

ABSTRACTS

PAPERS PRESENTED

Annual Meeting, SAEA, Little Rock, Arkansas, February, 1990.

MODELING CAPITAL STRUCTURE AND FINANCIAL DECISIONS
(Moderator: *Harry P. Mapp, Oklahoma State University*).

"Alternatives for Taxing Capital Gains: Effects on Farmland." *Ron L. Durst and Clifford Rossi, ERS, USDA.*

This paper compared effective tax rates for real capital gains under current law and various preferential tax treatment alternatives. Results suggest that an exclusion for long-term capital gains performs poorly in compensating for the effect of inflation. In addition, indexing capital assets for inflation would produce the lowest per acre tax on unrealized capital gains for current farmland owners.

"A Stochastic Optimal Control Formulation of the Risk Balancing Debt Choice Model." *Octavio Ramirez, Charles B. Moss and William G. Boggess, University of Florida.*

Following the financial stress of the early 1980s, agricultural economists have become increasingly interested in the choice of debt by noncorporate agricultural firms. Collins developed a static, deterministic model based on maximization of expected utility and obtained results that support the risk balancing proposition first advanced by Gabriel and Baker. This study validated Collins' basic results within the more rigorous framework of stochastic optimal control theory. It also expanded on Collins' results, providing interesting insights into the effects of business and financial risk on farmers' consumption, equity, and asset holdings.

"Financial Dimensions of Farm Production Decisions." *Lonnie R. Vandevier, Louisiana State University.*

A financial leverage model was developed for addressing various debt management questions and for evaluating the financial implications of farm production decisions. Maximum financial leverage and risk-adjusted maximum financial leverage estimated from the model provide information concerning the range of debt that can be incorporated into

the farm's capital structure. The model also provides a means for identifying the linkage between farm production and financial decisions. Empirical application of the model to a representative farm suggests that the farm's financial position affects its optimal enterprise portfolio and the portfolio return in turn affects its financial viability.

"The Value of Farm Level Data in Agricultural Portfolio Analysis." *Phil L. Kenkel and Jana L. Smith, University of Kentucky.*

The expected value-variance criterion is commonly used in portfolio analysis both for financial securities and in the context of selecting agricultural production activities. The implementation of this technique requires the incorporation of some reasonable estimate of the future return distribution, which is commonly approximated by historical data. In agricultural settings, as opposed to applications of portfolio analysis to financial securities, estimation of expected returns and variances often involves the use of aggregated yield and cost data. This study examined the value of farm level yield, price, and cost data in terms of relative efficiency of the resulting EV selections.

"Optimal Farm Financial Structure Including Rental." *Bruce L. Dahl and David L. Watt, North Dakota State University.*

Two optimal control models were developed to examine optimum farm financial structure considering owning versus renting land, the attitude of the operator toward risk, and possible bankruptcy. A North Dakota cash grain operation was modeled under different real interest, assets appreciation, and inflation rates. Analysis shows that high inflation, assets appreciation, and returns with low real interest cost suggest a farm portfolio of owned land financed with debt and by renting owned land to other farmers. Negative or low inflation, asset appreciation and returns with high real interest cost suggest a no-debt portfolio dependent on rented land.

OUTDOOR RECREATION AND WILDLIFE RESOURCES (Moderator: *John Stoll, Texas A&M University*).

“Economic Impacts of Outdoor Research on State Economics in the South.” *John C. Bergstrom, University of Georgia; H. Ken Cordell, Gregory A. Ashley, and Alan E. Watson, U.S. Forest Service.*

The economic impacts of recreational spending on the economies of North Carolina, South Carolina, Georgia, and Tennessee were estimated using the U.S. Forest Service IMPLAN input-output modeling system. Recreational expenditure data associated with state parks were obtained from the Public Area Recreation Visitors Study (PARVS). Results suggest that recreational spending may stimulate a considerable amount of economic activity in the state economies studied. Hence, future research into the economic development potential of outdoor recreation seems warranted.

“A Hedonic Analysis of Louisiana Deer Hunting Leases.” *Mark L. Messonnier and E. Jane Luzar, Louisiana State University.*

This study used primary data in a hedonic framework to analyze econometrically the market for hunting land in Louisiana. In addition, alternative specifications of the hedonic functional form were tested and compared with traditional linear specifications.

“An Economic Analysis of the Utilization of Wildlife Resources in South Texas.” *Jose G. Pena, Texas A&M University; Richard Trimble, University of Kentucky; David O. Wolfe and Mark C. Black, Texas A&M University.*

Surveys of landowners and hunters in LaSalle County, Texas evaluated the use and economic impact of wildlife resources and identified ways to improve the efficiency of their use. Thirty-five percent of the landowners and 17 percent of the hunters in the survey group responded to two separate questionnaires. The results indicated that 60 percent of the county's 947,482 acres with good wildlife habitat were being leased to hunters. Hunter expenditures and ranch receipts indicated that the utilization of the wildlife resources is generating about \$3,254,000 of income with an economic impact of about \$10.6 million to county residents.

“Estimating Waterfowl Hunting Demand: An Application of the Household Production Theory.” *Henglun Sun, John C. Bergstrom, and Christopher S. McIntosh, University of Georgia.*

An application of Bockstael and McConnel's household production framework (1981) to waterfowl hunting demand in Louisiana coastal wetlands appeared to generate strong empirical demand models for waterfowl hunting trips and bag. The demand model system is argued to be more consistent with theory and the “real world” because bag is allowed to be determined endogenously.

WORLD TRADE (Moderator: *Greg Pompelli, University of Tennessee*).

“Regional Analysis of International Rice Demand.” *Kent Lanclous, Purdue University; Hector O. Zapata and John G. Lee, Louisiana State University.*

The international rice market has been characterized as a thin market that results in substantial variations in observed prices and trade volumes. An Arminton trade-flow/market-share model was applied to evaluate factors that influence regional rice trade and U.S. rice export. Income was found to be a major determinant of total regional rice imports. Likewise, U.S. exports to a particular region are highly dependent on the total volume of rice imports to that region. Regional rice imports were less responsive to the world price ratio between rice and wheat, but imports from an individual source were dependent on the relative price among rice exporters.

“An Economic Analysis of China's Corn Industry: The Post Reform Period.” *Isis Pulido, Catherine Halbrendt, and Conrado Gempesaw II, University of Delaware.*

This paper has modeled China's basic grain industries and forecasts grain for human consumption to the year 2000. Under a number of rather conservative scenarios, China will likely remain an exporter of rice and an importer of wheat and corn. The magnitudes of these imports and exports are such that China will continue to have a large impact on these world grain markets.

“Derivation of the Effects of the European Community Sugar Program on EC Sugar Exports from an Econometric Model.” *Dale J. Leuck, ERS, USDA.*

The European Community (EC) sugar program induces productions on a program supply function exceeding that on a nonprogram supply function at world prices. An “allocation” incentive provides consumer transfers to high-cost producers receiving quotas for domestic consumption. Excess sugar receiving lower prices is produced through marginal cost pricing and as insurance that this quota is filled. Nonprogram supply functions for member countries are derived from econometrically estimated program supply functions. The model, including consumption and stocking equations, suggested that EC sugar exports of 3.8 million tons over 1983-1986 would have been at least 3 million tons less without the program.

“Sources of Price Instability in the U.S. Grain Market.” *Stephanie Mercier, ERS, USDA.*

The causes of price instability for export crops were explored from the U.S. perspective. A system of demand and supply equations for examining within-year price instability among major crops (corn, wheat, soybeans) was estimated, including an endogenous link to a trade-weighted exchange rate. Stocks seemed to stabilize corn and wheat prices, but not soybean prices. Supply side shocks such as bad weather and structural changes in world markets had significant destabilizing effects. Government policy actions, such as reducing the Federal deficit and controlling interest rates, affect price stability indirectly through the exchange rate.

