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Abstracts of Selected Papers

NAREA Annual Meetings, Annapolis, Maryland, June 12–15, 2005

SESSION: *Production Agriculture*. Moderator: Mark Sperow (West Virginia University)

“An Economic Analysis of Pasture-Raised Beef Systems in Appalachia.” Jason R. Evans, Mark Sperow, and Edward Rayburn (West Virginia University).

This analysis was aimed at assessing the profitability and economic risk involved in pasture-raised and traditional beef production systems in Appalachia. Stochastic budgeting was utilized and accounted for seasonal variability in prices, pasture availability, and animal performance. Pasture-raised systems were shown to carry less market risk and overall greater returns.

“Can the Small Dairy Farm Remain Competitive in U.S. Agriculture?” Loren W. Tauer and Ashok K. Mishra (Economic Research Service, USDA).

U.S. cost of milk production by farm size was decomposed into frontier and efficiency components with an estimated stochastic cost curve. Frontier cost of production decreases with farm size, but not as pronouncedly as non-stochastic cost. Higher cost on many smaller farms is caused by inefficiency rather than technology.

“Agricultural Contracting and Economic and Environmental Performance Measures on Fattened Cattle and Hog Farms.” Carmen L. Sandretto, Richard F. Nehring, and Erik O'Donoghue (Economic Research Service, USDA).

This study develops farm-level estimates of excess nutrients from both commercial fertilizer and manure on livestock farms; it identifies the link between structural change (measured by increases in CAFOs) and excess nutrients; and it calculates farm-level performance measures of economic activity (scale and technical efficiency) using a stochastic production frontier approach.

SESSION: *Agricultural Land Use*. Moderator: John Halstead (University of New Hampshire)

“Land Use Change and Agricultural Competitiveness.” Nicholas A. Gardner, D. Lynn For-

ster, and Michael P. Brady (The Ohio State University).

Will agricultural productivity decline as land use change creates the “impermanence syndrome” where agriculture stagnates due to nearby development? We analyze the effects of residential and commercial development on farming practices and performance. The data set used comes from a 2003 survey of 816 Ohio agricultural producers.

“Love Thy Neighbor...But Does This Include a 600-Cow Dairy Farm?” Robert Parsons and Grace N. Matiru (University of Vermont).

Survey analysis of town residents concerning a proposed 600-cow dairy farm finds 45 percent opposed, 31 percent in favor, and 18 percent not sure. There was significant difference based on age and years of residence. There was no difference based on education or sex. The survey provides extension educators with a detailed understanding of the conflicting views and identifies topics that can promote greater understanding in a public forum.

“Endogenous Planning Horizons in Urban Fringe Agriculture: The Impermanence Syndrome and Other Hypotheses Revisited.” Soji Adelaja (Michigan State University) and Kevin Sullivan (Rutgers University).

To test the impermanence syndrome hypothesis, this paper estimates a planning horizon model whereby the planned longevity of the farmer is regressed against causal factors. Results confirm the planning horizon hypothesis and suggest a positive relationship between planning horizon, profitability, and innovation.

“A Spatial Econometric Approach to Identifying Factors Associated with Agricultural Land Development in West Virginia.” Yohannes G. Hailu and Cheryl Brown (West Virginia University).

Understanding relationships between growth and agricultural land development is crucial for growth management policies. Using county-level data, a spatial econometric model examines the factors associated with agricultural land development in

West Virginia. Results indicate that counties with high growth, low per-acre farm income, and no land use policy experienced development pressure.

SESSION: *International Economic Development.* Moderator: Gerard D'Souza (West Virginia University)

"The Effect of National Policies and Labor Market on Land Use Decisions in Developing Countries: An Application of Simulated Maximum Likelihood to Systems of Censored Acres with Panel Data." Bayou Demeke and Ian Coxhead (University of Wisconsin-Madison).

This paper tests the hypothesis concerning the influence of national markets and policies on local land use decisions in the Philippines. We estimate a system of random effects acreage equations using simulated maximum likelihood methods. Results illustrate the role of labor market and price policies in shaping rural environmental outcomes.

