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Urban Land-Use Regulation: Are Homevoters Overtaking the Growth Machine?

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The leading theory about urban land-use regulation argues that city zoning officials are full partners in the business and real estate elite's "growth machine." Suburban land-use officials, in contrast, are thought to cater to the interests of the majority of their electorate—"homevoters." A unique database regarding over 200,000 lots that the New York City Planning Commission considered for rezoning between 2002 and 2009 allows us to test various hypotheses suggested by these competing theories of land-use regulation. Our analysis reveals that homevoters are more powerful in urban politics than scholars, policymakers, and judges have assumed.

I. Introduction

"No one is enthusiastic about zoning except the people," quipped Richard Babcock almost 50 years ago.[1] Despite its apparent popularity among citizens and local practitioners, many

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[1]Richard F. Babcock, The Zoning Game: Municipal Practices and Policies 17 (1966).

critics have charged, over several decades, that zoning and other land-use regulations unconstitutionally interfere with private property, meddle inefficiently in the real estate market, serve as a tool for exclusion, and drive up housing costs.[2] Even if zoning might be defensible in the abstract, others argue, public officials are too often "sloppy" and "self-serving" in its application.[3] More recently, zoning has been charged with stifling economic growth and promoting economic inequality by shutting workers out of our most productive big cities, helping to inflate the housing bubble, and even adding to American waistlines.[4]

Many commentators accordingly have called on federal, state, and local governments, courts, and voters themselves to reform the processes by which land use is regulated. But the appropriateness or viability of the proposed reforms depends in part on the political economy of the targeted land-use restrictions. Efforts to guard against inefficient land-use regulation by imposing heightened judicial scrutiny of rezonings, for example, likely will not improve zoning decisions if scrutiny focuses on evidence of developer influence when it should be looking instead for signs of excessive risk aversion by neighbors.

Public choice theorists have generally fallen into two camps about the politics behind land-use decisions. The "growth machine" theory views land-use officials as part of an elite coalition concerned primarily with economic growth.[5] Adherents of the growth machine theory, led by John Logan and Harvey Molotch, see zoning and other land-use regulations as the "mild sticks" that government uses to distribute development in ways that benefit elites in the coalition.[6] Other local government theorists, led by William Fischel, focus instead on the political power of homeowners and their "mercenary concern with property values."[7] In this view, policymakers cater to homeowners' demands for low property taxes (for homeowners, anyway), high levels of public services, uncongested public amenities, and protection from competition in the housing market when it comes time to sell. The

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[2]See, e.g., Andres Duany, Elizabeth Plater-Zyberk & Jeff Speck, Suburban Nation: The Rise of the Sprawl and the Decline of the American Dream (2001) (highlighting Euclidean zoning's typical ban on mixed-use development and promotion of low-density housing); Edward L. Glaeser & Joseph Gyourko, Zoning's Steep Price, 25 Regulation 24 (2002) (finding evidence suggesting that land-use restrictions are responsible for high housing costs in New York City and California); Rolf Pendall, Local Land Use Regulation and the Chain of Exclusion, 66 J. Am. Plan. Ass'n 2 (2000) (arguing that low-density zoning tends to exclude the poor and racial minorities from many suburban jurisdictions).

[3]Daniel R. Mandelker & A. Dan Tarlock, Shifting the Presumption of Constitutionality in Land-Use Law, 24 Urb. Law. 1, 2 (1992).

[4]Peter Ganong & Daniel Shoag, Why Has Regional Income Convergence in the U.S. Declined? (Harv. Kennedy School, Working Paper No. RWP12-028, 2013), available at <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2081216##>; Paul Krugman, Op-Ed, That Hissing Sound, N.Y. Times, Aug. 8, 2005, <http://www.nytimes.com/2005/08/08/opinion/08krugman.html>; Joseph Schilling & Leslie S. Linton, The Public Health Roots of Zoning: In Search of Active Living's Legal Genealogy, 28 Am. J. Preventive Med. 2, 96–104 (2005). See also Ryan Avent, The Gated City (Kindle Single, 2011).

[5]E.g., John R. Logan & Harvey L. Molotch, Urban Fortunes: The Political Economy of Place (1987).

[6]Id. at 155.

[7]William A. Fischel, The Homevoter Hypothesis: How Home Values Influence Local Government, Taxation, School Finance and Land-Use Politics 18 (2001).

growth machine is typically thought to describe urban land-use politics, while the homevoter theory explains suburban land use.

Recently, however, cities have begun to engage in land-use practices long associated with suburbs—downzoning land to more restrictive regulations, imposing substantial fees for development approval, and taking significant quantities of land off the market through programs to preserve historic landmarks and open space. That shift should lead to a reexamination of received wisdom about urban land-use politics. Empirical testing of the leading theories about what influences local governments' land-use decisions, however, has proved challenging. Using changes within a jurisdiction to understand the political economy of zoning is difficult because local governments seldom adopt new comprehensive zoning codes, and existing codes are often riddled with hard-to-assess flexibility devices or, in practice, are merely the starting place for negotiations between the local government and the developer.[8] Comparisons among different jurisdictions or metropolitan areas risk glossing over idiosyncratic regulatory histories and subsequent path dependence, and raise practical challenges of data compatibility and of modeling multiple, complex zoning codes.

In this article we take advantage of a period of unusually high rezoning activity in New York City to investigate empirically the politics underlying zoning. Since 2002, the city's Department of City Planning (DCP) has successfully initiated more than 120 neighborhood-sized rezoning "projects" throughout the city's five boroughs, each of which rezoned multiple lots, often in multiple ways. Using several data sources, we develop a lot-level data set of more than 230,000 lots that were considered for rezoning as part of these projects. We then categorize the lots according to how they were rezoned, and use associations between the characteristics of the lots and the neighborhoods in which they are located, on the one hand, and the zoning changes the city imposed, on the other, to test the primary theories about how local governments determine the restrictiveness of zoning.

We find a surprising level of empirical support for the homevoter-based theory, even though New York City is probably the last place in the United States that one would expect to see zoning policy catering to the interests of homeowners, rather than the growth machine. New York City has the lowest homeownership rate of any major city in the nation,[9] for example, and its land-use policies have long been associated with the interests of the real estate industry.[10] Nevertheless, our results show considerable evidence that homeowners have much more influence on land-use policy than the received wisdom about urban land-use politics would predict. The finding that cities may cater to homeowners, even when they are a minority of eligible voters, and even when their interests run counter to those of

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[8]See, e.g., Babcock, supra note 1, at 6–11.

[9]Christopher Mazur & Ellen Wilson, Housing Characteristics: 2010, in 2010 Census Briefs (U.S. Census Bureau No. C2010BR-07), available at <http://www.census.gov/prod/cen2010/briefs/c2010br-07.pdf>.

[10]See, e.g., Tom Angotti, New York for Sale: Community Planning Confronts Global Real Estate (2008); Roger Sanjek, The Future of Us All: Race and Neighborhood Politics in New York City 98 (1998); Marc A. Weiss, Density and Intervention: New York's Planning Traditions, in The Landscape of Modernity: New York City, 1900–1940 46 (David Ward & Oliver Zunz eds., 1997).

the growth machine, suggests that many assumptions about urban land-use policies need to be reexamined.

We begin in Section II by reviewing in greater depth the leading theoretical models of zoning officials' decision making, summarizing what other scholars have demonstrated through existing empirical analysis of zoning decisions, and exploring why the models matter. To set the stage for our analysis, Section II also includes a description of New York City's recent rezoning initiatives and the context in which the rezonings were adopted. In Section III we present our empirical analysis of New York City's recent rezonings. We begin with an explanation of our theoretical model and methodology. We then describe our data set, provide descriptive data about the lots rezoned or studied for rezoning, and report our regression results. Finally, we conclude in Section IV with an analysis of the policy implications of our findings.

II. Background

A. *Theories of Land-Use Decision Making*

Economists, legal academics, and courts all have offered a variety of theories about the primary motivations underlying zoning officials' decisions.[11] The "public interest" model views officials as personally disinterested agents of the public who are seeking to discern and implement policies that would serve the objective common good.[12] In this model, zoning decisions are primarily motivated by a desire to separate "incompatible" land uses and thereby protect residents from the negative externalities of industry, commerce, and density, or to otherwise shape efficient growth.[13]

Other major theories draw from the "public choice" literature, which views government officials as motivated primarily by personal interests, such as the desire for reelection, a larger agency or agenda, or higher office.[14] Zoning decisionmakers may, for example, seek to win reelection by pursuing policies that appeal to the median voter.[15] However,

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[11]By "zoning officials," we mean all public officials, whether elected or appointed, who formally participate in a jurisdiction's land-use regulation decision making, or direct those who do. Because of wide variation in local government structure, the specific officials involved vary widely between jurisdictions.

[12]See, e.g., Lewis D. Hopkins, Urban Development: The Logic of Making Plans (2001); Neil K. Komesar, Housing, Zoning, and the Public Interest, in Public Interest Law: An Economic and Institutional Analysis 218, 219–21 (Burton A. Weisbrod et al. eds., 1978); Frank I. Michelman, Political Markets and Community Self-Determination: Competing Judicial Models of Local Government Legitimacy, Ind. L.J., 53, 145 (1977).

[13]See, e.g., Otto Davis, Economic Elements in Municipal Zoning Decisions, 39 Land Econ. 4 (1963); Christian A.L. Hilber & Frédéric Robert-Nicoud, On the Origins of Land Use Regulations: Theory and Evidence from US Metro Areas, 75 J. Urb. Econ. 29 (2013); Bradley C. Karkkainen, Zoning: A Reply to the Critics, 10 J. Land Use & Envtl. L. 45, 64–78 (1994).

[14]See, e.g., Gordon Tullock, Arther Seldon & Gordon L. Brady, Government Failure: A Primer in Public Choice (2002).

[15]See generally, Fischel, supra note 7, at 72–97; Robert C. Ellickson, Suburban Growth Controls: An Economic and Legal Analysis, 86 Yale L.J. 385, 405–07 (1977); Davis, supra note 13.

public choice theory also suggests that officials may be responsive to interest groups that, though they lack votes, contribute money or manpower to election campaigns, or may provide other benefits, like postgovernment employment.[16] Zoning changes often confer concentrated benefits on individual property owners or small groups of owners, but impose more diffuse costs on other residents. Thus, interest groups have ample incentive to organize and lobby public officials about zoning policies and to aid their campaigns, while other residents are more likely to remain rationally ignorant of particular zoning proposals or lack sufficient incentive to organize in opposition to candidates standing for a particular zoning ideology.

1. The "Homevoter" Theory

Many analysts suggest that the influence of single-family homeowners may be the primary determinant of zoning policy.[17] William Fischel's "homevoter hypothesis" offers the most detailed case for this theory[18] (throughout this article, we use the term he coined to describe not only his specific proposition, but others that likewise focus on homeowners' influence). Fischel argues that in many jurisdictions, homeowners have the greatest influence over government decisions because they control the majority of votes, and they exercise that influence to protect and maximize their housing values.[19] Public officials respond by pursuing land-use, taxation, and spending policies that will increase (or at least maintain) the value of existing single-family housing within the jurisdiction. Though Fischel concedes that developers hold some sway, he dismisses it as "the influence of supplicants and salesmen" given the ultimate fealty of public officials to the interests of homevoters.[20]

Fischel and other proponents are explicit that the homevoter theory applies best in smaller, suburban jurisdictions with higher homeownership rates and fewer municipal

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[16]Ellickson, supra note 15, at 407–10.

[17]See, e.g., Babcock, supra note 1; Fischel, supra note 7; Ellickson, supra note 15; J.M. Pogodzinski & Tim R. Sass, The Theory and Estimation of Endogenous Zoning, 24 Regional Sci. & Urb. Econ. 601 (1994). See also Kristof Dascher, Home Voters, House Prices, and the Political Economy of Zoning (Beiträge zur Jahrestagung des Vereins für Socialpolitik 2012: Neue Wege und Herausforderungen für den Arbeitsmarkt des 21. Jahrhunderts—Session: Political Economy I, No. D10-V1), available at <http://hdl.handle.net/10419/62069>; François Ortalo-Magné & Andrea Prat, On the Political Economy of Urban Growth: Homeownership Versus Affordability (Nov. 14, 2011) (unpublished manuscript) (available at author's website: <http://francois.marginalq.com/documents/OMP_polecon_latest.pdf>).

[18]Fischel, supra note 7.

[19]Id. For critical perspectives on both the descriptive and normative aspects of Fischel's work, particularly the implications for local government service provision to the poor and minorities, see Richard Schragger, Consuming Government, 101 Mich. L. Rev. 1824 (2003) (book review); Lee Anne Fennell, Homes Rule, 112 Yale L.J. 617 (2002) (book review).

