Supply and Demand for Whole-Farm Crop Insurance: *What have we learned?*

Bruce A. Babcock

Center for Agricultural and Rural Development

Iowa State University

Presented at USDA Agricultural Outlook Forum,

March 1, 2007,

Topics Covered

- Supply
  - Tax forms vs. revenue to count
- Demand drivers
  - Subsidy structures
  - Insights(?) from prospect theory

Schedule F Insurance

1. Project farm income from past farm income
2. Farmer selects a coverage percent
3. Insurance makes up income shortfalls below guarantee

- ❖ CAIS, AGR and AGR-Lite
- ❖ IRS could pay losses

Problems with Schedule F

- Farmers can easily move income and expenses from one year to next without accrual accounting
  - Inflate losses in loss years
  - Increase future guarantees by inflating gains in gain years
- Schedule F costs are not costs that should be insured
  - Phantom tile lines, new pickup trucks, mileage expenses, etc. etc. etc.

Revenue to Count

- RA and new combined product (name???)
- Projected revenue =

  Acreage-weighted sum of per-acre expected revenue from each crop
- Whole-farm revenue guarantee =

  Coverage level X Projected Revenue
- Indemnity makes up for shortfalls in total revenue to count at harvest

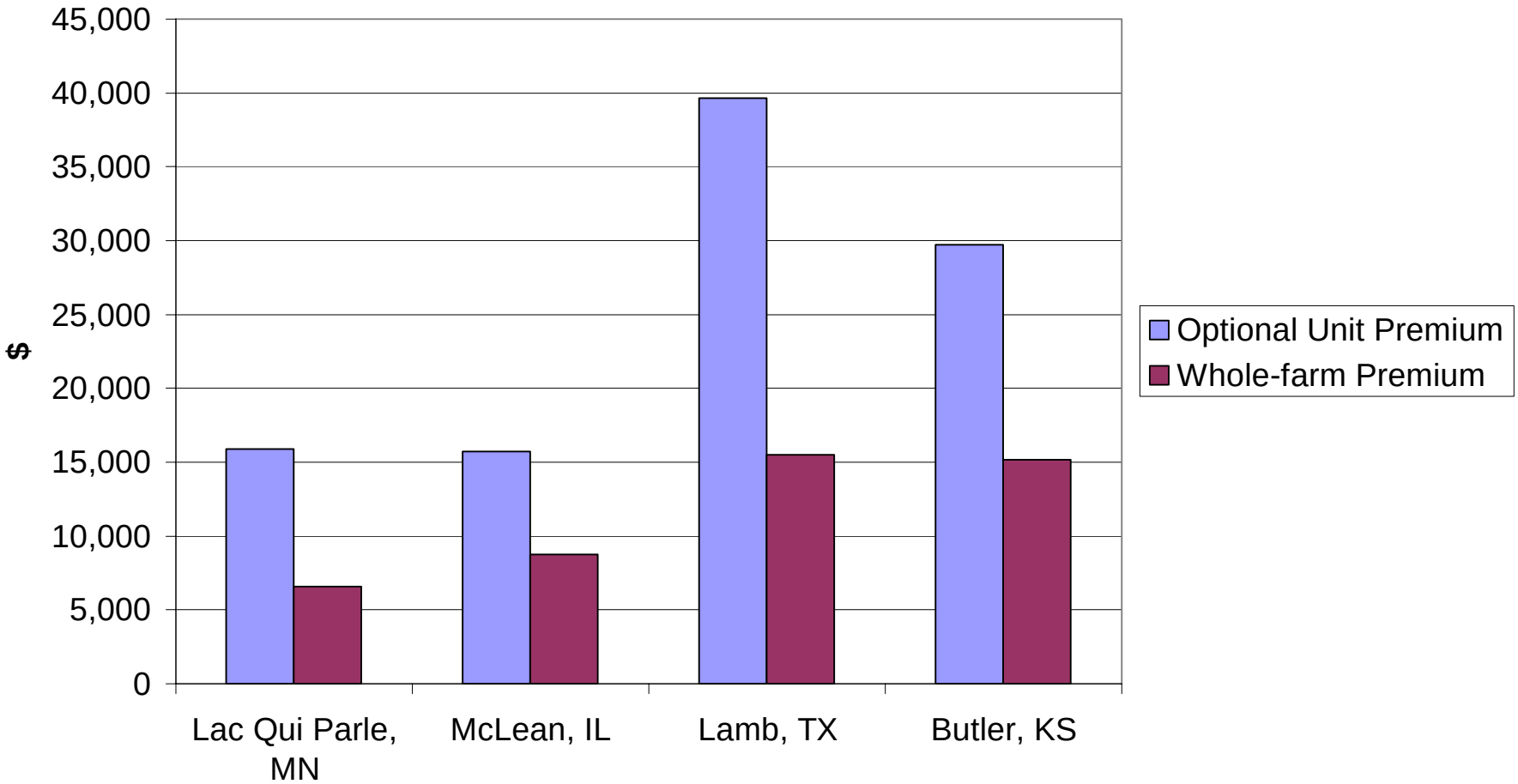
Example Farms: Acres

	Acres in Each Crop				
County, State	**Corn**	**Soybeans**	**Sorghum**	**Cotton**	**Spring Wheat**
Lac Qui Parle, MN	333.	333.3	0	0	333.3
McLean, IL	500	500	0	0	0
Lamb, TX	500	0	0	500	0
Butler, KS	500	0	500	0	0