"Tropical Forests at Risk: Emerging Land Markets and Deforestation in the Brazilian Amazon." Erin O. Sills (North Carolina State University) and Jill L. Caviglia-Harris (Salisbury University).

We investigate the completeness of the land market in a settlement in the Brazilian Amazon while accounting for the spatial landscape. We find property value to be determined by location, soil quality, access to water, and land use. Individual property values are found to increase through the creation of pasture and thus deforestation. These results provide evidence supporting the extensive use of pasture in agricultural systems in the region.

"The Determinants of Agricultural Policies in Ghana: A Political Preference Function Approach." Henry A. Dakurah (University of Alberta) and Ruerd Ruben (Wageningen University).

Government intervention in the agricultural sector in sub-Saharan Africa is widespread and has been used to achieve a number of different policy objectives. A simple political economy model based on a revealed preference approach is used to show the trade-off in welfare among interest groups when certain policy instruments are

changed. The study reveals that government policies in pre-democratic periods in Ghana were, to some extent, shaped by group influence. However, recent political developments in the country have led to a shift in priorities away from the traditional power groups towards rural and small-scale farmers.

SESSION: *Resource and Environmental Policy.* Moderator: Tim Phipps (West Virginia University)

"Modeling Cessation Lag: How Quickly Does Risk Fall Once Regulation Is Implemented?" Tammy Barlow Murphy (University of Massachusetts) and U.S. Environmental Protection Agency).

This paper examines the implications of cessation lag for estimating the benefits of regulation that reduces the risk of exposure to contaminants with adverse health effects. Several approaches to modeling cessation lag and the implications for the present discounted value of benefits are addressed.

"The Welfare Analysis of Green Tax Reform: The Case of Small Open Economies." James S. Shortle and JeongHwan Bae (The Pennsylvania State University).

There has been growing interest among state governments in substituting environmental taxes for conventional taxes. This study shows how specific aspects (e.g., factor mobility and interregional trade) of open economies affect the welfare consequences from environmental taxes. A numerical example is presented using a regional computable general equilibrium model.

"Age and the Value of a Statistical Life." David Herberich and Anna Alberini (University of Maryland), Maureen Cropper (The World Bank), and Nathalie Simon (U.S. Environmental Protection Agency).

The value of a statistical life (VSL) is the rate at which individuals are prepared to pay to reduce their risk of dying. It is a key input in the estimation of benefits of policies that save lives. One important question is whether there is one, constant VSL, or whether VSL varies with the age of the individual. Answering this question is important for policy purposes, because the primary

beneficiaries of environmental policies are the elderly.

In this paper we review the theoretical and empirical literature on the relationship between age and VSL, and then use data from the Current Population Survey and workplace fatality risks by industry and age from the Census of Fatal Occupational Injuries to estimate VSL by age.

SESSION: Demand and Marketing. Moderator: Mario Teisl (University of Maine)

“Consumer Acceptance of Chicken Fed with Genetically Modified High Available Phosphorus (HAP) Corn.” Meeta Gupta, John C. Bernard, and John D. Pesek (University of Delaware).

This paper assessed consumers’ willingness to purchase chicken fed with high available phosphorus (HAP) corn, especially genetically modified HAP corn. HAP corn has been proposed as a solution to phosphorus pollution in water bodies. A conjoint analysis based method was used, and data was collected using a mail survey.

“Adoption, Certification, Performance, and Trends of Organic Farming: Evidence from a Vermont Survey.” Qingbin Wang, Bob Parsons, and Amy Dillon (University of Vermont).

A survey of Vermont organic farmers was conducted in 2004 to examine their adoption of organic farming, certification, performance, concerns, needs for information, and future plans. This paper presents the analysis results of 162 farms, with a focus on the differences between organic farms that started with organic farming and farms that switched from conventional to organic farming.

“How Far Has the Farm Share of the Consumer’s Food Dollar Really Fallen?” Hayden Stewart (Economic Research Service, USDA).

