Subsidy Framing, Information and Payment Incidence in Factor Markets: Evidence from Market Experiments

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Subsidy Incidence

Many factor markets related to agriculture and biofuels are affected by policies designed to encourage production as well as transfer income to market actors.

Traditional agricultural policy goals have included the use of subsidies to transfer income to producers but have been found to impact related labor and land markets (Luckstead, Devadoss, and Rodriguez 2012; Sumner 2007; Tweeten and Zulauf 2008).

Biofuel policies have been found to affect factor markets for corn and land (Taheripour and Tyner 2007; Keeney 2009)

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Subsidy Incidence

Subsidy incidence is founded in theory from literature regarding tax incidence (Ruffle 2005).

"…the relative economic benefit of the subsidy is independent of who actually receives the subsidy" (Ruffle 2005, 1520).

The literature suggests that as institutions move from competitive markets to institutions dominated by individual negotiation the nature of tax incidence changes (Kerschbamer and Kirchsteiger 2000; Ruffle 2005).

Many factor markets for agricultural and biofuels are dominated by private negotiation.

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Decoupling
Existing agricultural policies deemed acceptable by WTO standards still can have a large impact on land values and rental rates via payment incidence causing allocative inefficiencies

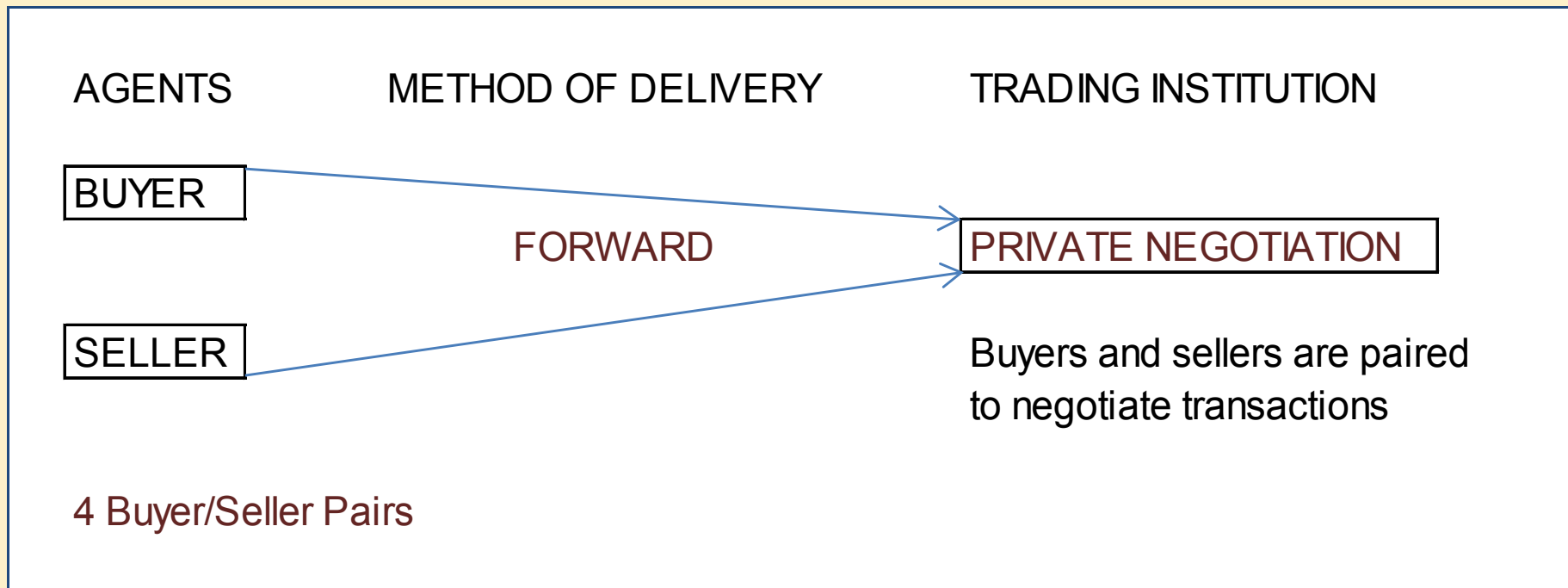Framing effect– not tied to the unit of production such as land or blend mandates

Information effect – are both sides of the market aware that the buyer is receiving subsidy

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Research Objective

We test the impact of subsidy framing (coupled, decoupled, or demand shift) and information effects in a laboratory market characterized by privately negotiated transactions.

