AGEC 620 Syllabus
Quantitative Analysis of Markets and Policy

Instructors
Joe Balagtas  
balagtas@purdue.edu  
Kran 557  
(765)494-4298  
Hours: by appointment

Tom Hertel  
hertel@purdue.edu  
Kran 563  
(765)494-4199  
Hours: by appointment

Roman Keeney  
rkeeney@purdue.edu  
Kran 692  
(765)494-4253  
Hours: by appointment

Teaching Assistant Metin Cakir, mcakir@purdue.edu, Kran 614, (765)496-7318, Office hours: Monday and Wednesday, noon-1:30pm

Secretary Marcy Halsema, mhalsema@purdue.edu, Kran 591

Course Information 3 credits, Tuesday & Thursday, 10:30am – 11:45pm, Rawls 1071

Course Objective: The goal of this course is to give students practical, hands-on experience conducting quantitative economic analysis of markets and policy. This will be done through a series of homework assignments which will combine analytics with computation in order to help students to bridge the gap between theory and application.

Prerequisites: ECON 607 required.

Policies and Grading: Grades will be based on performance on the homework assignments as well as the exams. Students are encouraged to work in teams of two and discuss the assignments with one another. Each team must submit an independent write-up (i.e. one write-up per pair of students). This should not be done in collaboration with other groups. Together these assignments will comprise 50% of the grade. The midterm will be worth 25% of the grade and the final exam will be worth 25% of the grade. Class participation is also strongly encouraged and can play a role in borderline cases.

Software: We will use the GEMPACK software suite in all homework assignments.

Academic Integrity: University policy on academic misconduct is clear - academic dishonesty in any form is strictly prohibited. Instances of academic dishonesty will be referred to the Dean of Students for disciplinary action. Penalties are severe and may include failure on the exam, assignment, failure in the course, and/or expulsion from the University. The risks associated with academic dishonesty far outweigh the perceived benefits. Academic dishonesty includes citing someone else's work as your own, using unauthorized "crib sheets" during exams, or sharing your answers with someone else. If you are unsure whether an action you are considering constitutes academic dishonesty, seek clarification from your instructor.
Students with Disabilities: If you have a disability that requires special academic accommodation, please make an appointment to speak with me within the first three weeks of the semester in order to discuss any adjustments. It is important that we talk about this at the beginning of the semester. Please note that university policy requires all students with disabilities to be registered with Adaptive Programs in the Office of the Dean of Students before classroom accommodations can be provided.

Organization
Part I of the course focuses on analysis of competitive markets, with emphasis on vertical and horizontal marketing linkages. Here, we develop the (partial) equilibrium displacement model to measure the impact of government interventions and structural change on prices, quantities, and economic welfare in agricultural markets.

Part II of the course focuses on quantitative analysis of marketing linkages from the farm gate to consumers in the presence of multi-stage oligopolies and oligopsonies. Here, we build on the work of Richard Sexton and others who have emphasized the importance of market structure for the distribution of economic surplus in the food marketing system. We will consider specifically the impact of imperfect competition in the international trading system for the potential gains to developing countries of trade reforms. One of the big puzzles has been why farmers in developing countries have not gained more in the wake of trade reforms. We will see the role that market power plays in this process.

Part III moves on to general equilibrium and welfare economics. Here, we begin with a computational analysis of the Pareto optimality of competitive equilibrium. We will systematically explore a series of market- and policy-induced departures from this benchmark, as well as possible Pareto improvements from a distorted point of departure. In this context we will develop a theoretical and computational approach to the decomposition of aggregate welfare which is extremely useful in the analysis of policy impacts, using this to explore second-best policy outcomes. Finally, we explore two important types of market failure: public goods and externalities. We formally explore how to model externalities in an applied general equilibrium model and analyze the interactions between agricultural policies and environmental quality.

In Part IV of the course, students will construct, calibrate, and utilize a relatively simple economic model of the agricultural household in a developing country which encompasses both production and consumption decisions. The question of separability between these two areas of household activity will also be explored, focusing particularly on the impact on household marketed surplus. We will focus closely this year on the role of excessively large transactions costs in causing households to be disconnected from markets, modeling their participation decision endogenously.
Part I. Supply, demand, and structural change in inter-related commodity markets
(3.5 weeks, 1 problem set)

Policy Problem: Assess the differential impact of alternative forms of structural change and policy interventions in the context of uncertain parameter estimates. Contrast the impacts of increased demand to those of technological change. Evaluate spillover effects across inter-related markets.

