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Back to Fundamentals—On Economics and Water Pricing

Some readers of my column may not know that I am an economist by training. As a graduate student and at the start of my professional career, I focused on government tax and expenditure policy as well as applied statistical/econometric work. The closest I came to the study of water resources was taking an undergraduate class in environmental economics. I started out my professional career as a member of the Economics faculty at the University of Arizona. It was not until I was appointed to fill a vacancy on the Arizona Corporation Commission (ACC) in 1985 that I was introduced to water matters as a regulator of private water companies. For those unfamiliar with the ACC, it is Arizona's statewide public utilities commission. It is a constitutionally established and elected body. I was appointed to fill a vacancy on an interim basis, until the next general election.

In late 1991, in what was another interesting development in my career path, I became the Executive Director of the regional water district that came to be known as the Santa Cruz Valley Water District. It was in that role that I became fully immersed in water. The district was formed on a temporary basis with an interim board and was charged with developing an operating plan that defined the district's role in augmenting the water supplies of the Tucson AMA. I learned a great deal during this interesting, challenging and ultimately frustrating experience. The district was dissolved in 1994 due to a veto exercised by the City of Tucson board member when the interim board voted on permanent formation of the District. I subsequently became a water resources consultant. In 2002, after almost 16 years away from academia, I joined the Water Resources Research Center. I tell you all this because I find the perspectives gained from my training as an economist and my ACC and water district experiences very relevant to my work today.

My experience as an ACC Commissioner helped me realize that fundamental principles of microeconomics were the most important to consider when establishing policy, particularly that related to water pricing. People respond to pricing signals. Prices do affect demand. Here's just one example. During the first half of the 1990s, there was significant concern about the underutilization of the water made available to Central Arizona through the Central Arizona Project canal. There was more supply of CAP water than demand and California had access to water left in the Colorado River by Arizona. I served on a Task Force created by the Director of the Arizona Department of Water Resources to consider options for increasing use of CAP water. It had been expected that, once available, the agricultural sector would use CAP water in place of groundwater. But for most irrigators the CAP water was more expensive to use than groundwater, and there were no regulations in place preventing the use of groundwater. The result was what an economist would have predicted. The agricultural districts chose to use lower cost groundwater. Making a quantity of CAP water available to agriculture did not translate into its use. The relative costs associated with alternative and available water supplies mattered. Weather conditions mattered, too: 1993 was a particularly wet year.

Some of my recent work connects water pricing with another topic in which I have been interested since my days at the ACC: public versus private ownership of water systems serving Arizona communities. The Arizona Water Infrastructure Financing Authority (WIFA) releases annually a rate survey of water systems throughout Arizona. Information on system connections, water deliveries, pricing structure and ownership is included, making it possible to look at differences associated with public versus private ownership. According to the 2008 WIFA Water and Wastewater Residential Rate Survey (www.azwifa.gov), almost three of four water systems in the state are privately owned. Private water companies are smaller on average, having about 16 percent of the water connections in the state and delivering less than 11 percent of water sold in that year. Whereas five publicly owned systems had more than 100,000 connections, no privately owned system was that large. One of the most interesting findings relates to the prevalence of tiered rate structures where the cost for additional water increases as more water is used. Such a rate structure is considered an effective mechanism for encouraging conservation. Back in the days when I was an ACC Commissioner, there was some resistance to adopting tiered rate structures. One of the reasons was concern that water companies might over-earn or exceed their revenue requirements if water use did not decrease. It took some time before increasing block pricing caught on at the ACC. But things have changed, particularly in recent years.

Examination of the WIFA data for 2003 and 2008 shows that while only 97 private water companies had tiered rate structures in 2003, 153 companies had them in place in 2008. Coupling this with the fact that private water companies typically self-initiate rate setting proceedings at the ACC, this increase is remarkable. It shows what can happen in a short period of time when policies of a rate-setting body change. Of the publicly owned water systems, whose rates are set by local governing bodies rather than the ACC, 65 and 75 had tiered rate structures in 2003 and 2008, respectively. I should note that the total number of water systems was a bit higher in 2003 (437) than in 2008 (424).

The manner in which water regulation is practiced, including rate setting, affects our ability to meet regional and state water policy objectives. We are continuing this work at the WRRC and look forward to sharing our results with you.