Economic fundamentals for water markets

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Smart water use: some crops fallowed; some fully watered. Water is applied strategically.

On-farm decisions: “trade” between acres.

Across farms: requires a transaction.

Across districts, across uses. More difficult still.

Strategic use increases the value of available water resources.
To buy/sell, you need the right or capacity to do so.

**Prior appropriations**: first in time, first in right.

Seniority system and implications for droughts.

Beneficial use: water rights granted for specific uses.

Use it or lose it: trade-offs in “waste management”.

Third party effects of water use and non-use.

Now: when water is leased or sold, how is price determined?
Price determination

Value to buyer = maximum acceptable price

Potential price range & Gains from trade

Value (cost) to seller = minimum acceptable price
Price determination

For-profit seller with strong bargaining position (e.g. sole provider of exempt well mitigation)

Non-profit with cost-recovery objective

Where will the price settle?
Depends on bargaining position
Gains from trade remain the same, but distribution of benefits differs
Gains from trade and price variation

- Gains from trade depends on the difference in value to the buyer and seller.
- Can be large: e.g. hay sold for required residential mitigation.
- Another implication: price variation can be large depending on buyer and seller positions.
- Could explain the big differences between for-profit and non-profit water bank prices in the Kittitas.
Transactions, and markets

- A **transaction**: A trade or contract (e.g. lease, sale, multi-year contingent contract).

- **Market** as institutional **frame**: “rules & tools” for trading.
  - Property rights, rules of transfer (e.g. transfer based on consumptive use, no third-party effects).
  - Interface between buyers and sellers (e.g. the local restaurant).
  - Regulation (relinquishment requirements, water bank rules).
Transaction costs

Market “rules and tools” affect transaction costs: the costs incurred through the act of buying/selling.

- Effort of finding willing buyers or sellers.
- Effort to assess personal value of water.
- Negotiation effort.
- Administrative requirements and costs.
  - Establishing the details of existing right.
  - Establishing right to buy or sell (establish past use).
  - Approval process/costs for a transaction.

A farmer allocating water on the same farm does not incur transaction costs, but does incur opportunity costs by leaving one (low-valued) crop dry.
Gains from trade and transaction costs

- Transaction costs cut into gains from trade.
- Can be large enough to block an otherwise beneficial transaction.
- Reducing transaction costs can increase the value and volume of transactions.
- This suggests that reducing transaction costs can be an important strategy for market development and improving market function.
When/where will water trading occur?

- When large gains from trade are likely, for many.
  - During drought.
  - To address mitigation requirements.
  - When there is variation in water value across uses.
  - When third-party concerns don’t preclude trade.

- When the hassles and costs of buying and selling (i.e. transaction costs) are low.

- When senior water rights use water for low-valued uses.
When/where will **markets** develop?

- When expected gains from trade are high.
- When expected transaction costs are high.
- Together they imply large economic losses from market failure.
- What drives change?
  - Inertia and information are important factors affecting markets.
  - New water use restrictions (e.g. response to lawsuit).
  - Technology change that increases gains from trade or reduces transaction costs.
The most active water markets in WA have arisen because groundwater pumping can negatively affect more senior surface water rights and instream flows.

The Skagit has similar problems, but the distribution of water and rights in the basin preclude active markets.

I’ll let the next speakers focus on these.

If we seem more severe and more frequent droughts, we are likely to see more market development in preparation for and in response to drought. I’ll talk a bit about this.
Approaches to improving water markets

- Problems commonly noted
  - Uncertainty over water/weather as season unfolds; timing.
  - Buyer/seller Search and bargaining difficulties.
  - Uncertainty over water value.
  - Are relinquishment concerns a common barrier to sale?

- A couple of ideas
  - Adoption/promotion of contingent contracts.
  - Smart Markets.
Contingent contracts (AKA dry-year contracts) are long-term contracts that specify prearranged water transfers during drought. Not new, but apparently not used much in WA. Can take many forms, but generally include several elements:

- trigger conditions for the water transfer option, including some drought condition index and a timing element.
- remuneration scheme that can include regular payment, drought-contingent payment, or both.
- This year, reports of pre-committed water for corn contracts. These types of commitments can inform water contract types.
“Smart markets” to reduce transaction costs

- A colleague of mine has implemented a very innovative “smart market” that uses a computer algorithm that facilitates groundwater transactions in Nebraska.
- It takes bids and offers over a period of time (a month), then finds the value-maximizing sale-purchase arrangements, and splits the gains from trade among buyers and sellers.
- Runs through a non-profit business.
- Experimental stage, but informative and promising. The state could fund a pilot project for something like this, but it takes planning and time.