Topics Available for Thesis Research in Agricultural Economics

Purdue University

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Institutional Innovation in the Cocoa Trade

Chocolate manufacturers and cocoa producers argue that the world cocoa market has become “broken”, with a wide gap between farmers’ incentives and consumer demand for quality. One factor may be the elimination of state marketing agencies in West Africa, allowing multinational cocoa processors (ADM, Cargill and Barry Callebaut) to exercise market power against both farmers and chocolate manufacturers. Other factors may be changes in consumer information and preferences, yielding increased willingness to pay for the environmental or social attributes of production processes. An important issue related to cocoa trade and social attributes of production, driving the overall USAID effort now, is child labor. This study asks whether and how the introduction of new marketing institutions (e.g. identity preservation, Fair Trade, mega-cooperatives) can help the world cocoa market become more competitive, aligning farmers’ incentives with consumers demand, and addressing social concerns related to cocoa production.

Food Security Following Trade Liberalization

Many developing countries fear that with trade liberalization they have given up tools to address both chronic and acute food insecurity. Hence, food security is prominent in their WTO negotiating positions on agriculture. But economists argue that trade liberalization should enhance food security, enabling imports to offset production shortages. The purpose of this research is to determine how governments address long-run chronic and short-run acute food insecurity, and whether that has changed as a result of the considerable trade liberalization already undertaken by developing country food importers, largely due to conditionality of structural adjustment programs. Lessons will also be drawn for the design of future trade policy reforms that could further impact food security.
Policy and Poverty in Mozambique

In 1992, Mozambique was labeled the “poorest country in the world." After one decade of fairly rapid economic growth, the country has shed that unwanted distinction. However, the distribution of growth remains a question. In 1997, a detailed household survey was conducted. A follow-up survey was conducted in 2002. Analysis found that poverty had declined substantially in the interval between the surveys. The challenge now is to design policies that will foster continued poverty reduction.

In seeking to meet this challenge, we plan to build upon recent advances in empirical analytical methods that preserve much of the rich detail of microeconomic analysis, while also incorporating information about the macro-economy and the structural relationships that exist in the economy. The analysis of micro-data, such as the 2002 household survey, within a macro-structure permits analysis of a wider range of policies, with more realistic results, than either approach can contribute on its own. Relevant topics that could be addressed by this methodology include: the effects of Mozambique’s current economic growth on poverty and inequality (i.e., the distribution of that growth, by household and by region), the impact of improved agricultural technology, the effects of globalization (especially reduced trade barriers and increased standardization of commodities) on the real incomes of the poor, and the impact of HIV/AIDS on the poor.

Tax Efficiency and Tax Incidence

There is widespread recognition in Mozambique that government finances have to be improved, the share of GDP accruing to the government has to be increased, and issues of fiscal efficiency, incidence and fairness of the tax system have to be addressed. While government revenue accounts for only about 15% of GDP, approximately half of economic activity is in the informal sector, which is difficult to tax. Existing rates for the formal sector are such that their distortionary effects need to be considered.

This research initiative seeks to develop a comprehensive data system that will support detailed analysis of fiscal incidence and implement selected analytic methods appropriate for fiscal analysis, including economy-wide general equilibrium modeling. The research strategy is to integrate the microeconomic household data, the multisectoral social accounting matrix, and macro national accounts, including detailed government accounts. The resulting data system will provide a comprehensive mapping of income-expenditure flows in the Mozambique economy, which is necessary for any detailed fiscal and poverty analysis. This data system will also be used to improve the quality of revenue projections.
Currently, corn rootworm management consists primarily of controlling larvae using crop rotation and soil insecticides. In the mid 1990s, the use of insecticides on corn after soybeans has increased dramatically, from 10% in Indiana in 1994, to 65% in 1996. This is an interdisciplinary project with entomology and weed science. The economic portion has two components. First, a cost-benefit analysis will be used to identify the maximum potential benefit from the transgenic corn. The economists will collaborate with the entomologists, weed scientists and growers to identify the cost differences both in terms of materials, and changes in labor costs. Second, a survey will be used to identify those growers who are most likely to adopt this transgenic corn, taking into account corn rootworm pressure, current control methods, and marketing opportunities.
TIMOTHY G. BAKER

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**Risk Management**

This project is to provide the background research for the department's risk management extension work. Essentially risk management alternatives are to be identified (marketing alternatives, hedging, crop insurance, diversification, revenue insurance, etc.), then the probability distribution of returns under the various alternatives will be determined.