[20]Fischel, supra note 7, at 15–16.

policy issues to muddy the political waters.[21] However, Fischel also argues that ward-based voting and logrolling turn homevoters into a powerful political force even in large cities with complex politics.[22] Furthermore, even if they do not constitute a majority in a given jurisdiction, homeowners tend to be wealthier, better educated, better connected, and vote more often than renters.[23] Pleasing homevoters, then, may be the predominant motivation for big-city zoning decisions as well.

Which specific land-use decisions will protect the interests of homevoters will differ between jurisdictions and over time. Nevertheless, the homevoter theory implies several general propositions. First, zoning officials trying to appease homevoters generally will favor land-use regulations that minimize development near existing homeowners. Homeowners are extremely risk averse, wary of any ill effects nearby new development might have on their home values.[24] Additionally, homeowners generally will prefer to limit the number of homes that would compete with theirs when they choose to sell.[25]

Second, local officials focused on homevoters will engage in "fiscal zoning." Because property tax burdens are capitalized into home values, local governments will seek to keep taxes on existing homeowners as low as possible for a given level of public services.[26] To the extent they permit or seek additional development in their jurisdictions, public officials, then, will be motivated to use zoning tools to make sure that new development will contribute at least as much in new tax revenue as its occupants will consume in city services.[27] Otherwise, the development would result in a net transfer from existing residents to new ones, requiring either a reduction in services or an increase in taxes, either of which would reduce the value of current residents' homes.[28]

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[21]E.g., Fischel, supra note 7, at 90–92; Ellickson, supra note 15, at 405–06. Indeed, Fischel not only emphasizes the suitability of his theory for smaller suburban jurisdictions, but dismisses the importance of big cities in an increasingly suburban nation. Id. at 92–93. But see Mark Purcell, The Decline of the Political Consensus for Urban Growth: Evidence from Los Angeles, 22 J. Urb. Aff. 85 (2000) (arguing that homeowner-led anti-growth sentiment has become increasingly important to determining land-use regulation in Los Angeles); Andrew H. Whittemore, Requiem for a Growth Machine: Homeowner Preeminence in 1980s Los Angeles, 11 J. Plan. Hist. 124 (2012).

[22]Fischel, supra note 7, at 92–94. See also James C. Clingermayer, Electoral Representation, Zoning Politics, and the Exclusion of Group Homes, 47 Pol. Res. Q. 969 at 973 (1994).

[23]Ellickson, supra note 15, at 406.

[24]Fischel, supra note 7, at 8–12; William A. Fischel, An Economic History of Zoning and a Cure for its Exclusionary Effects, 41 Urb. Stud. 317, 335 (2004).

[25]See Fischel, supra note 7, at 230; Ellickson, Suburban Growth Controls, supra note 15, at 400; Bruce W. Hamilton, Zoning and the Exercise of Monopoly Power, 5 J. Urb. Econ. 116 (1978); James A. Thorson, An Examination of the Monopoly Zoning Hypothesis, 72 Land Econ. 1, 43–55 (1996).

[26]Fischel, supra note 7, at 39–52.

[27]Id. at 65–67; Pendall, supra note 2 (2000); Pogodzinski & Sass, Theory and Estimation of Endogenous Zoning, supra note 17.

[28]Fischel, supra note 7, at 65–69. But see William C. Wheaton, Land Capitalization, Tiebout Mobility, and the Role of Zoning Regulations, 34 J. Urb. Econ. 102 (1993) (arguing that minimum lot sizes, while helpful, are not crucial for income sorting across jurisdictions to occur).

Third, zoning officials catering to homevoters may seek to limit the entry of particular racial or ethnic groups or the poor into their jurisdiction by zoning out lower-value housing, or specific housing types more likely to be used by those groups.[29] Existing residents may prefer such exclusionary zoning because they fear that larger numbers of residents from those groups will lower home values, reduce the quality of life in the community, or result in strained and lower-quality government services.[30] Or the motivation for exclusionary zoning may simply be naked racial or class animus.[31]

2. The "Growth Machine" Theory

An alternative theory about the motivations for zoning policies focuses on the influence of concentrated interest groups, namely, developers, landowners, and their allies in government and civic life.[32] Such groups are thought to hold particular sway in large cities with diverse electorates and complex politics.[33] Sociologist Harvey Molotch offers the most vivid formulation of this theory with his classic "growth machine" writings.[34] Molotch and his co-author John Logan argue that urban politics and policy making are dominated by a coalition of business, cultural, and government elites united in their shared interest in economic growth. "Place entrepreneurs" maneuver to capture the benefits of this growth by maximizing rents and sales prices of their land holdings.[35] According to Molotch and Logan, zoning merely "inconveniences" development, and the zoning bureaucracy is ultimately controllable through campaign contributions and influence.[36] Poor neighborhoods

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[29]J.M. Pogodzinski, The Effects of Fiscal and Exclusionary Zoning on Household Location: A Critical Review, 2 J. Housing Res. 245 (1991). Where officials' reluctance to allow the poor to live in the jurisdiction is driven by fiscal concerns, the fiscal zoning theories described above would apply.

[30]For example, residents may resist the entry of poor or nonwhite neighbors because of the perceived threat to public school quality, even if the new entrants are fiscally neutral. For a fuller description of such "public goods zoning" and the practical difficulty in distinguishing it from fiscal zoning, see Schragger, supra note 19, at 1845–46; see also William T. Bogart, "What Big Teeth You Have!": Identifying the Motivation for Exclusionary Zoning, 30 Urb. Stud. 1669 (1993).

[31]Of course, zoning decisions motivated specifically by the desire to keep out residents of a particular race or ethnicity violate federal law, but proving intentional discrimination is difficult. See, e.g., Village of Arlington Heights v. Metropolitan Hous. Dev. Corp., 429 U.S. 252 (1977).

[32]See, e.g., Logan & Molotch, supra note 5; Ellickson, supra note 15, at 407; Harvey Molotch, The City as a Growth Machine: Toward a Political Economy of Place, 82 Am. J. Soc. 309 (1977).

[33]Ellickson, supra note 15, at 408; but see Purcell, supra note 21 and Whittemore, supra note 21 (arguing that recent history reveals a greatly weakened growth machine in Los Angeles in the face of growing, homeowner-led anti-growth sentiment).

[34]Molotch, supra note 32; Harvey Molotch, The Political Economy of Growth Machines, J. Urb. Aff. 29–53 (1993); see also Logan & Molotch, supra note 5.

[35]Logan & Molotch, supra note 5, at 29–31, 66.

[36]Id. at 157.

are vulnerable to transformation by the growth machine because poor residents have little political clout and occupy land that could be put to higher valued uses. Wealthier communities, in contrast, are often able to shield themselves from growth and change. In any case, the growth machine values such "deluxe neighborhoods" as tools for attracting corporate executives from other cities.[37] Although land-use officials sometimes may need to build a coalition of support for pro-growth initiatives by catering to homevoters in some neighborhoods in order to secure enough support for growth in the most profitable areas, in general, the focus of land use is on the interests that make up the growth machine.

B. Prior Empirical Tests of the Theories

Several empirical studies seek to test elements of the homevoter hypothesis and growth machine theories, as well as other theoretical predictions about the motivations behind, and determinants of, zoning decisions.[38] Most analyze suburban jurisdictions' current zoning policies. For example, an article from the 1980s by the late Barbara Sherman Rolleston focuses on 185 suburban jurisdictions in northern New Jersey[39] and uses a two-stage regression analysis to assess the relationship between a jurisdiction's zoning practices and various characteristics of the communities that she argues are indicative of different motivations. She finds that the share of vacant land zoned for residential development is inversely related to the share of already developed land zoned for nonresidential purposes, which, she argues, reflects concerns about externalities (public interest motivations). Positive associations between the restrictiveness of residential zoning districts and both higher shares of racial minorities in surrounding communities and a relatively high nonresidential tax base, she concludes, indicate exclusionary and fiscal motivations as well. Rolleston also finds evidence that zoning responds to market demand by allowing for greater density on vacant land closer to employment centers. Although she does not connect this finding to a political economy theory, it could reasonably be construed as evidence for the growth machine theory.

J. M. Pogodzinski and Tim Sass conduct a similar analysis of suburban Silicon Valley jurisdictions in the 1980s, and their results suggest that zoning decisions are consistent with

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[37]Id. at 120–21.

[38]Although not directly relevant to our investigation, there is an additional body of research that tests these theories outside the land-use context. See, e.g., Carolyn A. Dehrning, Craig A. Depken II & Michael R. Ward, A Direct Test of the Homevoter Hypothesis, 64 J. Urb. Econ. 155 (2008) (finding that residential neighborhoods in Arlington, Texas that enjoy the greatest property value benefits of a new football stadium voted for it in higher numbers); Larry Lyon et al., Community Power and Population Increase: An Empirical Test of the Growth Machine Model, 86 Am. J. Soc. 1387 (1981) (finding a correlation between the power of a metropolitan area's local business community and its population growth).

[39]Barbara Sherman Rolleston, Determinants of Restrictive Suburban Zoning: An Empirical Analysis, 21 J. Urb. Econ. 1 (1987).

fiscal, exclusionary, and externality prevention (public interest) purposes, lending weight to the homevoter theory.[40]

James Clingermayer studies the determinants of zoning in 194 suburban jurisdictions located in several metropolitan areas using survey data to estimate the relationship between aspects of the zoning process and demographic characteristics, on the one hand, and the extent to which zoning limits multifamily housing, mobile homes, and small-lot development, on the other.[41] Clingermayer finds that zoning restrictiveness is associated with higher homeownership rates and a "legislative" zoning process (as opposed to a quasi-judicial process, which receives greater judicial scrutiny), but not with home values or median income and percent white (relative to the jurisdiction's metropolitan area). His findings are somewhat supportive of the homevoter theory, but provide no evidence of fiscal or exclusionary motives.[42]

Of the several other studies that focus on suburban zoning and land-use controls, most yield results that are at least consistent with the homevoter theory, albeit solely in the suburban context.[43] However, two studies of primarily suburban jurisdictions in the Boston area find that historical density is by far the best predictor of zoning restrictiveness and find little or no evidence tying restrictiveness to homeowner income, home values, or racial and ethnic composition.[44] Additionally, a recent study of almost 300 municipalities in the Rhône Department of France finds that homeowners exert very little influence over local

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[40]Pogodzinski & Sass, supra note 17. The authors seek to address the problem of endogeneity—particular types of residents may be attracted to communities with certain types of zoning schemes, thus confounding the causal relationship between jurisdiction demographics and zoning characteristics.

[41]James C. Clingermayer, Quasi-Judicial Decision Making and Exclusionary Zoning, 31 Urb. Aff. Rev. 544 (1996). See also James C. Clingermayer, supra note 22 (finding no association between homeownership rate, percent white, or income on the probability that a jurisdiction's zoning excludes group homes).

[42]But see Elizabeth Jean Taylor, Do House Values Influence Resistance to Development?—A Spatial Analysis of Planning Objection and Appeals in Melbourne, 31 Urb. Pol. & Res. 5 (2013) (finding that high housing values are associated with high rates of formal objections to development proposals in jurisdictions in Melbourne, Australia).

[43]In addition to the studies discussed above, see Laurie J. Bates & Rexford E. Santerre, The Determinants of Restrictive Residential Zoning: Some Empirical Findings, 34 J. Regional Sci. 253–63 (1994) (finding evidence of externality, fiscal, and poverty-based exclusion motivations in Connecticut jurisdictions in the 1960s); Jan K. Brueckner, Testing for Strategic Interaction Among Local Governments: The Case of Growth Controls, 44 J. Urb. Econ. 438 (1998) (finding that that growth controls are more likely in California jurisdictions with high home values, low densities, and that are near other communities that recently enacted controls, though income has no effect); John F. McDonald & Daniel P. McMillen, Determinants of Suburban Growth Controls: A Fischel Expedition, 41 Urb. Stud. 341 (2004) (finding that the relationship between growth controls in Chicago suburbs and several geographic and demographic characteristics are consistent with Fischel's hypothesis); Elizabeth Jean Taylor, Do House Values Influence Resistance to Development?—A Spatial Analysis of Planning Objection and Appeals in Melbourne, 31 Urb. Pol. & Res. 5 (2013) (finding that high housing values are associated with high rates of formal objections to development proposals).

