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RR #10

ECONOMICS, POLITICS, AND WORLD GRAIN TRADE

by Paul L. Kelley

Research Report #10

Department of Agricultural Economics

Kansas State University

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Economics, Politics, and World Grain Trade

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ECONOMICS, POLITICS, AND WORLD GRAIN TRADE¹

by

Paul L. Kelley²

I. INTRODUCTION

Harvey Kiser asked me to discuss with you how political policies and strategies of major grain trading countries can "distort" economic outcomes of markets and well-developed buying and selling arrangements of private sector firms. This is a topic of major concern to importer and exporter nations.

To address the topic assigned, this paper is divided into five parts. First, the relation between a passive or active role of government and the form of market competition in defining and constraining trade outcomes for a nation or group of nations is discussed in the Role of Governments and Markets. The proposition is advanced that trade outcomes, given competitive characteristics of a market, are strongly influenced by the role of government intervention in that trading market. Second, a relatively simple procedure for tracking and appraising impacts of the role of governments in world grain markets is proposed. The proposition is advanced that domestic macroeconomic policies of a nation(s) may be more important in explaining agricultural trade outcomes than domestic agricultural or agricultural commercial trade policy. Third, an example of using the tracking procedure of part two for following the roles of

¹Paper presented at the workshop, April 19, 1988, "The U.S. Grain Marketing System," International Grains Program, Kansas State University.

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governments in markets is applied to the macroeconomic policy responses of major world trading nations to world oil price shocks of 1973 and 1977. Impacts on world grain trade are appraised. Fourth, a practical example of using a dialogue process between policymakers and policy researchers within a public affairs educational model is outlined. Suggestions are made how this approach might be used to forecast optimum future grain trading strategies for particular countries or regions. Finally, a summary of the importance of understanding the role of governments in world grain markets for developing future trading strategies is presented.

II. ROLE OF GOVERNMENTS AND MARKETS

The topic "economics, politics, and world grain trade" can be partially discussed within the framework of a matrix of interactions between the role of governments and the role of markets. It will be helpful to define what we mean by the role of governments and the role of markets before we discuss their interaction.

A. Role of Markets

For years, economists and business persons have characterized markets as ranging from perfectly competitive to monopoly.³ A major reason for classifying markets in this way is to predict something about their conduct and performance with and without government intervention. For example, in markets defined as purely competitive, a single buyer or seller cannot influence the price outcome in a given transaction period for the commodity under discussion. Such markets are characterized as

³The emphasis here is on what are usually understood as commodity product markets, although much of the discussion applies to services and input markets.

consisting of large numbers of buyers and sellers with equal access to transaction information, etc. As we move to the other extreme of market classification, monopoly, i.e., one with a single dominant seller, we find that the seller has power to influence price. Monopoly markets do not exist under normal conditions in world grain markets. When monopoly markets exist, as in the U.S. for other commodities or services, they generally are classified as public utilities subject to some form of governmental control.⁴ A wide range of commodity markets falls within the range from purely competitive to monopoly. Many of the world grain trade markets are sometimes defined as oligopolistic (McCalla, 1981; and McCalla and Josling, 1985). However, it is probably reasonable to suggest that even in 1988, we really do not have rigorous analytical models or definitions of world grain markets that produce mechanisms for predicting price and quantity outcomes of the accuracy level some desire. For those interested in more details on this point, a useful discussion of modeling problems in international grain markets has been developed (Sarris, 1981).

For our purpose, a market for a commodity is defined as that set of institutional and business environments in which exchange of a commodity may occur in a given time context. Price and quantity outcomes can be determinant or not, depending on the form of competition characterizing that particular market.

⁴We omit here a discussion of state trading, although some forms of state trading approach monopolies as will be discussed later. The difficulty of including a detailed discussion of state trading involves how to treat the interaction of the row vector (Fig. 1), i.e., the role of governments, in a non-democratic form of society.

So it is important that a person(s) wanting to make a business or professional career in world grain trading have some notion of the form of competition that prevails and will likely prevail in the future for the particular grain commodity or commodities of special interest.

