Financing Needs of Small Unit Rental Properties

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Abstract

The financing needs of small unit rental properties are not well understood. This paper empirically estimates a Jaffee-Stiglitz (1990) disequilibrium model of multifamily mortgage demand and supply. The model is empirically tested in the context of Chicago's multifamily housing market. The fact that we jointly estimate a disequilibrium model of the demand for and supply of multifamily residential mortgages using individual property-level data over the period 2005-2010 enables us to examine just how widespread are credit constraints in today's market. The results suggest that noticeable differences exist in the way in which small and large unit rental properties are financed that explain why small unit property investors are significantly credit constrained relative to large unit property investors. These findings have implications for policies designed to help stabilize market conditions for housing.

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1. Introduction

The financing needs of small unit rental properties have never been absolutely understood and in most cases small unit rental properties have been left to get along with what money they can secure through local community banks. In the recent case of small unit rental properties, however, anecdotal evidence suggest small unit rental property investors have been rather severely credit rationed, and not simply credit constrained, by the credit crunch.

To determine if small unit rental property investors (mostly small, local investors who might be able to borrow without difficulty) are being severely credit constrained in the current market environment, while large unit rental property investors (mainly prime investors with capital equivalent to, or in excess of, the pledged collateral) are being supplied with credit, we estimate a Jaffee-Stiglitz (1990) disequilibrium credit rationing model. Testable hypotheses are obtained by noting that if lenders are feeling overexposed to a specific neighborhood or borrower type, they should be unwilling to make any new loans in that area or, perhaps, to that borrower type. To identify areas, then, where credit constraints bind heavily and where these constraints have indeed lowered investment, we create a variable measuring the cross-sectional variation in mortgage foreclosures across different geographical submarkets. Next, to test if small unit rental property investors have come under suspicion more and have encountered more rationing than large unit rental property investors in the current market environment, we construct a series of 0-1 variables: 2-4 unit rental property investors; 5-9 unit rental property investors; 10-49 unit rental property investors; 50-99 unit rental property investors; and 100+ unit rental property investors. In addition, we include a set of time 0-1 variables to measure market-wide changes in the supply of mortgage credit. The model is empirically tested in the context of Chicago's multifamily housing market. We focus on Chicago's multifamily housing

market because of the recent availability of abundant multifamily residential mortgage data by property size.

The results in this paper suggest that mid-size 10-99 unit rental property investors are significantly credit constrained relative to large 100+ unit property investors. Also, substantial financing differences exist by size of property (as our analysis shows, see below), differences that explain why a large number of mid-size 10-99 unit rental property investors are credit constrained in today's environment. The findings also suggest that small 2-4 unit property investors are significantly credit constrained relative small 2-4 unit owner occupiers. These findings have implications for policies designed to help stabilize market conditions for housing.

2. How Multifamily Rental Properties Are Financed

Quarterly data were collected on every (first-lien) multifamily residential mortgage loan in Cook County over the period from 2000Q1 to 2011Q1. Table 1 summarizes the amount of (first-lien) multifamily residential mortgages by lender type for every year of origination over this time period. The amounts include all (first-lien) multifamily residential mortgages. We divide our sample according to GSEs (i.e., Fannie Mae and Freddie Mac), multifamily commercial mortgage-backed securities (CMBS), the Federal Housing Administration (FHA), and others (i.e., banks and insurance companies). The GSEs make up about 57 percent of multifamily residential mortgage originations and their market share rose from 55 percent in 2000 to 68 percent in 2003, but then declined to 43 percent in 2010. Other lenders comprise about 42 percent of multifamily residential mortgage originations and their market share declined from 44 percent in 2000 to 29 percent in 2003, and then increased to 54 percent in 2010. In contrast, both CMBS and FHA make up only about 1 percent of multifamily

residential mortgage originations.

– Insert Table 1 Here –

Table 1 masks important heterogeneity in the financing of small versus large unit rental properties. For example, in Table 2 we show the amount of (first-lien) multifamily residential mortgage originations on small 2-4 unit rental properties, classified by lender type and year of origination, as in Table 1. Looking at this data, it is apparent that the GSEs dominate this market segment. The GSEs generally account for 83 percent of all (first-lien) multifamily residential mortgage originations on small 2-4 unit rental properties.[1] In contrast, the market share of others is about 17 percent. Multifamily CMBS does not compete in this market at all, while FHA has a small and rather insignificant share of the market. Of course, loans on small 2-4 unit rental properties are much different from loans on larger rental buildings because they are normally treated as single-family residential loans (where the GSEs completely dominate by virtue of their implicit, now explicit, guarantee).

– Insert Table 2 Here –

Additionally, we look solely at the amount of (first-lien) multifamily residential mortgage originations on large 100+ unit rental properties. The results are shown in Table 3. When comparing others and GSEs over the period 2000 to 2007, we find that other lenders were

[1] Van Order (200x) and others argue that the GSEs dominate the one-to-four residential mortgage market because of the economies in raising money wholesale in the capital markets and in the purchase and servicing of large numbers of mortgage loans. Generally, small 2-4 unit multifamily residential mortgage loans are underwritten much more like single-family residential mortgage loans than like large 100+ unit multifamily residential mortgage loans, with loans at 80 percent or higher loan-to-value ratios and with up to a 30-year amortization.

generally dominant in this early time period. For example, from 2000 to 2007 other lenders accounted for 69 percent of all newly issued mortgage loans to large 100+ unit property investors, while the GSEs made up only about 22 percent of the market. In contrast, in 2008 and 2009 the GSEs were dominant. The GSEs grew their market share to about 66 percent in 2008 and 2009, while other lenders decreased their market share to 31 in 2008 and then to 26 percent in 2009 (making them essential players in this market during times of great stress). Clearly, without the GSEs, large 100+ unit property investors would have been virtually unable to obtain acquisition financing or to refinance existing debt in 2008 and 2009.[2] Multifamily CMBS also saw its market share increase from 3 percent in 2000 to 11 in 2006, before falling to zero in 2008 as the CMBS market collapsed into much disarray.[3] The

[2]One cannot treat it as paradoxical that the GSEs represent a significant share of the large 100+ unit multifamily residential mortgage market. Nor can one treat it as paradoxical that the GSEs become dominant players in the large 100+ unit multifamily residential mortgage market when the market is under great stress. Both Fannie and Freddie have a long history in bolstering the U.S. housing market (including bolstering the multifamily housing market). Within the 5+ unit multifamily residential mortgage market, the GSEs delegate virtually all underwriting to their DUS (delegated underwriters and servicers)-approved lenders. In exchange for risk-sharing, these lenders have complete autonomy to underwrite and close all 5+ unit multifamily residential mortgage loans. The funding is non-recourse, or provided with no personal guarantees, unlike commercial banks, savings and loans, and some insurance companies. Additionally, the GSEs lend up to 80 percent of current value, with 30-year amortizations, whereas most commercial banks and insurance companies lend at best up to 75 percent of current value. Also, the interest rates on commercial banks and insurance company loans are about 20 to 100 basis points higher than rates on GSE loans. The GSEs also have special programs for low-income housing tax credit projects as well as for tax-exempt bond credit enhancements. In general, it can be argued that the GSEs were created to make possible improved terms of lending and to provide liquidity when it is needed the most. Of course, the GSEs' main focus has been to serve as a critical liquidity backstop for the single-family residential mortgage market. However, over time the GSEs have grown their multifamily residential mortgage business significantly. Combined, the GSEs currently hold $323 billion of multifamily mortgages, or about 31 percent of total multifamily debt outstanding, with 62 percent of these mortgages held in portfolio versus 38 percent securitized.

