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 URRAA 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))
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