Markets are defined here primarily from the standpoint of the seller(s). Markets also can be classified from the buyer(s) side.⁵

B. Role of Governments

When a market is defined as purely competitive or as a monopoly, we beg the question of the role of relevant government(s) in bringing about the forms of market competition in international grain markets under discussion (Schuh, 1981). This is an area that by and large has been neglected in the classical training of economists. However, this subject has received a considerable amount of attention in recent years by a number of authors (Josling, 1981; Johnson and Schuh, 1983).

Time does not permit an adequate discussion of the dynamics of how the form of market competition currently existing in world grain markets developed over time. Historically, various degrees of governmental interaction certainly influenced the type of competitive organization that now exists in several countries for major grains and oilseeds. So, world grain markets and the roles of governments in those markets as they exist in 1988 are assumed in this discussion.

It is convenient to define the role of governments as ranging from "passive to active" in relation to markets (Josling, 1981). A

⁵A detailed discussion of the wide range of forms of competition will not be presented here. Interested readers are referred to any of the standard economics references on price theory.

government(s) that exercises limited control over market processes of price and quantity traded of a commodity is defined as "passive". A government that exercises considerable control over market processes is defined as "active". Various degrees of categories can exist between these two extremes. For example, the Reagan administration has made a strong case over the past two administrative terms of getting government out of U.S. agriculture. In terms of our present discussion, this is a move to a more passive role in U.S. grain export operations.

An example in the opposite direction is that of the EC. In recent years, its policy of developing strong export subsidies for wheat implies an even greater or more active role in grain markets. One should note that most governments are quite capable of introducing contradictory policies under the umbrella of posturing to be either more "active" or more "passive" in their role in markets.⁶

What is the relation of our discussion of the role of governments to our title assignment, "Economics, Politics, and World Grain Markets"? The relation is simply this. Voters in a democratic society express their philosophy of the role of government intervention through the political process. This process, in turn, establishes laws, policies, and regulations that impact markets. Voters in democratic societies can and do change the role of governments in relation to markets over time. However, this is a very slow process and usually not too much is done, unless there is a major crisis that affects them.

⁶The U.S. Export Enhancement Program is being pushed by the Reagan administration, while at the same time espousing less market intervention.

Figure 1. Relation of the Role of Government and Form of Market Competition(a).

Role of Government	Form of Market Competition (b)			
	Perfectly Competitive	Monopolistic Competition	Oligopoly	Monopoly
Passive				
:				
Intermediate				
:				
Active				

(a) Adapted from Josling p. 9, 1981.

(b) See Tomek and Robinson, 1972 for definition of forms of market competition.

It will be useful to summarize our discussion by reference to a simple matrix of the role of governments and the role of markets in world grain trade in the following section.

C. Government and Market Interactions

The matrix of Figure 1 is proposed as an analytical device for appraising the role of governments and markets in world grain trade for a given time period.

It is proposed that performance of different forms of competition existing in a market is strongly affected by the role of government in that market. For example, if the basic structure of a market is that of a great deal of price competition, a different price and quantity outcome would be achieved with a passive role of government versus an active role

(See Appendix A - Policy Linkages Through Trade). Of course, we must rigorously define what is meant by passive and active roles of government. An example may be helpful. A government could assume an "active" role in what would otherwise be a purely competitive market by introducing either export or import subsidies. Or a government's role could be defined as "active", if it made substantial efforts to improve the information process in a market (See Appendix B). It really gets down to a set of value judgments on the part of society or a collection of societies of what constitutes "active" and "passive" roles of government in the market place. Individual politicians in any specific country may argue for protectionistic policies for specific commodities produced in their district for purposes of gaining political support for reelection, while supporting overall freer trade for the benefit of society.

But there appears to be a reasonable consensus that non-price and non-quantity trade distortion efforts are acceptable passive roles of government, whereas activities that distort price and quantity relationships in a purely competitive market are "non-preferred active" roles. On the other hand, active roles of government that make "less competitive markets more competitive" are regarded by some nations as "acceptable."

So it is critically important for us to define what we mean by "active and passive" roles of government, with reference to their interaction or implications for the form of market competition addressed.

In the opening round of the current General Agreement on Tariffs and Trade (GATT) discussions, the U.S. proposed eliminating major barriers to trade over a 10-year period (Ehrlich and Schwartz, 1987; Yeutter, Oct. 26, 1987). This is consistent with the view in high U.S. administration

circles that the world market for U.S. traded agricultural commodities should be essentially highly competitive. It is generally argued that U.S. and world producers and consumers would be better off with such a policy. This view of agricultural trade policy is not held by the EC, which proposed a substantially different approach (Yeutter and Lyng, July 6 and Oct. 26, 1987).