[44]Bengte Evenson & William C. Wheaton, Local Variations in Land Use Regulations, Brookings-Wharton Papers on Urb. Aff. 221 (2003); Edward L. Glaeser & Bryce A. Ward, The Causes and Consequences of Land Use Regulation: Evidence from Greater Boston, 65 J. Urb. Econ. 265 (2009).

growth-control policy compared to the influence of landlords and owners of undeveloped land.[45]

A second strain of empirical work analyzes existing zoning at the metropolitan-area level, which broadens the inquiry to include at least some urban jurisdictions, but introduces several other methodological challenges. In an early study, Eric Branfman, Benjamin Cohen, and David Trubek investigate the correlation between the clustering of poor residents in metropolitan areas (MSAs) (which they presume is due at least in part to exclusionary and fiscal zoning) and several variables designed to approximate the incentives for fiscal and exclusionary zoning.[46] They find that higher levels of clustering among poor residents are correlated with the share of an MSA's population that is black and Latino and the number of separate zoning jurisdictions within an MSA.[47] The authors find no significant correlation between the clustering of poor residents and incentives for fiscal zoning.[48]

More recently, Christian Hilber and Frédéric Robert-Nicoud test an "influential landowner" explanation of land-use regulations using estimates of developed and undeveloped land area for 95 MSAs as of 1992 and the Wharton Residential Land Use Regulatory Index, which rates MSAs as of 2006 based on the aggregate strictness of the land-use regulations used by the MSA's individual jurisdictions.[49] The authors hypothesize that zoning boards set land-use regulations in response to lobbying by two competing interest groups: owners of vacant land, who prefer weaker regulations, and owners of land that has already been developed, who prefer stronger controls. Importantly, this second group is composed not just of homeowners, but also of residential landlords and commercial property owners, so its strength is rooted in more than majoritarian voting and its interests are more diverse than Fischel's homevoter block. The authors test their theory by estimating the effect of the share of the MSA's developable land that is already developed (a measure of the relative political strength of the owners of those developments) on the MSA's regulatory restrictiveness, and find this effect to be significant and positive. The authors also find in most of their regressions that neither MSA-level homeownership rate nor population density have the same positive association with regulatory strictness, which they interpret as a rejection of the homevoter hypothesis and the public interest explanation of zoning motivation. However, their use of metropolitan areas rather than individual

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[45]Katharina Schone et al., Modeling Local Growth Control Decisions in a Multi-City Case: Do Spatial Interactions and Lobbying Efforts Matter? 154 Pub. Choice 95 (2013).

[46]Eric J. Branfman et al., Measuring the Invisible Wall: Land Use Controls and the Residential Patterns of the Poor, 82 Yale L.J. 483 (1973).

[47]Id. at 500.

[48]Id.

[49]Hilber & Robert-Nicoud, supra note 13. See also Albert Saiz, The Geographic Determinants of Housing Supply, 125 Q.J. Econ. 1253 (2010) (using data similar to Hilber and Robert-Nicoud and finding that higher housing prices, population growth, and geographical constraints on buildable land area lead to more restrictive metro-level land-use regulation).

political jurisdictions as the unit of analysis for both regulatory restrictiveness and homeownership rate casts some doubt on the significance of the results.[50]

A third group of studies focuses, like ours, on zoning *changes* rather than existing zoning. This allows researchers to differentiate decisions that zoning officials make from the zoning conditions they inherit from earlier periods. In a study from the late 1980s, Arnold Fleischmann describes more than 2,000 rezoning applications in the Atlanta metropolitan area in 1984, and finds that objections were raised to only 40 percent of the requests, generally only by a small number of people.[51] Even when objected to, most of these requests were approved (at least in some form), which may be inconsistent with the homevoter-based theory. Fleischmann also finds, however, that applications to rezone land to permit multifamily housing were denied at relatively high rates compared to other requests, consistent with fiscal and exclusionary motivations.

In another descriptive study of Atlanta rezoning applications, Dudley S. Hinds and Nicholas Ordway track the disposition of the applications by the racial composition of the Census tracts where the subject properties were located.[52] They find that between 1955 and 1965, when the city's politics were dominated by white officials, rezoning applications for properties in predominantly white tracts were rejected at a statistically significantly higher rate than those in predominantly black tracts. Between 1970 and 1980, however, following rapid gains by blacks in city government, the rejection rate for applications in the two groups of tracts was virtually identical. Although the findings do not point to a specific motivation of zoning officials, they underscore the political nature of rezonings and the potential significance of racial considerations in decision making.[53]

In one of the few studies to focus on urban rather than suburban land, Henry Munneke analyzes a sample of 772 vacant parcels in Chicago that were transacted from

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[50]Furthermore, in highly urbanized areas without significant suburban fringe, the practical difference between the two groups in Hilbert and Robert-Nicoud's framework (or at least their urban analogs) is somewhat blurred. In the absence of developable greenfields, land occupied by relatively small or old structures may function simultaneously as existing development and as effectively vacant, developable land that can be redeveloped at a higher density.

[51]Arnold Fleischmann, Politics, Administration, and Local Land-Use Regulation: Analyzing Zoning as a Policy Process, 49 Pub. Admin. Rev. 337 (1989); see also Arnold Fleishman & Carole Pierannunzi, Citizens, Development Interests, and Local Land Use Regulations, 52 J. Pol. 838 (1990) (finding that neither citizen opposition nor developer presence were accurate predictors of a rezoning application's probability of approval). But see Eric H. Steele, Participation and Rules—The Functions of Zoning, 1986 Am. B. Found. Res. J. 709 (finding that citizen opposition and support to rezoning proposals in Evanston, Illinois were correlated with their outcomes).

[52]Dudley S. Hinds & Nicholas Ordway, The Influence of Race on Rezoning Decisions: Equality of Treatment in Black and White Census Tracts, 1955–1980, 14 Rev. Black Pol. Econ. 51 (1986).

[53]See also Daniel P. McMillen & John F. McDonald, A Markov Chain Model of Zoning Change, 30 J. Urb. Econ. 257 (1991) (uses regression analysis to identify the determinants of zoning changes for 260 10-acre tracts in suburban Chicago between 1961 and 1981). Controlling for land prices, the authors estimate the effects of several geographical variables, including proximity to rail lines, highways, and key local and regional destinations, on a tract's likelihood of having changed zoning characteristics. Although they conclude from their results that the land-use patterns that emerge from the zoning changes are likely driven by externality concerns, the authors do not otherwise weigh in on the political economy of zoning decisions, and do not even include demographic variables in their analysis.

1986 to 1993.[54] The author finds that for parcels initially zoned for commercial, business, or industrial uses (but not residential), as the difference between the estimated value of the property under an alternative zoning category and its existing value increases, so does the probability of it being rezoned. The only control variables Munneke used are geographic characteristics, such as proximity to transportation, but the results support the notion that zoning changes tend to follow the market, even in mature cities, which is broadly consistent with the growth machine theory.

Finally, Adesoji Adelaja and Paul Gottlieb analyze the political economy of substantial downzonings intended to preserve open space in the suburban fringes of New Jersey.[55] They find that jurisdictions are more likely to enact substantial downzonings if they have low measures of farmer political clout.

C. Why the Theoretical Model of Decision Making Matters

In recent decades, land-use decisions by zoning boards and city councils have inspired a raft of intense criticism. The restrictive zoning thought to be ubiquitous in suburbia, for example, is blamed for unfairly excluding poor and minority households from employment opportunities, social networks, and high-quality education and other public services, resulting in increased racial and class segregation and inequality.[56] Restrictive zoning also likely drives up regional housing prices[57] and stifles economic growth by preventing workers from migrating to the country's most productive urban areas.[58] On the other hand, a separate group of critics sees zoning as too easily manipulated by special interests, allowing developers to foist unwanted growth onto existing communities.[59] Each of these conflicting

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[54]Henry J. Munneke, Dynamics of the Urban Zoning Structure: An Empirical Investigation of Zoning Change, 58 J. Urb. Econ. 455 (2005).

[55]Adesoji O. Adelaja & Paul D. Gottlieb, The Political Economy of Downzoning, 38 Agricultural & Resource Econ. Rev. 181 (2009).

[56]See, e.g., Branfman, supra note 46; Ganong & Shoag, supra note 4; Pendall, supra note 2; Jonathan Rothwell & Douglas S. Massey, The Effect of Density Zoning on Racial Segregation in U.S. Urban Areas, 44 Urb. Aff. Rev. 779 (2009); Jonathan Rothwell, Housing Costs, Zoning, and Access to High Scoring Schools (Brookings, Apr. 2012), available at <http://www.brookings.edu/~/media/research/files/papers/2012/4/19%20school%20inequality%20rothwell/0419_school_inequality_rothwell>.

[57]See, e.g., Glaeser & Gyourko, supra note 2; Jenny Schuetz, No Renters in My Suburban Backyard: Land Use Regulation and Rental Housing, 28 J. Pol'y Analysis & Mgmt. 296 (2009); Thorson, supra note 25; Jeffrey Zabel & Maurice Dalton, The Impact of Minimum Lot Size Regulations on House Prices in Eastern Massachusetts, 41 Regional Reg'l Sci. & Urb. Econ. 571 (2011). But see John M. Quigley & Larry A. Rosenthal, The Effects of Land Use Regulation on the Price of Housing: What Do We Know? What Can We Learn? 8 Cityscape 69 (2005) (identifying limitations to prior research relating land-use regulation to regional housing prices).

[58]See, e.g., Avent, supra note 4; Raven E. Saks, Job Creation and Housing Construction: Constraints on Metropolitan Area Employment Growth, 64 J. Urb. Econ. 178 (2008).

[59]See, e.g., Logan & Molotch, supra note 5; Jon C. Dubin, From Junkyards to Gentrification: Explicating a Right to Protective Zoning in Low-Income Communities of Color, 77 Minn, L. Rev. 739 (1993); Joel Kotkin, Let L.A. Be L.A., 33 City J. 3 (2012).

perspectives implies a different theory of zoning decision making: one views zoning officials as too deferential to the parochial preferences of local residents; the other views developers as running roughshod over their neighborhoods and the officials supposedly representing them.

Both schools of criticism are in some measure responsible for judicial decisions and legislative measures that seek to provide checks against undue developer influence over the zoning process and, to a lesser degree, seek to reduce the inefficiencies and unfairness resulting from parochial uses of zoning. Courts primarily have instilled checks by heightening the scrutiny accorded to particular types of zoning decisions.[60] Many of the cases developing these alternative standards of review have turned on the court's understanding of the motivations behind the challenged zoning action.[61] Thus in *Fasano v. Board of County Commissioners of Washington County*, the court justified its decision to treat a challenged rezoning as a "quasi-judicial action" and, accordingly, subject it to a more stringent review, by citing the threat of "almost irresistible pressures that can be asserted by private economic interests on local government."[62]

On the other hand, in *Snyder v. Board of County Commissioners*, a Florida appeals court adopted the *Fasano* approach in defense of a landowner whose request for a rezoning had been denied.[63] The court described at length a regulatory playing field in which vacant land is deliberately underzoned, forcing owners to negotiate upzonings, which, in turn, are granted primarily based on "whose ox is being fattened or gored by the granting or denial of the rezoning request."[64] The Florida Supreme Court reversed some aspects of the lower court's holding, but upheld the heightened scrutiny approach after citing Richard Babcock's complaint of rampant "neighborhoodism" as a threat to zoning administration.[65] Again, assumptions about the political economy of zoning appear to have been central to the decision.

In decisions that have confronted the broader societal effects of fiscal and exclusionary zoning head on, judges also have tied their holdings inextricably to theories of decision making. Most notably, in *Southern Burlington County NAACP v. Township of Mount Laurel*, the zoning municipality was explicit that its motive for adopting restrictive land-use controls

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[60]For a discussion of the evolving standards of review, see Mandelker & Turlock, supra note 3; see also Robert J. Hopperton, The Presumption of Validity in American Land-Use Law: A Substitute for Analysis, a Source of Significant Confusion, 23 B.C. Envtl. Aff. L. Rev. 301 (1996) (arguing that the concept of presumptions be jettisoned altogether rather than reformed).

[61]See Kenneth A. Stahl, The Significance of Reliance in Land Use Law, BYU L. Rev. (forthcoming), available at <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2237644##>.

[62]Fasano v. Board of County Comm'rs, 264 Or. 574, 588 (Or. 1973).

[63]Snyder v. Board of County Comm'rs, 595 So. 2d 65 (Fla. Dist. Ct. App. 5th Dist. 1991), *quashed*, 627 So. 2d 469 (Fla. 1993).

[64]Snyder v. Board of County Comm'rs supra note 63, at 73.

[65]Board of County Comm'rs v. Snyder, 627 So. 2d 469, 472 (Fla. 1993).

was, in the court's words, the "present and future fiscal interest of the municipality and its inhabitants."[66] Extrapolating from this candid admission, the court's landmark decision implicitly (though perhaps not unreasonably) assumed that local officials' allegiance to narrow homevoter interests left little room for successful lobbying by multifamily developers or housing advocates. As a result, the court imposed its now infamous "fair share" requirement.

Models of zoning decision making also are central to efforts to reform zoning practice through legislative means. Some reform efforts have sought to boost the influence of local residents out of an implicit concern that growth interests hold too much sway over professional land-use decision making. This is evident, for example, in the development of some community-based planning models and the increased use of direct democracy to advance land-use regulation.[67] In contrast, legislation enacted in a handful of states in response to concerns about exclusionary and fiscal zoning implies a theory of decision making rooted in the narrow interests of homevoters.[68] For example, Massachusetts's "anti-snob zoning act" provides affordable-housing developers a special right of appeal to a state, rather than local, agency if their application is denied or unduly burdened.[69]

A better empirical understanding of zoning decision making would help judges, legislators, and policymakers craft more effective reforms to zoning processes. If the evidence supports the theory that homevoters' risk aversion usually wins out in local land-use decisions even in urban areas, for example, that finding would add weight to calls for shifting authority to higher levels of government or regional bodies, imposing financial sticks,[70] providing home-value insurance, or forcing local governments to adhere to comprehensive plans or targets, like the "zoning budget" recently proposed by Roderick Hills and David Shcleicher.[71] If, instead, the evidence supports the view that zoning officials are part of the growth machine, as has traditionally been assumed in large cities, the approach of reformers will need to look quite different.

