AEC 855: Agricultural Production Economics
Syllabus, Fall 2010

Scott Swinton and Roy Black, Instructors

Catalog description: Analysis of agricultural production economic models, using econometrics, mathematical programming, and simulation. Introduction to the systems science perspective. Techniques for analysis of risk, environmental value, technological change, and technology adoption.

Prerequisites: EC 801, EC 805, and either AEC 835 or EC 820B or permission of instructor.

Meeting times: Fall term, Tuesday and Thursday 8:30 - 9:50 AM (119B Berkey Hall)

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Office hours by appointment.

Recommended preparation:
EC/AEC 801 - Mathematical Applications in Economics (or equivalent)
EC/AEC 805 - Microeconomic Analysis (or equivalent)
EC 820B or AEC 835 or equivalent applied econometrics course
(AEC 851 - Agribusiness Operations Management, would be complementary for discussions of budgeting, linear programming, and stochastic simulation)

Objectives for the course
1. Help students link analytical applications with production economics research questions.
2. Provide experience in the economic analysis of production data.
3. Encourage direct student participation in classroom teaching and learning.

Desired outcomes of the course:
1. Given a problem in agricultural production economics, students will be able to identify an appropriate theoretical framework, a suitable analytical method, and undertake an informed empirical analysis.
2. Students will master the key concepts of production economics, including input-output models, input-input models, output-output models, cost functions, input demand and output supply.
3. Students will have a good general understanding of agricultural production functions, cost and profit functions, math programming models, and non-optimizing simulation models.

Course grading:
Data analysis assignments (4) 30%
Class discussion and preparation 10%
Term project 30%
Final exam 30%

Recommended texts:


Baum, Christopher F. 2006. An Introduction to Modern Econometrics Using Stata. College Station, TX: Stata Press.

Background text:

In the syllabus,
  SMS = taught by Dr. Swinton;
  JRB = taught by Dr. Black.

Where possible, readings or web links are available on the course ANGEL website. In the readings listed below,
* = Required reading
(J) = accessible online via JSTOR (http://www.jstor.org/).

Supplementary readings (http://www.msu.edu/course/aec/855/sup855.pdf) offer greater depth in the topic areas addressed in the course.
Agricultural Systems & Models (SMS)

**Agricultural production systems and production economics** (9/2, 9/7)


**Discussion (9/7): Simulation approaches to yield response**


Review of Production Economics Concepts (SMS)

Output of one product with one input (9/9)

* Debertin, Chaps. 2-3

* Beattie & Taylor, Chap. 1, Chap. 2, pp. 10-19

(Nicholson & Snyder, pp. 295-298.)

Assignment 1 (9/9): Production function estimation (due 9/23)

Visiting speaker: John Antle (9/14): Linking biophysical simulation & economic decision models.


Output of one product with two inputs (9/16)

* Debertin, Chaps. 5-6.


(Nicholson & Snyder, pp. 298-306; 374-381.)

Planning term project (9/21) (due 10/21) (See instructions on ANGEL.)


Multiple products, joint products, production possibilities frontiers (9/21)

* Debertin, Chaps. 15-16.

(Nicholson & Snyder, pp. 445-449.)

Discussion: Alternative approaches to joint product analysis (9/23)


**Functional Form & Model Specification (SMS)**

*Introduction to production function forms* (9/28)
* Debertin, Chaps. 10-11, 24.

* Beattie & Taylor, pp. 74-80.


(Nicholson & Snyder, pp. 306-311; translog cost function, pp. 355-357.)

*Testing for functional form: Nested vs. non-nested tests in linear & nonlinear models* (9/30)

**Discussion: Forms of crop response functions (9/30)**


Cost functions, Links to duality, and Links between marginal analysis and budgets (JRB: 10/5-7).

* Debertin, Chap 4 and Beattie et. al Chap 4 ( cost functions)

(Nicholson & Snyder, Chap. 10, pp. 323-357.)

* Debertin, Chap 19 (budgets)

* Ohio State University. 2009. “2009 Ohio Enterprise Budgets.” http://aede.osu.edu/Programs/FarmManagement/Budgets/

Duality of Profit & Cost Functions (10/12-14)(JRB)

* Beattie, et al. Chap 6


Assignment 2 (10/12): Econometric estimation using duality (due 10/15)

Economies of Scale and Scope (Multiproduct firms) (10/19) (JRB)


* Adams, R. M. et al 2004 "Scale Economies, Scope Economies, and Technical Change in Federal Reserve Payment Processing", J of Money, Credit and Banking
Getting Data Ready for Analysis (JRB)

*Prescreening, diagnosing, and treating influential data points (10/21, 26)*


*Baum, Christopher. 2006. An Introduction to Modern Econometrics Using Stata. Chap 5.*

*Black, R. 2009. Notes and data samples.*

Assignment 3 (10/26): Data preparation and model design (due 10/29)

Constrained Maximization and Linear Programming (LP) (SMS: 10/28, 11/2)

*Paris, Quirino. An Economic Interpretation of Linear Programming. Ames, IA: Iowa State University Press, 1991. Chapters 1-2 (intro) and 9 (Lagrangean functions).*


(Nicholson & Snyder, pp. 42-45 [also 37-41].)

Risk in production models (SMS)

*Overview of risk in production models (11/4)*


Stochastic efficiency criteria and dominance analysis (11/9)


*Hardaker et al. (2004). Chapter 7.*

**Assignment 4 (11/9): Risk management (due 11/23).**

**Risk-weighted utility analysis (11/11)**


(Nicholson & Snyder, pp. 202-213.)

**Empirical risk analysis including stochastic programming (11/16)**


**Discussion: Risk in production analysis (11/16)**


Production Models in the Study of Environment & Health Effects (11/18, 11/23; SMS)

Overview


Linking biophysical simulation models with economic models


Multiple attribute evaluation of environmental hazards and economic criteria


Technology Adoption (SMS)

Overview (11/30)


**Discussion topic: Alternative approaches to adoption research (12/2)**


**Technological Change** (JRB: 12/7-9)


**Synthesis: Matching Methods to Problems** (SMS & JRB)

*Oral presentations of term paper research* (To be scheduled.)

**Final examination and term paper final drafts due:**

Friday, December 17: 7:45 - 9:45am. Room 119B Berkey Hall.