250 X 40 units which don't qualify for any deductions).

b. Income Tax on Capital Gains for the Cooperative Corporation. To compute this income tax, we use a taxable capital gain of $14,800,000 (($530,000-$160,000) X 40 units which don't

[56] This initial value represents current dollars, and is obtained by assuming that the "life" of the cooperative is 30 years (the average value in our sales sample) and that nominal values increased over time at an annual rate of 4.1 percent (see footnote 54 supra for how this appreciation rate was obtained).

[57] This value represents current dollars, and is obtained as described in footnote 54 supra.

[58] As mentioned above, the income tax consequences for the individual shareholders may also depend, in principle, on their tax filing status. However, in our hypothetical cooperative, the potential gain (for income tax purposes) realized from conversion by an individual shareholder ($215,000) is less than the allowable exclusion and thus there is no tax consequence, regardless of the tax filing status.

[59] While we do not have evidence about the typical share of units that would be fully exposed to tax consequences, we believe the assumed 20 percent is not an understatement and may well be an overstatement. For example, in our sales sample, the average share of investor/sponsor units in a building is 15 percent. And, the average number of commercial units in a cooperative building is very low (3 units). Moreover, rental and commercial units would likely trigger tax consequences only for the corporation. Only units that are used as temporary (vacation) residences, or which were bought very recently by the current residents would likely result in taxes for both the corporation and the individual shareholders – and, typically, there are probably not many of these. Yet, we consider that both the corporation and the individual shareholders are responsible for income tax on any gains from 20 percent of all units.

qualify for tax protection), and apply the corporate income tax rate of 35 percent.[60] The estimated corporate tax from capital gains is then $5,180,000.

TOTAL CONVERSION COST. The sum of these costs is $ 8.6 million.

The above cost estimates are included in column (1) of Table 7. These estimates likely represent an upper bound. It might be possible, for example, to minimize or even eliminate the taxes due from the corporation, given that most cooperatives have substantial "net operating loss carry-forwards" that can be used to offset gains (Romano, 2003; Garbardine, 2000). Additionally, as mentioned above, the individual income tax consequences may be overstated. Finally, for other cost components for which an approximate range was available, we used the upper bound.

Column (2) of Table 7 presents costs estimates under a more optimistic scenario, in which corporate income tax consequences can be reduced to 20 percent of the high estimate obtained above, and individual income tax consequences are half of the above high estimates.[61] Using these assumptions, the total conversion cost is lowered to $3.8 million.

[60] We implicitly assume here that the dollar values of depreciation and capital improvements cancel each other (taxable capital gains increase by the value of depreciation and decrease by the value of capital improvements).
[61] We do not consider lower bounds on other costs, even if they are available, since these other costs represent a relatively small portion of the total cost and thus their variation would not likely alter the results significantly.

Table 7. Monetary Transaction Costs of the Cooperative-to-Condominium Conversion

	High Estimate (1)	Low Estimate (2)
Condominium Subdivision Plan	**$35,000**	**$35,000**
Title Insurance	**500,000**	**$500,000**
TOTAL LEGAL FEES	**$145,000**	**$145,000**
out of which:		
Condominium Documents	$22,000	$22,000
Dissolution Plan	$4,000	$4,000
Meetings	$15,000	$15,000
Tax Planning	$24,000	$24,000
Closing Documents and Closings on Transfers	$80,000	$80,000
TOTAL RECORDING COSTS	**$21,000**	**$21,000**
out of which:		
Master Deed Recording and Tax Certification	$1,000	$1,000
Individual Deed Recording and Tax Certification	$20,000	$20,000
TOTAL REFINANCING COSTS (to make new condo mortgages)	**$1,361,900**	**$1,361,900**
out of which:		
Mortgage Tax	$972,800	$972,800
Bank Fees	$240,000	$240,000
Prepayment Penalties on the Blanket Mortgage	$149,100	$149,100
Transfer Tax	**$104,400**	**$104,400**
TOTAL TAX CONSEQUENCES	**$6,470,000**	**$1,681,000**
out of which:		
Income Tax on Capital Gains for the Individual Shareholders	$1,290,000	$645,000
Income Tax on Capital Gains for the Cooperative Corporation	$5,180,000	$1,036,000
TOTAL CONVERSION COST	**$8,637,300**	**$3,848,300**