The U.S. Department of Agriculture reports that the farm share of the consumer’s food dollar is decreasing. However, those estimates are based on a basket of foods representative of what households bought in 1982. This study re-estimates farm shares for two major commodities—fresh fruits and fresh vegetables—using food baskets representative of what American households bought in 1999. Farm value shares are found to

have decreased less than current estimates suggest, because agriculture is providing more goods with higher farm values.

“Will Eco-Marketing of Environmentally Friendly Traditional-Fuel Vehicles Affect Consumer Purchasing Behavior?” Caroline Noblet, Mario F. Teisl, and Jonathan Rubin (University of Maine).

We utilize survey data to determine the factors important in influencing consumer purchases of environmentally friendly gasoline vehicles in Maine. We find that a consumer’s decision is dependent upon perceived constraints as well as actual constraints. Preliminary findings suggest that consumers may respond to emission information in the purchase decision.

SESSION: Pest Management. Moderator: Jeffrey Hyde (University of Maryland)

“An Economic Analysis of Community Refuge Requirements for Insect-Resistant Bt Corn.” Jennifer Price, Jeffrey Hyde, and Dennis D. Calvin (The Pennsylvania State University).

The U.S. Environmental Protection Agency mandates an insect resistance management program for Bt corn. Guidelines do not allow a refuge to be planted on other farms, however. We assess how net income is impacted by shifting from current regulations to a less constraining community refuge system in which a refuge can be planted on another farm.

“Alternate Strategies for Managing Resistance to Antibiotics and Pesticides.” Amit Batabyal (Rochester Institute of Technology).

How should one manage the problem of resistance to antibiotics and pesticides? Although the salience of this question has now been recognized, the formal modeling of this question is very much in its infancy. Consequently, we have three objectives in this paper. First, we construct a dynamic and stochastic model of antibiotic or pesticide use. Second, we analyze two different strategies for overseeing the problem of resistance. Finally, we identify a specific probability function, and we show that whether the problem of resistance is best addressed with an interventionist strategy or a non-interventionist strategy

depends fundamentally on this probability function.

“Domestic Exclusion and Control of the Mediterranean Fruit Fly.” Michael J. Livingston (Economic Research Service, USDA).

Simultaneously efficient medfly exclusion and control policies are examined to determine whether and how changes in current policies might benefit domestic and foreign consumers and producers. The results suggest that reductions in control expenditures would increase domestic welfare, and that reductions in control and exclusion expenditures would increase global welfare.

“Reducing Deer Overabundance by Distinguishing High-Productivity Hunters: Revealed-Preference, Incentive-Compatible Licensing Mechanisms.” Kelly J. Ward (The Pennsylvania State University).

This paper models the current problem of overabundance (and under-harvesting) of white-tailed deer as a principal-agent problem, with adverse selection and moral hazard. Using econometric analysis of data available from hunter behavior studies in Pennsylvania, overall welfare gains are estimated from both reduced deer densities and increased hunter satisfaction.

SESSION: *Nonmarket Benefit Estimation*. Moderator: Doug Lipton (University of Maryland)

“What Determines Willingness to Pay per Fish? A Meta-Analysis of Recreational Fishing Values.” Robert J. Johnston (University of Connecticut), Matthew H. Ranson and Elena Y. Besedin (Abt Associates, Inc.), and Erik C. Helm (U.S. Environmental Protection Agency).

This paper describes a meta-analysis conducted to identify patterns in per-fish willingness to pay (WTP) among recreational anglers. While results indicate systematic WTP variation associated with resource and angler attributes, they also indicate systematic variation associated with study methodology. Results suggest that researchers exercise caution when comparing recreational fishing welfare estimates.

“Direct Estimation of Distributions of Willingness to Pay for Heterogeneous Populations.” Chhandita Das, Christopher M. Anderson,

and Stephen K. Swallow (University of Rhode Island).

This paper shows that shifting distributional assumptions from marginal utilities to welfare measures yields efficient and easily interpretable welfare measures when compared to the traditional models. The approach is illustrated by an application to a noxious facility siting study in Rhode Island.

“An Empirical Comparison between Contingent Valuation Method and Survival Analysis: Canaan Valley National Wildlife Refuge Study.” Huilan Li, George Seidel, and Jerald J. Fletcher (West Virginia University) and Christopher Kloczek (Animal and Plant Health Inspection Service, USDA).