INPUTS AND OUTPUTS OF THE AGRICULTURAL POLICY PROCESS: PREFERENCES, BEHAVIOR AND BENEFIT DISTRIBUTION (Moderator: *David B. Schweikhardt, Mississippi State University.*)

“Economic Perceptions and Agricultural Policy Preferences.” *Jayachandran N. Variyam and Jeffrey L. Jordan, University of Georgia at Griffin.*

The objective of this paper was to examine how public perceptions of farm policies influence preferences for government involvement. The analysis was based on micro data from a nationwide survey on public attitudes toward agriculture. To uncover the structure of perceptions as predictors of policy preferences, a reduced rank regression approach was employed. The estimated parameter stability

was studied using the bootstrap method. A single, statistically stable, reduced-rank variate was uncovered that captures perceptions about the degrees of government involvement, profitability of farming, and attitudes toward farming as an occupation.

“Political Economic Analysis of Dairy Policies in the United States.” *Mary A. Marchant, University of Kentucky and A.F. McCalla, University of California, Davis.*

The primary goal of this research was to endogenize government behavior, i.e., to identify variables that influence U.S. policymakers’ choice of the support price for manufactured dairy products through the development of two models. The behavioral model directly specified and estimated its policy equation, allowing for a large set of variables to be tested empirically for their influence on the support price level for MDP. Alternatively, the criterion function model followed a theoretically appealing economic paradigm, where the estimated policy equation is analytically derived. Empirical results of both models indicated that taxpayers’ interest in minimizing government costs denominated. Also, political variables, e.g., inertia and farm income, appeared to influence policymakers’ decisions in the behavioral model.

“Incorporating Strategic Government Policy Behavior and Product Differentiation into an International Burley Tobacco Model.” *William M. Snell and Michael R. Reed, University of Kentucky.*

International burley policies were endogenized to analyze the impacts of various policy linkages on international burley trade. The model assumes that the U.S. acts as the policy “leader,” while Italy, Japan, and Malawi behave as “followers” who react to U.S. policies. U.S. policymakers were hypothesized to take into account the impact of the foreign policy response (via a policy conjecture) in determining future policy levels. In addition, price indifference curves were developed to analyze the effects of changing quality differentials, consumer preferences, and price policies on burley demand within a given importing market.

“Distribution of Farm Program Benefits Across Commodities.” *Mary Keough, Joe L. Outlaw, Edward G. Smith, and Ronald D. Knutson, Texas A&M University.*

Economic research related to the distribution of farm program benefits has concentrated on how the payments are distributed among producers of different size, regardless of the specific commodities produced. The issue of equitability in the allocation of

program benefits across commodities has received little attention. This paper analyzed the relative benefits attributed to the commodity using alternative measures for quantifying farm program benefits. While differences in the level of farm program benefits exist across commodities, there is no consistent pattern of relative benefits tending to favor one commodity over another for a substantial time period.

TEACHING AND EXTENSION METHODS (Moderator: *Bobby Coats, University of Arkansas*).

“Undergraduate Education at Southern Land Grant Universities: The Agricultural Economics Graduates’ Perspective.” *John L. Adrian, Jr. and John E. Dunkelberger, Auburn University.*

Data for 171 individuals who were students at southern land grant institutions in 1977 were collected in 1987. Attention was focused on the individual’s educational attainment, career mobility, evaluation of college curriculum competencies and skills, and opinions relative to careers in agriculture. Results are useful in evaluating curriculum design and status of undergraduate programs. Results indicate that graduates are basically satisfied with their education and job status. They reflect a preference for more broad-based competencies and skills in curricula, especially involving communications, leadership, and decision making. Graduates seem to have marketable skills and are mobile.

“Prediction and Evaluation of Final Grade and Student Improvement in an Undergraduate Quantitative Methods Course.” *H.L. Goodwin, Jr. and William A. Coats, Texas A&M University.*

During the fall semester, 1988, pre- and post-entry information was gathered on 38 undergraduate juniors and seniors enrolled in Quantitative Methods for Agricultural Economics (AGEC 317). Information included various intellectual, academic, personal, lifestyle, and psychological/motivational measures, as well as performance measures for AGEC 317 itself. Regression analysis was utilized to predict final grade and score improvement on a pre-test/post-test performance. Results indicate that grade point in the major, intrinsic and extrinsic goal orientation, and expectancy for success are fairly

good predictors of final numeric grade. Pre-test/post-test performance improvement is not easily predicted; however, grade and final exam, marital status, self efficacy in learning, and intrinsic goal orientation appear to be the best descriptors of improvements.

“Risk Management Education: Knowledge and Program of County Extension Agents.” *Jean C. Buzby and Jerry R. Skees, University of Kentucky.*

Increased extension educational emphasis of risk management programs is not always matched with increased participation. Data from a national survey of county agents was applied to a concept of information flows to explore the impact of agents’ knowledge and programs on both farm-level risk management decisions and need for further educational emphasis.

“Landowner Characteristics and Attitudes Toward an Alternative Enterprise.” *David Zimet and Timothy Hewitt, North Florida Research and Education Center.*

Changes are occurring in agriculture as producers attempt to improve incomes, with many alternatives being considered. In the Florida Panhandle, an attempt was made to attract a poultry processing industry to the area. A questionnaire was designed to gauge the willingness of landowners to contract poultry production and to invest in poultry houses. Socioeconomic characteristics were obtained from the survey and potential education programs to assist producers were identified.

“Computer Analysis of Futures and Options Market Strategies.” *David Miller and M.J. Monson, University of Missouri.*

The literature on management of risk through the use of agricultural options has usually assumed a known production quantity. This paper presented an argument for modeling production deviations from anticipated quantities as changes in the hedge ratio. As an aid to visualizing the effective-price and effective-revenue profiles that emerge from changing futures prices and changing production levels with complex futures and options market positions, a computer spreadsheet was developed. This should aid producers in assessing the ultimate potential of marketing decisions they might make.

DEMAND ANALYSIS (Moderator: *Hui-Shung Chang, Auburn University*).

“U.S. Demand for Imported and Domestic Tobacco by Type.” *Sean Coady and Greg Pompelli, University of Tennessee.*

This paper examined the demand for imported and domestic tobacco by U.S. cigarette manufacturers. The Almost Ideal Demand System was used to estimate the demand for oriental, imported flue-cured and burley, domestic flue-cured, and domestic burley tobacco. The results indicate that nicotine content and price factors have caused U.S. tobacco market shares to suffer.

“A Characteristic Demand Model for Fluid Drink Products.” *Richard L. Kilmer, University of Florida and Xi-Lung Wu, University of Georgia at Griffin.*

A characteristic demand model is based on the geometry of product characteristics. This model reduced the parameters estimated by using data from space angles. The model is tested using data from fluid drink products. The data were consistent with the major hypotheses.

“Using Scan Data to Evaluate Advertising: A Suggested Methodology and Preliminary Results.” *David B. Eastwood, Morgan D. Gray and John R. Brooker, University of Tennessee.*

An analysis of variance methodology was proposed to analyze the effects of supermarket promotions and advertising on sales recorded by scan data. Attention focused on variable weight meat items. A way of using item movement in conjunction with television, radio, and newspaper advertising measures was discussed. Sequential and partial sums of squares were used to estimate the partial impacts of these promotions on item movement. Results suggest that the impacts vary by type of product, so management should choose advertising strategies carefully.

