Are "Decoupled" Farm Program Payments Really Decoupled? An Empirical Evaluation

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The FAIR Act and Direct Payments:

- In principle, FAIR signaled a transition toward less government involvement
- Subsequent years and 2002 Farm Bill have not demonstrated this– considerable ad-hoc assistance
- FAIR = "Freedom to Farm"– AMTA payments decoupled from production decisions
- Decoupled payments not subject to WTO URAA constraints– Green Box

Direct Payments: AMTA and MLA

- AMTA Payment Schedule:
  - FY 1996 $5.570 billion
  - FY 1997 $5.385 billion
  - … …
  - FY 2002 $4.008 billion
- Market Loss Assistance (ad hoc response to low corn, wheat, cotton and other crop market prices)
  - $17 billion FY 1999-2002
- Now (under FSIRA) CCP and fixed, decoupled payments

The 2002 U.S. Farm Bill:

- FAIR= “market transition” with less support
- AMTA Payments would decline each year and expire with FAIR
- It did not happen
- In fact, AMTA payments were expanded to include soybeans and were increased
- A very important provision of 2002 Bill: farmers could update their base yields and acreage (more on this later)

Effects of Decoupled Payments:

- If eligibility for payments does not have production requirements and payments are not linked to the market, are payments neutral?
- Research suggests DARA preferences may imply wealth changes through policy evoke responses
- AMTA implied small changes in wealth (1.8%)
- More likely– capital constrained individuals may respond– we often leave this out of models

What is a Decoupled Payment?

- AMTA– no production requirements
- MLA– no production requirements but triggered by market conditions (US reported as amber box)
- Counter-cyclical payments—in new Farm Bill
- Other Green-Box payments— disaster relief, etc.
- If payments are based on history, but are subject to updating, decoupling becomes tenuous (was not a problem for U.S. in recent Brazil cotton case)
- An aside– who benefits? Landowners ($1 AMTA raises rents by $0.80)

The URAA and Domestic Support:

- Of course, any policy that has production or market effects will affect trade
- Agreement mandates reducing "trade-distorting" domestic support by 80% over baseline
- Many loopholes, *de minimis* exclusions are one example
- Concern raised in recent years that U.S. would violate the $19 billion cap, especially with 2002 Farm Bill (though circuit breaker in FSIRA)

The WTO "Box" Classification System:

- Policies were categorized according to the degree to which they distorted trade:
  - *Green Box* = "minimally trade distorting" and not subject to constraints ("Decoupled" payments)
  - *Amber Box* = distorting policies subject to review and reduction
  - *Blue Box* = payments based on historical production (e.g., deficiency payments)
  - *Red Box* = prohibited policies (not applicable to domestic support)

Our Objectives:

- To utilize micro (farm-level) data to evaluate the effects of payments on acreage
- We use the ARMS data– important limitation is lack of repeated sampling– results in a bias of which we can assign a direction
- ARMS included details on payment receipts, including LDP, AMTA, and disaster payments
- We also utilize other data– county level payments, NASS data, futures prices, USDA input prices, FSA county loan rates

Conceptual Issues:

- Large literature has considered effects of risk aversion on production
- DARA preferences may imply that agents assume more risk, even with decoupled payments
- Production problem is inherently dynamic
  - Adjustment costs
  - Crop rotation issues (important and often ignored)
  - Farmers may be capital constrained

3 Ways Decoupled Payments Might Matter:

- Risk aversion decreases as wealth rises (e.g., DARA), causing agents to assume more risk
- Producers are capital constrained
- Payments signal future policies– very relevant with provisions of the 2002 Farm Bill

Empirical Models:

- Four different models considered:
  - Farm-level acreage equations (corn, soybeans, wheat)
  - Farm-level models of land utilization / waste
  - Farm-level model of land acquisition
  - County-level acreage equations (primarily to consider conditioning on past production– does this change AMTA effects?)
  - Key variables: MLA and AMTA

Econometric Issues:

- Basic model involves acreage response equations of the form:

$$A_t = f(A_{t-1}, P_t^*, w_t, G_t, PS_t^*, W_{t-1}),$$

- Two important concerns
  - Stratification– we utilize a probability-weighted resampling estimation scheme to address
  - Censoring– we utilize methods of Shonkwiler and Yen to address

Stratification Issues:

- Each farm observation represents a certain number of "like" farms in the population
- Some strata sampled more intensely than others
- Ignoring this biases estimates and inferences for population (no substantial effects in our analysis)
- Unfortunately, we cannot identify stratum (more efficient techniques available if we could)
- We do know, however, the # of farms in population represented by each observation
- If observation i represents M farms out of a population of N farms, its probability of being drawn is M/N

Jacknife Regressions:

- NASS argues in favor of this estimation approach
- Uses predefined subsamples (15) to replicate and recover estimates and variances
- Two problems:
  - Jacknife subsamples defined on entire sample and are likely to be invalid when working with only part of survey data
  - Properties unclear in two-step procedures like we use—would clearly understate variances of parameters

Modeling Censoring:

- Really only an issue for wheat, since most farms in sample produced corn and soybeans
- Two step procedure
  - Model discrete produce/no-produce decision using probit model

$$d_{it} = g(z_{it}, \alpha_i).$$

  - Use probit estimates to construct correction terms

$$y_{it} = \Phi(z_{it}, \hat{\alpha}_i) f(X_{it}, \beta_i) + \delta_i \phi(z_{it}, \hat{\alpha}_i) + \xi_{it},$$

The ARMS Data:

- Annual, stratified random sample
- Approximately 10,000 farms / year
- NO repeated sampling
- Detailed information about farm production, marketing, etc. and household financial data
- Detailed payment data 1998-2001
- Our focus is on sub-sample of 4,121 commercial Corn Belt farms (main U.S. growing region)
- Care in measuring price: max(LR, local E(price))

Farm Resource Regions

Basin and Range

- Largest share of nonfamily farms, smallest share of U.S. cropland.
- 4% of farms, 4% of value of production, 4% of cropland.
- Cattle, wheat, and sorghum farms.