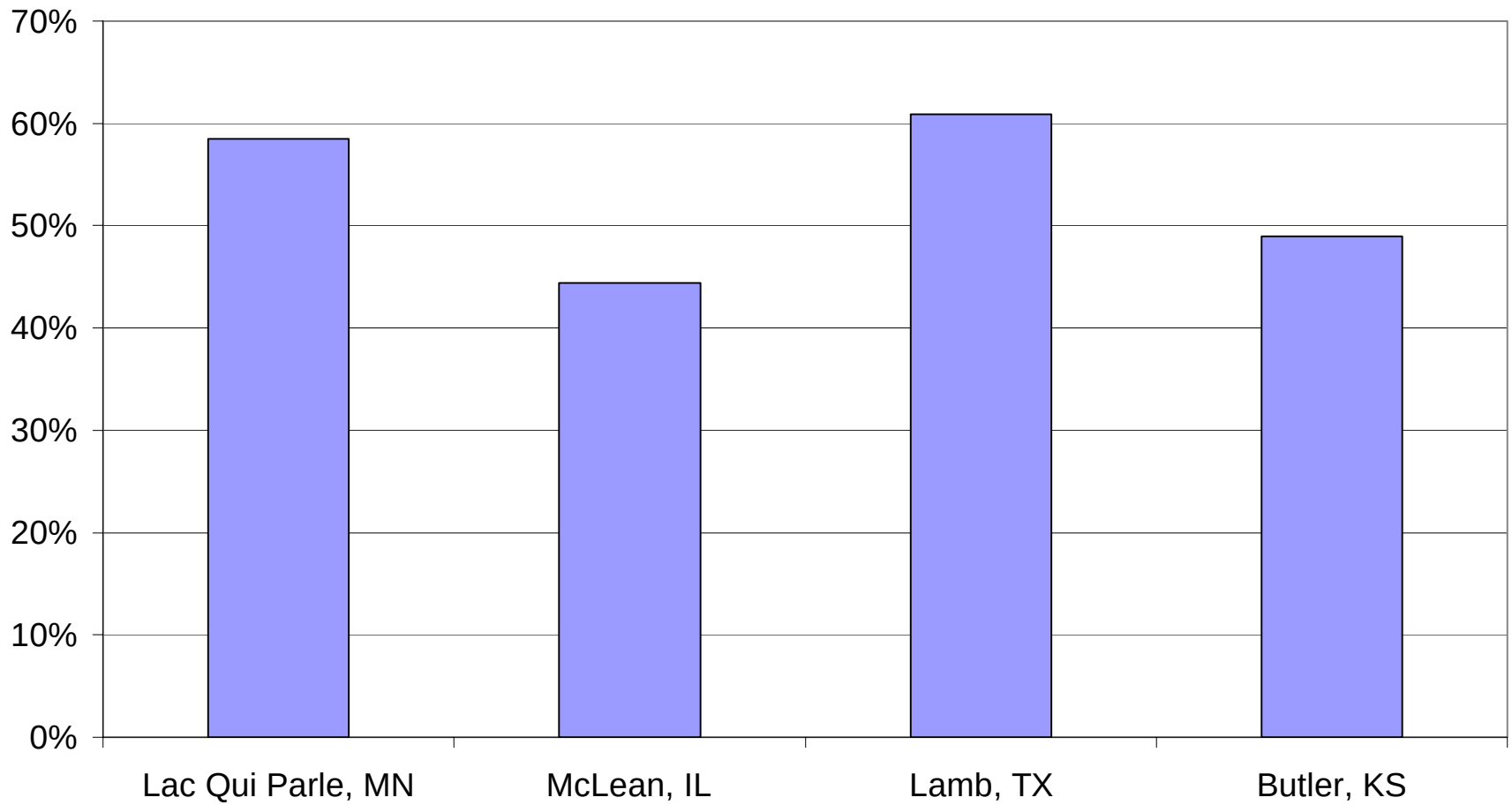
Example Farms: APH Yields

County, State	Corn (bu)	Soybeans (bu)	Sorghum (bu)	Cotton (lb)	Spring Wheat (bu)
Lac Qui Parle, MN	128	36	0	0	45
McLean, IL	153	47	0	0	0
Lamb, TX	156	0	0	637	0
Butler, KS	153	0	68	0	0

RA-HPO Premium Comparison at 75% Coverage (Using 2005 Prices)



RA-HPO Premium Reduction from Moving to Whole-Farm Unit



Why No Purchases?

- Value of risk reduction per dollar of total premium much higher for whole-farm insurance than optional unit insurance
  - Value of risk reduction measured by change in certainty equivalent returns

