Why Have Housing Prices Gone Up?

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Over the past 30 years, housing prices have risen regularly, and the dispersion in housing prices across American markets has increased even more substantially. Since 1970, U.S. Census data show that the standard deviation of prices across metropolitan areas increased by 247 percent, compared with 72-percent appreciation in average prices. This growing dispersion has occurred mainly in the upper end of the distribution. In many parts of the country, new housing units still are abundant, and housing prices remain relatively low. In a small, but increasing number of metropolitan areas (primarily, but not exclusively, on the coasts), housing prices have soared, and new construction has plummeted. Because rising prices have been accompanied by large reductions in residential development in these places, the natural explanation for these changes in metropolitan-area housing markets is that housing supply is limited. These constraints do not appear to be caused by a declining availability of land, but rather they are the result of a changing regulatory regime that makes large-scale development increasingly difficult in expensive regions of the country (Glaeser and Gyourko, 2003; Glaeser et al., 2005a).

Changes in housing-supply regulations may be the most important transformation that has happened in the American housing market since the development of the automobile, but this change is both under-studied and under-debated. The positive research agenda going forward should be to understand why these changes have occurred and how they relate to other major trends in American society. The normative policy agenda should be to better understand the costs and benefits of limits on new construction. The costs appear to include higher prices and a misallocation of labor, while the benefits include internalization of construction-related externalities. Given the magnitude of this regulatory shift, the economics profession could make a major contribution by analyzing the welfare effects of regulation on the rise in housing prices.

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I. The Economics of Zoning and Permitting

Our model is one of a local zoning authority that decides whether to approve or reject residential development. There are two locations: the zoning authority's town and a reservation locale. There are N total consumers, of which D live in the town. The remainder of the population lives in the reservation locale, and there are no constraints preventing people from moving there. Total utility in this outlying area is a decreasing function of the number of people living there, $\underline{U}(N - D)$.

In the town, the flow of utility equals $U(D) + a -$ (housing costs), where $U(D)$ is decreasing in the amount of development in the city, and a is an individual-specific desire to live in the town. The distribution of a is described by a cumulative density $F(a)$ and density $f(a)$. The cost of construction in the town equals K, which captures both physical costs of construction and the opportunity cost of land taken away from agricultural uses. We normalize the cost of construction in the reservation locale to be equal to zero, so that K reflects the additional cost of building a housing unit in town. Denoting the interest rate as r, the annual cost of housing construction is rK.

As in any spatial equilibrium, there will be a marginal consumer with a taste for the town equal to $\hat{a}$ who is indifferent between living in the town or the reservation locale. Every consumer with a value of a greater than $\hat{a}$ will live in the town, and the remaining consumers will live in the reservation locale. The marginal consumer must satisfy $D = N[1 - F(\hat{a})]$; we use the notation $\hat{a}(D) = F^{-1}(1 - D/N)$.

The initial population of the town is split into homeowners and renters. We assume that a

fraction h of these units are allocated to homeowners, and the remainder are allocated to renters. All individuals are assumed to live in the community for exactly L time periods. After that time, individuals are replaced by identical consumers so that the total size of the population remains unchanged. Individuals maximize $\int_{t=0}^{V} e^{-rt}u(t)\,dt + e^{-rV} \times \text{Asset}_V$ where $u(t)$ is the flow of utility at time t, and Asset_V is the value of any asset as of time V. Renters pay the market-clearing rent, which is equal to the same annual cost as the interest payments on a house. Because new construction increases the supply of housing units, both rents and housing values will decline with new development. If the town starts with $\underline{D}$ housing units, then houses in town will be worth

$$\frac{U(\underline{D}) - \underline{U}(N - \underline{D}) + \hat{a}(\underline{D})}{r}.$$

Given these assumptions, there is a unique amount of development that will maximize the average discounted lifetime utility of all current residents of the town, but there are two reasons why the level of development that maximizes the welfare of current residents will not be socially optimal. First, higher population density has a negative impact on the utility of future residents of the town and of residents of the reservation locale that is not internalized by current town residents. Second, current homeowners have an incentive to increase the value of their homes and do not internalize the impact that higher housing prices have on nonhomeowners who would like to live in the town.

We now consider the decision faced by the town's zoning authority who decides whether a new development project of size Δ will proceed. We simplify the analysis by assuming that utility in the reservation locale is fixed at $\underline{U}$. Furthermore, we will ignore the incentive of renters to lobby for more housing to be built. Essentially, this assumption implies that renters are not organized enough to support the construction of new housing.

The zoning authority will receive net benefits of $\alpha + g_C(C_R - C_D) + g_T(T_R - T_D) + \varepsilon$ from rejecting the project. The parameter α captures the innate distaste of the authority for development. C_D and C_R reflect the cash spent by developers and town residents to influence the authority's decision, and g_C is a concave function reflecting the influence that cash will have on the decision-making of the authority. Similarly, T_D and T_R reflect the time spent by the developer and residents, respectively, on influencing the authority, with a concave function g_T reflecting the influence of time on the authority. We assume that both $g(\cdot)$ functions are symmetric around zero. Finally, ε is a uniformly distributed, mean-zero idiosyncratic term with density 1. We will assume that the parameter values are such that there is always some positive probability that the project will be accepted and likewise some positive probability that it will be rejected.

