Working Lands Conservation and Rural Economic Outcomes:

Lessons from The Environmental Quality Incentives Program

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Selected Poster prepared for presentation at the 2024 Agricultural & Applied Economics Association Annual Meeting, New Orleans, LA: July 28-30, 2024

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Introduction

- There have been public efforts to incentivize conservation on agricultural land:
  - Temporary land retirement (CRP)
  - Conservation practices on working lands (EQIP, CSP, Illinois Cover Crop Premium Discount Program)
- There is concern about the impact of programs on rural economic outcomes, with some evidence that retirement decreases agricultural employment (Sullivan et al., 2004; Li and Ando, 2023).

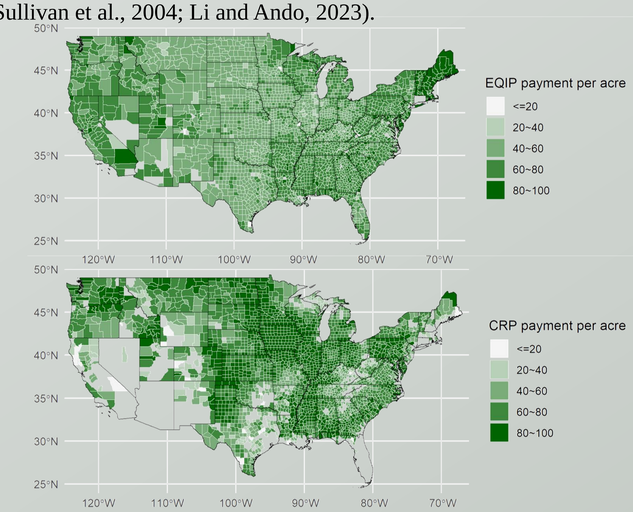


Figure 1: Cumulative EQIP and CRP payments per farmland acre by county in nominal U.S. dollars from 2009 to 2019

Conceptual Model

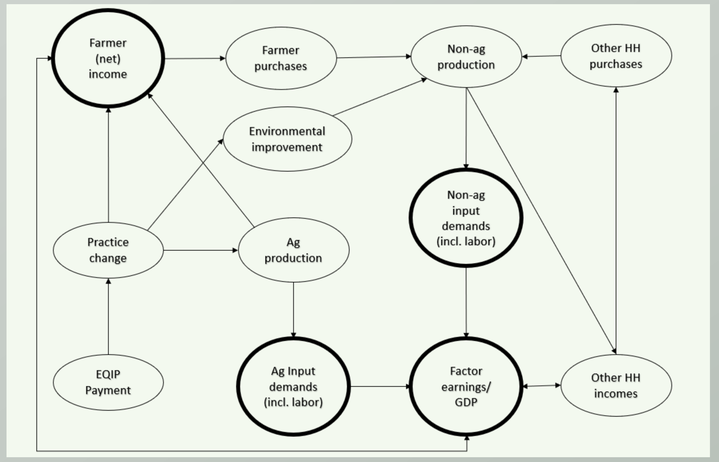


Figure 2: Conceptual framework: economy-wide impacts of conservation payments

Econometric Model

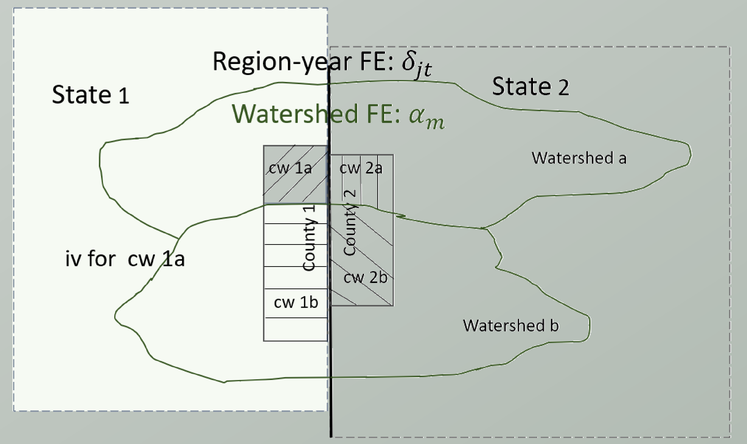
$$\ln(y_{imst}) = \beta_{1s}\ln(EQIP_{imt}) + \beta_{2s}\ln(CRP_{imt-1}) + \gamma_{ims}X_{imt} + \alpha_m + \delta_{jt} + \epsilon_{imt}$$

