Local Carrots or Local Sticks:
Election Cycle Effects on Rezoning in New York City

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Abstract

Zoning's distributional impacts are often understated, especially considering the frequency of rezonings and the laborious process surrounding approval. In this paper, I examine the motivations of local policymakers in New York City between 2009 and 2018 by testing whether rezoning decisions are made as a function of policymakers' re-election cycle by using a differences-in-differences design. In addition, I analyze the causal impact of density-altering rezoning on property values by using an instrumental variable design. Results indicate that as elections approach, the probability of a rezoning occurring increases, with rezoned lots being more likely to be downzoned. Of the lots rezoned, the average density due to rezoning decreases significantly as an election nears, suggesting that local policymakers may take advantage of rezonings to improve their chances of reelection. Moreover, in those lots affected by rezoning, the property and land values of downzoned lots increases dramatically over the baseline rate. Among upzoned lots, however, the effect of rezoning on property values and land values is mixed.

Research Questions

Does proximity to Election Day affect whether rezoning actions increase or decrease the density permittable construction? Moreover, do the demographic and economic characteristics of a neighborhood influence whether rezoning actions will increase or decrease the density of permittable construction, conditional on proximity to Election Day? What is the short-run impact of rezoning on property values, conditional on whether the rezoning increases or decreases the density of permittable construction?

Introduction

The use of zoning in American cities, while a relatively new practice in the grand scheme of urban development, has been a subject increasingly relevant to an urbanizing population. Zoning codes were first adopted in cities such as New York and Chicago, and are typically seen as a response to the rapid industrialization of the late 19th century[1]. The practice of separating land use to different sections of a city would serve as a means to limit the negative externalities of industrial development, such as noise or air pollution, thereby preventing those externalities from spilling over into residential areas. These externalities and others, such as the shadows cast by bulky commercial and office spaces, were very real problems for rapidly developing urban communities. In New York City, for example, the fear of an "urban canyon" created by new tall skyscrapers such as the Equitable Building helped fuel the demand for zoning controls with requirements such as setbacks to allow for natural light at the street level[2]. However, zoning has since matured, and zoning across cities around the world has become increasingly complex. In New York City, for example, the zoning resolution features thousands of pages of regulations and exceptions dictating land-use and building requirements ranging from parking requirements to height limits. In addition, zoning codes are constantly being changed and updated as cities develop, leading to questions regarding the distributional consequences of rezoning.

Moreover, the relationship between zoning and various economic outcomes in urban areas is incredibly relevant for residents. In New York City, gross rents have risen by 6.2% between 2014 and 2017, or around 2.1% every year. Meanwhile, the median income for a renter household only grew by 0.9% between 2013 and 2016, or an annual increase of 0.3%.[3] This marks an increase over previous trends. Between 2011 and 2014, median gross rents increased by 3.4%, or 1.13% per year, compared to median income for renters increasing by only 0.3% per year.[4] This corresponds to an alarming 30% of New York renters paying more than 50% of their incomes towards rent. Across the city, only 32.7% of households owned their home in both 2017 and 2014, with the remainder renting. In addition, the City's population is steadily growing. It is projected that the population of New York City will increase to 9 million residents by 2040[5], and current population increases have already outpaced predicted trends[6]. As additional residents move into the City, concerns over the ability of the City's housing stock to meet demand intensify, especially considering the already reasonably tight conditions of the

[1] Erickson, A. (2012). "The Birth of Zoning Codes, a History." *CityLab*.

[2] New York City Department of City Planning. "City Planning History."

[3] Gaumer, E. (2018). "Selected Initial Findings of the 2017 New York Housing and Vacancy Survey." *New York City Department of Housing Preservation and Development*.

[4] Gaumer, E. (2015). "Selected Initial Findings of the 2014 New York Housing and Vacancy Survey." *New York City Department of Housing Preservation and Development*.

[5] Salvo, J.J., Lobo, A.P., & Maurer, E. (2013). "New York City Population Projections by Age/Sex & Borough, 2010-2040." *Department of City Planning*.

[6] Moon, J. (2018). "New York City's Population Hits a Record 8.6 Million." *The New York Times*.

current housing market[7]. As a result, the use of zoning as a means of controlling the development of the City has come increasingly under scrutiny.

Zoning, by nature, is an incredibly political process. Indeed, zoning may be *the* most important policy local governments have at their disposal[8]. In New York City, any changes to the zoning resolution must go through an often laborious process involving an environmental review, as well as approvals by the City Council, relevant Community Boards, and the Mayor. First, the Department of City Planning (DCP) selects a study area to be considered for rezoning. The DCP, while largely a civil service agency, is run by a Director, who is appointed by the Mayor[9]. Once DCP proposes changes to the zoning of an area, the area must be studied under the State mandated City Environmental Quality Review (CEQR) process, through the Mayor's Office of Environmental Coordination (MOEC)[10]. MOEC is tasked with carrying out the City's environmental review responsibilities, and coordinates with other city, state, and federal agencies regarding environmental matters. The MOEC's Director is also appointed by the Mayor[11]. If the project is determined not to have a sizable or detrimental environmental impact, the MOEC issues a negative declaration and the CEQR process ends, following which the Department of City Planning enters the project into the Uniform Land Use Review Procedure (ULURP). If the MOEC issues a positive declaration, additional public meetings must be held with a period for public comment and DCP must submit a Draft Environmental Impact Statement for MOEC to approve before the proposed rezoning can enter the ULURP[12].

Once entered into the ULRUP, the project is then referred to the relevant Community Board(s), which are required to hold public hearings on the proposed rezoning[13]. Community Boards are composed of appointed members nominated by the Borough President and relevant City Council Members for staggered two-year terms[14]. While the Community Board writes a recommendation regarding the proposed project following public review, their recommendation has no formal power as it is not a binding decision. Following Community Board review, the proposal is sent to the Borough Presidents' desk, who, while an elected four-year position, also issues an advisory recommendation that is non-binding on the final rezoning outcome[15]. Following this process, the proposal reaches the City Planning Commission, a body of 13 members of which seven are appointed by the Mayor, one by each Borough President, and one by the Public Advocate, for additional review[16]. The City Planning Commission votes on whether to submit the project to the City Council, or to modify the project as they see fit (usually by the recommendations of the Community Boards' and Borough Presidents)[17]. If approved, the proposal continues to the City Council for a final vote. City Council members, like the Borough President, are elected on a non-staggered schedule every four-years. There are 51 City Council members in New York City, and they are limited to two terms[18]. Finally, the Mayor has the option to veto the proposal, although

[7] United States Department of Housing and Urban Development. (2015). "Comprehensive Housing Market Analysis, New York City, NY."
[8] Briffault, R. (1990). "Our Localism: Part I – The Structure of Local Government Law." *Columbia Law Review, 90:3; 1-115.*
[9] New York City Department of City Planning. *About.*
[10] Rules of the City of New York §43, 6-01.
[11] New York City Charter, Chapter 8 §192(e)
[12] Rules of the City of New York, §2-02, 5(b).
[13] New York City Department of City Planning. ULURP Rules., §2-03
[14] New York City Charter, Chapter 69 §2800(a)
[15] New York City Department of City Planning. ULURP Rules., §2-04, 05.
[16] New York City Charter, Chapter 8 §192(a)
[17] New York City Department of City Planning. ULURP Rules., §2-06.
[18] New York City Charter, Chapter 2 §21-22, 25.

the Mayor's veto may be overridden by a 2/3 vote in the City Council. Only then does the rezoning become law.

Given the politicized nature of rezoning in New York City, at least at face value, it is surprising that more empirical studies attempting to understand the motives of policymakers in the rezoning process do not exist. In addition, much of the political literature regarding the motives behind rezoning decisions often point in conflicting directions. Despite the nearly ubiquitous adoption of zoning as a means of transforming the economic landscape of cities, most economic literature understates the importance of zoning as an effective tool[19]. Given that an increasing number of people are privy to the consequences of zoning, the importance of thoroughly understanding both its political motives and economic and distributional consequences has become increasingly important.

In this paper, I will focus exclusively on zoning practices in New York City, while borrowing on the broader literature behind the political motives and economic consequences of zoning. New York City proves an interesting case study due to its recent influx of new residents and thriving economy, its notoriously high rents and property values, and its frequent neighborhood-wide rezonings[20]. Despite a rich literature surrounding the impacts of regulation on property values, and a rich debate between the potential exclusionary versus growth oriented motives behind zoning decisions, there are still many questions to be answered. By exploiting the existence of election cycles for City Council members and the Mayor in New York City, I hope to determine whether or not rezoning decisions are made as a function of these election cycles. This exogenous variable should be able to more definitively test if political motivations are causal in deciding which sections of the City are chosen for rezoning. Moreover, thanks to a long-held norm in the rezoning process that was only recently reversed under new City Council Speaker Corey Johnson, City Council members had the ability to de facto veto a proposed rezoning in their district before it came down to a full vote in City Hall[21]. As a result, I will assume that the rezonings observed must be politically beneficial for the City Council member(s) affected by the catchment area, as long as City Council members are rational and self-interested in seeking reelection.

In addition, I will analyze the short-run trends in property values following different types of rezoning actions. While a large literature exists that examines the relationship between urban land and housing regulations and property values broadly speaking, there is less work done on the direct impacts of a rezoning decision. Additionally, many studies examine the long-run impacts of rezoning on prices. Given that both City Council members and the Mayor are limited to two, four-year terms, I expect that they are interested in short-run outcomes. As a result, I will examine the impact on rezoning on property values by using election cycles as an instrumental variable.

Literature Review

The traditional view in the urban economics literature is that geography, transportation, proximity to amenities, and forces such as economies of agglomeration drive the structure, land-use, and economic geography of our cities. While the distance from the city center or proximity to a subway line certainly is an important factor in an individuals' calculus as to where they'll eventually settle down, and moreover studies of agglomeration economies are incredibly important in understanding the shifting economic dynamics of our cities and their development, many studies tend to ignore the impact of zoning and other municipal land use ordinances. However, since comprehensive zoning ordinances came into vogue in the early twentieth century, the vast

[19] Shertzer, Twinam, and Walsh (2016). "Zoning and the Economic Geography of Cities."

[20] Armstrong, A., Been, V., Madar, J., & McDonnell, S. (2010) "How Have Recent Rezonings Affected the City's Ability to Grow?"