[3]One must be cautious in generalizing from the multifamily CMBS data for Chicago. It seems likely that the multifamily CMBS data for Chicago are not truly representative of the U.S. as a whole. A comparison with the U.S. shows that as of the end of 2010 multifamily CMBS debt outstanding in the U.S. equaled $125 billion, or about 15 percent of total 5+ unit multifamily residential mortgage debt outstanding. In addition, over the seven years from 2001 to 2007, multifamily CMBS issuances in the U.S. generally ranged from a low of 8 percent of total multifamily residential mortgage originations to a high of 50 percent in 2008, with a mean of 24 percent. Here, in this case, since approximately 38 percent of the multifamily housing stock in Chicago is comprised of small 2-4 unit rental properties versus about 25 percent in the U.S., and since only about 20 percent of the multifamily housing stock in Chicago is comprised of large 100+ unit rental properties versus approximately 22 percent in the U.S., it seems reasonable to assume that the relatively small multifamily CMBS share in Chicago can be attributed to the fact that mortgages on small properties are relatively expensive to originate and sell into the CMBS market. Additional information comparing the distribution of the multifamily housing in Chicago versus the U.S. in the form of a data appendix is available from the authors upon request.

share of FHA lending has also varied over time. FHA increased its market share to 20 percent in 2003, from 1 percent in 2000 and 2001. By 2009 and 2010, however, FHA's market share was back down again to about 3 percent.

– Insert Table 3 Here –

Lastly, we look at the amount of (first-lien) multifamily residential mortgage originations on mid-size 10-99 unit rental properties. Table 4 shows the distribution of loans on mid-size 10-99 unit rental properties by lender type and year of origination. In this market segment, other lenders are clearly dominant. Overall, other lenders account for about 85 percent of all newly issued mortgage loans to 10-99 unit property investors. In contrast, the GSEs make up about 11 percent of lending in this market segment.[4] Further, the GSEs never come to dominant this market; that is, they never do what they were designed to do, increase their multifamily activity when the 10-99 unit property market is under great stress. Multifamily CMBS and FHA have a modest 2 percent and 2 percent market share, respectively.

– Insert Table 4 Here –

The implications of Tables 2-4 are that other lenders are much more dominant in the multifamily residential mortgage market on mid-size 10-99 unit rental properties than in the small 2-4 unit or large 100+ unit rental property market and that, whereas the GSEs provide significant support in the small 2-4 unit and large 100+ unit rental property markets, they are

[4]Mid-size 10-99 unit property investors generally do not consider the GSEs as financing options since GSE loans can be expensive to take out. The GSEs will normally underwrite the loans twice – once at the DUS level and once at the GSE level.

an extremely small share of the mid-size 10-99 unit rental property market. These findings are significant since they indicate that the mid-size 10-99 unit rental property market has no real fail-safe mechanism to prevent credit rationing effects in times of financial crises when other lenders become uneasy about lending.

The remainder of the paper proceeds in two parts. We start with some simple theoretical predictions. Because lenders must form an expectation about the probability of borrower default when considering a mortgage application, and because lenders may become overly pessimistic when feeling overexposed to a specific borrower, we predict that a broad wave of foreclosures may cause lenders to ration against specific borrowers. These predictions follow from the theoretical work in Jaffee and Russell (1976), and Holmstrom and Tirole (1997), among others. Second, we estimate a Jaffee-Stiglitz (1990) disequilibrium credit rationing model. We then use this model to assess the significance of credit frictions in the 5+ unit multifamily residential mortgage market in general, and whether mid-size 10-99 unit rental property investors in particular are being far more credit-rationed in the current environment than other property investors due to the lack of GSE involvement in this market. Additionally, we examine the small 2-4 unit multifamily residential mortgage market, and whether small 2-4 unit rental property investors in this market are far more credit-rationed than small 2-4 unit owner-occupiers. We will also point out that the financing needs of small 2-4 unit and mid-size 10-99 unit rental property investors who are credit constrained are not just a problem of a few borrowers; it is a problem affecting a large number of investors and significant proportion of the overall multifamily residential housing stock.

3. Small Property Investors and Credit Rationing

In this section, we outline a model of credit rationing that can be applied to the multifamily residential mortgage market. The model is related to Jaffee and Russell (1976), Holmstrom and Tirole (1997), de Meza and Webb (2006), and Lemmon and Roberts (2010), inasmuch as it has a similar setup in which borrowers are assumed to have more information about the likelihood of default than lenders. The empirical model is presented in the following section. The model is a two-period model in which loans are taken out at the beginning of the first period and repaid with interest at the beginning of the second period. Default allows the borrower to avoid repaying the loan in the second period but it comes with a cost.

Interest rates in the model are assumed to be fixed for the term of the mortgage at commencement of the mortgage. The interest rate varies with the expectation of default so as to ensure normal "downward-sloping" demand curves. There is a continuum of borrowers endowed with the same income stream for the two periods. Each borrower maximizes a quasi-concave utility function, which is increasing in period-1 and period-2 consumption. The only decision the borrower has to make is whether to repay the loan in the second period. Borrowers are heterogeneous with respect to default costs. Borrowers choose to default whenever the cost of default is less than the loan repayment.

On the supply side, lenders are risk neutral and operate in a perfectly competitive market. Lenders maximize the expected value of their profits from each loan customer. Because the lender does not know the quality of any loan it originates, it charges only one price, net of expected default costs. Lenders condition their default expectations upon their own experiences. Finally, a difference may exist between the loan size demanded and that willing

to be supplied. The former is conditional on the borrower's expectations of default (unconstrained equilibrium), while the latter is determined by the lender's expectations of default (constrained equilibrium).

