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**Imperfect Competition, Market Behavior, and Agricultural Trade  
Policy Analysis**

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Proceedings of a Meeting of the  
International Agricultural Trade Research Consortium  
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## PREFACE

This report provides summaries of the papers and discussions at the fourth Consortium on Trade Research held in Berkeley, Calif., December 17-19, 1981. Conveners of the meeting were Andrew Schmitz and Alexander Sarris of the Department of Agricultural and Resource Economics of the University of California at Berkeley.

The Consortium focused on the structure and behavior of international agricultural commodity markets and the effect of Government policy on market behavior. Copies of the papers as presented at the Consortium or in their final published form are available from the authors on request.

This summary report was prepared by Charles E. Hanrahan and T. Kelley White, Economic Research Service, U.S. Department of Agriculture. Summaries of the papers and the discussants' comments were prepared from materials submitted by the contributors to the Consortium.

## FOREWORD

The fourth meeting of the Consortium on Trade Research focused on the nature and behavior of the international markets for agricultural commodities and how Government objectives and policy affect those markets. These are important issues for U.S. agriculture and agricultural policymakers. They challenge USDA's Economic Research Service (ERS), Foreign Agricultural Service (FAS), and trade researchers in the academic community to work closely together to improve our understanding of how these important commodity markets work and to enhance the formulation of agricultural trade policy.

The goal of increased interaction between ERS and academic researchers was realized in June 1980 by establishing the Consortium on Trade Research. FAS joined the Consortium in 1982. The objectives of the Consortium are to:

- o Foster sustained efforts in international trade research which emphasize domestic impacts of policy developments in international commodity markets.
- o Encourage and facilitate interaction between ERS, FAS, and university trade policy researchers.
- o Provide a forum for the exchange of research results and the identification of problems and policy issues requiring research.

The Consortium is a cooperative undertaking between ERS, FAS, and various universities. Membership in the Consortium is mutually agreed upon by ERS, FAS, and university participants but is generally open to those who have an interest and are prepared to make a contribution.

JOHN E. LEE, Jr.  
Administrator  
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## HIGHLIGHTS

International markets for agricultural commodities are not perfectly competitive. Thus, the usual assumptions underlying the perfectly competitive model of market behavior--perfect knowledge, a large number of firms, free entry into the market, absence of market power, or ability to influence prices by any single market participant--do not hold for international agricultural commodity markets. The fourth Consortium on Trade Research conducted by USDA's Economic Research Service, the Foreign Agricultural Service, and several universities addressed market structure, the impact of Government policies on market behavior, and analytical tools for studying imperfect markets.

Participants examined the role and effect of Government policies which try to improve price information. Market information provided by government agencies, such as USDA diminishes the information advantages that large private speculative firms have in commodity trading, enables smaller firms to participate in those markets, and tends to enhance price stability especially where futures trading is important in price formation, as in the United States.

How government policies, macroeconomic as well as strictly agricultural, affect agricultural prices, national income, farm returns, farm asset values, inflation, and other variables were treated in several economic models presented by Consortium participants.

An econometric model of the world wheat market probed the interaction of domestic policy and world market prices. According to model results, the world wheat price is about 10 percent lower than it would be in the absence of trade restrictions. Model results also indicated that the United States and the European Community (EC) are the two trading groups that can significantly influence world wheat prices. Hence, U.S.-EC cooperation would be necessary for any world price stabilization schemes.

The Consortium examined aspects of the exercise of market power and how different policy objectives motivate the behavior of major participants in the world wheat market employing a game theoretic model. Game theory holds considerable promise as a tool for analyzing international trade, although additional experimentation is needed. The analysis suggests that Government policymakers place different values on the welfare of various interest groups. Thus, the assumption of maximization of net social payoff in models of market behavior is inappropriate because it ignores important distributional issues.

The Consortium explored the roles of marketing boards, as in Canada and Australia, versus private trade, as in the United States and Argentina, in pricing and exporting grain. Results indicated that if the Canadian Wheat Board hedged through the futures market both price and production risks of producers could be reduced. Whether or not the Board could act as a private trader in this fashion and the impact of its actions on prices are open to question. The Board would sell forward a

large volume of grain in a very short time but private traders, especially the large grain companies, enter the market continuously and both buy and sell incrementally.

