

ARE 231 PAPER: MIDWESTERN CORN AND SOYBEAN SUPPLY

In the paper “Crop Supply Dynamics and the Illusion of Partial Adjustment” (AJAE, 2014), Nathan Hendricks, Dan Sumner and I estimate supply elasticities for corn and soybeans using field-level data from the Cropland Data Layer. In your paper, you will extend their analysis in some direction.

Getting Started

The data and code are available [here](#). The ReadMe file is crucial because it explains how to use the code. It instructs you to run “create rotational dataset.do” first. This code creates a dataset named “dyn_supply_rot_1year.dta”. This is the dataset you can use for the supply models. Two important variables in this dataset include:

my_mlra	indicator for major land resource area
my_sample_rot	=1 for fields that planted corn or soybeans in consecutive years at least once during the sample period (i.e., monoculture at least once)
	=2 for fields that rotated corn and soybeans each year throughout the sample (i.e., never monoculture)

We estimate a transition probability model for the my_sample_rot=1 group, and we assume that supply response equals zero for the my_sample_rot=2 group.

Assignment

Your task is to extend the Hendricks, Smith, and Sumner and analysis in some direction. Here are some possibilities:

- (i) *Stability over time.* Is the supply elasticity the same early in the sample as late in the sample?
- (ii) *Heterogeneity across space.* Estimate different supply elasticities over space (e.g., by county) and analyze their similarities and differences.
- (iii) *Heterogeneity across rotations.* Explore the implications of assuming zero elasticity for the “never monoculture” fields.
- (iv) *Standard errors.* We cluster by year when estimating standard errors. How are the standard errors affected by a different clustering scheme?
- (v) *Sensitivity to trend specification.* We use a linear trend. What about other possibilities, such as no trend or a quadratic?
- (vi) *Price measurement.* Use relative price of corn to soybeans rather than each price individually, or use futures price only (without basis and loan rate adjustment).
- (vii) *Length of run.* The paper extrapolated the transition probability model to estimate long-run elasticities. Explore alternatives, such as including both the current and lagged price in the model or directly estimating the models $\Pr(c_{i,t+j} = 1 | c_{i,t-1} = 1) = x'_{it} \beta_1$ and $\Pr(c_{i,t+j} = 1 | c_{i,t-1} = 0) = x'_{it} \beta_0$ for $j=0, 1, 2$. In the paper, we estimate for $j=0$ and extrapolate to the long run.

You do not have to choose one of these topics. You may pursue a different idea.

If you wish, you may update the data to include the most recent CDL (2019), although I suspect you won't have enough time to do that.

Write up your results in the form of a mini-paper. Your paper should not be more than five single-spaced pages (including tables and figures) and should be written as though you aim to publish this work in an academic journal. I do not want your paper to read like a diary, i.e. "first I did this, then I did that". Rather, I would like you to tell a story. Include an outline of the question you are asking, a discussion of the empirical method, the results, and a conclusion. Be sure that a reader could duplicate your analysis. Don't try to cover all possible topics. Instead, pick one and write a coherent story.

Here are some points to keep in mind as you write:

1. Could non-expert readers replicate your results? If not, then they probably also will not clearly understand what you have done. Don't scatter the required steps throughout the paper. Try to consolidate it.
2. Could a reader understand your tables without scouring the text? Include enough detail in the tables and figures (and notes to the tables) for readers to understand them without reading every word of your paper. So, avoid using acronyms, state precisely what the statistic is, state what test produced the p-value etc.
3. State your findings in your introduction. By the end of the intro, you want readers to know what you do and what you find.
4. Don't use excessive digits in your tables. A t-stat of 1.45 is sufficient. Don't write 1.45376. The more digits, the harder it is to read and distill the results.
5. State clearly whether you were using real or nominal prices.

You may write your papers with a co-author, but I expect it to be joint work. I may ask you to revise and re-submit your paper if there are improvements you could make.

Feel free to be creative, both in your analysis and your writing. Writing is an important and understated component of economic research, and I would like to use this class to help you improve your writing. **Adhere to Cochrane's "[Writing Tips for Ph.D. Students](#)," which I placed on the class website.**

DUE DATE: Tuesday November 12 at 5:00pm (email code and pdf of paper to adsmith@ucdavis.edu)