WHY IS MANHATTAN SO EXPENSIVE? REGULATION AND THE RISE IN HOUSING PRICES*

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Abstract

In Manhattan, housing prices have soared since the 1990s. Although rising incomes, lower interest rates, and other factors can explain the demand side of this increase, some sluggishness in the supply of apartment buildings is needed to account for high and rising prices. In a market dominated by high-rises, the marginal cost of supplying more housing is the cost of adding an extra floor to any new building. Home building is a highly competitive industry with almost no natural barriers to entry, and yet prices in Manhattan currently appear to be more than twice their supply costs. We argue that land use restrictions are the natural explanation for this gap. We also present evidence that regulation is constraining the supply of housing in a number of other housing markets across the country. In these areas, increases in demand have led not to more housing units but to higher prices.

I. Introduction

In some of America's great cities, residential real estate prices have soared over the past 20 years. Between 1980 and 2000, real median home prices in Boston and San Francisco rose by 153 and 81 percent, respectively. According to the U.S. census, the median value of an owner-occupied housing unit in Manhattan rose from $245,633 in 1980 to $377,246 in 2000 (both figures in 2002 dollars), which implies a real appreciation rate of 2.2 percent

* We are grateful to the Manhattan Institute for supporting this research. Gyourko also thanks the Research Sponsors Program of the Zell/Lurie Real Estate Center at the Wharton School for funding. This paper has benefited from comments provided by Austan Goolsbee (the editor), Matt Kahn, Peter Linneman, Albert Saiz, Jesse Shapiro, the referees, and seminar participants at the Federal Reserve Bank of New York, the 2003 National Bureau of Economic Research Summer Institute, and the Wharton School of the University of Pennsylvania.

[*Journal of Law and Economics*, vol. XLVIII (October 2005)]
 0022-2186/2005/4802-0015$01.50

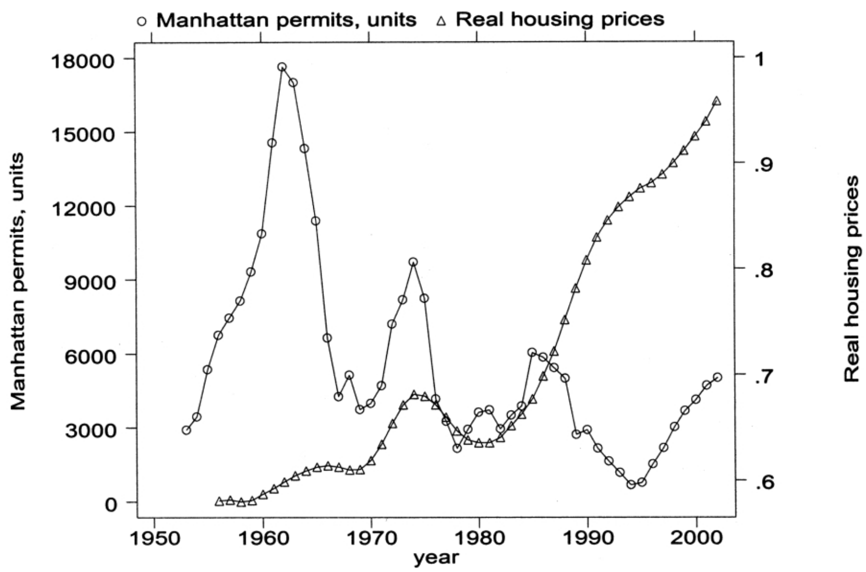

FIGURE 1.—Housing permits in Manhattan and prices (4-year moving averages)

per year that is double the national average as measured by the Freddie Mac Repeat Sales Price Index.

New York City's high wages (real per capita income rose from $26,730 to $46,349 in 2002 dollars between 1979 and 1997) and attractive amenities make the demand for its space understandable, but increases in the demand for housing need not result in large price increases. In many places, increases in the supply of housing offset increases in demand, leaving housing prices relatively unaffected. The population of Las Vegas almost tripled between 1980 and 2000, but the real median housing price did not change. In fact, in more than one-third of the larger American cities that added housing units faster than the national rate since 1980, real median housing prices actually fell. In the sprawling cities of the American heartland, land remains cheap, real construction costs are falling, and expanding supply keeps housing prices down.

Even in New York City, growth in the housing supply used to help keep prices down. As the city grew during the middle of the century, existing blocks of apartments and homes were demolished to make way for denser residential construction. As shown by Figure 1, tens of thousands of new units were built in Manhattan during the 1950s, while prices remained flat.[1]

[1] In Figure 1, building permits are combined single- and multifamily permits for Manhattan from the residential construction branch of the U.S. Census Bureau. The real housing price series is the NY-NJ-LI metropolitan statistical area Consumer Price Index for Shelter, deflated

Clearly, there are different forces affecting the supply of housing in Manhattan today. Although there were 13,000 new units permitted in Manhattan in 1960 alone, only 21,000 new units were permitted throughout the entire decade of the 1990s. In spite of skyrocketing prices, the housing stock has grown by less than 10 percent since 1980.

We argue that the limited supply response primarily is the consequence of an increasingly restrictive regulatory environment. The prevailing methodology for assessing the impact of government regulation on housing price is to compare values in places with some observable form of regulation with prices in places without that form of regulation. Lawrence Katz and Kenneth Rosen[2] provided one of the best known of such estimates. They found that housing prices were about 20–40 percent higher in San Francisco area communities that had enacted growth management control plans in the 1980s.[3] Their results are compelling, but more widespread analysis of this type is difficult to undertake because housing market regulations have become extremely challenging to quantify. The opponents of development have a strikingly diverse array of weapons, ranging from environmental lawsuits to public demonstrations. These tactics extend far beyond the official rules that govern residential construction.

Because the degree of housing market regulation is so difficult to measure, we adopt an alternative approach that is based on neoclassical economic theory. With or without regulation, that theory predicts that competition among builders will ensure that prices equal average costs. In unregulated markets, building heights will rise to the point where the marginal cost of adding an additional floor equals average costs (which will equal the market price). If market restrictions limit the size of a building, free entry of firms still will keep price equal to average cost. However, under the standard assumption of an increasing marginal cost function, both prices and average costs will be above marginal costs. Hence, the key difference between a regulated and an unregulated market is the gap between prices and marginal costs, and we use this difference to measure the extent of housing supply restrictions.

While this approach has the benefit of being straightforward, it also has two drawbacks. Because it provides only indirect evidence, we cannot measure the price impact of any specific policy. In addition, our estimates will overestimate the impact of regulation if the construction industry is not

by the gross domestic product deflator from the National Income and Product Accounts and rescaled to equal one in 2002.

[2] Lawrence Katz & Kenneth Rosen, The Interjurisdictional Effects of Growth Controls on Housing Prices, 30 J. Law & Econ. 149 (1987).

[3] Zoning is another way to restrict residential development. See William Fischel, The Economics of Zoning Laws (1985), for a review, and Bruce Hamilton, Zoning and the Exercise of Monopoly Power, 5 J. Urb. Econ. 116 (1978), for an early empirical study linking zoning restrictions to high housing prices.

competitive or if the data we use do not fully reflect the marginal cost of construction. Consequently, we also present evidence indicating that the single- and multifamily construction sectors are highly competitive and that there are no technological constraints to building tall structures in Manhattan. Auxiliary information on the impact of zoning and other supply-side restrictions also is consistent with our hypothesis. Finally, we interpret only very large gaps between prices and production costs as evidence for government regulation.

Thus, a key task in our approach is to estimate the marginal cost of producing a residence and to compare this cost with the home's market value. In the case of single-family homes, production expenses include the cost of building the structure and the cost of buying and preparing the land. In the case of multifamily buildings, the marginal cost of an additional unit is only the cost of expanding the project upward. Land and other site preparation costs generally do not increase with small changes in the size of the building. Land shortages well may limit certain types of development in Manhattan, but builders always can add an extra floor if that would be profitable. Being able to abstract from land and site preparation costs, which greatly reduces the data requirements to calculate the marginal production cost of a unit, is the primary reason we focus our analysis on Manhattan.

We document a large gap between the market price of condominiums and the marginal cost of producing another floor of such units in Manhattan. In recent years, average condominium prices have exceeded \$600 per square foot. Data on physical construction costs suggest that the upper bound even for the typical high-quality, luxury-type condominium unit in this market is no more than \$300 per square foot. If it costs \$300 per square foot to build an extra apartment that sells for \$600 per square foot, this would seem to offer an irresistible arbitrage opportunity for developers. In addition, other evidence for this market also consistently supports our contention that the high ratio of prices to construction costs is the result of regulation.[4]

To supplement our analysis of Manhattan, we also estimate the gap between the price and marginal cost of housing in 21 major metropolitan areas tracked in the 1998–99 special metropolitan files of the American Housing Survey

[4] As suggested above, a high ratio of sales prices to construction costs does not imply that developers are making excess profits. On the margin, the benefits of the very high prices should be competed away via legal bills, lobbying fees, the carry costs of invested capital during long delays, or any of the myriad other expenses associated with navigating the city's regulatory maze. Regulatory barriers essentially function as a tax that adds to the fixed costs of building. While this should not affect the margin concerning how high to build (conditional on building in the first place), it could change the decision of whether to build if the fixed costs are not covered by the return on the building. This is why our evidence is most convincing in accounting for why there are not additional taller buildings in Manhattan. Because we cannot be sure that other, nonregulatory fixed costs also did not rise, we do not claim that all of the sharp drop in construction levels is explained by regulation.

(AHS).[5] Given the rise of the Smart Growth movement and environmental sensitivities more generally, providing a broader geographic perspective is a useful exercise. In 12 out of the 21 markets that we examine, the typical home costs no more than 110 percent of the combined costs of the physical structure and the land. However, in the Boston, New York City, Norfolk–Newport News, Salt Lake City, and Washington, D.C., metropolitan areas, the gap between construction costs and home prices is between 10 and 33 percent. In the Los Angeles, Oakland, San Francisco, and San Jose areas, the gap is from one-third to one-half of typical house value.

Finally, we ask whether the existing restrictions on new construction could be socially optimal. Since the value of owner-occupied housing used as primary residences amounted to $9.4 trillion in the 1998 *Survey of Consumer Finances*,[6] the social welfare losses due to inefficient regulation may be considerable. On the other hand, if new construction generates negative externalities, then the optimal regulatory tax would be positive. While welfare analyses of building restrictions are notoriously difficult to implement, the exercise is more straightforward in Manhattan because changes in density are unlikely to alter the essential nature of the community. Our analysis does not find any negative externality (or combination of externalities) large enough to warrant a development tax that leaves market prices double the level of construction costs. In short, Manhattan is underpopulated. Likewise, high regulatory taxes mean that many of the attractive areas in California have too few people relative to the social optimum. The social costs of binding development restrictions lie in the misallocation of consumers by having them live in less productive, less attractive places.

The plan of the paper is as follows. The next section discusses the gap between housing prices and construction costs in Manhattan. Section III then presents other evidence on supply restrictions in the Manhattan market. This is followed in Section IV by an analysis covering 21 metropolitan areas from the AHS. Section V describes our welfare analysis, and the paper concludes with a brief summary.

II. The Gap between Prices and Production Costs in New York

Our primary empirical strategy is to measure the gap between real estate prices and the costs of producing the marginal apartment and to use that differential to measure distortions in the housing market.[7] The construction

[5] U.S. Census Bureau, American Housing Survey (http://www.census.gov/hhes/www/housing/ahs/metropolitandata.html). This analysis closely follows Edward Glaeser & Joseph Gyourko, The Impact of Zoning on Housing Affordability, 9 Econ. Pol'y Rev. 21 (2003).

