Abstracts of Selected Papers

Trade Accounts, Environmental Spillovers, and Development
(Chair: Linda Lee, Univ. of Connecticut)

"Regional Impact of Diary Trade Liberalization on the Northeast U.S. and Central Canada Dairy Sectors," M.A. Doyon, J.E. Pratt, and A.M. Novakovic (Cornell Univ.)

Quebec, Ontario, and the Northeast United States are expected to be important players in Canada-U.S. dairy trade. This study explores two dairy trade scenarios between Quebec, Ontario, and the Northeast United States. In simulation I, the United States is allowed to unilaterally export yogurt and frozen desserts to Canada, and simulation II reflects a total free trade environment. Free trade tends to alter somewhat the predominant flow of dairy products from east to west in Canada and west to east in the United States by creating north-south trade. In both trade simulations, the Canadian farm milk value decreases significantly.

"The Economics of Environmental Life Cycle Management and International Trade," J. Beghin and M. Metcalfe (North Carolina State Univ.)

With increasing attention being paid to pollution generated during consumption in such environmental policy schemes as Life Cycle Management, this paper incorporates endogenous consumption pollution intensities into a standard dual trade model in order to assess the potential welfare effects of coordinated policy reform. Welfare effects are examined in a small open and distorted economy where pollution is generated during both production and consumption. Producers control the level of pollution induced through consumption of their goods and face incentives to abate this pollution. An additional domestic policy standard must be imposed to obtain welfare-improving conditions through joint trade and environmental policy reform.

"Pesticide Use and Environmental Quality: A Global Comparison," A. Erickson (USDA/ERS), D. Gray (Cornell Univ.), and B. Krissoff (USDA/ERS)

Few agro-environmental indicators exist for cross-country comparison purposes. Set in a Pressure-State-Response framework, this study compares U.S. and other export competitors' pesticide use for five important commodities. Pounds of pesticide active ingredient are adjusted for each chemical's toxicity to long-term human health and persistence in the environment, which is then taken as a proxy for potential environmental degradation. Cross-country comparisons reveal that the United States tends to use the most pounds of active ingredients, but once pesticide use is adjusted for toxicity, persistence, and size of production, at least one other competitor uses more pesticides than does the United States in most cases.

"On the Speed of Convergence of Open Economies: An Empirical Analysis," J. Das and D. Abler (Pennsylvania State Univ.)

One implication of the neoclassical growth models is that countries grow faster in terms of per capita income if they start farther below their steady-state positions. Thus, countries with lower per capita income may catch up to richer countries in terms of per capita income. Several studies have estimated the speed of convergence using different data sets, but all of them treated the speed of convergence as fixed across the economies. In this paper, we formulate a function for the speed of convergence, which depends on several factors, including the partial output elasticity of capital, the population growth rate, the initial human capital level, and the gap between an economy's per capita income and the mean per capita income for all economies. The results show that differences in physical capital's share, human capital's share, and the level of per capita income across the state economies of India have definite impacts on the speed of convergence.

Coastal Watersheds and Groundwater Protection
(Chair: Gregory L. Poe, Cornell Univ.)

"The Cost Effectiveness of Cooperative Policies in Nonpoint Source Pollution Control," E. Besedin, C. Miller, and J.J. Opaluch (Univ. of Rhode Island)

This paper examines the control of coastal pollution from nonpoint sources within the context of a case study in Rhode Island. The paper develops a game theoretic analytical framework for comparing the cost effectiveness of cooperative versus noncooperative programs for mitigating nonpoint source pollution in coastal watersheds. The framework incorporates the stochastic nature of nonpoint source pollution and focuses on the issue of nitrate loadings from septic systems. The framework is applied to the case of nitrate pollution of Greenwich Bay, Rhode Island. Significant potential cost savings are found to result from cooperative programs.

"The Economic Impact of Pesticide Use in U.S. Agriculture," J. Fernandez-Cornejo, S. Jans, and M. Smith (USDA/ERS)

This paper develops the methodology necessary to calculate the impact of Integrated Pest Management (IPM) on pesticide use, yields, and farm profits. This methodology is then applied to the case of IPM adoption among fresh market tomato producers in eight states accounting for most U.S. production. The method is of general applicability. It accounts for self-selectivity and simultaneity by expanding Heckman's two-step method, and the pesticide-derived demand and yield equations are theoretically consistent with a restricted profit function. The results support the notion that, among fresh market tomato growers, adopters of IPM for insects and IPM for diseases apply significant less insecticides and fungicides, respectively, than nonadopters. The effect of IPM adoption on yields and profits is less clear.

