Experiments and Quasi Experiments

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BGVW Ch.12 Valuing Impacts from Observed Behavior: Experiments and Quasi Experiments
Demonstration Programs in the US

- Mainly in the areas of health, education, training, employment, housing, and social welfare

  - **Health insurance experiments**
    - Price elasticity of health care demand = -0.1 to -0.2.

  - **Income maintenance experiments**
    - The effects of income redistribution on labor supply

- **Criminal Policy**
    - 7 RCTs (Randomized Controlled Trials)
    - Effect size = 1.68 (Confidence interval [1.20, 2.36]) Bad effects
EXHIBIT 12-1

How the consumption of medical care changes as a function of the cost of care to users is central to many public policy questions, especially those relating to universal health insurance. To address this question, the federal government funded a social experiment, the Rand Health Insurance Experiment, between 1974 and 1977. Analysis of the data from the six experimental sites by Willard Manning and colleagues suggests that the price elasticity of demand for health care services is in the range of $-0.1$ to $-0.2$.


EXHIBIT 12-2

During the late 1960s and early 1970s, the U.S. government funded four income maintenance experiments. These experiments focused on how income transfers affected the supply of labor (equivalently the demand for leisure) of low-income persons. Data from these experiments were used to obtain estimates of wage and income elasticities. Based on averages of separate estimates from the numerous studies that have relied on data from these experiments, Gary Burtless derived a number of elasticity values. The compensated wage elasticities are 0.09 for married men, 0.24 for married women, and 0.14 for single women. The uncompensated wage elasticities are $-0.02$ for married men, 0.17 for married women, and $-0.04$ for single women. The income elasticities are $-0.11$ for married men, $-0.07$ for married women, and $-0.18$ for single women.

Scared Straight

**FIGURE 1**
FIRST EFFECT OF INTERVENTION, OFFICIAL CRIME MEASURES, RANDOM-EFFECTS MODEL

<table>
<thead>
<tr>
<th>Study</th>
<th>Treatment n/N</th>
<th>Control n/N</th>
<th>OR (95%CI Random)</th>
<th>Weight %</th>
<th>OR (95%CI Random)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Findenauer 1982</td>
<td>19 / 48</td>
<td>4 / 15</td>
<td>9.8</td>
<td>5.48 [1.85, 16.02]</td>
<td></td>
</tr>
<tr>
<td>GERP&amp;DC 1973</td>
<td>16 / 34</td>
<td>6 / 17</td>
<td>14.7</td>
<td>1.51 [0.61, 3.77]</td>
<td></td>
</tr>
<tr>
<td>Lewis 1983</td>
<td>43 / 56</td>
<td>37 / 55</td>
<td>15.3</td>
<td>2.03 [0.86, 5.09]</td>
<td></td>
</tr>
<tr>
<td>Michigan D.O.C. 1967</td>
<td>12 / 26</td>
<td>5 / 10</td>
<td>9.5</td>
<td>3.75 [1.11, 12.67]</td>
<td></td>
</tr>
<tr>
<td>Orshosvky &amp; Taylor 1981</td>
<td>16 / 38</td>
<td>16 / 41</td>
<td>15.2</td>
<td>1.09 [0.44, 2.66]</td>
<td></td>
</tr>
<tr>
<td>Yveend 1981</td>
<td>14 / 38</td>
<td>11 / 40</td>
<td>13.9</td>
<td>1.48 [0.57, 3.83]</td>
<td></td>
</tr>
<tr>
<td>Yacobbo 1973</td>
<td>27 / 137</td>
<td>17 / 50</td>
<td>21.6</td>
<td>1.09 [0.54, 2.07]</td>
<td></td>
</tr>
<tr>
<td>Total (95%CI)</td>
<td>147 / 496</td>
<td>98 / 158</td>
<td>100.0</td>
<td>1.72 [1.13, 2.62]</td>
<td></td>
</tr>
</tbody>
</table>

Test for heterogeneity chisquare=9.30 df=6 p=0.2
Test for overall effect z=2.55 p=0.01

**NOTE:** n = number of participants reoffending; N = number assigned to group; OR = odds ratio; CI = confidence interval; weight = amount of weight given to study in analysis; GERP&DC = Greater Egypt Regional Planning and Development Commission; D.O.C. = Department of Corrections.

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Field experiments in developing countries

- Symposia: Field Experiments, The Journal of Economic Perspectives, Volume 25 • Number 3 • Summer 2011
- Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty, by Abhijit V. Banerjee and Esther Duflo, PublicAffairs, April 2011
  - Through a careful analysis of a very rich body of evidence, including the hundreds of randomized control trials that Banerjee and Duflo’s lab has pioneered, they show why the poor, despite having the same desires and abilities as anyone else, end up with entirely different lives.
## Alternative Evaluation Designs

