

# Condo Rents and Apartment Rents

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# Condos and apartments

- There is (still) a strong correlation between structure type and tenure type:

	Owner Households	Renter households	ownership rate %
Single family detached (millions)	58.256	8.532	80.58
Other (millions)	13.561	27.132	23.92
% in Single Family Detached	83.83	31.45	

Table 1: Tabulations from 2010 Census

# But the rental market is not confined to apartment buildings. From the 2011 AHS:

	Housing units			
Total records	186,448			
Missing data	76,416			
Sampled units	110,032			
	Single family	Multifamily		
	83,077	27,055		
		Apartment	Condo	
		22154	4901	
			Owner-occ.	Renter occ
			2434	2467

Table 2: Tabulations from 2011 American Housing Survey.

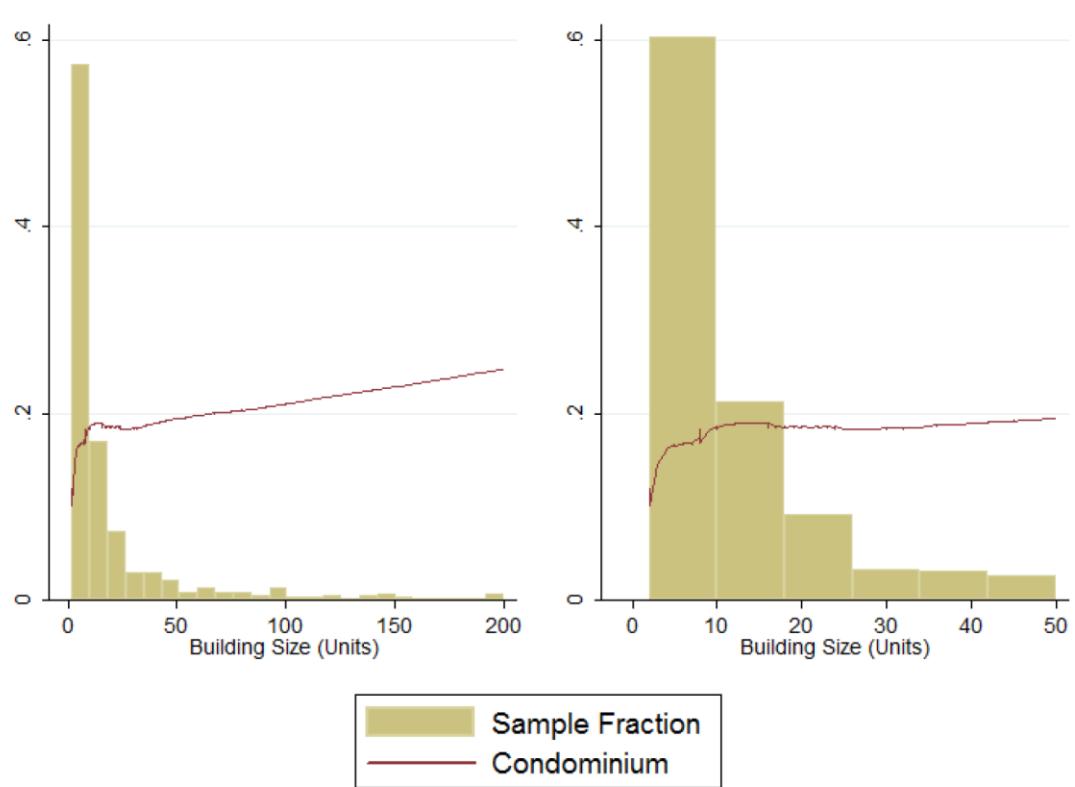
- Thus, even within the multi-family space, there are (potentially) two rental markets.
- But they are not identical service flows from otherwise identical units
- We posit that this is mainly a function of the number of units in the building
  - Owners are better neighbors (Coulson and Li, 2014; Dietz and Haurin, 2003)
  - In MF units, nevertheless, there may be a free rider problem, which suggests that centralized ownership and decision-making may be preferable (Glaeser and Shapiro, 2003)
    - This is contradicted by the evidence in Coulson and Fisher (2014) which shows that condo organization is rising in the number of units.
  - Coulson and Fisher note that the simple solution to this is professional property management
    - This has scale economies in the same way that