The research compares the similarities and differences of two methods—contingent valuation method and survival analysis—in estimating censored or truncated sample data on theoretical and empirical grounds. It also explores the potential benefits for future research in environmental economics. The research focuses on the estimation aspects.

SESSION: *Trade*. Moderator: Irene Xiarchos (West Virginia University)

“The Determinants of U.S. Outgoing Foreign Direct Investment in the Food-Processing Sector.” Titus O. Awokuse and Lei Xun (University of Delaware).

This paper extends the knowledge-capital model of multinational enterprises to the food processing sector. Using data covering 1982–2002, various foreign direct investment determinants were explored for 31 countries. Empirical results suggest that real sales in processed food by U.S. affiliates were not significantly affected by wages and openness in the host nations.

“The Influence of Inventories on the Relative Prices for Primary and Secondary Metals.” Irene M. Xiarchos and Walter C. Labys (West Virginia University).

The study analyzes how the relative differences between metal scrap and primary metal prices in levels and variances change as inventories change. Inventories reflect economic forces such as business cycles that influence metal markets in the

short term. Such forces are believed to affect both primary and secondary prices, but each in a different way.

“An Economic Model of U.S. Imports of Butter and Milkfat Products.” Kenneth W. Bailey and Zhen Wu (The Pennsylvania State University).

The U.S. imports high milkfat products under a tariff-rate quota system. This study developed a model to explain monthly imports of butter and butter substitutes and analyzed the economic factors that drive over-quota imports. It found that the wedge between U.S. and world butter prices explains much of the incentive to import these products.

SESSION: *Land Use Policy and Urbanization.* Moderator: Doug Morris (University of New Hampshire)

“Zoning Impacts on Land Development.” Brian Foley, Soji Adelaja, Richard Horan, and Patricia Norris (Michigan State University) and Paul Gottlieb (Rutgers University).

This paper investigates the impact of weighted average minimum lot size on the rate of conversion of vacant land to development. Results suggest a quadratic relationship between average minimum lot size and land development. The findings challenge the use of minimum lot size regulations that involve significantly low densities

“Projecting Land Development in Tucker County, West Virginia: The Effects of a Proposed Highway Corridor Project.” Julie Svetlik, Mike Strager, and Tim Phipps (West Virginia University).

This paper explores the possibilities of residential development resulting from a proposed highway corridor in Tucker County, West Virginia. We use a two-step approach to identify undeveloped land that is under threat of conversion to residential use in the county. A spatial hedonic model of residential prices is estimated and used in a land conversion model that predicts which parcels are most likely to be developed.

“Endogenizing the Reservation Value in Models of Land Development Over Time and Un-

der Uncertainty.” Amit Batabyal (Rochester Institute of Technology).

The notion of a reservation value is a key feature of most contemporary models of land development. It is clear that the magnitude of the reservation value has a fundamental bearing on the decision to develop or preserve land. This notwithstanding, many papers that analyze land development treat a landowner’s reservation value as an exogenous variable. Therefore, the purpose of this paper is to endogenize the reservation value in the context of a model of land development over time and under uncertainty. Our analysis shows that the optimal reservation value is the solution to a specific maximization problem. We also show that there exist theoretical circumstances in which the optimal reservation value is unique.

SESSION: *Agricultural Policy and Conservation.* Moderator: Alan Collins (West Virginia University)

“Environmental Stewardship, Farm Size, and Off-Farm Income: The Case of Corn Farms.” Jorge Fernandez-Cornejo (Economic Research Service, USDA) and Jiayi Lin (The Pennsylvania State University).

This paper presents the results of a survey of U.S. corn producers, who were asked about their adoption of environmentally beneficial practices and their structural and socioeconomic characteristics, and estimates a Poisson model to examine the impact of farm size and off-farm income on the adoption of these practices.

“Enrollment and Acceptance Decisions in the Conservation Reserve Program under Urbanization Influences.” Alan R. Collins and Serkan Catma (West Virginia University).