The main features of the model are illustrated by Figures 1 and 2. The loan supply is given by S. The supply curve (as it is drawn) is backward bending. At low loan amounts, lenders are willing to increase the level of the loan as the interest rate increases, because debt is relatively riskless (and even the most strategic defaulters will not walk away as long as sufficient equity exists in the property). The opposite relationship holds at the highest loan levels. At relatively high interest rates, the loan supply curve bends backwards because incentive effects and asymmetric information.

The borrower's loan demand is given by E. This demand function is conditional on the borrower's subjective perception of his or her probability of repayment. Equating loan demand E and loan supply S gives us a convenient way to represent the unconstrained equilibrium condition in market. Two points about this unconstrained equilibrium should be apparent. First, the equilibrium loan amount L^* and interest rate come at a point where borrower utility is maximized (as depicted by the fact that the borrower's indifference curve U representing constant expected utility is tangent to S at loan amount L^*). Second, at this level of demand the lender will earn zero expected profits only if the borrower's expectations are realized.

However, since the borrower's probability of default is not known exactly, the lender must form an expectation about the probability of default when considering the mortgage application.[5] This probability of default depends on the variables in the information set of lender. Two outcomes are possible. The constrained case, in which the lender's expectations

[5]Stiglitz and Weiss (1981) also stress this; concluding that risk perceptions on the part of the lender may differ from those of the borrower.

of default are higher than those of the borrower, is illustrated in Figure 1. In this case, the locus of equilibrium points E based on borrower's expectations of default diverges from the locus of equilibrium points L based on the lender's expectations of default. Very simply, because the lender regards borrower default as a real possibility, the lender uses L to constrain the borrower's demand for credit, thereby reducing the probability of default. Here the gap between L^* and L^{**} measures the amount of credit rationing that is likely to occur.

– Insert Figure 1 Here –

The unconstrained case is illustrated in Figure 2, in which the lender's expectations of default are less than or equal to those of the borrower. In this case, the intersection of borrower demand E with the given lender supply S at point L^* determines the equilibrium interest rate on the contract. Needless to say, this equilibrium is unconstrained by the lender's expectations of default. That is, adding the lender's demand constraint, L, in this case amounts to introducing a non binding constraint into the model, not because the borrower willing to pay a high interest rate to obtain L^*, but because the lender is much more optimistic than the borrower about what the future will bring and much less concerned about falling rents, rising vacancy rates, and declining property values.

– Insert Figure 2 Here –

Now, to see how the model applies to the multifamily residential mortgage market, consider the case of large 100+ unit rental properties. As Table 5 indicates, large 100+ unit rental properties are very different from small 2-4 unit rental properties and have experienced quite

different trends during the financial crisis of 2008-2009 (at least in the case of Chicago). Large 100+ unit multifamily rental properties in Cook County have had relatively low and stable default rates over the period 2005-2010, with the exception in 2009. Default rates on small 2-4 unit rental properties, in contrast, have been noticeably higher. They have increased from 1.8 percent in 2005 to 5.7 percent in 2008, and then have fallen to 3.8 percent in 2010. However, this increase is not totally unexpected in light of the fact that small 2-4 unit rental properties are generally less selective from a tenant credit review perspective. How this environment comes to bear on lender supply is uncertain. While we cannot just assume because default rates on large 100+ unit multifamily rental properties have been relatively low and stable in the years leading up to and during the financial crisis of 2008-2009 that lenders are more predisposed in the current environment to look for loans on large compared to small multifamily rental properties and that $L \geq E$ on large properties, such an assumption would not be, relatively speaking, totally unreasonable.

Next, consider the case of small 2-4 unit rental properties. Generally speaking, whenever lenders are feeling very vulnerable to defaults, as, for example, in the case of small 2-4 unit rental properties, given that default rates are in the 4 to 6 percent range (see Table 5), we would expect the lender's expectations of default to be greater than the borrower's and there to be gap between L and E, implying a rationed equilibrium. However, on the other hand, as we saw above, the multifamily residential mortgage market for small 2-4 unit rental properties is heavily influenced by the GSEs and securitization. This influence could in theory prevent us from observing a large gap between L and E.

Finally, consider the case of mid-size 10-99 unit rental properties. One could interpret the relatively moderate default rates on mid-size 10-99 unit rental properties (see Table 5) and

the lack of securitization in this market (see Table 4) in this way. The moderate default rates should cause a moderate gap between L and E, somewhere between that on the small 2-4 unit and large 100+ unit rental property market. Of course, at the same time the lack of securitization in this market may serve to exacerbate the gap between L and E.

These findings provide the central hypotheses of this paper: namely, that small 2-4 unit and mid-size 10-99 unit rental property investors are more likely to be credit rationed in the current economic environment than are large 100+ unit rental property investors. Testing these hypotheses are the focus of our research design and empirical analysis (Sections 4 and 5 below).

4. Empirical Methodology and Data

In this section, we turn an empirical analysis of the demand and supply of multifamily mortgages.[6] In particular, we estimate a Jaffee-Stiglitz (1990) disequilibrium model of multifamily mortgage demand and supply. The demand for multifamily mortgage loans is given by

$$C_i^d = \beta' X_i^d + \mu_i^d \tag{1}$$

The supply of multifamily mortgage loans is

$$C_i^s = \gamma' X_i^s + \mu_i^s \tag{2}$$

In the model, the mortgage interest rate does not necessarily adjust sufficiently to clear market. Instead, the actual quantity observed in the market is determined by

[6]Examples of empirical studies utilizing this theoretical framework include Sealey (1979), Goodwin (1986), and Perraudin and Srensen (1992), among others.

$$C_i = min(C_i^d, C_i^s) \tag{3}$$

where C_i is the actual quantity obtained by borrower i; X_i^d and X_i^s are vectors of variables that affect mortgage demand and supply (including any common variables that affect both demand and supply), respectively; and μ_i^d and μ_i^s denote white noise disturbances, $\mu_i^d \sim N(0, \sigma_d)$, $\mu_i^s \sim N(0, \sigma_s$, and β and γ are vectors of parameters.

The model in (1)-(3) can be estimated using switching regression techniques since, in practice, the actual loan quantity observed during period t are conditional on a particular regime or state occurring. When the multifamily residential housing market switches from one regime to another, values of C_i switch from C_i^d to C_i^s, or vice versa. In this paper, the maximum likelihood estimation of (1)-(3) is performed using the ML algorithm described by Fair and Jaffee (1972). Fair and Jaffee (1972) show that when we combine (1) and (2) with the condition of (3), we get

$$Q_i = \lambda_i(\beta^{'} X_i^d + \mu_i^d) + (1 - \lambda_i)(\gamma^{'} X_i^s + \mu_i^s) \tag{4}$$

Assuming μ_i^d and μ_i^s are independent of X_i^d and X_i^s, the maximum likelihood function becomes

$$\begin{aligned} L \quad = \quad & (2\pi\sigma_d^2)^{-\frac{n_1}{2}} (2\pi\sigma_s^2)^{-\frac{n_2}{2}} exp \left[-\frac{1}{-2\sigma_d^2} \sum_{i=1}^{n_1} (C_i^d - \beta^{'} X_i^d)^2 \right. \\ & \left. - \frac{1}{-2\sigma_d^2} \sum_{i=1}^{n_2} (C_i^s - \gamma^{'} X_i^s)^2 \right] \end{aligned} \tag{5}$$

where n_1 and n_2 are the number of observations for $Q_i = C_i^d$ and $Q_i = C_i^s$, respectively.

