# Discussion of Guerrieri, Hartley and Hurst

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# Quick Summary

This is an ambitious paper.

- Model:
  The authors develop a nontrivial model with two types of agents (rich/poor) and an externality that predicts:
  a. When economy-wide interest rates fall
  b. Then house prices in relatively inexpensive areas of an MSA appreciate faster than in relatively expensive areas.

- Data:
  Data on house prices from a variety of sources appear consistent with model predictions.

# A Discussion of the Data and Model

In the Model:

- In their explanation of changes to relative prices within MSAs, the authors abstract from changes to
  a. Risk (Piazzesi et. al. 2007)
  b. Credit constraints (Ortalo-Magne and Rady 2006)

- Changes to relative prices occur because relative rents change. (All rents are discounted using identical rates).

- We know that credit conditions changed and suspect that the premium to risk changed.

# Credit Conditions

Source: Gerardi, Lehnert, Sherlund, Willen (2008)

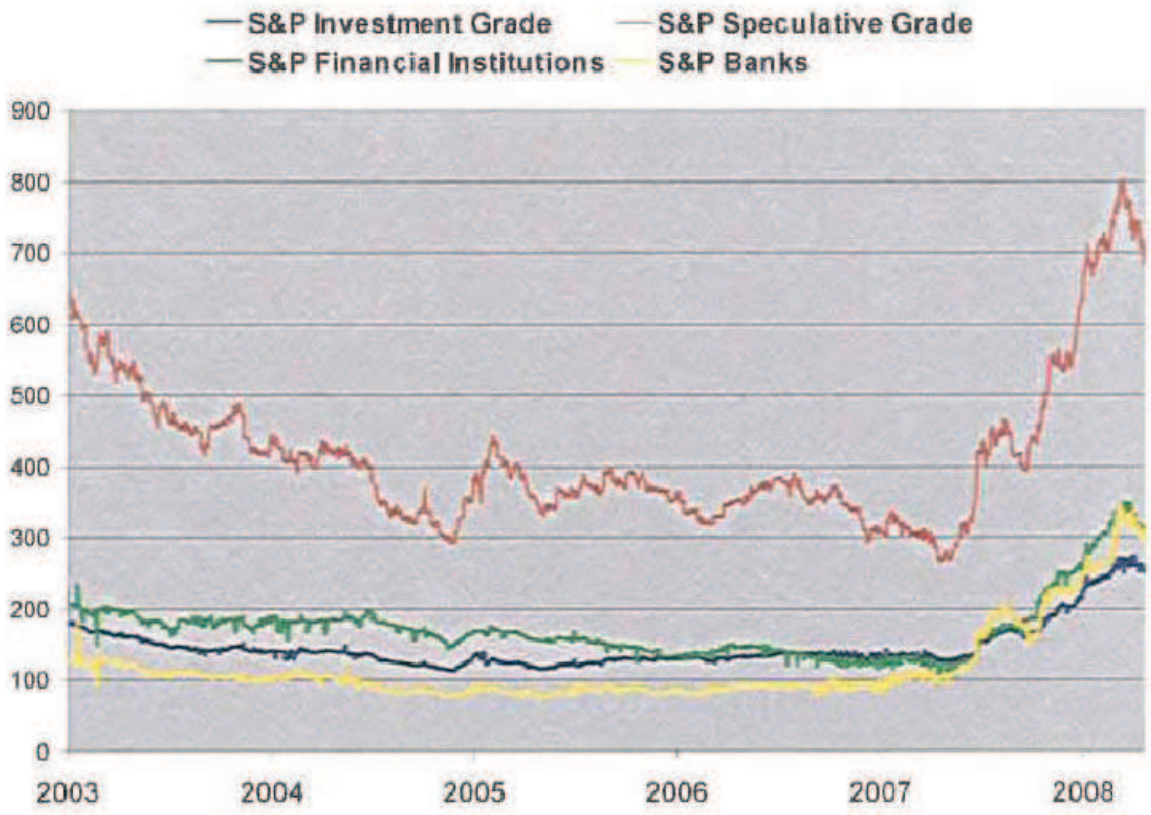
Massachusetts Originations, 2000 - 2007

| Year | Combined LTV | | Subprime |
|---|---|---|---|
| | Median | % $\geq$ 0.90 | purchase % |
| 2000 | 0.824 | 31.67 | 2.43 |
| 2001 | 0.850 | 34.42 | 2.89 |
| 2002 | 0.820 | 32.32 | 3.88 |
| 2003 | 0.850 | 34.47 | 6.86 |
| 2004 | 0.866 | 35.68 | 9.99 |
| 2005 | 0.899 | 39.40 | 14.81 |
| 2006 | 0.900 | 41.65 | 12.96 |
| 2007 | 0.900 | 41.62 | 3.95 |

