AGRICULTURAL ECONOMICS 608
BENEFIT-COST ANALYSIS

Spring 2017
Wallace Tyner, Instructor

AGEC 608 is an applied course in economic analysis of investment projects with emphasis on agricultural projects in developing countries. However, the methods we will learn are applicable to projects in industry, education, health, energy, and other sectors. The methods, appropriately modified, can also be used for project analysis in developed economies. Many of the tools also can be used for policy analysis, and we will spend some time on applications to environmental policy.

The basic objective of the course is that by the end of the semester you will be able to do benefit-cost analysis of relatively complex cases. The course is very applied with homework exercises designed to help you learn how to handle the various issues that come up in real world benefit-cost and policy analysis problems. You will learn how to apply all the financial functions in Excel and how to handle risk in benefit-cost analysis.

Texts and Readings

Our primary texts will be:


The Boardman, et al. book is on reserve in Krannert Library. The third edition of Boardman, et al. is on reserve, and the reading list uses the 4th edition. There are some differences, but not huge. The Boardman book is optional and is used primarily for the specialized methods of hedonic pricing, travel cost, and contingent valuation. It does a good job on those topics, but the new version of Campbell and Brown is improved. Another important resource is from EPA:

Some of the material to be introduced in class is not contained in either of the texts. In addition, we will use journal articles for certain topics and for case studies. You will receive a PowerPoint file containing most of the slides that will be used in class.

This set of readings is not intended to be a comprehensive list of materials on each topic. Rather, it is a selection of some of the more important books and articles in each subject area. Many of the papers are possible case studies, and you certainly are not expected to read all of them. Students desiring to pursue any particular subject in more detail should refer to the bibliographies of listed articles and books or consult the instructor for guidance on other sources. The Campbell and Brown text has a WWW site with sample spreadsheets. It is http://www.uq.edu.au/economics/bca. Use “other users login” with “user” for user name and password “abc2004.”

I. Introduction.

   Campbell and Brown, pp. 1-39.


II. Measures of project worth and interest calculations.

   Campbell and Brown, pp. 40-98.

   Boardman, et al., pp. 133-166.

III. Multiple objectives and multiple purposes.

   Boardman, et al., pp. 489-506.

IV. Identifying and quantifying benefits and costs.

   Campbell and Brown, pp. 99-171.

   Campbell and Brown, pp. 292-309.

   Boardman, et al., pp. 78-132, and pp. 443-463.

   Boardman, et al., pp. 27-77. (Background material)

V. Risk, uncertainty, and sensitivity analysis.
VI. Estimating impacts from observed behavior and contingent evaluation.

Campbell and Brown, pp. 217-252.


VII. The social discount rate.


VIII. Other applications of consumer and producer surplus, contingent evaluation, and case studies.

Campbell and Brown, pp. 182-215.


Volkswagen emissions control defeat device on US public health.” *Environmental Research Letters*, 1-10.


**Grading and procedures**

Each student will do a class project which will consist of a benefit-cost case study or a class presentation on one or more journal papers related to benefit-cost analysis. Both individual and group cases are available. Contact me to select your case study or journal paper(s). Journal papers that relate to but go beyond what we do in class are particularly welcome. If you have a possible original project related to your research area, that is ideal. The case study may be done as a paper or class presentation. The number of class presentations will be limited and will be allotted on a first come – first served basis.

Grading will be approximately as follows:

- homework: 50%
- case study or literature presentation: 20%
- final exam take home: 15%
- in-class final: 15%

Homework is due at the beginning of the class period of the due date. We will then review the homework solutions during the class period. You should make two copies of your homework – one to turn in and one to keep for yourself to use as we review the solutions in class. If you have a valid reason for not turning in the homework on time, do not attend the class session in which the homework is being discussed. You are
expected to complete the homework on time, and any exceptions should be discussed with me in advance. In addition to the paper copy, please email your homework Excel file to me with the file name HWx-lastname.xlsx, where x in HWx is the homework number (1-5). Email the file to agec608@purdue.edu.

The final exam will have a take-home and in-class component. You will be provided with copies of the previous five in-class final exams.

My phone is 40199, the email is wtyner@purdue.edu, and my office is KRAN 591B. The class teaching assistant is Xin Zhao. His office hours are Tuesday and Thursday 3:00-4:30, KRAN 689.

Please note that I will be periodically sending class emails related to the course. The emails will go to your Purdue email address, so make sure you use that address or have it forwarded to an address you use.