[6] Federal Reserve Board, Survey of Consumer Finances (Occasional Staff Studies 1998).

[7] Of course, as Edward Glaeser & Joseph Gyourko, Urban Decline and Durable Housing, 113 J. Pol. Econ. 345 (2005), emphasizes, there is no reason why housing prices cannot fall below construction costs in declining areas. In those places, there will be no construction, and any regulations that place limits on residential building would not bind.

of apartment buildings involves significant fixed costs that are invariant with building height and variable costs that scale with the size of the structure. Among the most significant fixed costs are those associated with land and site preparation. The existence of these fixed costs means that marginal cost will be lower than average cost in shorter buildings.

In the absence of government regulation, standard economic theory predicts that, in equilibrium, buildings will be sufficiently large so that price will equal marginal cost (which will also equal average cost). If government regulation limits building heights, prices will be above marginal costs, but as long as there is competition in the construction industry, prices will still equal average costs for the marginal builder. Land prices and regulation-related expenses will ensure that there are no arbitrage opportunities with or without government regulation. Of course, builders will skills at manipulating the regulatory environment can earn positive profits. Still, the key difference between regulated and nonregulated construction markets is in the gap between price and marginal cost, not between price and average cost.

We use the term "regulatory tax" to reflect the increase in costs imposed by regulatory restrictions. These restrictions could include a wide variety of quantity controls, zoning rules, taxes, or fees. The tax is defined as

$$\begin{aligned} \text{regulatory tax} &= \text{market price of a housing unit} \\ &- \text{marginal cost of that unit (absent government barriers).} \end{aligned} \tag{1}$$

This definition suggests two potential problems for accurate measurement. First, the marginal cost of a unit absent government barriers may be hard to measure. Second, even if we do measure this marginal cost correctly, there may be other reasons for a gap between price and marginal cost (for example, monopoly power of suppliers).

The issues surrounding cost measurement are very different for single-family dwellings versus apartment buildings. In both cases, one component of cost is the physical cost of construction, which can be assessed fairly accurately from industry sources. For apartment buildings, the marginal cost of a new housing unit is reflected in the cost of building up, so we can estimate the marginal cost of additional housing from readily available industry data described below. In the case of single-family dwellings, the marginal cost also depends on the price of land. Although the price of land could theoretically be observed from the sales of vacant lots, in practice these sales are too rare to be useful for us. An alternative is to use housing price hedonics to estimate how much current home owners value their own land. While we will turn to this approach for single-family homes in Section IV, the usual concerns about hedonic estimates lead us to focus on multifamily dwellings, for which the lack of land prices does not pose a problem.

The second potential drawback of our regulatory tax definition is that a gap between prices and costs can arise for reasons other than government regulation. In particular, to the extent that construction firms have some degree of monopoly power, we will mistake monopolistic price setting for government-created barriers to entry. However, all the available evidence suggests that the housing production industry is highly competitive. The *1997 Economic Census* reports that there were 138,850 establishments in the business of constructing single-family homes.[8] While there are a huge number of small, "mom-and-pop"-type operations, there also are more than 1,700 establishments with revenues in excess of $10 million. The multifamily housing industry is only slightly less concentrated. In 1997, there were 7,544 establishments in this industry and more than 1,000 in New York State alone. According to *County Business Patterns*,[9] over 100 such establishments were headquartered in Manhattan, with another 329 elsewhere in New York City. Nearly two-thirds of the multifamily builders in Manhattan were relatively small enterprises with fewer than 10 employees; nearly three-quarters of all such enterprises in New York City have fewer than 10 employees.[10] Because this is not an industry controlled by a few large firms, it is highly unlikely that there is any monopoly power with which to set prices. Thus, in the absence of restrictions on development, it is hard to doubt that residential construction would closely resemble the economic ideal of a perfectly free market.

Even with highly competitive apartment suppliers, the existence of technological barriers to building tall structures also could account for a gap between price and marginal cost. However, there is no evidence that would support this. In fact, buildings today are on average shorter than they were in the past. Figure 2 plots the time pattern of the fraction of units in new multifamily buildings taller than 20 stories from the *New York City Housing and Vacancy Survey* (*NYCHVS)*.[11] After reaching a peak of 80 percent in the 1970s, the share of units in structures over 20 stories fell to 44 percent in the 1990s. Given the large number of taller high-rises built early in the century, it is highly doubtful that technological problems can explain the relative dearth of new tall residential buildings today.[12]

[8] U.S. Census Bureau, 1997 Economic Census (1999).

[9] U.S. Census Bureau, County Business Patterns (1998).

[10] Of course, a firm does not have to be headquartered in New York City or Manhattan to build there. Nadine Brozan, Rental Developer's Manhattan Debut: Lower East Side, N.Y. Times, January 4, 2004, at 11.1, describes the first Manhattan residential high-rise built by a large, publicly traded real estate investment trust, AvalonBay Communities, headquartered in Connecticut. In addition, conversations with officials from the Association of General Contractors in Manhattan confirmed that builders working in the borough often were domiciled elsewhere.

[11] U.S. Census Bureau, Housing and Household Economic Status Division, New York City Housing and Vacancy Survey (1999).

[12] Another potential source of distortions in the New York City housing market is rent control. In some cases, rent control may limit the ability to tear down existing renter-occupied buildings. Nonetheless, this should still reflect a fixed cost that does not change the marginal cost of constructing an extra apartment in a new development.

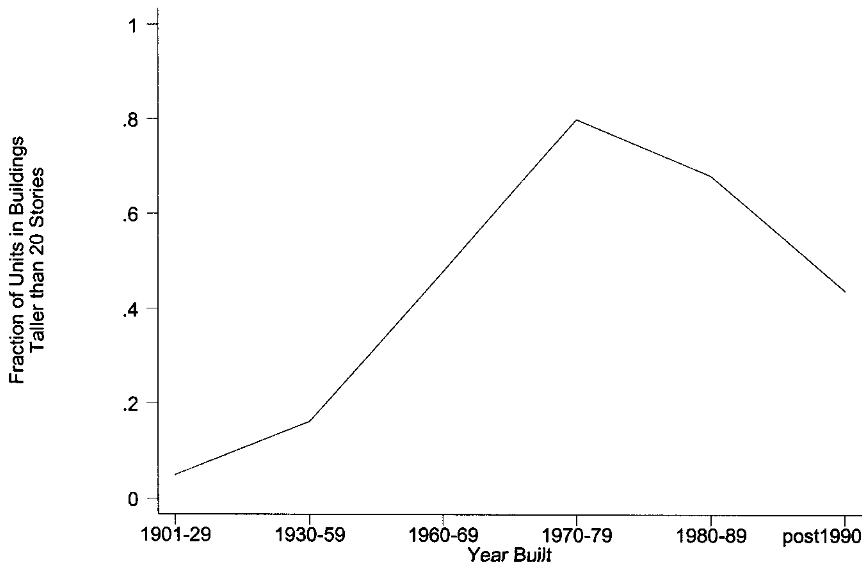

FIGURE 2.—Construction of tall residential buildings in Manhattan

A. Just How Expensive Is Manhattan Real Estate?

Our primary evidence on prices is condominium sales records in Manhattan from the First American Real Estate Corporation. These data originate from deeds records and represent transactions prices over the period 1984–2002. All sales prices reported in this section are converted into 2002 dollars using the Consumer Price Index (CPI). As our construction cost data are generally on a per-square-foot basis, we also convert our price data into per-square-foot measures.

We have a large sample of 23,060 condominiums spread throughout Manhattan. The distribution of sales prices is shown in the top row of Table 1. While there is considerable variation in the data, the basic numbers suggest that Manhattan condo units have been selling for around $460 per square foot over the past 2 decades, with recent values reaching above $600 per square foot. And the distribution is not strongly skewed, so the annual averages are not driven by a few outliers.

Variation in prices reflects both differences in the physical infrastructure of the apartments and the difference in neighborhood amenities. One concern with our analysis is that we are unable to measure all aspects of physical apartment quality. However, unless neighborhood attributes specifically affect construction costs, the variation in prices that is related to neighborhood amenities will not bias our results. Indeed, in a truly free market, these

TABLE 1

Distribution of Price per Square Foot for Condominiums (in 2002 Dollars)

	N	Mean ($)	25th Percentile ($)	Median ($)	75th Percentile ($)
Manhattan[a]	23,060	468	339	455	572
Manhattan[b]	156	500	271	461	664
Other boroughs[b]	165	149	89	120	177
By unit size:[a]					
<600 square feet	5,460	434	311	432	534
600–<800 square feet	6,722	445	339	439	542
800–<1200 square feet	6,729	472	346	460	580
1200 square feet	4,149	542	378	519	680
By building height:[a]					
<10 stories	3,686	377	252	365	474
10–19 stories	5,760	400	269	385	500
20–29 stories	3,199	497	396	482	577
30–39 stories	5,227	498	384	489	589
≥40 stories	4,788	573	438	543	678
By building size:[a]					
<20 units	1,063	406	256	380	526
20–99 units	5,548	415	285	398	513
100–199 units	5,729	458	338	447	562
200 units	10,720	506	383	488	603
By year:[a]					
1984	700	373	221	359	488
1985	982	451	305	450	550
1986	1,105	467	371	482	584
1987	1,616	507	420	505	591
1988	2,032	518	419	498	586
1989	1,535	515	391	484	586
1990	911	443	340	434	516
1991	722	421	310	383	499
1992	755	363	273	343	426
1993	41	385	284	379	463
1994	87	369	279	341	431
1995	232	354	267	342	408
1996	1,044	353	272	331	409
1997	952	384	284	357	433
1998	2,114	410	315	392	476
1999	2,484	460	366	446	533
2000	1,873	557	451	553	652
2001	1,642	601	503	592	696
2002	972	621	529	606	706

[a] Prices are from condominium sales records from First American Real Estate Corporation (data on file with the authors). Nominal sales prices are converted to real 2002 dollars using the Consumer Price Index.

[b] Prices are from U.S. Census Bureau, Housing and Household Economic Status Division, New York City Housing and Vacancy Survey (1999). Price is the reported market value for owner-occupied condos. Unit square feet is imputed from the number of rooms using the average square feet per room from condos in the New York metropolitan statistical area of the U.S. Census Bureau, American Housing Survey (1995–2001).

amenities would not create a gap between construction costs and prices. More attractive neighborhoods would simply end up having taller buildings.

For purposes of comparison, the second and third rows of Table 1 report data from the *NYCHVS*. This widely used data set has two failings relative to our condominium sales data. First, it is much smaller, even though we combine all independent observations in Manhattan from the years 1991–99. We have only 156 observations of condominiums in Manhattan and 165 for the outer boroughs. Second, the price data rely on self-reported market values, not actual sales data. Despite these issues, the data for Manhattan condominiums in the *NYCHVS* look quite similar to our larger sample of sales data. The mean price per square foot is $500, which is only slightly higher than what actual transactions show. The finding that prices are higher in the *NYCHVS* is not surprising given the literature on the upward bias of self-reported values.[13]

In contrast, the data on condominiums in the outer boroughs suggest that the housing market outside of Manhattan is quite different. The mean price in the outer boroughs is $149 per square foot, with the median value even lower at $120. These results do not call into question the Manhattan data, but they do remind us that New York's hot housing market is a very localized phenomenon. The outer boroughs are still full of much less expensive housing.