# Spreads on Debt

## Credit Risk Reprices

### S&P Composite Spreads



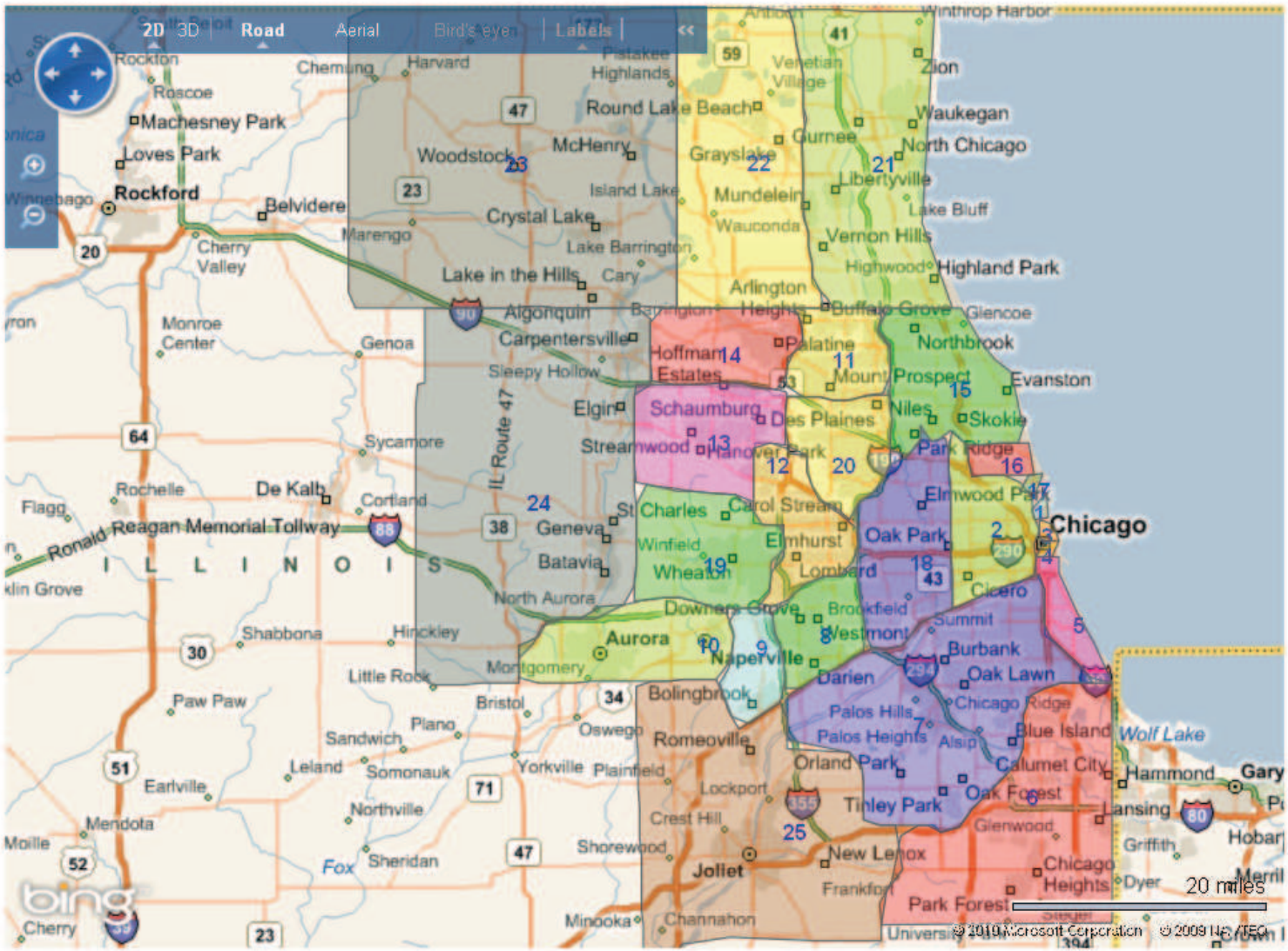

Data as of April 24, 2008. Source : Standard & Poor's Global Fixed Income Research

