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Effects of Livestock Mandatory Reporting on Fed Cattle Spot Market Price Volatility: Evidence from Iowa-Minnesota Regional Cattle Markets.

Bernadette Chimai,¹ Chanjin Chung²
Oklahoma State University



Introduction

The introduction of mandatory reporting in April 2001 as a result of the Livestock Mandatory Reporting Act of 1999 was expected to improve the accuracy of public market information from the United States Department of Agriculture Agricultural Marketing Service (USDA-AMS). With more accurate information, buyer and seller uncertainties regarding market conditions would reduce resulting in stable and less variable prices. However, empirical evidence suggests that prices appear more volatile after mandatory reporting contrary to expectations (Perry et al. 2005). The apparent increase in volatility has been attributed to the increase in the number of transactions reported. Before 2001, reported prices were collected voluntarily from feeders, packers and auctions through phone calls and visits. Also, firms decided which transactions to report raising further concerns of packers and feeders strategically reporting. Volatility can also be affected by changes in market structure in the cattle markets.

Objective

This study estimates the change in volatility of negotiated fed cattle prices in spot markets after implementation of mandatory reporting while taking into consideration the effects of changes in captive supplies and measurement error resulting from data collection and reporting in the two periods.

Data and Methods

USDA-AMS weekly negotiated live slaughter steer weighted average prices Iowa-Minnesota Captive supplies share data 1990-1998 (GIPSA), 2002 – 2015 calculated using monthly USDA-AMS formula and forward national slaughter data
Correct for measurement error in mandatory reporting period prices using multiple over imputation (Blackwell et al .2015)
Estimate change in volatility a Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model