Under these assumptions, the probability that the authority will authorize the project equals $0.5 + g_C(C_D - C_R) + g_T(T_D - T_R) - \alpha$. The cost of time to the developer equals W_D, and the cost to residents equals W_R. The developer therefore chooses the amount of time and cash spent to influence the zoning board to maximize

$$(1)\quad [0.5 + g_C(C_D - C_R) + g_T(T_D - T_R) - \alpha]\Delta \times \left(\frac{U(\underline{D} + \Delta) - \underline{U} + \hat{a}(\underline{D} + \Delta)}{r} - K\right) - W_D T_D - C_D.$$

From the perspective of each current homeowner, the development project will create a net loss equal to

$$\frac{U(\underline{D} + \Delta) - U(\underline{D}) + e^{-rL}[\hat{a}(\underline{D} + \Delta) - \hat{a}(\underline{D})]}{r}.$$

This expression reflects both the negative externality associated with higher population density and the decline in housing values. Individuals face a cost of influencing the authority equal to $W_R T_R + C_R$. Because a continuous distribution of residents implies that each individual person has a negligible impact on the zoning decision, we assume the existence of a community group that organizes town residents. This organization includes a proportion λ of homeowners and maximizes the aggregate utility of its members. We assume that $W_D > W_R$ so that the opportunity cost of time is higher to the developer than

to the homeowners. Although this assumption seems plausible, it implies that landlords cannot employ renters to lobby the zoning board at the same time cost faced by homeowners.[1]

Taken together, this model implies two central propositions (proofs in Glaeser et al., 2005b):

PROPOSITION 1: *If both the landlord and the homeowners association undertake some lobbying effort, then the landlord will use only cash and the homeowners will use only time.*

Such specialization of effort seems consistent with much anecdotal evidence on local battles between developers and community groups (Kee Warner and Harvey Molotch, 2000).

PROPOSITION 2: *If both actors engage in a positive amount of lobbying then:*

(i) *the probability the project will be approved will decline with* α,
(ii) *the probability that the project will be approved is decreasing with* h *and* λ,
(iii) if $g_C(x) = \gamma_C \times \tilde{g}_C(x)$ *and* $g_T(x) = \gamma_T \times \tilde{g}_T(x)$, *then the probability the project will be approved declines with* γ_T *and rises with* γ_C, *and*
(iv) if $U(\underline{D} + \Delta) = U(\underline{D}) - u\Delta$, *then the probability the project will be approved falls with* u.

Proposition 2 sets forth a number of comparative statics that can potentially explain the change in the zoning environment within the United States. The first pertains to a change in the preference of judges and other political decision-makers regarding development. The second comparative static suggests that the explanation could lie in the rise of homeownership and the success of community organization. The homeownership rate has increased by about 10 percentage points over the past 40 years, and political participation by homeowner groups has been rising (Eric C. Freund, 1974; Robert H. Nelson, 2004). The third part of Proposition 2 points to the changes in the relative effectiveness of using cash versus time to influence political decision-makers. The final comparative static concerns the taste for density. We should expect to see less development if rising incomes have caused people to place a higher value on living in a low-density community. Other factors, such as crime and improvements in transportation, also may have increased the desirability of low-density living.

[1] Historically, it has been rare to see renters fight zoning restrictions. Perhaps this absence is due to an agency problem that prevents developers from organizing renters. Stronger homeowner participation might also be because homeowners simply enjoy the social activity of protesting new developments.

II. Evaluating the Explanations for a More Restrictive Zoning Environment

A. *Judicial Tastes*

Robert Ellickson (1977 p. 338) noted that "suburban governments are becoming ever more adventuresome in their efforts to control housing development." Ellickson does not discuss reasons for this change but points to judicial decisions such as *Nectow* v. *City of Cambridge* that have increased the difficulty for landowners to stop municipalities from restricting new construction on their land. William Fischel (2004 pp. 332–33) points to the ideology of judges: "Courts, whose judges share the same environmental attitudes as middle class homeowners (just as 1920s judges shared the ideology of hearth and home), were more sympathetic to claims that the local decision had failed to account for environmental impacts than they had been to seemingly selfish claims that neighbors' home values were at risk." Other cases have made it clear that the courts will allow growth controls as long as other conditions are met: "once a community has satisfied its fair share obligation [a fraction of the region's low-income housing], the *Mount Laurel* Doctrine will not restrict other measures, including large-lot and open area zoning, that would maintain its beauty and communal character" (*Mount Laurel II,* 456 A.2d at 421; cited in Fischel [2004 p. 331]).