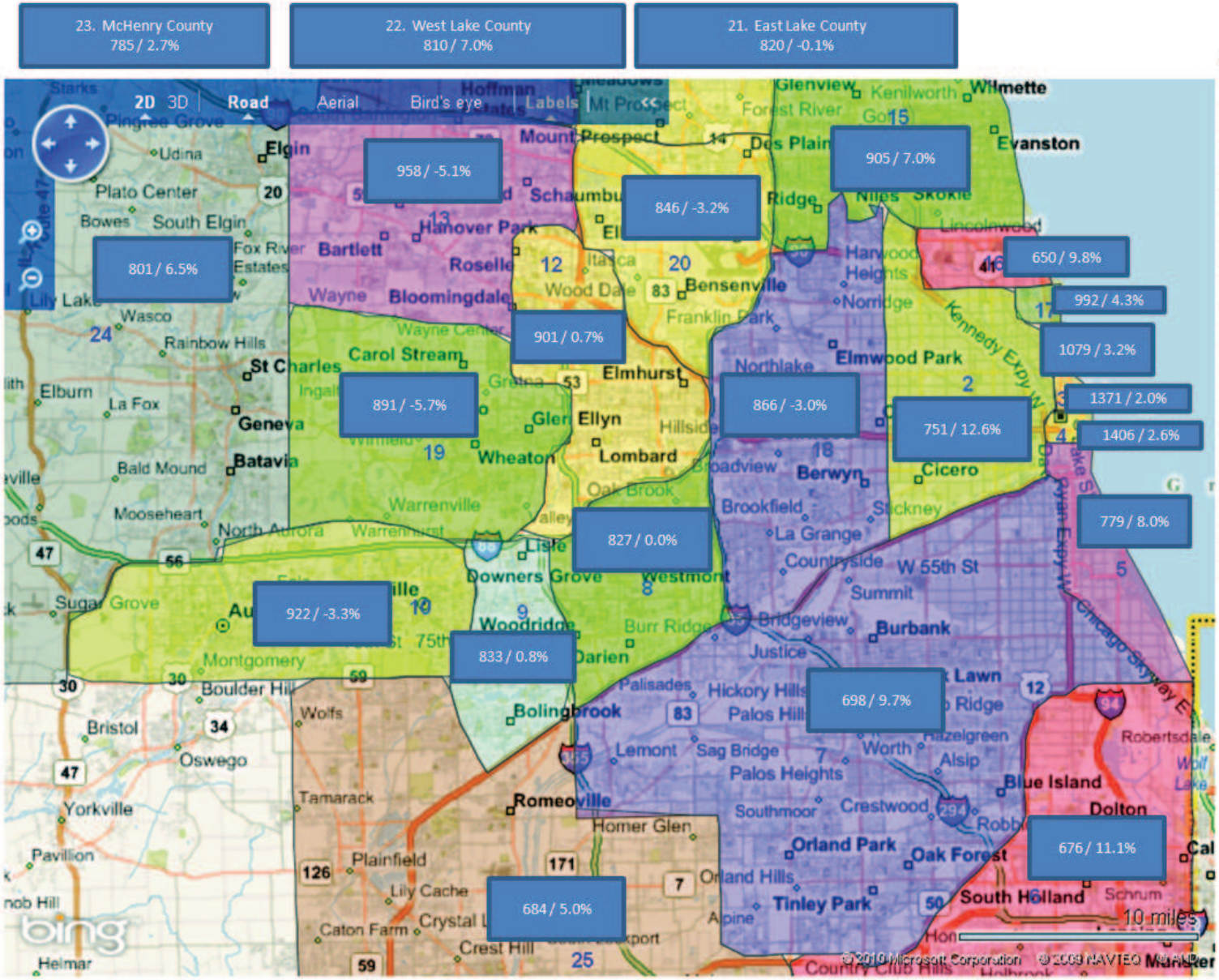
STANDARD &POOR'S

# Initial Thoughts

- When I first read the paper, I thought it was risky to propose a model that attributes observed changes in relative prices within MSAs to changes in relative rents.
- The authors do not have data on rents.
- Perhaps risk premia and/or credit conditions played a role.