Table 1. Cooperative and Condominium Housing (1976-1999)

	United States			New York City		
Year	All owner-occupied	Condominiums	Cooperatives	All owner-occupied	Condominiums	Cooperatives
1976	47,904	634	405	704.4	3.2	102.8
1980	52,516	1,090	313	759.2	5.5	121.9
1983	54,724	1,389	360	770.5	5.4	139.0
1987	58,164	1,941	516	889.7	36.7	189.3
1991	59,796	2,310	396	850.5	46.3	217.5
1995	63,544	2,736	371	834.0	48.3	209.4
1999	68,796	3,029	366	837.2	46.6	208.5

Sources : U.S. Census Bureau Annual Housing Survey 1976, 1980, 1983
U.S. Census Bureau American Housing Survey 1991, 1995, 1999

Note : This table shows numbers of owner-occupied units, in thousands.

Table 2. New Condominium and Cooperative Housing in New York City (1998-2001)

	New Construction		Conversion	
Year	Condominiums	Cooperatives	Condominiums	Cooperatives
1998	3,079	146	159	51
1999	1,049	74	397	10
2000	1,911	0	150	612
2001	3,704	129	683	370

Source : New York City Rent Guidelines Board

Note : The numbers in this table represent housing units contained in plans accepted for filing by the Office of the New York State Attorney General.

Table 3. Summary Statistics for the Sales Samples

	Condominiums	Cooperatives	Pooled
Building Characteristics			
Design (walkup=reference)			
highrise (%)	94.3	92.6	93.1
lowrise (%)	5.0	6.0	5.7
townhouse (%)	0.2	0.8	0.6
Number of elevators	3.5	3.2	3.3
Loft building (%)	7.0	4.8	5.5
Built pre-war (%)	23.9	50.7	42.4
Age	29.9	52.6	45.6
Building lot square footage	26,025	22,753	23,759
Regular lot shape (%)	45.4	27.7	33.1
Exterior wall material (brick=reference)			
brownstone/limestone (%)	0.8	2.1	1.7
concrete/glass/steel (%)	11.5	1.7	4.7
other (%)	0.3	0.1	0.2
Fuel type (oil = reference)			
steam/electric/gas	35.8	9.2	17.3
Roof covering (tar/ tar&gravel=reference)			
metal / shingles	1.2	0.3	0.6
Attended lobby (%)	93.0	87.5	89.2
Parking type (none=reference)			
garage	41.3	36.8	38.2
lot	3.8	1.9	2.5
Number of buildings in the development	1.1	1.2	1.2
Total number of units in building	240	186	203
Share of investor/sponsor units>=20% (%)	63.0	29.7	39.9
Number of commercial units	3.4	2.9	3.1
Ground rent (%)	3.4	2.8	3.0
Original use (condo/coop=reference)			
rentals	27.2	84.4	66.8
other	14.2	7.2	9.3
Years since conversion	13.0	19.9	17.8
Zoning-nonresidential (%)	54.4	28.5	36.5
Topography (level = reference)			
gentle	13.6	16.8	15.8
steep	0.1	1.0	0.7
Percentage financing allowed (60-79% = reference)			
100% (%)		1.1	0.7
80-99% (%)		30.4	21.1
40-59% (%)		16.1	11.2
10-39% (%)		1.3	0.9
0% (%)		2.1	1.5
Other (%)		3.6	2.5
Flip tax (%)		48.9	33.9
Unit Characteristics			
Number of bedrooms	1.4	1.4	1.4
Square feet	1,087	1,111	1,104
Square feet missing (%)	4.9	9.3	8.0

Table 3. Summary Statistics for the Sales Samples (continued)

