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Can PES schemes mimic markets?

Gabriela Scheufele and Jeff Bennett

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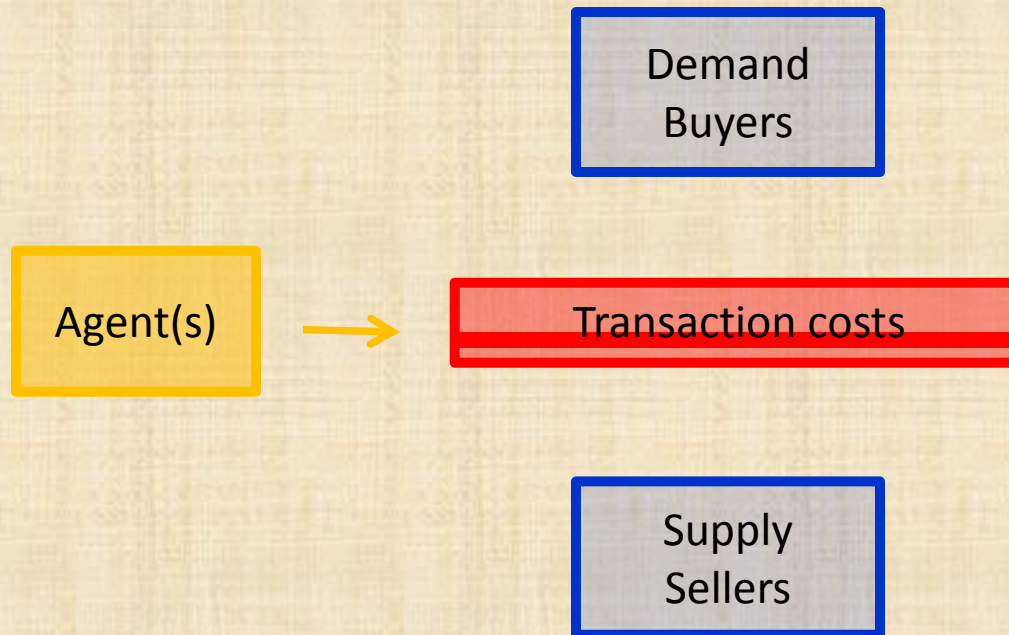
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Key elements

- Selecting suppliers
- Determining the price

Seller selection

- Everyone who meets some specified basic eligibility criteria
- 'First-come-best-dressed' principle
- Cost-effectiveness principle
- Efficiency principle

Price

- Uniform OR non-uniform
- Per unit of input OR per unit of output
- Based on marginal costs (MC), marginal benefits (MB) or other criteria

PES example 1:

- Price paid to suppliers equals individual marginal costs per unit of input
- Marginal cost curve estimated through reverse auction:
Suppliers choose quantity and price
- Suppliers selected using EBI/C ranking and included up to a budget constraint or supply target
- Supply valued in terms of an EBI

Example 1 (demand):

- EBI – not based on quantitative bio-physical relationship between inputs (management actions) and outputs (ES)
- Buyers may not maximize surplus
- ES supply not valued in monetary terms
- Market demand curve – individual marginal benefit curves not available

Example 1 (supply):

- Suppliers choose quantity and price: individual quantity determines price: how to choose?
- Zero economic profit – incentives to participate?
- Low cost suppliers earn the same profit as high cost suppliers (zero economic profit)
- The market supply function represents the horizontal sum of individual single values rather than individual supply functions
- The marginal unit is the individual supplier and not the unit of input

Example 1 (market dynamics):

- Non-uniform price paid to suppliers determined by individual marginal costs
- Price paid by buyers is an average price (budget divided by quantity of supply and number of buyers – taxpayers)
- Quantity supplied determined by a budget constraint or supply target
- Unknown whether scheme generated social net benefits
- Cost-effective - surplus distributed in favor of the buyers
- Long-run adjustments?

PES example 2:

- Price paid to suppliers and by buyers equals individual marginal costs and benefits per unit of output
- Individual marginal cost curves estimated through reverse auction: Each supplier chooses quantities for a given range of prices
- Suppliers selected through self-selection process

Example 2 (demand):

- Establishment of quantitative input-output relationship (bio-physical mode)
- Estimation of marginal benefits in monetary terms
- Market demand curve – horizontal summation of individual marginal benefit curves for rival ES (private and common goods)
- Market demand curve – vertical summation of individual marginal benefit curves for non-rival ES (public goods)
- Buyers maximize surplus

Example 2 (supply):

- Suppliers choose quantities given prices (enables profit maximization)
- Market supply curve – horizontal summation of estimated individual marginal cost curves
- Uniform price
- Low cost suppliers earn a higher profit than high cost suppliers

Example 2 (market dynamics):

- Uniform price and quantity determined through supply and demand (iterative process?)
- Generation of social net benefits (efficiency)
- Surplus shared between buyers and suppliers
- Long-run adjustments

Conclusion

- Degree by which a PES scheme that mimics a market for traded goods and services depends on design elements
- Compromises may be reasonable if transaction costs greater than generated net benefits

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