"The Economics of Site Investigation for Groundwater Protection: An Application of a Sequential Search Strategy," M. Forsyth (Univ. of Guelph)

Rehabilitation of areas of contaminated groundwater often involves significant costs for site investigation. Whether to undertake a site investigation and when to bring an ongoing investigation to a closure are questions facing decision makers at many contaminated sites across North America. A model based on the Variable Sample Sized Probability Ratio test is developed to determine when it is worthwhile investing time and money in a hydrogeological site investigation. In the event that a site investigation is undertaken, the model can be used to indicate when that investigation should be brought to a closure and which policy decision should subsequently be adopted. The model shows that the desirability of testing is sensitive to the cost-benefit ratio of undertaking remedial action and to the cost of testing. The methodology used in this paper has many potential applications in policy-making for the environment, including the evaluation of ecosystem and agroecosystem health.

"Optimal Control for Groundwater Management," C.S. Kim and C.L. Sandretto (USDA/ERS)

Most dynamic models of groundwater management ignore groundwater return flows in estimating economic benefits from groundwater used for irrigation. This paper uses a corrected dynamic optimal control model to provide an empirical demonstration of the effects of model misspecification. Results indicate that misspecification of the model leads to overestimation of net economic benefits, excessive groundwater withdrawal, and a greater than optimal decline in the water table level.

Consumer Labeling and Willingness to Pay in Market and Nonmarket Goods

(Chair: Julie Caswell, Univ. of Massachusetts)

"Effectiveness of rBST Labeling and Willingness to Pay for rBST-Free Milk: Evidence from a Consumer Survey in Vermont," Q. Wang, C. Halbrendt, J. Kolodinsky, and F. Schmidt (Univ. of Vermont)

This study examines the effectiveness of rBST labeling and willingness to pay for rBST-free milk in Vermont, which became the first state in the nation to adopt an rBST labeling law in April 1994. Results of a consumer survey suggest that the labeling law has had very limited impacts on milk consumption because many consumers were confused about the rBST labels. Estimation results of a two-limit Tobit model indicate that the willingness to pay for rBST-free milk is determined by a host of sociodemographic factors such as income and attitudes toward rBST.

"Bid Design and Yea Saying in Single-Bounded, Dichotomous-Choice Questions," K.J. Boyle, H.F. MacDonald, H. Cheng (Univ. of Maine), and D.W. McCollum (U.S. Forest Service)

Bid design in dichotomous-choice, contingent-valuation questions has been an issue of considerable concern and debate ever since the first application by Bishop and Heberlein in 1979. A number of researchers have proposed various systematic procedures to design bid structures, and despite the evolving literature on the optimal selection of bid levels and allocation of bids to the levels, questions remain. This study applies differing bid structures for the same contingent-valuation question to independent subsamples drawn from the same population. Simulations are conducted to discern how well the bid designs recover welfare estimates if people respond objectively to bid levels; the absence of a bid-magnitude effect. Our findings indicate that the systematic effect of bids on responses to dichotomous-choice questions reduces the effectiveness of the optimal design literature. Bias is reduced when bids are clustered around the mean, but welfare estimates are still affected by the presumed distributions that generate the bid designs.

"Eco-labels and the Derived Demand for 'Green' Inputs: The Case of Textiles," K. Smith and J. Beghin (North Carolina State Univ.)

This paper develops a framework for analyzing the market for eco-labeled textile products and the derived demand for "green" inputs used in the industry. The paper first provides a background on the use of eco-labels in the textile industry and two important "green" inputs used in the industry. Next, it presents a basic model for examining the demand for "green" textiles and the derived demand for "green" inputs. The paper then develops a Muth type equilibrium displacement model for "green" textiles and "green" inputs. The paper concludes by presenting planned extensions of the model.

"Determinants of Consumers' Use of Nutritional Information on Food Packages," R.M. Nayga (Rutgers Univ.)

This study examines how sociodemographic characteristics of a household's main meal planner affect use of nutritional information concerning ingredients, health benefits, calories, sodium, vitamins/minerals, fiber, fat, cholesterol, and sugar content on food packages. Results of the present study generally suggest that well-educated, female main meal planners are more likely to use various types of nutritional information than are others. Main meal planners who place more importance on nutrition but less importance on taste and those who have a higher perception of the healthfulness of their diet are more likely to use nutritional information on packages than are others. Household size, race, employment status, urbanization, region, age, and income are also significant factors.