[21] Khurshid, S. (2018). "On Land Use, Johnson Promises 'Deference' to Members But 'No Veto.'" *Gotham Gatzette.*

majority of large cities have come to adopt some variant of hierarchical zoning, aimed at segregating land-use by its function. On a fundamental level, it would seem bizarre that so many policy makers would opt to use zoning as a tool if they believed it was ineffectual. However, some more recent literature has begun to stress the importance of these land-use tools. Shertzer, Twinam, and Walsh (2016) find that, in the long-run, geography and transportation are less important than zoning in determining land-use. By examining the land-use of Chicago neighborhoods following the introduction of the first comprehensive zoning ordinance in 1923, Shertzer et al. (2016) find strong evidence that the decisions of planners are consequential in guiding the long-run spatial dynamics of the city. Importantly, they find that the ordinance was incredibly effective at separating land-use, and that the enactment of zoning served to increase property values in the city on aggregate.

Despite evidence that zoning may be a consequential factor in determining the land-use allocations of a city, even beyond transit and geography, there is surprisingly little empirical literature devoted to understanding both the political motivations behind zoning changes as well as the impact of zoning on residents' welfare. In urban economics, the closest approximations tend to examine the impacts of land-use regulations at large. For example, Turner, Haughwout, and Klaauw (2011) study the impact of increasing land-use regulations spanning municipal boundaries using a regression discontinuity design, and find that more stringent regulations such as minimum lot sizes increase property values and that decreases in land use regulation tend to be welfare improving. Gyourko and Glaeser (2002), find that for most of the United States, construction costs and sale prices for housing do not differ dramatically. In urban areas such as in New York City or San Diego, however, stricter land use and zoning controls may be responsible for higher prices. Glaeser, Gyourko, and Saks (2003) find similar results for properties only within Manhattan. In general, these papers, along with most in the urban economics literature, find that increased land-use regulation (regardless of type), tend to increase property values, and function as a sort of "regulatory tax" to development.

Studies such as Hilber and Robert-Nicoud (2011), build off these findings. Hilber et al. (2011) posit that local land-use boards determine their optimal level of land-use controls as a response to two organized lobbies: owners of developed land, and owners of undeveloped land. Their game theoretic model supports their Influential Landowner Hypothesis, which predicts that more developed areas will exhibit increased regulation, explaining why large cities may opt for additional regulation. While these results may help explain some of the inter-urban variation in aggregate levels of regulation, they do not help explain more targeted policy decision making. Hilber et al. (2011) only model two lobbies, and while presenting an interesting case, the model ignores the fact that many cities have multiple bodies concerned with land-use decision making, each facing re-election, term limits, campaign finance laws, and more. Moreover, this framework is less applicable to large cities such as New York City which have very little to no undeveloped land.

Most literature seems to coalesce around the general finding that increased land-use regulation increase property values. However, Turner et al. (2011), Gyourko et al. (2002), Glaeser et al. (2003), and Hilber et al. (2011) all use the Wharton Land Use Regulation data (WRLURI) as a measure of the regulatory environment. The WRLURI index is constructed from a number of sub-indexes that aggregate a wide variety of land-use regulation, encompassing factors such as the number of agencies required for zoning approval, wait times for building permits, and building codes. While these sub-indexes encompass many important land-use regulations, these papers do not tackle the direct impacts of zoning in say, the consequence of a rezoning action on residents' economic welfare both within and just outside the catchment area. As a result, while the evidence supporting inter-city differences in land or property values as a result of the general state of a city's regulatory environment is quite robust, our understanding of intra-urban impacts of land-use regulation, and more specifically, the effects of zoning, are less well understood. A general issue encountered with studies that address these intra-

urban phenomenon is the problem of endogeneity; it is unclear whether existing land or property values or their trend-lines impact zoning or regulatory decisions, or vice versa.

A number of studies attempt to correct for the problem of endogeneity. Kok, Monkkonen, and Quigley (2013), estimate the restrictiveness of land-use regulations within the San Francisco Bay Area by measuring the number of independent reviews and approvals a developer must go through in order to re-zone a particular lot. Kok et al. (2013) find that an increased number of reviews and approvals tended to increase both land and housing prices, even when controlling for the traditional factors of distance from city center, access to transportation, and Bay Area specifics such as elevation and proximity to a fault-line. Glaeser and Ward (2009) attempt to mitigate this problem through an instrument, using historical density levels as a means to predict current density in the greater Boston Area. However, as the authors themselves point out, the instrument is not a perfect means to identify the impact of land-use regulations, as historical density of a neighborhood is likely to impact current housing and land prices. Moreover, while Glaeser et al. (2009) find that land-use regulations are correlated with higher on the intra-urban area, the effect largely disappears when controlling for a number of other area based variables such as demographics, access to education, distance from the city center, and others. Zhou, McMillen, and McDonland (2008) also find evidence contradictory with predictions, in this case specifically with regard to zoning policies. They find that after Chicago switched from a hierarchical zoning ordinance to one which created exclusive categories, and moreover mandated that buildings conform rather than grandfathering in old mixed used buildings, residential property values did not change. In fact, only commercial and industrial areas enjoyed a boost in their values.

While these urban economics studies find that, in general, restrictive land-use policies may increase property values (which may in turn drive up rent prices), New York City's recent string of rezoning actions would seem to ignore these economists' policy recommendations. Over the past decade, Armstrong, Been, Madar, & McDonnell (2010) find that 86% of all city rezoning actions have either decreased or maintained the density the rezoned neighborhood. In areas considered traditionally residential, the area available for residential use has decreased. This poses the second issue, namely the issue as to determining the motivations of policy makers in their zoning decision. While literature such as Hilber et al. (2011) understand the relationship between policymakers and the public to be one composed of competing land owning based interest groups, most literature examining the political motives behind land-use decision making falls into two categories. The first, dubbed the "Homevoter Hypothesis," is elaborated by Fischel (2001). This hypothesis argues that the motivation behind land-use is majoritarian, and that homeowners will seek to maximize their capital gain and thus restrict the supply of housing. The other hypothesis, sometimes known as the "Growth Machine Hypothesis," posits that changes in zoning results from the pressures of real estate interests and other "pro-growth" groups.

Fischel (2001) argues that homeowners - not developers, renters, or any other interest – are the most numerous and influential group in land-use decision making, especially on the level of small localities. The reason is straightforward: local decisions are heavily reflected in the property values of the area, and homeowners, given that their home is their most valuable asset, have a large incentive to pay attention to these local land-use decisions. Moreover, zoning acts as a form of insurance. Fischel (2001) argues that homeowners are not worried necessarily about the expected impact of new development of an area as a simple cost/benefit analysis, but rather, homeowners are worried about the variance in outcomes. New development poses a risk to existing property values, and zoning decisions are a safeguard against outcomes that have the potential to lower property values and diminish the capital gains realized by existing residents. Moreover homeowners, due to the stakes

vested into the value of their home, are more active in local politics, serving as the dominant interest group in not only making land-use decisions, but in participating on school boards or public hearings.

Various studies have sought to directly test the Homevoter Hypothesis. If the Homevoter Hypothesis is true, and local land-use policies are indeed heavily reflected in local property values, we would expect that homeowners are systematically more engaged with local government than renters. McGregor and Spicer (2016) find that homeownership in Canadian municipalities increase voter turnout, as well as influencing the attitudes of homeowners. They find that homeowners are less likely than renters to support new construction of public housing, as well as less likely to support municipal amalgamations, another prediction of Fischel (2001). Holian (2011) finds similar results in the San Jose area. Homeowners are more likely to vote, with 72% of homeowners participating in local elections versus only 55% of renters. Their simple OLS model, however, did not find that homeownership was a robust predictor of voter turnout. Yet, when adding an additional variable of dissatisfaction, they find that dissatisfied homeowners are much more likely to vote than satisfied homeowners and renters of either category. These findings are also consistent with the predictions of Fischel (2001). Dehring, Depken, and Ward (2008) find that in Arlington, Texas, a new proposed stadium up for public referendum had increased support in areas for where pre-referendum property values increased. Moreover, districts where property values fell had increased voter turnout. These results are also consistent with the Homevoter Hypothesis, and signal that voters internalize the market information surrounding the referendum that signals the expected benefits of the stadium, and likewise vote based on those signals.

While these studies are largely congruent with the Homevoter Hypothesis, others, such as McCabe (2013), find that while homeownership and residential stability do indeed increase participation in local elections, these same factors are also unrelated to participation in membership groups such as civic groups or neighborhood organizations. McCabe (2013) finds that education is still the single most driving factor in political participation, and that while owning a home seems to have some effect on participation, that this effect may simply be due to other socioeconomic characteristics of homeowners.

In contrast to the Homevoter Hypothesis, the "Growth Machine" Hypothesis for urban political decision making posits that growth-seeking parties, such as real-estate interests, are the driving factor in land-use decisions in urban areas. Categorized by Logan and Moltoch (1987), the Growth Machine view argues that political power in urban areas would be most concentrated in those that would like to sustain constant growth, and moreover, that these groups would exert their pressure through lobbying and campaign donations. These groups' constant interaction with public officials through lawyers, lobbyists, and property brokers would yield influence over local decisions, and make it in the best interest of policymakers to seek to great "business friendly" environments. However, some of the Growth Machine's predictions square with the Homevoter Hypothesis, namely that policymakers will seek to increase the property values of more affluent areas, even despite the differing motives. Zoning, in the view of Logan and Moltoch (1987) is a means to distribute growth across a city, and is easily susceptible to outside influence from property owners and business owners. Moreover, they see planners as responding to local demand, and as an area's growth starts to outpace the supply of housing or commercial space, zoning's caps will eventually be lifted.