Table 1 also presents prices by apartment size, building height, number of units in the building, and year of sale. It is interesting to note that there is little relationship between apartment size and value per square foot except among the largest apartments, which are more expensive. All else equal, larger apartments should be somewhat cheaper to build on a square-foot basis because they have a fixed amount of some forms of infrastructure. Of course, all else is not equal, and we believe that these differences reflect omitted quality factors. The largest apartments almost certainly are nicer along other dimensions, so it is likely that higher prices also reflect higher quality.

Not surprisingly, there is a tendency for prices to rise in value with building height. The average price per square foot for condos in buildings with between 10 and 20 stories is $400, while the average price per square foot in buildings with more than 40 stories is $573. These price differences presumably reflect two factors. First, apartments in taller buildings have better views. Second, taller buildings will perhaps be of higher quality and may be made of more expensive building materials.

We also see that prices are higher in larger buildings. The price per square foot is around $400 in the smaller buildings (those with fewer than 20 units) but rises to over $500 for units in large buildings (those with more than 200

[13] See, for example, John C. Goodman & John B. Ittner, The Accuracy of Home Owners' Estimates of House Value, 2 J. Housing Econ. 339 (1992).

TABLE 2

DISTRIBUTION OF MANHATTAN CONDOMINIUM PRICE PER SQUARE FOOT, BY GEOGRAPHIC AREA (in 2002 Dollars)

	N	Mean ($)	25th Percentile ($)	Median ($)	75th Percentile ($)	Average Height[a]
Manhattan	23,060	468	339	455	572	27
By neighborhood:						
Greenwich Village/ Financial District	2,703	416	309	405	501	16
Lower East Side/ Chinatown	711	373	240	378	474	7
Chelsea/Clinton/ Midtown	4,086	515	355	490	648	34
Stuyvesant Town/ Turtle Bay	6,534	436	330	443	539	31
Upper West Side	3,913	494	361	476	592	24
Upper East Side	4,759	509	372	490	611	29
Morningside Heights/Hamilton Heights	18	162	130	141	190	5
Harlem	131	277	191	245	371	6
Washington Heights/ Inwood	128	169	91	162	210	6

SOURCE.—Condominium sales records, First American Real Estate Corporation, 1984–2002 (data on file with the authors). All nominal values are converted to real 2002 dollars using the Consumer Price Index.
[a] Average number of stories.

units). Again, it is unclear if this price differential reflects better views or other characteristics that might be related to building size.

Examining the data over time shows large increases in the price per square foot during the last few years. Prices were high in the 1980s and fell a bit during the recession in the 1990s.[14] They then recovered, rising steadily in the second half of the 1990s and ending at a level more than $100 per square foot above the previous high in the 1980s.

In Table 2, we look at the distribution of condominium prices by geographic location within Manhattan. Eighty-three percent of our sales occur in four neighborhoods that are closest to the midtown business district: the Upper East Side, the Upper West Side, Turtle Bay/Stuyvesant, and Midtown. Approximately 10 percent of our sales also occur in the Greenwich Village/

[14] That the number of condominium sales drops dramatically in 1993–94 is not the result of data error or a change in collection methodology by the First American Real Estate Corporation. Conversations with the First American Real Estate Corporation confirm the sample sizes and the fact that their data collection efforts and systems did not change during those 2 years. We believe the decline in sample size is due to the recession in the early 1990s. A further comparison with data published by Miller Samuel (a real estate appraiser specializing in Manhattan) also shows marked declines in condominium sales during this period (Miller Samuel, Manhattan Market Report (2002)).

Financial District neighborhood. Less than 5 percent of the sales occur in the Lower East Side, Harlem, Morningside Heights, and Washington Heights.

The most expensive area in the data set is the Midtown area, where prices per square foot averaged $515, and the median unit over the past 2 decades sold for $490 per square foot. The Upper East Side was the next most expensive area, with a mean price of $509 per square foot. The Upper West Side was only slightly less costly, with a mean value per square foot of $494. Stuyvesant/Turtle Bay had the biggest representation in our sample, with over 6,000 units. The mean price in that neighborhood was $436 per square foot. Units in the financial district and Greenwich Village were somewhat cheaper, with an average cost per square foot of $416. The Lower East Side apartments were cheaper still, valued at an average of $373 dollars per square foot. Although this price is still high, it is almost one-third cheaper than the top-price neighborhoods.

The remaining three neighborhoods, Morningside Heights, Washington Heights, and Harlem, appear to be quite different. In these neighborhoods, prices were generally below $250 per square foot, and often well below $200 per square foot. Indeed, values in these neighborhoods look more like the outer boroughs than the rest of Manhattan.

This neighborhood-level evidence suggests that there is variation in prices across Manhattan, with the uptown areas being considerably cheaper. Nonetheless, there is a fair amount of uniformity across large parts of the borough. Prices over the past 2 decades have regularly been well over $400 per square foot, and in many neighborhoods, almost one-half of the apartments cost more than $500 per square foot.[15]

B. The Costs of Production

Our primary sources for construction costs are the R. S. Means Company and Marshall & Swift.[16] Both firms provide building cost and project bud-

[15] Within the owner-occupied sector, we focus on condominiums rather than cooperative units because of concerns that sales prices of co-ops may not reflect the true cost of ownership owing to their more complex ownership structures and allegedly high maintenance fees. Information on the distribution of self-reported market value per square foot for Manhattan co-ops is available in the New York City Housing and Vacancy Survey, *supra* note 11. The mean value is $382 per square foot, with the median sale price being $310 per square foot. Holding unit and building quality constant, we would expect the absence of a straightforward, fee-simple ownership status to result in lower values for cooperatives because property rights are valuable. Furthermore, the average reported monthly fee associated with these co-ops is $600, which is about $200 more than the average reported for condominiums in our sample and at least partially reflects the fact that co-op buildings have independent debt. Thus, even with our concerns that reported values for cooperatives do not fully reflect the cost of owning the unit, these results clearly indicate that high prices are pervasive throughout the owner-occupied sector of the Manhattan real estate sales market and are not confined solely to condominiums.

[16] The R. S. Means data can be found in R. S. Means, Square Foot Costs (23rd ed. 2002). The Marshall & Swift estimates are from Marshall & Swift , Commercial Cost Explorer (January 2003).

TABLE 3

CONSTRUCTION COSTS (in 2002 Dollars)

	Average Cost per Square Foot ($) (1)	Marginal Cost per Square Foot (2)
R. S. Means: apartments in New York City:[a]		
8–24 story	249	273
4–7 story	225	
1–3 story	221	
Marshall & Swift: 25-story apartments in Manhattan:[b]		
High-quality luxury	353	373
Average-quality luxury	257	272
Good-quality	204	216
Average-quality	163	172
NYU Center for Real Estate and Urban Policy:[c]		
15-story luxury high-rise	301	362
6-story midrise	209	
AHS condos in apartment buildings[d]		
Chicago	144	N.A.
<10 stories	148	N.A.
United States excluding N.Y. MSA	129	N.A.
<10 stories	176	N.A.

NOTE.—Price is the reported market value of owner-occupied units from R. S. Means, Square Foot Costs (2002). All values are converted to 2002 dollars using the Consumer Price Index. NYU = New York University. MSA = metropolitan statistical area.

[a] Marginal cost is calculated assuming a quadratic cost function passing through the points (2,221), (5,225), and (15, 249). The reported value is the marginal cost of adding a 24th story.

[b] Costs per square foot are from the Marshall & Swift, Commercial Cost Estimator (Web site data accessed in 2002). Average costs per square foot are the average of reported values for building classes A, B, C, and D in November 2002. Marginal costs are reported for the 25th floor and are calculated from the statement that each floor above 3 stories adds an additional .5 percent to the average cost.

[c] Average cost estimates are from Zaxon, Inc., and were converted to real 2002 dollars using the Consumer Price Index. Marginal cost is calculated at the 15th story from the difference between costs of a 6-story and 15-story building.

[d] U.S. Census Bureau, American Housing Survey (http://www.census.gov/hhes/www/housing/ahs/metropolitandata.html).

geting services to developers. Their data are based on extensive surveys of builders in different markets throughout the United States and Canada. Their figures are supplemented with estimates for a specific type of building from the New York University Furman Center for Real Estate and Urban Policy.[17] The ultimate source of their data is Zaxon, Inc., a third construction cost service. We also use data on condominium costs outside of New York City from the AHS.[18] In each instance, the construction cost data pertain to condominium-type product in multiple-unit buildings, not single-family homes (which are analyzed below in Section IV).

Table 3 reports construction cost estimates from Means for residential

[17] Jerry Salama, Michael Schill, & Martha Stark, Reducing the Cost of New Housing Construction in New York City (Working paper, New York Univ. Sch., Ctr. Real Estate & Urb. Pol'y 1999).

[18] U.S. Census Bureau, *supra* note 1.

buildings by height that pertain specifically to Manhattan. Consistent average-cost data are available for structures up to 24 stories tall, and these costs range from \$220 to \$250 per square foot.[19] Taller buildings are modestly more expensive to build, although the Means data suggest that marginal costs are flat within a wide range of heights above seven stories. To estimate the marginal cost of increasing the height of a typical building in Manhattan, we assume that the Means data pertain to a quadratic average cost function that goes through the midpoints of their height categories (for example, 2, \$221; 5, \$225; 15, \$249). This calculation suggests that the marginal cost of adding the 24th story of a residential building is about \$273 per square foot.

If we interpret the Means data as applying to buildings shorter than 30 stories, these estimates apply to 88 percent of the buildings in our condominium sample. The *NYCHVS* top codes building height at 20 stories, with 80 percent of the observations in multifamily structures within Manhattan having fewer stories. Thus, the vast majority of Manhattan residences are in a building type that is comparable with the Means cost estimates.

As an initial check on the reliability of these data, we turn to a separate set of estimates provided by Marshall & Swift (see Table 3). These costs also are specific to Manhattan, but this firm provides more detail regarding different qualities of residential buildings. With respect to average costs, the physical production costs of an average- or good-quality 25-story apartment building based on information from Marshall & Swift's *Commercial Cost Estimator* are well below the numbers reported by Means. However, the figure of \$257 per square foot for an average-quality luxury building is within \$10 per square foot of the Means figure. A very high end luxury building does cost more (\$353 per square foot), but that certainly is not representative of most condominium buildings in Manhattan. Marshall & Swift also maintains that the cost schedule does not rise steeply with building height. Specifically, it claims that average costs typically rise by .5 percent for each added floor between 3 and 30 and then by .4 percent for each floor above 30. The implied marginal costs for the 25th floor of the four types of apartments are only about 6 percent higher than average costs. On the margin, it

[19] Both Means and Marshall & Swift report costs per gross square foot of space. To make them comparable to condominium sales prices, the figures in Table 3 are adjusted for the fact that high-rises contain common areas (for example, lobbies, elevators, interior fire escapes, systems rooms) that are not part of what is termed "net" or "leaseable" space. Because the purchase price of a condo reflects the value of this common space, the cost of providing this space must be incorporated into figures on the cost of production. Stated differently, since market prices are measured per square foot of net leased space, construction costs must be calculated on a comparable basis. Both companies report a value of .64 for the ratio of net-to-gross floor space. Consequently, we scale up gross costs by 1.56 (~1/.64). Discussions with industry participants indicate that this multiple is appropriate only for high-rises having fairly large lobbies and requiring redundant interior fire escapes and other systems. Smaller buildings will have higher ratios of net-to-gross space. Thus, our use of this ratio (and its implied multiple-to-gross costs per square foot) is conservative in nature.

costs from about \$175–\$220 per square foot to add units on the 25th floor of an average- or good-quality apartment building. The analogous number for the typical luxury building is around \$275 per square foot, which is very similar to the number from Means. It is only for the very highest quality structures that building up costs well over \$300 per square foot.