Dynamic Changes Affecting the Poultry and Meat Industries
(Chair: Richard Rogers, Univ. of Massachusetts)

"Estimating Disembodied Technical Change in the Poultry Industry: An Application of Stochastic Coefficients Regression," R. Aull-Hyde and C.M. Gempesaw II (Univ. of Delaware)

In the 1950s, the U.S. poultry industry began to adopt the contract growout system as a means of procuring live broilers as raw material inputs at poultry processing plants. This paper estimates the long-term impact of the contract growout system on productivity within the industry. First, we describe the contract growout system. Second, a general measure of the effects on productivity gains in the industry, from implementing the contract growout system, is estimated. Using thirty-eight years of poultry production and input data, a sto-chastic coefficients production function approach is used to estimate, for each year, the proportion of productivity gain that can be attributed to the con-tract growout system. Results indicate that, in each year, the contract growout system accounted for a substantial proportion of the increase in the indus-try's productivity. In a more general framework, the model presented here serves as an example of how decision makers, in any industry, can quanti-tatively evaluate benefits associated with previ-ously adopted technologies or operating practices.

"Environmental Practices of Delmarva Poultry Growers," K. Michel, J. Richard Bacon, C.M. Gempesaw II, and J. Martin (Univ. of Delaware)

This study analyzes the differences in environmen-tal manure management practices of poultry pro-ducers in the three states on the Delmarva Penin-sula and examines the factors that influence the timing of manure application to cropland during environmentally sensitive months of the year. The chi-square test results reveal that Delaware produc-ers are less likely than Maryland and Virginia pro-ducers to follow selected environmental manure management practices. The logit regression anal-ysis reveals that those with nutrient management plans are more likely to spread manure during en-vironmentally sensitive winter months than are those without a management plan.

"Plant Entry, Exit, and Post-Entry Performance in Selected Meat and Poultry Slaughter and Processing Industries, 1963–92," M. Ollinger, J. MacDonald, K. Nelson, and C. Handy (USDA/ERS)

Using plant-level data, plant entry, exit, and post-entry performance in the beef, pork, chicken, and turkey slaughter and processing industries are ex-amined for the 1963–92 period. We investigate differences among different types of entrant and existing plants. Results suggest that technological and financial barriers restrict entry by entry plants but encourage entry by existing plants. Results also suggest that plant size discourages plant exits and enhances plant performance; firm size encour-ages single-plant firm exits and reduces both sin-gle-plant and multiplant firm performance; and marginal costs encourage plant exits and reduce plant performance.

Land Use Management and Policy
(Chair: Cleve Willis, Univ. of Massachusetts)

"The Effect of Landfills on Rural Residential Property Values: Some Empirical Evidence," R.A. Bouvier and J.M. Halstead (Univ. of New Hampshire)

The question of whether solid waste landfills have an effect on residential property values has been a subject of much debate. Past research has resulted in mixed conclusions. The current study examines six landfills, which differ in size, operating status, and history of contamination. The effect of each landfill is estimated by the use of multiple regres-sion. In five of the landfills, no statistically signif-icant evidence of an effect was found. In one of the cases evidence of an effect was found, indicating that houses in close proximity to the landfill suf-fered a loss of about 6% in value.

"Measuring Heterogeneous Preferences for Preserving Farmland and Open Space," J. Kline and D. Wichelns (Univ. of Rhode Island)

Preferences for environmental programs often vary among individuals according to socioeconomic characteristics and fundamental attitudes and beliefs regarding program goals. Most researchers account for socioeconomic factors when conducting contingent valuation surveys, while not accounting for differences in preferences that transcend socioeconomic categories. This paper uses factor analysis and a dichotomous choice model to describe differences in public preferences that result from different attitudes and beliefs regarding the goals of programs for preserving farmland and open space. Results describe policy implications that are not apparent when using models that address socioeconomic characteristics alone.

Estimation Techniques in Consumer Demand Models
(Chair: Enrique Figueroa, Cornell Univ.)