**Financing and Hog Contracting**

This is a joint project with the University of Illinois. A survey of lenders attitude toward lending for contract vs. independent production has been completed and a simulation model is being built. There is the possibility that a student could define a thesis topic that would complement the work under way.

**Stochastic Dominance**

The literature on stochastic dominance includes the work by Jack Meyer on stochastic dominance with respect to a range of risk aversion. Meyer’s procedure uses a range of coefficients of absolute risk aversion. There is little agreement in the literature on the relevant range of absolute risk aversion, and many times stochastic dominance is performed on returns per acre and returns per dollar invested. This research is to rework the method of Meyer to use relative risk aversion. There is much less controversy regarding the range of relative risk aversion, and some of the problems associated with multiplicative gambles are alleviated.

**Machinery Cost**

This project is to use the machinery repair and remaining value equations in the literature to determine the marginal cost of using machines. Such costs are very relevant in the partial budgeting situations that frequently arise. The current literature contains frequent reference to average costs, but the marginal cost is often inaccurately assumed to be equal to the current repair cost per unit of use (without considering future repairs, remaining value, and trading time).
MICHAEL D. BOEHLJE

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**Industrialization and Vertical Coordination in the Agricultural Sector**

Significant changes are occurring in the agricultural sector — changes often described as the industrialization of agriculture. One of these changes is increased use of alliances, contracts and negotiated coordination between the various stages of the food chain. As quality and other product attributes become more important and valuable to consumers, and technology for producing and measuring these attributes develops, the benefits of negotiated coordination are likely to increase. The objective of this project would be to evaluate the efficiency gains, transactions costs, and quality impacts of changing technology to measure quality and other product attributes, and changes in market coordination systems in the markets for nutritional and industrial products in the agricultural sector. Results will be useful in anticipating both structural changes in the sector and strategies that agribusiness companies may adopt to increase efficiency and market share. (in collaboration with Allan Gray)

**Strategic Risk Assessment and Management for Agribusiness Firms**

The accelerating speed of change in the food and agribusiness industries is resulting in more risk and uncertainty — the future is becoming much less predictable. Not only is the future more uncertain, the drivers of that uncertainty are also changing — strategic risk which generally has a low probability of occurrence, but large consequences, is becoming an increasingly important component of the decision environment. Managing these risks requires not only new assessment tools such as scorecarding and mapping, but also more systematic decision frameworks that can be best structured as decision trees. And managing time to redefine a strategic choice in an uncertain environment into a growth, divest, exit, pause or follow-on option that truncates the loss exposure and allows capture of the profit potential transforms strategy under uncertainty from a defensive posture of minimizing losses and protecting positions to an offensive posture of creating and capturing value. This work would expand the risk assessment tools and techniques typically used in agricultural economics to include strategic risks, options analysis and scorecarding and mapping and the application of these tools and concepts to the development of strategy for agribusiness firms. (in collaboration with Allan Gray)
OTTO DOERING

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Resource Policy

Limited funding to work for the Natural Resources Conservation Service responding to their analysis needs on these issues. Much of the work is short term and specific, but has been expanded to MS thesis topics in the past.
Ken Foster

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<td>PhD</td>
<td>Monte Carlo Valuation of Investment Options</td>
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**Time Series Testing of Market Power**

First order conditions for profit maximization suggest that input prices and the value of marginal product should be cointegrated regardless of the degree of competition. However, the first order conditions for oligopolistic firms lead to very different hypotheses about the value of the cointegrating vector versus those of the perfectly competitive firm. While the methods for testing these hypotheses have been worked out, they are tedious to apply and the connection between market power and the cointegrating vector has not been previously addressed in the literature on market power. Furthermore, the traditional structural models used for testing market power suffer from multicollinearity and specification bias, and data driven time series specifications can alleviate these problems to some degree.