Northern Great Plains

- Largest farms and smallest population.
- 5% of farms, 6% of production value, 17% of cropland.
- Wheat, cattle, sheep farms.

Heartland

- Most farms (22%), highest value of production (23%), and most cropland (27%).
- Cash grain and cattle farms.

Northern Crescent

- Most populous region.
- 15% of farms, 15% of value of production, 9% of cropland.
- Dairy, general crop, and cash grain farms.

Eastern Uplands

- Most small farms of any region.
- 15% of farms, 5% of production value, and 6% of cropland.
- Part-time cattle, tobacco, and poultry farms.

Fruitful Rim

- Largest share of large and very large family farms and nonfamily farms.
- 10% of farms, 22% of production value, 8% of cropland.
- Fruit, vegetable, nursery, and cotton farms.

Prairie Gateway

- Second in wheat, oat, barley, rice, and cotton production.
- 13% of farms, 12% of production value, 17% of cropland.
- Cattle, wheat, sorghum, cotton, and rice farms.

Mississippi Portal

- Higher proportions of both small and larger farms than elsewhere.
- 5% of farms, 4% of value, 5% of cropland.
- Cotton, rice, poultry, and hog farms.

Southern Seaboard

- Mix of small and larger farms.
- 11% of farms, 9% of production value, 6% of cropland.
- Part-time cattle, general field crop, and poultry farms.

Source: http://www.ers.usda.gov/publications/aib760/

Results– Farm-Level Acreage:

- Price elasticities as expected, though corn is not price responsive over the period of study
  - 1.39 for soybeans
  - 0.46 for wheat (sub-sample of growers)
- We allow AMTA payment response to vary with:
  - Debt / assets (reflects capital constraints)
  - Level of insurance (reflects risk preferences, but may have some problems)

Results– Farm-Level Acreage:

- AMTA acreage response elasticities
  - Corn = 0.03*
  - Soybeans = 0.02*
  - Wheat = 0.04*
- For very risk averse farms– AMTA response is lower
- No real effect from financial leverage
- Implications– Overall effects of AMTA payments quite small– doubling AMTA payments would only have about 2-4% effect on acreage
- No significant direct wealth effects

Results– Farm-Level Acreage:

- Market Loss Assistance– larger effect for corn– elasticity about 0.10– doubling raises corn acreage by 10%
- No effect for soybeans or wheat
- MLA is proxy measure– per acre county average in preceding year– captures expectations
- Clearly, MLA less “decoupled” due to tighter link with market conditions
- Higher fertilizer prices shift acreage toward soybeans from corn and wheat (as expected)

Results– Idled Acreage:

- Farms receiving AMTA benefits have less idled land
- Elasticities about -0.16 to -0.33
- We need care in interpretation– farms with AMTA are farms with historical base, which likely means farms with more productive land– historical effect may affect inferences about AMTA

Idled Acreage:

- MLA payments have larger effect
- Elasticity -0.39, but only significant in first model
- MLA discourages land idling in following year
- More productive land less likely to be idled
- MLA effect not significant for owned acreage (much smaller sample– single year)

Results– Acquiring New Land

- Do AMTA payments lead to new land ownership?
- Only 4.94% of sample acquired owned land in 1999
- Note, land transactions do not necessarily imply more acreage in production
- AMTA and MLA payment effects not statistically significant
- No evidence that farms with higher payment receipts added to land holdings
- Suggests our treatment of total land being exogenous is well-founded

County-Level Model Results

- Allows us to condition on previous year's acreage
- Results largely accord with individual models, even when conditioned on prior acreages (and 1995 acreage)
- Negative own price effect for soybeans, but soybean and corn prices highly correlated and annual fixed effects also capture prices
- AMTA payments significant for soybeans and wheat
- Elasticities 0.01 and 0.06– similar to other models
- MLA again significant for corn--not surprising, MLA paid on corn base, not paid on soybeans

A Caveat:

- We are largely depending on cross-sectional variation to identify and measure effects
- AMTA payments determined by historical base
- Production patterns reflect comparative advantage– farms growing crop now may have grown it when base established
  - Historical Production => Acres today
  - Historical Production => AMTA payments
  - May lead us to conclude AMTA payments => Acres today
- But, we know direction of bias– implies stronger effect of AMTA payments than may be true
- We are able to address this in county models, no great effect

Conclusions:

- Arguments regarding production effects from decoupled payments not supported
- AMTA payment effect is statistically significant, but relatively small (elasticities=0.02-0.04)
- MLA more distortionary, elasticity=0.10
- “Decoupled payments” are indeed largely decoupled—production neutral
- Countercyclical support is more distortionary

Conclusions (continued):

- Very important to view in context of 2002 Farm Bill
- Updating provisions– does it link current production to future benefits?
- Anecdotal evidence it does, but our results imply any effect is small over 1998-2001
- A clue in other work– AMTA effects on land values jumped in 2001– did this signal markets expected future increases?
- May give us reason to worry more about how decoupled these fixed payments will be in future
- To my understanding, this argument not pertinent in recent Brazil/U.S. cotton case

Future Work:

- Focus here is on Corn Belt– major growing region
- However, is this the most relevant margin?
- We are extending this to evaluate upper Great Plains wheat and barley production
- Also, focus here is on acreage—could use land more intensively rather than expand acreage—we are considering this possibility