Few studies attempt to examine the credibility of both hypotheses regarding the political motives behind rezoning. Moreover, there have been incredibly few studies focused on New York City in particular. However, one recent study which examines both and is most similar in scope to this paper provides some insights. Been, Madar, and McDonnell (2014) use a logit model to assess the probability a lot be rezoned given a number of demographic and economic characteristics. They control for variables such as proximity to amenities such as rails stations, bus stops, schools, and parks. They also control for physical characteristics, such as the age of a

building, whether it lies in a historic district, is near a wide or narrow street, and the density of nearby buildings. Economic controls include building activity in the area, the amount of city investment, income, the homeownership rate, and if a block contains a high number of jobs. Demographic controls include the percent of college educated residents and race. Additional variables, such as the votes cast and the amount of campaign contributions were also included for the study, but only for 2005 (where the study spans the years of 2002 and 2009). Been et al. (2014) find that the influence of homeowners in New York City is surprisingly high, especially given the low rate of homeownership, with census tracts with higher homeownership rates being associated with a higher likelihood of being downzoned. They find similar results with areas with a higher proportion of white residents, which are much more likely to be downzoned. Moreover, they find evidence to suggest that areas with higher turnout are more likely to be downzoned. Taken together, the evidence points to possible exclusionary motives behind zoning decisions, and supporting evidence for many of the predictions of the Homevoter Hypothesis. However, the study does not employ an exogenous variable to tease out the potential direction of causality. In this paper, I plan to build off the findings of Been et al. (2014) by employing election cycles as an exogenous treatment, and moreover examining in a more focused manner some of the potential incentives facing elected representatives tasked with rezoning decisions.

Causal Model & Hypothesis

In this paper, I address some of the existing gaps in the literature by exploiting the existence of election cycles, which are exogenous to rezoning decisions, in order to tease out causality. In general, the fundamental issue which underlies the understanding of the political motives of zoning decisions is that nearly every potential motive is endogenously chosen. For example, if we assume that urban planners try to echo the market, and that their rezoning decisions are based on trends in the market, we would expect to see that areas with strong market growth would be rezoned more often. However, this clearly runs into the problem of endogeneity; planners are making decisions on policy as a function of property values in order to influence the trend in property values. As a result, it becomes difficult to observe a result that can definitively answer the question of whether trends in property values influence policymakers. Indeed, this is a problem encountered in the literature, and it poses an issue to nearly every test regarding the motives behind local land-use policymaking: whether it be the influence homeowners, the influence of local amenities, or the influence of landlords and growth-interested parties.

By employing election cycles, I hope to mitigate some of the issues encountered in the literature. Given that the date of an election is out of the control of policymakers, I would expect that if there are any systematic policy differences that re-occur in the years pre and post an election, then that would be an indication of what kind of policies a policymaker considers as a best response to an election. In this case, given that many of the relevant parties behind rezoning decisions are elected, I expect that policymakers will use zoning as a tool to maximize the probability of being re-elected in the next election cycle. In particular, this would mean rezoning decisions would target areas that align with specific electoral goals. In this study, I condition for a variety of socioeconomic and demographic control variables along with voter registration data to attempt to uncover these electoral goals. Moreover, I assume that policymakers are rational, and seek to maximize their chance of re-election.

In order to formulate my hypothesis, I build off the broad strokes of the existing literature. Given that prior literature underscores the increasing relationship between property values and more restrictive land-use regulations, for my first one-tailed hypothesis (*hypothesis a*) I expect that in areas with more homeowners and active voters, the probability of a lot being rezoned would decrease, but that any rezoned lots would be downzoned as Election Day approaches. The logic behind this hypothesis is congruent with both economic

literature that suggests that more restrictive policies lead to higher property values and the Homevoter Hypothesis, where homeowners and high-income voters are more likely to vote for candidates which seek to maximize their capital gain. As a result, I expect to see policymakers enact these types of policies as Election Day approaches. For *hypothesis a*, I will also condition on the characteristics of a given census tract, given that all my data will be aggregated to the census tract level. These controls will include variables such as the share of those with a college degree, the median household income, the mean age of the tract, the share of residents which are foreign born, and the share of white to non-white residents. Likewise, on the opposite tail, I expect that in census tracts with a higher share of renters, lower income, and less active voters to be associated with a higher share of density-increasing rezonings as an election approaches. *Hypothesis a* seeks to directly test the Homevoter Hypothesis. Moreover, I predict that that one of the critical predictions of the Homevoter Hypothesis, the influence of homeowners, is likely to be driving policy decisions. While New York City has a low share of homeowners in general, and logically one would assume that they would yield a lower level of political influence, Been et al. (2014) suggest that homeowners may have a higher impact on zoning decisions in New York City than one would expect. Given this, I seek to answer whether politicians' do indeed take this information into account for their policymaking calculus.

In addition, my model will also include additional variables such as a dummy variable which indicates if a candidate is currently an incumbent. As I am trying to identify the incentives facing policymakers running for re-election, I would expect to see that many of my initial predictions would cease to hold if the candidate is in their final term in office (*hypothesis b)*. Specifically, this implies that the probability of rezoning would be higher for non-incumbents, and that those rezonings would be biased towards downzoning. Given that city council members and the mayor are term limited, I would only expect non-incumbents to be concerned about their re-election chances. While this assumption is complicated by the fact that many incumbent city council members may be concerned with higher office, given that they will likely need to appeal to a broader set of voters than in their prior council districts, and moreover that there is no good way to observe if a council member has the intent to seek higher office, I will ignore this potential complication for the purposes of this study. Additional variables, as discussed above, includes the share of registered voters and active voters to the voting age population in a tract.

Along with testing for the Homevoter Hypothesis, I also test the prevailing prediction in economic literature, and one of the underpinning assumptions of the Homevoter Hypothesis, namely that downzonings should inflate property values and upzonings should cause property values to fall. While the simple supply and demand dynamics are apparent, my concern is specifically on the short-term ramifications of rezoning on property values. If the market takes time to equilibrate, this adjustment period may perversely impact the incentives of term-limited and politicians' whose time horizons are (presumably) focused on short-term effects. For example, if both downzoning and upzoning cause significant increases in property values in the short run, we would expect that policymakers would be indifferent between the two. I predict that in upzoned areas there will be little immediate change in property values, whereas in downzoned areas there will be an increase in property values (*hypothesis c)*.

To test for this, I build off the model created to answer *hypothesis a* and *hypothesis b*. In particular, I treat years until election variable as an instrumental variable for a two-stage regression. In the first stage, the instrument is years until election will predict the density of a rezoned lot, with additional control variables on the right-hand side. For my second stage regression, the instrument will fall out, with the predicted density values acting as the new treatment variable. The outcome variable will now be property values. This second research design will obviously be contingent on the results of the first, as in order for a two-stage design to be effective, years until

election must have predictive power on density. I also believe that the instrument is unrelated to the outcome of property values, as there exists no apparent reason as to why the number of years leading to a NYC local election should have any effect on property values across the city, satisfying the exclusion assumption. Moreover, I do not believe that the instrument years until election is related to the error term in the second stage regression, as the years until an election is unlikley to be related to any unobserved factors driving property values, satisfying the independence assumption.

In summary, I propose the following hypotheses:

a. I expect that in census tracts with a higher share of homeowners and active voters, the probability of rezoning increases as Election Day approaches. Moreover, the effect is biased towards downzoning, with the magnitude of the density decrease increasing as Election Day approaches.
b. I would expect to see that many of my initial predictions in *hypothesis a* would cease to hold if the candidate is a current incumbent; specifically, this implies that the probability of rezoning increases for non-incumbency, and is biased towards downzoning.
c. I predict that in upzoned areas there will be little immediate change in property values, whereas in downzoned areas there will be a marked increase in property values.

Data

In this study, I use the New York City Department of Finance's Property Land Use Tax Output (PLUTO) data, which provides information regarding every tax lot in New York City, which totals approximately 850,000 per year. The PLUTO data includes administrative boundary data for each lot, such as the lots' census tract, community district, and city council district. It also includes relevant building information, such as the number of floors, number of units, total area, and area disaggregated by use. Importantly, the data also include zoning related metrics, such as the Floor-to-Area Ratio (FAR) in any given year, the zoning district, and the building class.

Given building class information, I drop certain categories of building deemed unnecessary for this study. These include educational buildings, utilities, government buildings, outdoor recreational facilities, places of assembly, transportation facilities, churches, hospitals, single-use theatres, garages, factories, and warehouses. This limits the number of observations to slightly under 9 million. I also use the New York City Department of Finance's Real Property Value and Assessment Data (RPAD), which was exported from Access using SQL ODBM and matched into PLUTO data using each building's unique borough-block-lot number (BBL). RPAD data spans the years 2009 and 2018 and indicates each BBL's assessed market value and assessed land value. I choose to use the NYC DOF's assessed market value data as it provides a large sample of buildings over a large enough number of years to make for meaningful analysis. While some cite concerns over potential political bias in property assessment and valuation, for the purposes of this study, the market evaluation need not be exact, the only criterion is that the value is assessed in the same fashion so it is comparable across buildings and years.

The FAR will be the primary variable I will use to assess the density of a building as well as to identify any rezoning actions which have occurred. PLUTO provides data regarding both the statutory FAR during any given year as well as real FAR for a given building (important as many buildings are grandfathered in to old density restrictions, and hence may have a higher real FAR than is allowed under the Zoning Resolution). FAR dictates how much total area a building may be built out to encompass, given the floor area of its lot, where the floor area is always normalized to 1. For example, a building with a maximum FAR of 3:1 which sits on a 10,000 sq. ft. lot may be built to a maximum of 30,000 sq. ft., with the developer choosing the distribution of the area across floors, subject to other regulations that are less relevant to this study. For this study, an increase in the

statutory FAR across years would indicate that the City has taken action to increase the density of a lot, whereas a downzoning would be observed as having a lower FAR. While it would be ideal to study neighborhood-wide rezoning, the New York City Department of Planning's Uniform Land Use Review Procedure (ULURP) documentation do not provide a comprehensive list of BBLs captured in a rezoning's catchment area. Therefore, individual lot-level rezoning actions have also been included in the data, along with neighborhood-wide rezonings. While having the potential to add to noise to the dataset, these lots represent a small fraction of the total number of lots rezoned. Moreover, these individual lot level rezonings may actually be useful in my analysis, as they may represent special favors or punishments leading up to or following an election.

In addition to FAR affecting rezonings, I also analyze non-FAR rezonings by identifying changes in the zoning designation of individual lots year-over-year. Non-FAR rezonings are identified from to year-over-year changes in the categorical zoning variable (for example, R6 to R6A would be coded as a rezoning), which are then coded into a new variable that excludes FAR-altering rezonings. This captures decisions such as contextual rezonings, behind which the political motives are less clear. While density is the primary variable of interest in my analysis, including non-FAR rezonings in certain models may serve as a useful comparison.