Yet another source of construction cost information comes from a report prepared by Jerry Salama, Michael Schill, and Martha Stark, who report evidence from Zaxon.[20] These estimates indicate that the average construction cost of a 15-story luxury apartment building is about \$301 dollars per square foot, while it is \$209 per square foot for a six-story building. These data are very much in line with the Means and the Marshall & Swift numbers for high-end luxury buildings, although the marginal cost for an extra floor appears to be somewhat higher in these data. However, owing to quality differences between the two building types, this estimate is likely to be an overestimate of the actual marginal cost for a given structure quality.

Our final piece of evidence on construction costs relies on condominium sales prices from the AHS for areas outside of New York City. As long as the property market has not been trending downward (which was the case for most of the 1990s), sales prices should represent an upper bound on construction costs because developers also need to turn a profit.[21] The AHS data for Chicago indicate that the average price per square foot for condominiums is \$144 per square foot. In buildings with more than 10 stories, the average price per square foot is \$148. In the rest of the United States, the average price per square foot for condominiums equals \$129. This estimate rises to \$176 per square foot if we look only at buildings with more than 10 stories. We do not have formula for the relationship between marginal and average costs in these markets, but the average price data alone suggest that implied marginal costs in these cities is below what we estimate for Manhattan.

Part of the price differential across locations may be attributable to differences in construction costs, but the Means data suggest that the difference in construction costs across metropolitan areas is not extremely large. Means estimates that construction costs are 23 percent higher in Manhattan than in Chicago. As such, 1.23 times sales prices in Chicago represents yet another estimate of average construction costs in New York. Of course, to the extent that there might be a regulatory tax in other areas as well, this method will overstate construction costs.[22]

[20] Salama, Schill, & Stark, *supra* note 17.

[21] The AHS (U.S. Census Bureau, *supra* note 1) contains too few observations on units in newly constructed buildings to create statistically meaningful samples.

[22] As another source, we also turned to data from the New York City permit office. This office reports an estimate of the total value of structures put in place by builders along with the total number of units. Dividing the value per unit by the average square footage per unit from our condominium data yielded an average cost of \$89 per square foot. While this price

In sum, construction costs for high-rise residential buildings are quite high in Manhattan.[23] According to both Means and Marshall & Swift, the primary reason is high labor costs. Each firm computes location adjustment factors based on materials, equipment rental, and wage costs. Means reports that average installation costs (which include labor and equipment rental costs) are 1.633 times the national average. In contrast, materials costs are only 1.077 times the national average. Manhattan is 4–5 percent more expensive than the other boroughs of New York, but the relatively high costs extend throughout the metropolitan area.[24]

Finally, most of the construction cost data examined in this section include some so-called soft costs including architect fees or engineering consulting costs that may be somewhat fixed in nature. However, significant fixed costs involving land and site preparation are not included. Since our goal is to assess marginal costs, not average costs, any inclusion of fixed costs biases our estimates upward. Excluding other fixed costs does not bias our estimates downward. We now turn to the size of the gap between price and marginal cost.

C. The Regulatory Tax in Manhattan

Taken together, the construction cost data strongly suggest that something near $275 per square foot is a reliable upper bound on the cost of building up for the vast majority of Manhattan apartments. While a small number of apartments will actually cost more to build, in most cases this value will overstate the true cost. Even so, to be conservative in our computation of the regulatory tax, we will use a figure of $300 per square foot.

Figure 3 plots mean sales prices, construction costs, and the ratio of average price to cost annually from 1984–2002. Real construction costs over time are computed using the historical cost index for New York City published

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is not totally implausible, especially if many of the units were somehow controlled or stabilized, it seems quite low. One explanation for this low value is that builders must pay taxes based on the value of construction they report. Therefore, they have an incentive to underestimate true construction costs

[23] Construction costs for the highest-quality single-family residences provide a useful point of reference for just how high physical production costs are in Manhattan. In its single-family construction files, Means estimates that a 2,200-square-foot custom-quality home with an unfinished basement would have cost $132 per square foot to build in the New York metropolitan area in 2000. The analogous figure for a luxury-quality home, which is the highest quality category in the Means data, is $159 per square foot. (No land costs are included in these figures.)

[24] Salama, Schill, & Stark, *supra* note 17, suggests that corruption is partially responsible for these high costs. They argue that some forms of illegal practices, especially ones involving labor unions, lead to high wages and other labor costs. Those effects are captured in the location factors computed by firms such as Means, Marshall & Swift, and Zaxon. Other forms of corruption, such as outright bribery or bid rigging, will not be captured in the data for obvious reasons, and we do not attempt to adjust the data for such behavior. Corruption is not new to Manhattan. While it well may help explain the relatively high cost level, it seems unlikely that it could account for the sharp price increases we see in the late 1990s and early 2000s.

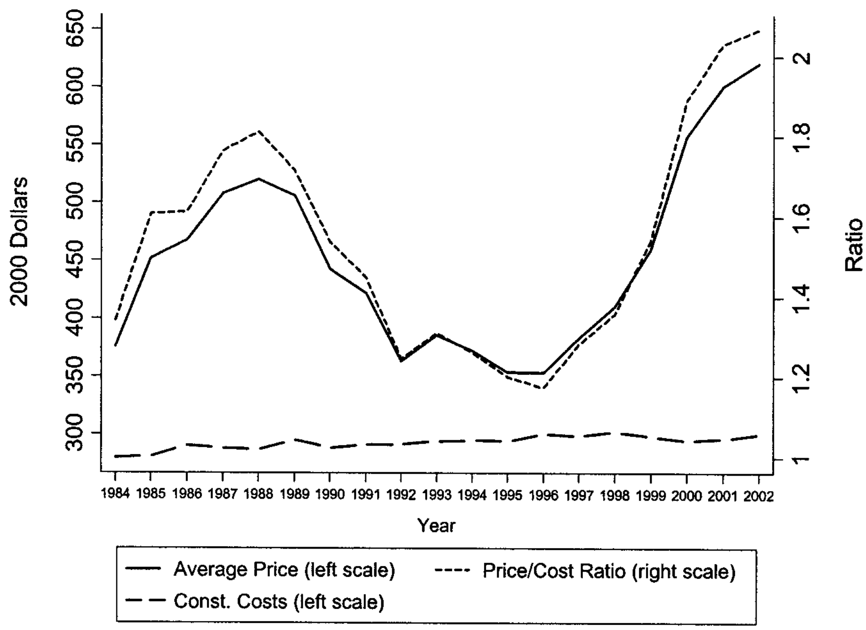

FIGURE 3.—Sales prices and construction costs in Manhattan

by Means. This series is adjusted for inflation using the CPI and rebased to equal $300 per square foot in 2002. Real construction costs are fairly flat, rising by only 7.5 percent during the entire 19-year period. That said, New York City is one of the few markets in which real physical production costs did not fall during this time period. For the nation as a whole, Means reports that construction costs fell by about 8 percent in real terms.

In contrast, condominium prices fluctuate significantly on an annual basis. These changes appear to be largely demand driven, as suggested by the small and fairly stable amount of new building permits documented in Figure 1. Housing price changes and number of housing permits shown in Figures 4*c* and 4*d* reinforce this point.[25] During the 1980s and 1990s, there is no evidence of a relation between residential permitting and lagged housing price appreciation. While we will return to those data below, for the moment they indicate that this is a market in which prices have been driven by changes in demand over the past 2 decades, not by a lagged response of supply to changes in demand.

Before comparing prices to construction costs, it is noteworthy that the numerator of this ratio represents asset values of older units that are not adjusted for depreciation. Stated differently, the sales prices do not reflect

[25] For an explanation of permits and prices in Figure 4, see note 1 *supra*.

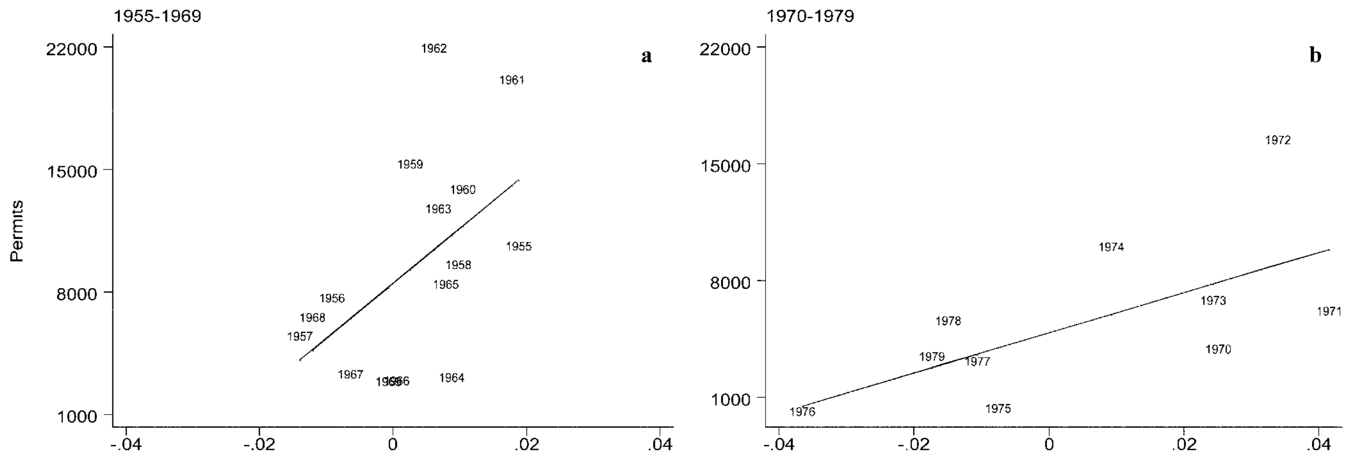

FIGURE 4.—Manhattan permits and changes in (lagged) housing prices, by decade

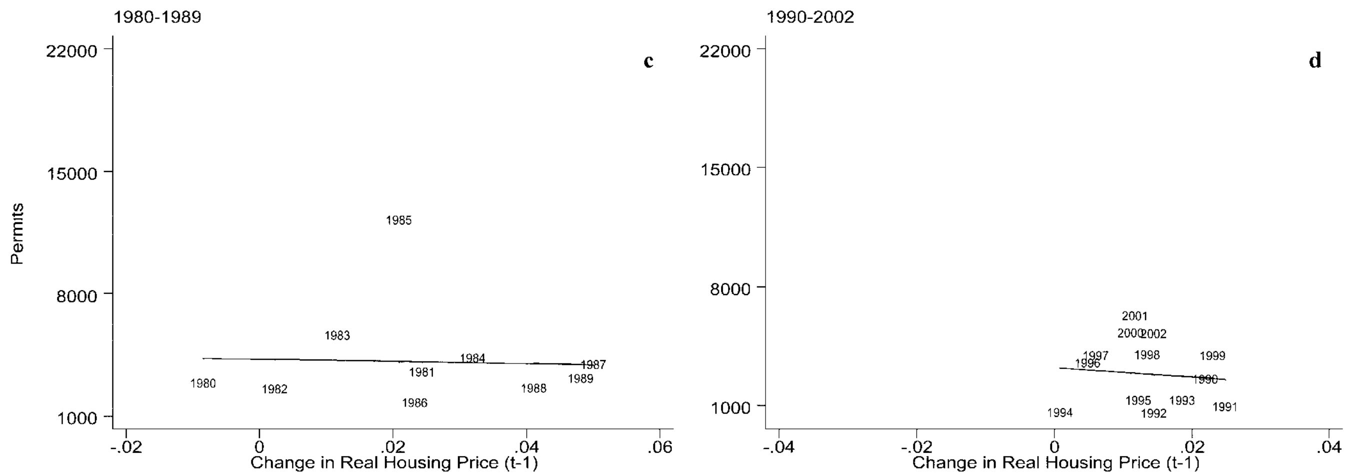

FIGURE 4 (*Continued*)

