




Outlook vs. Futures: Three Decades of Evidence in Hog and Cattle Markets

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Price Forecasting


- Forecasts are important in agriculture because prices are highly volatile
- Public outlook programs have been an important source of market analysis and agricultural price forecasts for nearly a century
- USDA forecasts are universally considered to be benchmarks




USDA World Agricultural Supply And Demand Estimates
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Agricultural Marketing Service
Economic Research Service
Farm Service Agency
Foreign Agricultural Service
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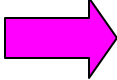


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MARKETING & OUTLOOK BRIEFS
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Evaluation of Outlook Price Forecasts

- **EMH:** futures prices provide forecasts at least as accurate as any other forecast
  Futures prices considered “gold standard”
- **Previous studies:** outlook forecasts are no more accurate, and often less accurate, than comparable futures prices (e.g., Just and Rausser 1981; Sanders and Manfredo 2004)

If an agricultural economist could forecast the price of corn better than the futures markets, he would be rich. Yet he does not put his money where his mouth is. He is not rich. It follows that he is not so smart.

---McCloskey (1992)

Current Study

- **Purpose:** provide a comprehensive evaluation of the accuracy of outlook forecasts relative to futures prices in hog and cattle markets
 - Published forecasts from four prominent livestock outlook programs
 - Most of the series begin in the mid- to late-1970s and end in 2006
 - Tests: RMSE, Encompassing, Structural Change
- **Contribution:** more definitive evidence on the performance of outlook price forecasts



Outlook Forecast Data

Commodity/ Outlook Program	Forecast Sample Period	# Observations		
		1-qtr.	2-qtr.	3-qtr.
Hogs				
Illinois/Purdue	1979.II-2006.III	106	105	104
Iowa	1975.I-2006.II	123	123	109
Missouri	1974.II-2006.III	125	124	103
USDA	1974.I-2006.II	126	104	NA
Cattle				
Illinois/Purdue	1979.II-2006.I	62	52	NA
Iowa	1975.I-1996.I	84	48	NA
Missouri	1974.III-2006.I	79	NA	NA
USDA	1974.I-2006.III	127	107	NA

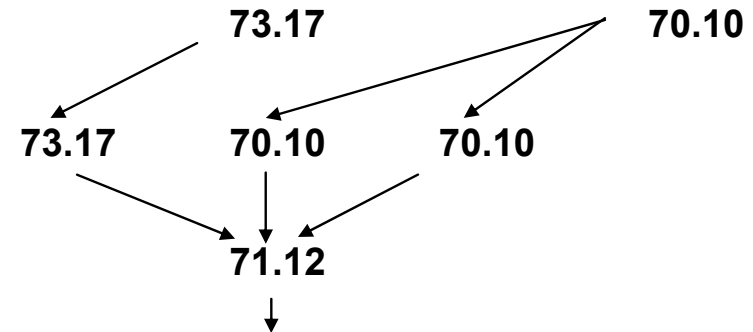


Hoffman Futures Forecast Model

USDA outlook release date: 11/18/2004

Forecast quarter: 2005.I

	Jan'05	Feb'05	Mar'05	Apr'05
Futures prices				
1) Settlement price by contract observed on day previous to USDA outlook report release		73.17		70.10
2) Monthly average price based on futures contract prices	73.17	70.10	70.10	
3) Quarterly futures price (average)		71.12		
4) Lean-live adjustment $[(3) \times 1/1.35]$		52.68		
Basis (cash-futures)				
5) 1st or 2nd quarter basis observed in 2002		-2.98		
6) 1st or 2nd quarter basis observed in 2003		-3.35		
7) 1st or 2nd quarter basis observed in 2004		-0.08		
8) 3-year moving average basis		-2.14		
9) Quarterly futures-based forecast $[(4)+(8)]$		50.55		
10) Actual quarterly price		51.92		



RMSE (\$/cwt.) Comparisons: Hogs

Forecast Comparison	1-qtr.-ahead	2-qtr.-ahead	3-qtr.-ahead
Illinois/Purdue vs. Futures	5.66	7.64	8.64
Difference	1.44 **	1.40 ***	1.73 **
Iowa vs. Futures	4.52	6.39	7.27
Difference	0.28	-0.03	0.01
Missouri vs. Futures	4.10	6.51	7.14
Difference	0.36	0.32	-0.04
USDA vs. Futures prices	6.06	7.46	NA
Difference	0.39	0.50	NA

One, two, and three stars indicate statistical significance at the 10% , 5%, and 1% levels, respectively, based on MDM test.