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[66]South Burlington County NAACP v. Mt. Laurel, 67 N.J. 151, 157 (N.J. 1975).

[67]See, e.g., Elisabeth R. Gerber & Justin H. Phillips, Direct Democracy and Land Use Policy: Exchanging Public Goods for Development Rights, 41 Urb. Stud. 463 (2004); Robert Heckel, The Manoa Valley Special District Ordinance: Community-Based Planning in the Post-Lucas Era, 19 Haw. L. Rev. 449 (1997).

[68]For a review of state legislation addressing exclusionary zoning, see Robert C. Ellickson et al., Land Use Controls, Cases and Materials 779–84 (4th ed. 2013).

[69]Mass. Gen. Laws ch. 40B (2013).

[70]See, e.g., Ellickson, supra note 15, at 494–509.

[71]Roderick M. Hills, Jr. & David N. Schleicher, Balancing the Zoning Budget, 62 Case W. Res. L. Rev. 81 (2011). Hills and Schleicher propose a system in which city government must periodically set a binding development target with which subsequent rezoning actions would cumulatively have to comply. By agreeing ex ante on city-wide goals, public officials would thereby staunch the ratcheting down of development capacity in much of New York City that has resulted from piecemeal, unlinked zoning actions supported by what are in essence pockets of homevoters.

D. Rezonings in New York City During the Bloomberg Administration

The rapid pace of recent rezoning activity in New York City offers a unique opportunity to shed some light on the politics underlying land-use regulations. Between the time Mayor Bloomberg took office in 2002 and the end of 2009, the city's DCP proposed, and the City Planning Commission (CPC) and City Council passed, more than 100 significant rezoning initiatives.[72] Almost all the initiatives consisted of (or included) zoning map changes that shifted lots into new zoning districts. By our calculations, these zoning map changes cumulatively affected more than 20 percent of the city's land area (excluding public rights of way, waterways, and mapped parks).[73]

Each individual rezoning project involved one or more zoning map change that affected areas ranging in size from a handful of lots to dozens of adjacent blocks, and within many of the projects, there was considerable variation in how different lots were rezoned. Some lots were considered for rezoning, but then left unchanged. In some cases, new zoning districts were applied to whole blocks, while in others, the new zoning district lines cut through blocks and treated adjacent lots differently. Some changes significantly increased or decreased the permitted bulk of new development that could occur on an affected lot, or changed its allowable uses, but some changes revised other restrictions applicable to new development on a given lot, without explicitly changing the amount of permitted development or the general use category. Those changes, which were often meant to ensure that new development was "contextual" or aesthetically harmonious with a neighborhood's existing buildings, included revisions to the front or side yard requirements, height limits, off-street parking requirements, minimum lot sizes, and prohibitions on attached housing.

City-initiated rezoning projects such as these[74] begin when the DCP identifies an area to study, either in response to neighborhood or landowner pressure or on its own initiative. After local consultations, the DCP proposes changes to zoning district boundaries and zoning classifications in some or all of the study area and triggers the City Environmental Quality Review (CEQR) process.[75] Under CEQR, the CPC determines whether the proposed change is likely to have a significant adverse environmental impact.[76] If not, the DCP certifies the proposal for formal entry into the city's Uniform Land Use Review Procedure

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[72]For a timeline of the rezoning actions, see Timeline on Neighborhoods Count: Celebrating DCP Rezonings, NYC.gov <http://www.nyc.gov/html/dcp/html/rezonings/rezonings3.shtml (last visited Aug. 2, 2012).

[73]Our data are described in Section III.B. We focus on the rezonings completed through 2009; as of fall of 2013, there have been about 22 more.

[74]All these rezonings were proposed and championed by the city's DCP. Throughout this period, other parties, namely, private landowners and civic associations, also applied for zoning map changes, but these generally affected individual lots or small groups of lots in anticipation of specific projects. We do not include these zoning changes in our analysis because, unlike the zoning changes in our sample, the role of public officials was limited to approval or denial.

[75]43 Rules of the City of N.Y. § 6-01.

[76]62 Rules of the City of N.Y. §§ 5-03, 5-05.

(ULURP).[77] If so, a full environmental impact review is required before ULURP can begin.[78]

Under ULURP, the proposed rezoning project must first be referred to the affected area's community board (which consists of area residents and other stakeholders appointed by the borough president).[79] The community board then will hold a public hearing on the proposed project; often, that hearing is the site of extensive community debate about the project's various elements. The board then votes on a written recommendation to the CPC to approve, modify, or oppose the proposed rezoning project.[80] The community board's recommendations are advisory only; it has no official veto or approval power. The rezoning project is then sent to the borough president, an official elected by voters at the borough (county) level.[81] The borough president may hold additional public hearings and, like the community board, may issue a recommendation to the CPC to approve, modify, or deny the proposed project, but this recommendation, too, is advisory only.[82] The proposal is next considered by the CPC, which is made up of 13 members: seven appointed by the mayor, one appointed by each borough president, and one appointed by the public advocate (a city-wide elected office).[83] The CPC then votes whether to recommend the proposed project to the City Council for final approval, to modify the proposal to take account of the reaction of the community board or borough president before sending to the City Council, or to withdraw the proposal.[84] Finally, the City Council considers the proposal;[85] between September 2002 and 2009, each of the city-initiated rezoning projects presented to the City Council ultimately was approved, though some with modifications.[86] As would be expected, none of the rezoning projects initiated by the DCP have been vetoed by Mayor Bloomberg.[87]

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[77]Id.

[78]Id., § 2-02(a)(5).

[79]N.Y.C. Charter § 197-c. At least half of all members of a community board must be nominees of city council members representing part of the community district. Id., § 2800.a.

[80]Id., § 197-c.e.

[81]Id.

[82]Id., § 197-c.g.

[83]Id., § 192.

[84]Id., § 197-c.h.

[85]Id., § 197-d.

[86]E.g., the Jan. 19, 2005 adoption of the "Hudson Yards" zoning map changes (N.Y.C. Land Use Application 20040499(A)ZMM).

[87]The mayor does have the right to veto a rezoning decision, but the veto can be overridden by a vote of two-thirds of the City Council. Id.

In proposing each of the individual rezoning projects, the DCP cites specific planning goals, including protecting existing residential neighborhoods from out-of-context development, changing the permitted uses of areas to encourage economic and residential development, and focusing higher-density development in transit-rich areas.[88] These individual zoning changes, accordingly, may serve local interests, but also constitute the building blocks of the city's overall planning and development strategies and goals.[89]

The first several years of this period of rezoning activity (which continues as of 2013, the final year of Mayor Bloomberg's third and final term) coincided with a widespread real estate boom in the city: residential properties appreciated by 41 percent on average between 2003 and 2006;[90] redevelopment of undeveloped or underdeveloped sites increased significantly; and the number of residential building permits issued annually doubled between 2001 and 2006.[91] This period of growth invited significant pushback at times by residents concerned by local "out-of-context" developments. Though such concerns are longstanding,[92] fears of "overdevelopment" accelerated during the building boom of 2001 to 2006.[93] The period was also characterized by heightened competition for land between existing manufacturing uses and new residential or service uses.[94]

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[88]See, e.g., New York City Department of City Planning, "Kew Gardens and Richmond Hill Overview," at: <http://www.nyc.gov/html/dcp/html/kewgardens/index.shtml (last accessed on June 23, 2009); and New York City Department of City Planning, "Bensonhurst Overview," at: <http://www.nyc.gov/html/dcp/html/bensonhurst/index.shtml (last accessed on June 23, 2009).

[89]The city also has expressed its broad, city-wide planning goals in PlaNYC 2030, its long-term sustainable development plan, as well as in the DCP's strategic plan. PlaNYC 2030, produced by the city's Office of Long Term Planning and Sustainability, lays out an agenda for the city's land-use and housing development, air and water quality, transportation infrastructure, energy use and production, and preparedness for climate change. PlaNYC 2030 sets a goal of adding 265,000–500,000 units to the city's housing supply by 2030, particularly in areas well served by public transit. City of New York, PlaNYC: A Greener, Greater, New York (2007). DCP's strategic plan articulates the city's more immediate planning goals, including strengthening regional business districts, facilitating housing production (again focused near transit), and fostering mixed-use developments, while also protecting "neighborhood character." New York City Department of City Planning, Shaping the City: A Strategic Blueprint for New York City's Future (2009), available at: <http://www.nyc.gov/html/dcp/html/about/strategy.shtml>.

[90]Vicki Been, Ingrid Gould Ellen, Josiah Madar & Simon McDonnell, Underused Lots in New York City (Lincoln Inst. of Land Policy Working Paper, 2009), available at <https://www.lincolninst.edu/pubs/1682_Underused-Lots-in-New-York-City>.

[91]Furman Ctr. for Real Estate & Urban Policy, State of New York City's Housing and Neighborhoods 2009, at 13 (2010).

[92]Alan. S. Oser, Perspectives: High-Rise Housing; The Stakes in "Contextual Zoning", NY Times, Mar. 2, 1986, <http://www.nytimes.com/1986/03/02/realestate/perspectives-high-rise-housing-the-stakes-in-contextual-zoning.html?pagewanted=all>.

[93]See, e.g., New York City Department of City Planning, "Mayor Michael R. Bloomberg and Queens Borough President Helen Marshall Announce the Rezoning of Queens Neighborhoods to Help Curb Over-Development," Press Release # 150-04 (2004).

[94]Laura Wolf-Powers, Up-Zoning New York City's Mixed-Use Neighborhoods: Property-Led Economic Development and the Anatomy of a Planning Dilemma, 24 J. Plan. Educ. & Res. 379 (2005).

After approximately 2007, however, when the city began to feel the foreclosure crisis and economic recession, property values fell, and after 2008, building activity slowed significantly.[95]

III. Empirical Analysis

The parts of New York City that the DCP considered for rezoning during the Bloomberg administration encompass hundreds of thousands of separate lots. By investigating the association between the treatment of these lots and various lot and neighborhood characteristics, we are able to test several hypotheses that follow from the homevoter and growth machine theories of zoning motivation.

A. *Methodology*

1. Conceptual Model

For each lot that the DCP included in a rezoning project study area, we consider four alternative outcomes. A lot is "upzoned" if the rezoning increases the amount of allowable residential development on that lot, "downzoned" if the rezoning decreases the amount of allowable residential development, "non-FAR rezoned"[96] if the rezoning subjects the lot to different regulations that do not materially affect its zoned residential capacity, and "not rezoned" if the lot, though located inside a study area, is not affected by the resulting rezoning.[97] The upzoning and downzoning outcomes include fundamental use-type changes (e.g., from a manufacturing zone that permits no residential to any zone that does), and in contrast to many of the earlier studies, our upzone, downzone, and non-FAR rezone categories also include changes that shift a lot from one residential category to another residential category. Although there is a fifth outcome that applies to lots outside of the study areas—not officially being considered for a rezoning—we believe that the areas selected for formal study are likely to be fundamentally different from those not studied at all.[98]

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[95]Furman Ctr. for Real Estate & Urban Policy, State of New York City's Housing and Neighborhoods 2010, at 38 (2011).

[96]As described further in Section III.B.1., "FAR" refers to "floor area ratio," the primary regulatory constraint on building bulk in New York City's zoning code.

[97]We note that "upzone" and "downzone" are used inconsistently in the literature. We use the terms to describe the change in allowable density on a parcel (e.g., after an upzoning, a parcel can be developed with more density). Sometimes, people use "up" or "down" to refer to the strictness of regulations, which effectively gives them the opposite meanings.

[98]As described in Section II.D., all the rezoning projects formally entered into ULURP by the DCP were approved, though not every lot inside a subject area was actually rezoned. We have no data about potential rezoning projects that the DCP studied internally but declined to enter into the formal land-use process so are unable to incorporate those lots into our model.

Accordingly, the most relevant comparison is between the up, down, and non-FAR rezonings and the lots that were considered for rezoning but then not rezoned.[99]

As described above, the rezoning process in New York City is complex, involving a large number of public officials in several stages, and each rezoning affects many lots at once. We model this process, simplistically to be sure, as a single independent rezoning decision made by "the city" for each of the hundreds of thousands of lots located in a rezoning project study area. In our model, the city bases each decision to varying degrees on several characteristics of the lot, the lot's location, and the neighborhood where the lot is located. If an entire block made up of several lots is rezoned in the same fashion, we treat this as multiple individual decisions based on the characteristics of each individual lot (which are often identical in these circumstances).