	Condominiums	Cooperatives	Pooled
Air conditioning type (unit=reference)			
central (%)	4.7	3.3	3.7
none (%)	1.3	3.9	3.1
Balcony (%)	19.7	7.7	11.4
Number of baths	1.7	1.6	1.6
Fireplace (%)	4.5	12.8	10.2
Garden (%)	0.3	0.3	0.3
Loft area (%)	0.1	0.2	0.1
Number of levels >=2 (%)	14.8	5.7	8.5
Number of levels missing (%)	29.6	20.4	23.2
Patio (%)	0.1	0.2	0.2
Roof rights (%)	0.1	0.1	0.1
Terrace (%)	6.6	5.7	6.0
Insulated glass window (%)	94.6	44.3	59.8
Floor number	14.9	9.2	10.9
Condition (average= reference)			
fair (%)	0.4	1.5	1.1
good (%)	14.9	16.6	16.1
missing (%)	36.1	42.0	40.2
View rating (average=reference)			
fair (%)	0.1	0.2	0.1
good (%)	19.0	13.2	15.0
excellent (%)	11.4	7.4	8.6
missing (%)	50.3	45.9	47.3
Dependent variable[1]			
Total value	786,137	727,378	745,440
Sale price	584,517	501,591	527,082
Monthly maintenance	739	691	706
Pro-rata share of the blanket mortgage		37,266	25,810
N	30,583	68,907	99,490

Note : Unless otherwise indicated, the statistics reported are mean values.

1) The dependent variable and its components are expressed in 2001 constant dollars.

Table 4. Distribution of Condominium and Cooperative Sales across Community Districts

Community District	Condominiums % of all sales	Cooperatives % of all sales
1. Financial District	7.5	1.4
2. Greenwich Village/Soho	6.5	8.2
3. Lower East Side/Chinatown	2.0	1.2
4. Clinton/Chelsea	8.5	4.1
5. Midtown	11.3	5.2
6. Stuyvesant Town/Turtle Bay	15.5	18.6
7. Upper West Side	21.6	22.1
8. Upper East Side	26.4	35.7
9. Morningside Heights/Hamilton	0.2	1.0
10. Central Harlem	0.1	0.0
11. East Harlem	0.3	0.6
12. Washington Heights/Inwood	0.1	1.9

Table 5. Hedonic Models of House Value

	Condominiums			Cooperatives		
	Coef.	Percentage effect	Std. error	Coef.	Percentage effect	Std. error
Building Characteristics						
Design (walkup=reference)						
highrise	0.0242	2.45	(0.0219)	0.0807	8.41	(0.0128) ***
lowrise	0.0476	4.87	(0.0211) **	0.0758	7.87	(0.0127) ***
townhouse	0.0504	5.17	(0.0390)	0.0065	0.65	(0.0157)
Number of elevators	0.0207	2.07	(0.0013) ***	0.0204	2.04	(0.0008) ***
Loft building	-0.0890	-8.51	(0.0107) ***	0.0949	9.96	(0.0070) ***
Built pre-war	0.2675	30.68	(0.0110) ***	0.1173	12.44	(0.0054) ***
Age	-0.0099	-0.99	(0.0004) ***	-0.0019	-0.19	(0.0003) ***
Age^2	0.0000	0.00	(0.0000) ***	0.0000	0.00	(0.0000) ***
ln (Building lot square footage)	0.0365	0.037	(0.0030) ***	-0.0074	-0.007	(0.0024) ***
Regular lot shape	0.0038	0.38	(0.0033)	0.0016	0.16	(0.0022)
Exterior wall material (brick=reference)						
brownstone/limestone	-0.0222	-2.20	(0.0147)	0.0467	4.78	(0.0074) ***
concrete/glass/steel	0.1365	14.62	(0.0063) ***	0.0346	3.52	(0.0085) ***
other	0.0153	1.54	(0.0302)	0.0069	0.70	(0.0304)
Fuel type (oil = reference)						
steam/electric/gas	0.0151	1.52	(0.0036) ***	0.0189	1.91	(0.0035) ***
Roof covering (tar/ tar&gravel=reference)						
metal / shingles	-0.1191	-11.23	(0.0251) ***	0.0626	6.46	(0.0188) ***
Attended lobby	0.1096	11.58	(0.0076) ***	0.1245	13.26	(0.0043) ***
Parking type (none=reference)						
garage	-0.0110	-1.10	(0.0042) ***	0.0115	1.15	(0.0031) ***
lot	0.1024	10.78	(0.0204) ***	0.0810	8.44	(0.0119) ***
Number of buildings in the development	0.0163	1.63	(0.0037) ***	0.0157	1.57	(0.0016) ***
Total number of units in building	-0.0004	-0.04	(0.0000) ***	-0.0002	-0.02	(0.0000) ***
Share of investor/sponsor units>=20%	-0.0162	-1.61	(0.0037) ***	0.0013	0.13	(0.0025)
Number of commercial units	0.0023	0.23	(0.0005) ***	-0.0019	-0.19	(0.0003) ***
Ground rent	-0.1147	-10.84	(0.0315) ***	0.0012	0.12	(0.0063)
Original use (condo/coop=reference)						
rentals	0.0590	6.07	(0.0093) ***	-0.0263	-2.60	(0.0057) ***
other	0.2557	29.14	(0.0106) ***	-0.0086	-0.86	(0.0076)
Converted bldg. * Years since conversion	0.0030	0.30	(0.0004) ***	0.0017	0.17	(0.0001) ***
Zoning-nonresidential	-0.0127	-1.27	(0.0042) ***	-0.0675	-6.53	(0.0027) ***
Topography (level = reference)						
gentle	0.0044	0.44	(0.0050)	0.0058	0.59	(0.0028) **
steep	-0.2994	-25.87	(0.0448) ***	-0.0074	-0.74	(0.0102)
Percentage financing allowed (60-79% = reference)						
100%				-0.0251	-2.48	(0.0101) **
80-99%				-0.0218	-2.16	(0.0025) ***
40-59%				0.1323	14.14	(0.0041) ***
10-39%				0.2337	26.33	(0.0089) ***
0%				0.3942	48.32	(0.0081) ***
Other				-0.0027	-0.27	(0.0056)
Flip tax				0.0193	1.94	(0.0020) ***
Unit Characteristics						
Number of bedrooms	0.0709	7.09	(0.0027) ***	0.1527	15.27	(0.0018) ***
ln (Square feet)	0.7776	0.78	(0.0054) ***	0.6138	0.61	(0.0034) ***

