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ABIZ 7260
Econometrics with Applications in Food, Agribusiness and Resources

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Textbook: There is NO required textbook for the course. Lecture notes will be provided for most topics.

Recommended:
Ernst R. Berndt. The Practice of Econometrics: Classic and Contemporary. Addison-Wesley, 1991.

No readings will be required from this text , but you may find this interesting later in the future (excellent discussions of applications in econometrics, eg chapters 2-3, 6-9).

Here are several good standard textbooks, but you are not expected to read any of these for this course:

William H. Greene. Econometric Analysis. Prentice-Hall, 2017 (8th edition).
A. Colin Cameron and Pravin K. Trivedi. Microeconometrics: Methods and Applications. Cambridge University Press, 2005.
Russell Davidson and James G. MacKinnon. Econometric Theory and Methods. Oxford University Press, 2004.
Jack Johnston and John DiNardo. Econometric Methods. McGraw-Hill, 1997.

Course Description:

Econometrics as applied to food, agriculture, agribusiness and resources. Econometric applications cover ordinary and generalized least squares, maximum likelihood, instrumental variables, nonstationary and dynamic models, and panel data. Lectures include critiques of selected applications especially in agriculture. Students will conduct an applied econometric study in one of these areas (food, agriculture, agribusiness and resources), or in another area after discussion with instructor.

Grading

Midterm	30 percent of course grade*
Final Exam	30 percent of course grade*
Paper (application)	40 percent of course grade

Notes:
1. The midterm will be scheduled prior to the voluntary withdrawal deadline.
2. Students will not be permitted to write makeup tests, except for documented medical or compassionate reasons.
3. Students appealing any term work (whether it be an informal or formal appeal) must appeal their term work within 10 working days of receiving their mark.

Statement on Academic Integrity

Students should acquaint themselves with University policy on plagiarism and cheating. See the Academic Integrity section of the University of Manitoba Graduate Academic Calendar. Ignorance of policies is not a valid excuse for violating them.
During online exams, each student must complete the exam independently – any discussion with others (or use of services in answering exams) will be considered as plagiarism and cheating.

Lecture Topics:
1. Ordinary Least Squares
2. Maximum Likelihood
3. Generalized Least Squares
4. Instrumental Variables
5. Nonstationary Models
6. Dynamic Models
7. Panel Data Models

Course Outline

1. Ordinary Least Squares (OLS) Model
- assumptions
- derivation of OLS estimator and cov(bOLS)
- unbiasedness and normality
- Gauss-Markov theorem (proof)
- hypothesis testing: t and F tests (skip proofs)
- specification errors, direction and magnitude of biases due to omitted variables
- dummy variables
- multicollinearity

2. Asymptotic Theory

- properties of plim's (simple proofs)
- consistency of OLS estimator (proofs)
- asymptotic distribution of OLS estimator without normality of disturbance (Lindberg-Feller central limit theorem), and related asymptotic distributions of t-tests and modified F tests (proofs)

3. Maximum Likelihood (ML) Model
- assumptions
- estimators
- asymptotic properties (proofs)
- hypothesis testing: likelihood ratio test

4. Generalized Least Squares (GLS)
- general approach
- heteroskedasticity (including White HAC, introduction to ARCH/GARCH models - GLS and ML estimation)
- autocorrelation (including test for common factor restrictions)
- feasible GLS for both het and auto (proofs of consistency and asymptotic normality, specification problems)
- seemingly unrelated regressions (SUR)

5. Instrumental Variables (IV)
- simultaneous equations, identification
- simple IV, two stage LS (2SLS) (proofs of consistency and asymptotic normality, truncation)
- weak instruments
- 3SLS
- Wu-Hausman specification tests (proofs)
- testing for causality within framework of IV and specification tests
6. Nonstationary Models
- spurious regressions
- unit roots (consequences, differencing)
- tests for unit roots (Dickey-Fuller, KPSS)
- cointegration
- error correction models
- tests for cointegration

7. Dynamic Models
- autoregressive distributed lag (ADL) models
- general to specific modelling

8. Panel Data Models
- fixed effects versus random effects
- dynamic models: first differences and instrumental variables

Term Paper for Course

You are to present a paper (approximately 15-20 pages, excluding computer print outs) applying econometric methods to data. The paper will generally be related to agriculture, agricultural economics, agribusiness or resource economics. Other topics may be approved in discussion with the instructor. Note: this cannot be a paper on consumer demand (since most students will be preparing such a paper for Abiz/Econ 7950 Advanced Agricultural Demand Analysis in the same term).

In applying econometrics to your data, you may use any reasonably sophisticated econometric or statistical package. An introduction to STATA will be provided in conjunction with Abiz/Econ 7950, but any other sophisticated package is acceptable. It is recommended that you become familiar with a package more advanced than Excel.

