Patience Is Not The Only Virtue: The Relationship Between Time Preferences, Class Attendance And Final Marks

Margaret Giles

Y H. Cheung
*Edith Cowan University*

Jacqui Whale
*Edith Cowan University*

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Paper presented to HERSLEB, University of Melbourne, December 2012

Earlier study

- “Patience is a virtue” but not for first year economics students
  - Final marks increased with discount rate (impatience)
  - Paper presented at Australasian Teaching Economics Conference in July 2012
  - Delegates querying generalisability of results for this and other papers that evaluated T&L interventions
- So what about selectivity bias?
  - Can we identify it?
  - Can we correct for it?

Yes 😊

- We had population data
  - We had survey respondent data
  - We also had non-respondent data

Data collection

Population
- Semester one and two 2011
- Economics 1 students
- Two metropolitan campuses
- N = 420
- Revised N = 412 (8 students enrolled in both semesters – only first semester enrolment included)

Sample (n = 163)
- In class surveys
  - 191 completed surveys (46.4%)
- 163 surveys with discount rates (39.6%)
**Characteristics from student admin data**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>1 = Male</th>
<th>1 = Joondalup</th>
<th>1 = Bachelor of Business</th>
<th>1 = Full-time</th>
<th>1 = International</th>
<th>1 = Enrolled in or already completed first year Finance unit</th>
<th>1 = University</th>
</tr>
</thead>
</table>

**Other characteristics**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>1 = University</th>
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</table>

**Survey**

The survey included twenty choice statements:

1. Paid one month from now: $54  □        Paid 7 months from now: $54.36   □ 
2. Paid one month from now: $54  □        Paid 7 months from now: $93.84   □ 
3. Paid one month from now: $54  □        Paid 7 months from now: $88.24   □ 
4. Paid one month from now: $54  □        Paid 7 months from now: $83.88   □ 
5. Paid one month from now: $54  □        Paid 7 months from now: $89.48   □ 
6. Paid one month from now: $54  □        Paid 7 months from now: $87.88   □ 
7. Paid one month from now: $54  □        Paid 7 months from now: $87.88   □ 
8. Paid one month from now: $54  □        Paid 7 months from now: $94.88   □ 
9. Paid one month from now: $54  □        Paid 7 months from now: $91.96   □ 
10. Paid one month from now: $54  □        Paid 7 months from now: $94.88  □ 

**Comparison of students who completed the survey (n = 191) with those who didn't (n = 221)**

Students who completed the survey:
- Were slightly older  
  - (F = 8.85; p = 0.0031)
- Had higher final mark (55% cf 37%)  
  - (F = 60.40; p = 0.000),
- Had higher course average (60% cf 48%)  
  - (F = 42.39; p = 0.000),
- Attended more tutorials (on average 10 cf 6)  
  - (F = 140.75; p = 0.000)
- Had parents with less education (43% cf 59%)  
  - (chi sq = 8.3518; p = 0.004).
Comparison of consistent surveys (n = 163) with inconsistent surveys (n = 28)

Students who completed consistent surveys:
- Had higher final marks (58% cf 42%)
  \( F = 18.49; p = 0.000 \)
- Had a higher course average (68% cf 48%)
  \( F = 24.00; p = 0.000 \)
- Lived at an address with a higher socio-economic index (IRSAD) score
  \( F = 5.85; p = 0.017 \)
- Were more likely to be studying part-time
  \( \chi^2 = 3.0927; p = 0.079 \)
- Were more likely to be domestic students
  \( \chi^2 = 8.3288; p = 0.004 \).

Factors affecting final marks before correcting for selectivity bias

Final marks
- Increase with
  - Discount rate \( (b = 39.8244) \)
  - Tutorial attendance \( (b = 5.4560) \)
- Decrease with
  - Discount rate x tutorial attendance \( (b = -3.3876) \),
    that is, the positive effect of tutorial attendance on final marks is more than offset by the negative effect of high discount rates

Factors affecting selection

Probit model
- \( n = 381; \) psuedo \( R^2 = 0.1263; \) LL = -215.8726
- Age – older students are more likely to submit consistent surveys \( (b = 0.0319) \)
- Weighted course average – better (more able) students are more likely to submit consistent surveys \( (b = 0.0293) \)

Factors affecting final marks after correction for selectivity bias (substantive model)

OLS model
- \( n = 381; \) Wald \( \chi^2 = 21.67; \) LL = -741.7663
  - \( \lambda = -18.3601 \), that is unobserved characteristics that result in some students being less likely to be surveyed also contribute to some students having higher final marks

Final marks
- Increase with
  - Discount rate \( (b = 25.3955) \)
  - Tutorial attendance \( (b = 3.2693) \)
- Decrease with
  - Discount rate x tutorial attendance \( (b = -2.1443) \), that is, the positive effect of tutorial attendance on final marks is more than offset by the negative effect of high discount rates

Much ado about nothing?

<table>
<thead>
<tr>
<th></th>
<th>OLS without correction for selectivity bias</th>
<th>OLS with correction for selectivity bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discount rate</td>
<td>( b = 39.8244 )</td>
<td>( b = 25.3655 )</td>
</tr>
<tr>
<td>Tutorial attendance</td>
<td>( b = 5.4560 )</td>
<td>( b = 3.2693 )</td>
</tr>
<tr>
<td>Interactive term</td>
<td>( b = -3.3878 )</td>
<td>( b = -2.1443 )</td>
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</table>
Take home message

- Interventions can be evaluated with survey data
- But .. ensure there is a hold-out / control group
- Check for selection bias
  - May change which are the important variables and their sign
  - May change their magnitude
  - May not change anything much