Producer Price Responses in Forward Contracting

Ziran Li, Dermot Hayes, and Keri Jacobs

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Motivation and Objectives

Curious about the use of forward contracting by producers

- How much is it used?
- Is it a consistent practice?
- How does it compare to hedging via futures markets?
- Can we identify price triggers?

Anecdotally, producers' forward contracting behavior not well explained by expected utility hedging theory

- What can explain the change in hedge ratio intra- and inter-marketing years?

Our Strategy

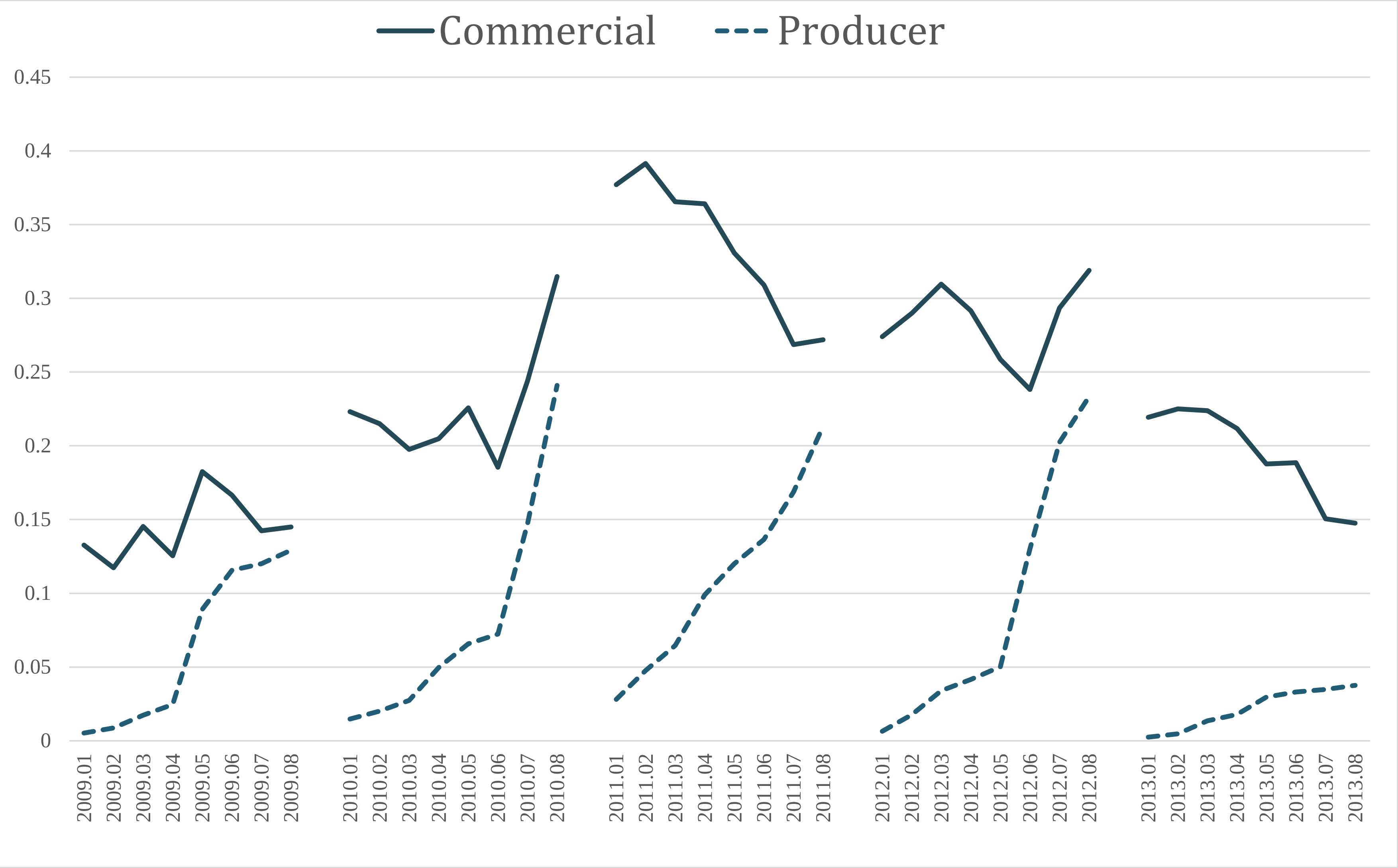
Producer contracting data

- Producers' forward contracts with a large grain marketing firm, 1/2009 – 8/2013
- Avg annual handle of 100m+ bushels of corn
- Hedge ratio: total bushels contracted / firm's grain handle

CFTC Disaggregated Commitment of Traders data

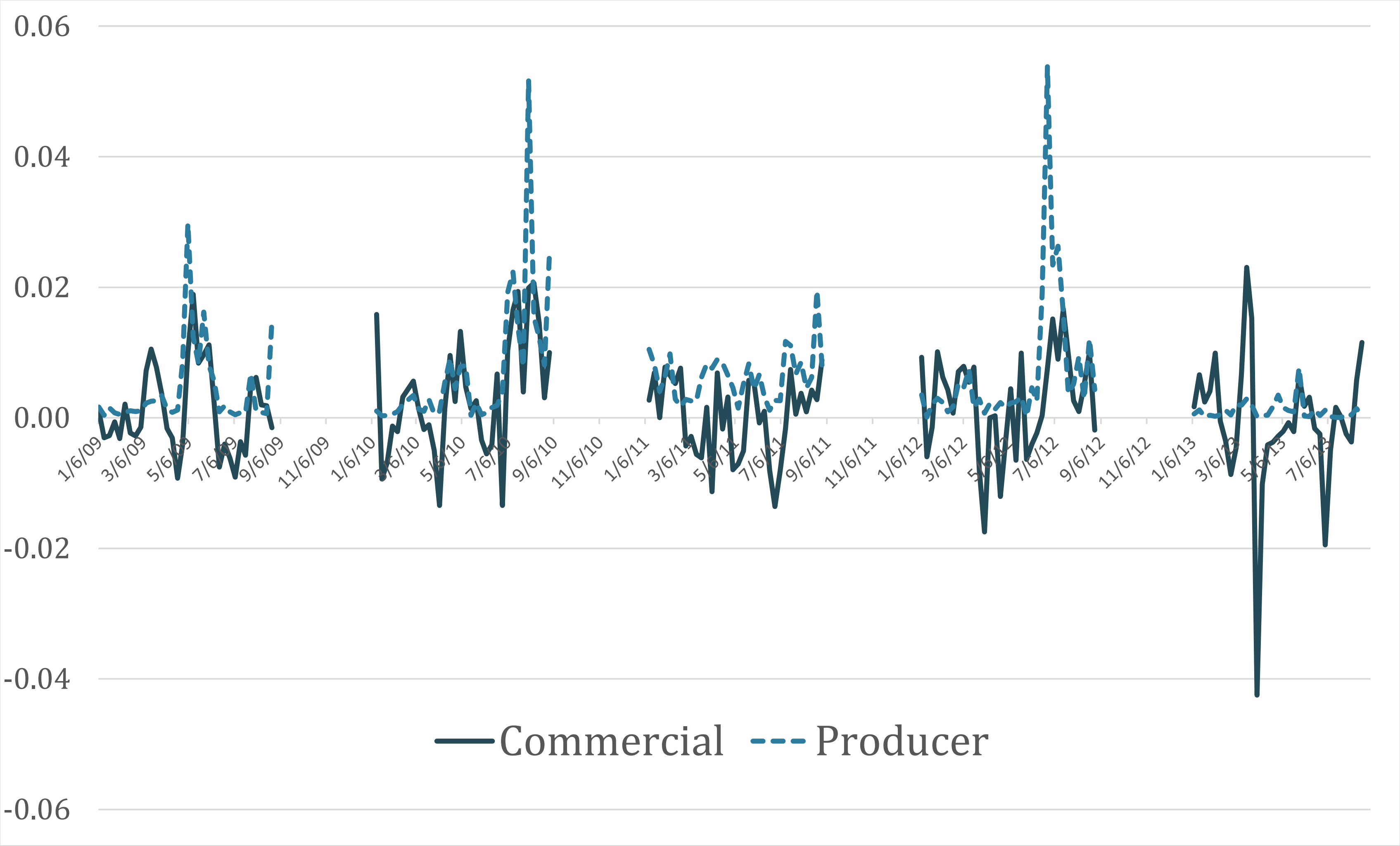
- Hedge ratio: weekly short open interest / USDA's estimate of corn harvest