# Issue 1

- Owners are better neighbors.
  - Owners have higher fixed acquisition cost, which incentivizes longer spells.
  - Plus they reap the return on their investment in both social and neighborhood physical capital.
  - Quality of life is better (Dietz and Haurin (2003), Coulson and Li (2014))
  - Rents are higher in condos

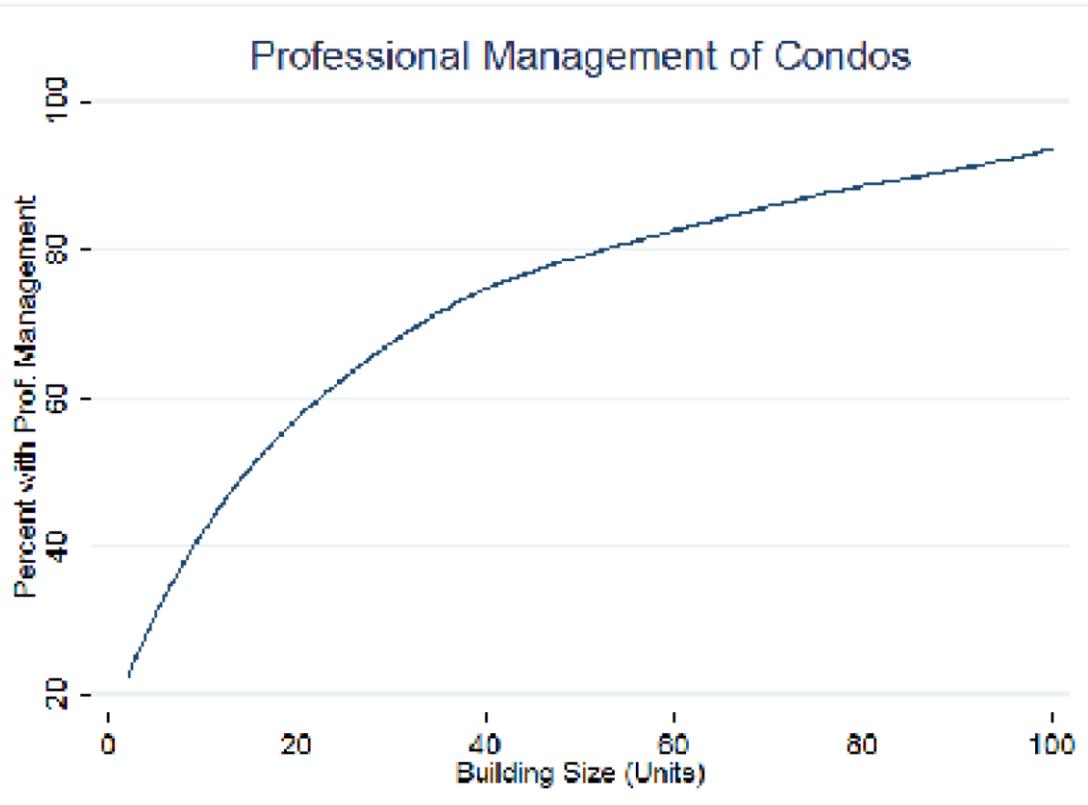
# Issue 2

- The willingness to engage in neighborhood investment is eroded by:
  - The difficulty of coordination
  - The free rider problem (Glaeser and Shapiro (2003))
  - And this should get worse as the number of units goes up (Cornes and Sandler, 1984))
  - Suggests that condo organization is better with larger buildings.
  - Coulson and Fisher (2014) shows that this is not the case:



## Issue 3

- The greater prevalence of condos at high unit count suggests that professional management is available at sufficient scale and maintenance itself has scale economies.



# Issue 4

- The same free rider issue that potentially plagues decentralized condo ownership would also plague partnerships.
- Small (single owner) apartments may have better service flow than small condos (whose scale is not sufficient for professional management).