Using a portfolio choice approach, a simultaneous system of equations was developed. Urbanization influences reduced acres offered for Conservation Reserve Program (CRP) enrollment. USDA was found to accept more CRP enrollment offers in counties with declining agricultural land values.

“Agroterrorism and Public Perceptions of Risk: Implications for the U.S. Food System.” Benjamin Onyango (Rutgers University).

The study examines consumer risk perceptions of agroterrorism. It applies an ordered probit model on a survey conducted from October to November 2004 on agroterrorism. Specifically, the relationship between likely agroterrorism sources and potential targets and the consumer's socioeconomic and value attributes are modeled.

“Who Benefits from Direct Environmental Payments? Distributional Dynamics of the Conservation Reserve Program.” Ron Laschever, Ruben Lubowski, and Michael Roberts (Economic Research Service, USDA).

We explore the relationship between CRP enrollment and farm operator age. We argue that this relationship results from a form of Tiebout sorting. Via entry, exit, and land sales, older operators have sorted onto CRP lands. This implies that initial landowners benefited most if CRP rents were capitalized into land values.

SESSION: *Water Quality Issues*. Moderator: Marc Ribaud (Economic Research Service, USDA)

“A Dynamic Optimization Approach in Evaluating Investment Benefits for Wetlands Restoration.” Anura Amarasinghe, G.H. Gebremariam, Gerard D’Souza, and Tim Phipps (West Virginia University).

Despite their beneficial effects, world wetland ecosystems are threatened due to growing population pressure and other land use and development activities. This study presents a theoretical dynamic optimization model that evaluates the economic benefits of wetland restoration programs by making optimum investment decisions over time.

“The Expected Value of Sample Information for Point-Nonpoint Water Quality.” James Shortle and Hwansoo Sung (The Pennsylvania State University).

There is considerable interest in watershed-based pollution control plans, but the approach can be highly information-intensive according to the U.S. Environmental Protection Agency and the National Research Council. This study examines the value of different types and levels of information for water quality management in the Conestoga watershed.

“Nutrient Trading Approaches to Reducing the Costs of Abatement.” Jim Hanson and Ted McConnell (University of Maryland).

The potential for nutrient trading to provide for a more cost-effective means of reducing pollution in the Chesapeake Bay is examined. Specifically, we explore ways to maximize the reduction of nitrogen loadings into the Chesapeake Bay using funds generated by Maryland's 2004 Flush Tax and look at the related effect on phosphorus loadings. Ask Jim

SESSION: *Marketing*. Moderator: Wesley Musser (University of Maryland)

“The Importance of Farmers Markets for West Virginia Direct Marketers.” Cheryl Brown, Stacy M. Miller, Deborah A. Boone, Harry N. Boone, Jr., Stacy A. Gartin, and Thomas R. McConnell (West Virginia University).

Promotion, communication, and pricing methods, extent of season and product diversity, market location, and vendors' socioeconomic characteristics were examined for their impacts on total farmers market sales and on the amount and percentage of household income from farmers markets, using data from a survey of West Virginia farmers market vendors.

“Retail Configuration and Milk Prices.” Alessandro Bonanno and Rigoberto A. Lopez (University of Connecticut).

This paper investigates how supermarket milk prices are affected by retail configuration (presence of seafood departments, banking services, pharmacies, and restaurants). A sample of 580 observations from 10 supermarket chains is applied to Shepard's price discrimination model. Empirical results indicate that the level of supermarket services is significantly and positively correlated with milk prices, consistent with price discrimination, as consumers shopping in higher-service supermarkets pay more for their milk. Further results show that economies of scope are more important than economies of size in pricing milk and that overall supermarket sales increase with the level of services.

“Price Transmission and Asymmetry in the New England Fluid Milk Market.” Chunxiang Li (University of Massachusetts).

An asymmetric error correction model (ECM) was used to analyze farm-to-retail price transmission in the New England fluid milk market for the period 1982 through 2004. Results suggest that farm and retail prices are cointegrated. Results from estimation of ECM suggest that asymmetric price transmission does not exist.

“Utilizing Expected Revenue in Developing Needed Price Premiums for Selecting Optimal Marketing Strategies for Sheep Producers in West Virginia.” Doolarie Singh-Knights, Dennis K. Smith, and Marlon Knights (West Virginia University).