Table 5. Hedonic Models of House Value (continued)

	Condominiums			Cooperatives		
	Coef.	Percentage effect	Std. error	Coef.	Percentage effect	Std. error
Air conditioning type (unit=reference)						
central	0.0195	1.97	(0.0055) ***	0.0206	2.08	(0.0052) ***
none	0.0003	0.03	(0.0109)	-0.0333	-3.28	(0.0049) ***
Balcony	0.0090	0.91	(0.0034) ***	0.0504	5.17	(0.0037) ***
Number of baths	0.1052	10.52	(0.0030) ***	0.1328	13.28	(0.0019) ***
Fireplace	0.0922	9.66	(0.0065) ***	0.0930	9.74	(0.0032) ***
Garden	0.0428	4.37	(0.0202) **	0.1164	12.34	(0.0152) ***
Loft area	0.0797	8.30	(0.0388) **	0.1182	12.54	(0.0214) ***
Number of levels >=2	-0.0129	-1.28	(0.0046) ***	-0.0157	-1.55	(0.0044) ***
Patio	-0.0186	-1.84	(0.0325)	0.0727	7.54	(0.0195) ***
Roof rights	0.0537	5.51	(0.0473)	0.0258	2.61	(0.0292)
Terrace	0.1016	10.69	(0.0048) ***	0.1610	17.47	(0.0039) ***
Insulated glass window	0.0077	0.77	(0.0057)	0.0047	0.47	(0.0021) **
Floor number	0.0058	0.58	(0.0001) ***	0.0096	0.96	(0.0002) ***
Condition (average= reference)						
fair	-0.0562	-5.47	(0.0179) ***	-0.0198	-1.96	(0.0074) ***
good	0.0385	3.93	(0.0036) ***	0.0870	9.09	(0.0027) ***
View rating (average=reference)						
fair	-0.0115	-1.14	(0.0477)	-0.0879	-8.42	(0.0215) ***
good	0.0341	3.47	(0.0041) ***	0.0302	3.07	(0.0031) ***
excellent	0.0807	8.41	(0.0048) ***	0.1067	11.26	(0.0039) ***
Year of Sale Indicators						
year85	0.0739	7.67	(0.0432) *	0.0234	2.37	(0.0131) *
year86	0.0032	0.32	(0.0405)	0.0624	6.44	(0.0128) ***
year87	-0.0029	-0.29	(0.0356)	0.0447	4.58	(0.0116) ***
year88	-0.0464	-4.53	(0.0351)	0.0095	0.96	(0.0116)
year89	-0.0674	-6.52	(0.0352) *	-0.0350	-3.44	(0.0116) ***
year90	-0.1287	-12.08	(0.0352) ***	-0.1387	-12.95	(0.0117) ***
year91	-0.2316	-20.67	(0.0352) ***	-0.2775	-24.23	(0.0116) ***
year92	-0.2761	-24.13	(0.0354) ***	-0.3190	-27.31	(0.0116) ***
year93	-0.3286	-28.01	(0.0350) ***	-0.3561	-29.96	(0.0116) ***
year94	-0.3210	-27.46	(0.0350) ***	-0.3443	-29.13	(0.0115) ***
year95	-0.3222	-27.55	(0.0350) ***	-0.3419	-28.96	(0.0114) ***
year96	-0.2904	-25.21	(0.0350) ***	-0.3242	-27.69	(0.0113) ***
year97	-0.2204	-19.78	(0.0349) ***	-0.2643	-23.23	(0.0113) ***
year98	-0.1206	-11.36	(0.0351) ***	-0.1538	-14.25	(0.0114) ***
year99	-0.0453	-4.43	(0.0351)	-0.0609	-5.91	(0.0114) ***
year00	0.0867	9.06	(0.0351) **	0.0667	6.90	(0.0115) ***
year01	0.1748	19.10	(0.0352) ***	0.1336	14.30	(0.0117) ***
year02	0.1783	19.52	(0.0360) ***	0.1471	15.85	(0.0132) ***
Constant	7.3093		(0.0570) ***	8.3408		(0.0321) ***
R-squared		0.9178			0.9106	
N		30583			68907	