"Preferences for Oyster Attributes by Consumers in the U.S. Northeast," A.B. Manalo (Univ. of New Hampshire) and C.M. Gempesaw II (Univ. of Delaware)

In a survey of shellfish consumers in the U.S. Northeast, a conjoint experiment was conducted where respondents were asked to rank oyster alternatives that differed on the following attributes: source information (i.e., farm-raised or wild-caught), price, and inspection information (by FDA or USDA). Ordered probit analysis of all responses revealed that inspection was the most important attribute, followed by source and price. Individual part-worths were also estimated and logit analysis revealed that the probability that source is the most important attribute increased when the respondent believed that farm-raised shellfish are safer than wild-caught. The probability that inspection is the most-valued attribute increased when the respondent believed the farm-raised shellfish are harvested in cleaner water than are those caught in the wild.

"Determinants for Food Away from Home Visit Frequency: A Count-Data Approach," D. Dong (Texas A&M Univ.), P.J. Byrne (Univ. of Florida), A. Saha and O. Capps, Jr. (Texas A&M Univ.)

Previously, food away from home (FAFH) analyses have concentrated on likelihoods and expenditures of U.S. households. The purpose of this study is to determine the sociodemographic effects of households on FAFH frequency using the National Panel Diary Group data. Poisson, OLS, and three generalizations of the Poisson model (Negative Binomial) were used in the analysis. Negative Binomial models dominated the Poisson and OLS models. Income and opportunity costs demonstrated positive impacts on the number of FAFH visits by a household. Black households, unmarried households, and households with a female household manager had significantly negative effects on the number of visits.

"Elasticity Estimation of Food Consumption in Rural China with Alternative Demand Systems," C. Feng and T.C. Lee (Univ. of Connecticut)

Relatively few food demand studies have been carried out for China. Most of them concerned income and consumption, adequacy, stability, growth, and equality of food distribution. Recent changes in market-oriented distribution processes have allowed us to study price responses in addition to income responses. This study utilizes the log-linear system, linear expenditure system, and almost ideal demand system to measure the elasticities of grain, meat, vegetables, alcohol, fresh eggs, seafood, and sugar, and their changes over time. With the exception of grain, the results show that expenditure and price elasticities declined in absolute value in the period 1978–90 and stabilized in recent years. Rural reform in 1978 seems to show its effect five years later, when the observed consumption started to exceed the estimated subsistence level of consumption for nonstaple foods.

Plenary Session

"A Content Analysis of the *Agricultural and Resource Economics Review,"* **C.M. Gempesaw II and F.Z. Albay (Univ. of Delaware)**

A content analysis is conducted on the *Agricultural and Resource Economics Review* to determine whether the journal has maintained a strong regional focus and whether there has been a narrow concentration of published articles in subject area and methodology. The results show that in the 1990s, the share of articles that do not focus on the Northeast has increased tremendously and more articles have used quantitative techniques than nonquantitative methods.

Production Decisions and Public Policies in Agricultural and Food Markets
(Chair: Harry Vroomen, The Fertilizer Institute)

"Multiproduct Impacts of Price Stabilization Policies," J.S. Clark (Nova Scotia Agricultural College) and A.J. Reed (USDA/ERS)

Mean and two year moving average price stabilization policies are analyzed under multimarket, multiproduct conditions. Consideration of interactions between markets becomes important under multiproduct systems. For a wheat/barley produc-
tion system for Canada, mean price stabilization decreases system variance, whereas two year moving average price stabilization increases total system variance.

"Effects of Individual Transferable Quotas on Industrial Organization in the Mid-Atlantic Surf Clam Fishery," J. Menzo and A.O. Adelaja (Rutgers Univ.)

This paper examines the impact of the introduction of Individual Transferable Quotas on industrial organization in the Mid-Atlantic Surf Clam Fishery. A market share regression model was utilized to examine the impact of size, effort, vessel age, and ocean quahog catch variables on industrial structure and to evaluate how the effects of those vari-
ables changed after Individual Transferable Quotas were introduced. Results indicate that Individual Transferable Quotas enhance the advantages of fleet size by allowing greater effort to be applied to excess capacity in the fishery. Results imply that in the presence of Individual Transferable Quotas, overall, efficiency was enhanced.

"An Examination of Production Contracts on Commercial Farms," C.B. Dodson (USDA/ERS)

Increased interest in the industrialization of production agriculture has generated concern about the effects of production contracts, especially among lenders. Lender impacts depend on whether customers are involved in crop or livestock production. Commercial crop farms with production contracts were larger, wealthier, and more profitable than other crop farms. Yet, their use of debt
did not differ significantly from other comparable-size crop farms. Contract livestock farms were smaller, more indebted, and more financially stressed than livestock farms without contracts. Farm expenses of contract livestock farms were mostly paid by contractors, indicating less need for farm operating loans. Also, they were more reliant on the Farm Service Agency for loans.

