Script:

PREFACE:

* I decided to move away from the “missing middle” idea and think about the welfare consequences of housing deregulation in general.
* However, a lot of the concepts and ideas that were borne out of my original idea have been applied in this new setting, and I’m super excited to share with you something I’m proud of.
* Because the research question is a bit different I think it would be good to start off on a clean slate.

Slide 2: THE PICTURE SLIDE

* I’m going to start you all out with a mesmerizing aerial view of a typical American community zoned for large lots and single-family housing.
* On one hand, one strand of thought suggests that this structure preserves nice amenities and high quality of life—and that regulation is a necessary tool to preserve this structure.
* On the other hand, this structure is thought to be upheld only because rich households have political power and the incentive to exclude undesirable, usually poorer, neighbors.
* While I’m not so much interested in modeling the political process that gives rise to this structure, I’m interested in measuring its welfare impacts of lot size regulations in a way that builds on the shortcomings of an exciting and new literature.

Slide 3:

* Let’s motivate this paper more concretely.
* READ. This is argued on the fact housing tends to take a larger share of the consumption basket for low-income households.
* READ.
* READ. I want to note that these lot sizes are ubiquitous and have growing prevalence in the United States; as evidenced by the Wharton Index.
* However, there is no previous work that joins these two perspectives in a general equilibrium framework. There is very good reason to do so.

Slide 4: (DO NOT READ SLIDE)

* What am I going to do to get you the best welfare estimates of lot size deregulation?
* Firstly, I argue that the income sorting mechanism caused by lot sizes have important implications for the macroeconomics of housing regulation.
* The standard story is that regulations slow aggregate growth by preventing productive labour from accessing productive local technologies that are responsible for the growth
* However, loosening restrictions in expensive cities in the presence of income sorting causes high income, productive households to leave, attenuating these negative effects. This channel is *ignored in all literature on housing regulation.*
* This channel may be exacerbated by *endogenous amenities*, as has been a typical lesson in the recent urban literature—this is also ignored in the literature.
* This does not mention the inherent externalities implied by this framework—for example, rich households may efficiently exclude poor households with these regulations to bolster their fiscal surplus, as argued in Hamilton’s classic work.
* Secondly, I’m going to provide observational evidence that the *heterogenous* lot size regulation has altered *urban form* within expensive cities—in particular, both the housing unit density gradients from suburbs to downtowns and the relationship between housing unit density and income sorting.
* I argue this evidence will matter for welfare consequences for two reasons:

1. Households can move both within cities to avoid large lots if there is significant within-city heterogeneity in them.
2. Within-city income sorting is important-- in particular, *low income people appear to be packed into high density neighborhoods to avoid stringent regulation.*

* This mechanism is generally ignored in the macro literature.

Slide 5:

* Read.
* Read. Counterfactual. I would study the following outcomes: welfare by income group, residential income segregation, within + across city inequality, and urban form.
* Read. I was able to look at some (unfortunately discontinued) assessment data. My plan is to use it temporarily as a proof of concept for the paper.
* Lastly, I estimate the causal effect of average neighborhood income on amenity value, and use it in the model. To estimate it, I use tract level terrain slopes as an IV, in conjunction with a control variable approach. I go into great detail at the end of the presentation.

Slide 6:

* Given the spatial scale of the model, I see this paper as firstly improving upon the literature that quantifies the macroeconomic impacts of housing regulation in ways I have already discussed.
* I see my paper as also building upon a literature that pays special attention to lot size regulation. I’ve discussed Song and Kulka’s JMPs before, so I want to make special note of Kulka et. al (2022). One of the main lessons is that lot size regulation and height restrictions are complementary—deregulation is effective when both are targeted.
* My paper is also related to recent literature that documents patterns of urban spatial sorting—including gentrification. However, I want to stress that it cannot explain these recent gentrification patterns, and instead speaks to an older literature on urban decay; including one that explains negative income sorting into downtowns (gleaser, kahn, rappaport 2009, Brueckner, thisse zenou 1999), nor can it explain how income sorting is shaped by patterns of filtering or housing cycles (Brueckner and Rosenthal, 2009).
* Heterogenous lot size regulation can also contribute to within-city inequality, and thus builds on that literature. This connection is in its beginning stages.
* This paper is also closely linked to a literature which studies the role that zoning policy plays in the presence of Tiebout sorting and ad valorem property taxes. In my model, the externality that gives rise to urban spatial sorting can be interpreted in the context of some of these papers.