We focus on the following explanatory variables because of their association (described alongside our results in Section III.D.) with the growth machine and homevoter theories:

1. The proximity and quality of fixed infrastructure and city services, including existing and planned rail stations, express bus stops, parks, and well-performing public schools;
2. Neighborhood market growth, including house price trends, building activity, and population change;
3. Neighborhood demographics, including the race and income of residents and the homeownership rate; and
4. Voter turnout.

We also include as controls several other independent variables that do not bear directly or clearly on the theories we are testing. For example, we recognize that, all else equal, the city makes zoning decisions at least in part to ensure efficient use of its infrastructure, whichever of the two primary theories of motivation holds. Accordingly, in addition to proximity to uncongested and planned rail stations, which is one of our key explanatory variables, we also control for proximity to congested rail stations and whether a lot is in a school district that is already overcrowded.

Based on the city's stated goal for many of its rezonings, we also include as controls several lot and block characteristics that proxy for the types of neighborhood "character" that the city's planners seek to protect from "out-of-context" development. These variables include the typical building type on a block (e.g., detached single-family home, other low-rise residential, other), whether a lot is on a wide or narrow street, whether the typical building on the block was built before 1940, any official historic designation, and whether a relatively high share of the block is made up of vacant land. To account for zoning activity that is in reaction to specific out-of-context development, we also control for whether there

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[99]We recognize that comparing the outcomes of only those lots considered for rezoning, rather than the outcomes of all lots (regardless of whether considered for rezoning) runs the risk that the relationships we find are endogenous to the choice of the areas studied for rezonings. But comparing the rezoned lots to all other lots would run the risk that we were ignoring substantial differences between those areas studied for rezoning and those areas that were never seriously considered for change.

was recent construction on the block that is significantly larger or taller than the existing buildings. Because we are separately testing for income, race, and other characteristics, these physical characteristics will not simply proxy for social variables that would instead suggest other motivations.

We also include the following control variables, which have no clear relationship to the homevoter or growth machine theories but may be important determinants of rezoning decisions: for lots where no residential use is currently permitted, whether the Census block has a relatively high number, or relatively low number, of jobs that new development might displace; whether the city has targeted the surrounding area for city-financed affordable-housing development; the share of tract residents with college degrees; and whether the city council member representing the district where the lot was located was on a key committee in the years prior to the enactment of the applicable rezoning project.

Because there may be differences between the boroughs that make a particular kind of rezoning for a particular lot more or less likely, we also control for time-invariant trends within the boroughs of the city by including borough fixed effects.[100] Finally, we control for the existing building bulk on each lot and the existing zoning regulations, which determine the practical meaningfulness of a rezoning and, in some cases, whether a given rezoning outcome is even possible.[101] A full list of the explanatory and control variables and their definitions is in Appendix 1.

To estimate the relationship between these variables and the probability that a lot will receive a particular kind of rezoning, we run multinomial logit regressions in which the probability of any of our three rezoning outcomes (relative to the fourth outcome of being studied but not rezoned) is a function of these variables.[102] Specifically, in our model's multinomial logit framework, the probability of each of the four outcomes (upzoned, downzoned, non-FAR rezoned, or no rezoning) is given by:

$$\mathrm{PROB}(\mathrm{O_i} = \mathrm{j}) = \frac{e^{\beta_j X_\mathrm{i}}}{1 + \sum_{j=1}^{3} e^{\beta_j X_\mathrm{i}}}, \text{ for } \mathrm{j} = 1, 2, 3$$

$$\mathrm{PROB}(\mathrm{O_{it}} = \mathrm{j}) = \frac{1}{1 + \sum_{j=1}^{3} e^{\beta_j X_{it}}}, \text{ for } \mathrm{j} = 4,$$

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[100]As described in Section II.B.1, our method for determining the rezoning outcome for each lot does not specify the year that the study area's rezoning was enacted. For this reason we cannot control for changes in the rezoning strategy over time. Because the rezonings were all done by the same administration, however, we do not expect that there would be considerable differences in strategy over the seven-year study period.

[101]For example, lots with zero residential development capacity cannot be downzoned and lots in the highest density zoning districts cannot be upzoned.

[102]This modeling structure is a product of experimentation with several different iterations, including simple simultaneous binary logits and more parsimonious models that focused on each individual rezoning outcome.

where PROB(O_{it} = j) is the probability that the *i*th lot will have rezoning outcome *j*, with outcome 4, no rezoning after study, as the reference outcome, X_i are the explanatory variables, and β_j are the coefficients to be estimated.

We include the non-FAR rezoning outcome in our model because it is a frequent and important alternative to upzoning and downzoning, but we cannot use non-FAR rezonings to test the theories of decision making. The non-FAR rezonings are something of a "black box"—very little is understood about how they will affect development. Some experts argue that they will essentially function like historic preservation, preventing any new development that does not replicate the existing building types, and therefore functioning like a downzoning. Others argue that at least in some instances, they will allow denser development, and will function like an upzoning. We hope to unpack the effect that the non-FAR rezonings have on development—an important issue because "contextual" zoning is spreading across the country—but must defer that to another day.

2. Testing the Homevoter and Growth Machine Theories

The homevoter and growth machine theories each suggest specific hypotheses about the effects certain explanatory variables will have on the probability that a lot will be rezoned in a given way. In some cases, the hypotheses based on the two theories match, but where they conflict, the results of our regressions can serve as evidence that one theory explains the primary motivations behind New York City's zoning decisions better than the other theory. For example, if the homevoter theory correctly describes the motivations of officials, we would expect that neighborhoods with higher homeownership rates, all else equal, will be particularly likely to be downzoned. We would expect no such association if zoning policy is set in accordance with the growth machine, however. Accordingly, a finding that lots in areas with high homeownership rates were more likely to be downzoned would lend support to the homevoter theory. We describe our hypotheses for each set of lot and neighborhood characteristics in our review of the regression results in Section III.D.

B. Data Sources and Variable Definitions

Our data consist of a detailed database of about 811,000 lots in New York City, of which about 230,000 were located in DCP-defined rezoning project study areas.[103] We augment our core data set by incorporating GIS and zoning analysis, Census-tract-level data from the

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[103]We create the core of the database by matching the 2003 version of the New York City Department of Finance's Real Property Assessment Data (RPAD) (which includes basic information about every parcel of land in New York City, including the zoning district in which it is located) to the 2003 version of LotInfo, a privately produced data set that geocodes each lot to shape files on a basemap. We use GIS to identify which lots are located inside a rezoning study area defined by DCP. We then match each 2003 lot to the 2009 version of RPAD to create a panel for tracking zoning district changes. For lots that change identification numbers, are combined with other lots, or are split into multiple lots between 2003 and 2009, we use a spatial matching process in GIS that overlays the 2003 LotInfo basemap onto the basemap released by the city with the 2009 version of its Primary Land Use Tax Output (PLUTO) data set. This allows us to associate these 2003 lots with the corresponding, altered, 2009 lots in RPAD. If we are unable to match a 2003 lot to any lot in 2009 RPAD data, we omit it from our sample. Less than 3 percent of the raw LotInfo data set with geographic data was dropped for this reason, so our sample is extremely comprehensive.

U.S Census, New York City administrative data, and additional variables we construct from these and other sources described below. The data sources and definitions of all variables are summarized in Appendix 1.

1. Rezoning Outcome Variables

We define our rezoning outcomes as follows: a lot is downzoned if it is in a different zoning district in 2009 than it was in 2003 and if its estimated residential capacity decreases by more than 10 percent;[104] upzoned if the lot is in a different zoning district in 2009 than in 2003 and if its estimated residential capacity increases by more than 10 percent or if it increases any amount from a 2003 value of zero; non-FAR rezoned if the lot is in a different zoning district in 2009 but its capacity changes by less than 10 percent; and not rezoned only if the lot is in the same zoning district in 2009 as it was in 2003 despite having been included in a DCP-designated study area for a rezoning project that was later adopted. We use the 10 percent threshold when defining our outcome variables to distinguish form- or context-based zoning changes that incidentally alter a lot's residential development capacity from changes more focused on increasing or decreasing the amount of permitted building bulk.

There are several important caveats to our core outcome measures. First, the estimates of zoned residential capacity rely on a somewhat simplistic interpretation of New York City's zoning code in order to translate its extreme complexity into a single square footage number for each lot. Specifically, the estimates are based solely on the maximum floor area ratio (FAR), the most significant single constraint on building bulk in New York's zoning code.[105] The estimate does not take into account height limits, side-yard requirements, minimum-parking requirements, and similar additional constraints that might effectively reduce the amount of floor area that can legally be built on some sites.

Further, the estimates are of residential capacity only. For a small minority of lots (those in high-density commercial zones for which the maximum allowable FAR for commercial development is higher than that for residential development), our estimate understates the total capacity for new development. We also note that the capacity estimates are of "paper" capacity only, and do not reflect factors that would bear on the likelihood of a lot actually being developed to its full zoned capacity, such as the size and age of any

[104]We estimate each lot's 2003 and 2009 zoned residential capacity (measured in square feet of building area) based on an analysis of New York City's zoning code, the lot's land area, and certain other relevant lot characteristics. This process is an expansion of the method we used to estimate zoned capacity in Been et al., supra note 90. By looking at the applicable zoning district in 2003 and 2009 and at any change in zoned capacity over this period, we then determine whether the lot was rezoned in the interim and calculate the effect, if any, of the rezoning on zoned residential capacity. Further information about our method for estimating zoned capacity is available upon request. The 10 percent threshold for our outcome definitions is based on our qualitative analysis of different types of zoning changes. Due to non-FAR constraints, a vast majority of lots whose maximum FAR was changed by less than 10 percent experienced no material change in allowable unit density and were located in low-density zoning districts, where small changes in building bulk would be barely perceptible. More than 90 percent of all upzoned and downzoned lots had their maximum FAR change by more than 15 percent.

[105]Floor area ratio, or FAR, is the ratio of the building area on a lot to the land area of a lot. A maximum allowable FAR sets a cap on the amount of building area that can be developed on a single lot but does not itself specify how it can be arranged on the lot.

existing building that would need to be torn down or the market demand for new construction where the lot is located. As a result, some upzonings or downzonings may allow or prevent major changes in theory, but have no practical effect on a neighborhood's development pattern in the immediate future.

There also are likely numerous inaccuracies in the underlying data we used to build the database. Notably, the zoning district that RPAD reports as applicable for a given lot appears to be a GIS-based approximation and, particularly near the edges of zoning districts, may not be accurate. In many cases, individual lots straddle more than one zoning district and rules from each may apply, but we base our capacity estimate only on the one zoning district shown in RPAD. As a result of these caveats, our database surely misclassifies the zoning outcome of some lots, though we believe this to be the case for only a small share of our sample.

Finally, because our outcome measures are dummy variables, they do not reflect how much capacity was added to an upzoned lot or removed from a downzoned lot. As a result, our analysis could obscure important differences, for example, between lots that are rezoned to allow for significantly denser residential development and those with increases that barely exceed our 10 percent capacity change threshold.

2. Independent Variables of Interest

Our transit proximity variables indicate which lots are located within a half-mile walking distance of an entrance to an existing or planned rail transit station served by an uncongested rail line, an entrance to a rail transit station served by a congested rail line, or an express bus stop.[106] For park proximity, we identify which lots are within a quarter-mile walk of a park that is at least a quarter-acre in size.[107] For our school-quality measure, we indicate whether a lot is located in a city school district that puts the lot in the top quartile of all lots in terms of percentage of fifth graders scoring at grade level in math.[108] Our school capacity measure (a control variable) indicates which lots are located in one of the city's school districts that the Department of Education reports to be overcapacity.

Our high-price appreciation variable is a dummy that identifies the top 25 percent of all lots in terms of the average housing price appreciation between 1998 and 2003 in the community district where the lot is located.[109] Our population growth dummy is the top 25

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[106]To generate our transit and park proximity variables we use GIS network analysis of the LotInfo base map and station location information from the Metropolitan Transportation Authority (MTA) for New York City Transit subway lines, the Staten Island Railway, the Metro-North Railroad, and the Long Island Railroad. Congestion information is provided by the MTA for segments of each rail line.

[107]Walking distances and park size are generated using GIS analysis of the LotInfo base map.

[108]New York City's Department of Education organizes the city's public schools into 32 school districts. District-level capacity data and standardized test performance data are from the New York City Department of Education and are for 2003 and 2005, respectively.

