

## 2010 2<sup>nd</sup> Year Exam – Answer:

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Question D

### **Part A**

The public sector is often used for the provision of public goods or when there are other market failures. Water provision almost surely is best provided by (local) natural monopolies, as there are significant investments in long lived infrastructure to be made, and as obvious scale economies arise. Thus water provision has a competition related market failure. It also likely has positive externalities to supply, and information asymmetries regarding quality. Given this, the question remains, what form of public sector provision should be used, with the possibilities including: privately owned and operated, competitively allocated franchises; privately owned, regulated firms; public ownership with private operation; or public ownership and operation, and, market failures aside, why is private ownership or private operation so problematic? To address this question I adopt a transaction cost economics framework, relying on the discriminating alignment hypothesis. That is the first order consideration will be the alignment of transaction characteristics with government structures.

Crucial to this framework is an understanding of transaction costs, which include not only the cost of contracting directly, but also the cost of haggling over appropriable quasi rents that may arise from contractual incompleteness. I take it for granted in this analysis that transactions with respect to the ownership or operation of water supply must inherently be incomplete. Not only are these contracts long term, implying that a great number of circumstances will and can change, making the cost of contracting over all of these circumstances prohibitive and an incomplete contract preferred, but I also believe that there are likely to be many new circumstances which simply can not be foreseen (taking as granted the bounded rationality of humans). I therefore begin by considering specific assets that might be relevant. Williamson (1991) provides six types of asset specificity: Site specificity (to economize on inventory and transportation); physical asset specificity (custom dies etc); human asset specificity (learning by doing); brand name capital; dedicated assets - discrete investments made in a general purpose plant for a particular customer; and temporal specificity - technological non-seperability (e.g. timely response of humans). Water supply exhibits practically all of these.

Site specificity is important - there are non-movable sources of supply and non-moveable sources of demand, and transportation is costly both in the sense of a fix cost of pumps and pipes and in terms of the operational cost of pumps (much like in sewage). There is considerable physical asset specificity, as the assets used for water supply could not be used for other purposes easily. Possibly pipes could be reused for oil and gas distributions, but they would have to be recovered from underneath streets, and the recovery cost may be prohibitive. In the Klein, Crawford, Alchian sense, the salvage value of pipes

may be close to zero. There is likely some human asset specificity, as the quirks of the infrastructure become known to experienced personnel over time. There may be dedicated assets: aside from pipes to homes, water suppliers provide water to industry, with some customers requiring specialized supply arrangements. And there is certainly temporal specificity, as even for a house-hold, 100 gallons of water today and tomorrow is not the same as an available supply of 200 gallons today and nothing tomorrow, and water needed to put out a fire is needed as early in the fire as is possible (water after the fire is not as helpful).

All of these specific assets provide hold up problems. Customers can not move house if the water supply increases dramatically in price (at least in the short run). Thus it would seem that pure market transactions are "shot through with appropriable quasi-rent hazards" in water supply, the case of the fire mentioned above being particularly compelling: In a spot market transaction with only one water supplier, the supplier could demand the entire value of the home that would be saved. Williamson (1991) highlights two important types of adaptation that take place in contracts. The first is autonomous adaptation, which is best served through the market and the price mechanism, and the second is cooperative adaptation where the contract serves only as a framework, providing guidance and norms. Governance systems that feature autonomy encourage independence and enterprise, whereas those featuring cooperation encourage compliance and mission orientation (Williamson 1999). Clearly the latter seems more applicable to water supply.

Contracts which support cooperative adaptation must explicitly contemplate unanticipated disturbances which require adaptation, provide tolerance zones in which misalignments will be absorbed, and require information disclosure and substantiation if an adaptation is needed. Shocks to demand and supply in water provision emphasize the need for cooperative adaptation. For example consider that there is a drought in a year. The supply has shrunk dramatically. If adaptation were autonomous, the price of water would rise dramatically as the firm adjusted to supply conditions, and some citizens would then, perhaps, be unable to afford water, while others would simply pay. With a government authority a coordinated and cooperative response to the change in supply can be made, perhaps including a ban on non-essential uses of water such as lawn sprinklers, to avoid the worst case of poor citizens with no water supply. Of course cooperative adaptation comes at a cost - that of lost incentives. To offset the loss of incentives, firms need greater controls. In this instance controls would have to come through regulation or ownership.

If regulation or franchising is considered then it should be noted that while lump sum payments capitalize the monopoly rents, the service will then be priced on monopoly terms. For this reason Stigler, amongst others, advocated lowest per unit cost regulation. But regardless of this, for competitively allocated franchises, regulated private firms, and private operation under contract, there is an excuse doctrine to appeal to when extreme disturbances to the contract occur. The disturbance can be ruled outside the contract, and so prices (say) can be renegotiated. However, knowing this there is an information problem. The government must monitor the water supplier to gain sufficient information to determine that the disturbance is outside the contract and requires a renegotiation, and such monitoring is costly and likely requires specialization. This would suggest either regulation or outright public ownership to solve the information problems. Without monitoring, the supplier would face moral

hazard, and be tempted to declare many circumstances outside of the contract (i.e. engage in strategic signaling).