RMSE (\$/cwt.) Comparisons: Cattle

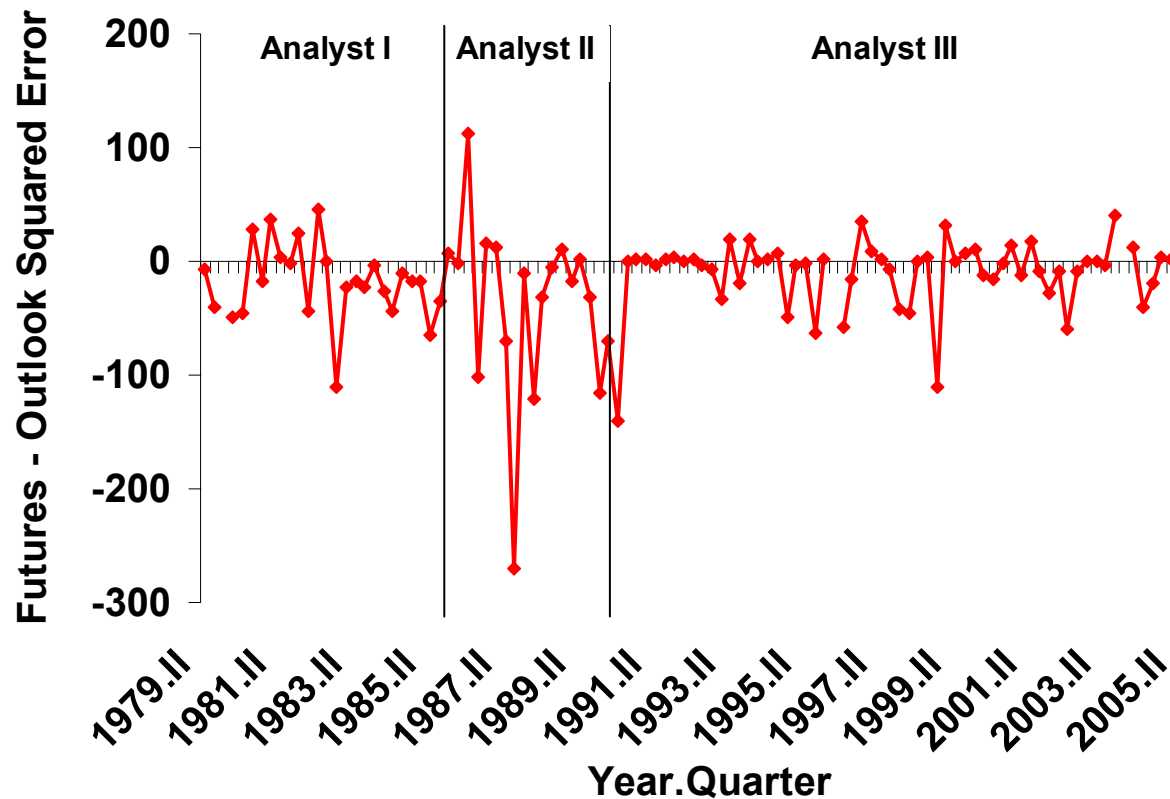
Forecast Comparison	1-qtr.-ahead	2-qtr.-ahead	3-qtr.-ahead
Illinois/Purdue vs. Futures	7.91	7.90	NA
Difference	1.59 **	1.85	NA
Iowa vs. Futures	5.43	5.99	NA
Difference	-0.15	-0.48	NA
Missouri vs. Futures	5.48	NA	NA
Difference	0.20	NA	NA
USDA vs. Futures prices	5.85	6.30	NA
Difference	0.28	-0.31	NA