“Demand for Fresh Beef Products in Supermarkets: A Trial with Scanner Data.” *Oral Capps, Jr. and Rodolfo M. Nayga, Jr., Texas A&M University.*

A trial of the use of scanner data to investigate the demand for fresh beef products in a retail firm (43 supermarkets) in Houston was presented. The beef cuts were brisket, chuck, ground, loin, rib, round, and all other beef. Own-price elasticities were negative, statistically significant, and in the elastic range. Cross-cut and cross-product prices played a relatively minor role. Own-advertisement elasticities were positive and statistically significant but

very inelastic. Cross-advertisement effects were marginal. Seasonality was evident only for purchases of brisket and all other beef. Perhaps the most important contribution of this research is the documentation of the utility of scanner data in research, especially for retail food chain executives whose primary concern lies with the development of effective marketing programs.

“Reliability Tests of Elasticity Estimates from Alternative Specifications of the U.S. Demand for Coffee.” *Albert Ade Okunade, Memphis State University and Patricia E. McLean-Meynsse, Southern University.*

Elasticities of U.S. coffee consumption were estimated using 1957-1987 annual time series data. The effects of orange juice, sugar, climate, and habit were introduced along with prices and income as regressors. A sequential model testing framework was used to determine which of the alternative specifications yield efficient elasticity estimates. Based on economic and statistical considerations the log-log, classic Box-Cox and extended Box-Cox dynamic habit persistence models were the most reliable. Their results indicate that coffee consumption is subject to habit formation, orange juice is an important substitute, sugar is a strong complement, and coffee is an inferior beverage.

PRODUCTION ECONOMICS (Moderator: *James W. Pease, VPI & SU*).

“An Analysis of the Factors used in Determining the Direction of U.S. Hog Production Decisions.” *W. Ken Farr, Georgia College.*

The decision processes of U.S. hog producers and the important factors used by them in making production decisions have long been the focus of academic research. Traditional models have specified that production decisions are determined by a set of expected prices used to represent the profitability of producing hogs. This paper expanded this focus to analyze whether or not alternative factors are used in making plans to expand hog production relative to reducing production. This was accomplished by use of a dichotomous response model to represent production increases/decreases. Predominantly, results show that producers depend on different variables when making plans to increase versus decrease production.

“Economic Analysis and Growth Analysis of Pigs on a Baby Pig Feeder.” *Wang Jirong and Richard Perrin, North Carolina State University.*

The performance of baby pigs on a liquid feeding system was evaluated in terms of a cost-benefit analysis and a growth function analysis. The results show that the system is profitable if the opportunity cost of the baby pigs is low, and that the growth of small pigs on the system is significantly different from average and large pigs but not significantly different from a managerial point of view.

“Measurement of Technical Efficiency by Region, Farm Size, and Tenure Status on United States Sugar Beet Farms.” *Richard F. Nehring, ERS, USDA.*

This study employed a stochastic frontier production function to examine the technical efficiency of sugar beet producers by size, region, and tenure in 1984. In general, the results suggest that large farms are more technically efficient than small farms, but regional differences are important. Large farms have a clear technical efficiency advantage only in the central states. With reduced price supports, small farms in this region may be especially vulnerable.

“Economic Valuation of Traits in Dairy Animals.” *Timothy G. Taylor, Thomas H. Spreen, and Michael A. Delorenzo, University of Florida.*

A methodology for estimating economic values for animal traits for use in selection indexes was proposed using both the primal production function and dual profit function. In contrast with previous methods that used a definitional or accounting form of the profit equation to obtain economic values for traits, the present analysis explicitly considered the existence of a production technology and optimizing behavior. This results in a much richer understanding of the economic determinants of trait values.

“A Decision Tool for Selection of Feasible Stocker Cattle Production and Marketing Strategies.” *Lawrence Falconer, Texas A&M University; Don Keeling, W. West Cattle Company; James McGrann, Texas A&M University.*

An effective Decision Support System (DSS) for planning stocker cattle production scenarios was defined and implemented to analyze alternative production and marketing strategies for a large ranch located in South Texas. These decision points were then analyzed using deflated historic prices with the stocker cattle DSS to estimate relative levels of variation in simulated profit levels.

ANALYSIS OF FARM COMMODITY PROGRAMS (Moderator: *Larry D. Sanders, Oklahoma State University.*)

“An Econometric Analysis of Government Programs for Corn.” *Young-Hyo Ha and Fred C. White, University of Georgia.*

This paper examined how government programs influence the corn market. Interrelationships among the supply, domestic and export demand, and government stocks for corn were estimated. Policy simulation was implemented to examine the effect of a change in government policy variables such as effective support price, effective diversion payment rate, and research expenditures. The policy impacts on supply, domestic and export demand, ending stock, government costs, and market price were examined.

“Parity Prices: A Flaw and a Fix.” *Lloyd D. Teigen, ERS, USDA.*

Parity prices are moving average prices, adjusted for input price inflation, under their 1948 definition. A technical flaw in the inflation adjuster makes parity prices now nearly twice the market price level. Correcting the flaw would reduce parity prices and better align them with market prices. Lower parity price levels would affect market orders for fruits and vegetables, as well as certain price support operations.

“Estimation of Supply-Inducing Price for Regional Wheat Acreage Relationships.” *Manuel Del Valle and Daryll E. Ray, Oklahoma State University.*

A procedure was presented for constructing the supply inducing price for use in acreage response relationships for government program crops. The approach used the crop's government participation rate as the weighting criterion for combining the effective support price and a partly rational expected market price.

“Participation in Federal Crop Insurance.” *Linda Calvin, ERS, USDA.*

Two consecutive droughts focused attention on how the United States helps farmers deal with uncertain yields. This paper investigated the factors that influence the decision to participate in Federal multiple peril crop insurance. Participation increases as the returns to insurance increase and as the coefficient of variation of yield increases. Participation decreases as farmers reduce revenue risk with diversification into other crops, livestock, and

off-farm income. Participation in commodity programs is positively associated with participation in crop insurance. Older farmers are less likely to participate. Those with large farms and high debt/asset ratios are more likely to participate.

“Quantity of Feed Grains Placed Under Nonrecourse Loan.” *James A. Langley, ASCS, USDA.*

The quantity of feed grains (barley, corn, oats, rye, and sorghum) placed under nonrecourse loan was found to be rated negatively to the ratio of market prices to the loan rate. However, there is a significant difference in response for some crops depending on whether the ratio is greater than one. Loan placements are also positively related to the quantity of the crop eligible for loan, the expected price of the crop, and generic certificate payments to feed grain producers. Relevant elasticities were derived for use in analyzing loan placements.

RURAL AND COMMUNITY DEVELOPMENT (Moderator: *Mike Ellerbrock, East Texas State University*).

“An Analysis of Industrial Site Characteristics by the Hedonic Price Method.” *Warren Kriesel, University of Georgia at Tifton; Kevin T. McNamara, University of Georgia.*

Knowledge of the determinants of industrial site price is important for private developers and public administrators. Hedonic price theory was used to posit a model of site price as determined by a vector of site-specific characteristics and a vector of county-level productivity measures. OLS estimation yielded an R-squared of 65.7 percent, with seven of twelve variables significant and all with the correct direction of influence. The results provide information on (1) what location will maximize a proposed site's value, (2) what characteristics are most important in a proposed site, and (3) how the value can be increased most efficiently.

“An Economic Analysis of the Relationship Between School District Inputs, Family Inputs, Community Inputs, and Basic Skills Test Results for Louisiana.” *Donald R. Andrews, Nicholls State University; Bichaka Fayissa, Middle Tennessee State University; Uday S. Tate, New Mexico State University.*

Data at the school district level were used to estimate the relationship between basic skills test scores

and various dimensions of educational inputs. The inputs examined in the regression analysis included expenditures per student, student-teacher ratio, years of teacher's experience, and mean full-time teacher's salary along with other school related and socioeconomic variables. Expenditures per student are significantly related to basic skills tests results in a quadratic manner in the short run. Variables measuring family and community structure are shown to be significantly related to test performance. These results are important for policymakers who are responsible for the allocation of funds in the education process.