- y_{imst}: Economic outcome under consideration in county i, watershed m, sector s, year t
- $EQIP_{imt}$: EQIP enrollment rate (acres under contract/farmland acres) in county i, watershed m, year t
- CRP_{imt-1}: CRP enrollment rate (acres under contract/farmland acres) in county i, watershed m, year $t-1$
- Controls (X_{imt}): yearly average max temperature and average precipitation, distance to the nearest city (with population > 50k), Latitude and Longitude, crop insurance prices, and weighted crop price.
- Watershed (α_m) and Region-Year (δ_{jt}) fixed effects.

Data

- Dependent variables:
  - Ag employment (QCEW, NAICS 11); Non-ag employment (QCEW)
  - GDP per capita (BEA); Unemployment rate (BEA); Net farm income (BEA)
- 588 county-watershed units in 330 border counties across 100 watersheds, over 11 years from 2009 to 2019, resulting in 4,368 observations.

Identification Strategy



- County-watershed observations on state boundaries
  - Rural counties, cropland acres > 10% of all county area
- Fixed effects: watershed FE and Region-year FE
- Instrumental variables:
  - State-level EQIP and CRP payment rates per farmland acre, excluding the unit itself.

Results

Table 1: The effects of conservation enrollment on the labor market

	Ag employment			Non-ag employment		
	Border	Allrural	OLS	Border	Allrural	OLS
EQIPrate	0.16+	0.27**	0.03*	0.14**	0.04**	0.0001
	(0.09)	(0.08)	(0.02)	(0.05)	(0.01)	(0.01)
CRPrate	−0.50+	−0.52*	−0.02	0.19	0.04	−0.001
	(0.29)	(0.21)	(0.06)	(0.12)	(0.06)	(0.02)
Num. Obs.	4368	12125	4368	4368	0.21	4368
R2	0.61	0.47	0.71	0.93	0.96	0.96

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Note: All models control for all control variables (X_{imt}), and population is also controlled. Watershed and region-year fixed effects are applied. The standard errors are clustered at the state level.

- With 1,190 employed in ag per county watershed, a 10% increase in EQIP enrollment rate adds 19 ag jobs, whereas CRP reduces by 60.

Table 2: The effects of conservation enrollment on other economic impacts

	Unemployment rate			GDP per capita			Net farm income		
	Border	Allrural	OLS	Border	Allrural	OLS	Border	Allrural	OLS
EQIPrate	−0.12**	−0.10***	−0.01	0.12*	0.11**	0.004	0.02	0.06	0.01
	(0.03)	(0.02)	(0.01)	(0.04)	(0.03)	(0.01)	(0.09)	(0.04)	(0.02)
CRPrate	0.08	0.08	0.01	−0.20	−0.18*	0.01	−0.27	−0.21	−0.09+
	(0.09)	(0.07)	(0.01)	(0.13)	(0.08)	(0.03)	(0.39)	(0.22)	(0.05)
Num. Obs.	4368	12125	4368	4368	12125	4368	4368	12125	4368
R2	0.72	0.69	0.84	0.39	0.24	0.59	0.48	0.41	0.50

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Note: Same controls as in Table 1, except GDP per capita does not control for the population.

- Given the average non-ag employment of 36,755, a 10% increase in EQIP enrollment rate would lead to increases of 529 in non-ag employment.
- A 10 percent increase in EQIP enrollment rate is associated with an increase in GDP per capita of $590 from the average level ($50,859).

Takeaways

- Environmental policies can negatively affect industry employment (Walker, 2011; Henderson, 1996; Greenstone, 2002) but conservation incentives on working lands (EQIP) have boosted local employment.
- EQIP has spillover effects on non-agricultural employment, leading to benefits that extend beyond agriculture.
- The insignificant impact of EQIP on net farm income suggests that while it may support broader economic outcomes, it may not directly translate into higher farm profitability.