**Monte Carlo Valuation of Investment Options**

Recent developments by Brody and Glasserman using monte carlo methods to value options and derivatives make it easier to estimate option values where the stochastic process does not necessarily follow Brownian Motion. Closed form solutions do exist for other classes of stochastic process, but these processes are restrictive. This research would focus on using time series methods to estimate discrete approximations to the stochastic processes of interest and use Brody and Glasserman’s monte carlo approach to value important agricultural investment or policy options such as farmer investment in cooperative processing.
This research addresses one of the critical issues the industrialization of agriculture poses for producers. Part of the industrialization process involved forming more tightly aligned supply chains that extend from the producer through the first handler to the processor or potentially the retailer. Examples of these organizations include New Generation Cooperatives, limited liability companies, as well as joint ventures and strategic alliances. The purpose of this research is to identify the returns and risks for producers who take the initiative in the formation of food supply chains through investment in value-added first handling, processing or other downstream activities. Key success factors associated with value-added businesses will be identified as part of this research. The results will be useful for producers as they consider significant capital investment in value-added processing.

The structure of all sectors of agribusiness is currently undergoing rapid change, including increased consolidation due to mergers, acquisitions, joint ventures and strategic alliances. This research will explore the structural changes in agribusiness, related to mergers, acquisitions, joint ventures, and strategic alliances, and identify the driving forces behind the reorganizations as well as the factors that contribute to the success of the new structures. The objectives of the research are to (1) analyze theoretically and develop a model of the structural change that is currently occurring in cooperative and investor oriented agribusinesses with particular emphasis on mergers, acquisitions, joint ventures and strategic alliances, (2) continue with the database development of the mergers, acquisitions, joint ventures, and strategic alliances that have occurred in the United States among cooperative and investor oriented agribusinesses at the regional and national level during the 1990s. In addition to listing the partners involved in the restructuring the database will contain the driving forces behind the reorganization as well as the factors that contributed to the success and/or failure of the reorganization. (3) perform empirical analysis of the data, draw conclusions and identify implications for agribusiness decision makers and policy makers.
Word of Mouth Marketing

In the changing, industrialized agriculture agribusiness firms are looking for new and innovative marketing approaches in order to remain competitive. One method of marketing that has not been the subject of a lot of research is word of mouth marketing. This research will examine how agricultural producers respond to different types of word of mouth marketing. Producers who have been part of a structured program (often a facilitated teleconference) will be interviewed to determine how effective the marketing program was. Demographic factors, associated with the participants, as well as characteristics of the program that have the greatest influence on success will be identified. The results of this research will be useful to agribusiness firms as they adapt their marketing programs to meet the changing economic conditions.
Evaluation of the Impact of Technological Advances on Retail Agronomic Firms

Technological advances will have substantial affects on the agronomic industry over the next few years. For example, seed choice is becoming increasingly tied to the pest control program and in many cases the fertilization program. It is likely that the role of the traditional agronomic dealer will change dramatically over the next few years. Information on the impacts of these technological advances on the agribusiness firm's clientele base, market share, profitability, and risk exposure can help define the strategic alternatives available to these firms. A project in this area would evaluate the implications of technological advances for strategic alternatives that reduce risk and maintain or improve profitability in small to medium-size retail agronomic firms.

Costs of Production for Retail Agronomic Dealers

As manufacturers of agricultural products continue to look for new ways to distribute their products, the economic well being of retail suppliers is being called into question. A detailed analysis of the cost structure for retail agribusiness is needed to determine the possible alternative business-to-business relationships that could evolve between manufacturers and retailers. A study along these lines could include a survey of agricultural retailers and modeling of the economic activities for a retailer under alternative relationships with manufacturers.

Changing Volatility of World Supplies: Policy Implications for U.S. Agriculture

The constant improvement in seed hybrids and the increasing adoption of top producing seeds around the world calls into question the expected volatility in world wide production of grains. In today's environment of low commodity prices many argue that we need a weather disaster somewhere in the world to reduce supplies and boost prices. But, how big of a weather disaster do we need? Perhaps the increased tolerance of the world's seed hybrids has reduced the negative effects of weather and even worse disaster than we think maybe needed to correct oversupplies. To the extent that downside yield risk has been reduced worldwide, there are serious implications for agricultural policy and the amount of future income support that will be needed from the government. This study would entail gathering data on Worldwide crop production and conducting statistical tests of the variability over time to determine if downside yield variability has been reduced.
Global Trade and Developing Country Poverty: Quantifying the Linkages

There is an increasing demand for answers to questions relating to the linkages between international trade and poverty, such as: “What is the likely impact of the Doha Development Round for poverty in Latin America?”; “What is the likely impact of continued rapid growth in China for poverty in South Asia?”; “What is the likely impact of continued reductions in international trade and transport costs for international trade, and hence for poverty in Sub-Saharan Africa?”

