

Empirical Models of Land Conservation and Land Use

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October, 2016

Abstract

This dissertation concentrates on land use, both urban and rural, in United States. First, I analyze how distance to certain amenities in a city can affect residential and non-residential uses, using spatial econometric techniques. Then, I move to more rural uses of land and focus on land conservation. I study how state fiscal incentives can affect private land conservation on the eastern region of the country. Finally, I concentrate on conservation easements and estimate the probability of different conservation purposes depending on certain variables affecting those purposes.

In the first chapter, I concentrate on land use in an urban area and how spatial econometric techniques can help explain land use decisions. I use a considerably big geo-referenced data set and estimate the probability of residential use for individual lots in the urban area. I specifically concentrate on the difficulties that this type of data sets present and how to overcome them. Spatial data sets pose challenges for discrete choice models because the data are unlikely to be independently and identically distributed. A conditionally parametric spatial probit model is amenable to very large data sets while imposing far less structure on the data than conventional parametric models. I illustrate the approach using data on 474,170 individual lots in the City of Chicago. The results suggest that simple functional forms are not appropriate for explaining the spatial variation in residential land use across the entire city.

In the second chapter, I study the effect that state level incentives have on land conservation. Acres conserved by Land Trusts have doubled between 2000 and 2010 (Land Trust Alliance Census, 2010). State tax breaks are one of many incentives in place to promote private land conservation. I use county-level data to estimate the effect of state income tax breaks on the percentage of land protected in each county, between 1990 and 2010. Using optimal matching and a panel fixed effect model, I study tax breaks that occur at different points in time. Results show a significant increase on the flow of acres protected per year in states with a tax break.

In the third chapter, I concentrate only on conservation easements in continental US and different conservation purposes. I focus on how different factors such as biodiversity and location affect the probability of different conservation purposes. Using a similar methodology as in the first chapter, I estimate a conditionally parametric multinomial logit. Results show that effects vary across regions and uses. This highlights the importance of a regional policy approach to deal with specific conservation goals.