In order to supplement my election cycle design, I also use data regarding voter registration from the New York State Board of Elections. Election cycles occur every 4 years, with all City Council positions up for election at the same time as a Mayoral election. Voter registration is published at the electoral district level and indicates both the address of registration as well as the party identification of the registered voter. I will be matching the registration data to my dataset using the unique x and y coordinates associated with each BBL. This does lead to some data-loss, but the loss only around 2% of the sample and appears to be non-systematic. In addition, I will also divide the count of registered voters in a tract by the estimated number of voting-age adults, as estimated by the American Community Survey, in order to have a rough approximation of the level of political engagement within any given tract. The share of registered democrats and republicans to the total amount of registered voters is also calculated.

For controls, I use the 2009 to 2013 and the 2013 to 2017 American Community Survey (ACS) five-year estimates, which were accessed using Social Explorer, and matched by county code and census tract. I include household tenure, which I convert to shares, to indicate the relative composition of renters versus homeowners within a census tract. In addition to tenure, I also match tract level variables using the ACS for the mean income of a household, race, the mean gross rent, the average commuting time, the share of residents in a tract which are native or foreign born, the share of residents who are not citizens, the share of residents in a tract which have a college degree, the unemployment rate, the mean age of a tract, and the GINI coefficient of a tract, which indicates the level of income inequality. All dollar values are inflation adjusted and indexed to 2017 dollars. 2009 and 2010 tracts are matched to new 2010 tract boundaries.

PLUTO data spans back to 2002, whereas the DOF only supplements RPAD data back to 2009. In addition the ACS only provides yearly estimates for most characteristics relevant to this study back to either 2009 or 2010. As a result, I will limit the scope of this study to only focus on rezoning actions following 2009, with an important caveat. For models concerning the political motives behind rezonings (hypothesis a and b), I use PLUTO data from 2007 to serve as the FAR-change baseline year. The DOF does not provide data from 2008, which makes the analysis slightly less accurate. However, given that 2009 is one of the 3 election years in my sample, I find it useful to include an earlier year to serve as a baseline. However, given that 2007 RPAD data does not exist, for the models concerned with property values (hypothesis c), I will use 2009 as the baseline year. While it would be useful to add additional years to the study, the lack of ACS and RPAD data would make

less accurate estimates, and also result in large gaps in the data that would necessitate a great deal of interpolation.

The final dataset contains some 8 million observations. Missing American Community Survey estimates (due to either a lack of data or a statistically reliable data given the margin of errors provided by the Census Bureau) along with unmatched RPAD data led to the loss of some observations. However, the total loss is less than 2% of the total sample, and much of the ACS loss appears to be in tracts that are mostly devoid of large stocks of buildings (such as areas with parks or other large structures), so the data loss should not pose a large problem in the analysis.

Model

I. Estimating the Causal Impact of Elections on Zoning Outcomes

In order to test the relationship between rezoning and election cycles broadly speaking, I run a multivariate paneled probit regression, with posterior marginal effects computed. The dependent variable is a dummy indicating whether lot was re-zoned. The model is run on to predict if a lot is FAR-rezoned, with non-FAR lots omitted from the dummy variable. This model is tested on the entire sample, with 2009 serving as the baseline year, running both a naïve and full model. Incumbency effects are added on the right-hand side, with a dummy indicating whether the current city council member has held their seat in the prior election. Standard errors are clustered by census tract. A linear probability model is included in the appendix, for comparison. The model is run again with a dummy indicating if a lot is downzoned or upzoned, in order to see if the probability of rezoning changes based on direction.

In Model 1, X is the independent variable, years to an election. A indicates the homeownership rate at the tract level; B indicates median household income in thousands at the tract level, CPI inflation adjusted to 2017 dollars; C denotes the tract level GINI index, bound between 0 and 1; D is the tract level unemployment rate; E the percent of individuals 25 or above with a bachelor's degree or more; F is the percent of residents who are non-Hispanic white; G is the percent of residents who are foreign born; H is the median age of residents; I is a dummy denoting if the city council seat is currently held by an incumbent; J is the voter participation rate, measured as the share of active registered voters over the voting-eligible population; K is the percent of active registered voters who are democrats; L is the percent of active registered voters who are republicans; δ is a vector of year fixed effects. Model 1 is as follows:

$$Pr(ReZone_{it}) = \Phi[\beta_0 + \beta_1 X + \beta_2(A_{it}) + \beta_3(B_{it}) + \beta_4(C_{it}) + \beta_5(D_{it}) + \beta_6(E_{it}) + \beta_7(F_{it}) + \beta_8(G_{it}) + \beta_9(H_{it}) + \beta_{10} I + \beta_{11} J + \beta_{12} K + \beta_{13} L + \beta_{14}\delta_t + \varepsilon_{it}]$$

A variant of this multivariate paneled probit regression is run, limited to only lots that were affected by either a FAR rezoning or non-FAR rezoning. The posterior marginal effects computed in this case would indicate the probability of a lot being affected by a FAR rezoning over a non-FAR rezoning baseline rate as an election approaches. This model is included in the appendix.

In the next model, Model 2, I limit my analysis to only lots affected by a FAR altering rezoning. This limited analysis is important, as it serves as a test for the effects of electoral cycles on rezoning at the intensive margin. In this case, the dependent variable is the change in the FAR from the year prior. Once again, both a naïve and full model are run, with the same independent variable and controls as listed earlier. γ denotes a vector of lot-level geographic fixed effects The model is a paneled random-effects model, with clustered standard errors by census tract. Random effects are chosen over fixed effects as homeownership, race, income inequality, and other controls are variables of interest in testing prevailing hypotheses in the literature. While this opens the

model up to possibility of omitted variable bias – there is still a strong theoretical reason to believe that time-invariant trends affect the dependent variable. A fixed-effects paneled model is included in the appendix, for comparison. Model 2 is as follows:

$$\Delta FAR_{it} = \beta_0 + \beta_1 X + \beta_2(A_{it}) + \beta_3(B_{it}) + \beta_4(C_{it}) + \beta_5(D_{it}) + \beta_6(E_{it}) + \beta_7(F_{it}) + \beta_8(G_{it}) + \beta_9(H_{it}) + \beta_{10} I + \beta_{11} J + \beta_{12} K + \beta_{13} L + \beta_{14}\gamma_i + \beta_{15}\delta_t + \mu_{it} + \varepsilon_{it}$$

II. Estimating the Causal Impact of Rezoning on Property Values

If the estimate $\beta_1 X$ is found to have any predictive power over ΔFAR_{it}, I will employ a two-stage instrumental variable model in order to estimate the causal impact of rezoning on property prices. In the first stage, ΔFAR_{it} is predicted based on all the controls introduced in models 1 and 2 (variables A through H). These controls are introduced with several building-specific controls included in PLUTO data that are thought to be correlated with property values. The controls included are as follows: J is the average time spent commuting to work in a census tract (a proxy for distance from CBD – as there are multiple in New York City); K is the building area in square feet; L is the number of units per lot; M is the number of floors per lot; and N is the number of buildings per lot. The exogenous variable years-to-election along with our initial controls from models 1 and 2 are instrumented in the second stage regression, and the log of property values is calculated as the dependent variable. As with earlier models, model 3 is clustered by census tract. Results are only included with year fixed effects, due to the importance of the general property value inflation trendline. Model 3 is as follows:

First-stage: $\widehat{FAR_{it}} = \beta_0 + [\beta_1 X + \beta_2(A_{it}) + \beta_3(B_{it}) + \beta_4(C_{it}) + \beta_5(D_{it}) + \beta_6(E_{it}) + \beta_7(F_{it}) + \beta_8(G_{it}) + \beta_9(H_{it}) + \beta_{10} I] + \beta_{11}(J_{it}) + \beta_{12}(K_{it}) + \beta_{12}(L_{it}) + \beta_{13}(M_{it}) + \beta_{14}(N_{it}) + \beta_{15}\gamma_i + \beta_{16}\delta_t + \varepsilon_{it}$

Second-stage: $log(PV_{it}) = \pi_0 + \pi_1 \widehat{FAR_{it}} + \beta_2(J_{it}) + \beta_3(K_{it}) + \beta_4(L_{it}) + \beta_5(M_{it}) + \beta_6(N_{it}) + \pi_7\gamma_i + \pi_8\delta_t + \mu_{it}$

Where γ_i represents a vector of lot fixed effects, δ_t is a vector of year fixed effects, and ε_{it} and μ_{it} are the error terms, respectively. All controls from models 2 and 3 are instrumented. The model is run on upzoned and downzoned lots separately, due to the somewhat confusing nature of interpreting the coefficient on ΔFAR_{it}. In addition, the model is run in the same manner to predict the log of land values, with all building specific controls dropped. The role of land values is added later in the analysis and is further discussed in the results.

Results

I. Descriptive Statistics

Table 1. *Number of rezoned lots, by borough 2009-2018*

	Upzoned	Downzoned	Non-FAR Rezoned	All Lots
Bronx	2,723	5,926	338	812, 194
Brooklyn	16, 487	30,344	3, 967	2,547,824
Manhattan	4,238	6,038	991	372,952
Queens	19,092	26,097	65,431	2,980,466
Staten Island	231	3,981	3,707	1,169,884
All NYC	42,771	72,396	74,434	8,072,921

Over the period of the study, a total of 115,167 lots were affected by a rezoning which altered their FAR. In line with observations from prior years, the number of downzonings is far higher than the number of upzonings. Another 74,434 lots were rezoned in a non-FAR rezoning, where their existing density was not affected. While these non-FAR rezonings are included in a few models, they are largely omitted from the

analysis as the specific change resulting from the rezoning is not observed. As Been et al. (2014) discuss, there is no uniform procedure in evaluating these non-FAR rezonings. While some regard these non-FAR zonings effectively as downzonings, there is little theoretical basis for this paper to consider them as such. For this reason, I omitted them from much of my analysis, although I will examine whether they are prioritized more or less compared to FAR rezonings as elections approach, and moreover if their effect on property values in comparable to upzonings and downzonings. Table 2 provide an overview of the average FAR in each of the five boroughs, by year. Intuitively, the average FAR is highest in Manhattan and lowest in Staten Island. Notably, the average FAR declined over the course the years of study, with the largest declines in density occurring in the Bronx and Manhattan. Given that only a small subset of lots are affected by rezoning, it is nevertheless impressive how their altered FAR has the power to drag down the overall mean of the FAR in each borough.

