How Rents and Expenditures Decrease: The Case of Tokyo Office Properties

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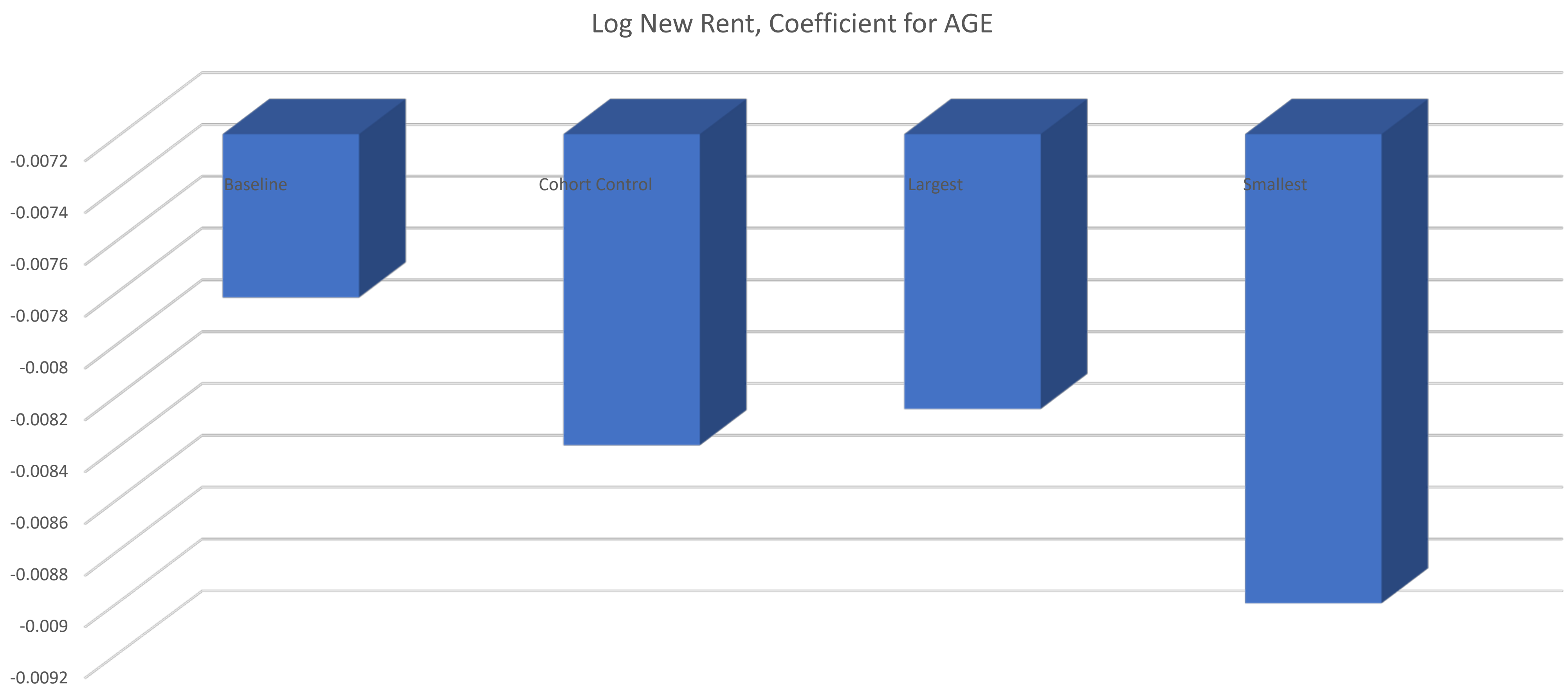
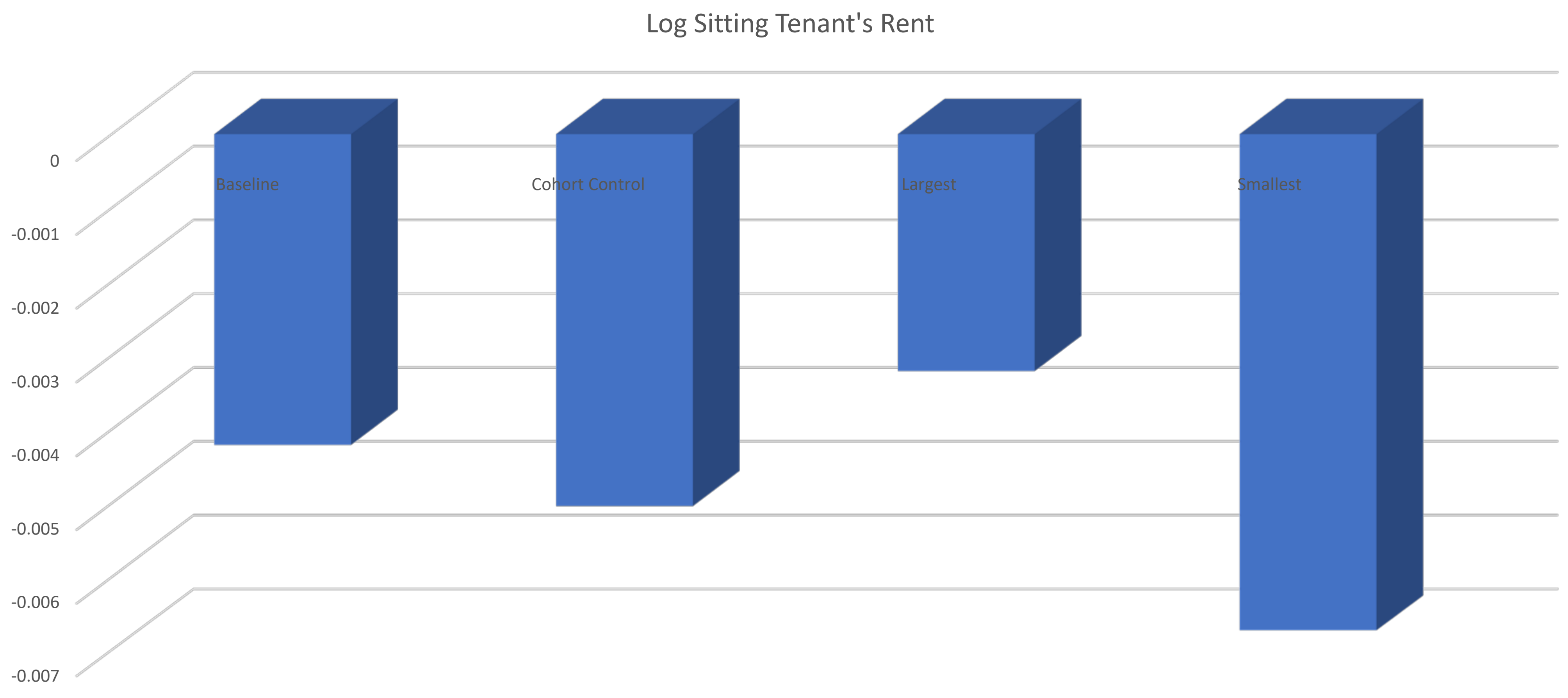
Summary