MOTIVATING EVIDENCE ON THE STRINGENCY OF LOT SIZES AND IMPORTANCE OF INCOME SORTING IN EXPENSIVE CITIES

Slide 7:

* I’ve shown you my facts before, but I want to reinterpret them in the context of this research question. **So I’ll cover them, but move quickly, and feel free to stop me if you have any questions.**
* The first fact I want to show you is that expensive cities appear to have a relatively smaller density of housing units in medium density neighborhoods. *Likewise, high-density locations near downtowns and low-density locations on the urban fringe appear relatively more dense in expensive cities.* Before making the connection to lot size regulation, let me answer how I will show this. READ.
* NOTE: Unless otherwise stated, all data are from the 2010 census or 2008-2012 ACS where applicable.

Slide 8:

* PRELIMINARIES—Blue curve is the regression for the superstar sample, and the red curve for the non-superstar sample. Reiterate.
* The story starts with *heterogeneity.* In particular, you rarely see this type of regulation in downtowns. As such, downtowns appear to be absorbing some of these housing units that would had been built in the absence of regulation.
* Likewise, these density regulations may contribute to the sprawl you see in low density neighborhoods, in line with the *theoretical literature on height restrictions and urban form—including much of Jan Brueckner’s work*.
* I also want to note that this relationship also holds when replacing housing unit density with population density, **suggesting household size is not a big factor here. Keep this in mind.**
* So what? One could dream of a number of different explanations… let’s dig deeper.

Slide 9: SHORT VERSION

* Going to gloss over this quickly, as most of this I presented before. If you’d prefer more context please feel free to ask!

1. One issue is that these patterns may not be driven by the relative presence (or absence) of heavily regulated structures—in particular, single family homes. To test this, I additively decompose housing unit density into a margin that captures single family homes, and a margin that captures a residual of other structures, and repeat the regression in Fact 1 for each of them separately. I find that this relationship is driven *entirely by the single family margin.*
2. Still, this might not be enough to make conclusions about regulation. To see why, one could ask *why* this single family margin is driving down density in these tracts. On one hand, single family homes could actually be produced at low *density*--hogging lots of space that could be used to produce other structures—this suggests a story about stringent lot size regulation. On the other hand, there may not be a lot of *land* used in the production of single family homes, and so that’s why there are relatively fewer of them-- suggesting a different story. In this vein, the Single-Family margin can be log-additively decomposed into a *density margin* and a *land margin, respectively*. The density margin is defined by the number of single family units divided by the sum of the sizes of all their lots, and I measure the average lot size using the Zillow assessment data. Conversely, the land margin is the fraction of tract land used to produce single family homes. I repeat the regression in Fact 1 for both margins and find that they *both* contribute.
3. The third point was suggested to me by Aradhya, which is asking if Fact 1 holds in European cities where lot size regulation is relatively different. Turns out that it does *not* replicate in contemporary French cities. To do this, I use 2018 GEOSTAT data to get the population densities of 1km x 1km grids, and merge that with boundaries of OECD “Functional Urban Areas”, and use recent and publicly available land prices from the French Government.
4. Will’s suggestion

Slide 10: (IF TIME PERMITS)

* This was another fact on income sorting that I showed you before.
* What is being done here is regressing MSA demeaned average income on the same density ranking used in the other regressions.

1. General negative income sorting into high density neighborhoods
2. Stronger income sorting in expensive cities (which can be caused by a whole host of factors as highlighted in the inequality and city size literature—heterogenous lot sizes could be one of them).

* (IF ASKED): Does not replicate in distance to CBD or after controlling for family size in a linear regression.
* I have a simple theory that replicates facts 1 and 2.

MODEL AND CALIBRATION The purpose of the model is simple--to deliver welfare estimates of lot size deregulation in settings where households are heterogenous in their earnings, and can move both within and across cities to avoid (or follow) stringent regulation. This is motivated by the facts I’ve shown you.

Slide 11:

* READ.
* I do not allow for commuting across MSAs in this framework, and assume a monocentric production structure. This is for data reasons.

Slide 12:

* Where does the income sorting mechanism come from? To explain, let’s start with the developer’s problem.
* READ + EXPLAIN NOTATION.
* READ. This makes sense—the minimum housing stock is just the housing supply per unit of land multiplied by the regulated minimum amount of land per housing unit
* I take the quantity as a minimum amount of housing stock required to be purchased to live in neighborhood i; households with income below this threshold will be priced out of the local housing market. Moreover, households in which this constraint binds are forced to purchase *undesirably large amounts of housing*.
* This set up draws isomorphisms with the exclusionary zoning literature—but I want to reiterate that the lot size *is not taken to be endogenously determined by local voting.*
* READ. So hot housing markets in strongly regulated neighborhoods are going to exhibit the highest levels of income sorting—think Rosedale just a few blocks away from here.
* Note: this model can be generalized to, say duplexes, by dividing the minimum lot size in half.

Slide 13:

* READ.