The fact that world trade in agricultural commodities is made up of different forms of competition and various philosophies of the roles of government in the markets is also illustrated by the emergence of the so-called Cairns group (Yeutter, Oct. 27, 1987).

The relevance of analysis employing the structure of Figure 1 is that we can arrive at a better understanding of likely outcomes of international negotiations such as the GATT, which attempts to change the role of governments in the international trading of grains and oilseeds. The U.S. is committed to a role of government that is directed in principal to enhancing the competitive nature of international agricultural markets. Other major exporters and importers, such as Canada, Australia, and the EC, are committed at the moment to roles of government that have the potential of making international agricultural trade less competitive (OECD, 1987).⁷

D. Dynamics of Change

There are numerous reasons explaining emergence of either a passive or active role of nations in trade policy (Houck, 1987). One should not

⁷Essentially by the use of what are equivalents to marketing boards in Canada and Australia and almost a state trading regime in the EC via the use of variable level export subsidies, etc.

assume that a rapid movement to a less restrictive trade policy by a nation will always be in the short-term interest of that nation. Some groups in a nation might gain and others might lose, or perhaps no group gains or loses. For this reason, analytical studies can play a role in helping policymakers and voters understand the consequences of whatever changing role that government might elect to pursue, given the form of competition relevant to that nation (Krissoff and Ballenger, 1987).

The bottom line of an improved understanding of the interaction of governments and markets is that we may be able to predict more accurately future market outcomes if we understand the change in the level of either direct or indirect future government market interventions.⁸

III. TRACKING THE ROLE OF GOVERNMENTS IN MARKETS - A SIMPLE MODEL

Those charged with responsibility of buying or selling grain and oilseeds for major firms or nations are sometimes so involved in the business of daily transactions that they may not have adequate time to sort out all of the key policy changes that can have major influences on their markets. This may require access to or establishment of a small economics or market research group. Such a unit can produce useful analyses even without access to a computer. For more sophisticated analyses, there is a rapidly expanding library of personal computer analytical programs of considerable value in grain trade policy analysis (Holland, 1981; Liu, 1985; Roningen, Wainio, and Liu, 1985; Johnson,

⁸We assume here different forms of world trade competition for wheat versus coarse grains, rice, and the oilseed sector. Further, we assume that nations vary in their intervention concerns about each of the major grains or oilseeds.

Womack, Meyer, Young, and Brandt, 1988; Chattin, Hulbert, and Holland, 1985; Dixit and Roningen, 1986; Manalo and Kelley, 1987; Sharples and Dixit, 1988).

If grain buyers and sellers cannot immediately access a market research group to assist them in tracking government policies in markets of interest, they should consider developing a simple matrix involving a checklist of examples of major areas of domestic and foreign economic policy that can impact grain and oilseed markets (Figure 2). For each of the major domestic and foreign economic policy categories, an example of major policy instruments implementing that policy area is presented. It is proposed that buyers (sellers) keep up-to-date on changes that may be introduced in each of these major domestic and foreign policy areas and their likely impact on prices and quantities of grain trade flows to particular markets of interest.⁹

The emphasis for buyers (sellers) should be on obtaining accurate descriptions of particular governmental policies and the most likely directional effects that those policies could have on trade in grains and oilseeds.

Some of the policy instruments noted in Figure 2 affect more than one policy area. A brief description of these instruments and policy areas follows in the next two sections.

⁹Such a "library" of information needs continual updating. In principal, assembly of such information on a global basis is really no different than the process used by a sharp competitive domestic business in any nation.