Trading institution and method of delivery:

A simplified private negotiation, forward laboratory market

AGENTS   METHOD OF DELIVERY   TRADING INSTITUTION

BUYER

FORWARD   PRIVATE NEGOTIATION

SELLER

Buyers and sellers are paired to negotiate transactions

4 Buyer/Seller Pairs

Five policy framing and information treatments are investigated:

No Subsidy   market in which no support is paid out

Annual Payment, Common Knowledge   buyers receive a periodic payment of 100 tokens
full information (buyers and sellers aware of subsidy)

Per-Unit Subsidy, Common Knowledge   buyers receive a 20-token per-unit subsidy
full information (buyers and sellers aware of subsidy)

Per-Unit Subsidy, Asymmetric Knowledge   buyers receive a 20-token per-unit subsidy
asymmetric information (subsidy is private—sellers unaware)

Unit Redemption Value Shifted   buyers receive a 20-token per-unit increase in redemption value
asymmetric information (shift is private—sellers unaware

Laboratory Procedures

Each session follows a standard procedure:

- 8 participants randomly designated as 4 buyers and 4 sellers

- presentation of instructions followed by one or more practice sessions

- 20 or more trading periods

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During each of 20+ trading periods:

- buyers and sellers randomly paired to trade up to 8 units over 3 bargaining rounds

- units traded sequentially

Information provided to players:

- unit redemption value/cost schedules

- private trading information—current bid/offer, trading partner's current bid/offer

- calculation of profits as each unit is traded

- private summary of period and total earnings

Payment procedures:

- Earnings denoted in tokens (1 token = 1 cent)

- $10 show-up fee

- All participants paid market earnings:

  Buyer Unit Earnings = Unit RV – Price
  Seller Unit Earnings = Price – Unit Cost

- Show-up fee, market + subsidy earnings paid in **$cash$** at the end of the session

Analysis

Data analyzed both graphically and using the following convergence model:

$$Z_{it} = B_0\left[(t-1)/t\right] + B_1(1/t) + \sum_{j=1}^{i-1}\alpha_j D_j\left[(t-1)/t\right] + \sum_{j=1}^{i-1}\beta_j D_j(1/t) + u_{it'}$$

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Market Results

Price and trades data represent averages for each trading period over 3 replications by policy and subject treatments

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Estimated Convergence Levels

Treatment	Market Outcome			
	Price	Trades	Seller Earnings	Buyer Earnings*
No Subsidy	80.0 [a]	17.1 [a]	135.7 [a]	134.9 [a]
Annual Payment, Common Knowledge	79.4 [a]	17.8 [ab]	139.1 [a]	137.8 [a]
Per-Unit Subsidy, Common Knowledge	85.8 [b]	17.4 [ab]	167.5 [b]	103.3 [b]
Per-Unit Subsidy, Asymmetric Knowledge	85.9 [b]	18.0 [b]	169.6 [b]	108.9 [b]
Revised Buyer Schedule, Asymmetric Knowledge	90.3 [c]	20.7 [c]	194.5 [c]	187.4 [c]

Estimated Convergence Levels—subsidy treatments

Treatment	Market Outcome
	Price
No Subsidy	**80.0** [a]
Annual Payment, Common Knowledge	**79.4** [a]
Per-Unit Subsidy, Common Knowledge	**85.8** [b]

Result: When the subsidy is fully decoupled from the factor, as is the case with the annual payment, payment incidence is mitigated and prices are not statistically different from the no-policy treatment

Estimated Convergence Levels—
per-unit subsidy, by information treatments

Treatment	Market Outcome
	Price
Per-Unit Subsidy, Common Knowledge	85.8 [b]
Per-Unit Subsidy, Asymmetric Knowledge	85.9 [b]
Revised Buyer Schedule, Asymmetric Knowledge	90.3 [c]

Result: Even with asymmetric information, factor buyers were willing to offer some of the per-unit subsidy to factor sellers.

When income transferred as shift in demand, subsidy equally split between buyer and seller.

Information, Framing, and Incidence

Regardless of whether or not both sides of the market were aware of a per-unit subsidy tied to the factor, buyers negotiated higher prices and shared surplus with sellers and subsidy incidence rate was similar.

When income transferred as demand shift, subsidy split equally as theory would predict given elasticities in our market

* Framing effects, but not information effects

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Policy Design, Market Behavior, and Incidence

Policy design can mitigate payment incidence, regardless of motivations such as other-regarding behavior or buyer competition, thereby reducing direct factor market distortions and allocative inefficiencies

Policies designed to be fully decoupled from both commodity production and related production factors will have less direct distortionary impacts across both commodity and factor markets

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Questions?