The goal of this project is to aid in bridging the gap between empirical models of international trade and detailed household survey modeling in order to enhance the capacity of researchers from both developing and developed countries to answer these questions. If one substituted “average real income” in place of “poverty” in the above questions, this proposal would not be necessary. A global trade, production and consumption database already exists to support this kind of analysis: GTAP (the Global Trade Analysis Project). The GTAP database and associated global general equilibrium models have emerged over the last decade as key vehicles for analyzing global economic issues, and papers on all of these topics have been presented at the annual GTAP conferences (www.gtap.org). However, when it comes to the analysis of poverty, GTAP is fundamentally flawed. It treats consumption, and hence welfare, in each country as being associated with a single “average” household.

The reasons for this limitation are clear. Prior to GTAP, no consistent economy-wide, global bilateral trade, production and consumption data base was publicly available. In order to launch this project, compromises had to be made, and domestic income distribution considerations were one of the (many) necessary sacrifices. However, as the project has matured, and as the interests of international policy making agencies have shifted more strongly towards poverty impacts of economic policies, this omission has become increasingly limiting for the researchers working on global trade issues; hence the need for this proposal.

The specific objective of this project is to enhance the GTAP data base and associated modeling framework to permit users to analyze the consequences for income distribution in general, and poverty in particular, of alternative global economic scenarios. In order to achieve this objective the research will build on earlier research on this topic in which household survey data from 14 developing countries has been assembled, processed and made consistent with the GTAP data base. Subsequent analysis of the links between trade liberalization and poverty highlights the importance of household earnings patterns – in particular household specialization of earnings. Future work will refine this framework and seek to address some of the other questions raised in this opening paragraph.
### Data Mining Techniques for Improving Corn and Soybean Profitability

Spatial statistical techniques have been shown effective in extracting management information from agricultural sensor data (e.g. yield monitors, satellite or aerial remote sensing, soil sensors) when the data comes from planned comparisons (e.g. split planter trials, strip trials, side-by-side blocks, paired fields). There have been many efforts at mining agricultural sensors data (see the proceedings of the International Precision Agriculture Conferences for examples), but few successes. Much of the initial attention has been focused on using yield and remote sensing data to identify intra-field management zones, but other uses include identification of target areas for intensive crop scouting and estimation of rate response (e.g. to fertilizer, plant population). This research would draw on data mining techniques from nuclear and electrical engineering to develop methods that identify patterns in crop response and use that information to fine tune management.

### Biotechnology and the Economics of the Seed Sector in West Africa

In West Africa the formal seed sector is not well developed. Most of the public sector seed system built in the 1970s and 1980s has collapsed. Only a few countries have for-profit seed companies (e.g. Ghana, Nigeria) and those companies are struggling. The main off-farm source of seed is from non-governmental organizations (NGOs), but they are not perceived as the long term solution. Seed sector underdevelopment has always constrained the dissemination of improved varieties in the region, but it becomes particularly important when genetically modified (GM) seeds are considered. With

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| JESS LOWENBERG-DEBOER |

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biotechnology seed companies typically acquire the additional responsibility of implementing biosafety and resistance management (e.g. refuges, rotations) plans.

A key hypothesis is that in West Africa the seed sector has not developed because improved varieties were not sufficiently better than traditional varieties to justify the transactions cost involved in seed marketing. Bt cowpea varieties may change that situation with 200% to 300% yield increases over traditional no-insecticide production. The first step in this research would be focus groups and key informant interviews with seed sector participants throughout West Africa. Case studies would be done of both functioning and failed seed businesses. Simulation may help us understand how introduction of Bt cowpea may affect the seed sector. This work would be done as part of the Network for Genetic Improvement of Cowpea in Africa (NGICA) plan to create Bt cowpea.