We focus exclusively on the multifamily residential mortgage market in Cook County to

estimate the model. Our analysis uses quarterly data covering the period from 2005Q1 to 2011Q1. The mortgage demand equation is

$$\begin{aligned} C_i^d &= a_0 + a_1 NPI_i + \sum_{y=1}^{5} \psi_y I(Origination\ Year = y) \\ &\quad + a_2 I(Investor\ Type_i = I) + \mu_i^d \end{aligned} \tag{6}$$

where NPI_i denotes net (of vacancies) property income for property i, $I(Origination\ Year = y)$ is an indicator function equal to 1 if the mortgage was originated in year y, and $I(Investor\ Type_i = I)$ is a dummy variable for institutional investors.

The mortgage supply equation is

$$\begin{aligned} C_i^s &= b_0 + b_1 NPI_i + b_2 FR_{ij} + b_3 AGE_i + \sum_{y=1}^{5} \psi_y I(Origination\ Year = y) \\ &\quad + b_4 I(Investor\ Type_i = I) + b_5 I(Low\text{-}Income\ Area_i = L) \\ &\quad + \sum_{k=1}^{3} \theta_k I(Property\ Size_i = k) + \mu_i^s \end{aligned} \tag{7}$$

where FR_{ij} denotes the foreclosure rate in area j for property i, AGE_i denotes property age, $I(Property\ Size_i = k)$ is an indicator function equal to 1 if property i belongs to size cohort k, and $I(Low\text{-}Income\ Area_i = L)$ is a dummy variable for low-income areas.

One concern in modeling the demand and supply of multifamily mortgages in (6) and (7) is modeling the role of credit frictions versus credit rationing. While we have 155,371 multifamily property investment observations in our complete data set, 18,725 observations are in market areas with foreclosure rates in excess of 5 percent. We use the variable FR_{ij} to measure credit frictions in these market areas. The variable FR_{ij} is expected to have a negative sign in

the mortgage supply equation. We have 31,899 observations in low-income areas and we use the indicator function $I(\textit{Low-Income Area}_i = L)$ to test the relation between credit-rationing and low-income areas. We also have 108,046 observations in moderate-income areas and we use the indicator variable $I(\textit{Moderate-Income Area}_i = M)$ to test the relation between credit-rationing and moderate-income areas. We use the indicator function $I(\textit{Origination Year} = y)$ to control for shifts in demand and supply, without necessarily having to attribute the shifts to specific measures like a decrease in price (a demand factor) or an increase creditworthiness (a supply factor). We use the indicator function $I(\textit{Investor Type}_i = I)$ to account for the fact that the amount of money that one can borrow for a mortgage depends greatly on the borrower's creditworthiness, and that large institutional investors generally possess higher creditworthiness than other investors (implying a higher level of demand and supply of multi-family residential mortgage debt). Lastly, we use the indicator function $I(\textit{Property Size}_i = k)$ to test for postulated credit-rationing effects among different sizes of property investors.

The amount $C_i = min(C_i^d, C_i^s)$ refers to newly granted (first-lien) multifamily mortgage loans to institutional and non-institutional investors in Cook County over the period 2005Q1 to 2010Q4. The property-level net (of vacancies) income variable, NPI_i, is derived from effective gross income (which is defined as gross possible rent for all space at market rent), less a vacancy factor. The market rents are gross rent estimates that are calculated by year and property location for Cook County. The vacancy rate data are derived from US Postal Service/HUD (USPS) address vacancy data. The foreclosure rate, FR_{ij}, is calculated as the number of mortgages with foreclosures initiated as a percent of total number of properties by property location. All foreclosure filings for Cook County come from information obtained from RIS and Cook County Court. The Court database includes new foreclosure

filings on both single- and multifamily dwelling units at the property level. The indicator variables $I(Origination\ Year = y)$, $I(Investor\ Type_i = I)$, $I(Property\ Size_i = k)$, and $I(Low\text{-}Income\ Area_i = L)$ are defined in terms of area median income (AMI). Low-income is below 80 percent of AMI; and moderate-income is between 80 and 115 percent of AMI.

5. Empirical Results

5.1 All 5+ Unit Multifamily Building Types

Table 6 shows the results of estimating the disequilibrium model given in equations (1)-(3) for 5+ unit multifamily building types. The first column reports the explanatory variables. Column two reports the coefficient estimates of the explanatory variables. Column three reports the t-statistics. The results show that NPI_i is a significant determinant of both the demand and supply of multifamily residential mortgages. In each case, the coefficient estimate of NPI_i has the expected sign and is statistically significant. In the demand equation, whether an investor is an institution has a relatively large positive effect on mortgage demand. In the supply equation, the coefficient estimate and t-statistic for FR_{ij} are -7.01 and -17.06, respectively. The coefficient estimates of $I(Low\text{-}Income\ Area_i = L)$ and $I(Moderate\text{-}Income\ Area_i = M)$ for low- and moderate-income areas are -10.14 and -2/09 and statistical significant, respectively. In contrast, property age has a positive effect on loan supply, indicating that in a diverse urban market like Chicago, older (predominantly more central) areas are generally more established, more stable, and far less risky. The variable, whether an investor is an institution has an insignificant effect on mortgage supply. Except for 2006 of the annual time dummies (fixed time effects), all other variables are significant at the 1 percent confidence level.

The two most important explanatory variables in Table 6 are $I(Property\ Size_i = k)$ for 10-49 unit and 50-99 unit property investors. In both cases, the variables have negative and significant coefficients in the mortgage supply equation. The results suggest that 10-49 unit and 50-99 unit property investors are credit rationed (or, more accurately, have been credit rationed in the current environment) relative to large 100+ unit property investors (the left-out case). It is also important to note that the coefficient of $I(Property\ Size_i = k)$ for 5-9 unit property investors is negative but insignificant.

