What Drives Land-Use Changes Across the U.S.?
A Regional Analysis of Landowner Decisions (39)

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Over the past quarter century, the United States has experienced dramatic land-use changes — including declines in cropland, increases in forests, and accelerated expansion of urban areas — that depart from trends over the previous decades. Broad-scale changes in land use produce important effects with implications for international trade, global climate change, wildlife habitat and a host of other policy issues. Understanding the drivers of land-use change is essential for projecting future land use and for designing policies to promote more socially-desirable land-use patterns. What has caused the changes in land use that have occurred in the United States over the past twenty-five years? What has been the role of major Federal farm policies? We investigate the relative influences of different economic and policy factors on regional land-use patterns by estimating an econometric model of individual land allocation choices for the contiguous United States over the period 1982-97, drawing on detailed micro-data on land use and land quality. This model adds a regional perspective to a national-level analysis previously

conducted by the authors.

Our model measures the effects of estimated net returns to alternative land uses on decisions by private landowners to allocate their land among six major uses: crops, pasture, forest, urban, range, and a Federally-financed use, the Conservation Reserve Program (CRP). Because individual landowners are likely to take prices and production technologies as given, we focus on net returns as the drivers of land-use change, abstracting from the various underlying factors affecting the net returns for land. These fundamental drivers include population growth, consumer tastes, international trade, and other factors affecting the demand for land in different uses as well as weather, technology, local rules, and other factors determining production possibilities from different land-use alternatives.

Our national scope allows us to estimate the impacts on land-use decisions of Federal policies, such as CRP, and other factors affecting the land base nationwide. Previous econometric land-use studies have focused on relatively small geographic areas, such as single regions or States. The few studies using national-level data have examined changes in a single land-use category, without modeling competition among land-use alternatives. Modeling this competition is critical for measuring the impact of factors affecting land-use choices when multiple land-use options are economically viable. We estimate a national model that accounts for transitions among a comprehensive set of major private land-use categories. Detailed data on the same points of land over time from the National Resources Inventory (NRI) allows us to model transitions among different land uses — rather than just net changes in particular category — and to account for variation in land quality that affects the profitability and corresponding choice of alternative uses.

Most econometric analyses of land use examine the relationship between observed land-use patterns and measures or proxies for land rents, but there has been little analysis of the relative importance of various factors in driving land-use changes. We use econometric estimates to simulate regional changes in landowners' willingness to supply land in various uses from 1982 to 1997 under a series of scenarios that isolate the impact of particular market and policy factors. Although price feedbacks will also influence land use in equilibrium, these simulations indicate the direction of impacts and relative importance of different factors affecting land use. This analysis provides the first evidence of the relative importance of different market and Federal farm policies affecting land-use changes in different regions across the entire United States.

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