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Do land use regulations stifle residential development? Evidence from California cities

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ABSTRACT

This paper estimates the extent to which the supply of new housing is restricted by land use regulations using a panel of California cities from 1970–1995. While land use regulation is found to significantly reduce residential development, estimates from fixed effects regressions are about 50–75% smaller than those from pooled regressions. Using the two-way fixed effects model, the implementation of an additional regulation is found to reduce residential permits by an average of 4%, which comes through reductions in both multifamily and single-family permits. Of the regulations measured, those categorized as zoning and general controls have the strongest effects. The partial effects of individual regulations show that while some significantly reduce development, others have a large positive impact.

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1. Introduction

Since the beginning of the 20th century, cities and counties across the United States have turned to land use regulation in various forms to manage the location, rate, and type of development that occurs in their communities. These policies are among the most controversial aspects of local political action – sometimes even affecting outcomes of local council and mayoral elections (Lewis and Neiman, 2000).

The effects of land use restrictions have been explored extensively, but primarily in terms of their impact on housing prices. Recent additions to this literature find land use regulation to positively affect housing prices. While this positive relationship may stem from an increased willingness-to-pay for housing in communities that more strictly control development, many researchers take it as support for the theoretical prediction that land use regulation restricts the supply of new housing. This paper focuses on the extent to which this restriction actually occurs.

Relatively few studies have attempted to estimate the extent to which land use regulation stifles new residential development. Moreover, the majority of those papers that have endeavored to do so rely upon cross-sectional policy variation, which precludes the ability to control for unobservables using panel data techniques. This paper uses a panel of regulatory data to estimate the effects of various land use regulations, individually and collectively, on residential development in California cities from 1970–1995. Given California's rapid population growth during much of this period, along with the extensive use of voter initiatives and the localized nature of its land use authority, many growth controls and other land use regulations were adopted across the state during these years.[1] Using city and year (two-way) fixed effects, the approach employed in this paper effectively compares the changes in residential development in cities that raised the restrictiveness of their land use regulations to the changes in development in cities that did not.

Panel data techniques overcome bias stemming from unobserved fixed heterogeneity, but do so at the cost of being more susceptible to attenuation bias. However, results from a simulation exercise, and from specifications run on a subsample of the data that is least likely to be mismeasured, suggest that measurement error plays a limited role in this paper's analyses.

The data suggest that the implementation of an additional land use regulation reduces the housing stock by an average of 0.2% per year. Residential permits are reduced by an average of about 4% per restriction, which comes through reductions in both single- and multifamily housing units. Of the regulations measured, those

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[1] Glaeser (2013) discusses the role these regulations likely played in the dramatic price growth experienced in California between 1970 and 1990.

categorized as zoning and general controls have the strongest effects. An analysis involving each individual regulation reveals a substantial amount of heterogeneity in the partial effects of these policies on single- and multifamily housing construction. While some regulations have a stronger impact on the development of multifamily dwellings, others primarily affect that of single-family homes. This analysis also yields the important result that, while some regulations reduce residential development, others actually increase it. Thus, although the regulatory indices that dominate the literature may offer the best measure of the stringency of a community's regulatory environment, this sort of aggregation masks some important underlying effects.

The next section of this paper gives a brief review of the existing literature. Section 3 contains a description of the dataset employed in this study. The formal analysis of the data is contained in Section 4. Section 5 concludes.

2. Relevant literature

Over the last four decades, researchers have developed an enormous literature empirically exploring the effects of local land use regulation. The vast majority of these studies have focused on the correlation between housing or land prices and the presence of land use regulation. While there is not strong consensus in the early literature, many recent studies find housing prices to be positively related to land use regulation.[2] Although this positive correlation is thought to be driven (at least partially) by supply-side factors, relatively few researchers have attempted to actually quantify the supply restriction that theory suggests would occur in the market for new housing following the adoption of (more) land use regulation.[3]

The bulk of the current literature exploring this relationship uses cross-sectional variation in local regulatory regimes and finds that land use regulation (measured in several different ways) significantly reduces housing construction. Thorson (1997) finds that an increase in the minimum lot size significantly reduced housing starts in rural areas of McHenry County, Illinois. Mayer and Somerville (2000) use data from 44 U.S. metropolitan areas to show that areas with more stringent regulatory environments issue up to 45% fewer single-family housing permits than less-regulated areas. Levine (1999) estimates that each additional land use regulation adopted by cities and counties in California led to 884 fewer housing units being built across that state between 1980–1990. Quigley and Raphael (2005) use an earlier version of the regulatory data from Levine (1999) and find that land use regulation reduces the stock of single-family housing, while having no effect on multifamily housing.