Transaction cost economics, break-even analysis, and sensitivity analysis are used to evaluate alternative marketing strategies for producers under two lambing systems. Price premiums necessary to encourage adoption under each marketing alternative are determined. This paper presents an analysis of the income effects of improved marketing opportunities for rural areas.

SESSION: *Air Quality and Global Environmental Issues*. Moderator: Jim Hanson (University of Maryland)

“The Potential for Mineland Reclamation to Offset Greenhouse Gas Emissions and Provide Landowner Income.” Mark Sperow and Christopher Bouquot (West Virginia University).

Changing mineland reclamation from pasture to forest cover could offset 2.6 million metric tons of carbon dioxide per year. Average carbon prices to attain these emission offsets vary by region and range from \$53.43 to \$152.84 per metric ton of carbon. The potential landowner revenue from activities that enhance carbon sequestration is estimated to be \$2.4–\$20.1 million per year.

“Analysis of Potential Carbon Sequestration and Revenue for Landowners of Abandoned Mine Lands.” Christopher Bouquot and Mark Sperow (West Virginia University).

This paper estimates potential income from carbon sequestration for owners of U.S. abandoned mine lands (AMLs). Carbon sequestration rates derived from literature, the Abandoned Mine Land Inventory System, and reclamation costs from case studies represent our data sources. The approximately half million acres of AMLs could

represent an opportunity for over 500,000 metric tons per year of carbon sequestration.

“Costs of Air-Quality Control Technologies on Animal Farms: A Regional View.” Noel Gollehon and Marcel Aillery (Economic Research Service, USDA).

Federal policy on manure management has focused on water quality. Animal agriculture is an important source of ammonia-nitrogen and other air emissions. This paper examines costs associated with selected on-farm air emission controls, and implications for water quality policy. We find that air emission controls influence the regional cost of meeting water quality objectives.

SESSION: *Environmental Economics*. Moderator: Chhandita Das (University of Rhode Island)

“Social and Spatial Dimensions of Historic Resource Management.” Vishakha Maskey, Ge Lin, and Tim Phipps (West Virginia University).

The study evaluates spatial socio-demographic determinants for listing in the National Register of Historic Resources for West Virginia. These socio-demographic determinants and spatial dependence are utilized to assist decision makers in efficient long-term preservation of historic resources and rural development.

“Modeling Green Technologies to Manage Urban Storm Water Run-off: Incorporating Ecological Benefits into the Decision Making Framework.” Brett R. Gelso (U.S. Environmental Protection Agency), E. Gregory McPherson (University of California, Davis), and Jeffrey M. Peterson (Kansas State University).

This essay discusses a model of a city planner who chooses optimal combinations of conventional constructed and natural methods of controlling urban flooding. Planners may be confronted with the problem of finding optimal allocations of these alternative control methods. Results identify socially optimal levels of green investments and constructed facilities.

SYMPOSIA

“Foreign Direct Investment: The Other Market Integration.” Hilda Christine Bolling and Michael Harris (Economic Research Service, USDA).

The twenty-first century so far has seen a continued advance in the activities of the multinationals in the food and beverage industry. The stock of outward U.S. foreign direct investment (FDI) has continued to grow, and inward U.S. FDI has surged. Certain multinationals have sharply increased their market shares of particular products in Canada, the UK, Argentina, and Brazil. This symposium discusses the role of multinationals in market integration and the prospect of change in this trend.

“Can Performance-Based Policies Improve Agricultural Land and Water Policy? Issues and Opportunities in New State Approaches to

CAFOs and other Farms.” Charles Abdalla (The Pennsylvania State University), Noel Gollehon (Economic Research Service, USDA), Patricia Norris (Michigan State University), Douglas Parker (University of Maryland), and James Pease (Virginia Tech University).

This symposium facilitated the sharing of knowledge concerning agricultural land and water policies. Information was presented on the environmental performance of small and mid-size farms and state strategies to address such performance. The discussion led to identification of key policy issues and opportunities for research and education using a performance-based approach.