Slide 14:

* Read. Lbar(z) is the exogenous mass of type z households.
* $\theta$ governs how responsive migration flows are to changes in neighborhood valuations. $\rho$ governs the responsiveness of migration flows across neighborhoods within a given city *relative* to across cities.
* The second expression is the expected welfare of an individual conditional on choosing a city C (associated with i) and the last expression is the unconditional *expected welfare* of a type z household—this is our (standard) measure of welfare.
* Importantly, the model doesn't take a stand on the extent to which the world is characterized by a closed or open city model. For example, It may be easier for households to move within a city to avoid local changes in lot size policy, or move across cities to cheaper housing markets. This is going to matter for the main set of mechanisms I want to study: rich households could escape affluent neighborhoods after deregulation by either moving across neighborhoods *or* to less productive labour markets.

Slide 15:

* I want to spend some time on this slide—it’s important.
* READ.
* DO NOT READ SLIDE:
* There are at least two main channels that I have emphasized thus far that would proximally give rise to the equation. Firstly, local income could increase local amenities through variety effects in a Dixit-Stigliz style model like in these papers, while local population could decrease the amenity value through urban congestion effects or from the disutility of density highlighted in Aradhya’s paper. When these two forces operate at the same elasticity $\Omega$, amenity values are a “separable” function of income per capita.
* Secondly, local governments could provide a congested public good financed through property taxes, like in the exclusionary zoning literature. In that case, income per capita would be replaced with property tax revenue per capita. In a model with Cobb-Douglas preferences, no lot sizes and random heterogeneity in property tax rates, this almost identical to income per capita. With assessment data, I have the luxury of playing around with both specifications.
* I can also change the spatial scale at which the externality operates, i.e. by grouping tracts into school districts to better reflect the idea of a "local jurisdiction".
* I also don’t want to limit myself to these interpretations—I want to think of the entire set of ways the attractiveness of a neighborhood responds to its composition—including crime and peer effects.
* Lastly, Omega will be estimated, and I will discuss my identification strategy in a moment.

Slide 16

* Wages determined in a standard way. (READ)
* Could also think about differentiating labour by two skill groups in a standard way. Might have some interesting implications.

CALIBRATION AND IDENTIFICATION

Slide 17:

* How am I going to measure minimum lot sizes? READ.
* LAST READ. So if an area has a high fraction of housing units zoned for large apartments, for example, then this region will not be assigned a minimum lot size even if some land is under the regulation.

Slide 18:

* READ ALL. I’m using this most general definition because it is highly plausible that developers respond to large minimum lot sizes by increasing the quality of the inputs into a house, and not necessarily the space it occupies.
* Note that the minimum stock per lot is identified by these data and the model. This can be compared *to the actual observed distribution of housing stock as a model validation exercise*.

Slide 19:

* Read. This is going to follow other papers using ACS data, including Hsieh and Moretti
* Read.
* Read. I may think about actually estimating both theta and rho using a Bartik design. However, that requires me to make some pretty strong assumptions that I’m not ready to talk about yet.
* One issue that baffles me is that some structural commuting papers estimate *small migration elasticities at smaller spatial scales*. At face value, that implies that the within-city correlation of idiosyncratic shocks is *negative.* Obviously, different estimation strategies yield different results.

Slide 20:

* Lastly, I’m going to go through the estimation strategy + identification of Omega.
* READ. Note that kappa is chosen *before-hand and so can be completely ignored in the estimation process.*
* READ. (After part 1) Income per capita is simultaneously determined in the model; an exogenous increase in unobserved amenities causes increases in housing prices through standard channels, whereby making the minimum lot size more expensive to purchase, and thus causes more income sorting.
* READ.

Slide 21:

* READ. So Lee and Lin would say that this instrument does not satisfy the exclusion restriction. It *is itself an amenity that causes income sorting.*
* READ. What do I do? I’m going to control for a large set of natural amenities that may be correlated with slopes. These include precipitation, distances to varying bodies of water, different types of forest and perennial snow cover, different types of community names that inform about local amenities (i.e. “hills”, “gultch”, etc).
* I don’t stop there. READ
* READ. I’m going to argue that slopes only provide an amenity value because they allow for *better views of other amenities,* so that slopes satisfy the exclusion restriction conditional on these controls.
* Next, I’m going to show that the first stage looks good.

Slide 22:

* FIRST SPECIFICATION: I include no controls, but have MSA fixed effects and clustering.
* SECOND SPECIFICATION: I select from the set of controls, and the first stage F stat looks good.
* THIRD SPECIFICATION: However, when I interact slopes with the maximum July temperature, the first stage vanishes. This is apparently due to multicollinearity – there is very little within city variation in this variable. Also, the pairwise correlation is about 98%.

DONE!