A Consortium paper on the process of making agricultural trade policy decisions in the Federal Government elicited a discussion on the role of university-based agricultural trade policy research in relation to the interagency decisionmaking process. University research, because of its orientation and the time required to produce results can contribute to the stock of knowledge about trade but is unlikely to play a major direct role in trade policy decisionmaking. However, university work on the structure of markets and the behavior of trading institutions and Government may contribute more explicitly to decisionmaking on agricultural trade policy.





# Consortium on Trade Research: Imperfect Competition, Market Behavior, and Agricultural Trade Policy Analysis

## PRICE FORMATION IN INTERNATIONAL COMMODITY MARKETS

Market Structure, Information, Futures Markets, and Price Formation

Markets for agricultural commodities are speculative markets and, as such, raise questions about the effect of speculation on "informational efficiency" or price stability. This paper addresses the following two questions about Government policies which are designed to improve price formation, given a speculative market environment where futures trading plays an important role in price formation:

by Albert S.  
"Pete" Kyle

1. Would excluding certain retail speculators from trading in commodity futures contracts decrease the amount of noise in prices and thereby increase the informativeness of prices by weeding out speculators who have no economic need to trade and no information which is not already well known?
2. Does a policy of using public money to collect information such as crop forecasts and export data and to distribute that information to all market participants tend to increase the information value of prices?

The model of price formation is based on assumptions different from those generally made by economists modeling other markets. In modeling other markets, it is often assumed that traders all have the same information, that all traders are so small that none has an effect on market prices, and that all traders are risk averse. By contrast, this paper assumes that some traders can acquire private information which they do not share with others, that these traders are so large that their trading activities have an effect on price which they take into account in making trading decisions, and that these traders are risk neutral. A special class of traders, called market makers, earns a small profit by adjusting prices to the flow of trade when they act as intermediaries between other groups of traders. These assumptions capture important features of commodity trading in agricultural products which may be missing in typical models of financial and commodity markets.

Within the context of this model, the trading activities of uninformed retail speculators initially tend to increase price fluctuations. But the increased price fluctuations induce informed traders to trade more, smoothing out the initial increase in price fluctuations and making the market more liquid. This increased liquidity makes it easier for large traders to obtain private information, because they can take larger positions without having larger adverse effects on prices. This enhanced profitability attracts more traders into an increasingly competitive market. Also, prices become more informationally efficient, or equivalently, more stable, suggesting that in the long run, retail speculation leads indirectly to more stable prices, and that conversely, a policy of discouraging retail speculation would eliminate these benefits.

Collection and publication of information by USDA not only has the direct effect of increasing informational efficiency but also the indirect effect of forcing private speculators to reveal more of their private information to maximize their profits. In other words, the increase in informational efficiency is more than one would guess at first glance. Furthermore, although such a policy might drive some large private speculators from the market by making their information less valuable, it does not discourage such private speculation enough to eliminate increased price stability caused by the policy in the first place.

## MARKET STRUCTURE, PRICE INSTABILITY, AND STABILIZATION POLICIES

Endogenous  
Price Policies  
and Their  
Impact on the  
Level and  
Variability of  
International  
Commodity  
Prices

by

Alexander H. Sarris

and

John W. Freebairn

The paper addresses domestic price policy for an agricultural commodity in a country where producer, consumer, and Government treasury gains and preferences for producer and consumer price stability are explicitly traded off to arrive at a specific set of yearly prices for producers and consumers. These prices derive from an optimization process and are functions of the international prices that the country faces. Given these "optimal domestic price policies," the international price is, in turn, determined by the interaction of the excess demands of all trading countries.

Because the resulting international price explicitly incorporates all of the parameters which enter into the separate domestic policy decisions, it becomes easy to assess the influences of individual country-specific policies on the world market and on the internal markets of trading partners.