The coefficients of the indicator function $I(Origination\ Year = y)$ are all greater zero; and most of the coefficients are highly statistically significant. They increase from 2.26 in 2006 to 18.63 in 2009, and then decrease to 2.99 in 2010 (relative to the left-out case, which is 2005). The coefficient estimates are consistent with lenders becoming far less circumspect in the good times (between 2005 and 2008), and becoming very, very cautious in the bad times (particularly in 2010).

5.2 All 2-4 Unit Multifamily Buildings

The evidence in the section above demonstrates that mid-size 10-99 unit property investors have been credit rationed relative to large 100+ unit property investors from 2005 to 2010. The evidence also implies a more than 800 percent increase in mortgage credit from 2005 to 2010 and a 74 percent decrease in mortgage credit in 2010. In this section, we present estimates of the disequilibrium model given in equations (1)-(3) for all 2-4 unit multifamily buildings.

The specification reported in Table 7 examines if small 2-4 unit rental property investors in this market are being far more credit-rationed than small 2-4 unit owner-occupiers. The

table is organized in the same way as Table 6, and we refer to the discussion there. The coefficient estimates of NPI_i are quite similar to the corresponding parameter estimates presented in Table 6. The coefficient estimate of FR_{ij} is significantly associated with the level of loan supply; the coefficient implies a 1.23 percent reduction in loan supply for a 1 percent increase in FR_{ij}. The coefficient on property age indicates that older areas are positively correlated with mortgage supply. The coefficient estimates of $I(\textit{Low-Income Area}_i = L)$ and $I(\textit{Moderate-Income Area}_i = M)$ for low- and moderate-income areas are also statistically significant.

The most interesting result in Table 7 is the coefficient of $I(\textit{Investor Type}_i = I)$, which, in this case, refers to smaller property investors versus owner-occupiers, as opposed to large institutional investors versus all other investors, as in Table 6. The negative sign on $I(\textit{Investor Type}_i = I)$ indicates that small 2-4 unit rental property investors are credit rationed relative to owner-occupiers (the left-out case). Finally, the coefficients of $I(\textit{Origination Year} = y)$ increase from 1.60 in 2005 to 15.90 in 2008, and then decrease to 7.56 in 2009 (the left-out case is 2010). This finding is consistent with the results in Table 6.

6. Discussion and Implications

Credit rationing in this model arises when mortgage debt is limited to some percent below what the borrower wants. For example, if a small 5-9 unit property investor has, say, NPI_i of \$2 per annum per square foot, the coefficient values of $a_0 = 30.52$ and $a_1 = 2.17$ in the loan demand equation imply an optimal loan demand of \$34.8 per square foot. However, in practice when the lender's expectations of default are higher than those of the borrower, the variable C_i would be determined by C_i^s. In this case, the optimal loan amount would be

determined by the values of b_0, b_1, b_3 and θ_1 in the loan supply equation, holding building age constant. With values of $b_0 = -5.54$, $b_1 = 4.78$, $b_3 = 0.36$, $\theta_1 = 1.60$ and NPI_i of \$2 per annum per square foot and average AGE_i of 70 years, for example, the loan supply is \$31.1 per square foot (11 percent below loan demand).

The example we have just examined illustrates how to determine the number of multifamily residential rental property investors that are credit constrained. For example, small 5-9 unit property investors can just get C_i^s, rather than C_i^d, when NPI_i is below \$2 per square foot. Thus, keeping track of the number of times NPI_i is below \$2 per square foot for small 5-9 unit property investors will, in this case, determine the percent constrained. In Table 6, the percent constrained ranges from 33 percent for small 5-9 unit property investors, to 90 percent for mid-size 10-99 unit property investors, and to 34 percent for large 100+ unit property investors.

Next, we use the coefficient values in Table 6 to determine the extent to which C_i^s differs from C_i^d. Among small 5-9 unit constrained property investors, C_i^s differs from C_i^d by about 21 percent, on average. Among mid-size 10-99 unit constrained property investors, C_i^s differs from C_i^d by about 45 percent, while C_i^s for large 100+ unit constrained property investors differs from C_i^d by 24 percent.

An alternative way to think about the results is as follows. Consider the example of a hypothetical 10-49 unit apartment building, with monthly rents of \$1,100 and a vacancy rate of 6 percent. With an average AGE_i of 82 years and coefficient values of $a_0 = 30.52$ and $a_1 = 2.17$, and taking today's mortgage interest, the loan demand equation in (6) implies that an otherwise unconstrained borrower would need/demand a loan with a debt service coverage ratio of about 1.09 times in order to refinance or purchase this property in the current

environment. However, given the estimates of C_i^s, the results in Table 6 would suggest that the minimum debt service coverage ratio allowable by lenders would be about 1.25. Continuing with this example, for an otherwise unconstrained 50-99 unit property investor, and a building with monthly rents of $850, the results in Table 6 would suggest would that a typical investor would demand a debt coverage ratio of 1.15. Yet, given the estimates of C_i^s, the results in Table 6 suggest that the resulting minimum debt service coverage ratio would be 1.25. Lastly, consider a large 100+ unit property with monthly rents of $850. The debt coverage ratio demanded is 1.21, while the constrained debt coverage ratio is 1.25. These differences in constrained and unconstrained debt coverage ratios imply a reduction in credit demand of 19.8 percent, 8.5 percent, and 3.9 percent for 10-49 unit property investors, 50-99 unit property investors, and 100+ unit property investors, respectively.

Turning to the extent to which small 2-4 unit property investors face constraints, the critical value of NPI_i, below which C_i is determined by C_i^s and above which C_i is determined by C_i^d, is about $2 per annum per unit for small 2-4 unit owner occupiers (same as above). In examining the distribution of NPI_i for small 2-4 unit property investors, we find the percent constrained to be about 24 percent, on average, and that C_i^s differs from C_i^d by about 15 percent. Differences between C_i^s and C_i^d are larger for small 2-4 unit property investors than for small 2-4 unit owner occupiers.

We next look at who is serving as a critical liquidity backstop in these different submarkets. The multifamily residential mortgage market has a big advantage over the other commercial mortgage markets in that multifamily property investors – especially large 100+ unit property investors – have access to GSE financing. It is unclear, however, whether the GSEs supply the same degree of liquidity to mid-size 10-99 unit property investors. The data below suggest they

do not. Among mid-size 10-99 unit properties, in particular, other lenders have a market share of 93 percent among constrained property investors versus 82 percent among unconstrained investors. In contrast, GSEs have respective market shares of 5 percent and 15 percent among the two groups (so there is, in fact, a general lack of GSE lending to credit-constrained mid-size 10-99 unit property investors). See Table 8.

