Timing in Commodity Marketing: How Do Producers Decide the "Right" Moment to Price Their Crop?

Fabio Mattos
University of Nebraska-Lincoln
fmattos@unl.edu

Stefanie Fryza
Canadian Wheat Board

Selected Poster prepared for presentation at the Agricultural & Applied Economics Association's 2014 AAEA Annual Meeting, Minneapolis, MN, July 27-29, 2014

Timing in Commodity Marketing: How Do Producers Decide the “Right” Moment to Price Their Crop?

Fabio Mattos and Stefanie Fryza

University of Nebraska-Lincoln and Canadian Wheat Board

Introduction

Agricultural economists have long been interested in how producers make marketing decisions and what variables influence the decision-making process. Previous studies in grain marketing found evidence that (i) producers would sell (hold) grain after price increases (decreases), (ii) seasonality and day of the week play a role in the timing of a marketing decision, and (iii) decision to sell or hold can be related to market prices being above or below a certain benchmark. Still, relatively little work has investigated how producers choose the “right” time to sell.

Objective

- To **explore variables that affect the timing of producers’ marketing decisions**
  - price-related variables
- In particular, we want to investigate whether **wheat producers in Canada** are more eager to sell when:
  - current price is above their benchmark
  - market price is trending up
  - market volatility increases

Research method

Cox proportional hazard model is used to model the time it takes for producers to sell their crop within the marketing window

- **hazard rate: probability of selling grain on day t, conditional on not having sold it until that day**

Hazard rate h(x,t) is modeled as:

$$h(t) = h_0(t)\left[\exp\left(\beta_1 GI_t + \beta_2 Spread_t + \beta_3 Trend_t + \beta_3 Vol_t + \sum_{j=1}^{4}\theta_j D_{jt}\right)\right]$$

$h_0(t)$ = baseline hazard function
t = number of days that producer took to sell grain

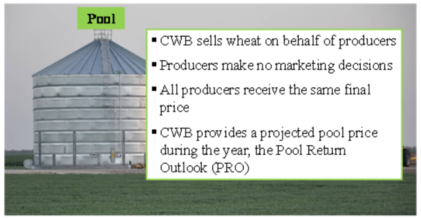
Covariates:

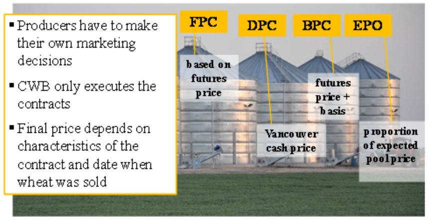
- GI: gain indicator = 1 if contract price > benchmark (PRO)
- spread = difference between futures price and benchmark (PRO)
- trend = futures price trend
- volatility = futures price volatility
- days of week = dummy variables (Tuesday through Friday)

Wheat marketing in Canada (until 2012)

- All wheat producers had to market their crop through the Canadian Wheat Board (CWB)
  - Western Canada (90% of national production)

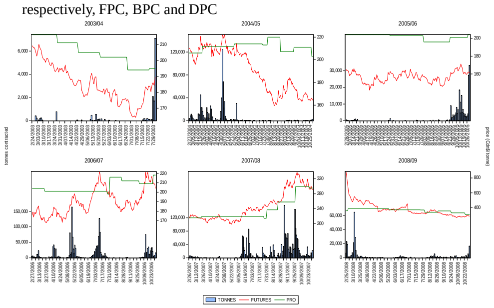
- CWB offered different marketing programs
  - pool pricing (default program)
  - marketing contracts (Producer Payment Options–PPO)
    - Fixed Price Contract (FPC)
    - Basis Price Contract (BPC)
    - Daily Price Contract (DPC)
    - Early Payment Option (EPO)

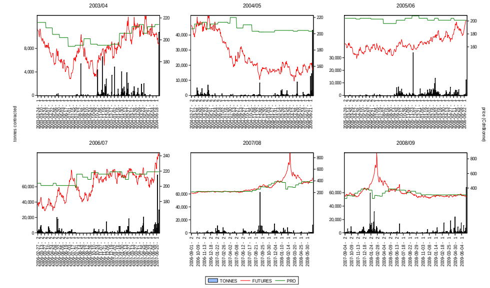


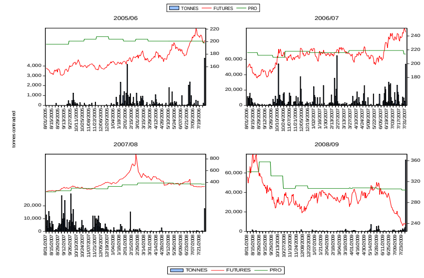


Data

- **Sample of 59,184 transactions (17,338 producers)**
  - Canada Western Red Spring (CWRS) wheat **between 2003-04 and 2008-09**
  - 3 marketing contracts (FPC, BPC, DPC)
- See below prices and quantity sold each day of the marketing windows for, respectively, FPC, BPC and DPC







Results

- Estimated coefficients generally indicate same effects across contracts
- **Conditional probability of selling grain on day t increases when:**
  - **current futures price is above benchmark (GI=1)**
  - **10-day price spread is negative**
  - **market price is trending up**
  - **market volatility is increasing**

	FPC		DPC		BPC	
	coef	exp(coef)	coef	exp(coef)	coef	exp(coef)
Gain indicator	1.354***	3.872	1.811***	6.114	0.100***	1.106
Price spread	-0.007***	0.994	-0.010***	0.989	-0.007***	0.993
Trend	0.002***	1.002	0.011**	1.011	0.005**	1.005
Volatility	0.042***	1.043	0.037***	1.038	0.016***	1.016
Day dummies						
Tuesday	0.124***	1.132	-0.228***	0.796	0.536***	1.708
Wednesday	0.015	1.015	0.310***	1.364	0.441***	1.554
Thursday	0.288***	1.333	-0.169***	0.844	0.311***	1.365
Friday	0.174***	1.191	-0.219***	0.803	0.344***	1.411
Obs.	36,826		8,324		10,535	

Statistically significant at 1% ***, 5% ** and 1% *

Conclusions

- Impacts of gain indicator, price spread, price trend and volatility are qualitatively the same across contracts when all transactions are considered
- Results indicate importance of reference prices in marketing decisions
- Future research:
  - investigate other factors that affect marketing decisions
  - explore other benchmarks

For further information

Fabio Mattos (fmattos@unl.edu)