The paper should include the following sections:
1. Introduction - briefly explain the problem or issue and why it is important
2. Data - briefly describe your data, data sources and limitations (possible measurement errors) in your data
3. Present a particular multivariate regression model and clearly explain why it is important in terms of understanding your particular problem or issue
4. Discuss any important variables omitted from the study due to inadequate data and how this is likely to bias estimation and hypothesis testing
5. Explain carefully your methodology for specifying and estimating the regression model and testing hypotheses
6. Carry out your methodology, explaining and interpreting results carefully, and modifying your methodology as appropriate
7. Explain how your econometric results help (or do not help) you understand the problem or issue at hand
8. Provide a candid assessment of the limitations of your study and how future research might try to address these .

Readings on Applied Econometrics in Agriculture

Note: this is intended as a brief introductory list of applied econometric studies. Some of these may be of value to you as background reading for your paper. I do not expect you to read any particular articles for this course (unless indicated otherwise in class).

Production

Mundlak, Y. "Specification and Estimation of Multiproduct Production Functions", Journal of Farm Economics, 1963, .
Mundlak, Y. and R. Hellinghausen. "The Intercountry Agricultural Production Function: Another View", American Journal of Agricultural Economics, 1982, .
Lopez, R.E. "The Structure of Production and the Derived Demand for Inputs in Canadian Agriculture", American Journal of Agricultural Economics, 1980, 38-45.
Shumway, C.R. "Supply, Demand and Technology in a Multiperiod Industry: Texas Field Crops", American Journal of Agricultural Economics, 1983, 65, 748-760.
Morrison, C.J. "Structural Change, Capital Investment and Productivity in the Food Processing Industry", American Journal of Agricultural Economics, 1997,
Morrison, C.J. and D. Siegel. "Knowledge Capital and Cost Structure in the US Food and Fibre Industries", American Journal of Agricultural Economics, 1998,
Morrison Paul, C.J. "Product Diversification, Production Systems, and Economic Performance in US Agricultural Production", Journal of Econometrics, 2005,

Consumption

LaFrance, J. "When is Expenditure Exogenous in Separable Demand Models?", Western Journal of Agricultural Economics, 1991, 49-62.
Eales, J. and L. Unnevehr. "Simultaneity and Structural Change in U.S. Meat Demand", American Journal of Agricultural Economics, 1993, 75, 259-268.
Moschini, G., D. Moro and R. Green. "Maintaining and Testing Separability in Demand Systems", American Journal of Agricultural Economics, 1994, 76, 61-73.
Edgerton, D. "Weak Separability and the Estimation of Elasticities in Multistage Demand Systems", American Journal of Agricultural Economics, 1997, 79, 62-79.
McGuirk, A., P. Driscoll, J. Alwang and H. Huang. "System Misspecification Testing and Structural Change in the Demand for Meats", Journal of Agricultural and Resource Economics, 1995, 20, 1-21.

Risk

Just, R.E. "An Investigation of the Importance of Risk in Farmers' Decisions", American Journal of Agricultural Economics, 1974, 56, 14-25.
Nerlove, M.L. and T. Scheurmann. "Expectations: Are They Rational, Adaptive or Naive? An Essay in Simulation-Based Inference", in G.S. Maddala, P.C.B. Phillips and T.N. Srinivasan, eds, Advances in Econometrics and Quantitative Economics, Oxford: Basil Blackwell, 1995.
Just, R.E. and R.D. Pope. "Production Function Estimation and Related Risk Considerations", American Journal of Agricultural Economics, 1979, 61, 276-284.

Chavas, J.-P. and M.T. Holt. "Acreage Decisions Under Risk: The Case of Corn and Soybeans", American Journal of Agricultural Economics, 1990, 72, 529-538.
Hennesy, D.A. "The Production Effects of Agricultural Income Support Policies under Uncertainty", American Journal of Agricultural Economics, 1998, 80, 46-57.
Coyle, B.T. "Risk Aversion and Yield Uncertainty in Duality Models of Production: A Mean-Variance Approach", American Journal of Agricultural Economics, 1999, 81, 553-567.
Sckokai, P. and D. Moro. "Modeling the Reforms of the Common Agricultural Policy for Arable Crops under Uncertainty", American Journal of Agricultural Economics, 2006, 88, 43-56.
Moschini, G. "Production Risk and the Estimation of Ex-Ante Cost Functions", Journal of Econometrics, 2001, 100, 357-380.