Notes: The dependent variable is log real house value, expressed in 2001 dollars. All models include tract fixed effects. Coefficients for the missing-value indicators are not shown in this table; they are available from the authors on request. Standard errors are in parentheses. *** denotes 1% siginficance level; ** denotes 5% significance level; * denotes 10% significance level.

Table 6 - Predicted Bundle Values

	Cooperative financing	Cooperative flip tax	Bundle: pooled means		Bundle: condominium means		Bundle: cooperative means	
Values ($)								
Condominium			573,527		608,885		557,520	
	average	average	527,275		561,376		526,941	
Cooperative	100%	No	505,774		527,981		495,595	
	80-99%	No	507,414		529,693		497,201	
	60-79%	No	518,613		541,383		508,175	
	40-59%	No	591,957		617,948		580,043	
	10-39%	No	655,151		683,916		641,965	
	0%	No	769,215		802,989		753,734	
	100%	Yes	515,606		538,245		505,229	
	80-99%	Yes	517,277		539,989		506,867	
	60-79%	Yes	528,694		551,907		518,054	
	40-59%	Yes	603,464		629,960		591,318	
	10-39%	Yes	667,886		697,211		654,444	
	0%	Yes	784,168		818,598		768,386	
Condominium Premium								
			($)	(%)	($)	(%)	($)	(%)
	average	average	46,252	8.8	47,509	8.5	30,579	5.8
	100%	No	67,752	13.4	80,904	15.3	61,925	12.5
	80-99%	No	66,113	13.0	79,192	15.0	60,319	12.1
	60-79%	No	54,914	10.6	67,501	12.5	49,345	9.7
	40-59%	No	-18,430	-3.1	-9,063	-1.5	-22,523	-3.9
	10-39%	No	-81,624	-12.5	-75,032	-11.0	-84,445	-13.2
	0%	No	-195,688	-25.4	-194,104	-24.2	-196,214	-26.0
	100%	Yes	57,921	11.2	70,640	13.1	52,291	10.3
	80-99%	Yes	56,249	10.9	68,896	12.8	50,654	10.0
	60-79%	Yes	44,833	8.5	56,977	10.3	39,466	7.6
	40-59%	Yes	-29,937	-5.0	-21,075	-3.3	-33,798	-5.7
	10-39%	Yes	-94,360	-14.1	-88,326	-12.7	-96,924	-14.8
	0%	Yes	-210,641	-26.9	-209,713	-25.6	-210,866	-27.4

Notes : Condominium/cooperative/pooled means are computed for subsamples including only tracts with both condominium and cooperative sales. To compute the value of a bundle with "average" financing and flip tax, we use a weighted average of the financing/flip tax coefficients, with weights given by the share of sales in the corresponding financing/flip tax category. $-values are in 2001 constant $. Percentage differences are expressed as percent of cooperative prices.