The theoretical idea is tested on an empirical model of the world wheat economy. Current domestic price levels in the various trading countries are used to derive implicit welfare weights for producers, consumers, and Government treasuries of the main trading countries. The impacts of various policy changes are then investigated.

The empirical results suggest that the current world price level for wheat is about 10 percent below what it would be in the absence of all of the trade restrictions around the world. The Common Agricultural Policy of the European Community (EC) appears to be the single greatest cause of this discrepancy. Furthermore, the United States and the EC can significantly influence world wheat price variability. Hence, their cooperation would be crucial in any world price stabilization scheme.

Towards a  
Countervailing  
Power Theory  
of World Wheat  
Trade

by

Philip L. Paarlberg

and

Philip C. Abbott

Empirical studies of the world wheat market have generally assumed that a neoclassical competitive model can adequately describe trading behavior. However, evidence on market structure and the existence of institutions through which monopoly power can be exercised support the hypotheses advanced by several researchers of imperfectly competitive markets. Therefore, this paper develops a model of the world market incorporating elements of imperfect competition and based on game theoretic concepts.

The model developed addresses the following issues:

1. What objectives motivate the behavior of the major participants in the world wheat market?
2. How do domestic and international policies interact to determine income distribution to various domestic interest groups?

3. How does a country's behavior in international markets depend on its domestic policies?
4. If the world wheat market is characterized as imperfectly competitive, how can the interactions between traders be captured in a model?

To address these issues the model that is developed allows for simultaneous endogenous government policy formation in all countries, for policy retaliation, and for the evolution and dissolution of coalition structures. The model relies upon a Government criterion function to yield a set of first-order conditions for optimal trading behavior and optimal Government intervention. Using revealed preference theory, these first-order conditions are used to determine the marginal value policymakers place on the welfare of various domestic interest groups. From the first-order conditions, bargaining functions can be derived that represent a country's policy choice set. Given these bargaining relations and a set of equilibrium conditions (rules of the game), an international market solution can be obtained. The revealed preference evidence is also used to measure the conjectural variations faced by a country in the international market, which may be used to indicate what sort of equilibrium condition applies to that country's trading behavior. This paper indicates how such a model could be put together for the world wheat market from typical domestic econometric models. Estimates of conjectural variations as well as revealed Government objectives have been obtained for three countries.

Preliminary analysis of Canada, Japan, and the United States over the past two decades suggests that the values Government policymakers place on the welfare of various interest groups are not equal and not stable over time. Hence, maximization of net social payoff (as is commonly assumed) is an inappropriate Government criterion function, because important distributional issues are ignored. Further, the conjectural variation of the trade elasticity faced by each country is estimated. Apparently Canada views the conjectural variation of the excess demand it faces as variable. Hence, a closed-loop game theoretic solution is necessary. In contrast, Japan does not appear to treat the conjectural variation of the excess supply elasticity it confronts as variance, hence an open-loop solution is appropriate. Finally, U.S. policy is developed on the assumption that the excess demand it faces is perfectly inelastic.

Future research will need to examine the policy behaviors of other major traders--Australia, Argentina, the EC, and Centrally Planned countries--to determine the values these countries' policymakers place on the welfare of domestic interest groups and to estimate these countries' conjectural variations. By including the other major traders, the world wheat market model will need to be solved using game theoretic equilibrium conditions.

Commodity Price  
Stabilization  
in Imperfectly  
Competitive  
Markets

by

David M. Newbery

Discussant:

Eric  
Monke

World commodity markets deviate from the perfectly competitive paradigm in two respects--individual countries introduce distortions between domestic producer, consumer, and world prices, and some countries possess market power in some commodities. The paper analyzes the effects of these features on the issue of stabilizing commodity prices. The first part discusses whether the presence of a stable configuration of market distortions strengthens the case for commodity price stabilization, and finds that under certain circumstances the answer is yes. In this section, countries are assumed to set policies not to pursue market power, but for other, largely redistributive reasons.

If, on the other hand, countries have a monopoly in commodity supply, one can ask whether such countries would seek more or less stabilization than a competitive market. Here the answer is that if the monopolist chooses to stabilize prices, it will engage in more stabilization than the competitive market; otherwise, the monopolistic market will supply as much stabilization as the competitive market.