Figure 2. Categories of Domestic and Foreign Economic Policies and Target Instruments

Instruments	Domestic Policy			Foreign Economic Policy				
	Agri-cultural	Indus-trial	Macro-economic	Agricultural	Industrial	Foreign Investment	Aid	Balance of Payments
Loan Rates	*							
Target Prices	*							
Deficiency Payments	*							
Federal State Research	*	*						
Export Subsidies	*							
Import Tariffs	*			*	*			
Short-Long term Credit	*							
Non-tariff Trade Barriers	*			*	*			
Export Promotion	*	*		*	*			
Land Retirement	*							
Acreage Restrictions	*							
Marketing Boards	*							
State Trading				*				
Foreign Invest. Restrict.						*		
Foreign Invest. Induce.						*		
Loans and Grants							*	
Institution Building							*	
Taxes			*					
Monetary Controls								*
Exchange Rate Adjustment								*
Exchange Rate Control								*
Debt Restructuring								*
Import Restrictions								*
Voluntary Restraint Agrmt.								*
Govt. Export Promotion								*
Deficit Financing			*					
Domestic Expenditures			*					
Small Business Programs		*			*			
Payment In Kind	*							

^a Adapted from Root, 1973, p. 260.

A. Domestic Economic Policy

It is widely agreed that in the past a nation's domestic policy drove its foreign economic policy (Paarlberg, 1985; Hathaway, 1987). That belief, while still strong, may be weakening for some countries like the U.S., where the agricultural sector is becoming less powerful politically and more dependent on international economic factors. Time does not permit a detailed discussion of each of the policies and target instruments included under domestic policy of Figure 2. However, an example of agricultural policy as well as world economic changes will serve to illustrate the tracking process that is relevant.

1. Agricultural

The 1985 U.S. farm bill resulted in sharply lower loan rates for U.S. supported commodities in order to reduce U.S. treasury costs and grain stocks and to make the U.S. more competitive in world markets. These actions have begun to be effective at the same time that world macro policies have resulted in a lower value of the U.S. dollar. At the same time that the above events were occurring, the U.S. instituted a PIK (Payment in Kind Program), principally for feed grains, and the Export Enhancement Program, primarily for wheat. Close monitoring of these programs should provide grain buyers (sellers) with valuable insights of possible, future, worldwide, grain price trends (Lambert, 1987; Tierney, Barnaby, and Mintert, 1988).

2. Industrial

Industrial domestic policy can differ substantially from a nation's agricultural policy because of the power of special interest groups. A

notable example is the plant closing notification content of the U.S. trade bill vetoed by President Reagan on May 25, 1988.

3. Macro

Domestic macroeconomic policies of nations are of critical importance. In the U.S., macroeconomic policies produce substantially different effects on trading sectors today than they did three or four decades ago. This is because of the shift to floating exchange rates in the early 1970's, expansion of the relative importance of exports as a percent of U.S. farm income, and the rapid increase of mobility and volume of funds in world capital markets. Many professional agricultural economists assert that U.S. and world macroeconomic policies are more important today in determining the well-being of U.S. agriculture than domestic agricultural policy. This is true also in other major countries of the world. An example of this argument is presented in part three of this paper.

B. Foreign Economic Policy

For analytical purposes, it is useful to classify a nation's foreign economic policy into subgroups. Such a grouping is presented in Figure 2. This classification is not intended to be exhaustive but to serve as a beginning checklist for ultimately gaining a better understanding of agricultural trade policy. Within each of these categories of foreign economic policy, specific policy targets can generally be identified - some of which may be internally inconsistent within a category or between many categories.

A nation's foreign economic policy includes all attributes that affect composition, direction, and magnitude of its exports and imports. A country may have a substantially different foreign economic policy for

its agricultural versus its non-agricultural sectors. The ultimate policy target of a specific subset of a nation's foreign economic policies also may be political or national security objectives rather than an economic end. A recent example is the now famous U.S. Russian grain embargo of 1980 (McCalla, White, and Clayton, 1986).

1. Commercial

As defined here, commercial policy includes all actions of government that seek to alter current account transactions. In the past, the most obvious policy instruments used were import tariffs. In some cases, export tariffs (taxes) have been used. Since World War II, however, there has been a rapid rise in the use of non-tariff barriers in agricultural trade (Hillman, 1978). Included as policy instruments in this area would be the U.S. Export Enhancement Program (which has been vigorously used for wheat), U.S. export credit, and other indirect subsidy programs. Health issues, grades, containers, and labeling are also examples of non-tariff barriers used by various countries to restrict trade to "protect" local producers.

2. Investment

Investment policy should be disaggregated into public and private policies. Governments can engage in direct and indirect long-term international lending through their linkage with such agencies as the World Bank, IMF, etc. More recently, the U.S. government's "bail out" of private sector U.S. banks holding unsatisfactory international loan portfolios brings a new dimension to this area.