There can be little doubt that court decisions have become friendlier to anti-development sentiment. While courts clearly are important, ultimately it is unsatisfying to attribute the change in the zoning environment to changing attitudes of judicial decision-makers. These

attitudes are not exogenous, but reflect other trends in American society. If changes in the tastes of judges and policymakers reflect societal trends like the environmental movement, then these changes should be viewed as an improved effectiveness of certain groups in shaping policy. In the language of the model, this should be viewed as an increase in T_R or γ_T, not an exogenous change in α. Empirically, we cannot reject the hypothesis that judicial tastes changed, but on theoretical grounds this explanation is so unsatisfying that we will turn elsewhere.

B. *The Impact of Residents' Groups*

While the influence of developers may or may not have declined, many observers have noted a sizable increase in the organization and political influence of local residents. Alan Altshuler and David Luberoff (2002) examine the history of large-scale government projects ("Mega-projects") and suggest that a change began in the 1960s, when citizens became better able to challenge large-scale projects that would impact their neighborhood. One early and striking example was Jane Jacobs's leadership of the Greenwich Village movement that stopped Robert Moses's West Side highway project in New York. Through increasingly sophisticated use of the media, local groups learned how to turn mega-projects into public-relations disasters.

There is abundant evidence of the impact of homeowners' and neighborhood groups, but there is less understanding of where this impact comes from. One hypothesis is that homeowners have become better organized (an increase in λ). Some analysts have suggested that the organizational skills of environmental groups were learned from the organizational successes of the civil-rights movement and the anti-war protests. Either through imitation of these earlier groups or because of rising education and media savvy, local residents have simply become better at using the media and the courts. The typical residential activist of 2004 seems much more skilled than her counterpart from 1955.

C. *Relative Efficacy of Cash and Time in Influencing Local Decision-Makers*

Another possible hypothesis is that developers' ability to use cash to influence local decision-makers has decreased over time. This influence historically has come both from legal payments, in the form of campaign donations or legal cash transfers (i.e., a developer employing a politician for legal work), or illegal cash payments or bribes. Zoning environments may have become more restrictive if developers in the 1960s were more easily able to bribe local politicians than they can today. In other words, the urban growth machine described by Molotch (1976) has weakened as it has become harder for developers to transfer cash to politicians.

There is some evidence suggesting a decline in corruption over time within the United States. Glaeser and Claudia Goldin (2004) use newspaper records to show a decline in the share of articles alleging corruption between the late 19th century and the mid-20th century. However, their coverage does not show a significant change between the 1960s and the 1990s, which is when residential permitting and construction intensity slowed down. Anecdotes about corruption in development abound, and it may be true that such anecdotes were more common in the 1960s than today. While this hypothesis remains plausible, there is precious little evidence either supporting or refuting a changing ability to bribe local decision-makers.[2]

D. *The Value of Amenities*

Another natural explanation for the rise in restrictions on new construction is that rising income levels have increased the willingness to pay for high-amenity neighborhoods and, in particular, for low-density neighborhoods (assuming low density is a normal good, of course). This hypothesis corresponds to an increase in the parameter u, which the model

[2] Even if it were possible to document such a change, it would be desirable to go further and understand why this change occurred. One plausible explanation could be that improvements in the news media have caused more attention to be paid to corrupt deals. A second explanation is that the political influence of local party machines has declined. These machines may have facilitated the flow of funds from developers (or anyone else) and ensured that legal repercussions from local justice would be modest. The decline of local machines might also have played a role in reducing the influence that developers were able to have on local governments.

predicts should lead to a decrease in permitting as the incentive of homeowners to spend time to block new construction rises.

The empirical analysis in Glaeser et al. (2005b) suggests that richer communities are less likely to build new housing units, but the magnitude of this effect is not nearly large enough to explain the decline in permitting we see in the data. Examining the zoning environment of very rich places in 1960 also suggests that rising incomes can only explain a small part of the change in the permitting environment. If the income hypothesis is correct, then permitting in these places should have been as restrictive in 1960 as the entire metropolitan areas of Boston or New York in more recent years. However, places like New Rochelle, NY, San Mateo, CA, and West Orange, NJ, allowed at least 10 times as much development in the 1950s as metropolitan areas with comparable incomes today.

E. *Changes in the Housing Market*

A final hypothesis is that the impact of new construction on housing prices has changed over time. In the 1950s, housing costs were low, lower incomes made people less concerned about environmental amenities, and an absence of construction in previous decades may have meant that the quality of new housing was significantly higher than older units. For these reasons, new construction may not have led to major reductions in housing prices for existing units, and as such, homeowners had much weaker incentives to fight new construction. In 2004, however, homeowners appear to believe that new construction will significantly reduce housing prices. Certainly, empirical evidence from recent decades linking rising housing prices to reductions in construction suggests that they are right. As in the case of the previous theories, we have little evidence on the relevance of this theory and we look to further research to examine this hypothesis and the others more thoroughly.

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