# Chicago Submarkets Data from REIS, Inc.






## Submarkets:

1. Lincoln Park
2. City West
3. Gold Coast
4. The Loop
5. South Shore
6. Southeast Cook County
7. Southwest Cook County
8. Downers Grove
9. Woodridge/Lisle
10. Aurora/Naperville
11. Wheeling
12. Glendale Heights/Lombard
13. Schaumburg/Hoffman
14. Palatine
15. Glenview/Evanston
16. Rogers Park/Uptown
17. Belmont to Montrose
18. Oak Park
19. Glen Ellyn/Wheaton
20. O'Hare
21. East Lake County
22. West Lake County
23. McHenry County
24. Kane County
25. Joliet

Data from REIS, Inc.

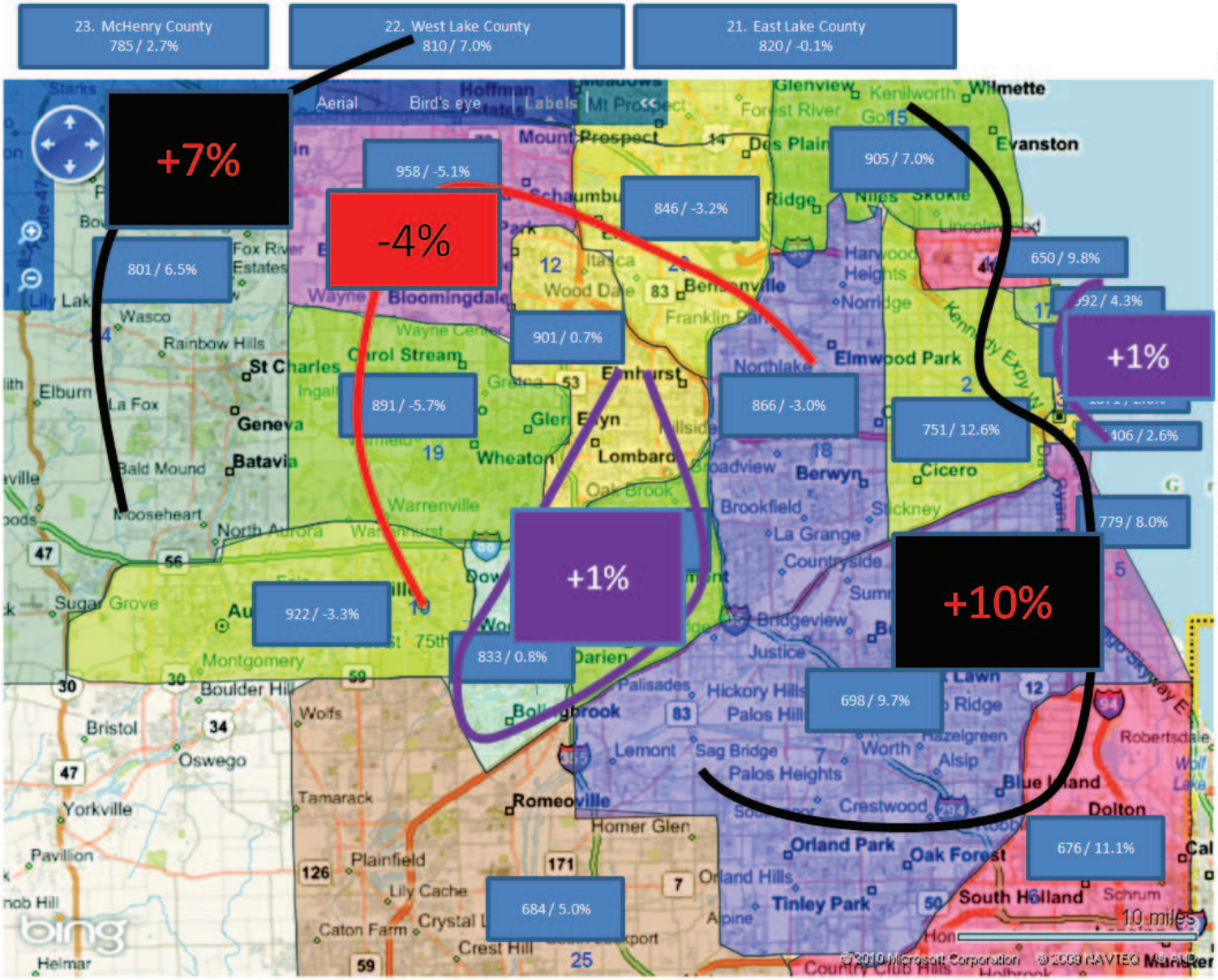
# Chicago Submarkets Data from REIS, Inc.