Table 2. *Mean Floor-to-Area Ratio, by Borough, by Year*

	Bronx	Brooklyn	Manhattan	Queens	Staten Island	All NYC
2009	1.727	1.664	5.575	0.917	0.612	1.418
2010	1.728	1.658	5.573	0.921	0.612	1.419
2011	1.708	1.659	5.574	0.922	0.612	1.417
2012	1.706	1.659	5.572	0.905	0.592	1.416
2013	1.677	1.658	5.027	0.907	0.592	1.365
2014	1.677	1.621	5.034	0.908	0.592	1.366
2015	1.676	1.621	5.035	0.908	0.592	1.367
2016	1.675	1.622	5.029	0.908	0.592	1.369
2017	1.675	1.634	5.032	0.908	0.592	1.370
2018	1.686	1.636	5.061	0.909	0.592	1.373
Average	1.700	1.645	5.284	0.916	0.603	1.395

Focusing specifically on the magnitude of FAR changes among rezoned lots, Table 3 illustrates average changes in FAR among upzoned and downzoned lots. Downzonings were most dramatic in the Bronx and Manhattan, as were upzonings over the same period. Notably, the average downzoning across all boroughs is a decline in the FAR by nearly 1.0. This change represents a significant change in density – especially considering that the overall NYC average in FAR is only 1.395.

Table 3. *Mean Change in Floor-to-Area Ratio of Rezoned Lots*

	Upzoned	Downzoned	Average Rezoned
Bronx	1.410	-1.126	-0.328
Brooklyn	0.806	-0.713	-0.178
Manhattan	1.263	-3.755	-1.685
Queens	0.548	-0.643	-0.140
Staten Island	0.323	-0.658	-0.604
All NYC	0.772	-0.972	-0.325

These trends are striking, at least at face value. With Manhattan and the Bronx showing strong declines in their average FAR, the most and least affluent boroughs seemed to be most dramatically affected by downzonings. This observation certainly does raise questions regarding the importance of the demographic characteristics emphasized with higher probabilities of downzoning – such as household wealth, the relative education of a

neighborhood, and race, among others. However, these will be more aggressively analyzed in the regression results. Additional demographic summary statistics are included in the appendix (see Appendix 1).

II. Regression Results

A. The Probability of Rezoning

Table 4 shows the results of the multivariate probit regression, with posterior average marginal effects calculated for each of the independent and control variables. While the probit analysis is lacking some of the traditional explanations regarding what drives the probability of a building being rezoned (such as nearby transportation access, nearby school capacity, nearby parks, and other amenities), the model does control for year fixed effects, and the effect of an approaching election is still significant. The posterior margins suggest that each year closer to an election increases the probability of a lot being rezoned by 1.5% over the baseline, holding all else equal. While the effect appears to be small, it also appears to be larger than other possible demographic and economic explanations. These results suggest that electoral cycles may indeed contribute to which lots are chosen for rezoning, out of the total realm of all lots in NYC. While it would have been preferable to exclude lots which, for example, were re-zoned in the few years prior to the time frame included in this study, such analysis was not conducted as there is no definitive way to judge how often the average lot is rezoned in NYC. Two rezonings in a twenty-year period, for example, would seem odd at face value, but there is no definitive way to make a quantified judgement without additional historical data.

As for other variables included as controls, the effect of homeownership is significant and in the negative direction. Each percentage increase in the homeownership rate appears to decrease the probability of a given lot being rezoned by 0.033%. In high homeownership areas, such as parts of Queens and Staten Island where the homeownership rate hovers around 70%, this effect would be particularly pronounced with the probability of a lot in these areas being rezoned decreasing by some 2.31%. This lends some credence to the Homevoter Hypothesis, where more "entrenched" homeowners being more likely to dislike changes in their local zoning codes. Given the rather large effect, especially in high-homeownership tracts, it is still remarkable that homeownership could have any significant effect in a city where one would least expect it – and may shed additional light on the sticking power of the Homevoter Hypothesis in at least partly explaining local land use decisions. However, results from other models in this study will pour some cold water on these findings.

The variables that may tease out either "entrenchment," or to some extent possible exclusionary moves, however, are less clear. Household income, for example, is positive, but not statistically significant. Another variable of interest is the effect of race on rezoning, which is also not statistically significant. Interestingly, the percentage of a tract which is white ceases to be significant with the addition of percent republican as a control variable, which I suspect to be due to collinearity. Educational attainment is also not statistically significant, and rules out three variables with significance in prior literature as potentially being linked to land-use decisions. This is an interesting result, suggesting that some of these exclusionary motives may not explicitly drive the probability of a lot being chosen for a rezoning. The results do not rule out, however, exclusionary motives driving both the intensity and magnitude of rezoning decisions, which is discussed in the following model.

Table 4a. *Multivariate Probit Regression*

FAR Rezoned	*Model 1a*	*Model 1b*	*Model 1c*	*Model 1d*
Year to Election	-0.1348*** (-6.92)	-0.1367*** (-6.78)	-0.4382*** (-13.92)	-0.4359*** (-13.81)
Homeownership Rate		-0.0111*** (-11.35)	-0.0129*** (-12.46)	-0.0097*** (-8.73)
Household Income†		0.0017 (1.47)	0.0026** (2.23)	0.0022 (1.73)
GINI Index		-1.9313*** (-5.77)	-1.2117*** (-3.54)	-1.0161*** (-2.98)
Unemployment Rate		0.0156 (-3.14)	-0.0103** (-2.41)	-0.0092** (-2.13)
Bachelors or Above		0.0043** (2.50)	0.0031 (1.72)	-0.0001 (-0.08)
Percent White		0.0001 (0.14)	-0.0027*** (-3.42)	0.0004 (0.37)
Percent Foreign Born		0.0037*** (2.60)	0.0025 (1.81)	-0.0007 (-0.43)
Median Age		-0.0204*** (-5.99)	-0.0171*** (-5.03	-0.0129*** (-3.55)
Incumbency				-0.1691*** (-3.95)
Voter Participation				0.0009*** (3.72)
Percent Democrat				-0.0172*** (-5.50)
Percent Republican				-0.0476*** (-7.12)
Constant	-2.0168*** (-76.06)	-0.4955** (-2.46)	-0.1396 (-0.66)	1.3073*** (3.68)
Year FE	No	No	Yes	Yes
Pseudo R-Squared	0.02	0.06	0.15	0.16
N	8,072,921	8,070,038	7,261,250	7,074,089

Z-scores in parentheses. *** indicates 99% confidence level, ** indicates 95% confidence level. †Household income in thousands

Adding various political variables as controls does yield some additional interesting results. Results suggest that incumbency lowers the probability of rezoning occurring, implying that more rezonings would occur durring a City Council member's first term, comparatively speaking. Given that most rezonings in NYC are downzonings, this is particularly interesting as it suggests a potential re-election motive behind the frequency of rezonings. This incumbency effect will be further explored in the next model. Voter participation, on the other hand, moves in a direction against expectations. As the share of active voters increases, the probability of rezoning occurring increases, albeit by a very small percentage. This confounds the Homevoter Hypothesis, at least to a certain extent, as the Hypothesis also states that more active participation and higher turnout should lead to more exclusionary zoning practices. However, this does not appear to be the case. One potential explanation

is that the number of active voters measures registered voters across any electoral cycle – including federal and state elections. Given that City elections occur on non-federal election years, the set of active voters in both elections may differ, and local policymakers may simply not target what would appear as highly "active" tracts in the data because they have better information regarding where active *local* voters live. Alternatively, this result may also support the Growth Machine theory, suggesting that policy-makers are not beholden to voters, and are rather concerned with non-voting interests such as lobbyist or real-estate interests.

Party identification also has an interesting effect on rezoning probabilities. Increasing percentages in both democrats and republicans seems to decrease the probability of a lot being rezoned, albeit at a much higher rate for republicans. The decreasing probability of rezoning is particularly pronounced in republican areas of the City, which may suggest that the Mayors Office or City Council at large may indeed withhold any rezoning related benefits they endow themselves to members of the minority party. Alternatively, an increasing share of republican voters may serve as an easy heuristic for policymakers, translating to areas with whiter and more affluent constituents, leading to a decreased probability of rezoning.

Table 4b. *Multivariate Probit Regression Posterior Marginal Effects, in Percent*

FAR Rezoned	*Model 1a*	*Model 1b*	*Model 1c*	*Model 1d*
Year to Election	-0.482	-0.465	-1.525	-1.489
Homeownership Rate		-0.038	-0.045	-0.033
Household Income		-0.005	0.009	0.007
GINI Index		-6.584	-4.216	-3.471
Unemployment Rate		0.053	-0.036	-0.031
Bachelors or Above		0.014	0.011	0.000
Percent White		0.000	-0.009	0.001
Percent Foreign Born		0.013	0.008	-0.002
Median Age		-0.069	-0.059	-0.044
Incumbency				-0.578
Voter Participation				0.003
Percent Democrat				-0.058
Percent Republican				-0.163

Other explanations for why the frequency of rezonings increase as elections approach also apply. A new mayoral administration or an administration beginning their second term may simply begin studying possible rezonings at the beginning of a term, with their completion increasing with time, coincidentally as an election approaches. Due to this, examining both the direction and the extent to which density is altered as a function of the election cycle is of particular importance in determining if exogenous political factors such as an approaching election truly do affect rezoning decisions in a meaningful way. These factors are discussed over the proceeding few models. At the very least, results may indicate potentially discontinuous attitudes towards the types of rezonings undertaken at DCP as administrations change or enter their second term.