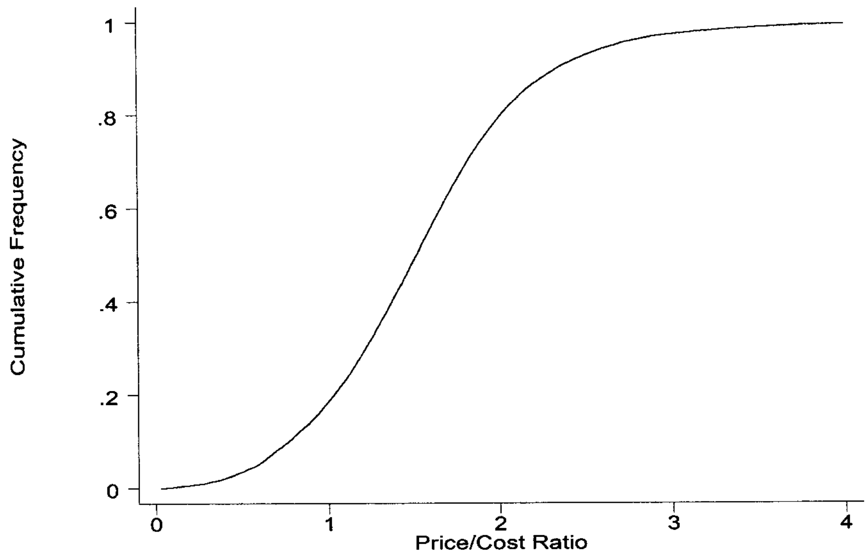

FIGURE 5.—Cumulative distribution of price-to-cost ratio, Manhattan condominiums, 1984–2002.

values as if new, while the construction costs are for new product. Ideally, prices should be adjusted upward to account for the economic depreciation that occurs on older units. Unfortunately, the condominium sales data we use do not include enough reliable information on the age of buildings in which the units are located. Obviously, this makes our estimate of the regulatory tax a very conservative one.[26]

Even with this downward bias, the mean ratio of price to construction cost (P/CC) has always been well above 1 (1.17 is the minimum in 1996). In 10 of the 19 years covered, the mean ratio is over 1.5, and it has been above 2 since 2001. In addition, Figure 5 shows that it is rare for any units to have ratios below 1.[27] Eighty-two percent of all the units transacted between 1984 and 2002 have prices above construction costs, and the vast majority of those with ratios below one occur between 1992 and 1996 when market prices were relatively low.

For a majority of Manhattan condominium owners, these data suggest that

[26] We are able to adjust reported prices of the single-family homes for depreciation (see the discussion in Section IV *infra*). Those effects are large, which indicates that values should be adjusted upward by about 40 percent before comparing them to new-construction costs. Because we cannot be sure whether a similar adjustment would result for high-rise residential products, we prefer our conservative approach of making no adjustment to prices.

[27] Prices in Figure 5 are from First American Real Estate Corporation sales records. and costs are $300 per square foot.

some form of regulatory constraint means that their cost of housing now is at least 50 percent more than it would be under a free-development policy. That is, price has been double physical production costs in recent years. The current gap between price and marginal cost is the highest ever in the borough, although it was systematically above 1.7 in the mid- to late-1980s.

III. Other Evidence on the Regulatory Causes of New York's High Prices

While it is difficult to think of a plausible alternative explanation for why buildings are not taller, we recognize that our analysis essentially is naming a residual. Consequently, we offer three alternative pieces of evidence to support our contention that the gap between price and marginal cost is caused by barriers to construction.

A. The Battle of Carnegie Hill and Other Case Studies

The "Battle of Carnegie Hill" is perhaps the most famous of New York City's recent conflicts between developers and local residents.[28] This case from the Upper East Side of Manhattan involved the actors Woody Allen, Kevin Kline, and Paul Newman, as well as some of New York City's financial elite, including Citigroup CEO Sanford Weill and the family of prominent investment banker and former Clinton administration deputy secretary of the treasury Roger Altman.

The case appeared mundane at first. Citigroup sold a corner site at 91st and Madison Avenue, on which it had built a one-story branch bank facility, to a local developer. That firm, Tamarkin Architecture and Development, proposed a 17-story apartment building. The builder had previously acquired the air rights necessary for a structure of this height, and there were other buildings at least as tall within eyesight of 91st and Madison. Nevertheless, the development was potentially constrained by other facets of the local regulatory environment, most prominently those associated with landmarks preservation.[29]

[28] We are grateful to Matt Kahn for bringing this particular case to our attention. The events were reported by the *New York Times* as they played out. For more recent descriptions and overviews of the entire battle between the developer and its opponents from various perspectives, the interested reader can see reports and commentary from the following three sources: Ralph Gardner, Jr., The Battle of Carnegie Hill, N.Y. Mag., April 2, 2001 (http://www.newyorkmetro.com/nymetro/realestate/neighborhoods/features/4521/); Carter B. Horsley, The Battle of Carnegie Hill, City Rev., April 3, 2003 (http://www.thecityreview.com/car-mad.htm); and "Carnegie Hill: By the Content of Its Character," which was posted on the Upper East Side section of an electronic guide to what is happening in Manhattan (Web site accessed in 2003).

[29] Any development that is not what is termed "as of right" must go through the Uniform Land Use Review Process (or ULURP) in New York City. The building code and broader regulatory environment that help determine what is and is not as of right is very voluminous. For more on that, see the report by Salama, Schill, & Stark, *supra* note 17, especially section 4 on the land use review process, building codes, permit approval, and taxes and fees.

In the first half of 2000, the local Landmarks Preservation Commission denied the developer's request to build a 17-story building after hearing from numerous parties that the structure would unjustly change the character of their neighborhood. For his part, Allen produced a short video about Carnegie Hill, and *New York Magazine* reported that Kline quoted *Richard II* to the Landmarks Preservation Commission on the matter—"How sour sweet music is, when time is broke, and no proportion kept!"[30]

Even before the Landmarks Preservation Commission stepped in, Weill faced social pressure to stop the proposed development, with Altman's wife, Jurate Kazickas, asking Weill to buy back the site from the local developer.[31] Approximately 3 years later, construction finally began on a scaled-down nine-story building that had been approved by the Landmarks Preservation Commission.

The point of this example certainly is not to conduct research by anecdote, however entertaining it might be. The more general issue that the regulatory process constrains the ability to build up is supported by the data plotted in Figure 2. Additional evidence can be found in the distribution of the height of new condominium buildings constructed in Manhattan in the 1980s, which displays a large degree of heterogeneity.[32] For example, our sample contains eight structures that were erected between 1980 and 1989 in the Midtown section of Manhattan, with their heights ranging from four to 70 stories. In the Upper East Side (Carnegie Hill's neighborhood), there were seven condominium buildings put up during the same time period, and they ranged in height from one to 32 stories. (The Appendix reports analogous data for other Manhattan neighborhoods.) While we do not claim that all of this heterogeneity is due to regulation, the data are abundantly clear that much new residential building has occurred at fairly low densities.[33]

Community opposition is just one way in which the heights of construction projects in Manhattan are kept down. For many parts of the city, zoning legislation itself contains restrictions on the size or height of buildings. The importance of these restrictions is emphasized by the lengths to which developers are willing to go in order to get around them. Certain provisions

[30] Richard II, act 5, scene 5, lines 44-4-5.

[31] For the entire interchange between Sanford Weill and Jurate Kazickas, see Gardner, *supra* note 28.

[32] The data are from the First American Real Estate Corporation (on file with the authors), the source of the price data used in Section II.

[33] The Battle of Carnegie Hill also helps illustrate another important lesson for research in this area—namely, that it is extremely difficult to accurately measure the degree of regulatory constraint facing housing development. It was not simply the presence of a complex local code and one public commission that influenced the developer's construction plans, but the ability of well-funded opponents to use the regulatory process to substantially delay and change proposals. The inability to measure these factors precisely suggests that traditional difference-in-difference methods may radically underestimate the true impact of regulation on housing prices (assuming the measurement error is classical in nature, of course).

in Manhattan's zoning code related to inclusionary zoning allow developers to exceed regulated building sizes in exchange for creating modest-income housing nearby. One recent example reported in the local press involved the developer of a high-rise condominium building on East 51st Street being able to increase the height of its project from 27 to 32 stories in return for constructing a low-rise structure nearby for lower-income elderly households.[34]

This case has several relevant implications for our research. First, developers certainly appear to desire to increase the size of their projects and provide more housing units. It was a regulatory barrier, not a technological one, that prevented the original building plans on 51st Street from rising to 32 stories, and the news article reporting this case provides other examples. Second, the developer of the building on East 51st Street reported that the purely physical construction costs for the final five floors were only $135 per square foot, and he claimed to have sold a three-bedroom unit on the 29th floor for about $1,500 per square foot. This suggests that our assumption of $300 per square foot for physical production costs is, indeed, a conservative one. Moreover, the gap between market price and construction costs is huge in this case. Finally, cases like this make clear that regulation itself helps push even marginal costs above those for on-site labor, equipment, and materials. For a different condominium project reported in the same news article, the developer paid a little more than $100 per square foot for the development rights to add 13 of 24 residential floors on a just-completed building in Manhattan. The magnitude of this cost amounts to 1/6th of the average market price of condominiums in Manhattan since the year 2000.[35]

B. Commercial Real Estate in Manhattan

The P/CC ratio for nonresidential real estate such as the office market also conveys useful information about constraints in the residential market. For example, if we are correct that the regulatory tax arises because existing residents block new residential supply out of self-interest, then the P/CC ratios presumably should be lower in the office sector where the lessees (that is, the tenants) are likely to have substantial political clout and clearly have no interest in maximizing asset value for their landlords. Because commercial and residential real estate are often located in different areas, residential

[34] Josh Barnabel, The Alchemy of a Zoning Bonus, N.Y. Times, December 14, 2003, at 11.1.

[35] *Id.* We hasten to add that because this is a regulatory-induced increase in marginal cost, it should not be included in the denominator of the price-to-construction-cost ratios computed above. That said, it does help explain why developers are not systematically earning excess profits even though market prices far exceed physical production costs.

property owners will have a smaller incentive to fight commercial construction.[36]

While we do not have detailed microdata on office building prices over time, we were able to obtain average annual transaction values for a few recent years from the CoStar Group, a commercial real estate information provider. These values are compared to office building construction costs provided by Means.[37] In 1996, the first year for which we have data, the CoStar Group reports an average sales price of only $91 per square foot on the basis of 98 recorded sales of office buildings in Manhattan.[38] This is well below the $140 per square foot that Means estimates it took to construct a 15-story office building that year. (All values are in 2002 dollars.) This is the bottom of the market for Manhattan real estate, for both office and residential space. The vacancy rate in the office sector was a very high 21 percent at the beginning of 1996,[39] and the P/CC ratio was below .7. Recall from Figure 3 that, even at the bottom of the market, the typical condo was trading at nearly 1.2 times construction costs according to our very conservative estimate. While the office sector clearly was overbuilt in the sense that values fell below replacement costs, there is no evidence of this occurring in Manhattan's housing market over the past 2 decades.