Finally, the paper explores the role of an international buffer agency countervailing the power of a monopoly producer, and examines the Nichols-Zeckhauser case for considerable countervailing stockpiling. This result is sensitive to the specification of the bilateral trading environment and the choice of policy instruments available to the importer.

Comments by Eric Monke: The degree of competition in international agricultural commodity markets remains a matter of dispute. Few economists would argue that market share calculations, without the complementary analysis of structure and conduct, are useful for the identification of imperfect competition. Market shares of total exports provided in this paper are worse indicators of market power, because these figures ignore the potential for domestic response to attempted manipulation of international markets. Even if these numbers do indicate potential market power, they appear to be far less than 100 percent. Newbery's analysis is couched in a monopoly framework, and it is not clear that oligopolies will mimic monopolistic behavior.

Regardless of its relevance to agriculture, the argument has intrinsic interest. Do market imperfections strengthen the case for price stabilization policies? The answer appears to be no. When the market imperfections involve importation, Newbery demonstrates that the case for stabilization policies is strengthened only in the presence of quotas, and then only if the quotas are binding less than half the time. Because the latter case implies that free trade conditions prevail more than half the time, domestic resource allocation will be largely unaffected in this situation. Thus quotas are not likely to result in significant rent transfers to domestic producers, and they are not likely to lobby for quota policies. For the case in which quotas are binding, Newbery shows that some benefits

of price stabilization are already realized by the quota policy, and the need for further stabilization programs is lessened.

On imperfections on the export side of the market, Newberry compares the storage behavior of a monopolist relative to that undertaken for perfectly competitive production. The case for stabilization seems indeterminate and depends on the shape of the demand curve. If the demand curve is inelastic upward and elastic downward, for example, a monopolist will gain from price instability and undertake less storage than in a perfectly competitive market. A more definite answer to the question seems possible, however. Because the monopolist will never market output which earns negative marginal revenue, production exceeding the quantity associated with zero marginal revenue will be either destroyed or stored. Thus the distribution of potential prices will be truncated relative to the distribution of prices observed under perfectly competitive production. Prices will be more stable under monopoly, and, therefore, the need for price stabilization policies is lessened.

The Simple  
Analytics of  
Price Supports  
in the Con-  
text of  
International  
Trade

by

Peter Berck

In this paper, we model agricultural price and income policy through various stages of the development of U.S. agriculture. The emphasis is on the effects of Government intervention under conditions of uncertainty. We analyze the interaction of price supports and/or deficiency payments, acreage controls, stocks, and export subsidies, recognizing that many other policy instruments also exist. However, to include more instruments in our framework is beyond our capabilities. Using the uncertainty framework in this paper, it is clear why the Brannon proposal is a least-cost policy to pursue and why export subsidies during the sixties could be economically justified.

and

Andrew Schmitz

Also, we clearly show why producers prefer price instability to stability when target prices are used to protect farmers against downside risk. Because of the growing importance of international trade, grain stocks increase since the profitability of holding stocks increases because of the nature of aggregate demand. In this case, Department of Treasury costs can be reduced substantially given a specified level at which farm prices are to be supported. Through the use of storage, farm income can be maintained, and, at the same time, governments can reduce their outlays on subsidies because the growth in international trade makes the aggregate demand for U.S. products increasingly more price elastic.

Government  
Intervention  
And Food  
Price Inflation

by

John W. Freebairn

A three-sector quantitative policy model of the U.S. agricultural sector, the balance of the domestic economy, and the international economy is constructed to evaluate the effects of policy changes and of noninstrument shocks on the performance of the agricultural sector and on the general economy. Policies evaluated include macroeconomic measures emanating from fiscal, monetary, and exchange rate spheres as well as agricultural sector policies such as acreage diversions, price supports, storage subsidies, and trade import quotas.