The within-Chicago rent data show some interesting variation.

Some of the results the authors document in the case of prices appear to hold (qualitatively) in the case of rents.

- Rents for the closest-in suburbs increased at the fastest rate (2000-2006).
- Rental growth is negatively correlated with initial rental level.

# Chicago Submarkets Data from REIS, Inc.

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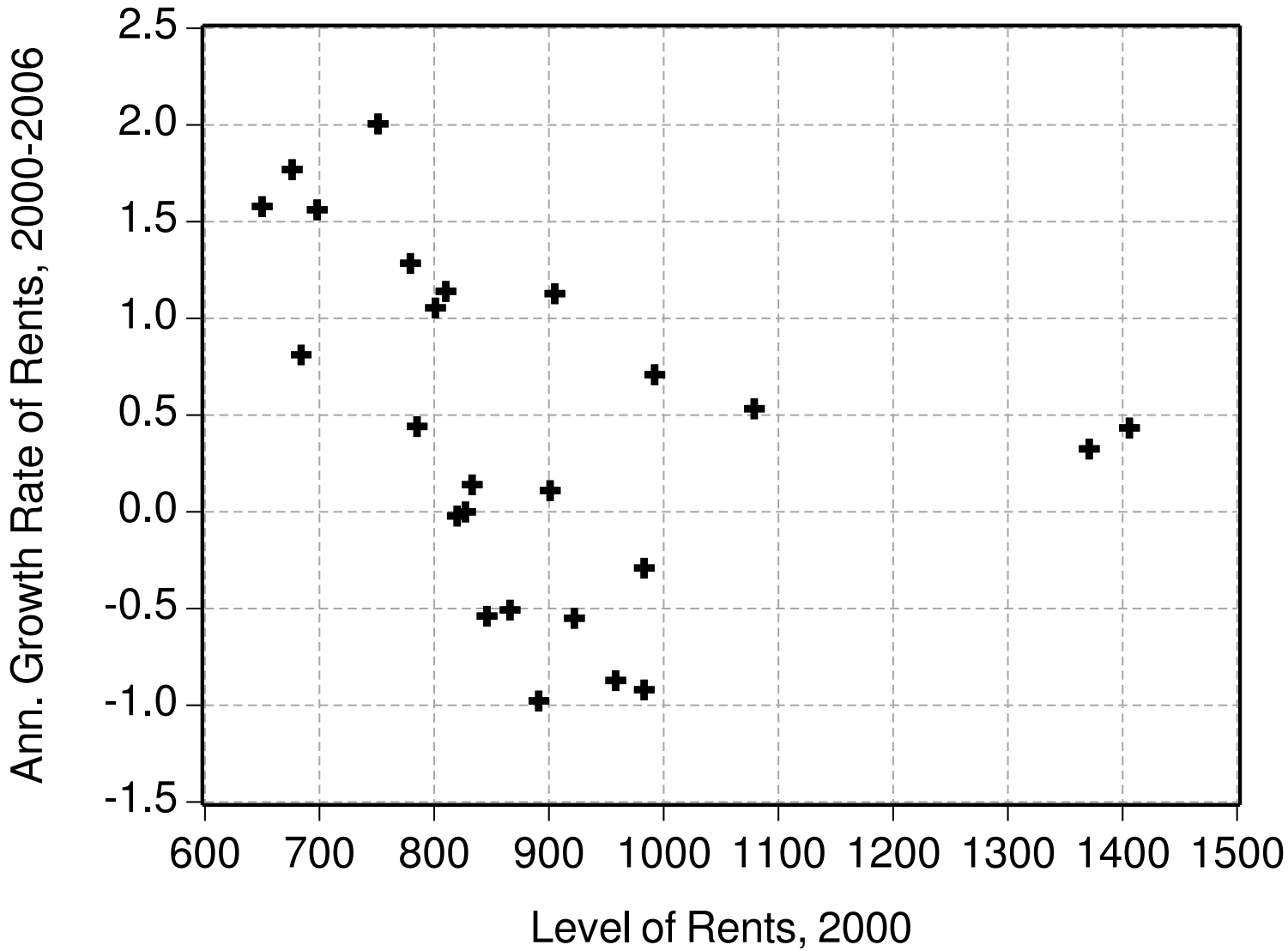
# Chicago Submarket Data from REIS, Inc.