- Values decline over time because the structure depreciates
- Option to redevelop becomes more valuable over time, offsetting some of the depreciation effect.
- So far, implications are only for *value*, not rents.
- Test: regress log(rent) on gross floor area, walking minutes to station, renovation (endogenous?), and age. Fixed effects for cohort (decade) and year.
- Also operating expenses and net cash flows.
- 10,000 office buildings in Tokyo, over 20,000 rents.

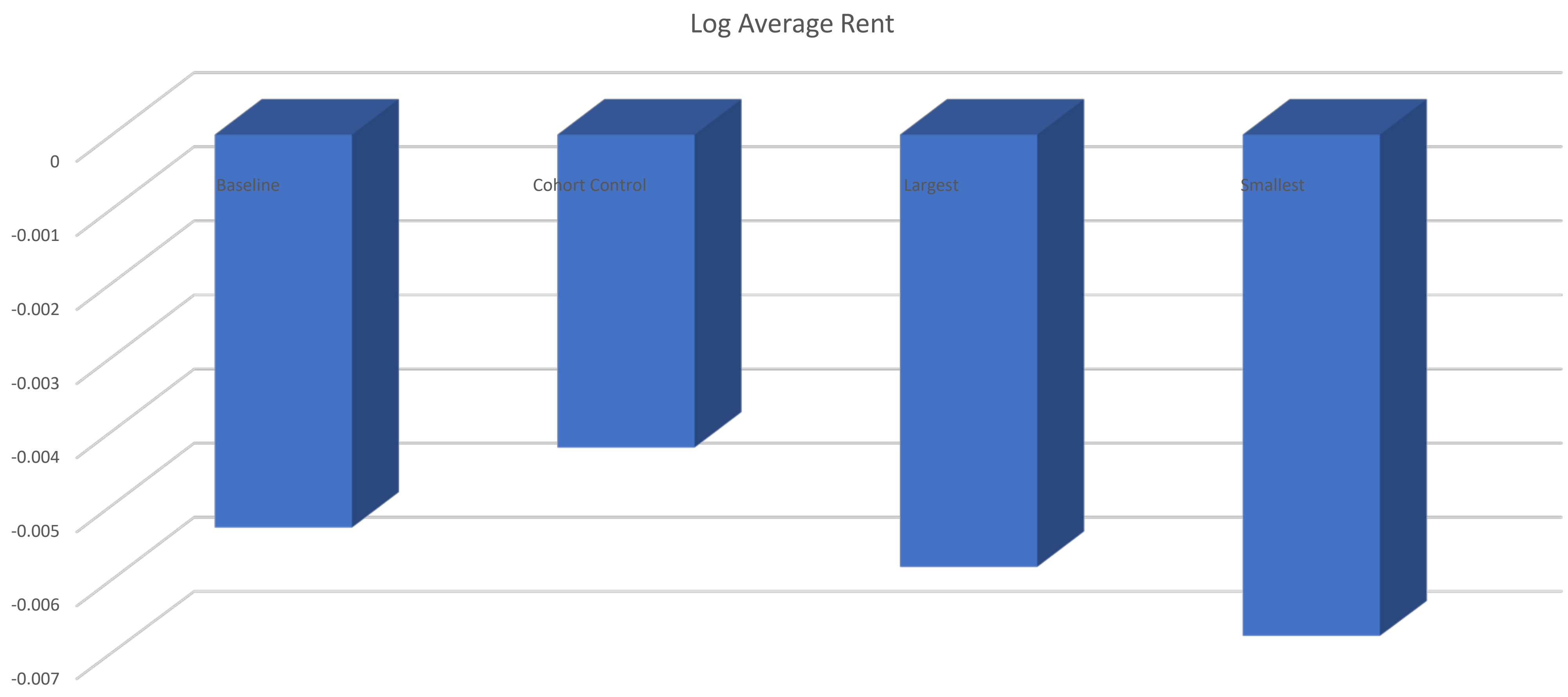
Log New Rent, Coefficient for Age



Log Sitting Tenant’s Rent, Coef. for Age – all but first are insignificant



Log Average Rent, Coefficient for Age



McKenzie (2006), "Disentangling Age, Cohort, and Time Effects in the Additive Model"

- General Case:
- t = year of sale
- j = age
- t – j = year of construction
- i = individual observation
- $P_{i,j,t} = \alpha_{t-j} + \beta_j + \gamma_t + e_i$ = cohort + age + year of sale + error
- Can identify 2nd differences, e.g., age effects =
- $\left(\bar{P}_{t-j-1,j+1,t} - \bar{P}_{t-j-1,j,t-1}\right) - \left(\bar{P}_{t-j,j,t} - \bar{P}_{t-j,j-1,t-1}\right)$ =
- $\left(\beta_{j+1} - \beta_j\right) - \left(\beta_j - \beta_{j-1}\right)$
- Only need to normalize on one slope to identify all three effects, e.g., $\left(\beta_j - \beta_{j-1}\right)$ = 0