**Grain Legumes vs Legume Cover Crops for Sahelian Farmers?**

Traditionally, West African farmers have maintained soil fertility by long term fallow. Land was cleared and farmed for several years, and then abandoned to indigenous vegetation for several decades. This worked well when population density was low, but with the increasing population density, farmers are looking for cost effective alternatives. One of the options is the use of legume cover crops like velvet bean (*Mucuna pruriens*). This study will examine the use of cover crop biomass as livestock feed. In particular the role of feed quality will be studied. The methodology will use a representative farm model from the Gaya region of southwestern Niger. The principal hypothesis is that with current price relationships Sahelian farmers will prefer to grow grain legumes like groundnuts or cowpea, rather than a cover crop, but if the demand for high quality meat continues to grow there may be a role for cover crops.

**Economic Assessment of Precision Agriculture Technology**

Global Positioning Systems (GPS), yield monitors, remote sensing and other precision farming technologies have greatly reduced the cost of crop production information. Variable rate applicators with GPS are making it technically feasible to apply inputs differentially according to recommendation maps. Manufacturers are rushing to the market with a wide variety of precision farming products and farmers are wondering which aspects of site specific management make economic sense. Potential research topics related to precision farming technology include:

- Implications of applicator inaccuracy on variable rate lime profitability
- Use of remote sensing and other sensor data in defining management zones
- Potential economic benefits from integrated precision farming systems.
- Economics of real-time sensors for nitrogen management

Answering these questions will involve some mix of case studies, on-farm trials and simulation.
Economics of Managed Drainage in the Corn Belt

Managed drainage is the practice of limiting outflow from subsurface drainage tile during parts of the years to reduce nitrates entering surface waters and to enhance crop production. Most of the nitrate from drained crop land is lost during late fall and early spring when there is no crop growing. By retaining water (raising the water table) in midsummer when no field operations are planned, it is theoretically possible to increase yields. Economic issues involved in managed drainage include the cost of structures needed to limit outflow and the value of yield change. While the environmental benefits of managed drainage are well documented, the yield and economic impacts are only known through anecdotal accounts. The objective of this study is to document the yield changes with managed drainage on a watershed in White County, IN, and to estimate the expected profitability and risk effects of this practice. Yield monitor data will be collected from paired fields on four farms. One field on each farm will have traditional free flowing drainage and the other will have managed drainage. Spatial econometric methods will be used to estimate the effect of drainage controlling for soil type, topography and other factors. Budgeting and stochastic dominance will be used to estimated expected profits and risk characteristics of managed drainage.

Economics of Site-Specific Mint Production

Mint is high value crop grown in northern Indiana mainly for mint oil which is used as a flavoring in food and toothpaste. US mint producers are under pressure from lower cost imported mint oil from Asia. They are searching for ways to cut cost per unit and increase quality. Use of aerial and satellite remote sensing is being considered to identify stand, weed and soil fertility problems. This study will work with mint farmers in northern Indiana to measure the costs and yield effects of site-specific mint management. Timeliness issues will be addressed via a representative farm linear programming model of a mint operation. Risk will be analyzed using stochastic dominance.
External Validity of Value Elicitation Mechanisms

Agricultural markets have historically been dominated by production and sale of generic commodities. However, in recent years a pronounced trend has developed toward a more demand-driven marketplace where agricultural producers must give considerable thought into consumer demand for specific food and fiber attributes prior to making production decisions. This study will develop and compare existing methodologies, such as experimental auctions, conjoint analysis, contingent valuation, for estimating consumer and producer demand for novel agricultural goods. In addition, this study will determine external validity of survey and experimental methods by comparing predicted market share or willingness-to-pay with purchase behavior from actual retail sales in grocery stores, online markets, etc.

Antibiotic Drug Use in Livestock Production: Effects of a Ban on Producers and Consumers

The routine feeding of subtherapeutic antibiotics to livestock has raised considerable controversy in recent years. Consumers are becoming increasingly aware and concerned about this issue, primarily as it relates to the development of antibiotic-resistant bacteria. In fact, both houses of the U.S. Congress have recently considered legislation to ban or restrict use of antibiotics in livestock feed. However, little is known about the potential economic effects of such a ban, particularly domestic consumer demand for such a policy. This research will assess the economic impacts of a ban on subtherapeutic feeding of antibiotics in the pork sector. Specific objectives of the study include: a) use in-store valuation experiments to determine U.S. consumer demand for the ban (including the positive externality associated with reduction in antibiotic resistance), c) determine the effects of an antibiotic ban on producers, and d) determine the overall welfare effects of a ban on antibiotics by developing a model of the U.S. pork sector.