### TABLE 12-1  Five Commonly Used Evaluation Designs

<table>
<thead>
<tr>
<th>Type</th>
<th>Structure</th>
<th>Major Advantages</th>
<th>Major Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design 1: Comparison of net changes between treatment and true control groups</td>
<td>( R: O_1 X O_2 ) ( R: O_3 O_4 )</td>
<td>Random assignment guards against systematic differences between control and treatment groups so highest internal validity</td>
<td>Direct and ethical costs of random assignment; as with all evaluations external validity may be limited</td>
</tr>
<tr>
<td>Design 2: Comparison of post-treatment outcomes between true control and treatment groups</td>
<td>( R: X O_2 ) ( R: O_4 )</td>
<td>Random assignment guards against systematic differences between control and treatment groups so high internal validity</td>
<td>Direct and ethical costs of random assignment; danger that a failure of randomization will not be detected</td>
</tr>
<tr>
<td>Design 3: Simple before/after comparison</td>
<td>( O_1 X O_2 )</td>
<td>Often feasible and relatively inexpensive; reasonable when factors other than treatment are unlikely to affect outcome</td>
<td>Does not control for other factors that may cause change</td>
</tr>
<tr>
<td>Design 4: Comparison of post-treatment outcomes between quasi-control and treatment groups</td>
<td>( X O_1 ) ( O_2 )</td>
<td>Allows for possibility of statistically controlling for factors other than treatment</td>
<td>Danger of sample selection bias caused by systematic differences between treatment and quasi-control groups</td>
</tr>
<tr>
<td>Design 5: Comparison of net changes between treatment and quasi-control group</td>
<td>( O_1 X O_2 ) ( O_3 O_4 )</td>
<td>Allows for possibility of statistically controlling for factors other than treatment; permits detection of measurable differences between treatment and quasi-control groups</td>
<td>Danger of sample selection bias caused by systematic differences between treatment and quasi-control group in terms of nonmeasurable differences</td>
</tr>
</tbody>
</table>

\( O \) — observation  
\( X \) — treatment  
\( R \) — random assignment

CBAs of E&T Programs: Outline

- **E&T Programs**
  - Programs to increase employment and/or wages of unemployed or unskilled workers
  - Job search assistance, remedial education, vocational training, subsidizing private-sector employers in exchange for hiring program participants

- **Evaluation of E&T Programs**
  - CBA
## Table 12-2

**Stylized Cost-Benefit Framework Showing the Impacts of E&T Programs**

<table>
<thead>
<tr>
<th></th>
<th>Society (A)</th>
<th>Participant (B)</th>
<th>Nonparticipant (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output produced by participant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-program output</td>
<td>+</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>Gross earnings</td>
<td>+</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Fringe benefits</td>
<td>+</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Participant work-related expenditures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tax payments</td>
<td>0</td>
<td>_</td>
<td>+</td>
</tr>
<tr>
<td>Expenditures on child care, transportation, etc.</td>
<td>_</td>
<td>_</td>
<td>0</td>
</tr>
<tr>
<td>Use of transfer programs by participants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welfare payments</td>
<td>0</td>
<td>_</td>
<td>+</td>
</tr>
<tr>
<td>Other transfer payments</td>
<td>0</td>
<td>_</td>
<td>+</td>
</tr>
<tr>
<td>Program operating costs</td>
<td>+</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>Use of support programs by participants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support services received by participants</td>
<td>_</td>
<td>0</td>
<td>_</td>
</tr>
<tr>
<td>Allowances received by participants</td>
<td>0</td>
<td>+</td>
<td>_</td>
</tr>
<tr>
<td>Program operating costs</td>
<td>_</td>
<td>0</td>
<td>_</td>
</tr>
</tbody>
</table>

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The CBA Framework in the Education and Training Context

- The framework in Table 12.2 is readily understandable to policy makers
  - Benefits and costs for program participants and nonparticipants
  - Includes distributional implications
  - Benefits and costs can be calculated from data collected in the experiment

- Four categories
  - Output produced by participant
  - Participant work-related expenditures
  - Use of transfer programs by participants
  - Use of support programs by participants
Conceptual issues in constructing CBAs of E&T programs

- Table 12.2 includes elements that are not consistent with CBA
- An increase in consumer surplus rather than income should constitute benefits
  - net benefits = increase in income – increase in taxes – decrease in transfer payments – increase in work-related expenditures
Increase in wage by an E&T program

- E&T raises the wage from $W_0$ to $W_1$
- Correct benefits $= A + B$
- Increase in income $= A + B + C$
Induced increase in hours worked

- E&T increases hours worked
- Benefit = A
- Increase in income = A + B
- B is offset by a decrease in leisure
Mandated participation in workfare

- Welfare grant withdrawn → Public-sector workfare with $h^*$ gives the same income as the welfare grant
- Labor supply curve shifts from $S_0$ to $S_1$
- Same income
- Decline in utility
Move from welfare to a private sector Job

- Private job $h_1$ is better than Workfare $h^*$
- Income higher than the welfare but the surplus is lower
  - $W_m W_{l} r b < W_m a h^* h_0$
Benefits of an E&T Program for recipients: Summary

- Decrease in transfer income: All
- Income increase by a wage rate rise: All
- Income increase by more hours worked: Not All
  - Have to subtract the effects of a decrease in leisure
Work related expenditures

- E&T → Increase in child care expenditures
- In a first best economy, zero net benefit in a secondary market
- Zero benefits from an increase in hours worked caused by free child care services