[109]The price change data for each community district are from a repeat-sales-based price index for residential properties calculated by the Furman Center. For more information about the price index, see Furman Ctr. for Real Estate & Urban Policy, State of New York City's Housing and Neighborhoods 2011, at 149 (2012).

percent of all lots, based on their tract-level change in population from 1990 to 2000 reported by the U.S. Census.[110] For our final market trend variable, we calculate the number of new construction building permits filed from 1998 to 2003 near each lot and identify the top 25 percent of lots by this measure in each borough.[111]

Our key tract-level demographic characteristics (homeownership rate, median income, and race/ethnicity) are all derived from the 2000 Census. We create five income-related dummy variables representing quintiles of lots based on their tract-level median income. For race/ethnicity, we create five dummy variables for each major racial/ethnic group (non-Hispanic white, non-Hispanic black, and Hispanic (of any race)) and four dummy variables for non-Hispanic Asians (who make up a much smaller share of the city's population) based on the tract-level share of residents of the given race or ethnicity.[112]

Our voter participation data are at the election-district level and come from the New York City Board of Elections. Our variable is the number of votes cast for the 2005 general election (at which City Council seats and the mayor's seat were voted on), normalized by the number of housing units located in the election district.[113]

3. Control Variables

Our first measures of neighborhood "character" identify lots located on blocks that are predominantly (at least 75 percent by land area) made up of prewar (pre-1940), detached, and low-rise attached residential buildings, respectively.[114] Our variable "recent large development on block" describes lots located on blocks that are at least 75 percent residential by land area, and on which there is a building that was built between 1998 and 2003, on a narrow street,[115] with a gross building area that is (1) in the top 10 percent for the whole block and (2) more than 25 percent larger than the block's median building area.[116] To

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[110]We exclude from our calculation of high population growth all Census tracts with a 1990 population less than 200.

[111]Our building permit data are from the New York City Department of Buildings. To calculate the number of nearby permits, we count all new construction permits filed on a lot's block between 1998 and 2003 and (using GIS) on all other blocks that intersect a 1,000-foot buffer around that block.

[112]We recognize that some of our demographic variables are moderately (or even highly) correlated, but given our large sample size (New York City has more than 2,000 Census tracts), we do not believe multicollinearity is a significant issue for our model. Simplified models with less-correlated variables yielded similar results.

[113]We match lots to election districts using an election district shape file from the New York City Board of Elections. We use LotInfo to calculate the number of units located within each district. For lots located inside more than one district, we spatially weight the lot to allocate its units between districts.

[114]To construct this variable we use the building age, building type, and land area fields from RPAD.

[115]We use GIS analysis of the LotInfo basemap to measure the widths of rights of way. Consistent with provisions in New York City's zoning code, we classify as narrow any right of way less than 75 feet wide.

[116]Data used to construct this variable are from RPAD, except for street width, which is from GIS analysis of the LotInfo basemap.

determine whether a lot is located in a historic district, we use our own GIS analysis of LotInfo and shape files of all historic districts as of 2003.

Our variable "wide street" identifies lots located on public rights of way wider than 75 feet, a threshold used by New York's zoning code. Lots are located on a "high vacant block" if at least 25 percent of the block's land area is made up of vacant land.[117] Our final two neighborhood character variables identify lots in zoning districts that prohibit residential development and whether they are located in a Census block with relatively many or few jobs.[118]

Our dummy for high city investment identifies lots that are in the top 25 percent of all lots in terms of the share of all community district units that were built or rehabbed with city money between 1987 and 2003.[119]

To account for the power of individual council members to focus rezoning efforts on their districts, we construct variables that identify lots that were in council districts served by city council members who sat on the land-use committee and economic development committee, respectively, in the two calendar years before the rezoning project corresponding to the lot's study area was adopted.[120] The campaign contribution data consist of dollars contributed by individuals, at the zip-code level, for 2005 city council campaigns.[121] We normalize this measure by the number of housing units in each zip code. We also include from Census data the tract-level percent of adults over 25 years old with college degrees.

Finally, we construct a series of "development ratio" dummy variables to describe the extent to which a lot is already built out with an existing structure to its full zoned capacity, which our model predicts will be important control variables. These variables are a development ratio less than 50 percent of zoned capacity, between 50 and 80 percent, and over 80 percent of zoned capacity. These variables are based on our estimates of zoned residential capacity and the gross building size data for each lot in RPAD. Similarly, we use our estimates of allowable FAR to divide all zoning districts into four different density categories (in addition to our variables describing lots that prohibit residential development) to control for existing zoning. We also include lot size as a control variable, which is based on the lot area data in RPAD.

C. Descriptive Data

Table 1 shows the number and location of all lots in New York City and the lots with each rezoning outcome. Of approximately 811,000 total lots in New York City, the DCP included

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[117]RPAD identifies lots that are vacant land.

[118]Lots that permit no residential development have a residential FAR in our data set of zero. Counts of jobs in Census blocks are from the U.S. Census Bureau's Longitudinal Employment and Household Dynamics data. Our cutoff between high- or low-employment Census blocks is 95 employees.

[119]Data on housing unit construction and renovation financed with city funds was provided by the New York City Department of Housing Preservation and Development.

[120]Data are derived from a review of historical committee membership records and matching lots to council districts using the 2003 and 2004 version of PLUTO (between which dates council districts were redrawn).

[121]Campaign finance data are from the New York City Campaign Finance Board.

Table 1: Number of Lots by Rezoning Outcome

			Inside Rezoning Project Study Areas			
	All Lots	*Outside Rezoning Project Study Areas*	*Upzoned*	*Downzoned*	*Not Rezoned*	*Non-FAR Rezoned*
Bronx	84,294	54,803	3,755	6,838	3,505	15,393
Brooklyn	270,224	186,934	16,364	21,814	5,788	39,324
Manhattan	41,838	34,495	4,965	1,052	549	777
Queens	309,846	200,965	13,733	19,582	9,256	66,310
Staten Island	104,520	102,796	127	1,549	30	18
All NYC	810,722	579,993	38,944	50,835	19,128	121,822
Share of all lots citywide	—	72%	5%	6%	2%	15%
Share of study area lots	—	—	17%	22%	8%	53%

Table 2: Mean (or Median) Values of Fixed Infrastructure and City Services, Housing Market, Homeownership, and Voting Variables

		Inside Rezoning Project Study Areas		
	Outside Rezoning Project Study Areas	*Upzoned*	*Downzoned*	*Not Rezoned*
Near uncongested or planned rail station	47%	68%	59%	40%
Near express bus stops	30%	23%	23%	19%
Near park	65%	72%	68%	63%
High-performing school district	19%	17%	33%	20%
High-appreciation area	19%	52%	34%	34%
High population growth area	26%	23%	24%	29%
High building activity area	26%	24%	24%	22%
Tract homeownership rate (median)	45%	28%	35%	48%
Election district votes cast per unit (median)	0.43	0.36	0.41	0.43

about 28 percent (slightly more than 230,000) in the study areas of rezoning projects adopted between 2003 and 2009. Of these lots in study areas, 22 percent were downzoned, another 17 percent were upzoned, and 8 percent were considered for rezoning, but not rezoned at all. That more lots were downzoned than upzoned at first blush casts doubt that the city's zoning decisions are motivated primarily by allegiance to the growth machine. Further, just over half (53 percent) of all lots in the rezoning project study areas were non-FAR rezoned, the category that we omit from our analysis, but as noted above, many observers consider the equivalent of a downzoning. The number of lots downzoned or non-FAR rezoned, however, cannot prove either theory of zoning because it could be that the lots subject to those types of changes were systematically different from other lots in the study areas, or other lots in the city.

Table 2 shows for each of the primary rezoning outcome groups, and for lots located outside the rezoning project study areas, the mean or median values for our variables of interest concerning fixed infrastructure and city services, market trends, voter turnout, and homeownership. Consistent with the city's goals of focusing development near transit, a higher share of upzoned lots were near uncongested or planned rail stations than downzoned lots or lots that were in study areas but not rezoned. However, somewhat surprisingly, even downzoned lots were more likely to be located near these rail stations than the typical lot located outside a rezoning project study area. A slightly higher share of upzoned lots were located near parks than the downzoned and unchanged lots. Conversely, downzoned lots were much more likely to be located in a high-performing New York City public school district than upzoned lots or unchanged lots.

Of the market trend indicators, the largest difference between lots receiving different zoning outcomes is the share located in parts of the city that had enjoyed particularly high property value appreciation in the years immediately preceding our study period. More than half of all upzoned lots were located in these high-appreciation areas, compared to only about a third of the downzoned lots and unchanged lots.

Both the median upzoned lot and median downzoned lot had tract-level homeownership rates that were lower than the typical lot not studied for rezoning, though the rate for the median downzoned lot was 7 percentage points higher than that for upzoned lots. Downzoned lots also had a slightly higher election-district-level count of votes per housing unit than upzoned lots.

Table 3 shows that upzoned and downzoned lots both tended to be more concentrated in tracts with a median household income in the lower or middle range compared to lots that were not considered for rezoning. Lots in study areas that remained unchanged, in contrast, tended to be middle- and upper-middle-income tracts.

The different rezoning outcomes were, broadly speaking, distributed across lots with racial/ethnic characteristics in line with the city's overall lot distribution. Table 4 shows that a majority of each study area lot group was located in tracts with relatively small (less than 20 percent) Hispanic and non-Hispanic black shares, consistent with lots located outside study areas. There were some notable differences between the different groups of lots, however. Upzoned lots and unchanged lots were more likely than downzoned lots to be located in tracts that were less than 20 percent white. Conversely, downzoned lots were much more likely than upzoned lots or unchanged lots to be located in tracts that were more than 80 percent white. Downzoned lots were also more likely than upzoned lots to be located in tracts with very low shares of black or Hispanic residents.

Descriptive data for the other independent variables are in Appendix 2. Seventy-two percent of all downzoned lots were located on blocks made up primarily of single-family

Table 3: Mean Values of Tract Income Group Variables

		Inside Rezoning Project Study Areas		
Tract Median Household Income	*Outside Rezoning Project Study Areas*	*Upzoned*	*Downzoned*	*Not Rezoned*
0–20th percentile (< $37,000)	23%	27%	16%	9%
20th–40th percentile ($37,037–$47,883)	20%	30%	25%	21%
40th–60th percentile ($47,923–$58,544)	18%	20%	32%	26%
60th–80th percentile ($58,671–$71,059)	18%	14%	17%	29%
80th–100th percentile ($71,117–$227,304)	22%	9%	9%	15%

Table 4: Mean Values of Tract Racial Composition Variables

Tract Racial Makeup	Outside Rezoning Project Study Areas	Inside Rezoning Study Areas		
		Upzoned	Downzoned	Not Rezoned
Tract 0–20% white	39%	46%	28%	45%
Tract 20–40% white	10%	14%	11%	15%
Tract 40–60% white	12%	12%	13%	11%
Tract 60–80% white	17%	19%	28%	19%
Tract 80–100% white	21%	9%	20%	10%
Tract 0–20% black	67%	60%	73%	54%
Tract 20–40% black	9%	8%	7%	6%
Tract 40–60% black	5%	5%	8%	11%
Tract 60–80% black	7%	7%	7%	16%
Tract 80–100% black	12%	20%	5%	14%
Tract 0–20% Hispanic	65%	58%	68%	71%
Tract 20–40% Hispanic	19%	26%	19%	21%
Tract 40–60% Hispanic	8%	10%	5%	3%
Tract 60–80% Hispanic	7%	6%	6%	4%
Tract 80–100% Hispanic	1%	0%	2%	0%

homes or other low-rise residential buildings, compared to only 43 percent of all upzoned lots, illustrating the very different built character of the neighborhoods where the different rezoning outcomes occurred. However, 14 percent of all upzoned lots previously had no residential development permitted, which, while higher than the other groups, means that upzoned lots were not primarily drawn from manufacturing areas, as might have been expected.

Conspicuously, almost half of all upzoned lots were in community districts with the most capital investment in housing by the New York City government, compared to only 12 percent of all downzoned lots and 21 percent of unchanged lots.

The mean values of the control variables describing the "development ratio" (the percentage of zoned capacity taken up by any existing building on the lot) vary considerably between upzoned and downzoned lots, though not unexpectedly. Fifty-five percent of all upzoned lots were already developed at more than 80 percent of their development capacity. Given the opportunity costs of demolishing an occupied structure, these lots were unlikely to have been redeveloped with larger buildings without an upzoning. About half of all downzoned lots, in contrast, had more than half their zoning capacity unused as of 2003, indicating that the rezoning foreclosed a relatively high opportunity to be more intensively developed. The different groups of lots also tended to be in very different zoning categories at the beginning of our study period. Sixty-one percent of all downzoned lots were already in relatively low (though not the lowest) density districts, which likely reflects substantial overlap with the low-rise residential neighborhood character described above. Upzoned lots were less concentrated in a single zoning density class. Interestingly, a quarter of all upzoned lots were already zoned for medium-density development as of 2003.

D. Regression Results and Interpretation

Table 5 shows the results of our regression as relative risk ratios (which we refer to more generically as odds ratios) for each of our key dependent variables: one describing the effect of the variable on the relative probability of an upzoning (compared to being studied but not rezoned); the second describing the effect of the variable on the relative probability of a downzoning (compared to being studied but not rezoned).[122] An odds ratio greater than 1 indicates, all else equal, that the variable is associated with a higher relative probability of the given outcome compared to being studied but not rezoned. An odds ratio between 0 and 1 indicates a negative association. We discuss each group of results below.