Testing Auction and Consumer Theory with Experimental Economics

Secondary data are often unavailable to carry out hypothesis tests of interest. As such, we must turn to methods that generate primary data in a closely controlled environment where incentives are properly aligned. I have an ongoing interest in a number issues and projects that utilize experimental methods. Examples of potential projects include: a) testing predictions of the newly developed commitment cost theory, b) testing strategic equivalence of incentive compatible auctions in induced value and homegrown value experiments, c) elicit and determining predictive performance of risk preferences obtained in non-hypothetical experiments, d) developing homegrown value auctions to elicit cross-price elasticities, e) investigate effect of value uncertainty on auction and market efficiency in an induced value setting, and f) comparing behavior in laboratory experiments to field behavior.
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**Entrepreneurial Counties in Indiana**

I have an interest in studying the attributes that make counties in Indiana entrepreneurial. How much can communities actually do to increase economic development especially those that struggle to form a consensus on a strategic plan for their communities.

**Feasibility of Producing Melon Fruit-Rollups**

This is an interdisciplinary study with Horticulture and Food Science. The study involves testing what types of melons need to be produced to be able to be processed into melon “leather” and overall economic feasibility of producing melon fruit-rollups.

**Indiana’s Policy toward Entrepreneurs**

Indiana ranked thirty-first out of the fifty states in terms of new business start-ups and first in business bankruptcies. What policies does the state have in place that hinder/help entrepreneurs start and retain their businesses?
WILLIAM A. MASTERS

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Political Economy of Agriculture

Agriculture is typically taxed in poor countries, and subsidized in rich ones. This project explores the causes of this agricultural policy transition, to assess their implications for the U.S. and elsewhere. Preliminary results suggest that the transition occurs similarly across a wide social and political spectrum, but varies systematically with underlying agro-economic conditions. We use this variation to test alternative explanations for countries’ agricultural policy choices, so as to help trade negotiators anticipate changes in other countries’ political preferences over time, and to help policymakers in the U.S. meet our own political needs more cost-effectively. In particular, it may be possible to devise a system of payments to landowners that leads to more attractive political and economic outcomes in the U.S. and other industrialized countries, and expanding market opportunities for the world’s lowest-income farmers.

Identity Preservation in Cocoa Trade (joint with Phil Abbott)

The international trade in cocoa beans provides an unusual opportunity for consumers in high-income countries to influence the development of tropical forest areas. Through the “Sustainable Tree Crops Program” financed by USAID, we are helping to analyze how changes in trading arrangements could help eliminate child labor, preserve forest tree cover, and raise farmers’ income. We consider the costs of achieving these objectives, consumers’ willingness to pay, and the effects of alternative market structures on farmers’ choices.

Using Prizes to Reward Agricultural R&D

Many desirable agricultural innovations are public goods that spread directly from farmer to farmer and end up helping consumers rather than farmers. When the high cost of excluding free-riders makes patent protection ineffectual, R&D for such innovations requires public funding. Almost all of that funding is now provided on a pre-paid basis, through allocations and grants to research agencies. An alternative would be to use research prizes, to be paid after successful innovations are discovered. Improvements in economic impact assessment make it possible to compute a schedule of prizes for various kinds of innovations, offering incentives for research that are roughly proportional to the payoffs for society as a whole. Such a “schedule-of-prizes” approach may be particularly useful now that genetic material and research techniques are increasingly held by private firms under patent protection – making prize payments necessary to have these inputs applied to non-marketable, “public good” kinds of innovations. The proposed research project articulates the methods and procedures that might be used to compute...
and implement a schedule of research prizes for African agriculture, with case studies of particular innovations that could be financed in this way.