Market conditions for the office sector improved rapidly, just as Figure 3 shows they did for the condo market. By 2000, the last year before the massive disruption in the Manhattan office market from the terrorist attack that literally destroyed 16–17 million square feet (3.6 percent of the total stock) and severely damaged another 12–13 million square feet,[40] the CoStar Group reports that the mean office building traded at $215 per square foot, which is nearly 1.5 times the $144 per square foot that Means estimates for average construction costs that year.[41] While the P/CC ratio for office buildings was well above 1, it still remained below the 1.9 figure for the condominium market. Moreover, office space production is picking up in the Manhattan market, with over 12 million square feet of office space under construction or expected to be delivered between 2003 and 2006 according to more recent data. This is more than five times the quantity of new office

[36] We appreciate a referee for raising this point with us. Of course, it is the zoning laws that are generally responsible for the separation of residential and commercial real estate.

[37] The data were provided by the CoStar Group (on file with the authors); Means, *supra* note 16.

[38] The annual samples are small, often 1/10th or less the size of our condominium samples, but they represent the universe of sales of office properties in Manhattan that year according to the CoStar Group.

[39] See CoStar Group, CoStar Office Report Mid-Year 2001, chart Vacancy Rates by Class, 1995–2001, at 385 (2001).

[40] We thank Peter Linneman for these numbers. They are from his fall 2001 supplement to the *Linneman Letter* (vol. 1, issue 2) real estate markets report.

[41] There were 178 office building sales in 2000.

space delivered between 1996 and 1999, which indicates a lagged response of supply to market prices increasing above replacement costs.[42]

In sum, data on the office sector are much more limited than what is available for housing, but the evidence is consistent with a market in which supply still responds to demand (with a lag) and with smaller premiums of price to cost even in periods of strong demand. This is precisely what one would expect in a sector where politically influential business tenants desire to keep their rent levels down by minimizing restrictions on new supply.

C. Permitting and Prices

We close our analysis of the regulatory tax in Manhattan by returning to the data on housing price changes and housing permits in Figure 4. Absent an increase in fixed costs (such as regulatory constraints or other factors), one would expect increases in housing prices to lead to more new construction in a free market. In order to look at the relationship between prices and quantities a bit more closely, we regressed the number of permits issued in Manhattan during a given year on the change in prices during the previous year.[43] Figure 4 plots the data and the regression line for four different time periods dating back to 1955.

The 1955–69 period was a time of relatively modest real price changes, as positive appreciation typically was associated with a high level of permitting activity the following year. A similar, but less strongly positive correlation is observed for the 1970s in the adjacent plot. Despite a larger variability in real price changes from 1970 to 1979, the association of larger price appreciation with higher future permitting activity is clearly evident.[44]

Were this pattern to hold during the 1980s and 1990s, it clearly would be at odds with our previous conclusions that this is a market in which regulation is constraining builders from bringing new units to market. However, Figures 4*c* and 4*d* document that changes in prices are not correlated with

[42] The estimate of the production pipeline in the office sector is from Integra Realty Resources, Viewpoint 2004 (http://www.irr.com/IRRviewpoint2004.pdf). The amount of new construction delivered in previous years is from CoStar Group, *supra* note 39, chart Historical Deliveries, 1982–2001, at 391. Since 1982, cumulative deliveries of new office space amounted to about 17 percent of the stock in 1982. In percentage terms, this is double the fraction of new housing brought to the market in Manhattan.

[43] Lagged prices are used on the right-hand side on the assumption that it takes some time for developers to be able to respond to price changes, even in an unregulated market. The housing price series is for the New York metropolitan area. The real housing price series is the NY-NJ-LI metropolitan statistical area Consumer Price Index for Shelter, deflated by the gross domestic product deflator from the National Income and Product Accounts and rescaled to equal one in 2002. There is not an analogous price series for Manhattan proper (that is, for New York County).

[44] Both of the regression-line slopes are significantly different from zero at the 95 percent confidence level. However, the estimation error is large enough that we cannot confidently conclude the slope is greater for the 1955–69 period. All regression results are available on request.

future permitting activity in the 1980s and 1990s. Both slopes are slightly negative, but we cannot reject the null hypothesis that each is zero.

Although these simple regression plots obviously do not identify a supply-demand framework, they strongly suggest that the supply side of the housing market was able to respond more flexibly in earlier decades. Because we are not sure that other fixed costs beyond those associated with regulatory constraints did not also increase over recent decades, we cannot claim that the rise of development restrictions is entirely responsible for the paucity of building in general. However, even if a land or environmental constraint was responsible for the small number of new residential buildings, the results above present clear evidence of a regulatory impact on building height. By limiting the number of stories in new buildings, these regulations have helped constrain the supply of new housing units in Manhattan.

IV. Is There Evidence of a Regulatory Tax in Other Housing Markets?

In this section, we estimate the magnitude of the regulatory tax in other markets across the United States. The housing price data employed here come from the 21 metropolitan areas tracked in the 1998–99 special metropolitan files of the AHS.[45] We use observations on single-unit residences that are owner occupied, so condominiums and co-ops in buildings with multiple units are excluded from the analysis. The typical observation is for a single-family suburban home. The AHS data include self-reported home values, lot size, and a number of other physical attributes of the unit including living area square footage. Because the AHS contains no information on building costs, we turn to Means for data on that variable.[46] Means provides estimates of physical construction costs for each of the 21 metropolitan areas investigated here.

The Means data for single-family homes contain information on four unit qualities—economy, average, custom, and luxury.[47] The data are broken

[45] U.S. Census Bureau, *supra* note 5.

[46] Two publications are particularly relevant for greater detail on these data: R. S. Means, Residential Cost Data (19th ed. 2000); and R. S. Means, Square Foot Costs (21st ed. 2000).

[47] Tsuriel Somerville, Residential Construction and the Supply of New Housing: Endogeneity and Bias in Construction Cost Indexes, 18 J. Real Est. Fin. & Econ. 43 (1999), points out that the evolution of a particular hedonic estimate of construction costs for a sample of new homes in Baltimore, Cincinnati, and Houston from 1979 to 1991 follows a different path than does the Means index. We do not argue that the Means data are perfect, but they have passed the market test of revealed preference in that they are very widely used in the construction industry for budgeting purposes—an important indicator of reliability, we believe. In addition, the Means data have performed well in other research contexts (see Glaeser & Gyourko, *supra* note 7; and Joseph Gyourko & Albert Saiz, Reinvestment in the Housing Stock: The Role of Construction Costs and the Supply Side, 55 J. Urb. Econ. 238 (2004)). Finally, as noted above, this firm's price data for high-rise residential buildings are quite consistent with those from other independent sources.

down further by the size of living area (ranging from 600 to 3,200 square feet), the number of stories in the unit, and a few other differentiators. In our comparisons with housing prices from the metropolitan files of the AHS, we presume that construction costs are those associated with the mean of economy- and average-quality homes and use city-specific cost adjustments provided by Means. Holding constant the size and other physical traits of the unit, construction costs for an average-quality home are about 40 percent higher than those for an economy-quality home according to the Means data. Thus, our estimates of construction cost reflect modest quality, but not the lowest possible quality that meets building code requirements.[48]

While there are various adjustments that need to be made to the data before comparing housing prices to construction costs, the biggest difficulty with this procedure is in inferring the free-market cost of land.[49] We use the AHS data to estimate the marginal value of land via a standard housing hedonic that expresses the value of a house as a function of its various characteristics, including the amount of land on which it sits. The estimated coefficient on land area will reflect the degree to which the market valuation of a house increases with lot size. Of course, this estimate of the market valuation of land area may be biased, particularly if the amount of land is correlated with omitted housing characteristics. If houses on bigger lots tend to be of higher quality (in ways that we cannot explicitly control for), the resulting specification error will bias the coefficient upward. Conversely, omitted charac-

[48] This assumption of modest, but not really low, quality is also reflected in our assumptions that the costs are for a one-story house with an unfinished basement and the average costs associated with four possible types of siding and building frame. In addition, we develop cost estimates for small (<1,500 square feet), medium (1,550–1,850 square feet), and large (>1,850 square feet) homes in terms of living area.

[49] Two other important adjustments are made to the AHS data before comparing housing prices to construction costs. These are to account for the depreciation that occurs on older homes and the fact that research shows that owners tend to overestimate the value of their homes. To account for the latter factor, we follow Goodman & Ittner, *supra* note 13, and presume that owners typically overvalue their homes by 6 percent. Empirically, the more important adjustment takes into account the fact that the vast majority of homes are not new. Depreciation factors are estimated using the AHS as follows. First, house value per square foot (scaled down by the Goodman & Ittner correction) in the relevant year is regressed on a series of age controls and metropolitan area dummies. The age data are in interval form so that we can tell if a house is 0–5, 6–10, 11–25, 26–36, and more than 45 years old. As expected, the coefficients on the age controls are all negative and represent the extent to which houses of different ages have depreciated in value on a per-square-foot basis. We then adjust the reported values to account for the estimated depreciation so as to compare the value of a unit as if it were new with its replacement cost. On average, this adjustment results in about a 40 percent higher asset value for comparison with new construction costs. See our 2003 working paper (Edward Glaeser, Joseph Gyourko, & Raven Saks, Why Is Manhattan So Expensive? Regulation and the Rise in Home Prices (Nat'l Bur. Econ. Res. Working Paper No. w10124, November 2003)) for more detail on this procedure.

teristics will bias the coefficient downward if houses on bigger lots are built where land is cheap.[50]

Hedonic estimates of the value of land per square foot (in 2000 dollars) for each metropolitan area are reported in Table 4.[51,52] The results for average house value indicate a wide range of prices across metropolitan areas, from 13–15 cents per square foot in Birmingham and Houston to about $4 per square foot in the Bay Area communities of San Francisco and San Jose. While there clearly are some high-priced locations, these data suggest that consumers in most areas place a relatively low value on land on the margin. In 16 of the 21 metropolitan areas, the estimated price is below $1 per square foot. In the two lowest-price areas of Birmingham and Houston, the hedonic land values imply that a typical homeowner would be willing to pay no more than $1,400–$1,600 for an extra quarter-acre of land.[53] Even in the Baltimore and Salt Lake City metropolitan areas, in which we estimate the price of land to be from $.83–$.88 per square foot, a quarter-acre of added land is valued at no more than $9,040. On the other hand, the hedonic price of land

[50] While these are the most likely sources of bias, there probably are other factors making it difficult to pin down the value of a standard unit of land (for example, differential option value across locations, and so on). We make every effort to guard against our regulatory tax estimates being biased upward for the single-family house markets in which we must estimate land value as part of the marginal cost of production. Toward that end, we restrict the underlying samples from the AHS to homes with no more than 2 acres of land (that is, with less than 87,120 square feet of lot). Including observations with larger amounts of land reduces estimated land prices below those reported below in Table 4, which suggests that there is some downward bias of the hedonic estimates associated with large-lot residences being developed in parts of the metropolitan area with cheap land. In addition, as suggested above, the hedonic estimate of land price will overestimate the free-market value in markets with binding regulatory constraints.