But governments can restrict investment outlays primarily only for balance of payment reasons. Direct investments can be induced by specific measures. With the rapid rise of the international capital markets since

post-World War II, national governments now play a far less important role in this area than in the past, except for those in developing nations. Interested readers are referred to Johnson and Schuh, 1983 for an excellent discussion of this problem.

3. Foreign Aid

Foreign aid, as generally understood, is a post-World War II phenomenon starting with the Marshall Plan to restructure the economy and political systems of Western Europe. In more recent years, foreign aid has been primarily directed toward developing nations for a variety of reasons, including the major political objective of stopping or buffering the spread of world Communism. The U.S. and other major developed nations have been involved in single as well as joint efforts in this area. Early foreign aid activities of the U.S. involved development of infrastructure and institution building, i.e., strengthening and upgrading the agricultural research potential of an area. More recent activities have been directed toward other ends.

4. Balance of Payments

For this discussion, we include all major activities of governments to maintain or restore equilibrium in their external accounts. For short periods of time, governments may rely on compensatory financing by drawing down on their own international reserves or by borrowing. "If the disequilibrium continues, governments must generally respond to a deficit (surplus) by 1) deflating (inflating) the domestic economy with monetary and fiscal instruments, 2) devaluing (revaluing) the exchange rate, or 3) imposing exchange controls over some or all international transactions" (Root, 1973). In recent years, many Latin American countries have

followed various devaluation schemes, debt restructuring, restrictions on imports, and export promotion (Shapouri and McKaig, 1987).

While all domestic and foreign economic policies are important in influencing future international market outcomes for grain and oilseeds, prime attention should be given to macroeconomic policies.

IV. TRACKING IMPACT OF MACROECONOMIC POLICIES OF MAJOR NATIONS ON WORLD GRAIN MARKETS IN THE 1970s AND EARLY 1980s

A. Setting: 1960s - early 1970s

Current U.S. agricultural trade problems have their roots in economic policies of the U.S. and other major, developed and developing nations in the 1960s and '70s. A long period of sustained world growth in the 1970s created excessive demands for certain major world resources, particularly petroleum, and an over-investment in the capital structure of U.S. agriculture.

There is general recognition that movement from fixed to floating exchange rates in the early 1970s, following collapse of the fixed exchange rate regimes of the Bretton-Woods Agreement, gave rise to a sharp decrease in the value of a previously overvalued dollar. Accompanying the shift to floating exchange rates was emergence of a well integrated international capital market beyond policy control of any single nation (Schuh, 1983). Within this setting, the impact on expansion of U.S. agricultural exports was dramatic, following two additional major international policy shocks.

B. First OPEC Oil Shock - 1973-74

The first shock, induced by the Organization of Petroleum Exporting Countries (OPEC), resulted in a four-fold increase in petroleum prices in 1973-74. OPEC countries generated significant trade surpluses so their capital accounts increased dramatically in international banks. Seeking profitable investments, these banks found a ready and willing market in many developing nations, particularly in Latin America. A part of these funds was channeled directly into productive development investments, but a substantial part was spent on direct consumption. Consequently, many developing nations accumulated significant debts in this period to pay for expanded imports - particularly from the U.S. At the same time, major developed countries engaged in easy monetary policies - permitting continued economic growth in developing nations.

C. Results of the First Shock

The world economy weathered the first 1973-74 oil crisis in a reasonably good manner. Nominal prices of U.S. farm products rose, but increases were tempered by an expansion in the U.S. agricultural system. Land previously in reserve was brought back into production, and new farm asset debt accumulated in part because of lending strategies of the Farm Credit System Land Banks. The international expansion was led by export growth. "For all non-OPEC developing countries, the total dollar value of exports was 2.5 times greater in 1980 than in 1975. Furthermore, annual growth in gross domestic products (GDP) for all developing countries averaged 5 percent during this period" (Shane and Stallings, 1987).

Impacts of the first oil shock can be summarized as (1) setting the stage for large debt accumulation in developing nations and (2) overexpansion of assets in U.S. agriculture, with the illusion of being on a permanent ever-expanding road to export prosperity in both developed and developing nations.