"Analysis of Excess Capacity in U.S. Corn and Wheat Production," K.P. Smith (Univ. of Missouri) and M.R. Dicks (Oklahoma State Univ.)

Excess capacity is measured for wheat and corn by developing econometric models to estimate yield, cropland available, domestic demand, and export
demand. Excess capacity is defined as the ability to produce in excess of demand at an acceptable price. Our measure of excess capacity is compared

with previous measures, and short-run projections for excess capacity in these crops are provided. The magnitude of excess capacity in production of wheat and corn was high in the 1950s and 1980s, but low in the 1960s and 1970s. Following a widespread drought in 1988, excess capacity levels have been slowly replenished.

"Economically Estimating Optimum Nitrogen Fertilizer Rates for Corn in New Jersey," A. Weliwita, R. Govindasamy, and J.R. Heckman (Rutgers Univ.)

Four production functions, namely, Cobb-Douglas, transcendental, quadratic, and square root, were estimated to obtain economically optimum nitrogen fertilizer rates for corn in New Jersey. Yield response data collected at seven sites in New Jersey during the period 1992–95 were used for the analysis. Mean economically optimum rates range from 184 kg N ha^{-1} for the transcendental to 344 kg N ha^{-1} for the Cobb-Douglas at a common nitrogen fertilizer-to-corn price ratio. Statistical analyses show that all the models except Cobb-Douglas do well in predicting economically optimum rates of nitrogen fertilizer.

New Approaches in Natural Resources and Environmental Policy
(Chair: Thomas W. Ilvento, Univ. of Delaware)

"Clearing the Air: Offsetting Emissions between Stationary and Non-Stationary Sources in New Jersey," G.D. Hrunka and P.J. Parks (Rutgers Univ.)

A conceptual model links attainment of an ambient air quality standard to emissions reductions by stationary and non-stationary sources. The model motivates a simulation of carbon monoxide (CO) offsets by vehicles using the Garden State Parkway in New Jersey. Results suggest that while CO emissions by stationary sources may be offset, this is only part of a comprehensive strategy needed to attain the CO National Ambient Air Quality Standards in New Jersey's nonattainment region.

"A Conceptual Analysis of Environmental Implications of Policy Reforms: A Graph-Theoretic Approach," T.T. Temel (Rutgers Univ.), T.L. Roe (Univ. of Minnesota), and E.M. Tavernier (Rutgers Univ.)

The environmental consequences of reforms are rarely considered in policy design. To better understand the linkages between reform-driven sectoral activities and their environmental effects, we propose a graph-theoretic approach. This approach helps to identify the channels through which sectoral activities impact the environment and to provide insights into the potential impacts on the economy.

"Incorporating Natural Resources in National Income Accounting," M. Ray (Univ. of Georgia)

Natural resources represent capital that can and should be used to produce goods and services for the benefit of their owners. Increasingly, economists are attempting to include the net flow of natural resources in their calculation of national products and incomes, because the current national accounting systems do not capture the value of natural resources adequately and, therefore, development strategies that rely on standard income accounting techniques may not result in sustainable development. Methods for natural resource accounting suggested by S.E. Serafy and by Adger and Whitby imply that the incorporation of environmental concerns in economic measurements is essential for properly understanding the process of development in natural resource dependent countries.

"Fishing for Dollars: The Impact of Labor Interest Groups on Political Preferences and Fish Stocks,"
R.D. Horan (Pennsylvania State Univ.), E.H. Bulte (Wageningen Agricultural Univ., the Netherlands),
and J.S. Shortle (Pennsylvania State Univ.)

Models of optimal fisheries management tradition-
ally assume social welfare optimization as the goal
of the managing agency. However, public choice
theories suggest that politicians do not choose pol-
icies to maximize welfare for society. Instead, they
act to maximize the economic well-being of polit-
ically important interest groups. In this paper, we
examine fisheries management under alternative
political preferences. We find that, in general, the
relationship between steady state values in the po-
litical optimum and the Pareto efficient case is am-
biguous. In addition, we show that implementation
of economic incentives to achieve the political op-
timum can be quite complicated.