B. The Magnitude and Direction of Rezoning

Testing the impact of an election on the direction and magnitude of density change associated with a rezoning, I find strong indication that election cycles do indeed influence the extent of the density alteration in rezoning. As illustrated in Table 5, each additional year closer to an election decreases the average FAR of a rezoned lot by 0.44, consistent with my hypothesis, and suggesting a very strong tendency towards downzoning as a function of election cycles. Compared with the mean FAR of all lots in the city, election cycle effects represent

a decrease in average density by 31.4%. This is perhaps the most illuminating result of this study, indicating that politicians significantly bias the direction and intensity of their rezoning decisions due to an approaching election. Given that much of the existing literature in urban economics stresses the importance of rezoning and other land-use decisions being made as a function of existing transportation and infrastructure capacities, this result challenges the benevolence of urban planners as decision makers free from exogenous political shocks. Moreover, it demonstrates the capacity of City Council members and the Mayor in driving rezoning decisions and suggests that even politicians in the largest, densest, and most prototypically "urban" city in the United States still seem to derive some electoral benefit from downzoning – even in spite of a growing population and recent influx of new residents.

Somewhat contrary to expectations, an increase in the homeownership rate of a census tract is associated with additional *increases* in the density of a rezoning. The results suggest that while lots in areas with high fractions of homeowners are less likely to be rezoned, the rezonings in these areas which do occur tend to be biased towards upzoning. This information certainly does qualify the Homevoter Hypothesis to a certain extent and departs with expectations. However, it may be that if the political costs of rezoning higher homeowner areas have been overcome or at least internalized by policy makers, that additional downzoning pressures do not apply. However, there is no additional tests to answer such questions, and should be the focus of further research. It may indeed be the case that this result supports an alternative hypothesis, namely the Growth Machine theory of urban land use decision making. While homeowners may be successful in lowering the probability of their lot being rezoned in the first place, it may be that if their lot is eventually chosen for rezoning, upzoning pressures from real-estate interests and developers to build on relatively underdeveloped land may influence policymakers. In either case, these results paint the Homevoter Hypothesis in mixed light, at least in New York City. This said, the bias towards downzoning in general still appears to be incredibly strong, suggesting that there may be additional political benefits to downzoning that are neither captured by nor driven by homeownership rates.

The influence of median household income does conform to expectations, with increases in household income associated with downzoning. In this model, every $1000 increase in median household income of a tract decreases the average change in the FAR by 0.0242. Using the prior example, in a particularly high-income tract with a median household income of $85,000, this would be associated with an average change in the FAR of rezonings of 2.057 – an enormous effect when considering the additive effects with regards to the election cycle. This effect is rather significant and may shed additional light regarding the motives behind deciding the direction and magnitude of rezoning in NYC. Moreover, these results may indicate that at least with respect to class and income, exclusionary zoning motives drive rezoning decisions to some extent.

The influence of race, on the other hand, is not statistically significant in the full model. Like in the previous model, the percentage of white residents is statistically significant in other models but ceases to hold explanatory power when adding the percent of active voters which are registered republicans. Prior to this addition, the effect of an increasing percentage of white residents is a bias towards downzoning. The effect of an increasing share of republican active voters is also towards downzoning, and I suspect that there may be an issue of collinearity. When controlling for borough, however, the effect of race is statistically significant and negative (see appendix 5). This result implies that in rezoned lots, increasing shares of white residents is associated with additional downzoning, which is consistent with expectations. Moreover, the result implies that exclusionary motives related to race and income may still be influential in driving the magnitude and direction of rezoning.

Increasing shares of foreign-born residents also appears to be associated with additional downzoning. This is contrary to expectations, as I expected that due to the lower share of voting residents in these neighborhoods, there would be a tendency towards politically "costly" upzoning. Moreover, the coefficient on the percent foreign born is rather large in magnitude, with a one percent increase in the number of foreign born residents in a given census tract being associated with a decrease in FAR by 0.024. In a tract with a higher share of foreign

born residents than average, say 30%, this effect becomes sizable – associated with a decrease in FAR by 0.72. There are a few potential explanations to this phenomenon. One is that immigrant groups are well organized in NYC and exert their political influence and lobby for downzoning in their neighborhoods. Alternatively, it may be that existing residents would like to exploit the exclusionary effects of rezoning and put pressure on policymakers to downzone in areas with increasing proportions of foreign residents so as to limit their influx. Regardless of motive, the strong association with a higher share of foreign born residents and downzoning is an interesting and unexpected caveat of land-use politics in NYC.

Table 5. *Multivariate Paneled Random Effects Regression, Effect on FAR-Rezoned Lots*

Change in FAR	*Model 2a*	*Model 2b*	*Model 2c*	*Model 2d*
Year to Election	0.2350*** (9.64)	0.2698*** (10.12)	0.4640*** (3.91)	0.4425*** (3.49)
Homeownership Rate		0.0109*** (3.47)	0.0108*** (4.00)	0.0140*** (4.95)
Household Income†		-0.0245*** (-5.25)	-0.0239*** (-5.64)	-0.0242*** (-6.24)
GINI Index		-4.6456*** (-4.74)	-3.8461*** (-4.55)	-4.1478*** (-5.26)
Unemployment Rate		-0.0291*** (-3.14)	-0.0072 (-0.81)	-0.0094 (-1.10)
Bachelors or Above		-0.0001 (-0.02)	0.0038 (0.86)	-0.0002 (-0.05)
Percent White		-0.0042*** (-2.91)	-0.0045*** (-3.34)	-0.0001 (-0.06)
Percent Foreign Born		-0.0204*** (-6.53)	-0.0223*** (-6.98)	-0.024*** (-7.45)
Median Age		-0.0025 (-0.20)	-0.0109 (-1.08)	0.0042 (0.43)
Incumbency				-0.2723*** (-3.84)
Voter Participation				-0.0021*** (-3.38)
Percent Democrat				-0.0028 (-0.59)
Percent Republican				-0.0369*** (-3.97)
Constant	-0.5604*** (-9.78)	3.9384*** (6.25)	4.1522*** (7.70)	4.3521*** (5.87)
Year FE	No	No	Yes	Yes
R-Squared	0.04	0.18	0.32	0.34
N	115,167	115,002	115,002	111,111

Z-scores in parentheses. *** indicates 99% confidence level, ** indicates 95% confidence level. †Household income in thousands

Other variables seem also appear to have no influence on both the magnitude and direction of rezoning. The unemployment rate, for example, has no explanatory power in predicting the change in the FAR. This may be

due to unemployment and median household income being highly correlated. Educational attainment also has no detected effect. I expect that the percent of adults with a bachelor's degree or above to be correlated with other variables such as income and homeownership, explaining why this variable also has no explanatory power. Median age is not significant as well, which I expect is a result of there being little intra-tract variation in age in New York City.

Controlling for incumbency, we find that an incumbent city council member decreases the FAR of rezonings over those which have a new member who will be up for re-election. This is not consistent with my expectation, which expected a downzoning effect for non-incumbents in order to enhance their chances at re-election. This result is further complicated by the results of the identically run fixed effects model (see appendix 4), where the incumbency effect is significant in the opposite direction. One possible explanation is that incumbents may be concerned with higher office, and so are still inclined to downzone in their second term. Second, it may be that DCP and the Mayor's office drives rezoning decisions, not City Council members, and assigns more dramatic downzonings to second-term City Council members. In either case, it is still clear that the probability of a lot being rezoned decreases substantially if a lot is in a district where a City Council member is in their second term, which is consistent with expectations. The motivation behind the downzoning effect detected for incumbency on the size and direction of rezoning remains somewhat unclear, and the result is further complicated by the opposite result from the fixed effects model.

Voter participation, on the other hand, seems to exhibit a strong downzoning effect, consistent with expectations. It is rather interesting that voter participation seems to have a little to positive effect of determining which lots are chosen for rezoning yet seems to influence the direction of the rezoning towards downzoning. This may reflect on the procedure in place behind DCP's rezoning process, where the City chooses study areas, and voters have an opportunity to voice their concerns to various policymakers post-study. This result may also shed light on the explicit political gain of rezoning and provides some evidence to link downzoning with political gains. The association of areas with higher shares of active voters and downzoning may indeed point to the use of downzoning as a political tool to incentivize voters to vote for the downzoning-inducing candidate, especially combined with evidence regarding the effect of incumbency and the general trend towards downzoning as a function of the election cycle.

C. The Effect of Rezoning on Property and Land Values

Given that the variable years to election is a significant explanatory variable in the change in FAR, I use years to election as an instrumental variable in predicting the change in property values due to a rezoning. Table 7 illustrates the effect of a rezoning, with the intensity of the density change due to the rezoning based on the change in the floor to area ratio, on the log of property values. This model is limited strictly to lots that were rezoned, to determine the direct effect of a rezoning on property values (strictly speaking, how rezoning can be used as a very precise tool for policymakers in effecting the property values of certain buildings over others). While this limited sample also limits the scope of the results, insofar that the effect of a rezoning on an existing neighborhood is not examined, broader neighborhood-level analysis should be further pursed in order to understand the localized effect of rezoning and therefore the economic impact on existing neighborhood residents. Table 7 provides a very direct assessment of a rezoning action's effect on a particular lot – which may shed some light on rezoning's economic effects but does not capture any spillover effects.

The instrumental variable model suggests that, overall increases the floor-to-area ratio is associated with a decline in property values, holding each of the building specific controls constant. In particular, a increase of the FAR by 1.0 (a significant change, considering that the average FAR in NYC is 1.3) is associated with a 44% reduction in property values. Multiplying by the average change in FAR over the period studied, a decrease by 0.395, this translates into an average increase in property values due to rezoning of 13.95%.

Table 7. *Two-Stage Paneled Instrumental Variable Regression on Property Values, Effect on FAR-Rezoned Lots*

log(PV)	*Model 3a, Rezoned*	*Model 3b, Rezoned*	*3b, Upzoned*	*3b, Downzoned†††*
Change in FAR††	-0.8554*** (-86.60)	-0.4295*** (-31.10)	-0.1630*** (-5.89)	-0.4440*** (-31.65)
Commute Time		-0.0147*** (-27.17)	-0.0195*** (-33.19)	-0.0109*** (-11.92)
Lot Area†		0.0019*** (5.31)	0.0018 (1.24)	0.0019*** (4.29)
Building Area†		0.0009*** (3.37)	0.0041*** (4.94)	0.0016*** (7.72)
Number of Buildings		0.1545*** (6.42)	0.0849*** (6.28)	0.2988*** (8.87)
Number of Floors		0.1343*** (18.80)	0.2141*** (17.69)	0.0964*** (21.10)
Units Total		0.0009 (0.43)	0.0006 (0.41)	0.0001 (0.01)
Constant	13.1956*** (1751.33)	13.3453*** (328.95)	13.5697*** (294.01)	12.8026**** (182.98)
Year FE	Yes	Yes	Yes	Yes
R-Squared	0.07	0.30	0.36	0.41
N	113,437	113,311	42,152	71,159

Z-scores in parentheses. Standard errors bootstrapped for accuracy, with 10 repetitions.
*** indicates 99% confidence level, ** indicates 95% confidence level. †In thousands of square feet
†† Predicted change in FAR values. ††† Given that this is limited to downzoned lots, change in FAR values are strictly negative.