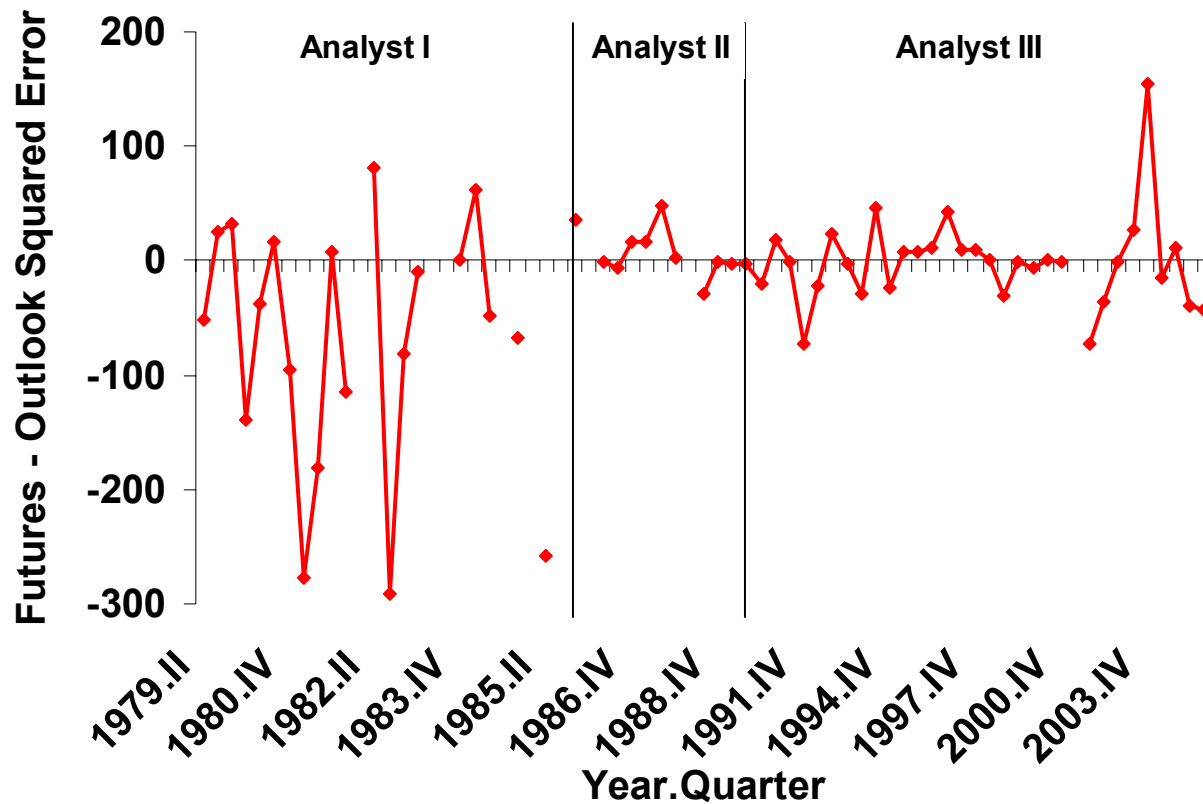
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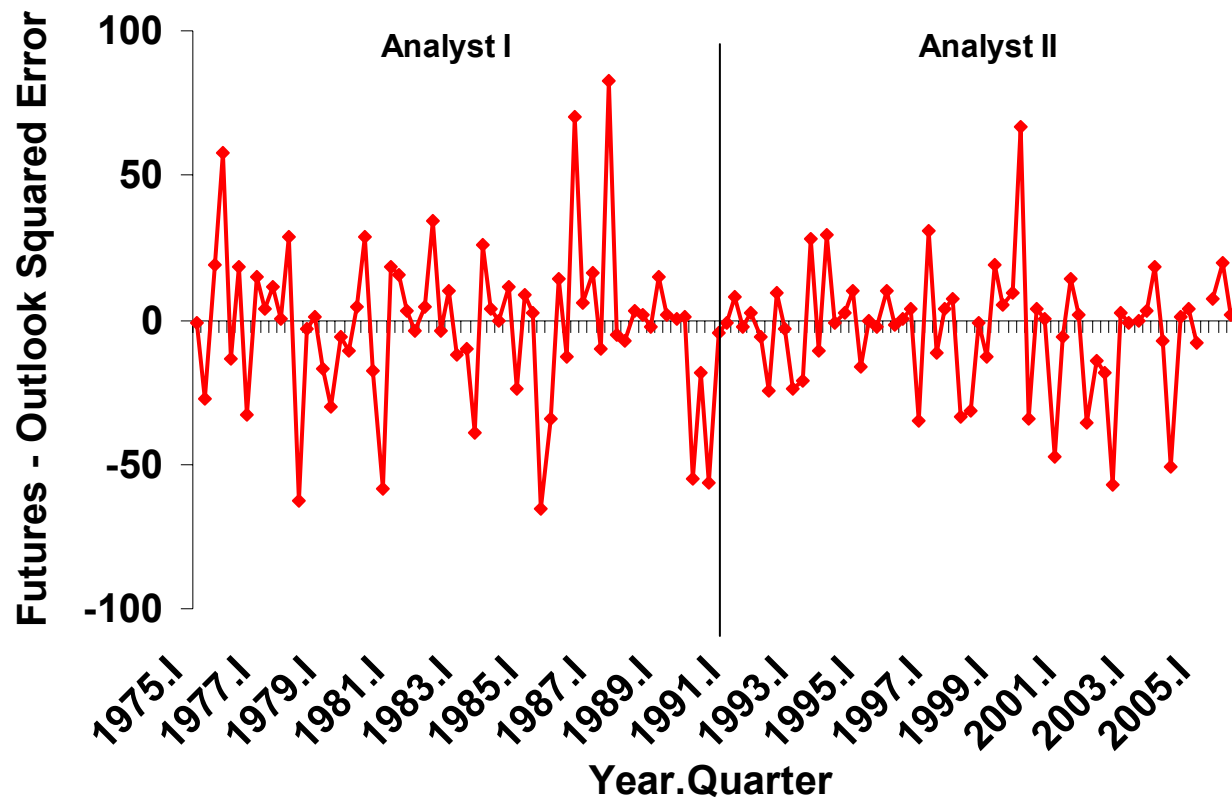
Futures minus Illinois/Purdue One-Quarter Ahead Squared Hog Forecast Errors