Next we take a closer look at small 2-4 unit property investors. Among smaller investors, the GSEs have respective market shares of 90 percent and 95 percent, on average, for constrained and unconstrained investors (so a slightly smaller presence in the constrained property investor segment versus the unconstrained segment). Other lenders have respective market shares of 10 percent and 5 percent among the two groups. Also, in the small 2-4 unit rental property mortgage market, market shares are obviously affected by investor type – owner versus non-owner occupiers, with fewer lenders, overall, willing to lend to small 2-4 unit non-owner occupiers.

Lastly, there are striking differences in these market shares over time, and whether the GSEs have been able to provide liquidity to the different property segments. To illustrate, among all lending to credit constrained multifamily residential property investors (including lending to small 2-4 unit owner and non-owner occupiers), the GSEs accounted for 93 percent of total funds in 2005. Their market share then fell to 87 percent in 2008, and to 72 percent by 2010. As this occurred, other lenders increased their lending to all credit constrained property investors from 7 percent of total funds in 2005, to 13 percent in 2008, and to 28 percent in 2009. It is also interesting that FHA provides most of its credit constrained lending – about 72 percent – to mid-size 10-99 unit property investors. Another 11 percent of FHA's credit constrained lending is to small 2-4 unit property investors. Among unconstrained multifamily

residential rental property investors, FHA does most of its lending – about 60 percent – to small 2-4 unit property investors. Alas, multifamily CMBS is a relatively inconsequential part of the total volume of lending to multifamily residential property investors. However, CMBS is used more for constrained rather than for unconstrained investors.

7. Conclusions

This paper has been in three parts. We began with an investigation of the way of capital and the manner in which multifamily residential rental properties are financed (specifically, multifamily residential rental properties in Chicago's multifamily residential property market). Summary results in Tables 1-4 show that there is a great deal of heterogeneity depending on property size in the way in which a typical multifamily residential rental property is financed. This heterogeneity is to be expected, for small 2-4 unit properties can qualify for conventional one-to-four family GSE financing (with different loan amounts and different terms given to owner-occupiers and investors), while the GSEs also have special financing programs for large 100+ unit properties (offering full loans at 80 percent loan-to-value compared with other lenders that are at best at 65 to 75 percent). In contrast, other lenders dominate the mid-size 10-99 unit property market, since these properties are more difficult to underwrite and have a higher level of risk.

Second, several theoretical predictions were formed. Because lenders may become overly pessimistic when feeling vulnerable to borrower default, the theory generally predicts that lenders may credit-ration against specific borrowers, resulting in a situation in which lenders limit the supply of mortgage debt by negotiating a contract with a lower loan amount. As the figures in Table 5 show, current default rates on multifamily residential mortgages are highest

on small 2-4 unit properties, but are much lower on large 100+ unit properties. Default rates on mid-size 10-99 unit properties fall somewhere in between these two extreme. These default rates make us think that large 100+ unit property investors are free to borrow as much as they like in the current environment, while small 2-4 and mid-size 10-99 unit property investors may face significant limits on the amount of debt they are able to take on.

Third, we estimated a Jaffee-Stiglitz (1990) disequilibrium model of multifamily mortgage demand and supply for Chicago's multifamily mortgage market over the period 2005-2010. Based on our estimations, we were able to infer the number of multifamily residential rental property investors that are credit constrained, the type of property investors that are most affected, and the extent to which loan supply differs from loan demand. Compared with large 100+ unit property investors, mid-size 10-99 unit property investors in Chicago are much more likely to be credit constrained. These property investors obtain much less financing from the GSEs and more from other lenders. Also, our findings suggest that small 2-4 unit property investors are much more credit constrained than are small 2-4 unit owner occupiers. Again, these investors receive less financing from the GSEs and more from other lenders.

The empirical results have several important policy implications. First, policies designed to provide a reliable flow of capital to small 2-4 unit non-owner occupiers and mid-size 10-99 unit rental property investors (e.g., greater access to GSE financing for small 2-4 unit non-owner occupiers and mid-size 10-99 unit rental property investors) could help to stem the flow of foreclosures (term defaults) and maintain the supply of affordable rental housing in lower-income areas. Each year over the past four years multifamily residential mortgage foreclosures in Chicago have been higher in lower-income areas than in higher-income areas. And in Chicago small 2-4 and mid-size 10-99 unit properties are disproportionately concentrated in

lower-income areas. Second, collectively, policies designed to provide a reliable flow of capital to small 2-4 unit non-owner occupiers and mid-size 10-99 unit rental property investors could help stabilize market conditions for housing. Third, given the fact that we are in a relatively static/no-growth environment, there is likely to be very little filtering down of units occupied by one income group to the next lower income group over the next decade. In this case, policies designed to provide a reliable flow of capital to small 2-4 unit non-owner occupiers and mid-size 10-99 unit property investors might be the only direct way of influencing the supply of affordable rental housing in lower-income areas.

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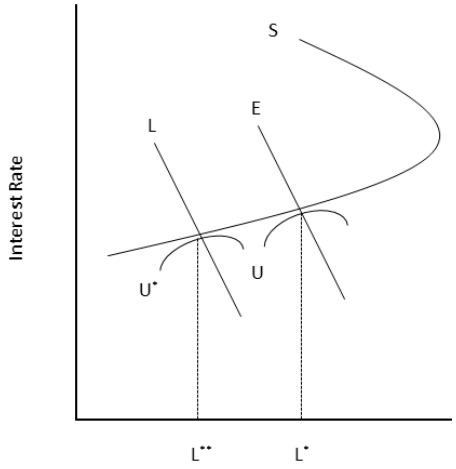

Figure 1: Model of Borrowing Behavior with Lenders Expectation of Default Greater than Borrowers. Vertical axis: Interest rate. Horizontal axis: Loan amount. Lending may take place on certain property types along E or L depending on default expectations.

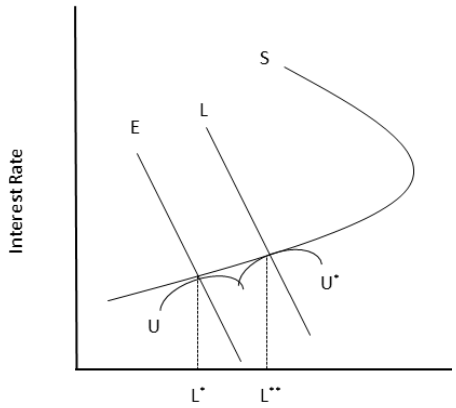

Figure 2: Model of Borrowing Behavior with Lenders Expectation of Default Less than Borrowers. Vertical axis: Interest rate. Horizontal axis: Loan amount. Lending takes place along the demand curve E. The lender demand constraint L is a non-binding constraint.