“The Impact of Community Attributes on In-Migration of Elderly Persons.” *Kevin T. McNamara, University of Georgia; Warren Kriesel, University of Georgia at Tifton.*

Attraction of retired persons has become an important economic development strategy for many communities seeking economic growth and diversification. The paper discussed the results of a Georgia county-level migration model for persons aged 55 years or more. The model estimated elderly migration as a function of economic and quality-of-life factors. The results suggest that access to health-related services, community economic stability, and social economies of agglomeration are important determinants of elderly migrant's location decisions.

“Cooperatives' Failures: The Case of Three Limited-Resource Produce Marketing Cooperatives.” *Forrest Stegelin and Lionel Williamson, University of Tennessee.*

In the 1980s, Kentucky has witnessed cooperative liquidations, which have been the source of much public attention. The question becomes: “Why the co-op demise?” Three limited-resource produce marketing cooperatives that failed, each with fewer than five years existence, were analyzed to identify reasons for the failures. By studying the situation analyses, insight was gained as to key elements to monitor for successful operation and economic efficiency in this era of alternative enterprises and agricultural production diversification strategies.

PRICE ANALYSIS (Moderator: *Barry R. Goodwin, Kansas State University*).

“Evaluation of Selected Fresh Vegetable Terminal Markets: A Stochastic Dominance Approach.” *Roger Hinson, Mooyul Huh and John G. Lee, Louisiana State University.*

Vegetable production can offer a high-valued cash crop alternative. While returns may be high, vegetables are perceived to have more risk than conventional row crops. This study used stochastic dominance analysis to evaluate terminal market price risk for four vegetable crops across five market locations. Results from the analysis identify differences in efficient market selection depending on the form that price risk follows. While vegetables as a whole are considered risky, substantial differences in the type of terminal market price variability existed between the commodities.

“A Hedonic Price Model of Texas Rice Markets: A Study of the 1987 and 1988 Marketing Years.” *Earl L. Taylor, Mark L. Waller, M. Edward Rister, Edward G. Smith, Warren R. Grant and Doyle A. Koop, Texas A&M University.*

During the 1980s, the U.S. rice industry experienced several structural changes. To investigate the impact of these structural changes, confirmed sales data from Texas bid/acceptance markets were analyzed. A hedonic price model was estimated to determine if the quality adjustments associated with the World Market Price are reflected in buyer behavior. The results of this preliminary study indicate that rice millers often value the quality characteristics of rough rice differently than those inherent values reflected by the USDA's adjusted World Market Price.

“Rational Expectations of Livestock Sector Prices.” *Barry W. Bobst and Robert W. Harrison, University of Kentucky.*

A rational expectations approach, developed by Wallis, was used to estimate price forecasting functions for beef cattle, hog, broiler, and turkey prices on quarterly data for the 1964-1987 period. Rationally-expected prices were estimated as functions of predicated values of exogenous variables specified in a structural model of the livestock sector. Quarter-step-ahead functions and forecasts are developed for all four species. In-sample mean square errors of beef cattle price predictions are decomposed to assess the stability of the underlying market structure. Results indicated that the quality of predictions is not deteriorating over time.

“The Impact of Macroeconomic News on Commodity Futures Prices.” *Dhaneshwan Ghura, North Carolina State University.*

This paper analyzed the immediate and delayed response of 20 commodity futures prices to macroeconomic news. Results show that the impacts of news from the credit and foreign exchange markets were important whereas news from weekly money supply announcements was not in the period 03/01/87-02/28/88. News from announcements of inflation and real activity indices was important for some commodities and not for others. Several commodities reacted to news with delay, indicating the possibility of inefficiency in commodity markets.

“The Impact of Corn Price Variability on Virginia Hog Supply.” *Suzanne D. Thornsbury and David E. Kenyon, VPI & SU.*

The impact of input price risk on Virginia hog producers was the focus of this study. Because feed represents the largest single expense in raising hogs, three alternative corn procurement strategies were compared using a mean variance procedure to determine their impact on hog production returns and risk. Corn costs from 1954-1988 were calculated for a 500 sow farrow-to-finish operation where a producer alternatively produces corn, purchases corn monthly, and purchases corn once a year with farm storage. Market hog prices were also compared to evaluate the effect of output price risk over the same time period. Results indicate that purchasing corn monthly results in substantial reductions in the overall cost and risk associated with hog production in southeast Virginia.

RISK AND FARM MANAGEMENT (Moderator: *Bruce L. Dixon, University of Arkansas*).

“Using Generalized Stochastic Dominance to Estimate Pesticide Value in Alternative Pest Management Strategies for Cotton.” *Kenneth W. Paxton, David R. Lavergne and Gene Burns, Louisiana State University.*

This paper used stochastic dominance techniques to estimate the value of a particular pesticide in cotton production. Thirty-two insect management strategies were evaluated to determine the efficient sets of strategies. Nine strategies were selected from the original set and analyzed with generalized stochastic dominance. Upper and lower bounds of risk premiums were estimated for these strategies for selected ranges of risk preferences. Risk premiums

varied among comparison strategies as well as for different ranges of risk preferences.

Risk and the 92 Year "Old Rotation," A Target-MOTAD Analysis of Sustainable Cotton Rotations. *James L. Novak, Charles C. Mitchell, Jr. and Jerry R. Crews, Auburn University.*

A Target-MOTAD analysis was used to assess the risks and returns of sustainable cotton crop rotations from Auburn University's 92 year "Old Rotation." Study results analyze continuous cotton, with and without winter legumes; two years of cotton-winter legumes-corn, with and without nitrogen fertilization; and three years of cotton-winter legumes-corn and rye-soybeans double cropped. Thirty observations on deviations from target income were used to identify the optimal sustainable rotation(s). Study results suggest that diversification in rotations as well as diversification in crop mix can be used to reduce risk for a given level of target income.

"Prediction of Subjective Yield Expectation Using Farm Records." *James W. Pease, Ernest W. Wade, VPI & SU; Jerry S. Skees, University of Kentucky; Chandra M. Shrestha, Pennsylvania State University.*

Researchers often use historical yields as proxies for subjective expectations for yields. Even when farm level yields are available, correspondence between forecasts estimated from historical yields and subjective forecasts is rarely examined. This research took yield series and subjective expectations and examined whether correspondence can be observed between records-based and subjective forecasts. Records-based forecasts were estimated by alternative procedures, each simulating different cognitive procedures that may be used by farm operators to estimate future yields. Results indicate that operators may use simple procedures to estimate yields, which could alter purchase decisions for products such as crop insurance.

"The Effect of Farm Size on Costs of Reducing Risk Through Increased Crop Machinery Capacity." *Glenn A. Helmers and Hisham El-Osta, University of Nebraska.*

The objective of this study was to quantify the additional machinery costs that accompany higher probabilities of completing tillage and planting for corn and soybeans. A Mixed Integer Programming model utilizing machine timeliness constraints was used with labor and machinery selection endogenized. Analyses were completed for both corn and soybeans as well as for diversified production. Completion probabilities investigated were 50, 75,

85, 90, and 100 percent. Cost increases for these probabilities ranged from \$.02 to \$.09 per dollar of output. While for corn increased costs were greater for small farms than for large farms, the opposite was observed for soybeans and diversified production.

