AGRICULTURAL ECONOMICS 613

INTRODUCTION TO ECONOMICS OF RISK

Syllabus

3 credits, 3 hrs. of lecture:
Prerequisites: STAT 511 (basic statistics), ECON 511 (intermediate micro theory), AGEC 552 (math programming), or equivalent.

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Description and Objectives

The course is an introduction to the economics of risk. It emphasizes the expected utility hypothesis and individual decision making. It will be oriented toward providing a background in expected utility theory and application from which students can move on to applications and more advanced work in their fields of specialty. The course is presented at a level that can be handled by agricultural economics master’s students who have had intermediate microeconomic theory.

Grading

Homework and class participation 50%
Final exam 50%

Term Paper or Presentation

Students are required to do an acceptable paper or presentation. The project or presentation is not intended to be a huge deal. I want you to do something outside of what is covered in class. Some examples: review several articles on a topic, do something empirical, or give a 20 minute presentation to the class on something you are doing or have done in the area of risk. Many students in the past have presented their MS thesis work if it has something to do with risk, or you may present something you are working out for your dissertation if it has something to do with risk. I will be flexible and most students choose the presentation option, but a paper is equally acceptable. Presentations are usually the last couple of weeks of class, but you may do it earlier.

Office Hours

Stop by my office or e-mail for an appointment. The other class I teach (AGEC 424) meets MWF 1:30 to 2:20 and has three two-hour labs, which begin on Thursdays at 7:30, 1:30 and 3:30, so I won’t be in my office at those times. I check email often so that is the first choice to contact me.
COURSE OUTLINE

**Class 1&2: Introduction**
Expected Utility Hypothesis, Axioms, Proof of EUH, uniqueness of utility, EUH history
Reading: 1 (pp. 77-85)

**Classes 3 through 7: Technical Aspects of Risk**
- indirect utility; risk aversion; certainty equivalent; risk premium; insurance premium; maximum bid; absolute and relative risk aversion; increasing, constant, and decreasing absolute and relative risk aversion; units of risk aversion; bounded utility; uncertain vs. certain initial wealth; investor behavior and risk aversion; utility of wealth vs. income; log utility and geometric mean; utility functional forms; getting U(W) from r(W).
Readings: 1, 3-6, 11

**Class 8**
Utility function elicitation, Joint estimation of technology and risk preferences
Reading: 12, 13

**Class 9 and 10**
Review of probability, Expected utility and moments, example extension application AgRisk, price and yield uncertainty
Reading: 15

**Class 11 & 12**
Stochastic Dominance
Readings: 23, 24, 27

**Class 13 & 14**
Mean-Variance Model
Readings: 31-32

**Class 15**
Riskless Assets: MV Separation Theorem, Stochastic Dominance with a riskless asset
Readings: 36, 39, 40

**Class 16 & 17**
Covariance Risk, Diversification, Single Index Model
Readings: 48-50

**Class 18**
MOTAD, Target MOTAD
Readings: 44-46

**Class 19**
CAPM
Readings: 51-52

**Class 20**
Increasing Risk I
Readings: 54

**Class 21**
Lexicographic Utility and Safety First
Readings: 56

**Class 22**
GAMS problems

**Class 23 & 24**
Production under Risk
Readings: 60
**Class 25:** Increasing Risk II  
Reading: 55

**Class 26:** Time, Risk, and Related Issues  
Reading: 64

**Class 27 & 28:** Discrete Stochastic Programming  
Readings: 66

**Class 29:** Failures of Expected Utility Theory (Anomalies and Prospect Theory)  
Readings: 73, 77

**Class 29:** State Preference Theory  
Readings: 79

**Class 30:** Review of EUH (2018 – We didn’t get to this topic the last time the course was taught, so I may bring a couple of quotes from the readings to class the first week.)  
Readings: 73
AGING 613 Readings

Most of the journal articles are available on-line, so I assume you can find them, but let me know if you can’t find a journal article. The bold readings are the most important in each section. We will discuss how to acquire the book chapters in class.

Introduction

1. Copeland and Weston, Financial Theory and Corporate Policy, Chapter 4, pp. 77-108.

2. Luce and Raffia, Games and Decisions, Chapter 2, pp. 12-38.

Technical Aspects of Risk

3. Levy and Sarnat, Portfolio and Investment Selection: Theory and Practice, Chapters 4 and 5.

4. Robison and Barry, The Competitive Firm’s Response to Risk, Chapters 1, 2, and 3.


Measuring Risk Attitudes

12. Anderson, Dillon, and Hardaker, Ag Decision Analysis, Chapter 4.


Numerous other references on measuring risk aversion and utility will be distributed in a pdf file.

**Review of Probability**


**Stochastic Dominance**

Basic Stochastic Dominance


Nth Order Stochastic dominance


Stochastic Dominance with Respect to a Function

a. Theory


b. Application

c. A computer program
30. Goh, Shih, Cochran, Raskin, “A Generalized Stochastic Dominance Program for the IBM PC”, *Southern Journal of Agricultural Economics*, December 1989, pp. 175-182. (These authors also have a U of Arkansas bulletin on the program.)

**Mean-Variance**


**MV with a Riskless Asset (Separation Theorem)**


38. McCarl and Spreen have a MV example program in their Chapter 14 – Risk Modeling http://agecon2.tamu.edu/people/faculty/mccarl-bruce/mccspr/new14.pdf

**SD with a Riskless Asset**


MOTAD


45. P. Barry, editor, Risk Management in Agriculture, Chapters 9 and 10.

47. McCarl and Spreen have a MOTAD examples in their Chapter 14 – Risk Modeling http://agecon2.tamu.edu/people/faculty/mccarl-bruce/mccspr/new14.pdf

Single Index Model


CAPM


Increasing Risk


Lexicographic Utility and Safety First

56. Barry, P.J., editor, Risk Management in Agriculture, Chapter 2 (pp. 19-21), and Chapter 5.


Production Under Risk

62. Anderson, Dillon and Hardaker, Ag Decision Analysis, Chapter 6, “Production Under Risk”.

Time, Risk and Related Issues


Discrete Stochastic Programming (Stochastic Programming with Recourse)


72. Chapter XIV Risk Modeling of McCarl and Spreen
Download page: http://agecon2.tamu.edu/people/faculty/mccarl-bruce/books.htm

Failures of the EUH

a. Shoemaker

b. Machina

c. Allais Paradox
Don’t tell anyone but I recommend the Wikipedia entry on this topic: http://en.wikipedia.org/wiki/Allais_paradox

d. Kahneman and Tversky: Prospect theory


State Preference Theory


Review of EUH