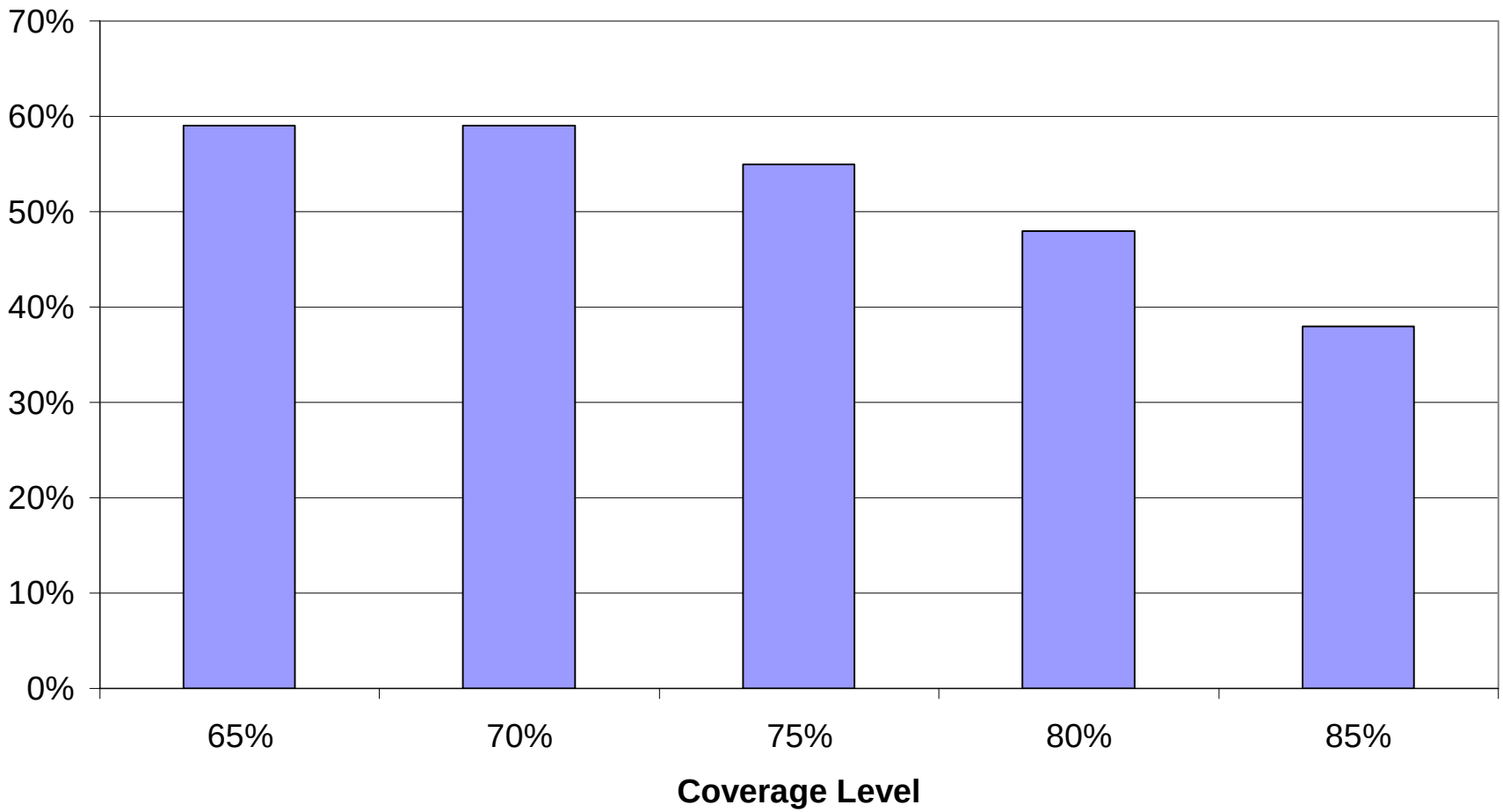
Two Explanations

- Subsidy structure drives producers to optional units
- Preferences of farmers not captured by standard models that explain how producers make decisions under risk.