POLICY ISSUES FOR THE DAIRY AND TOBACCO PROGRAMS (Moderator: *Rodney Clouser, University of Florida.*)

"Scale Neutrality of Bovine Somatotrophin: Ex Ante Evidence from the Southwest." *Henry Kinnucan, Joseph J. Molnar and Upton Hatch, Auburn University.*

Bovine somatotropin (BST), a new technology capable of enhancing a cow's ability to produce milk 7-23 percent, is expected to be available for commercial use in late 1990. Ex ante survey procedures were used to determine the potential effect of BST on the size distribution of dairy farms in the Southeast. Results of logit analysis indicate a positive net correlation between farm size and (1) farmers' knowledge of BST and (2) intentions to adopt early, suggesting that BST will not be scale neutral. An estimated "price elasticity" for BST of -1.8 to -2.1 indicates an elastic demand for the input. Therefore, price may be an effective instrument for attenuating the scale-bias.

"The Linkage Between the Farm Level Decision to Use BST and Aggregate Milk Supply Response." *S.J. Monson and M.J. Monson, University of Missouri.*

Beginning with a decision criterion for the usage of BST on an individual cow, a theoretical model was developed to ascertain the effects of BST on the aggregate dairy supply response function. The use of BST on an individual cow is a function of output and input prices, feed efficiency, the response rate to treatment, and the cost of treatment. Application of the decision rule to the aggregate dairy herd indicates that the supply response is greater with the availability of BST than without it.

"Effects of Alternative Tobacco Policies on the Financial Performance of Tobacco Farms." *C. Stassen Thompson and S. Sureshwaran, Clemson University.*

Results of a simulated financial analysis of tobacco farms were reported as an information base for evaluating the financial consequences of alternative policy options. A large number of small farms

were under severe financial stress in 1984. Some small farms that may not survive are more efficient in relation to investment vis-a-vis medium-sized farms that may survive. Opportunities for these farms to expand and thereby earn an income sufficient for family consumption expenditures and reinvestment in the business are limited by the uncertainties involving the tobacco program.

“Measures of Social Benefits of Eliminating Government Programs for a Commodity with Mandatory Output Control.” *S. Sureshwaran and C. Stassen Thompson, Clemson University.*

Impacts of eliminating the mandatory tobacco quota program on representative farms of different sizes and technologies, and on the South Carolina economy, were examined. Various welfare measures were used to evaluate impacts of different levels of analysis. Gross output, regarded as the most appropriate measure of social welfare, increased in the intermediate-run and long-run following deregulation by \$28 and \$31 million, respectively.

QUANTITATIVE AND RESEARCH METHODS (Moderator: *Stephen R. Koontz, Oklahoma State University*).

“An Application of the Tolerance Approach of Sensitivity Analysis to MOTAD Solutions.” *Thomas R. Harris and David K. Lambert, University of Nevada at Reno.*

Mathematical programs that incorporate producer behavior in the presence of risk have been developed and used extensively during the past decade. However, differences between observed and risk model results have occurred. This paper examined the role of resource availability uncertainties on solutions of risk models. Tolerance procedures for sensitivity analysis were applied to a MOTAD model to determine ranges that the right-hand side constraints can vary individually and simultaneously without causing a change in the basis solution.

“Climatic Variables and the Distribution of U.S. Corn Yields.” *Michael S. Kaylen and Suffyanu S. Koroma, University of Missouri.*

This paper presented a U.S. corn yield model that incorporated monthly climatic indices. The model is unique in that it includes a stochastic trend term. This term suggests yield growth has been leveling

off since reaching a peak in 1963. The estimated model was used to depict the distribution of 1989 corn yields. The entire distribution, as opposed to just the first two moments, is of interest because the distribution is skewed. The model appears to be reasonable in that the expected yield for 1989 is in close agreement with USDA estimates. The model was also used to show the effects of various climatic changes on expected yield.

“Rational Bubbles and Land Prices.” *Jim Baffes and Robert G. Chambers, University of Maryland.*

Land-price models explain price behavior based on market fundamentals, i.e., the current price of land as the discounted sum of future net returns. This paper tested whether land price fluctuations can be attributed to a rational bubble. The test is performed using state-wide data for the U.S. farm-land market. The general findings suggest the existence of rational bubbles for all states.

“Uncertainty in Regression Coefficients and Value Assessments.” *Hector O. Zapata, John F. Denison, and Harlon D. Traylor, Louisiana State University.*

This study examined the sensitivity of estimated coefficients in a hedonic price model to measurement error in all variables. It compared OLS estimates to those of an errors-in-variables model (EVM). While the OLS model appeared to yield useful information, it was not as complete and reliable as that resulting from the EVM. It was found that some parameter estimates are unbounded and that in cases where OLS estimates would prescribe no quality control measures, the EVM demonstrated that further control measures were economically justified.

“Cointegration: Some Results on U.S. Cattle Prices.” *David A. Bessler, Texas A&M University.*

Cointegration was reviewed. Tests for non-stationarity and cointegratedness were considered. These were proposed as useful in sorting out market efficiency and lead-lag relationships in cash and futures markets. An application to U.S. cattle prices offered weak support for an underlying cointegration-type relationship between the two data sets.

POTPOURRI OF MARKET ANALYSIS

(Moderator: *Carter Price, University of Arkansas*).

“The Impact of the 65 MPH Speed Limit on Agricultural Hauler Schedule Tightness.” *Rich Beilock, University of Florida.*

Despite rising concerns regarding motor carrier safety, in the spring of 1987 Congress passed legislation permitting a return to speed limits above 55 MPH along certain roadways. Produce haulers are known to operate under unusually tight schedules. This study examined the impact of higher speed limits on schedule tightness. The results indicate that schedules have remained virtually unchanged. Therefore, higher speed limits have reduced schedule tightness. A tendency was found for schedules not to account fully for legally mandated driver rest periods. Finally, regulated carriers were found to maintain tighter schedules than independents.

“Socioeconomic Determinants of Attitudes Toward the Use of Bio-Engineered Products in Food Production.” *C. Halbrendt, University of Delaware; W. Florkowski, University of Georgia at Griffin; L. Sterling, University of Delaware; C. Huang, University of Georgia at Griffin.*

Results from a survey, which asked questions regarding attitudes toward bio-engineering, were analyzed to determine if socioeconomic characteristics played a role in determining these attitudes. The study showed that these characteristics do have explanatory power in predicting attitudes. Education and gender were the strongest of these characteristics, followed by geographic location, age, and income.

“The Synthesis of Composite Forecasts in the Decision-Making Process: A Comparison for U.S. Hog Production.” *Christopher S. McIntosh and Kamil H. Shideed, University of Georgia.*

A primary use of forecast information is to improve decision making. When more than one forecast is available, analysts can improve forecast accuracy, in a mean squared error sense, by using a composite forecast. The mean squared forecast error, however, may not be the appropriate metric for evaluating alternative forecasts. The paper examined four different composite forecasting approaches, constructed from three forecasts of U.S. hog prices. The forecasts were evaluated using a parametric test for significant differences in mean squared forecast errors and using a decision-oriented “modified mean squared error” measure.

“Estimating the Supply Impact of the Milk Diversion and Dairy Termination Programs.”

Bruce L. Dixon, Dwi Susanto and Calvin R. Berry, University of Arkansas.

A two-equation, random-coefficient, regression model of commercial milk production was estimated using monthly observations from 1983 through 1988 for the 21 major milk producing states in the United States. Policy variables were entered into the model to represent the impact of the Milk Diversion Program (MDP) and the Dairy Termination Program (DTP). Results show that the MDP and DTP are both highly significant. The MDP was primarily short term in impact; the DTP has been longer term. The programs’ effectiveness across states varied considerably. There has been a positive interaction effect of the MDP on DTP effectiveness.

