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The Forgotten Economics of Water Trades

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As economic rewards from completed water transactions grow in the 1990s, agricultural interests and municipalities must answer a key question: how should water trades be organized? The better organized trading efforts, the more likely transactions can be successfully identified, designed, negotiated and implemented. However, organizing trades is costly. These costs constitute the forgotten economics of water trades.

From the perspective of agricultural interests, the organization of trades must consider the following. Should growers individually pursue trading opportunities with interested buyers? Or, should growers negotiate jointly with buyers? If so, how? If growers are served by a water district, should they rely on the district to negotiate on their behalf? Alternatively, should growers interested in participating in water trades create a separate organization that would work with their district? If so, how may capital be raised for the organization?

In this article, *WS* focuses on these questions. It does so for two reasons. First, some of these questions have been and continue to be the subject of legislation. Second, in *WS's* view, water trading in the west has been more stymied by the inability of willing sellers than willing buyers to organize effectively.

ECONOMIC RISKS

From an economics perspective, water trades have the same characteristics as oil exploration: large up front costs, high risk of failure, and, if successful, significant delay before economic rewards are realized. Each characteristic must be taken into account when organizing water trades.

UPFRONT COSTS. Successful water trades do not emerge from thin air. They require expenditure of resources to identify potential trading opportunities, design and negotiate agreements, and monitor implementation. Much of these costs are

incurred even before one knows whether a binding agreement can be reached with a buyer, let alone executed.

Before negotiations begin, a strategic plan and implementation strategy must be developed for the contemplated transaction or series of transactions. The potential trading value of water resources with alternative buyers must be assessed. Contractual terms and conditions that are competitive with the alternatives of buyers must be prepared. Otherwise, the wrong buyer or buyers may be approached or, even if the right ones approached, the wrong terms offered. Prudence may also require completion of extensive hydrological investigations of the water resources before negotiations. Otherwise, the buyer may not understand nor the seller able to explain the water resources offered in proposed transactions. If so, this reduces the prospect that the parties may reach an agreement. For similar reasons, prudence may also require extensive analyses of the regulatory and political contingencies that may stand in the way of necessary approvals. Otherwise, effort may be wasted on negotiations with buyers and/or on types of agreements destined for failure.

The accumulation of costs continues during negotiations. The inevitable counterproposals must be developed and evaluated. Economic valuation of the alternatives must be conducted to aid decision-making. Otherwise, concessions may be made or hard positions taken in negotiations without a clear understanding of the stakes. Once an agreement in principle is reached, formal agreements must be prepared and presentation materials for decision-makers who must formally approve an agreement but did not participate in negotiations must be developed. Both efforts warrant the investment of significant resources. Otherwise, the formal agreement may not accurately reflect the agreement in principle; this unknowingly sets the foundation for future conflict. Without clear explanations of the inevitably complex terms, the work product of negotiations may not be fully understood by final decision-makers; this increases the risk of rejection.

Rather than the end of a transaction, the signing of an agreement only begins the endgame. Regulatory and/or legal approvals are required. Concerns about third party impacts from the implementation of the agreement must be addressed. Effective planning in the pre-negotiation stage, of course, should minimize these problems. However, addressing third party concerns still requires the investment of time and resources. In fact, the resources devoted to explaining the agreement to third parties may be as much as the amount devoted to reaching an agreement with a buyer.

RISK OF FAILURE. While the upfront costs of a water transaction are certain, success is not. Participants face many hurdles, anyone of which may make a transaction impossible. Sellers may not be able to form a consensus on what terms and conditions constitute an acceptable agreement. Even if sellers reach a consensus among themselves, buyers may not find reasonable the sellers' minimum acceptable terms. Or even if buyers are interested in the sellers' water resources, hydrological, legal, economic, or political problems may arise.

Transactions which look attractive in theory may not be viable in practice. Participants may find themselves in the position of tossing a coin numerous times. Unless the coin lands on the equivalent of "heads" every time, they may not succeed.

DELAY. Not only do parties incur the upfront costs of a transaction and face the risk of failure, they also must wait a significant period of time before rewards are realized. While it may take only months to develop a strategic plan and implementation strategy, it may take years to reach an agreement with a buyer and obtain all regulatory and/or legal approvals. In California, for example, completion of an environmental impact report and related litigation may take up to two years or longer, *once* an agreement with a buyer has been reached.