Figure 1A
Distribution of Sales of Condominium Units

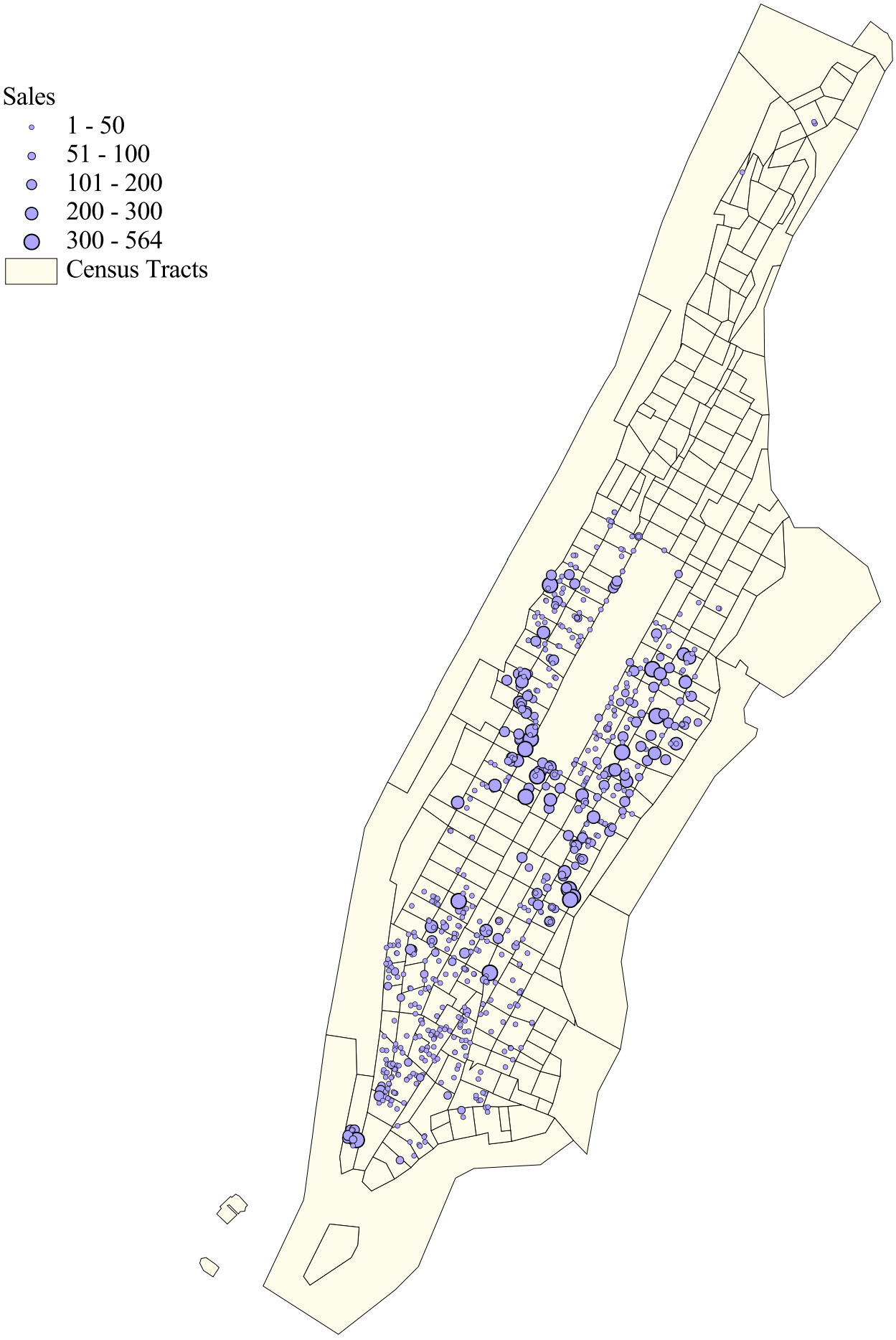

Figure 1B
Distribution of Sales of Cooperative Units