PRODUCTIVITY GROWTH AND TECHNOLOGICAL CHANGE: ANALYTICAL METHODS AND POLICY ISSUES (Moderator: *George Norton, VPI & SU*).

“Competitive Pressure and Productivity Growth: The Case of Florida.” *Nicholas G. Kalaitzandonakes and Timothy G. Taylor, University of Florida.*

The relationship between the degree of competitive market pressure and the rate of productivity growth was empirically investigated with a case study of the Florida fresh winter vegetable industry. The empirical results indicate that those crops that faced considerable competitive pressure exhibited significant productivity growth while those crops that faced minimal competitive pressure generally exhibited little growth in productivity. Thus, the hypothesis that competitive pressure is positively related to productivity growth is supported.

“Capacity Utilization and the Measurement of Agricultural Productivity.” *James H. Hauver, Jet Yee and Eldon Ball, ERS, USDA.*

The study developed a theoretical model of capacity utilization and productivity measurement, which is estimated by full information maximum likelihood (FIML) techniques over the period 1948-1979. Primal and dual capacity utilization measures were developed, together with a multifactor productivity index, adjusted for capacity utilization. Capacity utilization is usually above but also close to 1. Adjusting for capacity utilization reduces productivity growth by more than half. An analysis of shadow prices for capital and self-employed labor indicates

that a capital shortage and self-employed labor surplus prevailed throughout the entire sample period.

“Rates of Return to Louisiana Agricultural Research and Extension.” *Abiodun Ojemakinde, Albany State College; Mark Lange, Louisiana State University.*

This study provided the first state-level separate marginal rates of return to public agricultural research and extension expenditures derived from a normalized profit function application to the major agronomic crops of Louisiana for the period 1949-1986. The estimated marginal rates of return to research and extension expenditures are 19.61% and 15.7%, respectively. The methodology shown appears to be replicable for most states. These marginal rates of return do not capture benefits associated with other products, gains in family environment, or community development.

“Benefit Spillovers, Intergovernmental Grants, and Federal Deductibility of State Taxes: Implications for Agricultural Research Funding in the Southern Region.” *David B. Schweikhardt, Mississippi State University.*

The agricultural research system faces important policy issues regarding the appropriate method of financing agricultural research. These issues were examined by combining public finance theory with returns to research literature. Results suggest: (1) the Federal government can promote optimal research investment by providing matching grants to the states; (2) competitive grants are appropriate when states retain a small share of the benefits of research; (3) because fewer taxpayers in the southern region itemize their Federal tax returns, the cost of research is higher for southern states; and (4) the Hatch formula might be changed to provide more optimal resource allocation. Such changes could reduce Hatch funds for southern states.

TRADE POLICY IMPLICATIONS TO THE UNITED STATES (Moderator: *Stanley Fletcher, University of Georgia.*)

“Assessing Model Assumptions in Trade Liberalization Modeling: An Application to SWOPSIM.” *Stephen L. Haley, Michael T. Herligy, ERS, USDA; Brian Johnston, Australian Bureau of Agricultural and Resource Economics.*

Economists concerned with modeling trade liberalization under the GATT must deal with the effects of removing U.S. land set-aside requirements and

deficiency payments. This paper reviewed the results of several sensitivity tests of ERS’s Trade Liberalization (TLIB) model. The range of outcomes for various acreage reduction specifications is not wide enough to cast doubt on the core implications of the TLIB model. More significant challenges to TLIB results come from two sources: (1) the degree to which agricultural resources are believed to be immobile and (2) the degree to which deficiency payments are assumed to be decoupled from farmers’ decisions of how much to produce.

“The Impact of the Canada-U.S. Free Trade Agreement on Southeastern Farm Income.” *Nancy S. Dykes and Glenn C.W. Ames, University of Georgia.*

A small, world-trade liberalization model was used to estimate the impacts of the Canada-U.S. Free Trade Agreement (FTA) on southeastern producers’ total revenue from 23 commodity groups. Corn, soy-oil, and beef producers would suffer revenue losses under the FTA while poultry meat, soybean, and other oilseed producers would benefit as a result of the agreement.

“An Analysis of the Export Enhancement Program for Wheat.” *Kenneth W. Bailey, University of Missouri at Columbia.*

A major goal of the Export Enhancement Program (EEP) was to expand U.S. exports. This objective was empirically tested in this study for the case of wheat. A conceptual model reflecting the impact of the EEP on global wheat trade was developed and incorporated within a nonspatial equilibrium model of world wheat trade. The results suggest that the EEP expanded U.S. wheat exports 20 percent in 1986/87, but only 7 percent in 1987/88. Most of the actual expansion in 1987/88 was due to nonprice factors that increased Soviet and Chinese imports.

“Impact on the U.S. Raw Cotton Market of Removal of the Multifiber Arrangement: Some Preliminary Results.” *Shangnan Shui and John Beghin, North Carolina State University.*

A multimarket model of the cotton, textile, and apparel industries was used to quantify the impact on domestic raw cotton of the removal of the Multifiber Arrangement. This trade policy reform would decrease domestic demand for U.S. cotton but boost cotton exports. Overall, U.S. cotton producers would lose.

FARM INPUTS, RECREATION SUPPLY, AND RECREATION POLICY (Moderator: *Teofilo Ozuna, Jr., Texas A&M University.*)

“Estimation of Derived Demands for Farm Inputs Using Primary Census Data.” *Clayton W. Ogg, U.S. EPA.*

Cobb-Douglas estimates of derived demand for variable inputs suggest that western irrigator's demands are more responsive to their price compared with results from previous studies for the U.S. as a whole. Energy demand was the most elastic. Input use was especially responsive to output price.

“Effective Recreation Opportunities (EROS) Indices: A Computable Recreation Supply Measure.” *Donald B.K. English, University of Georgia; H. Ken Cordell, U.S. Forest Service.*

Recent conceptual developments in recreation supply have included economically meaningful measures including the effective acreage equivalent (EAE) and effective price (EP). Both measures consider the effectiveness of recreation resources in serving the population, as well as the costs of using those resources. Unfortunately, both also require visitation data that is not routinely collected. This paper developed another supply measure, the Effective Recreation Opportunities (EROS) index, which can be calculated from existing resource and visitation data. The paper outlined the theoretical background and calculation methods for EROS. EROS is shown to be theoretically consistent with both EAE and EP.

“The Determination of an Optimal Policy for Protecting Ground Water Control.” *Wen-Yuan Huang and Noel D. Uri, ERS, USDA.*

An analytical framework was presented that identifies the trade-offs that a regional authority desiring to enhance ground water quality is confronted with as it strives to balance the preferences of farmers and households while endeavoring to maximize net regional welfare. The basic rule developed indicates that the regional authority must choose a policy whereby any increase (decrease) in regional income is just equal to the decrease (increase) in net benefits to households.

“The Conservation Reserve Program: Insight From Modeling Representative Farms.” *J. Dixon Esseks, Northern Illinois University; Michael E. Klingebiel, Kemper Associates; Stephen Kraft, Southern Illinois University.*

One set of factors influencing the attractiveness of the CRP is the relative returns from land placed in the CRP to the value of the same land when used on the farm. Using five representative farm models from five different areas of the Midwest, the returns to land eligible for the CRP were studied within a whole-farm context using linear programming. The results indicate that the attractiveness of the CRP changes with higher commodity prices, rental rates, availability of labor, and the presence of livestock enterprises.