Because the money used to pay the upfront costs of a water transaction could have earned interest if invested, "delay is money." The economic consequences of delay and the risk of failure are interrelated. In general, the greater the risk of failure, the more onerous the economic burden from delay.

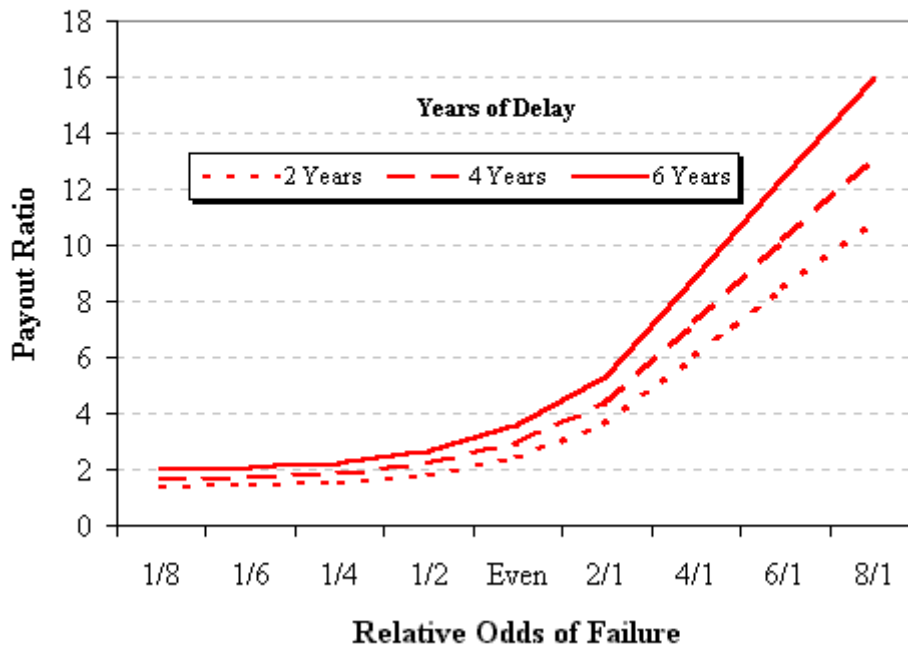
Consider the payout ratio a successful water transaction requires so that each dollar invested in upfront costs yields the same expected return as an investment in a high-yield (*i.e.*, "junk") bond. This payout only represents the required return on upfront costs; it does not include the return earned by growers and other beneficiaries of the transaction, such as districts or the area-of-origin. A payout ratio of 2, for example, means that a successful transaction must return two dollars for each dollar spent in up front costs. If the individuals who funded upfront costs do not receive this return, their investment would not be economically attractive.

Figure 1 plots the payout ratio as a function of delay and the risk of the transaction as measured by the relative odds of failure. For a transaction as likely to fail as succeed, the relative odds of failure is even money. With two years delay, this transaction must payout \$2.40 per dollar of up front costs; with four years delay, \$2.90; with six years delay, \$3.50. For transactions with a higher risk of failure (*e.g.*, relative odds of failure are greater than even money), the payout ratios are higher and quite sensitive to delay. For transactions with a lower risk of failure (*e.g.*, relative odds of failure are less than even money), the payout ratios are considerably lower and not as sensitive to delay.

INDIVIDUAL OR GROUP ACTION?

Given the above risks, how should water trades be organized? For three reasons, growers should jointly negotiate with buyers through a trading organization funded by private investors.

