SPATIAL COMPETITION IN GRAIN MARKETS:
Are there Differences in Elevators' Pass-through of Grain-handling Efficiencies?

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A Bit about My Professional Background and Goals

**PRIMARY RESEARCH AREAS**

Agricultural marketing and policy, with focus on grain markets

Market structure and competitiveness within supply chain

Risk management and uses of market and policy tools

Production and farm management

Applied econometrics, with focus on spatio-temporal issues
The Changing Landscape of Grain Markets

- U.S. agricultural sector becomes more crop-centric
- Substantial expansion in export demand
- Higher ag demand for transportation services
- Increased competition for transportation
GRAIN-HANDLING INDUSTRY ALSO EVOLVES

Renewed entry of higher capacity, higher speed shuttle-loading grain facilities with two goals:

1) Reduce handling and transportation costs
2) Capture marketing opportunities

Analysis of first entry wave (1980s) shows some effect on elevators' cost-savings pass-through to producers:
Marginal pass-through, but potential for more in regions with greater spatial elevator separation
WHEAT MARKETS PROVIDE RESEARCH OPPORTUNITY

One Commodity, Two Different Market Structures

**Kansas**
- Many producers
- Little on-farm storage
- Many grain-handling facilities
- Diverse marketing channels
- Little quality differentiation

**Montana**
- Fewer producers
- Nearly 100% on-farm storage capacity
- Few, spatially dispersed facilities
- Nearly 85% grain is exported
- Protein content premiums/discounts
Red indicates shuttle-loading facility. Larger circles indicate higher storage capacity. Lines are railroads.

**Grain production**
- Kansas: 1.153 mil
- Montana: 0.262 mil

**On-farm storage capacity**
- Kansas: 0.380 mil
- Montana: 0.520 mil

Grain includes barley, corn, sorghum, soybeans, and wheat.
WHY?

Develop a model that helps explain why there are differences in pass-through across different market structures.

HOW MUCH?

Use natural differences in market structures to empirically estimate whether pass-through differences exist and quantify those differences.
Estimate potential differences in observed basis (price) bids for wheat by shuttle-loading and non-shuttle-loading facilities within two different market structures
**THEORY and PAST EVIDENCE:**

Arbitrage opportunities imply that basis bids would be correlated across grain-handling facilities.

**EMPIRICAL EVIDENCE:**

Analyses of residuals from regression that does not control for spatial autocorrelation indicate that

- Semi-variograms for both KS and MT suggest spatial autocorrelation of elevators within a 150-160 mi radius
- Moran's I and Geary's C spatial autocorrelation tests reject the no spatial autocorrelation hypothesis
**Concentration of Elevators within 60 Mile Radius**
- 26

**Per Bushel Premium at Shuttle-Loading Facilities**
- $0.04
- <$0.01

**Lessons and Implications**

Grain-handling market structure matters for elevators' decisions to pass through cost savings to producers.

Pass-through decreases in markets with higher density of grain-handling facilities.

Suggestive evidence that pass-through increases when farmers have greater on-farm storage capacity.
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