HEDGING STRATEGIES, PRICE DISCOVERY, AND FUTURES MARKET (Moderator: *Michael S. Kaylen, University of Missouri*)

“The Effect of Alternative Criteria on Recommended Hedging Strategies for Missouri Soybean Producers.” *Richard K. Rudel and Francis McCamby, University of Missouri.*

This paper compared the hedging ratios produced by the mean-variance criterion with those produced by two specific versions of the mean-target absolute deviations (mean-TAD) criterion. This comparison was made for twelve simple hedging situations. The mean-TAD criterion gave slightly larger initial ratios in all cases. For one target level, the mean-TAD criterion gave ratios that were independent of the levels of the cash and futures positions unless constraints were imposed just as the mean-variance criterion does. This result can be attributed to the specific target level chosen.

“A Measure of Interfirm Competition in Price Discovery: An Application to Fed Cattle Slaughtering.” *Clement E. Ward, Oklahoma State University.*

A new measure of market power, the competition index, was described and compared with current measures of market power (concentration ratios, Herfindahl index, and entropy index). The competition index, unlike current market power measures, accounts for the vertical dimension in interfirm competition resulting from vertical coordination alternatives (e.g., vertical integration and forward contracting). Interfirm competition is shown to in-

crease for fed cattle sales (i.e., the competition index declines) as number of buyers increases, as variance of buy market shares decreases, and as captive supplies decline.

“A Simultaneous Futures Model for Non-storables.” *Livia Cloman Lynch, Berry College; James E. Epperson, University of Georgia.*

Cash-futures price relationships for nonstorable commodities have received less attention than those for storable commodities. This paper explored and analyzed this important relationship. A theoretical cash-futures model for nonstorable commodities was developed and empirically tested using data for the live beef market. The Two-Step Two-Stage Least Squares methodology was used, and the empirical application focused on the nearby price relationship.

“Hedging with Margin Requirements and Imperfect Capital Markets.” *Kenneth H. Mathews, Jr., ERS, USDA; Duncan M. Holthausen, Jr., North Carolina State University.*

A multiperiod minimum risk hedging model was developed and used to examine the effects of margin requirements and two capital market imperfections — differential interest rates for lending and borrowing and debt constraints. We found that each reduces the optimal hedge ratio, but not by enough to mirror actual hedging practice.

DEVELOPMENT AND TRADE (Moderator: *C. Parr Rosson, Texas A&M University.*)

“Patterns in Agricultural Protection.” *Lilyan E. Fulginiti, Iowa State University.*

Why do poor countries tax agriculture more than other sectors while rich countries subsidize farmers? Using the neoclassical economic theory of the political market for distortionary policies, an explanation was sought by examining changes to factors affecting the supply and demand curves in the political market. The aggregate effect of these changes is to shift both the demand curves and the supply curves to the right as industrialization proceeds.

“The Impact of Foreign Assistance on Agricultural Growth.” *George W. Norton, Jaime Ortiz, VPI & SU; Philip Pardey, University of Minnesota.*

Foreign development assistance (aid) takes many forms: financial, technical, and food. The rationale for aid rests on humanitarian, political, and economic grounds. The effectiveness of aid to agriculture was assessed empirically using a production

function approach with cross-sectional, time-series data for 98 countries. Results indicate that aid to agriculture has had a positive and significant impact in Asia and Sub-Saharan Africa but little effect in the Middle East and Latin America. Debt problems may be influencing the effectiveness of aid in Latin America. Aid effects did not differ across countries by income level or by importance of the agricultural sector.

“The Impacts of Official Development Assistance of Growth, Savings and Imports.” *Mylene W. Kherallah, E. Wesley, F. Peterson, and Fred J. Ruppel, Texas A&M University.*

Estimates of the relationship between Official Development Assistance (ODA) and income growth have been inconclusive. Relationships between aid, growth, savings, and imports were estimated using a four-equation simultaneous system over a cross-section of 56 LDCs from 1980 to 1985. ODA was insignificant in the income growth and savings equations but was positively related to LDC imports. It appears that ODA is distributed to countries with low income and low savings rates and serves to build trade ties.

“Prospects for an Extended North American Free Trade Area: Opportunities, Barriers, and Recommendations.” *Amy L. Angel, Fred O. Boadu and Fred J. Ruppel, Texas A&M University.*

The U.S. - Canada Free Trade Agreement has renewed interest in economic integration as a trade and economic policy option for the United States. Attention has turned southward to relations with Mexico, but few studies have been done that give more than a casual analysis of this option. Free trade could also be extended toward the Central American and Caribbean nations. This paper surveyed the issues involved with extended North American free trade: historical trade relations, incentives for free trade, effects of free trade on the region, and obstacles to a successful agreement. Policy alternatives were also discussed and suggestions for a fruitful accord were given.

“The Nexus of Development and Trade: An Examination Involving the United States and Asia, Middle East.” *Thomas L. Vollrath, ERS, USDA.*

Two significant changes that have recently occurred in the world economy are increased economic interdependence among countries and dramatic shifts in trade patterns and the location of production. Perennial concerns are expressed about the impact of U.S. agricultural development assistance to developing countries on domestic agricul-

tural income and general economic welfare. In this study, which investigates development and trade connections, the international economy was divided into three primary producing sectors and five manufacturing sectors. Bilateral comparisons of global competitiveness patterns across these economic sectors point to economic complementarity between the United States and countries in Asia and the Middle East.

EMERGING FARM AND ENVIRONMENTAL POLICIES: IMPLICATIONS FOR RESOURCE USE AND ECONOMIC WELFARE (Moderator: *Lynn Reinschmiedt, Mississippi State University.*)

“Adoption of Low-Input Farming Systems Under Conservative Compliance.” *Dana L. Hoag and Kevin Jack, North Carolina State University.*

The Food Security Act of 1985 outlined programs for both soil conservation and reduced chemical pollution from agriculture through the use of low-input systems. These systems are not necessarily consistent, and conservation compliance will likely determine the net outcome of the two objectives. An analysis on an example farm in North Carolina showed that conservation compliance can weaken incentives for low-input systems. However, circumstances allow for both increased and decreased use of low-input systems under conservation compliance plans.

“Farm Production Decisions Under Conservation Compliance.” *Herb A. Holloway and Dana L. Hoag, North Carolina State University.*

A study of seventeen North Carolina farms revealed that commodity programs produce incentives for using erosive practices. The restriction against producing program crops on nonbase acres increased erosion most. Therefore, conservation compliance can reduce erosion on farms that discontinue using commodity programs because they lose the commodity program incentive for erosive practices. Farmers with high yields and high proportions of base acreage were more likely to bear the cost of conservation measures and to continue using commodity programs. About half of farmers in Stanley County, North Carolina would find it less profitable to use commodity programs with required conservation measures than to have no programs at all.

“The Economic Implications of Banning a Widely Used and Relatively Cheap Pesticide: The Case of Parathion and Fruits and Nuts.” *Walter Ferguson, ERS, USDA; John Bratland, Department of Interior.*

Regulatory pesticide bans generally involve impacts that include changes in cost of production and yield and quality of commodities affected by the ban. A model was derived to address simultaneously the implications of cost, yield, and quality impacts. The benefits of parathion use were illustrated by analyzing the economic implications of using alternatives to parathion for 14 fruit and nut crops. National estimates of the economic impacts of a parathion ban on growers (both the users and non-users of parathion) and on consumers (both domestic and foreign) were provided.

“Estimating Program Participation Rate and Acreage Responses of Participants and Nonparticipants for Rice: An Application of Implicit Revenue Function Approach.” *Dean T. Chen and Shoichi Ito, Texas A&M University.*

This paper developed an alternative approach for estimating program participation rate and acreage responses for U.S. rice using the implicit revenue function approach. The empirical results show that the impact of changes in farm prices on the participation rate is statistically significant and inelastic during the recent period. In addition, farm incomes of the participants are inelastic with respect to change in farm prices due to government protection, while the incomes of nonparticipants are elastic. Further, acreage responses to changes in farm prices are found to be quite different between program participants and nonparticipants.

