OVERVIEW

of Some of the Remaining Text

Forthcoming Chapters

10. Demand estimation methods, findings
11. Supply methods
   11.7 “Privatization Question”
12. Demand & Supply Modeling
13. WRE’s Themes

Demand Analysis

Demand versus Value

usually continuously expressed

usually value of a discrete item or a marginal value
Demand Analysis

When speaking of “demand”,
※ insist on economic literacy
※ \( w = D(p; ...) \) or \( MB = D^{-1}(w; ...) \)
※ Projecting quantity demanded (so-called water “needs” or “requirements”) is an empty exercise if rising scarcity is ignored.

Eight Empirical Methods

1. point expansion
2. residual imputation
3. math programming
4. production function
5. statistical regression
6. contingent valuation
7. hedonic pricing
8. travel cost

2006 study of TX communities

※ 730/1406 communities
※ quantity, rate, income, weather data
※ monthly \( \times 5 \) years (1999-2003)
※ over 39,000 observations in completed dataset
Table 2.1 Dataset Elements

<table>
<thead>
<tr>
<th>Numeric TWDB Identifier</th>
<th>Observation Year</th>
<th>Observation Month</th>
<th>Water Meter Fee</th>
<th>Minimum Volume</th>
<th>Rate Block Minimums 1-7</th>
<th>Water Rates 1-8</th>
<th>Sewer Indicator</th>
<th>Minimum Sewer Volume</th>
<th>Sewer Block Minimums 1-3</th>
<th>Sewer Rates 1-4</th>
<th>Winter Averaging Months</th>
<th>Historical Precipitation</th>
<th>Average Low Temperature</th>
<th>Average High Temperature</th>
<th>Water Bill</th>
<th>Sewer Bill</th>
<th>Household Size</th>
<th>Household Monthly Use</th>
<th>Total Bill</th>
<th>Average Price per 1000 Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days without Precipitation</td>
<td>Service Population</td>
<td>Service Connections</td>
<td>Consumer Price Index</td>
<td>County of Service</td>
<td>Winter Average Use</td>
<td>Volume Used</td>
<td>Volume per Capita</td>
<td>Personal Income</td>
<td>Household Size</td>
<td>Household Monthly Use</td>
<td>Water Bill</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 3.1 Average Water Use by Month, 1999-2003

Figure 3.2 Histogram of Water Use (99.6% of Utilities and Years Shown)
Figure 3.4 Histogram of Personal Income

Figure 3.5 Mean Marginal Water Prices

Figure 3.6 Mean Marginal Sewer Prices
Water demand form:

\[
\ln \left( \frac{d}{dp} \right) = \beta_0 + \beta_1 \ln(C) + \beta_2 \ln(R) + \beta_3 \ln(I) + \beta_4 \ln(P) + \beta_5 S + \beta_6 \ln(C+R) + \beta_7 \ln(C+P) + \beta_8 S \ln(C) + \beta_{9} \ln(R+I) + \beta_{10} \ln(R+P) + \beta_{11} S \ln(R) + \beta_{12} S \ln(I) + \beta_{13} S \ln(P) + \nu
\]
Table 4.2 Parameter Estimates for the GCD Regression (n=39145)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Coefficient*</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln C</td>
<td>0.189</td>
<td>0.0264</td>
</tr>
<tr>
<td>ln R</td>
<td>0.339</td>
<td>0.0233</td>
</tr>
<tr>
<td>ln I</td>
<td>0.541</td>
<td>0.0624</td>
</tr>
<tr>
<td>ln P</td>
<td>-0.448</td>
<td>0.0331</td>
</tr>
<tr>
<td>S</td>
<td>0.393</td>
<td>0.0252</td>
</tr>
<tr>
<td>ln (C+R)</td>
<td>-0.219</td>
<td>0.0487</td>
</tr>
<tr>
<td>ln (C+I)</td>
<td>0.316</td>
<td>0.0699</td>
</tr>
<tr>
<td>ln (C+P)</td>
<td>0.909</td>
<td>0.0597</td>
</tr>
<tr>
<td>S • ln C</td>
<td>-0.0699</td>
<td>0.0156</td>
</tr>
<tr>
<td>ln (R+I)</td>
<td>-0.260</td>
<td>0.0550</td>
</tr>
<tr>
<td>ln (R+P)</td>
<td>-0.526</td>
<td>0.0416</td>
</tr>
<tr>
<td>S • ln R</td>
<td>0.0903</td>
<td>0.00861</td>
</tr>
<tr>
<td>ln (I+P)</td>
<td>-0.800</td>
<td>0.0637</td>
</tr>
<tr>
<td>S • ln I</td>
<td>-0.268</td>
<td>0.0185</td>
</tr>
<tr>
<td>S • ln P</td>
<td>0.144</td>
<td>0.00915</td>
</tr>
<tr>
<td>Constant</td>
<td>5.58</td>
<td>0.0674</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.49</td>
<td>0.0054</td>
</tr>
</tbody>
</table>

*All parameter estimates significant at 99% confidence level.

Figure 4.1 Texas Community Water Demand Functions

11.7 Privatization Debate

What should own/run these natural monopolies?
11.7 Privatization Debate

Public or Private Management?

∗ Can’t apply First Theorem here!
∗ An assumption isn’t met (DRTS).
∗ Decreasing returns to scale is commonly untrue due to high proportion of fixed costs in producing retail water.
∗ Completely different issue than natural water ownership
∗ Privatization ≠ competition

Which is economically efficient?

Likely neither!

∗ Public managers aren’t rewarded for net benefits or low costs.
∗ Political process advances nonefficiency goals in public decision making.
11.7 Privatization Debate

Public or Private Management?

- Do public authorities use too much labor?
- Other losses or neglects too?

- May miss municipal bond tax exemption
- Pursuit of profit leads to abuse?
- Does rate regulation encourage too much capital?
- Other losses or omissions too?

- Statistical analysis is inconclusive regarding cost differences, but neither style seems least-cost
- Both types tend to omit important opportunity costs anyway
11.7 Privatization Debate

There are middle-ground options!

- public authorities can outsource some regular functions
- public authorities can outsource new projects & their operations to various degrees
- for some of the formalities, see the text

13. The Water Challenge

a few pages of cross-cutting themes

Major Messages

- Marginalism
- Go with the Flow
- Not Needed, Not Required
- Efficiency Objectives
- Attend to Opportunity Costs
- Appreciate Program Packages
- Address Risk
- Refine Institutions
- New Labels Are Empty
- Criticize Missed Opportunities
- Conduct Policy/Project Analysis
- Enable Markets, But Be Real
- Improve Pricing
- Overrated 2ndry Effects
- Empirical Practices
- Privatization