Although most of the existing work suggests land use regulations restrict growth, some studies have found evidence to the contrary. In their 1992 monograph, Glickfeld and Levine describe the immense population growth that took place in California in the 1980s, as well as the land use restrictions that followed. They run a few basic time series regressions of residential permits from 1973 to 1988 on the annual number of land use regulations enacted statewide and then separately for various metropolitan areas throughout the state. These regressions lead them to conclude that the regulations did not significantly affect new construction. Pendall (2000) uses cross-sectional data from over 1000 jurisdictions in the 25 largest metropolitan areas to estimate the effect of various land use regulations on housing starts and affordability. He finds that while residential construction is reduced by zoning laws that only allow for low-density development, urban growth boundaries, adequate public facilities ordinances, and building permit caps have little or no effect on the construction of new housing.

A handful of authors have used panel techniques to examine the relationship between various land use regulations and housing construction, but with no less discordant results than from the cross-sectional studies.[4] Dempsey and Platinga (2013) find that urban growth boundaries reduce the probability of development. While Zabel and Paterson (2006) find that critical habitat designations significantly reduce the supply of single-family housing permits, Sims and Schuetz (2009) show that wetland protection bylaws do not significantly impact residential development. Skidmore and Peddle (1998) and Burge and Ihlanfeldt (2006) examine the effects of impact fees on housing construction using panel regulatory data for jurisdictions in Illinois and Florida, respectively. The former study finds that the adoption of impact fees reduces residential development, while the latter finds that impact fees increase construction of single-family housing.[5]

The approach taken in this paper is most similar to that of Glaeser and Ward (2009). These authors use a panel of regulatory data to determine the effects of minimum lot sizes, stringent wetlands bylaws, septic regulations, and subdivision rules in Greater Boston. The effects of the latter three regulations are analyzed individually and collectively by way of a dynamic regulatory index, which sums the values of indicators for each of the three regulations. They find that land use regulation significantly reduces the issuance of building permits, with the effect coming primarily through subdivision rules. Despite the thoroughness of this study, the data only cover the Boston metropolitan area, so the generalizability of its findings may be limited.

This paper fills a void in the current literature by more accurately estimating the effects of land use regulation on the type and amount of new housing development in California. By exploiting within-city variation in the timing of adoption for various land use regulations, this paper uses two-way fixed effects regressions to identify the effects of land use regulation on residential development.

3. Data description

3.1. Regulatory data

The data utilized here come from several different sources. The regulatory data are composed of responses to two surveys of California land use officials. The first survey was administered in 1989 (Glickfeld and Levine, 1992) and the other in 1992 (Levine et al., 1996).[6] The jurisdictions represented in these two surveys account for 99.9% of the land area of California and 99.4% of the 1990 population (Levine, 1999). The data contain eighteen dummy variables indicating which of the various land use restrictions had been adopted in each jurisdiction as of 1992. Table 1 displays the eighteen regulations measured in the data, as well as the variable names used in this paper and the median year of adoption. The policies are grouped by whether they are intended to regulate residential or non-residential development. Additionally, the residential land use regulations are

[2] See Fischel (1990) for a review of the early literature. This literature is also summarized well by Quigley and Rosenthal (2005), which contains more recent contributions. See also Jackson (2015), Glaeser and Gyourko (2003), Ihlanfeldt and Shaughnessy (2004), Glaeser et al. (2005), Mostafa et al. (2006), Hui et al. (2006), Ihlanfeldt (2007), Chakraborty et al. (2010), Zabel and Dalton (2011), Caldera and Johansson (2013), and others.

[3] Ihlanfeldt (2004) provides a brief summary of the literature relating land use restrictions to residential housing development.

[4] Ganong and Shoag (2013) and Hilber and Vermeulen (2015) also construct panel datasets of land use regulation across the United States and England, respectively.

[5] The theoretical model in Burge and Ihlanfeldt (2006) predicts this would occur when impact fees reduce exclusionary regulations and increase the percentage of proposed projects that are approved for construction.

[6] The results of this paper are qualitatively similar when the panel is extended using data from the 2005 Wharton Survey of Residential Land Use Regulation (Gyourko et al., 2008), with regulation measured as a standardized sum of the regulatory variables in each dataset.

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