Futures minus Illinois/Purdue One-Quarter Ahead Squared Cattle Forecast Errors



Futures minus Iowa State One-Quarter Ahead Squared Hog Forecast Errors



Encompassing Test

- Forecast may have a larger MSE than another forecast but still provide useful information
- **Harvey, Leybourne, and Newbold (1998)**: one forecast encompasses another if the optimal weight of the inferior forecast in a composite forecast is zero

$$e_{1t} = \lambda(e_{1t} - e_{2t}) + \xi_t \quad t = 1, \dots, n$$

Futures forecast
error

Outlook forecast
error

Encompassing Test Results: Hogs

Forecast Comparison	1-qtr.-ahead	2-qtr.-ahead	3-qtr.-ahead
---MDM statistic---			
Illinois/Purdue vs. Futures	1.18	0.95	1.31
Iowa vs. Futures	3.81 **	2.51 **	2.56 **
Missouri vs. Futures	2.97 ***	1.97 *	2.52 **
USDA vs. Futures	2.98 **	1.67 *	NA
--- λ estimate---			
Illinois/Purdue vs. Futures	0.13	0.14	0.18 *
Iowa vs. Futures	0.40 ***	0.51 **	0.50 **
Missouri vs. Futures	0.35 **	0.33 **	0.52 **
USDA vs. Futures	0.37 ***	0.34 **	NA



One, two, and three stars indicate statistical significance at the 10% , 5%, and 1% levels, respectively.