Table 5: Multinomial Logit Regression Results for Variables of Interest (Odds Ratios)

	Upzoning	*Downzoning*	*Theory Supported*
N	38,944	50,835	
Near uncongested or planned rail station	1.502***	1.096***	Ambiguous
Near express bus stops	1.278***	1.543***	Ambiguous
Near park	1.390***	1.524***	Ambiguous
High-performing school district	1.426***	3.917***	Ambiguous
High-appreciation area	0.805***	0.731***	Ambiguous
High population growth area	1.026	1.411***	Homevoter
High building activity area	1.030	1.067**	Homevoter
Tract homeownership rate	0.747***	1.430***	Homevoter
Election district votes cast per unit	0.475***	2.302***	Homevoter
Tract median household income:			
20th–40th percentile ($37,037–$47,883)	0.524***	0.786***	Ambiguous
40th–60th percentile ($47,923–$58,544)	0.377***	1.140**	
60th–80th percentile ($58,671–$71,059)	0.262***	0.764***	
80th–100th percentile ($71,117–$227,304)	0.210***	0.354***	
Tract 20–40% white	0.817***	2.305***	Homevoter
Tract 40–60% white	0.598***	4.928***	
Tract 60–80% white	0.607***	4.749***	
Tract 80–100% white	0.847**	7.199***	
Tract 20–40% black	0.782***	1.409***	Ambiguous
Tract 40–60% black	0.141***	1.045	
Tract 60–80% black	0.361***	1.035	
Tract 80–100% black	0.976	1.963***	
Tract 20–40% Hispanic	1.810***	1.057	Ambiguous
Tract 40–60% Hispanic	3.727***	1.947***	
Tract 60–80% Hispanic	0.764***	1.432***	
Tract 80–100% Hispanic	0.811	11.11***	
Other variables and controls		SEE APPENDIX 3	

***Indicates 99% confidence level; **indicates 95% confidence level; *indicates 90% confidence level.

[122]We do not show the odds ratios for the relative probability that a lot was subject to a non-FAR rezoning.

1. Proximity to, and Quality of, Fixed Amenities

Proximity to fixed amenities that are difficult to replicate should increase the potential gains to existing homeowners of limiting new housing construction nearby. Furthermore, residents will likely support measures that prevent congestion in these amenities. Accordingly, if New York's rezoning decisions are primarily influenced by the preferences of homevoters, we hypothesize that a lot's proximity to a rail station serving an uncongested rail line, express bus stop, or park, or the lot's location in a particularly high-performing school district, will be associated with an increased probability that the lot will be downzoned (and a decreased probability of being upzoned). Alternatively, these areas may be particularly attractive to developers that hope to capture value from location near these amenities. Therefore, we hypothesize that if the growth machine is the primary influence on zoning, a lot's proximity to a rail station, express bus stop, or park, and its location in a high-quality school district, will be associated with an increased probability that the lot will be upzoned.

The first panel of Table 5 shows that proximity to an uncongested or planned rail station, an express bus stop, and a park, and being in a high-quality school district all are associated with a higher relative probability of being upzoned. All the results are significant at the 99 percent level. These results are consistent with our hypothesis regarding the growth machine theory. However, proximity to each of these amenities is also associated with a higher probability that a lot is downzoned (relative to being studied but not rezoned), which is consistent with our interpretation of the homevoter theory. The fixed infrastructure and city service variables, then, do not help distinguish between the two motivational theories.

2. Neighborhood-Level Market Growth

Because homeowners are risk averse to potential threats to their home values, we expect homevoters to focus anti-growth sentiment toward areas with high levels of new construction or harbingers of future development. We hypothesize that if zoning officials are motivated by homevoter preferences, relatively high levels of neighborhood construction activity, population growth, and price appreciation will increase the probability that a lot will be downzoned. Alternatively, we predict that if zoning is motivated by the growth machine, these market indicators will be associated with an increased probability of being upzoned to accommodate denser development and to exploit the widening gap between current and potential land values.

The second panel of Table 5 shows that being in an area with particularly high levels of price appreciation is associated with a lower relative probability of being upzoned, which is inconsistent with our predictions under the growth machine theory, and supports instead our hypothesis for the homevoter theory. High price appreciation neighborhoods are also associated with a lower relative probability of being downzoned, however, which is not what we predicted under the homevoter theory. Thus the variable does not provide unambiguous support for either theory. The other two market trend variables, high population growth and high building activity, are both associated with an increased relative probability of being downzoned, which is consistent with officials responding to the heightened concerns of homevoters in areas facing particularly strong threats of unwanted development. The association between these variables and being upzoned is not statistically significant, so provides no competing evidence that zoning officials are instead serving growth machine interests.

3. Neighborhood Homeownership Rate and Voter Turnout

We hypothesize that if the homevoter theory is correct, a neighborhood's homeownership rate and voter turnout rate will be associated with a decreased probability of being upzoned (and increased probability of being downzoned) because residents will be part of the dominant voting block and their preference will be to limit development to protect the value of their homes. Alternatively, under the growth machine theory, we predict that homeownership and voter turnout will have no effect on the probability of any rezoning outcome.

Table 5 shows that both variables are associated with a statistically significant lower relative probability of an upzoning and higher relative probability of a downzoning. Both, then, provide unambiguous support for the homevoter theory.

4. Neighborhood Income

If zoning officials are motivated by the preferences of homevoters, we predict that a lot's location in a low-income neighborhood will be associated with an increased probability that a lot will be downzoned and decreased probability of being upzoned. Limiting the development capacity of areas likely to attract affordable housing and poor residents would be consistent with exclusionary or fiscal goals that are associated with homevoter preferences. Additionally, we predict that lots located in high-income neighborhoods will also be associated with an increased relative probability of being downzoned and decreased probability of being upzoned because of exclusionary preferences by wealthy residents wishing to shield their own neighborhoods from the entry of new residents. In contrast, we hypothesize that if zoning officials are influenced by the growth machine, low neighborhood income will be associated with an increased probability of upzoning because of the significant potential in poor neighborhoods to increase exchange values through redevelopment and the pursuit of growth. Because they house the business elites, we expect that the highest income neighborhoods will be uniquely equipped to fend off development pressure under the growth machine theory, and will have a decreased relative probability of being upzoned (and increased relative probability of being downzoned).

The fourth panel of Table 5 shows the odds ratio for each quintile of tract-level median household income. As income rises, the relative probability of an upzoning declines monotonically (the omitted category is the lowest income quintile, which, by definition, has an odds ratio of 1). This rough linear relationship (with the highest probability of upzoning occurring at the lowest income group) is inconsistent with the inverted-U-shaped relationship predicted by the homevoter theory. It is also inconsistent with the growth machine theory, which predicts that only the very wealthiest areas will have a discernible advantage in resisting development pressure. Furthermore, the top quintile of income is associated with a lower relative probability of a downzoning compared to being in the lowest income tracts or the middle-income tracts. This suggests that high neighborhood income does not necessarily allow residents to shield their neighborhood from future development. Accordingly, the association between neighborhood income and the relative probability of being upzoned or downzoned does not clearly support either of the theories.

5. Neighborhood Race

Because we control for income and several other neighborhood characteristics, we hypothesize that under the growth machine theory, the racial makeup of a neighborhood will not affect the probability of any given rezoning outcome. However, if the homevoter-based theory holds true, the associated exclusionary preferences of homeowners would suggest that increasing a neighborhood's percent black or Hispanic will increase the probability that a lot will be downzoned and decrease the probability that it will be upzoned.[123] Similarly, a higher percentage of white residents will be associated, under the homevoter theory, with both a higher probability of being downzoned and lower probability of being upzoned in order to maintain the neighborhood's existing demographics.

The bottom panels of Table 5 show the odds ratios for the several variables describing tract-level racial and ethnic composition and, on balance, provide further evidence in support of the homevoter-based model, though with some ambiguity. The first of these panels shows that relative to neighborhoods that are less than 20 percent white (the omitted category), those with higher shares of white residents are associated with a lower relative probability of being upzoned. This is consistent with zoning officials accommodating the resistance of homeowners to expanded residential development in the neighborhoods in which they tend to live. Moreover, being in a neighborhood with a relatively high percentage of white residents is strongly associated with a higher relative probability of being downzoned, providing further evidence of the exclusionary motivations associated with the homevoter theory.

The second of these panels in Table 5 shows that relative to a tract that is less than 20 percent black (the omitted category), a tract that is between 20 and 80 percent black (the middle three quintiles) has a lower relative probability of being upzoned. Additionally, being in a tract that is more than 80 percent black increases the relative probability of being downzoned compared to tracts with few black residents. These results are consistent with our hypothesis that homevoters will seek to exclude racial and ethnic minorities from the city as a whole by opposing any increase, and supporting decreases, in development capacity in neighborhoods thought to attract minority residents. However, the fact that there is no statistically significant association between race and the relative probability of a lot being upzoned or downzoned for some of the categories is consistent with the growth machine's view that race does not matter (apart from its association with income). This mixed pattern is similar for the variables describing Hispanic population shares. The last panel of Table 5 shows a strong association between tracts that are over 80 percent Hispanic and the

[123]It is possible that those with exclusionary motives would support a radical upzoning of neighborhoods with substantial minority or ethnic population in order to facilitate a complete "urban renewal" project. See Dubin, supra note 59. We cannot distinguish between rezonings of different magnitudes.

probability of being downzoned (consistent with the homevoter theory), but no statistically significant association between such tracts and being upzoned. Thus the variables indicating the share of the neighborhood's population that is black and Hispanic lend only mixed support for the homevoter theory.

IV. Conclusion and Policy Implications

Our results provide significant evidence that the land-use politics of large cities are not as different from those of the suburbs as theorists, policymakers, and judges have assumed. The fact that a city like New York, with its unusually low homeownership rate, strong real estate and business interests, and ardent embrace of the benefits of agglomeration economics, nevertheless downzoned 6 percent of its lots (and put another 15 percent in a category that likely will function as a downzoning) in less than a decade is remarkable. The sheer number of downzonings, while surprising, is insufficient to cast doubt on the leading theories about what motivates land-use decisions, however, because it could be that the land downzoned was different from other land in ways that were consistent with those theories. We seized upon New York City's spurt of rezonings to conduct a rigorous empirical test of the leading theories that controls for the characteristics of the land and the neighborhoods rezoned. We began with a nuanced analysis of the competing theories to identify testable hypotheses, revealing multiple areas in which the predictions of adherents to the growth machine model of local politics should diverge from the predictions of the homevoter model. We then built a unique and unparalleled data set to allow us to control for the myriad of characteristics of the land, the neighborhood, and general market trends that might influence land-use decisions wholly apart from the factors that the growth machine and homevoter hypotheses suggest are important.

Our stringent empirical testing of the predictions we argue follow from the growth machine and homevoter theories reveals surprising support for the homevoter-based model. New York City is not Scarsdale or Greenwich, for any number of reasons, but it, too, pays considerable attention to the interests of homeowners, even when those homeowners are a minority of voters. That finding demands attention from the academics, policymakers, and judges who seek to contain the potential land-use decisions have to waste precious resources, drive up the cost of housing and of doing business, and threaten the equality of opportunity available to many families. Or to frame the call more positively, those who wish to harness the power of cities to foster innovation and problem solving, reduce energy use and the associated global warming, and improve the quality of life residents enjoy sustainably must consider how to control the influence risk-averse homeowners have over land-use decisions that will interfere with those goals.

There are several lessons one can draw from our findings, and from the analysis itself. First, courts and policymakers should be wary of uniform "local government" rules. New York City is more like suburban Marin County, California than we thought, but is nevertheless quite different from Boston or Austin, on the one hand, or from small towns, on the other. One-size-fits-all land-use and local government law is easy to apply, of course, but is likely to miss the mark at a disturbingly high rate.

Second, courts should think harder about the presumptions they apply in evaluating local decisions, given the evidence that homevoters have considerable influence beyond the suburban bedroom communities. The suspicion some courts harbor that upzonings signal undue developer influence or ad hoc and unprincipled decisions may be appropriate, but should at least be matched by suspicions that neighborhood opposition to land-use change likely tilts land-use decisions to be unfairly exclusionary and more risk averse than is optimal.

That is not to say that courts should scrutinize the decisions of land-use officials differently from the way they review other complex local government decisions. Our analysis shows the extraordinary difficulty of determining when a land-use policy is even "rational," much less optimal. The difficulty of articulating predictions[124] about what a growth machine would want under certain circumstances reveals the complexity of understanding, to take just one example, how even the most profit-maximizing rational decisionmaker will trade off the need to use infrastructure efficiently with the need to channel market demand. Similarly, the ambiguity that arises over whether upzoning areas in which racial or ethnic minorities are concentrated is exclusionary (because it could lead to displacement of those groups) or an attempt by the local government to steer economic development (and associated jobs and other benefits) to groups that have often been left out of the benefits of growth shows the difficulty of trying to review local government's land-use decisions. Courts should be wary of the dangers of becoming zoning boards of appeal because untangling decisions that balance the multitude of interests that even a perfectly rational and fair land-use decisionmaker must accommodate—from fiscal concerns to the need to use infrastructure wisely—is no small task. Land-use decisions are complex and the motivations and thinking behind them are hard to uncover even with very rich data and sophisticated statistical techniques. Increased scrutiny of the decisions may yield too many false positives and false negatives about motivations to actually improve land-use processes.