Gordon C. Rausser

and

Harry de Gorter

Examples of noninstrument shocks include droughts and surges in Soviet grain-import requirements. The framework incorporates the interrelationships among the three sectors, determining the forward and feedback links and includes the sector as well as general economic policy instruments. The framework is designed to generate an assessment of a number of performance measures including general economic inflation, national income, and agricultural sector returns and asset values.

Key issues addressed include:

1. What are the effects of other exogenous shocks on the agricultural sector and the general economy?
2. Should sector policies in agriculture be designed to deal with specific shocks on the agricultural sector?
3. Are sector policies more or less important than macroeconomic policies in analyzing various policies and their effects on the agricultural sector?
4. What is the relative effect of agricultural sector policies on the general economy as well as the agricultural sector?

To respond adequately to each of the issues, the framework is constructed to evaluate the following shocks:

1. A dramatic shift in grain export demand.
2. A dramatic environmental-induced change in agricultural crop production.
3. A change in agricultural policy such as price-support schemes, land-use controls, and public holding of stocks.
4. A change in fiscal policy.
5. Changes in monetary policy, including sterilization or no sterilization of changes in foreign account and in Government deficit; and accommodation, or not, for real shocks in the agricultural sector and the balance of the international economy.
6. Changes in exchange rate policy couched in terms of fixed, flexible, and Government-managed floating exchange rate regimes.

To assess the effects of these shocks, key features are incorporated into the model representation including explicit treatment of public versus private grain storage, detailed agricultural sector policies, and policy reaction functions for both monetary and agricultural sector instruments; a flex price specification for the agricultural sector and a fixed price specification for the domestic economy; explicit links with the international economy and endogenous determination of the

exchange rate; and explicit links between the domestic economy and the agricultural sector through agricultural input markets; inventory investment equations for agriculture and the balance of the economy along with fixed investment relationships for breeding stocks in the livestock sectors; and margin relationships between farm and retail prices.

The results of experiments reported include a permanent-versus-temporary increase in crop export demand, a restrictive monetary policy, and a bountiful harvest in the 1981 crop year.

The model results indicate that the framework adequately incorporates the interactive and feedback effects of macroeconomic policies, sectoral policies, and noninstrument shocks on key performance variables in agriculture and the general economy. Much insight appears to be gained by focusing on a model representation which is integrative in scope and distinguishes key features such as public-versus-private decisions, policy reaction functions, and fix/flex prices.

The results indicate that policy and noninstrument shocks: (1) have different shortrun and longrun effects in terms of both magnitudes and direction on key performance measures; (2) have effects that result in sectoral policies which may be substituted for or are complementary with macroeconomic policies in either the short or long run with some reversals occurring due to the dynamics of the meat sector; and (3) are either exacerbated for some policies or ameliorated for others by including the endogenous policy reaction functions.

#### MARKET INSTITUTIONS AND GOVERNMENT POLICYMAKING IN AGRICULTURAL TRADE

Marketing  
Boards Versus  
Private Sales  
And The Manage-  
ment of Risk:  
The Case of  
Wheat

by

Colin A.  
Carter

Discussant:

Alex F. McCalla

International wheat prices have been highly unstable in the past decade, and wheat producers in the major exporting countries have faced significant amounts of both price and production risk. The systems for marketing wheat differ significantly among these countries as do the methods of risk management by wheat producers. Australia and Canada have central selling agencies, and in the United States and Argentina, the private trade is responsible for pricing and exporting wheat. The purpose of this paper is to explore the ability of each of the marketing systems to manage price and production risk.

Australian and Canadian farmers receive a pooled average price for their wheat, but the U.S. price received changes daily. However, through the use of futures and forward contracts, U.S. farmers can sell their wheat any time before, during, or after the harvest. That is, they can either hedge or speculate on their wheat sales. In Canada, neither of these pricing options is available.

The pooling concept, as it is currently practiced, is one which views marketing wheat as an activity that takes place after the crop is harvested. This does not allow farmers the option to



forward sell at the time of the production decision and, therefore, does not allow them to manage price risk between the date of planting and the beginning of the crop year (August 1 in Canada) when production is known with good certainty.