# The contract with the manager

- Building owner maximizes

$$2n\phi_b\sqrt{b} - bc_b\sqrt{n}.$$

where

$b$  = manager effort

$n$  = number of units

$c_b$  = cost of manager effort

$\phi_b$  = productivity of manager effort

- The first term is return to effort in service flow (rent) and second is cost
- Thus, effort is subject to diminishing returns, but scale exists in the number of units being managed

# The condo owner's problem

- With a similar specification for owners

$a$  = individual owner effort

$2\phi_a$  = effort's productivity

$ac_a\sqrt{n}$  = cost of effort

$q$  = unit size

- A given owner's problem is:

$$\max_a \quad 2q\phi_a \sqrt{\sum_{j=1}^l a_j} - a_k c_a \sqrt{n}.$$

holding the other owners' contributions of effort constant. Underprovision due to free rider problem.

- (Again, first term is rental yield, second is cost)

# The apartment owner's problem

- The same as the condo owner's but with all the free rider externalities internalized.
- Set the number of owners to one, and use whole building instead of unit.

# The impact on rent

- For condos:

$$\frac{\phi_a^2 q^{\frac{3}{2}} (2l - 1)}{c_a l^{\frac{3}{2}}} + \frac{\phi_b^2 (ql)^{\frac{3}{2}}}{c_b}$$



Owner's contributions



Professional management

- For solely-owned apartments:

$$\frac{\phi_a^2(ql)^{\frac{3}{2}}}{c_a l} + \frac{\phi_b^2(ql)^{\frac{3}{2}}}{c_b}$$

Owner's contributions      Professional management

In large buildings the first term disappears

# Identification of productivity and cost parameters does not seem possible

- Instead, simply estimate rent premia for condos and apartments as flexible functions of number of units.

$$Rent_i = X_i\beta + \delta C_i + f_a(N_i) + C_i f_c(N_i) + \gamma(1 - C_i)S_i + \nu_i$$

- The f's are fourth order polynomials.
- With a shift term for small buildings, to capture the single owner phenomenon
- What do we expect:
  - Small apartments have higher rents than small condos
  - Condos have rent premium
  - But this dissipates at large unit counts

# Data

- Use the 2011 American Housing Survey
- Unit count is suppressed in later surveys
- Nearly all quality measures are higher in condos than apartments
- And perhaps a bit higher in owner-occupied condos than rental condos

	Apartments		Renter-Occupied Condos		Owner-occupied Condos		
Variable	Obs	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
rent		849.1183	727.827	1074.424	910.3417		
nunits		28.50718	64.49448	38.58127	84.38318	42.94084	89.0782
pool		0.392898	0.488406	0.498567	0.5001	0.489424	0.499992
climb		1.20046	1.757428	1.450345	2.495955	1.85415	3.259765
floors		2.812946	2.335635	3.215241	3.343337	3.996713	4.366858
baths		1.191974	0.429813	1.354276	0.509585	1.594084	0.58441
halfb		0.106617	0.345746	0.191326	0.452843	0.292112	0.507773
fplwk		0.116819	0.321211	0.212809	0.409377	0.353328	0.478102
porch		0.668909	0.470617	0.760843	0.426655	0.836894	0.369538
airsys		0.523833	0.499443	0.645318	0.478514	0.66516	0.472031
garage		0.330144	0.476379	0.467369	0.554464	0.681183	0.466114
unitsf		917.1884	841.2416	999.5732	765.4368	1349.091	1175.99
built		1965.84	25.21849	1974.461	20.93156	1974.711	22.5661
ggmaint		0.69527	0.460304	0.776652	0.416574		
gbmaint		0.673874	0.468805	0.741792	0.437738		
nobmaint		0.053399	0.224833	0.014187	0.118286		
nogmaint		0.053309	0.224653	0.014187	0.118286		
N		22154		2467		2434	

# Two selection issues

- Since observed quality is higher in condos than apartments, maybe unobserved quality is too.
- And maybe is higher in owner-occupied condos than in rental condos
- The sample is of apartments and renter-occupied condos, so need to account for selection into apartments, and conditional on condos, selection into rental-occupied condos.
- Selection into apartments or condos ( $Y_1 = 1$  for condos)

$$Y_{1i} = Z_{1i}\beta_1 + e_{1i}$$

$$P(I_{1i} = 1) = P(e_{1i} > -Z_{1i}\beta_1)$$

- Rental condo ( $Y_2 = 1$ ):