Compare changes in weekly pre-harvest hedge ratios for both with changes in futures prices. Can we identify a role for *reference prices?*



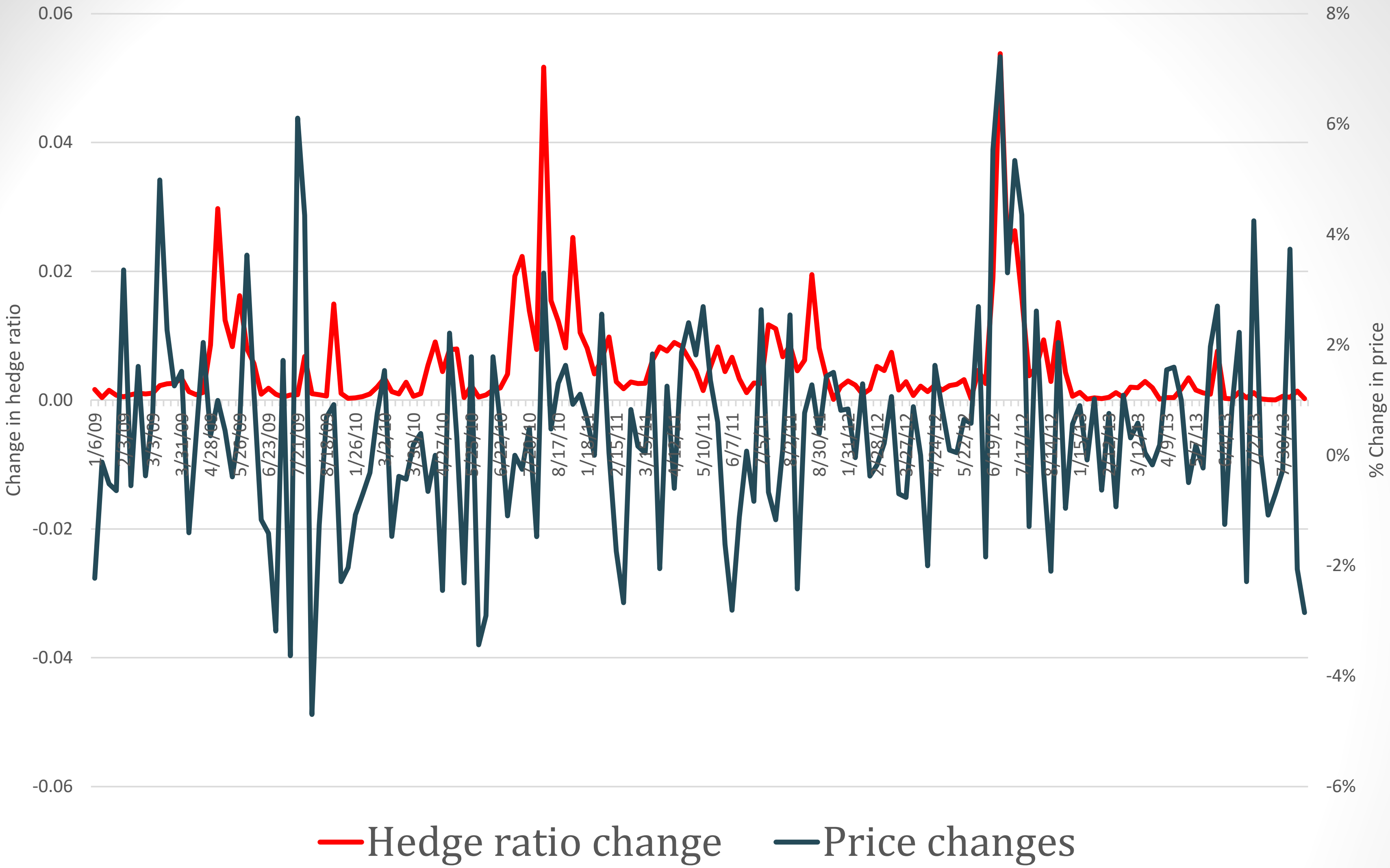
Pre-harvest hedge ratios

What explains the proportion hedged from one year to the next?



Weekly change in hedge ratios

Series are correlated – the commercial series can be negative, but the producer series never can be.



Weekly changes in hedging and December contract price

Hedge ratio increases during rising prices, but is relatively unchanged during declining prices

Reference Prices

Do producers consider the harvest price when managing risk or something else?

- Prices unchanged during the pre-harvest period
  - last year's marketing price
  - projected harvest price by RMA
  - break-even based on cost of production
- Prices updated during pre-harvest period
  - December contract 365 days ago
  - December contract 30 days ago
  - 30-day moving average of December contract

Simple Framework

$$h_t - h_{t-7} = \beta_0 + \beta_1 time + \beta_2 (p_t - p_t{}^r) + \beta_3 (p_t - p_t{}^r) 1_{\{p_t - p_t{}^r < 0\}} + \varepsilon_t$$

Changes in the hedge ratio are impacted by

- Time to harvest
- The harvest price relative to some reference price
- Whether the harvest price is above or below the reference price (threshold effect)

What We Find – Producer

	Reference Price			
	Last week's price	Last year's average	Estimated production cost	RMA projected price