This paper demonstrates that in a market where prices are well balanced, pooling after production offers nothing over hedging through the futures market. Wheat prices are distributed in a symmetric fashion, and it is argued that the timing of wheat sales within a particular crop year is, on average, not critical.

Price pooling, as it is now practiced by the Canadian and Australian Wheat Boards, exposes risk-averse producers to a significant amount of price risk which could be reduced if the pool practiced a forward selling or hedging program at planting time, passing along a more accurate initial price to producers. This treats production and marketing as simultaneous rather than recursive decisions. The end result would be a larger output and a higher level of utility for producers.

The optimal hedge, accounting for both price and production uncertainty, was calculated for Canadian wheat producers. It was found that the Canadian Wheat Board, on behalf of producers, should hedge through the futures market (or by forward sales) a very large percentage of expected output each spring before planting.

Comments by Alex F. McCalla: Professor Carter has prepared a most interesting paper. It has three parts: the first tests the symmetry of wheat futures prices; the second explores the question of whether, if output is known, farmers marketing to agencies such as the Canadian Wheat Board, would be better off if the Board hedged as compared to current pooling policy; and the third part explores the question that, if production is unknown (for example, prior to planting), would farmers be better off by hedging either through the Board or individually. The conclusion: the Board should hedge. This has clear policy implications.

Let me begin with some specific comments. The statistical procedures used in the paper are quite interesting. To test Dalton's proposition that futures prices are skewed to the left,

Professor Carter Colin uses the generalized characteristic function for a family of stable symmetric functions. He concludes prices are symmetric but that they are distributed in a Paretian stable distribution rather than a normal distribution thus questioning Dalton's results. However, when he turns to testing the benefits of hedging using the same prices, he assumes agents maximize expected utility using a mean-variance criteria. Clearly, here, he is using a normal distribution. It seems to me the reader deserves more explanation for the transition.

My second point concerns an ambiguity about who is hedging. It is clear that the Board would hedge as an entity but who is

hedging in the private market? Is it a representative farmer, some mythical "market" hedger, or each farmer? If it is the latter, there would be a distribution of outcomes and also substantial transaction costs which in sum would clearly exceed Board costs.

A third issue relates to the discussion of the timing of the Board's price announcement. The analysis is based on pre-1972 and post-1980 Board practices of announcing initial prices after planting. But in the period 1972-80, the Board did announce preplanting prices. How well did it do? Some coefficients of variation throughout the paper seem to suggest the Board does badly. But the analysis is incomplete. It seems to me Professor Carter should go further and test several expectations models. As it is now, it implies that preplanting prices are worse than nothing, but, again, the analysis is incomplete.

My fourth point relates to the assumption that Board hedging would have no impact on Chicago prices. In two separate places, he argues this case. First he says Canadian wheat production is only 3 percent of world production. This number is irrelevant. The real number is Canadian production relative to the volume of wheat traded in Chicago. At the end of the paper he argues that the Canadian crop is less than 3 percent of the volume of futures contracts traded in Chicago. Again this is not likely relevant because most contracts are traded many times. The more relevant comparison might be to open interest on the actual volume of grain represented by futures contracts. My subjective judgement is that if the Canadian Wheat Board sold forward 15 million metric tons of wheat in a relatively short time, it would indeed have a price impact. To argue that private traders handle similar volumes is open to question because private traders, such as Cargill, are continuously in the market, on both sides, trading incrementally. This is far different than the Board entering once a year and only on one side of the market. Clearly price impacts would need to be included in computing the potential benefits of Board hedging.

Finally, Professor Carter's paper raises important issues regarding Board policy. However, the tone of the paper bothers me a bit. Colin talks of the "weaknesses" of the Board in terms of poor price signals and riskiness of final prices, but clearly the market isn't perfect either. His conclusion that pooling is no better than hedging, when production is known, is only relating to price risk. But suppose pooling offers additional normative benefits--for example, equity and not being penalized for poor marketing decisions. Clearly these equity issues are at the historical foundation of the Canadian Wheat Board. I believe analysts should carefully limit the implication of their analyses to the specific issues addressed.

In sum, it is a good paper. I like the basic issue addressed--namely the necessity of treating production and marketing decisions simultaneously.