# Rent Regressions: Chicago Submarket Data

Regress Annualized Growth Rate of Rents, 2000-2006 on Level of Rents (2000).

| | All Data | Rent $<$ \$1200 |
|---|---|---|
| Avg. Growth, 2000-2006 | 0.41% | 0.42% |
| Avg. Level, 2000 | \$889 | \$845 |
| Coefficient | -0.0018 | **-0.0051** |
| Robust SE | 0.00094 | 0.0016 |
| t-stat | -1.88 | **-3.29** |
| N | 25 | 23 |
| R-squared | 0.14 | 0.39 |

Regression of total pct. change in rent on log level of rent: estimate is $-0.27$ (0.07). The authors estimate $-0.33$ (0.05).

# Model Discussion

So, something very interesting is in the data.

But is this the model we want to explain the data?

Study closely two features of the model:

- Quasi-linear preferences.
- Fixed housing density.

# Model Discussion

Suppose agents in location $i$ have preferences of

$$c_i + \phi H_i h_i^{\alpha}$$

Agents take $H_i$ as given. The rental price must satisfy:

$$\alpha\phi H_i h_i^{\alpha-1} = R_i$$

$$\text{Implying} \quad h_i = \left(\frac{R_i}{\alpha\phi H_i}\right)^{\frac{1}{\alpha-1}}$$

Quasi-linear preferences:
Housing demand is independent of income.

The authors vary $\phi$ by type so demand is a function of income.

# Model Discussion

From before

$$\begin{aligned} R_i h_i &= \alpha \phi H_i h_i^{\alpha} \\ c_i &= y_i - \alpha \phi H_i h_i^{\alpha} \end{aligned}$$

Utility in any location $i$ is therefore

$$U_i = y_i + \left( \frac{1-\alpha}{\alpha} \right) R_i h_i$$

- $y_i$, $U_i$ are identical for all $i$ in a given MSA.
- Within-MSA rental *expenditures* are constant for each type.
- Within-MSA variation only due to variation in type.

# Model Discussion

But, as the authors note (p. 3)