A more useful method of analysis, however, is to examine the causal effect of changes in the FAR by if a lot was upzoned or downzoned. Of all upzoned, lots, an additional increase in the FAR by 1.0 against the upzoned baseline is associated with a 16% reduction in property values. Multiplying by the average change in FAR of an upzoning over the period of study, this translates to a decrease in property values due to upzoning of 12.58%. Of all downzoned lots, an additional decrease in the FAR of 1.0 is associated with a 44% increase in property values. Multiplying by the average change in FAR of a downzoning over the period of study, this translates to an average increase in property values due to downzoning of 42.78%. These results suggest that, at the intensive margin, additional downzoning dramatically increases property values, whereas additional upzoning decreases property values. This somewhat departs from expectations. While the profound effect of downzoning to increase property values are certainly realized, and perhaps sheds light on why such a large proportion of rezonings in New York City over the period were in fact downzoning, the large property value decreasing effect of upzonings is somewhat surprising. While in the long run it is expected that a rightward shift in the building supply curve will eventually lower property values, an immediate impact of this magnitude seems large given the inelastic nature of the housing market. A possible explanation may simply be that the model controls for factors such as building size and units, and upzoned lots are less expensive on a *per unit* basis, representing an effect akin to economies of scale. Alternatively, upzoned lots may spur immediate construction, which leads to a temporary decline in property values as the lot is redeveloped and no property (and thus no property value) sits on the lot. The effect driving this upzoning property value declines is unclear – with the second possible explanation tested in the next section, which is limited to land values. The results, however, do show rather clear evidence regarding the causal direction that additional decreases in the FAR will inflate property values, which is certainly in line with theoretical predictions.

Table 8. *Two-Stage Paneled Instrumental Variable Regression on Land Values, Effect on FAR-Rezoned Lots*

log(LV)	*Model 3a, Rezoned*	*Model 3b, Rezoned*	*3b, Upzoned*	*3b, Downzoned†††*
Change in FAR††	-1.0377*** (-95.32)	-0.9166*** (-55.16)	0.1302*** (5.89)	-0.8226*** (-98.29)
Commute Time		-0.0201*** (-29.60)	-0.0370*** (-29.15)	-0.0067*** (-8.50)
Lot Area†		0.0378*** (4.80)	0.0035 (1.08)	0.0036*** (6.09)
Constant	11.4817*** (1276.31)	12.3006*** (387.93)	13.1646*** (203.10)	11.1904*** (331.27)
Year FE	Yes	Yes	Yes	Yes
R-Squared	0.24	0.28	0.56	0.45
N	113,212	113,086	41,966	71,120

Z-scores in parentheses. Standard errors bootstrapped for accuracy, with 10 repetitions.
*** indicates 99% confidence level, ** indicates 95% confidence level. †In thousands of square feet
†† Predicted change in FAR values. ††† Given that this is limited to downzoned lots, change in FAR values are strictly negative.

Due to the unclarity of the effect of upzoning on property values – the same model is run again, but with the predicted value in this case being the log of the land value. Building specific controls are dropped in this case, as they should theoretically be unrelated to underlying land value. The purpose for this model is to uncover any speculative effect regarding the fundamental valuation of land given a certain rezoning direction. This model also hopes to correct for any potential bias in the upzoning results from Table 7, which may be driven by a decrease in property values due to new construction. Table 8 illustrates that downzoned lots are associated with a large increase in land values. A downzoning which decreases FAR by an additional 1.0 is associated with an increase in the land value by 82%, which further supports the theory that more restrictive density is expected to increase the value of both the property and the land underneath it. Multiplying by the average change in FAR due to rezoning, this translates to an increase in land values due to rezoning of 79.95% on average. On the upzoning side, however, in this case additional upzoning also leads to higher land values. An additional increase in FAR by 1.0 on an upzoned lot is associated with an increase in the land value by 13%. Multiplying by the average change in FAR due to upzoning this translates to an increase in land values due to upzoning of 10.05%. This result is more in line with hypothetical predictions – where downzoned lots see a dramatic effect in both property and land values. Upzoned lots, however, appear to experience more modest inflationary effects. These results shed light regarding both the causal direction of rezoning on property and land values in the short-run and may indicate why policymakers seem to so strongly prefer downzoning over upzoning. The strong inflationary effect of downzoning may indicate that downzoning is a more consistent policy tool in the local land-use toolbox, and therefore is a less risky policy decision compared to upzoning if the desired aim is to serve consistencies that would more directly benefit from increased property values.

Conclusion

The results of this study suggest that the political motivations behind rezoning decisions are not only often overlooked in the academic literature, but that exogenous political motives do indeed seem to have a significant effect in deciding who, where, and what gets rezoned. I hope that these results can serve help bridge the gap in Urban Economic and Political Science literature, the former which doubts the influence of politics in explicitly manipulating land-use decisions and the latter which often struggles with the problem of endogeneity in determining the potential motives that policymakers may have in deciding which lots to rezone and to what extent. Moreover, these results suggest that politicians in New York City, specifically the Mayor and City

Council members, may use rezoning as a political carrot in encouraging voters to support them at the next ballot. I find strong evidence that an approaching election not only raises the probability of a density-altering rezoning from occurring in the first place, but that the approaching election has a pronounced density effect that skews heavily on the side of increasingly less-dense downzonings. With the exception of Manhattan, the closer that voters are to deciding who to cast their vote for, the average density of a rezoning decreases by a remarkable 31% over the average NYC building density. Moreover, given that increased voter participation seems to amplify the downzoning effect, at least on the margin, the voter participation effect seems to provide a plausible causal story that politicians may use downzoning to reward loyal constituent and help them win reelection.

The results of this study cast doubts on the rigidity of the Homevoter Hypothesis in New York City. While results from the multivariate probit model show that increasing homeownership is associated with a decreased probability of rezoning, the random effects panel of rezoned lots suggests that homeownership may have the opposite effect on lots chosen for rezoning. As discussed earlier, the mixed direction this homeownership effect should certainly be a cause of pause. While homeowners may be successful in lobbying against changes in the zoning code in the first place, if they are chosen for rezoning their influence may wane. This raises the question regarding the role of real-estate interests and other lobbying groups on New York City land use politics and may potentially provide some credibility to the Growth Machine hypothesis. Given that lots with homeowners are likely to be less dense, the upzoning bias associated with increasing homeownership may indicate a desire to redevelop such lots. As conflicting results regarding property values suggest, additional research on the association between upzoning and immediate redevelopment should be further studied.

In assessing potential exclusionary motives behind rezoning, namely the influence of income, race, education, age, and immigration status, the results lean towards exclusionary motives playing a potentially significant effect in driving land-use policy. Income certainly appears to have a strong effect on rezoning decisions in New York City. Increasing median household income not only decreases the probability of a lot being rezoned, it also creates a strong downzoning bias towards lots which were chosen for rezoning. Race, on the other hand, does both decrease the probability of a lot being rezoned and create a downzoning bias as the share of white residents rises, but only in some models. Neither education attainment or age have any statistical significant in determining both the probability of a lot being rezoned and the direction and magnitude of a rezoning. Finally, immigration status appears to have a significant downzoning bias on rezoned lots, but no effect on the probability of a lot being rezoned. This may be due to either the power of immigration related groups in driving rezoning decisions towards downzoning, or alternatively the effect of existing residents attempting to reduce the stock of housing so as to price out additional increases in the foreign-born population. The overall picture regarding potential exclusionary motives behind rezoning remains somewhat mixed, with potentially strong exclusionary motives associated with income and immigration status, slightly less robust results regarding the effect of race, and no effect detected regarding education and age.

This paper also contributes additional evidence that more restrictive density controls are associated with significantly higher property values by isolating a causal mechanism via an instrumental variable. Results indicate that the average rezoning increases property values by 13.95%. My findings also show that the average downzoning in New York City increases property values by 42.78% and increases land values by 79.95%. The economics of upzoning, however, remains rather murky. While my analysis suggests that upzoning is associated with declining property values on upzoned lots, with an average decrease in property values of 12.58%, this effect may be confounded when considering that new construction may take many years to be reflected in reported property values. Isolating the analysis to changes in land values, however, suggests that upzonings may increase land values, even if they decrease property values in the data. Results show that the average effect of an upzoning on land values is an increase of 10.05%. While positive, the inflationary effect of upzoning seems to be dwarfed in comparison to those of downzoning. Moreover, given that we are interested in the behaviors

of policymakers and likewise the short-term effects of rezoning, it is clear that one rezoning direction leads to a strong inflationary effect while the other may yield mixed short-term results. Given that policymakers have so strongly favored downzoning over the period of the study, the results may indicate that policymakers may be aware and have internalized these effects and use the direction of rezoning to strategically manipulate their chances of reelection.

I hope that these findings contribute to the existing literature, and perhaps provide additional clarity regarding both the motives and effects of rezoning. Over the course of the study, a remarkable 21.13% of New York City was affected by a rezoning, the plurality of which were in the form of a downzoning. Given the frequency and extent to which New York City's land use regulations are being transformed, the importance of understanding the dynamics of rezoning from both the angle of political motivations and tangible outcomes is more important than ever. This said, there are many issues in regarding land-use and rezoning that warrant further exploration, and moreover limitations in this study's design that should be addressed in future studies. A more expansive analysis of potential factors driving rezoning decisions that incorporates variables omitted in my analysis, such as distance to amenities or the capacity of nearby amenities, would be useful if a study were to revisit the electoral effects on rezoning. Such an analysis could also help determine the extent to which city planners use these traditional inputs in driving rezoning decisions, along with any exogenous political effects they consider. As mentioned earlier in this study, the dynamics surrounding the somewhat mysterious contextual zoning and other non-FAR rezonings should be further explored, especially considering that a sizable chunk of all rezonings are done in this way. As for understanding changes in property values – more neighborhood level analysis should be conducted, examining the potential spillover effects of a rezoned lot on nearby existing developments, in order to fully understand the impact of rezonings. Finally, additional research should be conducted on the long-run dynamics of how these changes in property values influence rent prices, a useful metric to understand economic welfare outcomes in high-renter cities such as New York City.