Lecture I.1-I.2: Introduction to Food Market Linkages, and Policy Incidence

Readings:


Topics:
   a. Vertical and horizontal relationships in agricultural markets
   b. Incidence of agricultural policy

Homework I.1: Measuring Economic Effects of Demand and Supply Shifts


Verma, Monika “So what is GEMPACK?”, mimeo, Dept. Agr. Economics, Purdue University, August 2008.

Lecture I.4-I.5: Overview of Research and Promotion in Agricultural Markets

Readings:


Topics:
   a. Commodity check-offs
   b. Producer-funded promotion and R&D
Lecture I.5. Other applications of the EDM framework

Readings:


Part II. Analysis of food marketing channels in the presence of oligopoly and oligopsony (3.5 weeks, one problem set)

Policy Problem: Activities undertaken by the food manufacturing, wholesale and retail sectors now account for the bulk of the consumers’ food dollar, and the food marketing system’s share of total consumer expenditures continues to rise. Part of this reflects the demand for increasing convenience, but part of it is due to the increasing concentration, and hence market power, of this sector. This section of the course will examine the impact of market power on the distribution of economic surplus between farm producers, wholesalers, retailers and consumers. For this purpose, we will develop a simple theoretical model of oligopoly and oligopsony in the food sector. This is followed by implementation of a model aimed at assessing the implications of market power for the distribution of gains from trade reform. Specifically, we will ask the question: When trade liberalization occurs, how much of the aggregate benefit will accrue to farmers in the developing country when there is oligopoly and oligopsony market power in the international food marketing system?

Lecture II.1: Overview of the food marketing system, consolidation, market power and implications for competition and welfare.

Readings:


Topics:

a. New empirical industrial organization
b. Vertical integration
c. Four-firm concentration ratio
d. Herfindahl index
e. Lerner index
f. Sunk costs
g. Cost efficiency trade-off
h. Distributional implications of market power
Lectures II.2-II.3: Quantitative Analysis of Concentration in the Food Marketing System

Reading:


Topics:

a. Successive Oligopolies
b. Successive Oligopoly/Oligopsony
c. Deadweight loss from market power

Homework II.1: Analyzing the implications of market power for the distribution of gains from trade reform

Lectures II.4 - II.5: Imperfect Competition in the Food Marketing System: Empirical Evidence

Reading:


Topics:

a. Market conduct parameter
b. Identification of market power
c. Comparative statics in demand and supply
d. Bilateral oligopoly

In Class Midterm covering Modules 1 and 2:
Part III. General Equilibrium and Welfare Economics (4 weeks: 1 problem set)

Policy Problem: Analyze the incidence of a policy interventions in general equilibrium and the implications for welfare, including the measurement of second-best interactions and externalities.

Lectures IV.1: Review of basic concepts of Welfare Economics
Reading:

Supplementary Reading:

Lecture IV.2: Specification of a simple computational general equilibrium model

Lecture I.6: Review of model linearization and implementation in GEMPACK; Sensitivity Analysis in GEMPACK

Readings:


Lecture IV.3: Analytical Decomposition of Welfare in the Presence of Pre-existing Distortions

Reading:


Homework IV.1: Development of a general equilibrium model and evaluation of the conditions for Pareto Optimality. Second-best outcomes and interactions with existing distortions, including externalities.