Williamson (1976) says that when choosing among the relevant modes of governance, one should consider: The costs of ascertaining and aggregating consumer preferences through solicitation; the efficacy of scalar bidding; the degree to which technology is well developed; the degree to which incumbent suppliers develop idiosyncratic skills; demand uncertainty; the extent to which long-lived specialized equipment is involved; and the susceptibility of the political process to opportunistic representations (and the differential proclivity to make them). I have already made the case that water supply faces demand uncertainty (actually more supply uncertainty in this context), and that long-lived specialized equipment is involved. It is possible that the supply uncertainty consideration alone would merit full public ownership. If supply were so uncertain year on year that a new contract with the regulator would always be required, because a need for a large adaptation was always immanent, then this would suffice. However, I now turn to the last of Williamson's considerations, that of the political process, broadly defined.

The US does not, like some other nations, suffer from much of a problem with Government opportunism - that is the risk of appropriation of long-lived non-moveable assets by the government, which would lead to an underinvestment in said assets. However, it does suffer from a risk of third-party opportunism. Third-party opportunism is when a third-party to a public-private contract makes opportunistic representations. Suppose that a private firm were supplying water to an area and another firm wanted the contract. Then the second firm could make it hard to verify claims about water quality, or that the adaptations that are being undertaken are not in the public's interest, and so forth. The only solution to this problem is full public ownership, where no one can be faulted for issuing or renewing a contract, or improperly regulating a firm or industry (c.f. the oil industry regulator with regards to the Gulf Spill). Finally, I note that as per Williamson 1999, probity is an issue in water provision. Water must be safe to drink and it is hard to imagine setting a sufficient penalty for a private provider to absolutely guarantee that they will meet quality standards. With a quality failure by a private firm, we would assume a breach of probity, whereas with a public firm, we would assume an unforeseeable accident.

## **Part B**

Given first order economizing we would expect that water firms will be publicly held. If water firms are privately held we would expect higher prices, as efficiency of governance has not been achieved. However, to the extent that we do observe private firms we would expect them to have the lowest specific investments. That is we would expect them to be situated with access to easy supply, and if they own their own pipes and pumps, we would expect, perhaps due to geographic considerations, that they had achieved their natural monopoly economies. Private supply will be better able to contract with industry who must undertake their own unique relational specific investments in the contract, such as for power stations, large scale manufacturing and so forth. We would expect elaborate relational contracting in this regard.

Furthermore, given a supply shock we would expect more autonomous and less cooperative adaptation by water providers, which would mean more dramatic price increases and greater price volatility. Private water firms would also be keener to maintain their brand, as their reputations would have to replace the guarantee of probity that comes from the public sector. We would likely see regulation as opposed to unregulated firms, though the regulation may come through a contract with a municipality or other structure.

### **Part C**

Private contracts may be lucrative (given that they confer natural monopolies), so we would expect to see extensive lobbying by private firms. Such an activity is costly, and winner must recoup their costs by charging higher prices. We would also expect to see third-party opportunism for the reasons given above: this would lead to broader contracts as regulators or granting agencies have costs in renegotiating contracts, including reputation costs (so they do not wish to be seen to have made a mistake), and so again higher prices.

My understanding of the US is that public ownership is seen as a form of socialism, so I would expect to see efforts by lobbyists and the (particularly Republicans within the) government for privatization in some form. US firms have successfully won private contracts in other jurisdictions (especially Latin America), and may seek them in the US. However, the abject failure of many of these foreign contracts may well serve as a warning against this for legislators. It is unclear whether foreign experience would therefore be a benefit or a cost with regards to the performance of US water supplier.

### **Part D**

I would use a municipality as a unit of analysis and seek to compare those that are publicly supplied with those that are privately supplied. Using an indicator variable for public ownership, I would attempt to predict prices (using robust OLS) after controlling for measures of geographic, demographic and other innate characteristics. I would be particularly interested in developed measure of specific assets, and in interacting them with the public ownership variable. Likewise it would be instructive to try to predict public ownership using a probit or logit regress where the explanatory variables were measures of specific assets. If there were any breaches in probity during the lives of private firms, I would try to use them to predict a hazard model of being taken over by a public firm (or having a public firm enter and directly compete).

Finally it may be possible to determine the levels of adaptations faced in various municipalities by looking at weather records to estimate supply and demand shocks. It would be interesting to see if large adaptations were positively correlated with public ownership.