On the other hand, our findings lend credence to proposals such as that advanced by Professor Hills and Professor Schleicher to force land-use decisions to be more transparent, and to force local decisionmakers to consider the city-wide and region-wide consequences of their decisions.[125] Our findings also reinforce the need to address the exclusionary implications of homevoters' risk aversion, either through state or regional overrides of local government decisions on locally unpopular, but necessary, land uses, like affordable housing,[126] or through measures to reduce risk aversion directly.[127]

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[124]The difficulty of extracting testable hypotheses from the growth machine and homevoter theories also suggests that better theories may emerge if scholars provide not only general political theories but also more detailed predictions about how decisionmakers will actually behave if those theories are correct.

[125]See Hills & Schleicher, supra note 71.

[126]E.g., the "anti-snob zoning" act in Massachusetts (described supra note 69) or the state-level review in Oregon of regional plans that must take into account the need for new housing at affordable prices (Elickson et al., supra note 68).

[127]In addition to home equity insurance, like that described by Fischel (Fischel, supra note 7, at 268–70), Lee Ann Fennell suggests allowing capital losses from home sales to be more generously carried over to offset other gains. Fennell, supra note 19, at 657.

Suburbs around the nation are scrambling to imitate what is working so well for the cities that are attracting innovation and providing extraordinary quality of life for their residents. However, our results show that cities may be taking a page from suburbia in their land-use policies. Rigorous empirical testing of the growth machine and homevoter hypotheses about what motivates land-use decisions, using a unique opportunity provided by New York City's recent spate of rezonings, reveals surprising attention to homeowner concerns, even in the city in which those homeowners are a minority of the population. Cities should not be the new suburbs when it comes to land-use decisions, however, so our findings should motivate land use scholars, policymakers, and courts to reconsider how to best check the tendency of land-use decisions catering to risk-averse homeowners to be unfairly exclusionary and inefficient.

Appendix 1: Variable Definitions and Data Sources

Variable	*Definition*	*Data Source*
Near congested rail station	Dummy variable equal to 1 if the lot is within half-mile walking distance of a rail station considered congested by MTA and not within a half-mile of a planned rail station	Authors' GIS analysis and MTA station entrance location data
Near uncongested or planned rail station	Dummy variable equal to 1 if the lot is within half-mile walking distance of a rail station not considered congested by MTA or a planned rail station	Authors' GIS analysis and MTA station entrance location data
Near express bus stops	Dummy variable equal to 1 if the lot is within half-mile walking distance of express bus stop	Authors' GIS analysis and MTA station entrance location data
Near park	Dummy variable equal to 1 if the lot is within quarter-mile walking distance of park at least a quarter acre	Authors' GIS analysis and LotInfo
Overcrowded school district	Dummy variable equal to 1 if the lot is in top 75th percentile of lots in terms of school district capacity usage (approx 102%) as of 2003	Authors' GIS analysis and NYC Department of Education data
High-performing school district	Dummy variable equal to 1 if the lot is in the 75th percentile or higher of all lots in district-level percentage of students performing at grade level in math in 2005	Authors' GIS analysis and NYC Department of Education data
Prewar block	Dummy variable equal to 1 if at least 75% of land area of block is residential use and was built before 1940	Authors' calculations based on RPAD data
Detached single-family block	Dummy variable equal to 1 if at least 75% of block land area was used for detached single-family house	Authors' calculations based on RPAD data
Other low-rise residential block	Dummy variable equal to 1 if more than 75% of land area on block was 1–4 story residential (other than detached single family)	Authors' calculations based on RPAD data

Appendix 1 *continued*

Variable	*Definition*	*Data Source*
Historic district	Dummy variable equal to 1 if lot is in an officially designated historic district	Authors' GIS analysis and Landmarks Preservation Commission data
Residential block with large development in 1998–2003	Dummy variable equal to 1 if block is predominantly residential and within the same block, there is a building built (1) between 1998 and 2003 (2) on a narrow street, (3) that has a gross building area in the top 10% for the whole block, and (4) more than 1.25 times block median building area	Authors' calculations based on RPAD data; authors' GIS analysis of LotInfo (for street widths)
Wide street	Dummy variable equal to 1 if lot faces a street with right of way more than 75 feet wide	Authors' GIS analysis of LotInfo
High vacant block	Dummy variable equal to 1 if at least 25% of the block's land area was vacant land	Authors' calculations based on RPAD data
Lot with no residential permitted on low-jobs block	Dummy variable equal to 1 if residential use is NOT permitted on lot and the number of employees in Census block is more than 95 as of 2002	Authors' calculations based on RPAD and U.S. Census LEHD
Lot with no residential permitted on high-jobs block	Dummy variable equal to 1 if residential use is NOT permitted on lot and the number of employees in Census block is more than 95 as of 2002	Authors' calculations based on RPAD and U.S. Census LEHD
High-appreciation area	Dummy variable equal to 1 if lot is at the 75th percentile or higher of all lots in property price appreciation between 1998 and 2003 for the community district where the lot is located	Furman Center Repeat Sales Index and New York City Department of Finance sales data
High population growth area	Dummy variable equal to 1 if lot is at the 75th percentile or higher of all lots in tract-level population growth between 1990 and 2000 (minimum 200 residents in tract in 1990)	Authors' calculations based on U.S. Census data
High building activity area	Dummy variable equal to 1 if lot is at the 75th percentile or higher of all lots in number of building permits filed between 1998 and 2003 on the lot's block or on any block within 1,000-foot buffer	Authors' GIS analysis and NYC Department of Buildings data
High city investment area	Dummy variable equal to 1 if lot is at the 75th percentile or higher of all lots in share of community district housing units receiving city capital funds 1987–2003	New York City Department of Housing Preservation and Development data
Tract homeownership rate	Percentage of occupied housing units inhabited by owner per 2000 Census	U.S. Census
Tract college educated	Percent of adults 25 years and older in tract with a college degree per 2000 Census	U.S. Census

Appendix 1 *continued*

Variable	*Definition*	*Data Source*
Tract income	Median income per 2000 Census	U.S. Census
Tract percent white	Percent non-Hispanic white per 2000 Census	U.S. Census
Tract percent black	Percent non-Hispanic black per 2000 Census	U.S. Census
Tract percent Hispanic	Percent Hispanic (of any race) per 2000 Census	U.S. Census
Tract percent Asian	Percent non-Hispanic Asian per 2000 Census	U.S. Census
Election district votes cast per unit	Total number of votes cast in 2005 general election per housing unit in the election district where lot is located	New York City Board of Elections and RPAD
Zip code campaign contributions per unit	Total dollars contributed to 2005 City Council campaigns per housing unit in the zip code where lot is located per unit located in the zip code	New York City Campaign Finance Board and RPAD
City Council Land Use Committee membership (lagged)	Dummy variable equal to 1 if lot is in council district that had representation on Land Use Committee one year prior to DCP's review of rezoning application	Analysis of City Council records and PLUTO
City Council Economic Development Committee membership (lagged)	Dummy variable equal to 1 if lot is in council district that had representation on Economic Development Committee one year prior to DCP's review of rezoning application	Analysis of City Council records and PLUTO
Block development ratio	The ratio of total building area to zoned residential capacity for the block of which the lot is partf	Authors' calculations based on RPAD and zoning analysis
Lot development ratio	Dummy variable equal to 1 if the lot's building area was more than 80% of the lot's zoned residential capacity	Authors' calculations based on RPAD data and zoning analysis
Very low density zoning (0.1–0.99)	Dummy variable equal to 1 if max FAR is > 0 BUT < 1.00	Authors' calculations based on RPAD data and zoning analysis
Low density zoning (1.00–2.99)	Dummy variable equal to 1 if max FAR is >/= 1.00 BUT < 3.00	Authors' calculations based on RPAD data and zoning analysis
Medium density zoning (3.00–5.99)	Dummy variable equal to 1 if max FAR is >/= 3.00 BUT < 6.00	Authors' calculations based on RPAD data and zoning analysis
High density zoning (6.00–>)	Dummy variable equal to 1 if max FAR is >/= 6.00	Authors' calculations based on RPAD data and zoning analysis
Already contextually zoned	Dummy variable equal to 1 if lot is in a contextual zoning district	RPAD data and zoning analysis
Lot size	Land area of the lot in increments of 1,000 square feet	RPAD
Boro dummy MN	Lot located in Manhattan	RPAD
Boro dummy BX	Lot located in the Bronx	RPAD

Appendix 1 *continued*

Variable	*Definition*	*Data Source*
Boro dummy BK	Lot located in Brooklyn	RPAD
Boro dummy QN	Lot located in Queens	RPAD
Boro dummy SI	Lot located in Staten Island	RPAD

Appendix 2: Additional Lot Characteristics

Mean (or Median) Values of Additional Variables

	Outside Rezoning Project Study Areas	*Inside Rezoning Project Study Areas*		
		Upzoned	*Downzoned*	*Not Rezoned*
Near congested rail station	3%	5%	1%	7%
Overcrowded school district	38%	44%	50%	52%
Prewar block	24%	37%	28%	19%
Detached single-family block	8%	2%	6%	6%
Other low-rise residential block	57%	41%	66%	59%
Historic district	2%	3%	2%	3%
Residential block with large development in 1998–2003	3%	1%	2%	2%
Wide street	32%	42%	33%	40%
High vacant block	1%	1%	0%	0%
Lot with no residential permitted on low-jobs block	1%	4%	0%	2%
Lot with no residential permitted on high-jobs block	4%	10%	0%	4%
High city investment area	28%	45%	12%	21%
Tract 0–20% Asian	83%	86%	86%	80%
Tract 20–40% Asian	14%	10%	11%	15%
Tract 40–100% Asian	3%	4%	2%	4%
Tract college educated (median)	20%	21%	23%	22%
Zip code campaign contributions per unit (median)	$1.38	$2.18	$1.95	$1.52
City Council Land Use Committee membership	11%	39%	30%	45%
City Council Economic Development Committee membership	49%	20%	13%	7%
Block development ratio (median)	75%	87%	59%	80%
Lot development ratio > 80%	44%	55%	18%	54%
Lot development ratio 50–80%	28%	15%	33%	25%
Lot development ratio < 50%	28%	30%	49%	21%
Very low density zoning (FAR: 0.1–>0.9)	53%	34%	20%	55%
Low density zoning (FAR: 1.00–2.99)	29%	27%	61%	30%
Medium density zoning (FAR: 3.00–5.99)	11%	25%	17%	7%
High density zoning (FAR: 6.00–>)	2%	0%	1%	1%
Already contextually zoned	10%	1%	1%	8%
Lot size (median)	2,500	2,500	2,500	2,500

Appendix 3: Additional Regression Results

Multinomial Logit Regression Results for Control Variables (Odds Ratios)

	Upzoning	*Downzoning*
Near congested rail station	0.380***	0.346***
Overcrowded school district	1.679***	0.917***
Prewar block	1.431***	1.160***
Detached single-family block	0.412***	2.695***
Other low-rise residential block	0.673***	2.571***
Historic district	0.706***	0.840**
Residential block with large development in 1998–2003	0.475***	0.626***
Wide street	1.040*	0.648***
High vacant block	1.747***	0.283***
Lot with no residential permitted on low-jobs block	2.104***	0.0112***
Lot with no residential permitted on high-jobs block	1.791***	0.0102***
High city investment area	4.510***	0.485***
Tract college educated	5.162***	0.590***
Tract 20–40% Asian	0.430***	0.453***
Tract 40–100% Asian	0.485***	0.624***
Zip code campaign contributions per unit	1.269***	1.184***
City Council Land Use Committee membership	1.066**	0.876***
City Council Economic Development Committee membership	2.462***	2.974***
Block development ratio	1.796***	0.0300***
Lot development ratio > 80%	1.303***	0.228***
Lot development ratio 50–80%	0.727***	0.558***
Low density zoning (FAR: 1.00–2.99)	0.655***	14.63***
Medium density zoning (FAR: 3.00–5.99)	1.393***	37.31***
High density zoning (FAR: 6.00–>)	0.0600***	14.30***
Already contextually zoned	0.0459***	0.0842***
Lot size (1,000 square foot increments)	0.993***	0.971***
Lot size in increments of 1,000 square feet (log)	0.895***	0.987
Borough dummy BX	0.223***	2.659***
Borough dummy BK	1.046	0.472***
Borough dummy QN	1.089	1.490***
Borough dummy SI	4.434***	15.22***

***Indicates 99% confidence level; **indicates 95% confidence; *indicates 90% confidence.