Results

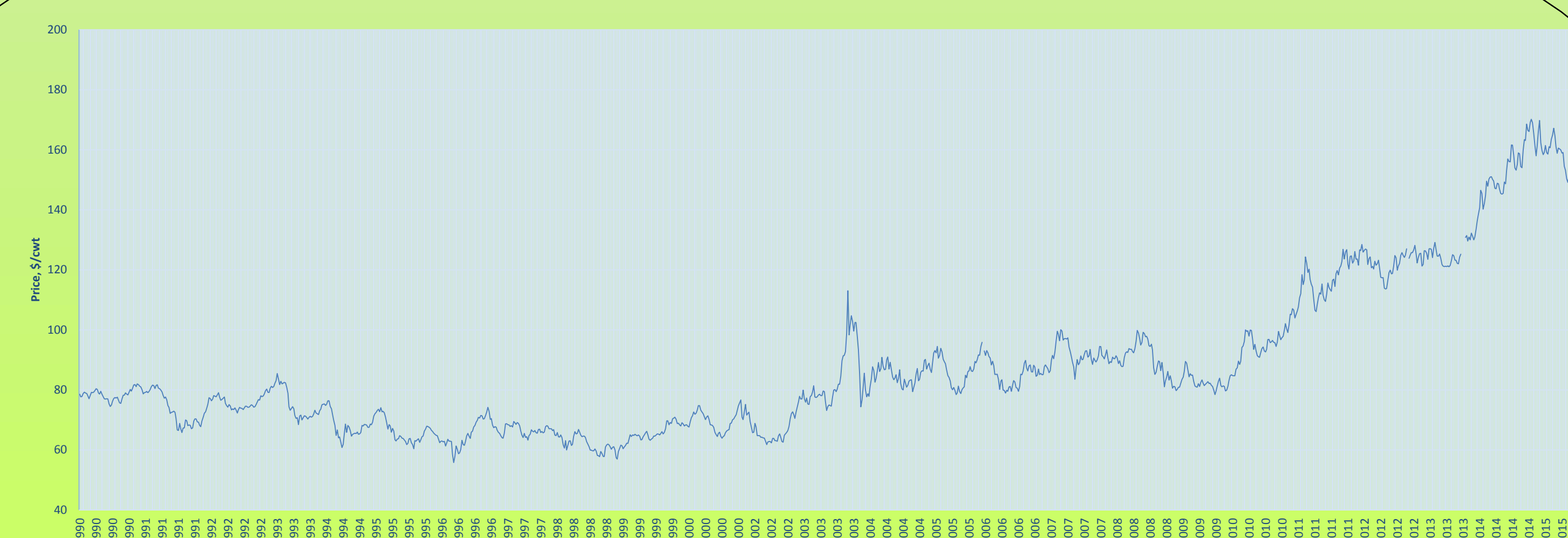


Figure 1. Weekly Negotiated Steer Prices for the Iowa-Minnesota Slaughter Cattle Market, 1990-2015

Table 1. Descriptive Statistics for Weekly Steer

Attribute	Before mandatory reporting	mandatory reporting period
Number of weeks	563	722
Mean price	69.66	102.20
Standard deviation	6.25	26.00
Skewness	0.30	0.87
Coefficient of variation	8.96	25.44
Kurtosis	-0.82	-0.17
First order autocorrelation	0.98	0.99

Table 2. Regression Estimates for Uncorrected, Corrected Low Error and Corrected High Error Steer Prices

		(1) Uncorrected Price	(2) Uncorrected Price	(3) Corrected Low ^a	(4) Corrected High ^b
Mean	Mandatory reporting	3.219 ** (0.226)	1.911 ** (0.218)	0.417 ** (0.137)	0.402 ** (0.137)
	Futures price	0.659 ** (0.003)	0.660 ** (0.003)	0.639 ** (0.001)	0.637 ** (0.001)
	Constant	18.495 ** (0.275)	19.846 ** (0.279)	22.441 ** (0.146)	22.601 ** (0.145)
	Variance				
Mandatory reporting		1.138 ** (0.261)	2.437 ** (1.230)	-0.464 (1.748)	-0.438 (1.704)
	Captive supply		0.099 (0.078)	0.003 (0.115)	0.009 (0.112)
	Constant	-0.072 (0.267)	-1.285 (1.225)	-0.874 (1.764)	-0.898 (1.722)
ARCH	L1 arch	0.969 ** (0.111)	1.004 ** (0.121)	0.491 ** (0.066)	0.491 ** (0.068)
	L1 garch	0.005 (0.041)	-0.052 (0.036)	0.459 ** (0.042)	0.446 ** (0.049)
Log likelihood		-3665.93	-3347.90	-2377.27	-2360.44
Wald χ^2		81033.31	73504.71	401905.96	416508.41
Number of observations		1,279	1,174	1,181	1,181

Conclusions

- Prices are significantly more volatile during mandatory reporting than before without correcting for measurement error in the prices.
- Share of captive supplies has no significant effect on volatility of prices in this market. The increase in volatility in prices during mandatory reporting cannot be explained by changes in the importance of captive supplies
- We find no significant change in volatility in the Iowa-Minnesota regional market after correction for measurement error in the mandatory reporting period.

Limitations and directions for future studies

- This study assumed the sample selection and strategic reporting was not based on the actual prices resulting in random measurement error. However, previous studies on packer and feedlot reporting behavior suggests strategic reporting of prices that favor the reporting firm. Extensions of this study will consider the nonrandom nature of the measurement error.
- Captive supplies share data was obtained from two different sources, GIPSA reports for before mandatory reporting and USDA-AMS during the mandatory reporting period.
- The mean price model will be revised to capture seasonality in prices and cattle cycles.

References

Perry, J., J. Macdonald, K. Nelson, W. Hahn, C. Arnade, and G. Plato. 2005. Did the Mandatory Requirement Aid the Market ? Impact of the Livestock Mandatory Reporting Act. No. LDP-M-135-01. Electronic Outlook Report from the Economic Research Service.

1,, 2, Ph.D. Student and Prof. Department of Agricultural Economics, Oklahoma State University, Stillwater, OK 74078
Phone: (405) 625-0455 email: chimaii@okstate.edu