Coulson and McMillen (2008)

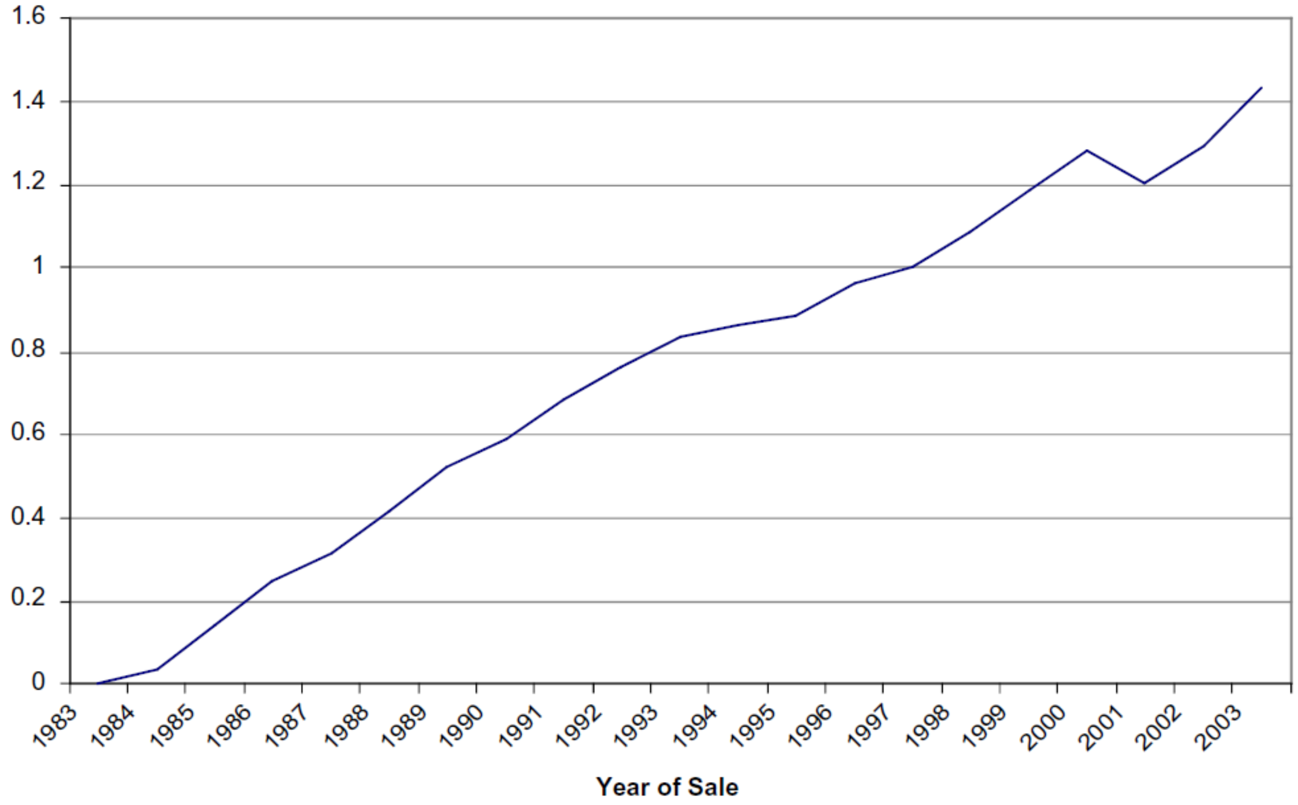


Fig. 8. Year of sale effect.

