

Risk Attitude & the Structure of Decision Making: Evidence from the Hog Industry

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*Selected Poster prepared for presentation at the Agricultural & Applied Economics Association's
2011 AAEA & NAREA Joint Annual Meeting, Pittsburgh, Pennsylvania, July 24-26, 2011.*

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Introduction: Hog Industry & Research

- Growth in contract use; decline in spot sales
- Mixed evidence on RISK ATTITUDE → CONTRACT
 - Models of Contract Use:

$$CONTRACT = f(\text{risk attitude, age, farm size, financial state})$$
 - Models of Risk Aversion:

$$RISK ATTITUDE = f(\text{age, farm size, financial state})$$
 - Should indirect effects be considered?

Objectives

- Explain Risk Attitude & Contracting:



- Contributions:

– Insight on structure of producers' decision making & role of risk attitudes.

Hypotheses

- H₁. Producers' age & experience reduce contract use indirectly through negative impacts on risk aversion.
- H₂. Firm size & leverage increase contract use indirectly through positive impacts on risk aversion.
- H₃. Risk aversion is positively related to contract use.

Reliable Measure of Risk Attitude

Risk Attitude Scale Survey Items	Factor Loadings
RA1 I usually like "playing it safe" (for instance, "locking in a price") instead of taking risks for market prices for (weaner, feeder, finished) hogs.	RA1 0.92
RA2 When selling/marketing my hogs, I prefer financial certainty to financial uncertainty.	RA2 0.86
RA3 When selling/marketing my hogs, I am willing to take higher financial risks in order to realize higher average returns.	RA3R 0.38
RA4 I like taking financial risks with my hog farm business.	RA4R 0.59
RA5 I accept more risk in my hog farm than other hog farmers.	RA5R 0.36
RA6 With respect to the conduct of business, I dislike risk.	RA6 0.45

Reliability of Measure	Original Items	Standardized Items
Cronbach's Alpha	0.785	0.780

Risk attitude items scaled 1 = "strongly disagree" through 9 = "strongly agree."



Research Methods

- Data: Interview 50 producers in University of Illinois Farm Business Farm Management (FBFM) program
 - Survey & Accounting data for 2006.

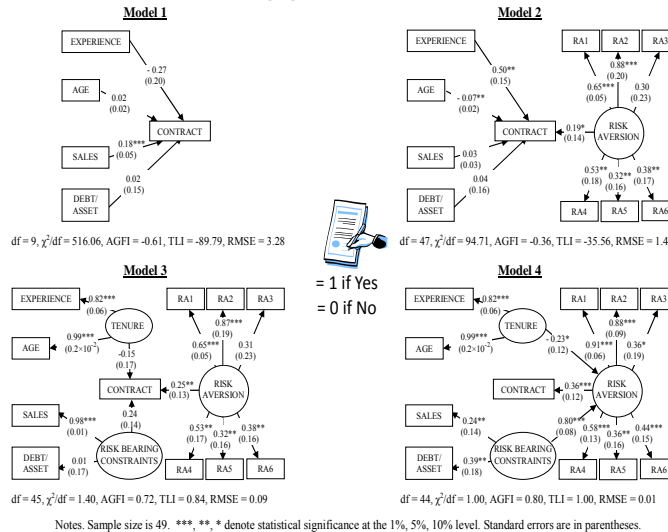
Structural Equation Models:

Structural Model:
$$\eta = B\eta + \Gamma\xi + \zeta \quad (1)$$

Measurement Model:
$$y = \Lambda^y\eta + \varepsilon \quad (2)$$

$$x = \Lambda^x\xi + \delta \quad (3)$$

Bootstrapped SEM Results



- Measurement of Model Fit:

- Likelihood ratio $\chi^2/df \leq 2.50$ → actual and predicted input matrices not statistically different at 10% level.
- Adjusted Goodness-of-Fit Index (AGFI) is measured by squared residuals between predicted and actual data, and is bounded above by 1 (perfect fit).
- The Tucker Lewis Index (TLI) accounts for parsimony in a comparative index between proposed and null models, with recommended values ≥ 0.90 .
- Root Mean Squared Error of Approximation (RMSEA) estimates how well the fitted model approximates the population covariance matrix, with values ≤ 0.08 indicating a close fit.

Summary of SEM Results

- Model 4 is best representation (best fit)
 - OLS versions of Models 1 & 2 also have
 - Poor fit ($R^2 = 0.25$ & 0.30)
 - Sign & magnitude of age & experience indicate collinearity
 - Supports hypotheses H₁, H₂, & H₃.
 - Age, experience makes producers more comfortable managing price risk without long-term contracts.
 - Larger (expanding?) farms with more debt have constrained capacity to bear risk, and hence contract to ensure stable cash flows (to service debt).
- RISK ATTITUDE more important than in other models.

Implications

- Attitudes revealed by observed behavior reflect contextual/situational circumstances.
 - Measures of risk attitude do not capture only an inherent predisposition toward risk sans contextual circumstances.
- Care must be taken to identify parsimonious but accurate structure of decision making process.
 - If structure of decision making process is inaccurately modeled, the importance of key variables like risk attitudes may be underestimated.

Conclusions

- While other factors contribute to growth of contract use in the hog industry, risk attitudes are an important indicator of who may contract.
 - While inherent predispositions toward risk may not be changing dramatically, changing circumstances combined with risk preferences may drive propensity for risk averse behavior.
- Future research should investigate generalizability of results for other decision contexts.
 - Hog contracting by younger segments appears to be driven by experience/competence/confidence in managing risk, whereas youth is commonly associated with riskier behavior in other contexts.