**Climate, Productivity and Economic Performance**

There is a strong correlation between climatic conditions, agricultural productivity, and per-capita income. Tropical countries have consistently experienced lower growth rates and have lower output than temperate-zone countries. Using new data on climate differences across countries, we try to understand why this correlation has arisen, and what can be done about it.
Degree Level | Research Topic | Funding
---|---|---
MS | Risk Assessment of SPS Barriers | No
MS/PhD | Implementing Multifunctionality Rules | No

**Risk Assessment of SPS Barriers**

Recent literature analyzing sanitary and phyto-sanitary (SPS) trade barriers has begun to demonstrate how trade barriers can be linked to the risk of importing a diseased product. A deficiency in this literature is the risk assessment component which has treated risk as discrete choices of a probability of importing a diseased good and the expected loss if an outbreak occurs. These parameters are not known with certainty and the expected losses are particularly suspect estimates. This research is intended to improve the risk assessment of models tying SPS trade barriers to the risk of importing a disease bearing product.

**Implementing Multifunctionality Rules**

Differing views of multifunctionality are a source of conflict in World Trade Organization (WTO) negotiations. Recent conceptual work proposes that production subsidies satisfying three conditions be considered WTO legal. Empirical work to date has developed subsidies that satisfy two of the rules, but no empirical example of a case meeting all three rules has been developed. The objective of this research is to provide empirical examples where the proposed WTO rules for multifunctionality set WTO legal production subsidies.
Agricultural producers face many sources of variability which can affect the cash flow, net returns, and economic progress of the farm firm. The risks which producers face may have been significantly affected by the 2002 Farm Bill. The direct payments, marketing loans and loan deficiency payments, and counter cyclical payments impact on cash flow and risk bearing ability. Less than fully equity in the farm business creates financial risk which may compound the effects of the business risks which all farmers face. Farmers typically combine production, marketing, and financial responses to risk and practice risk balancing. Past research has often failed to consider the sequential nature of the decision-making and knowledge which becomes available during the production process. For example, grain storage investments are often analyzed assuming storage will be used each year without considering the effect of alternative market situations. This project will analyze the interactive effects of various risk responses in a whole farm situation. Emphasis will be given to the short and long run consequences of alternative risk management strategies on representative farm firms.

Several surveys of producers attending the Purdue Top Farmer Crop Workshops have been conducted. Parts of these surveys have dealt with measuring producers' risk attitudes using alternative measurement procedures. In addition, some producers completed the Myers-Briggs personality type indicator test. Producers surveyed have also provided information on a variety of production, marketing, and financial decisions. Analysis will consider the efficiency and effectiveness of alternative measures of risk attitudes and prediction of observed economic behavior. Possibilities exist to test these measures with participants in future workshops or with other groups of producers.
PAUL V. PRECKEL

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<tbody>
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<td>PhD</td>
<td>Global Trade and Developing Country Poverty: Possible Quantifying the Linkages</td>
<td>Possible</td>
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<tr>
<td>PhD</td>
<td>Optimizing Swine Production and Marketing Possible Management via Simulation Modeling</td>
<td>Industrial</td>
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Global Trade and Developing Country Poverty: Quantifying the Linkages

There is an increasing demand for answers to questions relating to the linkages between international trade and poverty, such as: “What is the likely impact of the Doha Development Round for poverty in Latin America?”; “What is the likely impact of continued rapid growth in China for poverty in South Asia?”; “What is the likely impact of continued reductions in international trade and transport costs for international trade, and hence for poverty in Sub-Saharan Africa?”

The goal of this project is to aid in bridging the gap between empirical models of international trade and poverty, such as: “What is the likely impact of the Doha Development Round for poverty in Latin America?”; “What is the likely impact of continued rapid growth in China for poverty in South Asia?”; “What is the likely impact of continued reductions in international trade and transport costs for international trade, and hence for poverty in Sub-Saharan Africa?”