Our second class session on Thursday, February 16 will be held in the computer lab in HAMP 3144. The purpose is to acquaint everyone with the economic, financial, and logical functions we will be using in the homework exercises. Then again on March 7, 21, and 28 (if needed), we will hold class in MTHW 301 to learn the @Risk software for doing uncertainty analysis. @Risk is also available in the KRAN 250 computer lab, SC 179, and HAMP 3144. Also, if you would like it installed for the course period on your personal computer, you may contact our computer administrator, Carol Wood, at cwood@purdue.edu. Carol is in Krannert 577.

If I have to miss a class, we will handle that in one of two ways: 1) at the first class meeting, I will ask everyone to complete a schedule conflict form. If we can find a time everyone can meet, we will schedule makeup classes as needed; 2) we can use WebEx to do a class from anywhere.

**Ground Rules**

The ground rules for homework are that you are allowed to interact, work together, etc., so long as each person has their own spreadsheet and does the spreadsheet entries and calculations independently. You can learn a lot from this interaction.

The ground rules for the take home final are that you must not interact in any way with anyone but me. Absolutely no discussion with classmates is permitted. Thus, it is a good idea to develop over the course of the semester your own independent ability to do the exercises.

**Special Needs**

If you have a disability that requires academic adjustments, please make an appointment to meet with me during the first week of classes to discuss your needs. Please note that university policy requires all students with disabilities to be registered
with Disability Resource Center in the Office of the Dean of Students before classroom accommodations can be provided.

**Academic Integrity**

University policy on academic dishonesty is clear: academic dishonesty in any form is strictly prohibited. Anyone found to be cheating or helping someone else cheat will be referred directly to the Dean of Students for disciplinary action. Penalties are severe and may include dismissal from the University. The risks associated with cheating far outweigh the perceived benefits. Academic dishonesty includes citing someone else's work as your own, using "cheat sheets" or sharing your answers with someone else. If you are unsure whether your planned action constitutes academic dishonesty, seek clarification from your instructor. Other information regarding your rights and responsibilities as a student is contained in the Purdue University Code of Conduct.

**Campus Emergencies**

In the unusual event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances.

If we hear a fire alarm during class we will immediately suspend class, evacuate the building, and proceed outdoors. Do not use the elevator. If we are notified during class of a Shelter in Place requirement for a tornado warning, we will suspend class and shelter in the basement. If we are notified during class of a Shelter in Place requirement for a hazardous materials release, or a civil disturbance, including a shooting or other use of weapons, we will suspend class and shelter in the classroom, shutting the door and turning off the lights.

Correspondence between Boardman, et al. Editions 3 and 4

<table>
<thead>
<tr>
<th>Edition 4</th>
<th>Edition 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-24</td>
<td>1-22</td>
</tr>
<tr>
<td>507-510</td>
<td>507-512</td>
</tr>
<tr>
<td>133-166</td>
<td>131-164</td>
</tr>
<tr>
<td>489-506</td>
<td>488-503</td>
</tr>
<tr>
<td>27-77</td>
<td>26-69</td>
</tr>
<tr>
<td>78-132</td>
<td>73-128</td>
</tr>
<tr>
<td>443-463</td>
<td>441-459</td>
</tr>
<tr>
<td>167-187</td>
<td>165-184</td>
</tr>
<tr>
<td>320-405</td>
<td>314-395</td>
</tr>
<tr>
<td>406-463</td>
<td>403-432</td>
</tr>
<tr>
<td>238-273</td>
<td>236-269</td>
</tr>
</tbody>
</table>

Correspondence between Campbell and Brown editions 1 and 2

<table>
<thead>
<tr>
<th>Topic</th>
<th>Edition 2</th>
<th>Edition 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1-39</td>
<td>1-34</td>
</tr>
<tr>
<td>Measures of project worth</td>
<td>40-98</td>
<td>36-91</td>
</tr>
<tr>
<td>Quantifying benefits and costs</td>
<td>99-171</td>
<td>92-137</td>
</tr>
<tr>
<td>Traded vs non-traded goods</td>
<td>292-309</td>
<td>177-193</td>
</tr>
<tr>
<td>Risk analysis</td>
<td>253-291</td>
<td>194-220</td>
</tr>
<tr>
<td>Consumer and producer surplus</td>
<td>182-215</td>
<td>146-174</td>
</tr>
<tr>
<td>Discount rate</td>
<td>Several places</td>
<td>221-236</td>
</tr>
<tr>
<td>Non-market valuation</td>
<td>217-252</td>
<td>261-287</td>
</tr>
</tbody>
</table>