Age

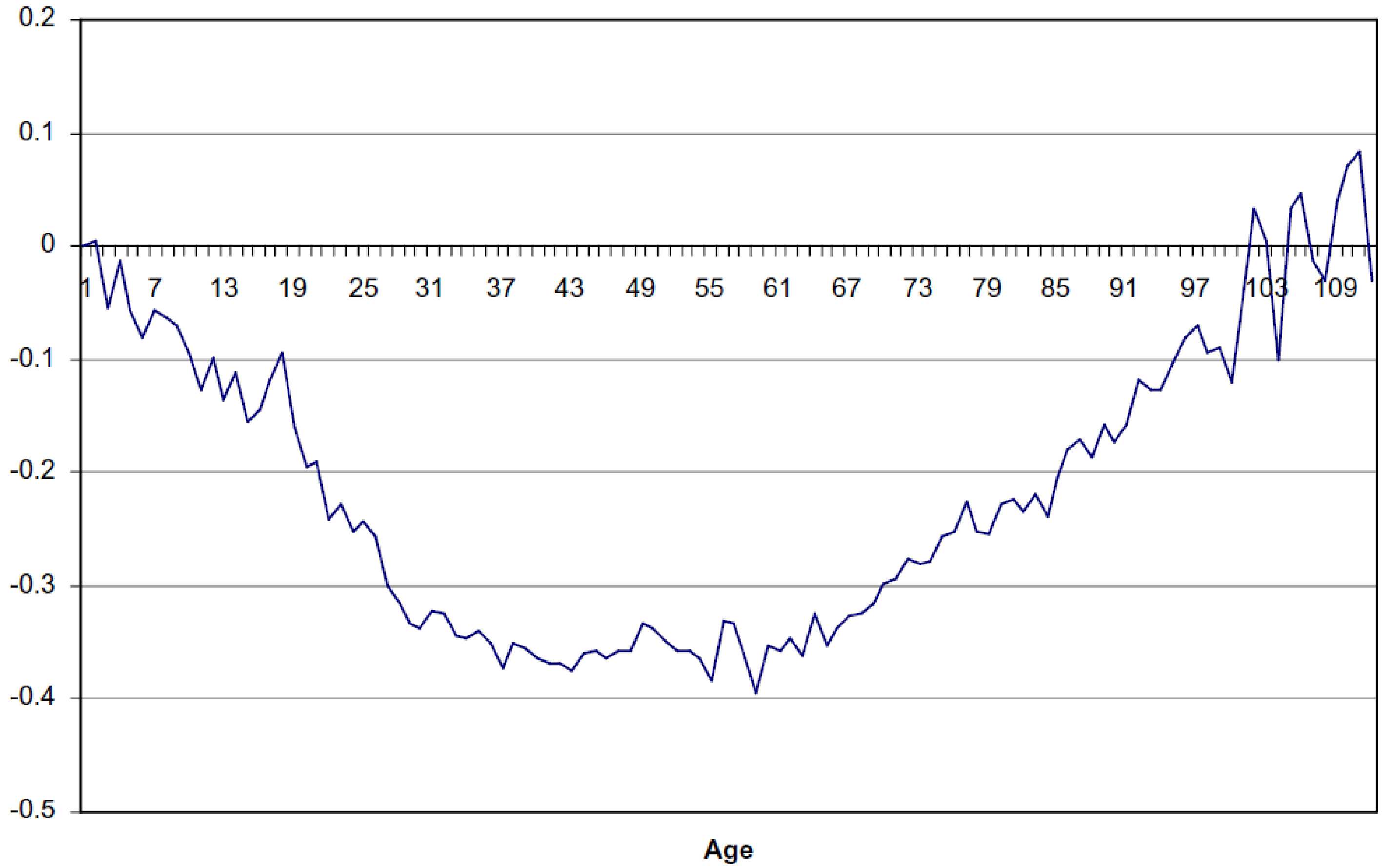


Fig. 9. Age effect.