[51] Four different hedonic specifications were estimated. Generally, the specifications are of the following form: House Price $= p \times$ Land Area $+ z \times$ Other Controls, where the model is estimated separately for each metropolitan area. The other controls include the number of bedrooms, the number of bathrooms, the number of other rooms, the age of the home, and indicator variables that take on a value of one if the home has a fireplace, has a garage, is in the central city of the metropolitan area, has a basement, and has central air conditioning. Two of the specifications use the logged value of housing price, while two are purely linear in nature. In addition, two of the models (one logged, the other not) use the data on interior square footage to capture the size of the home, while the other two use the detail on the number of bedrooms, bathrooms, and other rooms. In general, the results were quite consistent, although there is some variability in estimated land prices across the different hedonic models. The key conclusions regarding the zoning tax are not sensitive to this choice. All the underlying results are available on request.

[52] Glaeser, Gyourko, & Saks, *supra* note 49, performed a similar analysis using the 1999 national file of the American Housing Survey. The results are similar quantitatively, with the coastal metropolitan areas having much higher marginal prices of land. However, the estimates here tend to be smaller and much more precisely estimated. Given the far fewer number of observations at the metropolitan area level in the national file, we are much more confident of the reliability of the results reported here. The relatively large number of observations in the metropolitan files allow us to estimate attribute prices much more precisely.

[53] There are 43,560 square feet in an acre of land, so $\$.13 \times 10{,}890 = \$1{,}416$ and $\$.15 \times 10{,}890 = \$1{,}634$.

TABLE 4

HEDONIC LAND PRICES AND ZONING TAXES: SELECT METROPOLITAN AREAS FROM AMERICAN HOUSING SURVEY METROPOLITAN FILES

Metropolitan Area	Year (1)	Hedonic Price of Land ($/Square Foot) (2)	Average House Value ($) (3)	Zoning Tax/ House Value (4)
Baltimore	1998	.88	154,143	.018
Birmingham	1998	.13	114,492	0
Boston	1998	.68	236,231	.186
Chicago	1999	1.62	187,669	.057
Cincinnati	1999	.40	133,050	0
Detroit	1999	.37	144,686	0
Houston	1998	.15	103,505	0
Los Angeles	1999	2.59	260,744	.339
Minneapolis	1998	.38	144,719	0
New York	1999	1.38	253,232	.122
Newport News (Va.)	1998	.48	127,475	.207
Oakland	1998	2.34	284,443	.321
Philadelphia	1999	.81	135,862	0
Pittsburgh	1998	.70	100,060	0
Providence	1998	.56	148,059	0
Rochester	1998	.21	109,050	0
Salt Lake City	1998	.83	167,541	.119
San Francisco	1998	4.10	418,890	.531
San Jose	1998	3.92	385,021	.469
Tampa	1998	.37	103,962	0
Washington, D.C.	1998	.64	213,281	.219

NOTE.—Hedonic prices of land were estimated using data from the metropolitan area surveys of U.S. Census Bureau, American Housing Survey (AHS) (1998, 1999). In some cases, areas were over sampled and included in the 1999 national file of the AHS. Four hedonic models were estimated. See the text and note 19 *supra* for those details. The prices reported here reflect the average of the prices associated with the second- and third-highest estimates across all four specifications (that is, we discarded the highest and the lowest estimates and report the mean of the two remaining estimates). The housing price for each metropolitan area is the mean for the sample of single-unit homes with lot sizes less than 2 acres. The computation of the zoning tax as a fraction of mean house value is as follows for each area *j:*

$$\frac{\text{ZoningTax}_j}{\text{MeanHouseValue}_j} = \frac{(\text{MeanHouseValue}_j - \text{CC}_j) - \text{HedonicLandPricePerSqft}_j \times \text{MeanLotSize}_j}{\text{MeanHouseValue}_j}.$$

MeanHouseValue and MeanLotSize are specific to a metropolitan area and pertain to the sample of single-unit, owner-occupied residences with less than 2 acres of land.

is much higher on the West Coast. Using the $4-per-square-foot average of the prices in the two Bay Area metropolitan areas surveyed implies that a quarter-acre is valued at well over $40,000.

While these calculations obviously take some liberty with the meaning of a small change in the quantity of land, they do illustrate that the value of land as measured by these hedonic prices is not likely to constitute the bulk of the total value of the typical home in most of these metropolitan areas. This is evident by comparing the quarter-acre land values discussed above with the mean home prices (in 2000 dollars) reported in column 3 of Table 4.

Column 4 reports our estimate of the regulatory tax as a percentage of average house value in the metropolitan area. Note that the tax is zero or negligible (defined as less than 10 percent) in over half the markets.[54] However, the tax exceeds 10 percent of average home price in nine market areas (Boston, Los Angeles, New York, Norfolk–Newport News, Oakland, Salt Lake City, San Francisco, San Jose, and Washington, D.C.). The estimate regulatory tax in New York is 12 percent. While this value is lower than the estimate we found using condominiums in Manhattan, that is not surprising because the New York metropolitan area covers a large area outside of Manhattan and the tax easily could be lower in suburban areas. The impact of regulation on land values is much greater in other markets, especially those on the West Coast. In Los Angeles, Oakland, San Francisco, and San Jose, the gap between prices on the extensive and intensive margins amounts to from one-third to one-half of home value at the mean. In Boston, Newport News, and Washington, D.C., the gap constitutes about one-fifth of total property value.

Thus, the evidence for single-family housing markets across a diverse set of metropolitan areas suggests a big role for regulatory restrictions in a select set of primarily coastal markets. While we have taken every possible precaution to guard against our regulatory tax estimates from being biased upward, we recognize that the inability to control fully for heterogeneity in the quality of land makes these estimates less robust than those reported for Manhattan.

These regulatory tax estimates would be more convincing if it could be shown that they are related to zoning or other land use restrictions. Unfortunately, such data are difficult to obtain. Perhaps the most prominent source of such information comes from the Wharton Land Use Control Survey.[55] This survey took place in 1989 and covered 60 metropolitan areas. While this is a decade prior to our AHS-based results, if there is persistence in the strictness of land use controls over time,[56] then we still should see a meaningfully positive correlation between our regulatory tax measure and the severity of land use restrictions.

Among other variables in the Wharton Land Use Control Survey is a measure of the average length of time between an application for subdivision

[54] We assigned a value of zero for the regulatory tax if physical construction costs exceeded the average housing price in the metropolitan area. We would not expect to see new construction in areas with production costs above market prices. In all areas but Philadelphia and Pittsburgh, a positive regulatory tax results if we assume construction costs associated with the lowest-quality units (that is, economy homes) tracked in the Means data. Effective house quality may, in fact, be lower than we presume in these areas, but we think it preferable to employ assumptions that lead our estimates to be conservative rather than aggressive.

[55] Anita A. Summers & Peter Linneman, Wharton Land Use Control Survey (1989).

[56] Housing industry professionals certainly claim there is, but there is no consistent time-series evidence of which we are aware on this matter. This clearly is a matter that future research should address.

approval and the issuance of building permits for a modest-sized single-family subdivision of less than 50 units. This measure can take on values ranging from one to five with a value of one indicating the permit issuance lag is less than 3 months, a value of two indicating the time frame is between 3 and 6 months, a value of three indicating a 7–12 month lag, a value of four meaning the lag is between 1 and 2 years, and a value of five signaling a very long lag of over 2 years.

We are able to match data for this variable with 20 of the 21 metropolitan areas reported in Table 4.[57] The simple correlation is .74 between our regulatory tax measure and the average delay between application and approval of a small subdivision. Regressing our regulatory tax estimate on this delay measure, we find that a 1-unit increase in the categorical zoning lag variable is associated with a 15-percentage-point increase in the amount of the regulatory tax.[58] While this sample size is quite small and no causality can be inferred, it still is comforting that the places we estimate to have regulatory tax levels that are high are in fact those with more onerous zoning.

V. Can Manhattan's Regulatory Tax Be Justified?

Our findings suggest that government regulations have restricted supply in Manhattan and a few other coastal housing markets, but the existence of this regulatory tax is not necessarily inefficient. Indeed, much of the literature on zoning has argued that land use controls are absolutely necessary to get developers to internalize the social costs of their actions. In this section, we ask whether there is likely to be any negative externality large enough to warrant a regulatory tax of the magnitude we found in Manhattan.

While welfare analyses of zoning are inherently difficult to perform, Manhattan provides perhaps the best possible laboratory. The analysis is more straightforward for it because adding a large number of housing units, and therefore a large number of people, would not change the basic nature of the place. Even so, our results are most properly viewed as educated guesses and not precise estimates.

In a big city such as Manhattan, an optimal zoning tax should incorporate at least three elements in order to reflect the marginal social cost of a new resident to the community. First, the zoning tax should reflect the fact that a new apartment may eliminate views from existing apartments. Indeed, most current height restrictions exist for exactly that reason. Second, the new development should be taxed to the extent there are negative externalities created by extra crowding. Pure wage effects (that is, the fact that more workers can depress wages) are pecuniary, not real, externalities, so the usual

[57] The Wharton Land Use Control Survey did not include the Norfolk–Newport News area.

[58] The R^2 value is .55 and the *t*-statistic on the zoning constraint variable is 3.2 from this regression with 20 observations.

economic logic suggests that these effects should not be part of the development tax. Third, the tax should reflect the fiscal burden of the new resident. This fiscal burden should be defined as the difference between government expenditures on the new resident and the taxes that the resident will pay. We will address each of these components in turn.

A. Estimating the Value of Views Destroyed by New Construction

The view-related externality is perhaps the most straightforward to estimate. For each new apartment, this equals the number of views blocked by a new apartment times the welfare cost of blocking a view. The number of views blocked should reflect the marginal impact of a single new apartment given the existing structure of apartments in New York.

In a world with homogeneous consumers, the welfare value of a view should equal the current market price of a view, which can be estimated by comparing apartments with or without views.[59] In a recent review of existing hedonics literature, a typical result suggests that a good view raises the value of the property by about 10 percent.[60] However, most of this literature uses-cross sectional data on single-family homes and often estimates the value of a view associated with some type of natural resource such as the ocean or a mountain range. Hence, the relevance for our problem of the value of an urban view may be limited.

As an alternative method to estimate the value of a view, we compare the prices of condominiums in the upper and lower floors of the same building using our sample of Manhattan condos. This sample covers 20,426 units in 518 apartment buildings, so the estimates it generates are relatively precise. We regressed price (in log form) on the square footage of the unit (also in log form) and a series of dummy variables controlling for the floor of the unit and a measure of unit size. Specifically, we included a dummy variable (I_{11-20}) that takes on a value of one if the unit is on floors 11–20, another dummy variable (I_{21-30}) that equals one if the unit is on the 21st–30th floors, and yet another (I_{31+}) for units on or above the 31st floor of their buildings. The regression results were as follows:

$$\log(\text{Price}) = \underset{(.006)}{.08} \times I_{11-20} + \underset{(.009)}{.16} \times I_{21-30} + \underset{(.01)}{.23} \times I_{31+} + \underset{(.008)}{1.00} \times \log(\text{Square Footage}). \tag{2}$$

[59] In principle, this will be true with heterogeneous consumers as long as there are enough apartments of differing types. If a new apartment blocks the view of someone who values his or her view more than the market does, this person can change apartments and acquire a new (identical) apartment with a view and pay the market cost of a view. Of course, we recognize that urban housing markets are rarely that fluid.

[60] Earl Benson *et al.*, Pricing Residential Amenities: The Value of a View, 16 J. Real Est. Fin. & Econ. 55 (1998).

The regression also includes building-specific fixed effects and year-of-sale fixed effects that are not reported here. Standard errors are in parentheses, and the R^2 value is .59.