FINANCIAL CONDITION, CREDIT ASSESSMENT, AND PUBLIC FARM CREDIT PROGRAMS (Moderator: *Danny A. Klinefelter, Texas A&M University.*)

“An Empirical Examination of Farm Financial Ratios as Predictors of Future Farm Performance.” *Jana L. Smith and Phil L. Kenkel, University of Kentucky.*

Farm financial ratios are extensively utilized by lenders and other professionals to evaluate and predict the farm firm financial situation. However, the predictive power of farm financial ratios has received little attention. This study examined the predictive power of financial ratios in an empirical setting using financial data from 362 farm firms

during the 1984-1986 time period. The performance of simple decision rules was also examined. This study indicates that financial ratios have a high predictive potential, but incorporating this information into simple decision rules for lender use was generally unsuccessful. This study also indicates that financial ratios are more useful in predicting farms with favorable future financial situations.

“Measuring Farm Financial Stress: A Kentucky Case Study.” *Kurt Stephenson, VPI & SU; Timothy Collins, Louis E. Swanson and Jerry R. Skees, University of Kentucky.*

Four different farm financial types were identified using panel survey data. Serious financial stress in Kentucky is more likely to be income related and not debt related.

“Development of an Expert System to Evaluate the Ability of An Agricultural Firm to Support Operating Credit.” *Kedric Karkosh and James McGrann, Texas A&M University.*

Good financial management requires accurate financial statement preparation and analysis. The analysis and understanding of these statements has limited their use in the past. This paper developed a prototype expert system to evaluate the ability of the farm or ranch firm to support additional operating credit. With this system the producer can now have the expertise to evaluate his financial position and to make a more informed financial decision. The lender can use the system as a second opinion to his own analysis; this system can help point out inconsistencies and problem areas in the lender's analysis.

“The Cost Effectiveness of Farmers Home Administration Guarantee Farm Loan Program.” *William Herr, Southern Illinois University.*

FmHA farm lending has shifted to loan guarantees from direct lending. This article developed a model for examining the cost effectiveness of the change. A major finding is that credit supply and demand elasticities are important variables determining effectiveness of the change in credit delivery modes. Relating program costs to net credit flows, after allowing for crowding-out, substantially increases the cost of public farm credit programs from that shown by previous studies.

USE OF SIMULATION MODELS (Moderator: *Roland Roberts, University of Tennessee*)

“Stochastic Temperature Impacts on the Profits of a Vegetable Processing Plant: A Tomato Example.” *Raymond J. Schatzer and Abdulhamid A. Elmagrabi, Oklahoma State University.*

A simulation model was used to analyze the impact of stochastic temperature on the flow of raw tomatoes into a tomato processing plant. The resulting random yields impact on the potential of the processing plant to make a profit. The impact depends upon the product mix, size of the processing plant, and the acres of raw product.

“A Comparison EPIC Model and Statistically Simulated Crop Yield Distributions.” *Kelly J. Bryant and Ronald D. Lacewell, Texas A&M University.*

Economists often need expected crop yield distributions for production, resource use, risk, and farm policy studies. Traditionally, statistical models and methods have been used to simulate many crop yields in order to build a distribution. More recently, crop growth simulation models offer economists an opportunity to develop yield distributions under various tillage practices, crop rotations, and irrigation strategies. The dependability of the crop model results and how they compare to more traditional simulation methods is of concern. This study compared the simulated yields of the EPIC crop growth simulation model to two statistical methods of yield simulation for a two-crop dryland rotation of the Texas high plains. Results show that EPIC gave distributions different than those generated by the other simulation methods. The crop yields generated by EPIC should not be considered absolutely correct and should be analyzed as a percent or direction of change from a base EPIC run.

“Use of Empirical Distributions in Simulation Models: An Extension Using Meteorological Data.” *Larry W. VanTassel, University of Tennessee; James W. Richardson and J. Richard Conner, Texas A&M University.*

This paper presents a procedure using empirical probability distributions to provide intra/inter-temporal correlation of any random variable that can be represented by an inverse function (F^{-1}), an intratemporal correlation matrix, and a fixed intertemporal relationship. Using empirical probability distributions and meteorological variability, an example was developed with endpoints of the empirical functions distributed exponentially, stacked, and standard. The statistical properties observed in the

historical series appears to be closely maintained in the simulated series.

“An Evaluation of the Importance of the Net Operating Loss Carryback to Oklahoma Cow-Calf Producers.” *Randall D. Little and Daryll E. Ray, Oklahoma State University.*

This study investigated the importance of the net operating loss (NOL) carryback provision of the

Federal tax law to a typical cow-calf producer under stochastic production and price conditions. Simulation modeling was used to generate estimates of adjusted gross income. Income taxes and after-tax income are derived from the adjusted gross income, both with and without the NOL carryback.

POSTERS PRESENTED

Annual Meeting, SAEA, Little Rock, Arkansas, February, 1990.

“Instructional Use of Computers: A Comparison of Selected Schools in the U.S.” *Kim Jensen, Burton English, and Robert Goodman, University of Tennessee.*

The purpose of this study was to compare instructional use of computers in the southern region versus other regions. A 1989 survey of heads of departments of agricultural economics regarding computer use was conducted. Results revealed respondents within the region had fewer computers available for undergraduates than other respondents but compared favorably in computers for graduate students. A higher percentage regionally had instructional labs, used primarily by undergraduates. Graduate students usually used research laboratories. Most respondents believed computer literacy was critical to employability and ability to conduct research. Expansion of computer availability to students was a high priority, if given additional funding.

“Kentucky’s 1890 Extension Small Farm Program: Using Paraprofessionals to Educate Limited-Resource Farmers.” *Marion Simon, Kentucky State University.*

Cooperative extension’s traditional methods do not always reach limited-resource farmers or fit their attitudes, educational levels, community status, off-farm job constraints, or financial constraints. Kentucky State University’s 1890 Small Farm Program uses paraprofessionals to teach improved production and marketing practices to limited-resource farmers in eleven Kentucky counties. This pilot program has been successful in educating “hard-to-reach” small farmers by an on-farm, “one-on-one” approach. The paraprofessional’s ability to gain the farmer’s confidence has provided a vital link between “hard-to-reach” farmers and Kentucky’s Cooperative Extension System.

“In-Class Computer-Generated Presentation Techniques.” *Joe T. Davis, David L. Debertin, and Loys L. Mather, University of Kentucky.*

This poster displayed and provided a demonstration of instructional materials developed at the University of Kentucky using computer-generated graphics. The demonstrations were based on materials developed in five different classes, ranging from freshman to graduate level. Advantages and disadvantages of the technique were delineated along with hard copy examples of materials used in the various classes. Software and equipment requirements along with an estimated cost of developing the capability at another institution were also presented. A micro computer was used to demonstrate actual materials used in classes using the projection technology.

“The Establishment of a Consumer Information Management System.” *Chung L. Huang and Sukant Misra, University of Georgia.*

The study presents the concept and operation of a Consumer Information Management System (CIMS) for collecting primary data to address consumer-oriented research issues. The main purpose of CIMS is to create an easy-access and ready-to-use system that can serve many potential surveys individually or simultaneously as needed. The discussion focuses on the advantages and disadvantages of such a system and on the importance of maintenance to keep panels representative over time. The CIMS data base may be expanded via networking with similar operations among researchers in other parts of the country.

“State Farm Credit Programs.” *James Mikesell, Douglas Duncan, and George Wallace, Texas A&M University.*

While Federal credit subsidies to farmers are well known, many states also subsidize farm borrowers.