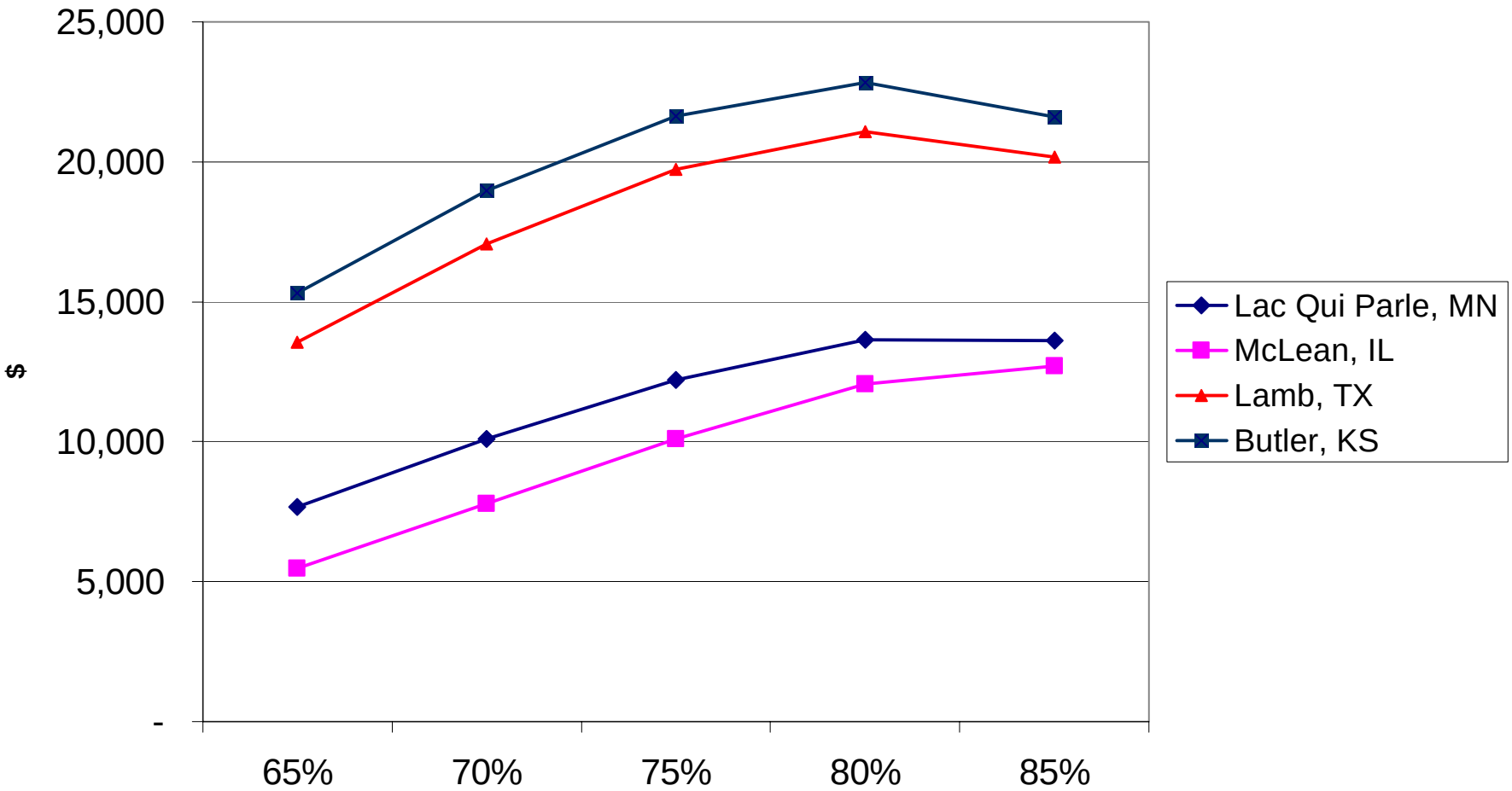
Subsidy Structure

- Premium subsidy ($/acre) equals profit gain from buying crop insurance if rates are actuarially fair
- Premium subsidies are proportionate to total premiums