We are most interested in the coefficient on the I_{31+} indicator variable, which effectively captures the difference in the prices of condos on the bottom 10 floors of the building and those above the 30th floor. Although this coefficient of .23 is likely to overstate the value of a view,[61] the results suggest that the difference in value between being very high up in a building and being on the first 10 floors is about 25 percent of unit price, which we use as our estimate of the value of a view.[62]

How many apartments' views does a new apartment block? No economic literature on this topic exists. An upper bound for this value should be one, because the worst outcome possible is that no apartments have any views, and this would mean that on average each apartment blocks one other apartment's view. Of course, it is easy to contemplate lower numbers. For example, it is possible to imagine tall buildings spaced far enough from one another (perhaps in the Corbusier Radiant City) that no views are blocked. We take .5 as a reasonable middle ground.

Given that assumption, each new apartment destroys one-half of a view of some other apartment. Since the loss of one complete view would reduce the value of the apartment by 25 percent, each extra dollar of tall building will lead to about 12.5 cents of lost view. This finding suggests that lost views are not likely to amount for more than 10–15 percent of the total value of new housing. As such, this analysis suggests that apartments should face a construction-related regulatory tax equal to approximately 12.5 percent of their value.

B. Congestion Externalities

A second possible source of externalities that could justify a large regulatory tax on development is crowding. If people find living in a crowded place to be distasteful or more costly, then it is sensible to tax new residents for the costs they impose on current residents. This is a difficult issue to analyze for a number of reasons. First, research in urban and transportation economics suggests that tall buildings actually help internalize congestion

[61] If interior quality is superior on higher floors, our estimate of view is biased upward. We are largely unconcerned by this because our goal is not to provide a precise measure but to determine whether views and other externalities could reasonably justify the gap between values and costs that we currently see in Manhattan. An overly generous estimate of the value of a view nicely serves that purpose.

[62] Because the indicator variable is not continuous, the derivative relating price to floor is not well defined. Using the adjustment suggested by Robert Halvorsen & Raymond Palmquist, The Interpretation of Dummy Variables in Semilogarithmic Equations, 70 Am. Econ. Rev. 474 (1980), for such cases yields the 25 percent figure.

because they allow the length or frequency of trips to be reduced.[63] If that effect is dominant, then tall buildings should be subsidized, not taxed. A related question is whether the appropriate tax should be based on gross or net congestion. Gross congestion can be thought of as the social costs imposed on New Yorkers created by one more apartment in New York. Net congestion is the gross congestion minus the social costs alleviated by having the apartment located somewhere else. Perhaps in an ideal system, all localities would charge fully for the gross congestion cost to that locality. However, if some localities are not charging (as the previous section's results suggest is the case), then the appropriate tax should be based on net congestion costs.

Given New York's specialization in high density, we suspect that congestion externalities could be lower in Manhattan than anywhere else in the country. Indeed, the net congestion cost imposed by an extra apartment might be positive. The island does not have a bucolic, rural character that would be spoiled by new residents. In addition, residents of Manhattan overwhelmingly take public transportation or walk. Only 11 percent of Manhattan residents in the 2000 census reported driving alone or carpooling to work. Congestion does matter on the sidewalks or the subways, but it is far less important than automobile traffic, primarily because people without cars take up much less space than people with automobiles. As already noted, congestion also could be reduced if greater densities cause people to take fewer trips. If one accepts these arguments, then it seems quite likely that the relative congestion effect is likely to be lower in Manhattan than in any alternative locale. By turning a car driver into a subway rider, congestion on net is reduced rather than increased. Moreover, many urban residents of Manhattan move there precisely because they want to be around other people. This suggests a congestion amenity, not a disamenity.

While we suspect the net congestion externality may be positive, we do not estimate it because this calculation requires knowing the congestion externalities in all of the relevant alternative locales. Instead, we estimate the size of gross congestion externalities, which should be thought of as the cash value of the total loss of utility on everyone in Manhattan created by a new resident. The natural means of estimating this value is to see whether rents, holding income constant, rise or fall with city population. If people demand a compensating wage differential for living in a more densely populated city, then this differential is a natural measure of urban amenities in the metropolitan area. In this case, income will be low in cities where amenities are high and high where amenities are low. If the distaste for crowding is large, then we should expect to see a strong positive relationship between real income and city size.

[63] For reviews and the theory behind this contention, see Masa Fujita, Urban Economic Theory (1989); and Yoshitsugu Kanemoto, Theories of Urban Externalities (1980).

Using the 193 cities with population levels greater than 100,000 in the 1990 census, we estimate the following regression:[64]

$$\log(\text{Median Rent}) = \underset{(.64)}{3.4} + \underset{(.06)}{1.04} \times \log(\text{Per Capita Income}) - \underset{(.016)}{.05} \times \log(\text{City Population}). \tag{3}$$

Standard errors are in parentheses, and the R^2 value is .58.[65] The $-.05$ coefficient on log population indicates that rents fall only modestly with increases in population, holding income constant. The fact that a 1 percent increase in population causes a .05 percent decrease in rents suggests that people are paying less (holding income constant) in more populated places. This result supports the idea that there is a small gross congestion externality.[66]

While there certainly are reasons to question these estimates, they strike us as reasonable benchmarks for the value of the gross congestion externality in New York. Using this estimate, a 1 percent increase in city population reduces the utility level (measured as a share of housing costs) by one-twentieth of 1 percent. In other words, because of congestion externalities, an extra percent of population in New York should cause the value of all homes to drop by one-twentieth of 1 percent. Therefore, there should be an additional 5 percent zoning tax on new apartments owing to these congestion externalities. Thus, there appears no way that congestion externalities themselves could justify anything close to the size of the regulatory tax that we presently see in Manhattan.

C. *Fiscal Externalities from New Construction*

The final category of social costs due to new construction that we examine comes through government taxation and expenditure. If new residents require more in local government expenditures than they pay in taxes, then this would be yet another reason for potentially taxing new construction. Of

[64] This sort of specification will generate the elasticity that we are interested in if, for example, $\underline{U} = W/P + A$ across cities, where $\underline{U}$ is reservation utility, W is wages, P is the price level (which will be proxied for with rents), and A is the amenity level.

[65] The regression also included a control for the percentage of residents over the age of 25 with fewer than 9 years of schooling.

[66] Other specifications indicated a smaller negative or even positive effect of population. For example, controlling for land area yields a positive coefficient on population, although it is not statistically significant. We also tried controlling for population density directly and found that denser areas had higher rents. At face value, this suggests that crowding is good. However, a more likely explanation is that this estimate reflects omitted variables having to do with supply constraints or local amenities. In addition, attempts to instrument for population and density in the crowding regressions yielded slightly positive coefficients on population. Putting all of the evidence together, it is unlikely that the value of this particular externality would be less than -5 percent.

course, one could argue that a sensible response to these fiscal externalities is to charge new residents directly for the services that they use, instead of relying on some type of development tax. Still, it is worthwhile asking whether new residents in Manhattan condominiums create a net fiscal drain on New York City.

While compelling statistics do not exist, there are good reasons to believe that new residents in Manhattan condominiums would represent a considerable fiscal transfer to, not from, the city. First, these residents tend to be rich. People living in apartments that cost more than $500,000 will tend to be far richer than the average New Yorker. As such, they are likely to increase the average income in the city. Second, these residents tend to have small numbers of children. On average, 23 percent of the residents of Manhattan are enrolled in school, as opposed to 27 percent for the city as a whole. The residents of expensive condominiums are also disproportionately likely to enroll their children in private schools. These individuals are paying taxes for public schools and not using them, to the benefit of the government's budget. Finally, a number of government expenditures entail large fixed costs. For these expenditures, new population is an unqualified improvement since it allows those expenditures to be spread over a larger base. Altogether, we are quite confident that the residents of new condominiums in Manhattan are likely to be a fiscal boon, not a fiscal drain on the city.

While the analysis in this section does not allow us to pin down the level of the optimal tax (or subsidy) on new development, it does show that there is no negative externality (or combination of externalities) large enough to justify the current gap between prices and production costs of condominiums in Manhattan. Moreover, it is possible that a thorough analysis of the impact on transportation might even justify subsidizing denser construction in Manhattan. And when one recalls that we have been very conservative in not adjusting market values for depreciation, it is hard to escape the conclusion that regulatory constraints on building in Manhattan are far too restrictive.

VI. Conclusion

Home building is an enormously competitive industry with virtually no natural barriers to entry. Therefore, price markups over construction costs are a strong indication of artificial barriers to new construction. In the bulk of the United States, the costs of producing housing are hard to estimate because of the lack of reliable data on the cost of land. Nevertheless, available data indicate that especially in expensive coastal areas, there often is a substantial gap between the price of housing and construction costs. This gap suggests the power of land use controls in limiting new construction.

Even stronger evidence of a regulatory impact can be found in the borough of Manhattan. Since the marginal cost of bringing a new apartment to market is well approximated by the cost of building up, construction costs for apartments are much easier to estimate. After examining several sources, we find that $300 per square foot is about the maximum conceivable value of those construction costs in Manhattan. Although this level is high, condominium prices in Manhattan are now routinely two times that amount, which implies that one-half or more of the value of a condominium can be thought of as arising from some type of regulatory constraint preventing the construction of new housing. Other evidence also supports the importance of regulation. For example, over the past 40 years in Manhattan, we have seen a substantial contraction in the number of residential building permits, a decline in the share of new units in tall buildings, and substantial heterogeneity in the height of what does get built.

In principle, regulations limiting building need not be economically inefficient. However, we can find no externality associated with new housing units in Manhattan that is remotely large enough to warrant a development tax that would make up for the current gap between construction costs and apartment prices.

Why is the construction environment so restrictive and why has it become worse over time? Our view is that there has been a reallocation of property rights over the past 30 years. In the 1960s, landowners were generally free to develop their property in the manner they desired. However, neighbors have become increasingly effective in opposing new construction in more recent decades. As illustrated by the Battle of Carnegie Hill, media-savvy local residents have become adept at using every means possible to restrict new construction. The result has been a reassignment of property rights from developers to local homeowners.

Of course, the Coase theorem tells us that this reassignment need not be inefficient. However, the reassignment of property rights appears to have resulted in rights that are both diffuse and poorly defined. The large amount of real estate litigation suggests that ownership is hard to clearly establish. Moreover, that politics is frequently involved in property rights may be more closely linked to the ability to generate votes than any preordained legal right. These poorly defined, widely diffused property rights help explain why sensible mechanisms have not come about to allow developers to efficiently compensate existing homeowners for any losses due to new construction. Furthermore, existing residents will always have an incentive to behave like monopolists and to attempt to reduce supply in order to boost the value of their own homes.[67] In future work, we hope to explore why the impediments to new construction in Manhattan and certain other markets have grown to be so high.

[67] Of course, this incentive alone suggests that we should see big gaps between price and marginal cost in all markets. Clearly, other factors influence the ability of homeowners to carry out these monopolistic tendencies. We hope to pursue this question in future research.

APPENDIX

TABLE A1

List of New Buildings by Height in Neighborhoods of Manhattan, 1980s

Greenwich Village/Financial District	Chelsea/Clinton/ Midtown	Stuyvesant Town/ Turtle Bay	Upper West Side	Upper East Side
6	4	5	4	1
16	21	13	5	4
18	30	21	9	5
44	35	24	11	12
	42	27	31	14
	53	29	35	15
	56	30		15
	70	35		18
		44		19
				31
				32

Source.—Data were provided by First American Real Estate Corporation (on file with the authors).

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