$$Y_{2i} = Z_{2i}\beta_2 + e_2$$

$$P(C_i = 1) = P(e_{2i} > -Z_{2i}\beta_2 \text{ and } e_{1i} > -Z_{1i}\beta_1)$$

$$E(Rent_i) = X_i\beta + \delta C_i + f_a(N_i) + C_i f_c(N_i) + \gamma(1 - C_i)S_i + E(v_i | e_{1i} < -Z_{1i}\beta_1 \text{ or } [e_{1i} > -Z_{1i}\beta_1 \text{ and } e_{2i} > -Z_{2i}\beta_2])$$

$$\begin{aligned} &= X_i\beta + \delta C_i + f_a(N_i) + C_i f_c(N_i) + \gamma(1 - C_i)S_i + (1 - I_{1i})\sigma_{ve_1}\lambda_R + C_i\sigma_{ve_1}\lambda_{C1} \\ &\quad + C_i\sigma_{ve_2}\lambda_{C2} \end{aligned}$$

Where the  $\sigma$ 's are covariances and  $\lambda$ 's are the “two-stage” Mills ratios.

# Selection results

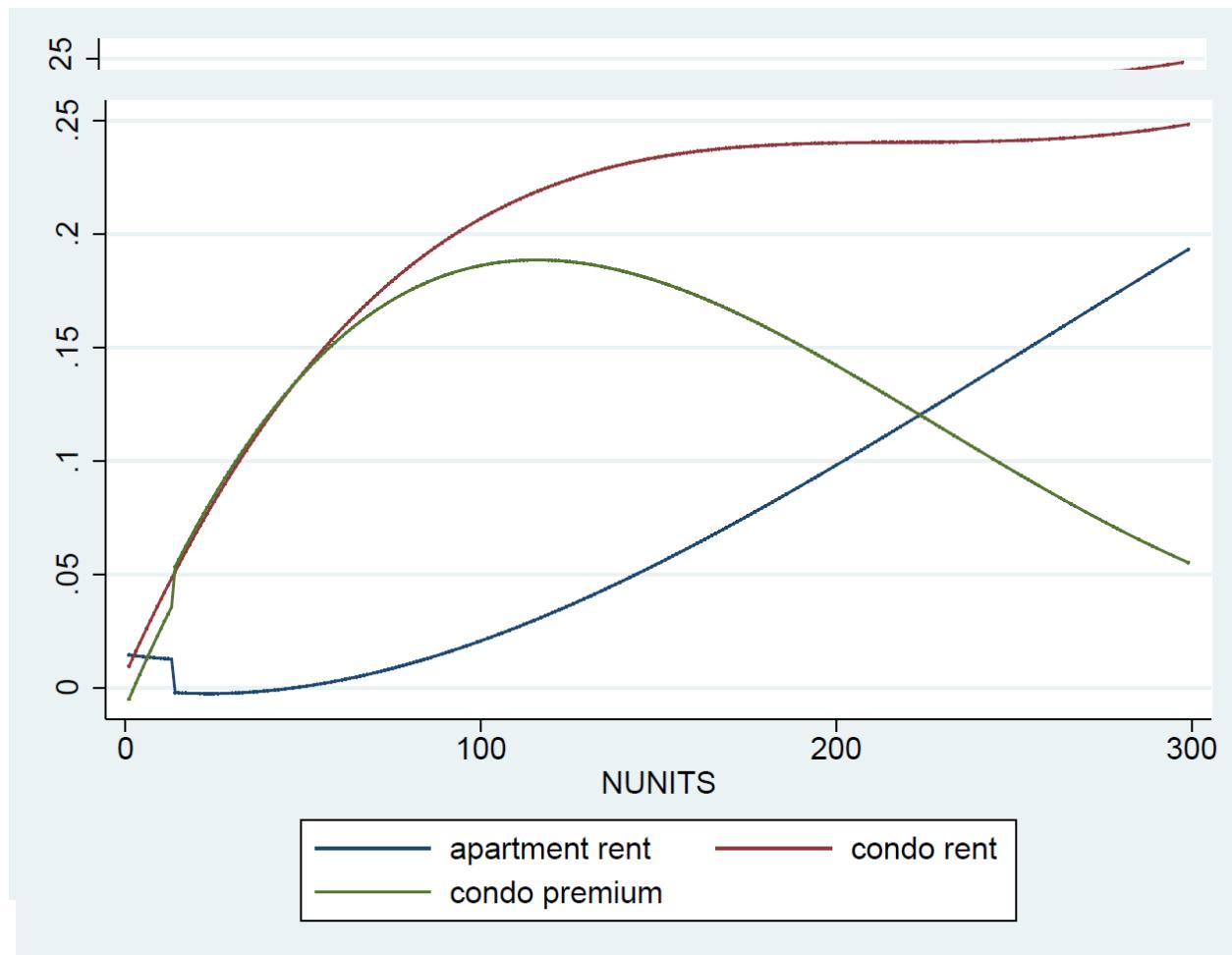
Variable	Prob (Condo)		Prob (Owner-occ.)	
	Marginal Prob.	Z-ratio	Marginal Prob.	Z-ratio
nunits	0.000452	3.79	6.88E-06	0.03
nunitsq	-1.78E-06	-3.71	1.40E-08	0.01
nunitcu	1.49E-09	3.25	-1.60E-10	-0.18
baths	0.097887	20.76	0.022134	1.02
halfb	0.08652	16.68	0.001765	0.11
fplwk	0.085391	14.37	0.014728	0.73
floors	0.011139	9.13	0.000654	0.24
climb	0.001056	0.73	-0.00049	-0.19
porch	0.028068	5.09	0.025931	1.55
airsys	0.044151	8.1	-0.03933	-3.52
Garage	0.081586	16.38	0.065881	2.2
Unitsf	1.45E-05	6.42	2.69E-05	2.99
Age			4.76E-05	0.07
age2			1.66E-05	2.28
builtpre1960	0.000134	0.02		
built6080	0.038384	6.14		
built8085	0.024038	2.97		