An Illustrated  
Partial Anatomy  
of the Agri-  
cultural Trade  
Issue Decision  
Process of the  
U.S. Government

by

George E. Rossmiller

Discussant:

Timothy E. Josling

The workings of the Federal executive branch in making decisions on agricultural trade policy is examined. To illustrate this decision, the author used a case study of a domestic injury complaint by the Pennsylvania mushroom industry that asked the U.S. Government to provide temporary relief from import competition. The case study illustrates that: (1) the interagency group as a decision body is highly operational, (2) economic analysis is only one of several factors that influence the final decision, and (3) most issues have a long history, but the need for decisionmaking may arise quickly, sometimes unpredictably, and the time frame for such decisions is usually extremely short, thus limiting the time for problem solving.

The paper points out that concerning the input of economic analysis into the decision process: information provided to the interagency group must be simple, brief, and defensible, and problem-solving economic analysis must draw upon the stock of pertinent research available at the time the problem arises. A major role for the trade researcher is as contributor to the stock of knowledge from which the problem-solving analysts might draw. Agricultural trade economists might also broaden their base of participation to include interaction with other agencies besides the U.S. Department of Agriculture.

Comments by Timothy Josling: Dr. Rossmiller has taken a step-by-step approach through the administrative process of deciding on an import relief petition. His interesting paper demonstrates the complexity of the interagency process in making trade policy. The paper, by implication, indicates the minor role that academic-or university-based research plays in the real world of trade policy. Rather than commenting on the issue of canned mushrooms or specifically on the interagency process, my remarks will be on the interface of academic research and actual trade policy decisions.

University work on trade policy can perhaps be loosely classified as four types:

1. Parameter estimation and quantitative projections of trade in specific commodity markets.
2. Descriptions and/or models of interrelationships among markets.
3. Effects on welfare and the measurement of protection levels for particular countries and commodity policies.
4. Examination of the structure of markets and the impact of policies on market behavior.

The first of these types of research has an obvious if limited value for practitioners of trade policy. The body of empirical literature on commodity trade flows yields at the least some rough "ballpark" estimates of elasticity parameters, which can be used in the ad hoc analyses of trade policy problems. Unfortunately, the large number of commodities and countries to

be covered and the rapid changes in market conditions under particular circumstances make it likely that the probability of finding a recent and soundly based empirical study will be small. I suspect that this market intelligence function is more the province of the Economic Research Service than of university academics, however valuable the estimation of market models as a training device for graduate students.

The understanding of the complexities of trade, in particular the interactions among commodity, foreign exchange, labor, and capital markets, seems naturally to be a function best undertaken in the quiet contemplation of a university. Much original work has been done in this area by agricultural economists in the past few years. However, my intuitive feeling is that much of the value in this work is in educating fellow economists who are steeped in microanalysis and single-commodity models, rather than policymakers, who usually start with a firm, if nonanalytical, grasp of interdependencies.

The estimation of trade policy impacts on real income and income distribution is a third hallowed area for academic exploration. As an ex post critique of policy actions, welfare models are fine. As an ex ante prop for decisionmaking, I doubt whether they are greatly valued. The objective function is usually not specified in the way that the policymaker sees it, and the constraints are difficult to build in. Moreover, the amount of policy detail needed to be useful in an actual decision is probably more than can comfortably be incorporated into most trade-policy models.

A fourth area of research seems to hold some promise of whetting the policymakers' appetites. The recent emphasis on the structure of trade and the behavior of trading institutions and governments seems to strike a chord. Policymakers clearly eschew the ubiquity of competitive markets. Market power models formalize what is intuitively known and give policy an explicit function in the working of markets.

Coordination of university research and government trade policy formulation could certainly be improved by more interchange of ideas, topics, data, and basic policy information. This is an issue which the Trade Research Consortium might wish to pursue. But by its nature, academic research into agricultural trade policy is unlikely ever to play a major direct role in actual trade policy decisions.

APPENDIX--TRADE CONSORTIUM MEMBERS AND PARTICIPANTS

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