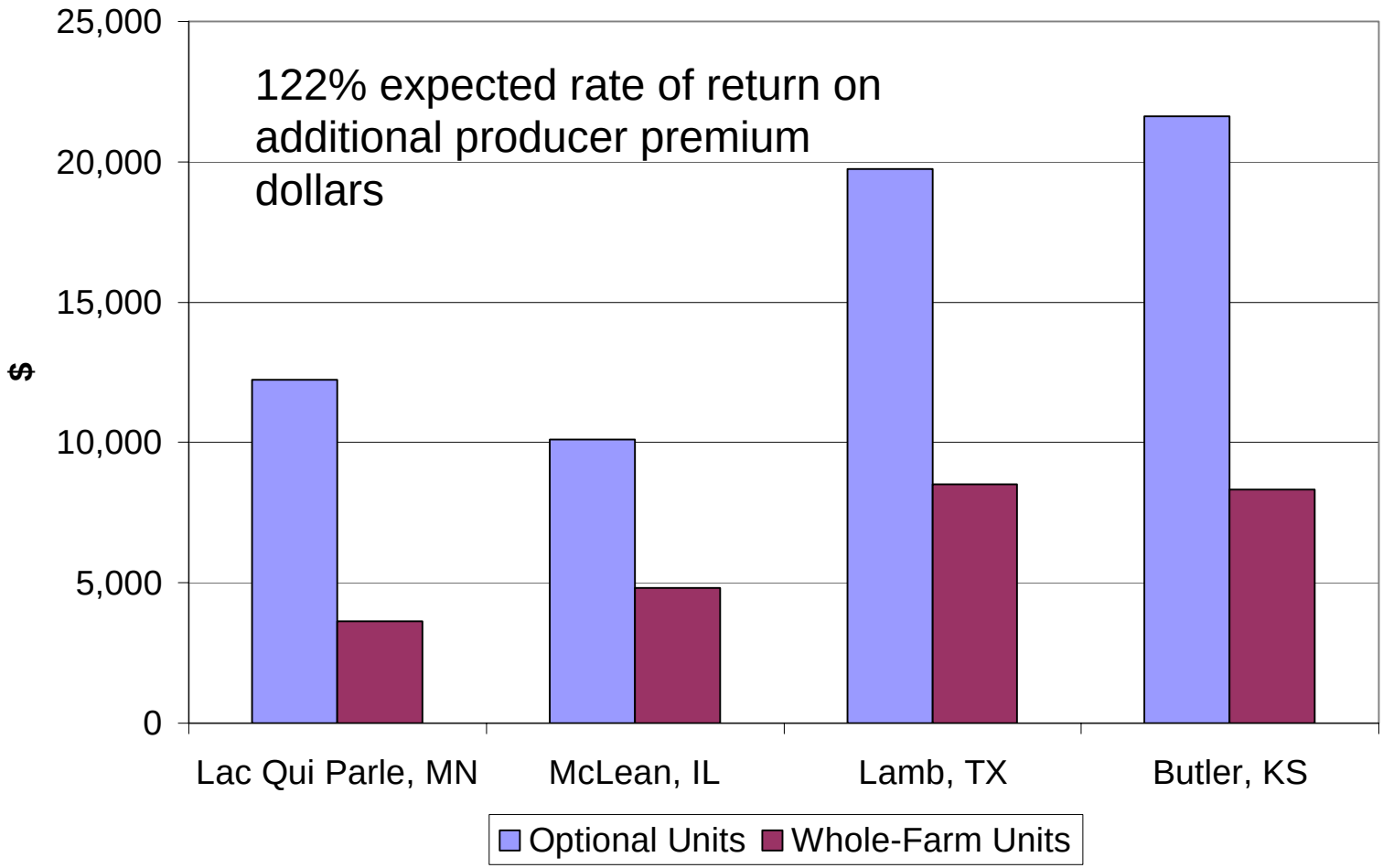
Premium Subsidy Percent



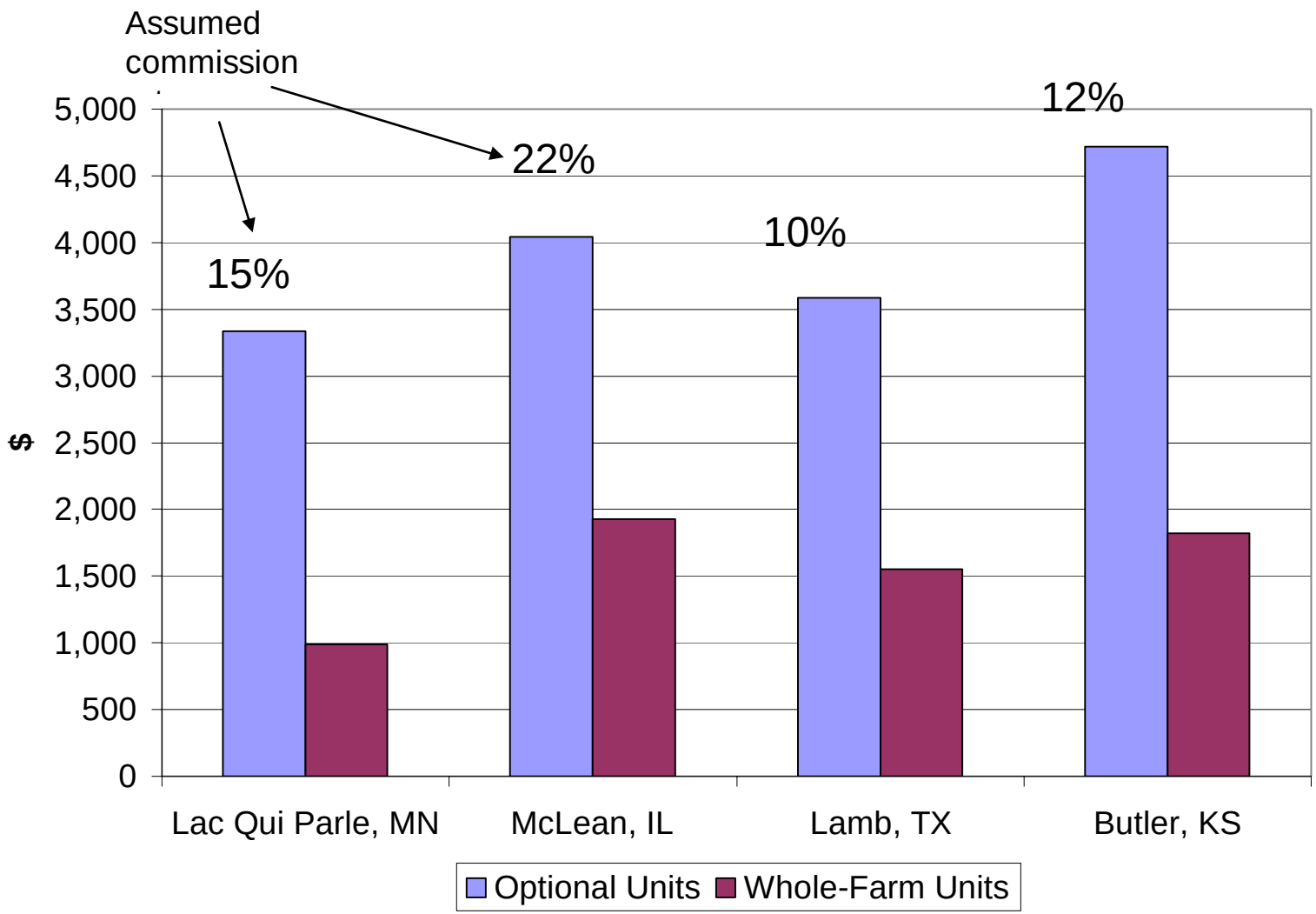
Annual Expected Profit from Crop Insurance with Optional Units



Expected Farmer Profit at 75% Coverage for Optional Units vs. Whole-Farm Units



Representative Agent Commisions



Preliminary Summary

- Agents have hot incentive to push optional units due to commission structure
- Farmers have strong incentive to buy optional units (122% rate of return)

- No surprise that farmers prefer optional units compared to enterprise and whole-farm units

Voucher a Solution?

- If subsidy structure were neutral with respect to unit structure would farmers push agents to sell them whole-farm insurance?

- More fundamentally, if Senator Lugar's old voucher plan were adopted, would farmers buy crop insurance?