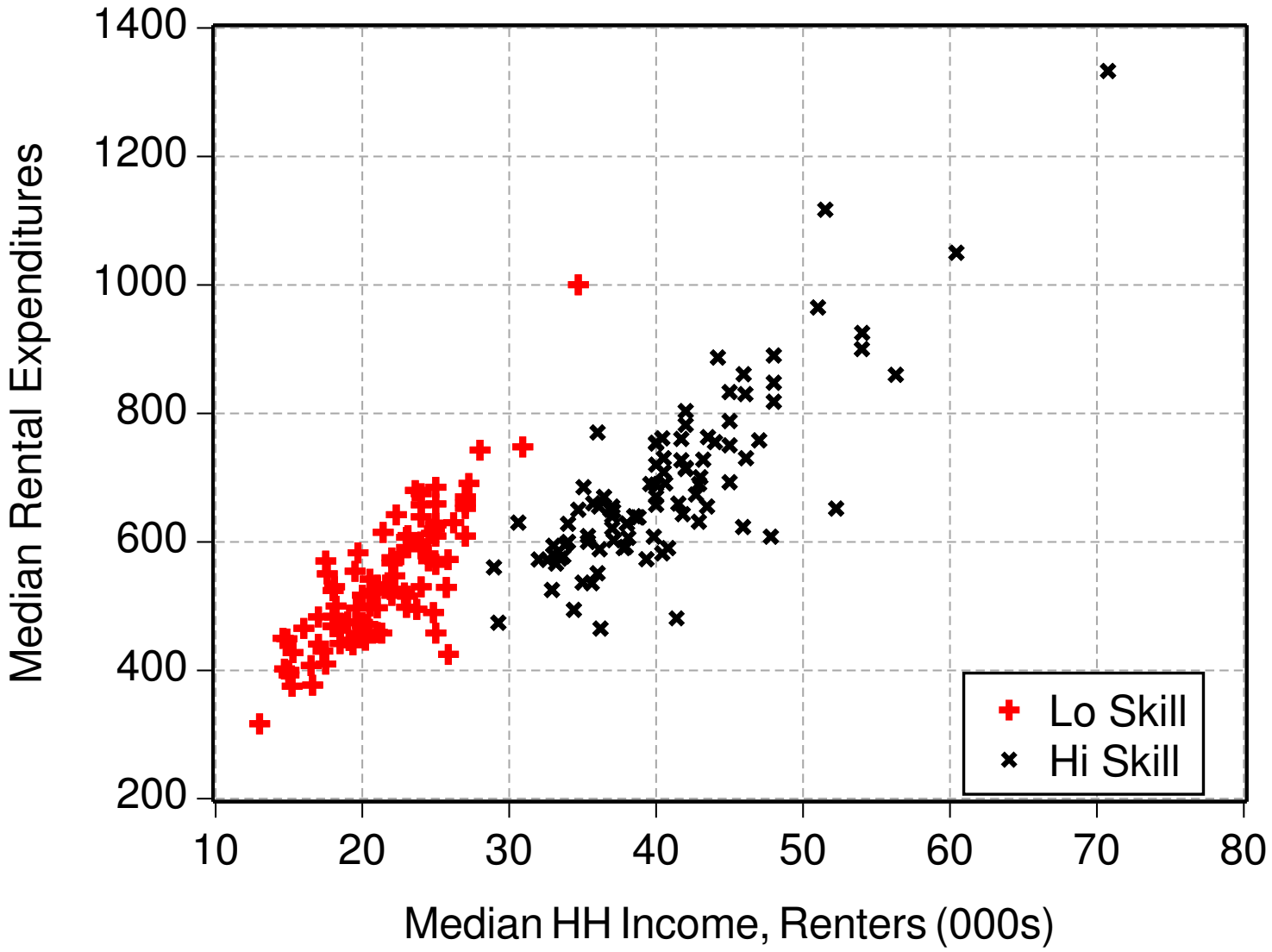
*Any model of housing price dynamics designed to explain cross-city house price dynamics should also be able to explain within city house price dynamics.*

If utility is equated across MSAs $i$ and $j$, (holding type fixed)

$$y_i + \left(\frac{1-\alpha}{\alpha}\right) R_i h_i \quad = \quad y_j + \left(\frac{1-\alpha}{\alpha}\right) R_j h_j$$

For a given type:
In MSAs where wages are high, rental expenditures are low!

# MSA-Level Data, 2000 Census



# Model Discussion: Supply Restrictions

- Housing supply restrictions play a key role in the paper
- If $R_i > \hat{r}C$, location $i$ will be fully developed. (meaning $n_i h_i = 1$ in that location).
- Since $n_i h_i$ is always $= 1$, a shock to housing demand can only lead to a horizontal expansion of neighborhood boundaries.
- Leads to "Gentrification" and/or "Expansion"
- The locations where type switches (poor to rich) or newly developed locations (nothing to poor) have the fastest relative growth rates in rents.

# Model Discussion: Supply Restrictions

Consider preferences: $c_i + \phi H_i h_i^{\alpha}$ with $\phi^p < \phi^r$.
In a segregated equilibrium, poor consume no housing.

- Denote boundary of rich neighborhood as $I$. $H_I = \gamma$.

$$\hat{r}C = R_I = \alpha\phi\gamma h_I^{\alpha-1}$$

- Consider some other neighborhood $i' = I - \gamma$. $H_{i'} = 2\gamma$.

$$R_{i'} = \alpha\phi 2\gamma h_{i'}^{\alpha-1}$$

- Indifference: $R_I h_I = R_{i'} h_{i'}$. This implies $h_{i'} = (1/2)^{1/\alpha} h_I$.

- $\hat{r}$ or $C$ fall: $h_I$ and $h_{i'}$ increase.
  With fixed housing density, city must expand.