- Selection into condo is easily observable.
- Selection into occupation is not
- Note the use of vintage as shifters in first stage (legal and tax considerations)

# Rental hedonic

Variable	A	B	C
xcondo	0.007 (0.026)	0.010 (0.038)	0.006 (0.038)
smallapt	0.0140* (0.008)	0.0141* (0.008)	0.0147* (0.008)
pool	0.113*** (0.011)	0.114*** (0.011)	0.114*** (0.011)
climb		0.002 (0.003)	0.002 (0.003)
baths	0.250*** (0.012)	0.253*** (0.012)	0.252*** (0.012)
halfb	0.0688*** (0.013)	0.0803*** (0.014)	0.0807*** (0.014)
fplwk	0.133*** (0.014)	0.133*** (0.014)	0.132*** (0.014)
porch	0.0477*** (0.011)	0.0474*** (0.011)	0.0475*** (0.011)
airsys	-0.158*** (0.011)	-0.159*** (0.011)	-0.160*** (0.011)
garage	0.218*** (0.010)	0.219*** (0.010)	0.216*** (0.010)
unitsf	0.000168*** (0.000)	0.000166*** (0.000)	0.000167*** (0.000)
sfsq	-1.17e-08*** (0.000)	-1.16e-08*** (0.000)	-1.17e-08*** (0.000)
built	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
grounds		0.0329*** (0.012)	
building		0.0296** (0.012)	
selrent1		-0.000989** (0.000)	-0.00100** (0.000)
selrent2a		0.038 (0.239)	0.033 (0.239)
selrent2b		0.006 (0.004)	0.007 (0.004)
Constant	6.179*** (0.442)	6.193*** (0.443)	6.281*** (0.443)
F-Stat (units)	16.64***	16.60***	15.95***
F-stat (condo)	3.41**	3.58**	3.69**
CMSA dummies	YES	YES	YES
Location dummies	YES	YES	YES
R-squared	0.159	0.159	0.161
Standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

- Signs and sizes pretty much in line with other hedonic studies
- Selection into condo is important, selection into occupation, not so much
- Condo shifter not so important
- Action come through building size
- Small apartment shifter is significant



- Apartment rent higher only for  $n < 4$
- Condo premium is large and increasing (is this surprising?).
- Free rider issue only crops up after  $n > 100$

# Conclusion

- Lots to do
  - Differential management abilities
  - Unobserved quality specification