Prospect Theory vs. Neoclassical Theory

- Expected utility theory:
  - Preferences defined over final outcomes
  - Predicts people will insure the performance of a portfolio rather than individual prospects within the portfolio

➢ Literature predicts producers prefer whole-farm insurance vs. optional (unsubsidized)

Loss Aversion

- Prospect theory (Kaneman and Tversky)
  - Preferences over risk depends critically on reference point and framing of the choices
  - Do farmers perceive a loss if one crop does well but the other does not?
  - Yes? Then the farmer will value the loss more than the gain and prefer optional units

Crucial Role of Framing

- Agents have an incentive to sell optional units
- Do they frame the choice of unit structure that emphasizes the fact that a “loss” can occur yet no compensation will take place?
- Or do they frame the choice in terms of final outcomes and ability for farmer to pay back production loans?

Preference or Subsidies?

- Difficult to determine if preference for optional units is driven by
  - Subsidy structure (percent of premium)
  - Loss aversion among farmers
  - Agent commission structure which drives framing of choices

Role of Vouchers

- Adoption of unit structure-neutral voucher system would eliminate one variable driving unit choice
  - Why should Federal government be in the business of driving choice, particularly in budget-tight times?
- Introducing increased competition between agents would perhaps help neutralize framing issue.
  - Why should an agent be paid more if a farmer chooses optional units?