Getting the Most for Federal Dollars: Optimally Incentivizing Riparian Buffers

By James Manley & Jason Mathias

What is a Buffer?
- A buffer is an area of vegetation adjacent to water
- Either grass or trees
- Reduces nutrient pollution

The above diagram gives a view of how buffers work to reduce nutrient pollution. Pollution, in the form of water runoff from rain, flows from fields and pastures into streams. A buffer acts to reduce the amount of pollutants entering the stream both in the surface flow and subsurface flow through direct absorption by the vegetation or increased denitrification.

CREP-CP22
- The Conservation Reserve Enhancement Program became part of USDA’s CRP in 2002
- CP22 within CREP focuses on river buffers
- Goal: create 10-15 year contracts with farmers for buffer plantings along waterways
- Contracts pay an annual rate based on soil rental rate per acre & a per acre incentive
- Other incentives tied to installation costs

Landowner Demand
- Relatively few options for land use and fewer options for temporary retirement mean that the market mechanism cannot be effective
- Also, owners of high quality land have no incentive to reveal their WTP
- Previous empirical research has shown that auctions do not work well, so optimal offers by USDA are critical

Data: 2058 county-years in five states

Specification
\[ P_{ij} = \beta_0 + \beta_1 X'_{ij} + \beta_2 X_{ij} + \beta_3 \gamma_{ij} + \alpha_i \]
\[ P_{ij} \] : proportion of eligible riparian acres enrolled in CP22 in a county-year
\[ X_{ij} \] and \( \gamma_{ij} \) are factors affecting decisions. \( a \) represents opportunity costs, \( c \) represents county level factors, and \( y \) represents incentives offered, all for county \( i \). \( \beta_0 \) is the intercept while \( \beta_1 \), \( \beta_2 \), and \( \beta_3 \) represent the coefficients on those variables. We use the Tobit estimator to address the large number of zeros in the dependent variable.

Key Findings
- Previous work found that up-front payments had extraordinary importance: we do not find this (accounting for full incentives key)
- Cattle production increases incentives and participation
- Washington State has low participation, given other characteristics

More $$ for cattle?
- The current set of incentives offers much more to cattle producers than to other types of agriculture
- “Allowable costs” include fencing, bridges, and provision for watering livestock

What’s up with Washington?
- All else equal, Washington’s participation in CREP is significantly lower than other states
- Participation in CRP as a whole is high
- Government vs. rural “culture”?
- High intensity cattle production here as opposed to the other 4 states?
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