Dynamics

Griliches, Z. "Distributed Lags, Disaggregation, and Regional Demand Functions for Fertilizer", Journal of Farm Economics, 1959, 41, 90-102.
Nerlove, M.L. and I. Fornari. "Quasi-Rational Expectations, An Alternative to Fully Rational Expectations: An Application to Modeling U.S. Beef Cattle Supply", Journal of Econometrics, 1998, 83, 129-161.
Mundlak, Y. and H. Huang. "International Comparison of Cattle Cycles", American Journal of Agricultural Economics, 1996.
Howard, W.H. and C.R. Shumway. "Dynamic Adjustment in the U.S. Dairy Industry", American Journal of Agricultural Economics, 1988, 70, 837-847.
Luh, Y.-H. and S.E.Stefanou. "Productivity Growth in U.S. Agriculture under Dynamic Adjustment", American Journal of Agricultural Economics, 1991, 1116-1125.
Mbaga, M. and B.T. Coyle. "Beef Supply Response under Uncertainty: An Autoregressive Distributed Lag Model", Journal of Agricultural and Resource Economics, 2003, 28, 519-539.
Coyle, B.T. "Dynamic Econometric Models of Canadian Crop Investment and Production under Risk Aversion and Uncertainty", Organization for Economic Cooperation and Development (OECD), Paris, 2005.
Vasavada, U. and K. Cook. "Short-run Dynamics of Machinery Demand in Canadian Agriculture", Canadian Journal of Agricultural Economics, 2005, 44, 139-150.

Business and Finance

Lundblad, C. "The Risk-Return Tradeoff in the Long-Run: 1836- 2003", Journal of Financial Economics, 2007, 85, 123-150.
Chen, H-F and B.T. Coyle, "Aggregate Risk-Return Models with Daily Data, and Correspondence to Models Relating Aggregate Risk to Fundamentals", 2016.
Dorfman, J.H. and M.D. Park, "Estimating the Risk-Return Tradeoff in Agribusiness Stocks: Linkeages with the Broader Stock Market", American Journal of Agricultural Economics, 2010, 93, 426-423.
Engle, R.F., Ghysels, E. and B. Sohn, "Stock Market Volatility and Macroeconomic Fundamentals", 2009.

Development

Strauss, J. "Joint Determination of Food Consumption and Production in Rural Sierra Leone: Estimates of a Household-Firm Model", Journal of Development Economics, 1984, 14, 77-103.
Jacoby, H.G. "Productivity of Men and Women and the Sexual Division of Labor in Peasant Agriculture of the Peruvian Sierra", Journal of Development Economics, 1992, 37, 265-287.
Fulginiti, L.E. and R.K. Perrin. "Argentine Agricultural Policy in a Multiple-Input, Multiple-Output Framework", American Journal of Agricultural Economics, 1990, 72, 279-288.
Mundlak, Y., D.F. Larson and R. Butzer. "Determinants of Agricultural Growth in Indonesia, the Phillipines and Thailand", World Bank, 2002.
Mundlak, Y., D.F. Larson and R. Butzer. "Agricultural Dynamics in Thailand, Indonesia and the Phillipines", Australian Journal of Agricultural Economics, 2004.
Bellemare, Marc F., Christopher B. Barrett and David R. Just. "The Welfare Impacts of Commodity Price Volatility: Evidence from Rural Ethiopia", American Journal of Agricultural Economics, 2013, 95, 877-899.

International Trade

Frankel, J. and J. Romer. "Does Trade Cause Growth?" American Economic Review, 1999, 89, 379-399.
Irwin, D.A. and M. Tervio. "Does Trade Raise Income? Evidence from the Twentieth Century", Journal of International Economics, 2002, 58, 1-18.
Harrigan, J. "Technology, Factor Supplies, and International Specialization: Estimating the Neoclassical Model", American Economic Review, 1997, 87, 475-494.
Lai, H. and D. Trefler, "On Estimating the Welfare Gains from Trade Liberalization", 2004.
Peterson, Hertel and Stout, "A Critical Assessment of Supply- Demand Models of Agricultural Trade", American Journal of Agricultural Economics, 1994, 76, 709-721.
Grant, J.H. and D.M. Lambert, "Do Agricultural Trade Agreements Increase Members Agricultural Trade", American Journal of Agricultural Economics, 2008, 90, 765-782.
Sun, L. and M.R. Reed, "Impacts of Free Trade Agreements on Agricultural Trade Creation and Trade Diversion", American Journal of Agricultural Economics, 2010, 92, 1351-1363.
Arnaud, C. and D. Donaldson, "How Large Are the Gains from Economic Integration? Theory and Evidence from U.S. Agriculture, 1880-2002", 2011.
Trefler, D. "The Long and Short of the Canada-U.S. Free Trade Agreement", American Economic Review, 2004, 94, 870-895.
Clausing, K.A. "Trade Creation and Trade Diversion in the Canada- U.S. Free Trade Agreement", Canadian Journal of Economics, 2001, 34, 677-696.