Cohort – Year Built

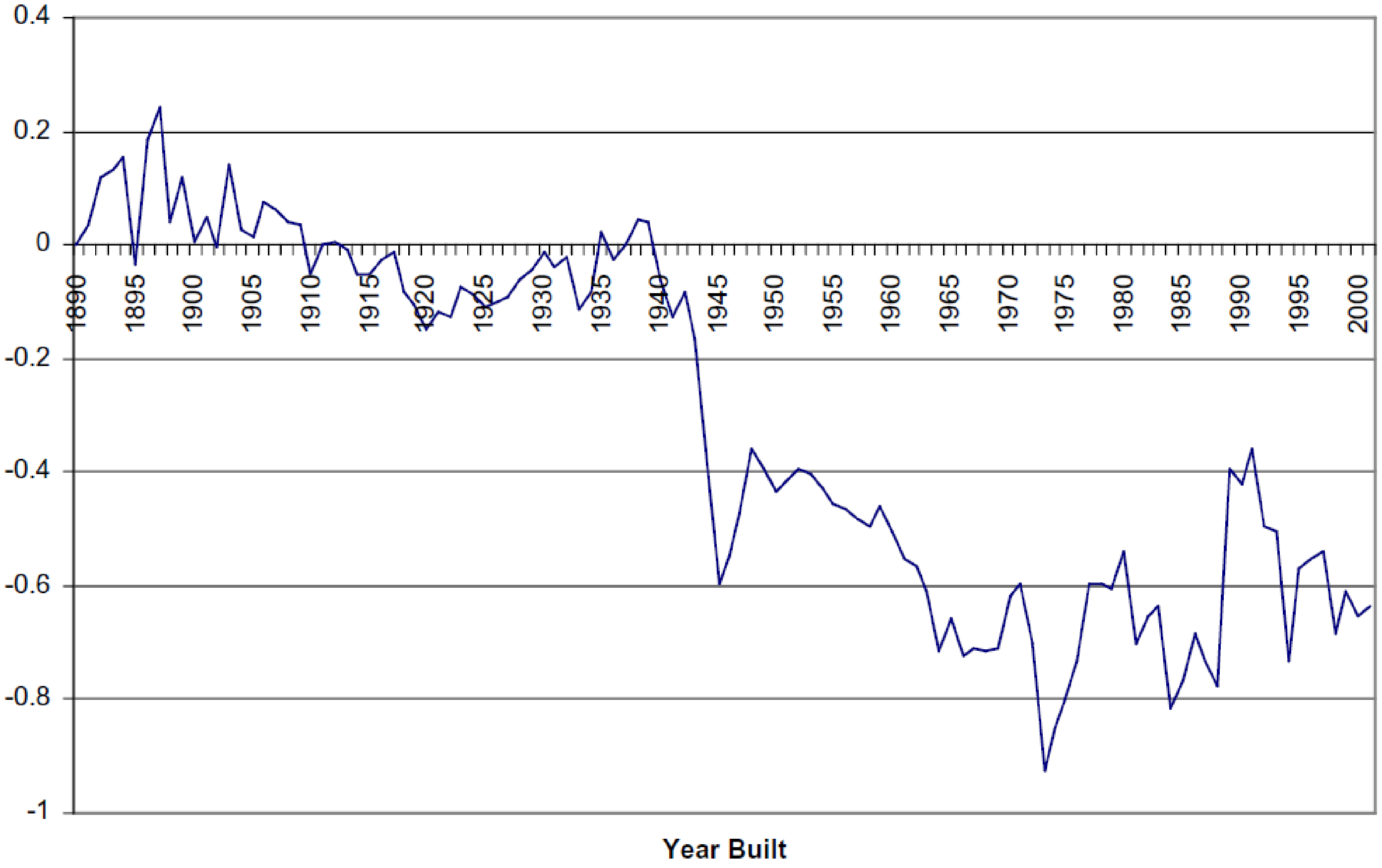
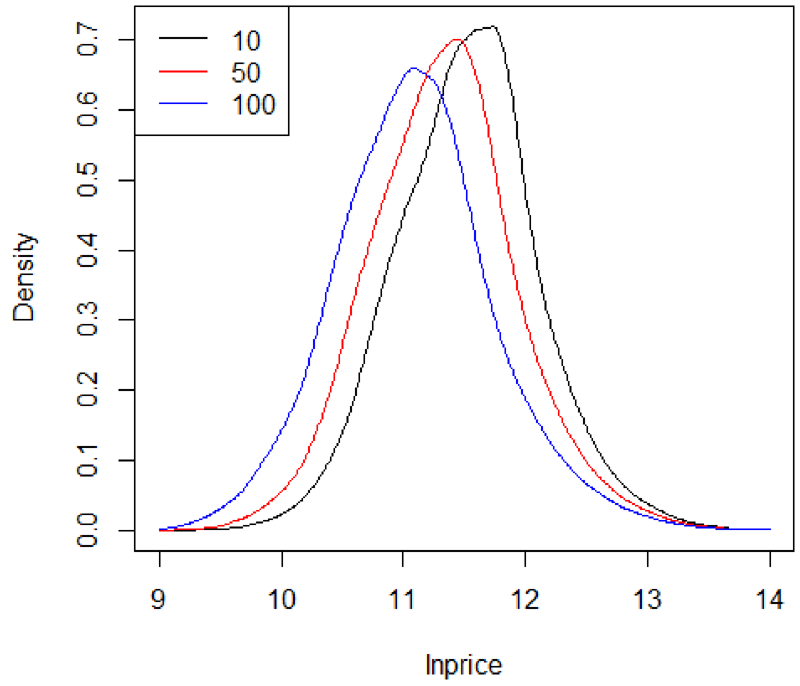
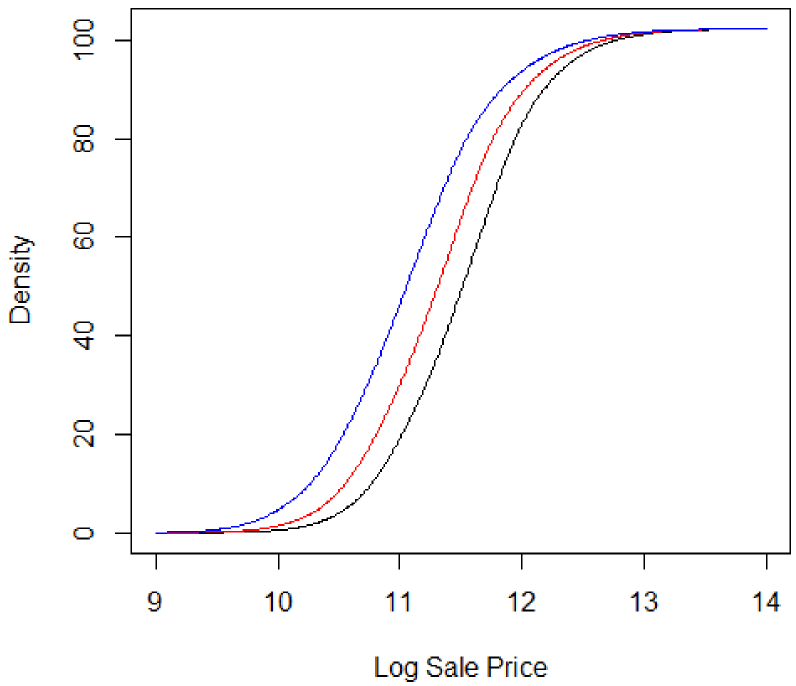


Fig. 10. Cohort effect.

Some observations

- Very few hedonic studies of office rents – a significant contribution to the literature
- Would like to see data on sales prices. It does not seem like the development option should matter for rents. Implies that rents will decline more with age than is the case for values.
- Would be interesting to compare coefficients for variables like floor area and age for rents and values. One year prior to redevelopment, rents should still reflect the structural characteristics, but values will reflect land value only. Literature on residential teardowns.
- Recent literature on tall buildings (Liu, Rosenthal, Strange; Ahlfeldt and McMillen). How do rents vary by floor?
- Quantiles: More variation for older properties.





Effect of Age on Sales Prices