Topics:
Lectures IV.4 and IV.5: Externalities

Reading:


Topics:

a. Equilibrium and inefficiency  
b. The Coase Theorem  
c. Markets for Externalities  
d. Corrective Taxation

Lecture IV.6: Public Goods

Reading:


Topics:

a. Pure public goods: non-excludability and non-rivalry  
b. Impure public goods and congestion

Lecture IV.7: Discussion of assignment, wrapup GE/welfare module
Part IV. Economic Analysis of Agricultural Households in Developing Countries
(4.5 weeks = 9 lectures and 2 assignments)

Policy Problem: Assessing the impact of a food price increase on agricultural households in a developing country. We begin by looking at the qualitative impact of this on supply and demand decisions. From here we move into computational analysis. We begin by modeling the impact of this price increase on the farm firm, in isolation from consumption. We then turn to modeling the impact on consumption, in isolation from production. Next, we conduct analysis of the impact on the entire farm household, first assuming separability between production and consumption decisions, and then in the presence of non-separability induced by transactions costs. The specific focus this year will be on the responsiveness of the farm household to stochastic variation in market prices under varying degrees of transactions costs. We will also explore how to compute and decompose the welfare effects of this price shock. Finally, we cover one particular case study in which the author tests for separability of production and consumption decisions.

Lecture II.1: A Separable Household Model with Household Production


Topics:
- a. Introduction of the basic model and qualitative analysis of behavior
- b. Motivation for the problems of model estimation, calibration and simulation.
- c. Model calibration, linear and non-linear solutions

Lecture II.2: The Cobb-Douglas, Restricted Profit Function

Reading:

Topics:
- a. Brief review of duality, including self-duality of the Cobb Douglas functional form (see also AGEC 619)
- b. Empirical specification of a restricted profit function
- c. Analysis of results
- d. Limitations

Homework II.1: Programming the restricted Cobb Douglas profit function and the translog, indirect utility function in GEMPACK and simulation of the individual impacts of stochastic food price shocks.
Lecture II.4: The Translog, Indirect Utility Function


Topics:
- Brief discussion of flexible functional forms (see also AGEC 619)
- Brief review of indirect utility functions and duality in consumer demand
- Introduction to the translog indirect utility function
- Empirical specification and discussion of results

Lecture I.5: The Household Model Revisited: Implications for Marketed Surplus in the Presence of Separability


Topics:
- Impacts of a change in wages on labor supply and marketed surplus
- Analysis of the impact of a food price change on marketed surplus
- Implications of changes in household expenditure
- Calibration of the translog function

Lectures II.6 and II.7: Computational analysis of welfare. Non-separability in household consumption and production.

Readings:


Topics:
- Consumer surplus, Compensating and Equivalent Variations
- Local approximations to the change in household welfare
- Two examples of computational welfare analysis
- Sources of market failure
- Theoretical implications
f. An example

Homework II.2: Analysis of the behavioral implications of a food price shock in the presence of market failure. Computational analysis of the welfare impacts of a food price change with and without market failure.

Lecture II.9: Testing for Separation in Household Production and Consumption


*Final Exam: Covers modules 3 and 4*
Appendix: Quantitative Analysis of Markets and Policies

Concepts covered:
Imperfect competition
Distributional consequences of market power
Econometric identification of market power
Increasing returns to scale
Vertical integration
Welfare and distributional effects of oligopoly and oligopsony in food marketing
Applications of duality; testing and estimation (linked to AGEC619)
Flexible functional forms (linked to AGEC619)
Marketed surplus
Leisure demand/labor supply
Separation of household and firm decisions: implications for supply response
Transactions costs, market failure and empirical tests of separability
Consumer Surplus, Compensating and Equivalent Variations
Producer Subsidy Equivalent
Transfer efficiency and farm-income support
Factor mobility, technology and supply response
Pareto Optimality
Competitive Equilibrium
Walras Law
Two Theorems of Welfare Economics
Second Best Outcomes
Analytical decomposition of welfare changes in an economy
Externalities
Marginal Cost and Benefit of Abatement
Coase Theorem
Transactions costs
Pigouvian taxes
Public goods, the Samuelson Rule and Lindahl pricing

Applied economics tools covered:
Cobb Douglas Production and Profit Functions
Translog Indirect Utility Function
CES, and nested CES, Production and Cost Functions
Calibration to econometric estimates from the literature, including: consumer demand, production/cost functions, factor supply and market power
Computation of market power and the distribution of surplus
Modeling multistage oligopoly/oligopsony
Econometric identification of market power
Systematic sensitivity analysis using Gaussian Quadrature
Approaches to computing and decomposing Equivalent Variation
A variety of approaches to computable partial and general equilibrium analysis