The specific objective of this project is to enhance the GTAP data base and associated modeling framework to permit users to analyze the consequences for income distribution in general, and poverty in particular, of alternative global economic scenarios. In order to achieve this objective the research will build on earlier research on this topic in which household survey data from 14 developing countries has been assembled, processed and made consistent with the GTAP data base. Subsequent analysis of the links between trade liberalization and poverty highlights the importance of household earnings patterns – in particular household specialization of earnings. Future work will refine this framework and seek to address some of the other questions raised in this opening paragraph.
Optimizing Swine Production and Marketing Management via Simulation Modeling

The pace of technical and institutional change in the hog sector is rapid, and the competitive pressures are strong. To survive economically, it is critical for producers to evaluate and respond quickly and efficiently to opportunities for technological advancement. The optimal management of many new technologies may not be obvious at the outset, and the margins for error may be small. For example, optimal management of the ractopamine feed additive requires the simultaneous adjustment of protein content of the feed and marketing strategies in addition to determination of the optimal concentration of the additive. Experimentation with live animals in this context is not practical. The number of animals and amount of time needed to determine optimal strategies is quite large, and given that profits would be below optimum during the experimentation phase the potential costs of determining these strategies in an operating production facility is huge. For this reason, researchers have turned to biological models as a means to fine tune the production system. By adding an economic component to these models, feeding and marketing strategies can also be optimized from the farm profit perspective. The goal of this project is to extend work on the determination of optimal production and marketing strategies to the evaluation of emerging technologies.
GERALD SHIVELY

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<td>Agricultural Intensification and Deforestation in the Philippines</td>
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<tr>
<td>MS/PhD</td>
<td>Landuse Change in the Vietnamese Central Highlands</td>
<td>Pending</td>
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<tr>
<td>PhD</td>
<td>Dynamic Time Series Models of Agricultural Price Formation</td>
<td>None at present</td>
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Agricultural Intensification and Deforestation in the Philippines

I have an ongoing “microeconometric” research project focusing on the impacts of agricultural development near the forest margin in a remote part of Palawan, in the Philippines. I am using panel data to study the ways in which technological advances in agriculture (in this case irrigation development) have had spillover environmental effects. The research may provide an opportunity to conduct overseas fieldwork.

Landscape Change in the Vietnamese Central Highlands

I am starting new research focusing on changes in agricultural land use during the 1990s in Vietnam. The research will use econometric analysis of a large sample of panel data to examine factors related to crop choice, agricultural intensification, and poverty reduction.

Estimating Dynamic Time Series Models of Agricultural Price Formation

I have an ongoing interest in time series econometric work focusing on dynamic models of agricultural price formation and market integration, including models with structural breaks and changes in regime. I have very interesting sets of data from Ghana and the Philippines that would be ideal for a graduate student interested in advanced time series econometric work. The data are available for term paper and thesis writers.
WALLACE E. TYNER

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<tr>
<td>PhD</td>
<td>Linking Development Policy and General Equilibrium Policy Analysis</td>
<td>Possible</td>
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<tr>
<td>MS</td>
<td>Economic Analysis of Technical and Policy Issues Related to Biomass Energy</td>
<td>Possible</td>
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**Estimation of the Impact on EU and Mediterranean Farmers of EU Trade Liberalization in Agricultural Commodities**

The European Union has a complicated system of protecting its agriculture from foreign competition. For major commodities like wheat, there are six policy instruments that are used. For fruits and vegetables, the protection system is more complicated and involves use of import windows, tariff-rate quotas, and minimum import prices. Currently, the EU is under considerable pressure from its Mediterranean neighbors to liberalize trade in agricultural commodities, especially fruits and vegetables produced in the southern Mediterranean countries. The objectives of this research would be to estimate the impacts of such liberalization on farmers in the EU and Mediterranean countries.

**Linking Development Policy and General Equilibrium Policy Analysis**

There is a vast empirical literature demonstrating the critical importance of agricultural productivity gains to overall economic growth and poverty reduction in developing countries (Thirtle, Timmer, Ravallion, Mellor, etc.). There is also a significant general equilibrium literature implying that developing country well-being can improve significantly from trade liberalization even if the conditions in the agricultural sector worsen. While these two bodies of literature seem to be in conflict, they are, in fact, asking different questions and making vastly different assumption on the nature of linkages among the rural and urban sectors. The objective of this research is to incorporate a better understanding of these linkages into general equilibrium models in an attempt to better capture the impacts of different policy alternatives and development programs.

**Economic Analysis of Technical and Policy Issues Related to Biomass Energy**

There are a wide range of economic, technical, and policy issues related to the development of biomass energy. We intend to use process or descriptive engineering models to capture the technical and economic linkages so that analysis can be performed on the impacts of different policy and technical research issues.