Intercept	0.0062***	0.0078***	0.0087***	0.0080***
	(0.0012)	(0.0010)	(0.0011)	(0.0010)
Time to Harvest	-2.48E-05***	-2.44E-05***	-2.98E-05***	-2.77E-05***
	(7.63E-06)	-(7.55E-06)	-(7.92E-06)	-(7.54E-06)
Weekly Dec Price Chg	0.1325***	0.1238***	0.0569***	0.1222***
	(0.0222)	(0.0200)	(0.0127)	(0.0200)
Price below reference	-0.1217***	-0.0964***	-0.0125	-0.0949***
	(0.0302)	(0.0230)	(0.0257)	(0.0237)
R^2	0.29	0.30	0.22	0.29
N	166	166	166	166

Compare with DCOT series values of 0.06 and 0.0, respectively.

What We Find – Producer

	Reference Price			
	Last week price	Last year price	Last 30-day's average	Last month price
Intercept	0.0062***	0.0126***	0.0055***	0.0071***
	(0.0012)	(0.0016)	(0.0011)	(0.0013)
Time to Harvest	-2.48E-05***	-4.67E-05***	-1.98E-05***	-2.45E-05***
	(7.63E-06)	(8.69E-06)	(7.14E-06)	(7.85E-06)
Current – Reference Price	0.1325***	-0.0007	0.1169***	0.0417***
	(0.0222)	(0.0032)	(0.0146)	(0.0080)
Price below reference	-0.1217***	0.0133***	-0.1049***	-0.0241***
	(0.0302)	(0.0057)	(0.0214)	(0.0140)
R^2	0.29	0.20	0.39	0.29
N	166	166	166	166

Compare with DCOT series values of 0.10 and 0.0, respectively.

Summary Findings

- Open interest in DCOT reflects farm-level hedging during periods of increasing prices
- Asymmetric contracting response to price movements – problematic from a risk management perspective
- Evidence that reference prices play a role in producers’ hedging behavior

Thank you.

kljacobs@iastate.edu