Year	GSEs	CMBS	FHA	Other	Total
2000	$506,366,620	$43,876,500	$15,733,600	$2,259,457,281	$2,825,434,001
2001	$255,605,098	$45,053,060	$38,388,100	$2,668,312,703	$3,007,358,961
2002	$470,471,075	$38,506,000	$34,322,000	$3,825,960,586	$4,369,259,661
2003	$414,179,332	$209,992,000	$168,515,300	$3,685,245,364	$4,477,931,996
2004	$308,003,169	$80,100,541	$130,491,336	$3,788,665,991	$4,307,261,037
2005	$433,605,676	$106,587,250	$91,880,500	$5,276,525,360	$5,908,598,786
2006	$521,561,141	$177,352,000	$61,597,680	$4,762,459,077	$5,522,969,898
2007	$468,531,600	$263,264,800	$64,005,176	$5,849,737,612	$6,645,539,188
2008	$703,285,700	$0	$89,264,400	$3,150,857,467	$3,943,407,567
2009	$348,128,965	$17,600,000	$89,876,400	$1,432,184,178	$1,887,789,543
2010	$307,128,103	$51,117,000	$109,316,354	$2,655,659,674	$3,123,221,131

Table 1: Multifamily Mortgage Originations in Chicago by Lender Type, 2000-2010. Table shows a large increase in 5+ unit multifamily mortgage originations over the period 2000-2007. Between 2007 and 2009 originations fell by 73 percent. Originations rebounded in 2010. Overall market is not overly dependent on CMBS.

Year	GSEs	CMBS	FHA	Other	Total
2000	$4,038,159,402	$1,035,997	$14,628,989	$1,014,062,922	$5,067,887,310
2001	$6,209,289,399	$16,000,000	$1,885,548	$2,312,235,813	$8,539,410,760
2002	$7,899,020,019	$0	$1,436,400	$827,612,731	$8,728,069,150
2003	$10,292,834,935	$23,800,000	$32,978,490	$851,810,213	$11,201,423,638
2004	$9,381,722,740	$0	$11,783,776	$1,793,637,198	$11,187,143,714
2005	$11,071,497,703	$0	$8,988,352	$1,180,326,450	$12,260,812,505
2006	$9,379,465,759	$35,816,750	$15,440,500	$1,517,815,984	$10,948,538,993
2007	$7,732,069,448	$12,161,030	$1,553,000	$1,036,808,905	$8,782,592,383
2008	$3,641,264,447	$8,342,000	$922,000	$1,723,444,322	$5,373,972,769
2009	$2,379,801,259	$0	$3,430,746	$717,864,561	$3,101,096,566
2010	$2,364,694,019	$0	$27,557,000	$661,881,048	$3,054,132,067

Table 2: Small 2-4 Unit Multifamily Mortgage Originations in Chicago by Lender Type, 2000-2010. Table shows that Fannie Mae and Freddie Mac dominate the small 2-4 unit multifamily mortgage market. Fannie Mae and Freddie Macs market share of the small 2-4 unit multifamily mortgage market over the 2000-2010 period totaled nearly 85 percent.

Year	GSEs	CMBS	FHA	Other	Total
2000	$52,696,250	$16,000,000	$0	$502,576,664	$571,272,914
2001	$78,521,000	$14,650,000	$7,792,000	$275,612,609	$376,575,609
2002	$156,336,800	$18,835,000	$0	$1,090,191,569	$1,265,363,369
2003	$146,495,000	$11,281,000	$98,299,400	$225,777,642	$481,853,042
2004	$60,254,958	$26,207,000	$68,130,300	$458,108,102	$612,700,360
2005	$177,803,100	$13,750,000	$14,872,200	$270,059,264	$476,484,564
2006	$360,407,000	$102,380,000	$25,323,900	$452,472,000	$940,582,900
2007	$122,355,500	$41,565,000	$6,035,000	$706,547,903	$876,503,403
2008	$446,730,000	$0	$13,000,000	$205,216,488	$664,946,488
2009	$192,560,000	$17,600,000	$4,374,300	$75,471,956	$290,006,256
2010	$135,368,500	$31,692,000	$23,103,500	$402,552,711	$592,716,711

Table 3: Large 100+ Unit Multifamily Mortgage Originations in Chicago by Lender Type, 2000-2010. In the 2007-2009 period, Fannie Mae and Freddie Mac were the dominate lender in large 100+ unit multifamily mortgage market in Chicago, with a market share totaling 67 percent. Ordinarily, however, Fannie Mae and Freddie Macs market share of the large 100+ unit multifamily mortgage market is closer to 20 percent. Table shows that Fannie Mae and Freddie Mac dominate the small 2-4 unit multifamily mortgage market. Fannie Mae and Freddie Macs market share of the small 2-4 unit multifamily mortgage market over the 2000-2010 period totaled nearly 85 percent.

Year	GSEs	CMBS	FHA	Other	Total
2000	$442,697,957	$18,439,000	$13,262,000	$1,076,211,269	$1,550,610,226
2001	$161,497,107	$23,751,060	$30,596,100	$1,212,281,496	$1,428,125,763
2002	$281,459,651	$14,400,000	$34,322,000	$1,719,803,920	$2,049,985,571
2003	$216,782,434	$179,951,000	$70,215,900	$2,128,880,678	$2,595,830,012
2004	$220,954,722	$53,893,541	$53,889,036	$1,929,176,935	$2,257,914,234
2005	$232,165,026	$92,421,000	$67,451,000	$2,673,026,982	$3,065,064,008
2006	$149,704,323	$70,937,000	$31,158,780	$3,026,383,591	$3,278,183,694
2007	$308,726,250	$178,759,800	$45,419,020	$3,872,242,140	$4,405,147,210
2008	$249,040,700	$0	$49,264,400	$1,855,052,469	$2,153,357,569
2009	$125,815,000	$0	$60,024,400	$850,977,574	$1,036,816,974
2010	$152,702,103	$19,425,000	$67,201,752	$1,645,428,139	$1,884,756,994

Table 4: 10-99 Unit Multifamily Mortgage Originations in Chicago by Lender Type, 2000-2010. In the 2000-2011 period, Fannie Mae and Freddie Macs market share of the 10-99 unit multifamily mortgage market in Chicago was quite modest, totaling only 11 percent. Others market share has totaled 85 percent.

	Property Size			
Year	2-4 Unit	5-9 Unit	10-99 Unit	100+ Unit
2005	1.8	0.1	0.2	0.0
2006	2.8	0.3	1.0	1.6
2007	4.5	0.3	1.1	1.6
2008	5.7	0.5	1.7	1.2
2009	5.4	0.7	2.3	3.7
2010	3.8	1.8	1.6	0.4

Table 5: Multifamily Mortgage Foreclosure Rate for Cook County by Property Size, 2005-2010. Table shows the number of foreclosures initiated as a percent of total mortgages outstanding for Cook County by property size. All foreclosure filings for Cook County come from information obtained from RIS.