Encompassing Test Results: Cattle

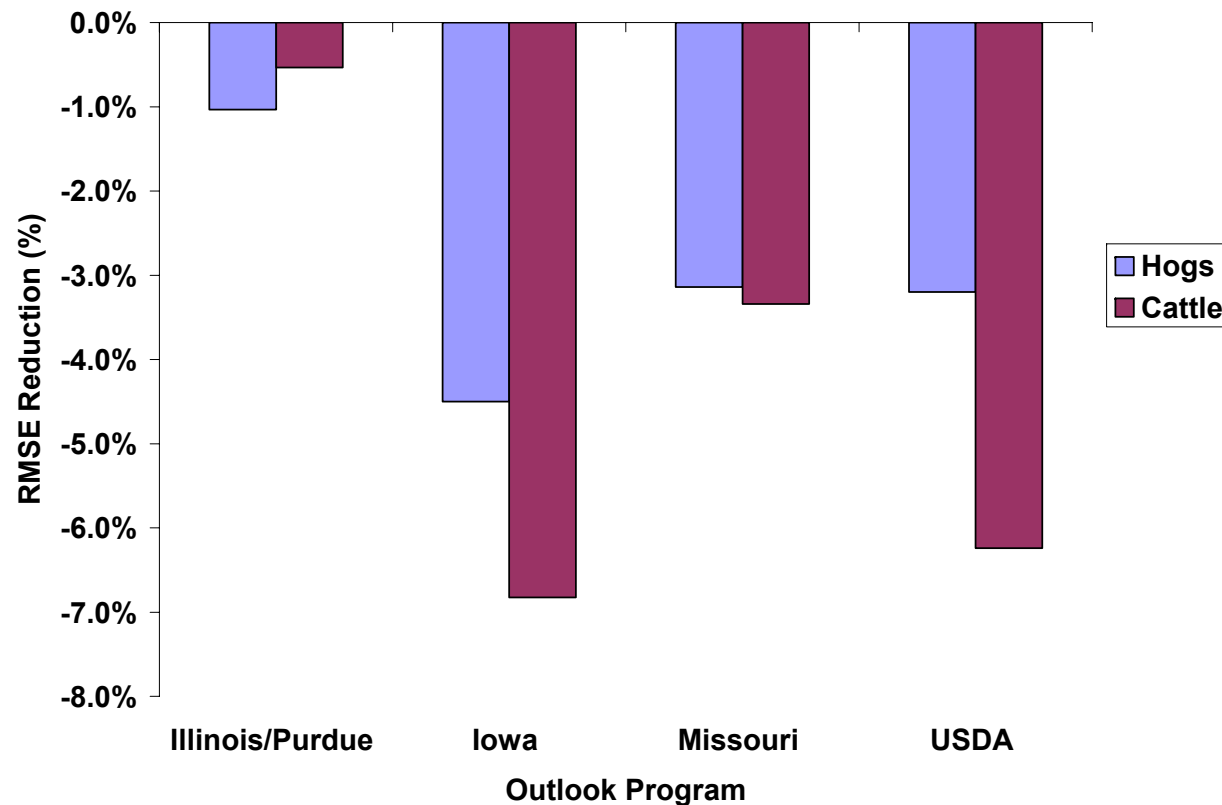
Forecast Comparison	1-qtr.-ahead	2-qtr.-ahead	3-qtr.-ahead
---MDM statistic---			
Illinois/Purdue vs. Futures	0.80	0.77	NA
Iowa vs. Futures	3.26 **	2.53 **	
Missouri vs. Futures	2.31 **	NA	NA
USDA vs. Futures	3.00 ***	2.95 ***	NA
--- λ estimate---			
Illinois/Purdue vs. Futures	0.11	0.12	NA
Iowa vs. Futures	0.58 ***	0.80 ***	NA
Missouri vs. Futures	0.41 **	NA	NA
USDA vs. Futures	0.39 **	0.59 **	NA



One, two, and three stars indicate statistical significance at the 10% , 5%, and 1% levels, respectively.



Average RMSE Reduction from Combining Futures and Outlook Forecasts



Structural Change Test

- Unknown breakpoint test (QLR) originally proposed by Quandt (1960):

$$e_{1t} = \lambda(e_{1t} - e_{2t}) + \xi_t \quad t = 1, \dots, n$$

$$QLR = \max_{\tau_1 \leq \tau \leq \tau_2} F(\tau)$$

Structural Change Test Results for Encompassing Regressions

Forecast Comparison	Horizon	QLR statistic	
		Hogs	Cattle
Illinois/Purdue vs. Futures	1-qtr.-ahead	1.05	4.62
	2-qtr.-ahead	7.94 *	8.92 **
	3-qtr.-ahead	1.46	NA
Iowa vs. Futures	1-qtr.-ahead	1.83	4.44
	2-qtr.-ahead	4.46	6.45
	3-qtr.-ahead	1.41	NA
Missouri vs. Futures	1-qtr.-ahead	0.92	4.76
	2-qtr.-ahead	3.00	NA
	3-qtr.-ahead	4.65	NA
USDA vs. Futures	1-qtr.-ahead	11.06 **	1.61
	2-qtr.-ahead	7.45 *	1.21



One, two, and three stars indicate statistical significance at the 10% , 5%, and 1% levels, respectively.



Conclusions

1. No meaningful differences in forecast accuracy between outlook forecasts and futures prices (except Illinois/Purdue)
2. Outlook forecasts generally contain incremental information not found in futures prices
3. Limited evidence that informational content of outlook forecasts has changed over the last three decades

