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# Net Economic Outcomes from Community College and Private Vocational School Attendance in Washington State

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# Outline

I. Introduction

II. Nonexperimental Estimation

III. Results

INSERT WORKFORCE TRAINING RESULTS COVER HERE

# Figure 1
# Summary of WA Project, Approximate Sample Sizes by Program and Year

| Program | 97/98 | 99/00 |
|---|---|---|
| JTPA II-A Adults | 3,303 | 2,508 |
| JTPA II | 4,565 | 4,045 |
| JTPA II-C Youth | 2,403 | 1,676 |
| CC Job Prep | 19,063 | 16,742 |
| CC Worker Retraining | 3,317 | 6,894 |
| CC ABE | 11,000 | 13,108 |
| Private Career School | -- | 10,992 |
| Apprenticeship | 3,212 | 3,198 |
| Secondary Voc/Tech | 6,000 | 11,000 |
| | | |
| Comparison Group Pools | | |
| ES Labor Exchange Registrants | 113,457 | 234,865 |
| H.S. Exiters | 20,000 | 25,000 |

# Figure 2
# Summary of WA Project, Variables

Pre-exit year data

- Administrative data with demographic information
- Wage record data back to 90s (including OR, AK, ID)
- Higher education data back to early 90s
- UI benefit data
- TANF/Food Stamps/Medicaid data

Exit year program data

- (Most recent) training service received
- Institution characteristics

Outcome data

- Earnings
- Employment
- Hourly wage
- UI receipts/benefits
- TANF/FS/Medicaid receipt/benefits
- Higher education enrollment

# Figure 3
# Assumptions and Notation

Assume: $Y_{it} = f(X_i \mid D_i) + g(D_i) + e_{it}$

$Y_{it}$ = outcome for individual $i$ in time $t$

$X_{it}$ = covariates related to $Y_{it}$ — it may be time-varying or time invariant

$D_i$ = 1 if "treatment"; 0 otherwise

$e_{it}$ = error term

$t' < t_l < t$, where $t_l$ = "treatment" period

# Figure 4
# Nonexperimental Data

Potential Problems

1. (selection on observables) $D \not\perp X$

2. (selection on unobservables) $E(e_{it} - e_{jt}) \neq 0$

$i \ni D_i = 1; \quad j \ni D_j = 0$

3. (non-overlapping support) $S(X \mid D_i = 1) \cap S(X \mid D_i = 0) = \varnothing$

# Figure 5
# Estimation Approaches

1. Assume randomization and use difference in means

2. Regression-adjusted difference in means, net impact estimator = $\hat{c}$

$$\hat{Y}_t = \hat{a} + \hat{\beta} X_t + \hat{c} D$$

3. Difference-in-differences estimator $m$

$$m = \left(\overline{Y_{it} - Y_{it'}}\right) - \left(\overline{Y_{jt} - Y_{jt'}}\right)$$

where $i \ni D_i = 1$ and $j \ni D_j = 0$

4. Matching

# Figure 6
# Matching Algorithms

Notation

$C(X_i)$ is neighborhood of $X_i$, $i \in I_1$

Matched observation for $i = A_i \ni \{j \in I_0 \mid X_j \in C(X_i)\}$

Algorithms

1. # of comparison observations: 1-1 or 1-many
2. With or without replacement
3. Nearest neighbor or caliper (radii)

Nearest Neighbor $C(X_i) = \min_j \|X_i\|, j \in I_0$

$W_{N_0,N_1}(i,j) = 1$ if $j \in A_i$; 0 otherwise

Caliper (radii) variant $C(X_i) = \left\{X_j \middle\| \|X_i - X_j\| < \varepsilon\right\}, \quad j \in I_0$

-- if no $j$; then $A_i = 0$

-- Can use nearest neighbor within radii

# Figure 6 (continued)
# Propensity Score Matching

Substitute $P(D_i = 1 \mid X_i)$ for $X_i$ in matching algorithms.

In practice $P(D_i = 1 \mid X_i)$ estimated with logit and

use $\hat{P}\left(D_i = 1 \mid X_i\right)$.

# Results

# Postsecondary Vocational Education, Long-Term Impacts

| Impact | Mean | Levels | Trends (Diff-in-Diff)* |
|---|---|---|---|
| Quarterly Earnings | $3,600 | +(25 – 30%) | +(30 – 45%) |
| Employment | .70 | +(11 – 14%) | +(14 – 20%) |
| Hours | 300 | +16% | +(25 – 35%) |
| Hourly Wage | $11.20 | +14% | +(12 – 20%) |

Detailed Results in Appendix 1.
* Percent of mean level.

# Postsecondary Vocational Education, Short-Term Impacts

| Impact | Mean | Levels | Trends (Diff-in-Diff)* |
|---|---|---|---|
| Quarterly Earnings | $4,100 | +(22 – 31%) | +(27 – 39%) |
| Employment | .75 | +(9 – 11%) | +(16 – 19%) |
| Hours | 330 | +12% | +(25 – 29%) |
| Hourly Wage | $12.00 | +18% | +(20 – 24%) |

Detailed results in Appendix 2.
* Percent of mean level.

# Worker Retraining, Long-Term Impacts

| Impact | Mean | Levels | Trends (Diff-in-Diff)* |
|---|---|---|---|
| Quarterly Earnings | $3,800 | +(5 – 7%) | +(0 – 14%) |
| Employment | .70 | +7% | –4% – +10% |
| Hours | 320 | +(10 – 14%) | +(0 – 15%) |
| Hourly Wage | $11.50 | 0% | –(3 – 6%) |

Detailed results in Appendix 3.
* Percent of mean level.

# Worker Retraining, Short-Term Impacts

| Impact | Mean | Levels | Trends (Diff-in-Diff)* |
|---|---|---|---|
| Quarterly Earnings | $4,000 | +(5 – 11%) | +(0 – 14%) |
| Employment | .73 | +14% | +(0 – 10%) |
| Hours | 320 | +9% | +(0 – 13%) |
| Hourly Wage | $12.00 | +3% | –(0 – 4%) |

Detailed results in Appendix 4.
* Percent of mean level.

# ABE in Community Colleges, Long-Term Impacts

| Impact | Mean | Levels | Trends (Diff-in-Diff)* |
|---|---|---|---|
| Quarterly Earnings | $2,100 | –(0 – 10%) | +(0 – 6%) |
| Employment | .55 | 0% | +(9 – 22%) |
| Hours | 240 | +7% | +(5 – 25%) |
| Hourly Wage | $8.50 | 0% | +3% |

Detailed results in Appendix 5.
* Percent of mean level.

# ABE in Community Colleges, Short-Term Impacts

| Impact | Mean | Levels | Trends (Diff-in-Diff)* |
|---|---|---|---|
| Quarterly Earnings | $1,900 | –(15 – 25%) | +(0 – 50%) |
| Employment | .56 | –(13 – 18%) | +(7 – 27%) |
| Hours | 230 | –15% | +(0 – 30%) |
| Hourly Wage | $8.15 | –9% | –5% – +4% |

Detailed results in Appendix 6.
* Percent of mean level.

## Private Postsecondary Career Schools, Short-Term Impacts

| Impact | Mean | Levels | Trends (Diff-in-Diff)* |
|---|---|---|---|
| Quarterly Earnings | $2,800 | +(0 – 8%) | +(12 – 30%) |
| Employment | .65 | +(0 – 5%) | +(9 – 15%) |
| Hours | 260 | 0% | +(12 – 24%) |
| Hourly Wage | $10.00 | 0% | +(0 – 6%) |

Detailed results in Appendix 7.
* Percent of mean level.