Variable	Coefficient	Std Error	t-statistic
Loan Demand:			
Constant	30.52	8.07	3.78
NPI_i	2.17	0.31	7.03
$I(Origination\ Year = 2005)$	4.63	6.56	0.71
$I(Origination\ Year = 2006)$	4.38	6.70	0.65
$I(Origination\ Year = 2007)$	1.70	6.76	0.25
$I(Origination\ Year = 2008)$	7.38	7.04	1.05
$I(Origination\ Year = 2009)$	-0.44	8.04	-0.06
$I(Investor\ Type_i = I)$	20.19	4.59	4.40
Loan Supply:			
Constant	-5.54	8.39	-0.66
NPI_i	4.78	0.21	22.62
FR_{ij}	-7.01	0.41	-17.06
AGE_i	0.36	0.02	20.19
$I(Investor\ Type_i = 5\text{-}9\ Unit)$	1.60	7.23	0.22
$I(Investor\ Type_i = 10\text{-}49\ Unit)$	-30.79	7.41	-4.16
$I(Investor\ Type_i = 50\text{-}99\ Unit)$	-17.10	8.23	-2.08
$I(Low\text{-}Income\ Area_i = L)$	-10.14	1.94	-5.24
$I(Moderate\text{-}Income\ Area_i = M)$	-2.09	1.53	-1.36
$I(Origination\ Year = 2005)$	2.26	1.89	1.20
$I(Origination\ Year = 2006)$	6.89	1.86	3.70
$I(Origination\ Year = 2007)$	7.40	1.92	3.85
$I(Origination\ Year = 2008)$	18.63	2.02	9.22
$I(Origination\ Year = 2009)$	4.99	2.26	2.20
$I(Investor\ Type_i = I)$	0.00	0.00	.

Table 6: Test of Credit Rationing in Multifamily Mortgage Market in Chicago, All 5+ Unit Multifamily Building Types, 2005-2010. Table shows maximum-likelihood estimates of a Jaffee-Stiglitz (1990) disequilibrium model of multifamily mortgage demand and supply. The demand for multifamily mortgage loans is given by $C_i^d = \beta' X_i^d + \mu_i^d$. The supply for multifamily mortgage loans is given by $C_i^s = \gamma' X_i^s + \mu_i^s$. The equilibrium condition is given by $C_i = min(C_i^d, C_i^s)$.

Variable	Coefficient	Std Error	t-statistic
Loan Demand:			
Constant	39.02	1.31	29.81
NPI_i	4.48	0.09	48.46
$I(Origination\ Year = 2005)$	1.40	1.07	1.31
$I(Origination\ Year = 2006)$	3.19	1.11	2.89
$I(Origination\ Year = 2007)$	5.30	1.17	4.53
$I(Origination\ Year = 2008)$	5.46	1.31	4.17
$I(Origination\ Year = 2009)$	1.67	1.38	1.20
Loan Supply:			
Constant	41.36	1.45	28.55
NPI_i	6.44	0.09	75.52
FR_{ij}	-7.68	0.23	-34.13
AGE_i	0.21	0.01	19.72
$I(Low\text{-}Income\ Area_i = L)$	-23.71	0.90	-26.23
$I(Moderate\text{-}Income\ Area_i = M)$	-11.23	0.70	-16.00
$I(Origination\ Year = 2005)$	1.60	1.04	1.54
$I(Origination\ Year = 2006)$	11.94	1.04	11.50
$I(Origination\ Year = 2007)$	15.90	1.07	14.82
$I(Origination\ Year = 2008)$	15.43	1.26	12.21
$I(Origination\ Year = 2009)$	7.56	1.15	6.59
$I(Investor\ Type_i = I)$	-12.15	0.77	-15.87

Table 7: Test of Credit Rationing in Multifamily Mortgage Market in Chicago, Small 2-4 Unit Multifamily Residential Properties, 2005-2010. Table shows maximum-likelihood estimates of a Jaffee-Stiglitz (1990) disequilibrium model of multifamily mortgage demand and supply. The demand for multifamily mortgage loans is given by $C_i^d = \beta^{'} X_i^d + \mu_i^d$. The supply for multifamily mortgage loans is given by $C_i^s = \gamma^{'} X_i^s + \mu_i^s$. The equilibrium condition is given by $C_i = min(C_i^d, C_i^s)$.

Lender	2-4 Unit	5-9 Unit	10-99 Unit	100+ Unit
A. Unconstrained Property Investor				
GSE	95.5	1.2	15.4	40.3
CMBS	0.0	0.0	1.0	4.0
FHA	0.0	0.0	1.3	0.8
Other	4.5	98.8	82.3	54.8
B. Constrained Property Investor				
GSE	89.8	1.0	5.2	32.8
CMBS	0.0	0.0	0.7	4.7
FHA	0.0	0.0	1.0	14.1
Other	10.1	99.0	93.2	48.4

Table 8: Multifamily Mortgage Originations in Chicago by Borrower and Lender Type, 2005-2010. Table shows the percent of total multifamily mortgage originations in Chicago by borrower type (i.e., constrained versus unconstrained) and lender type (i.e., GSE, CMBS, FHA, and Other).

Year	2-4 Unit	5-9 Unit	10-99 Unit	100+ Unit
A. GSE				
2005	92.5	0.9	5.6	44.4
2006	93.9	1.1	3.9	33.3
2007	92.1	1.5	3.8	23.1
2008	87.2	0.3	5.4	0.0
2009	84.8	0.8	6.7	71.4
2010	71.7	1.3	8.3	25.0
B. CMBS				
2005	0.0	0.2	1.0	0.0
2006	0.0	0.0	1.3	4.8
2007	0.0	0.0	1.0	7.7
2008	0.0	0.0	0.0	0.0
2009	0.0	0.0	0.0	0.0
2010	0.0	0.0	0.0	12.5
C. FHA				
2005	0.0	0.0	1.0	22.2
2006	0.0	0.0	0.6	9.5
2007	0.0	0.2	0.8	0.0
2008	0.1	0.0	0.9	16.7
2009	0.0	0.0	0.8	14.3
2010	0.0	0.0	2.3	37.5
D. Other				
2005	7.4	98.9	92.4	33.3
2006	6.1	98.9	94.2	52.4
2007	7.9	98.4	94.5	69.2
2008	12.7	99.7	93.8	83.3
2009	15.2	99.3	92.5	14.3
2010	28.3	98.7	89.4	25.0

Table 9: Lending Among Constrained Property Investors over Time, 2005-2010. Among constrained property investors, the table shows the percent of total multifamily mortgage originations in Chicago by lender type (i.e., GSE, CMBS, FHA, and Other) and over time.