Figure 1
Payout Ratio on Upfront Costs

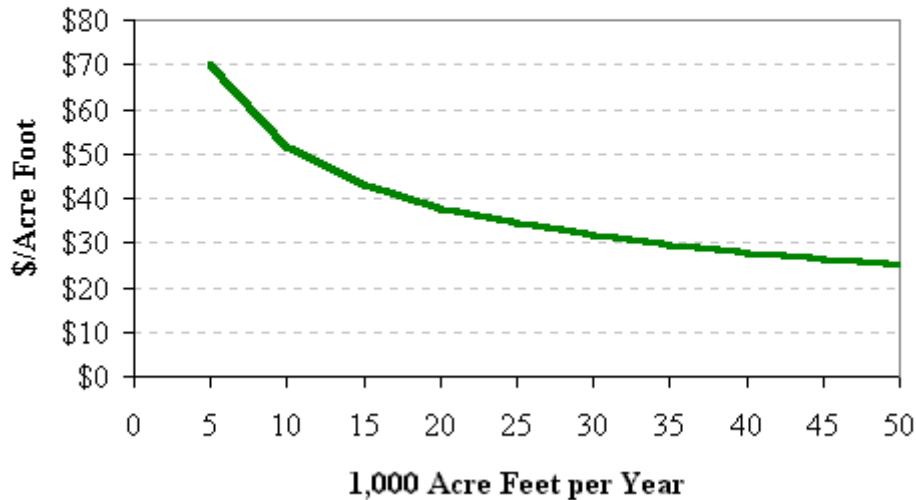


THE CASE FOR JOINT ACTION. From the perspective of agricultural interests, there are two major advantages from jointly negotiating with buyers. Together, growers have a stronger bargaining position with buyers.

Through exclusive control of a potential transaction, the entity representing growers may obtain a higher price than if the growers individually competed in selling their water. For example, one of the **WS** editors recently demonstrated with a case study based on farm survey data that, by vesting exclusive control over the access to agricultural water to a single entity, sellers may increase their gains from a water transaction by as much as 200-fold. (Rodney T. Smith, "District Control of Water Transfers Likely to Benefit Landowners", in *California Agriculture*, November-December 1992)

Second, joint action enables growers to exploit the fact that upfront costs of a water trade, per acre foot of water sold, decline with the size of the transaction. Figure 2 plots a representative relation for a transaction involving the long-term leasing of water with modest environmental issues and serious, but not politically explosive, third party concerns. Upfront costs cover all the legal, economic, hydrological, and other efforts required for the preparation of negotiations through obtaining regulatory and/or legal approvals. For a transaction of 5,000 acre feet per year (afa), up front costs could be \$70 per acre foot (af); for 25,000 afa, \$34/af; for 35,000 afa, \$30/af.

Figure 2
Upfront Costs vs. Size of Transactions



The cost-savings from joint action are substantial. Suppose, for example, that a payout ratio of three is required to make the funding of up front costs economically attractive (this ratio corresponds to a transaction with four years delay and a relative odds of failure of "even money"). Therefore, transactions must return to the individuals funding upfront costs three times the amounts in Figure 2. For transactions involving 15-year leases of 5,000 afa, 25,000 afa, or 35,000 afa, the annual lease payment needed for the repayment of up front costs could be \$27.61/af, \$13.32/af, or \$11.67/af, respectively.

ROLE OF PRIVATE INVESTORS. For different reasons, neither growers nor water district may have the financial capability to commit the \$500,000 to \$1,000,000 needed to fund upfront costs, bear the risk of failure, and incur the cost of delay for the scale of water transactions discussed above. For growers with pre-existing large debt, they lack any further borrowing capacity. For growers with unused borrowing capacity, they may not wish "to bet the farm" by funding the upfront costs of water transactions.

Water districts may also not have the ability or the willingness to fund transactions. Unless *all* growers want to participate in transactions, the district will find itself torn between growers who support and the growers who do not support the funding of trading efforts. Especially for failed ventures, the increase of water rates and assessments may prove to be politically divisive.

From an economics perspective, there is a role for equity capital in which investors fund the development and implementation of water transactions in return for a share of the financial proceeds generated by successful transactions. The

raising of equity capital requires the creation of a separate trading entity with exclusive rights to market water. Without exclusive marketing rights, growers will forego the two benefits from joint action—bargaining leverage and savings in upfront costs. In addition, they would increase the share of the financial proceeds private investors would demand because the lack of the exclusive right increases the risk of failure for the trading organization.

CONCLUSION

For a decade, advocates of water trading have searched for and removed suspected impediments to water trades. Recently, the role of growers versus districts in water transactions has been at the top of the legislative agendas, in both Congress (see "Aftermath of Congressional Water War," *WS January 1993*) and state legislatures (see "Katz Introduces Water Transfer Bill," *WIM January 1993*).

For sellers, effective water trades require joint action backed with equity capital provided by private investors. Proponents of legislation that promote or at least do not undermine these principles will be successful at providing the framework for water trades. Proponents of legislative reforms that do not may find their efforts unsuccessful.