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Appendix

Appendix 1. *Mean Value of Key Variables, 2017 by Census Tract*

	Manhattan	*Brooklyn*	*Queens*	*Bronx*	*Staten Island*
Homeownership	23.55%	34.31%	49.73%	21.96%	65.93%
*Residential FAR**	5.284	1.645	0.916	1.700	0.603
Family Income	$91,715	$59,775	$66,931	$41,688	$75,298
Property Value	$1,109,822	$207,193	$205,129	$295,786	$210,297
Gross Rent	$1822	$1396	$1508	$1168	$1301
Inequality	.52	.47	.42	.46	.44
College Degree	60.83%	34.64%	30.71%	19.92%	31.89%
Age	38	36	39	35	40
Foreign Born	28.15%	36.81%	46.13%	34.55%	21.86%
Non-Citizen	14.87%	14.67%	19.10%	17.51%	7.80%
Race: White	56.95%	44.22%	40.12%	23.78%	73.15%
Race: Black	15.56%	32.95%	11.89%	32.34%	11.89%
Race: Asian	12.78%	11.58%	23.9%	3.89%	8.12%

*Residential FAR values listed by statutory, rather than effective (historic) ratios.

Appendix 2. *Linear Probability Model*

FAR Rezoned	*Model 1a*	*Model 1b*	*Model 1c*	*Model 1d*
Year to Election	-0.0048*** (-141.23)	-0.0045*** (-6.89)	-0.0141*** (-9.99)	-0.0138*** (-9.76)
Homeownership Rate		-0.0003*** (-11.64)	-0.0004*** (-11.97)	-0.0004*** (-11.10)
Household Income†		0.00007** (2.02)	0.00008** (2.32)	0.00009** (2.33)
GINI Index		-0.0651*** (-5.431)	-0.0361*** (-3.09)	-0.0311*** (-2.66)
Unemployment Rate		0.0006*** (3.82)	-0.0003** (-2.24)	-0.0003** (-2.22)
Bachelors or Above		0.0001 (1.82)	0.00007 (1.21)	-0.00001 (-0.18)
Percent White		0.00003 (1.35)	-0.00004 (-1.70)	0.00003 (0.65)
Percent Foreign Born		0.00007 (1.55)	0.00004 (0.90)	-0.00005 (-1.00)
Median Age		-0.0005*** (-4.99)	-0.0003*** (-3.79)	-0.0002*** (-2.52)
Incumbency				-0.0063*** (-4.42)
Voter Participation				0.0074*** (5.54)
Percent Democrat				-0.0415*** (-3.26)
Percent Republican				-0.0950*** (-5.28)
Constant	-0.0216*** (324.24)	0.0705*** (0.45)	0.0897*** (10.12)	0.1238*** (8.77)
Year FE	No	No	Yes	Yes
R-Squared	0.002	0.01	0.02	0.03
N	8,072,921	8,070,038	8,070,038	7,863,968

t-scores in parentheses. *** indicates 99% confidence level, ** indicates 95% confidence level. †Household income in thousands

Appendix 3. *Multivariate Probit Regression, only FAR and non-FAR Rezoned Lots*

FAR Rezoned	*Model 1a*	*Model 1b*	*Model 1c*	*Model 1d*
Year to Election	-0.1466*** (-67.11)	-0.1539*** (-3.72)	-0.0045 (-0.05)	-0.0081 (-0.08)
Homeownership Rate		-0.0392*** (-10.63)	-0.0439*** (-10.17)	-0.0399*** (-9.05)
Household Income†		0.0272 (0.62)	0.0016*** (0.34)	0.0007 (0.16)
GINI Index		-1.0909 (-1.06)	-2.160 (-1.83)	-2.0267 (-1.63)
Unemployment Rate		-0.0059 (-0.45)	-0.0064 (-0.44)	-0.0038 (-0.26)
Bachelors or Above		0.0088 (1.48)	0.0057 (0.90)	0.0046 (0.69)
Percent White		0.0050** (1.96)	0.0013 (0.46)	0.0081** (2.09)
Percent Foreign Born		0.0069 (1.54)	-0.0038 (-0.74)	-0.0014 (-0.24)
Median Age		-0.0397*** (-3.12)	-0.0286 (-1.85)	-0.0269 (-1.67)
Incumbency				-0.0784 (-0.77)
Voter Participation				0.0354 (0.18)
Percent Democrat				0.6435 (0.52)
Percent Republican				-2.1297 (-1.16)
Constant	0.4490*** (113.30)	3.448*** (5.00)	4.3374*** (5.47)	3.5489** (2.36)
Year FE	No	No	Yes	Yes
Pseudo R-Squared	0.01	0.36	0.41	0.42
N	189,435	189,435	186,601	181,498

Z-scores in parentheses. *** indicates 99% confidence level, ** indicates 95% confidence level. †Household income in thousands

This multivariate probit regression is identical to that in table 4a, but only run on lots that were rezoned in either a FAR or non-FAR rezoning. The purpose behind this probit model is to see if policymakers bias one type of rezoning as a function of an approaching election. However, the probit model with year fixed effects demonstrates that there is no difference in the probability that either type is chosen systematically over the other as an election approaches. The model does suggest, however, that the probability of a FAR rezoning decreases as the homeownership rate and the percent of white residents increases. Such lots are more likely to be chosen for a non-FAR contextual rezoning.

Appendix 4. *Multivariate Paneled Fixed Effects Regression Results*

Change in FAR	*Model 3a*	*Model 3b*	*Model 3c*	*Model 3d*
Year to Election	1.0376*** (7.42)	0.9025*** (8.50)	1.5951*** (4.98)	1.4999*** (5.16)
Homeownership Rate		-0.0974 (-1.32)	-0.2645 (-0.57)	-0.0342 (-0.77)
Household Income		0.0208 (0.36)	0.0347 (1.22)	0.0415 (1.49)
GINI Index		8.4239 (0.54)	6.8684 (1.36)	5.6574 (1.24)
Unemployment Rate		-0.1759 (-1.85)	0.7116 (1.21)	0.0781 (1.40)
Bachelors or Above		-0.0564 (-0.68)	-0.0546 (-1.24)	-0.0773 (-1.73)
Percent White		-0.0237 (-0.37)	0.0426 (1.11)	0.0551 (1.36)
Percent Foreign Born		0.1225 (1.39)	0.0342 (0.64)	0.0508 (0.91)
Median Age		0.1077 (0.71)	0.0893 (1.49)	0.1099** (2.00)
Incumbency				0.9054** (2.09)
Voter Participation				-0.2872 (-0.12)
Constant	-1.3658*** (-9.74)	-7.0087 (-0.73)	-9.9039** (-2.04)	-10.8858*** (-2.35)
Building FE	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	Yes
R-Squared	0.31	0.42	0.65	0.67
N	115,167	115,002	115,002	111,111

Z-scores in parentheses. *** indicates 99% confidence level, ** indicates 95% confidence level.

As anticipated, adding fixed effects wipes out the explanatory power of time-invariant control variables. The independent variable years to election, however, remains significant and explanatory. Interestingly, the incumbency effect is significant at the 0.05 confidence level, and positive. This result implies that incumbency leads to an upzoning bias, in contrast to the random effect's downzoning bias.

Appendix 5. *Multivariate Paneled Random Effects Regression Results, with Borough Effects*

Change in FAR	*Model 3a*	*Model 3b*	*Model 3c*	*Model 3d*
Year to Election	0.1971*** (7.95)	0.2587*** (10.31)	0.6082*** (5.11)	0.5690*** (4.60)
Homeownership Rate		0.0078*** (2.51)	0.0058** (1.99)	0.0067** (2.12)
Household Income		-0.0216*** (-4.70)	-0.0205*** (-4.92)	-0.0294*** (-5.34)
GINI Index		-3.3866 (-3.31)	-2.4975*** (-2.81)	-3.0122*** (-3.61)
Unemployment Rate		-0.2791*** (-3.17)	-0.0072 (-0.91)	-0.0008 (-1.07)
Bachelors or Above		0.00002 (0.01)	0.0039 (0.92)	0.0019 (0.46)
Percent White		-0.0063*** (-3.98)	-0.0073*** (-4.86)	-0.0047** (-2.22)
Percent Foreign Born		-0.0251 (-7.88)	-0.0274*** (-8.50)	-0.0272*** (-8.52)
Median Age		0.0058 (0.46)	-0.0027 (-0.28)	0.0084 (0.83)
Incumbency				-0.1391 (-1.93)
Voter Participation				-0.2017*** (-3.12)
Percent Democrat				0.0109 (0.02)
Percent Republican				-1.8955** (-1.97)
Bronx	1.2000*** (4.77)	0.2010 (0.73)	0.1144 (0.46)	0.7176 (0.31)
Brooklyn	1.4421*** (4.77)	0.8393*** (3.22)	0.8692*** (3.76)	0.7543*** (3.28)
Queens	1.3506*** (4.38)	0.8519*** (3.05)	0.9612*** (3.79)	0.8771*** (3.53)
Staten Island	1.0709*** (3.15)	0.1937 (0.57)	0.4896*** (1.77)	0.6204** (2.28)
Constant	-1.7681*** (-5.79)	2.5956 (3.28)	2.7777*** (4.42)	2.9103*** (3.37)
Year FE	No	No	Yes	Yes
R-Squared	0.12	0.22	0.35	0.37
N	115,167	115,002	115,002	111,111

Z-scores in parentheses. *** indicates 99% confidence level, ** indicates 95% confidence level.

When controlling for borough effects, there are few changed in the direction and significance of both the dependent variable and the controls. However, the impact of increasing percentages of white residents does change. In each of the models, results suggest that increasing percentages of white residents is associated with further downzoning of rezoned lots, further complicating results from prior models. The effect of each borough, on the other hand is positive. Given that Manhattan is the baseline borough, this indicates that there is an upzoning effect in rezoned lots in the outer boroughs, at least relative to the rezonings occurring in Manhattan.