D. Second OPEC Oil Shock - 1979-80

The second OPEC oil shock in 1979-80 had entirely opposite effects, both in developing nations and in the U.S. agricultural sector. This round of petroleum price increases came at the time when the U.S. started its move towards a massive defense expenditure build-up, resulting in huge "full employment" budget deficits in the U.S. This fiscal strategy was reflected in a rapid build-up in interest rates, attracting major capital inflows to the U.S. High interest rates resulted in bidding up the price of the dollar, making U.S. agricultural exports much more expensive to developing nations.

E. Response to 1979-80 OPEC Oil Price Shock

The U.S. rise in interest rates impacted heavily on debt-laden developing nations. Response to the 1979-80 petroleum price increase was more significant than response to the 1973-74 OPEC shock because of the large debt that had accumulated both in the U.S. agricultural sector and in developing nations during the 1970's. Major industrial nations also responded in a different fashion to the second round oil price increase by simultaneously restricting available credit.

The 1973-74 first round oil price increase resulted in resource-driven inflation of 1973-81. This, in turn, reduced manufacturing profits over this period. "Only traditional measures could deal with anticipated

inflation. The sudden lowering of monetary growth sharply slowed the world economy, raised real interest rates, and made the debt a burden" (Shane and Stallings, 1983). The U.S. agricultural system was near "full capacity" as defined by most of the idle acreage reserves being back in production. This capacity, as well as a heavy inflow of capital, had to be adjusted to the reality of a reduced world demand for agricultural imports. These policy responses of developed nations to the second round oil price increases triggered the debt repayment crisis of developing nations that is now a major policy problem affecting U.S. agricultural exports.

These macroeconomic problems led to internal policies in developing nations to restrict imports, particularly grains, and an attempt to expand exports, for example, Mexico and Uganda. The U.S. policy response to the major worldwide decline in U.S. grain exports was an aggressive move to an export market orientation by implementing provisions of the 1985 farm bill. Enhancing U.S. agricultural competitiveness in international grain markets were (1) lower U.S. commodity loan rates, (2) targeted use of the Export Enhancement Program with heavy emphasis on wheat exports, and (3) vigorous use of generic certificates in the Payment-in-Kind program in the U.S. feed grain sector. These programs have resulted in reduced U.S. grain stocks. They have been fortuitously supported by a recent sharp decline in the value of the U.S. dollar, making our agricultural exports again more attractive to importers.

U.S. agricultural trade policy is at a watershed. Historically, U.S. domestic farm policy dominated U.S. agricultural trade policy. Today, worldwide macroeconomic events and major economic policy directions

in the U.S. play prime roles in shaping and constraining U.S. agricultural trade policy and their impact on U.S. exports. Domestic agricultural policy, while still of major importance, no longer is the sole determinant of U.S. agricultural trade policy.

The policy now is oriented toward the international market. This is a result of aggressive new programs authorized by the 1985 Farm Bill and the U.S. trade policy position announced in the opening Uruguay Round of the GATT negotiations of October 1987.

These new directions posed by the U.S. suggest changing roles of government and the private sector in the international agricultural marketplace. These roles will be tested, resisted, and shaped by major worldwide macro events, as well as internal policies of major customers of the U.S. agricultural trade sector. Some of the new U.S. policies, as well as those in importing nations, are based solely on short-term political objectives. As a result, they are in contradiction to well reasoned long-term trade objectives for both the public and private export sectors of the U.S.

V. EXAMPLE: ROLE OF GOVERNMENT IN A SPECIFIC INTERNATIONAL GRAIN AND OILSEED MARKET

It is the purpose of this section of the paper to suggest a practical and operational way of applying what has been discussed in the previous sections to a "real world trade problem." Many of you have responsibilities for import purchases of major grains. For our purposes, assume that you represent the policymakers or decision makers regarding grain purchase strategies for your country over the next several years.

To further simplify the problem, let's restrict our analysis to only wheat imports for Brazil since 1980. Our problem is to decide what went wrong with these imports. This is of major concern for U.S. wheat exporters. From the U.S. point of view, the problem is "How can the loss in the aggregate export level and the loss of U.S. market export shares be turned around?" From the point of view of Brazilian grain buyers, the problem perhaps is "Is it desirable to increase wheat imports to previous early 1980's highs and, if so, where are the 'best' import sources for Brazil?"

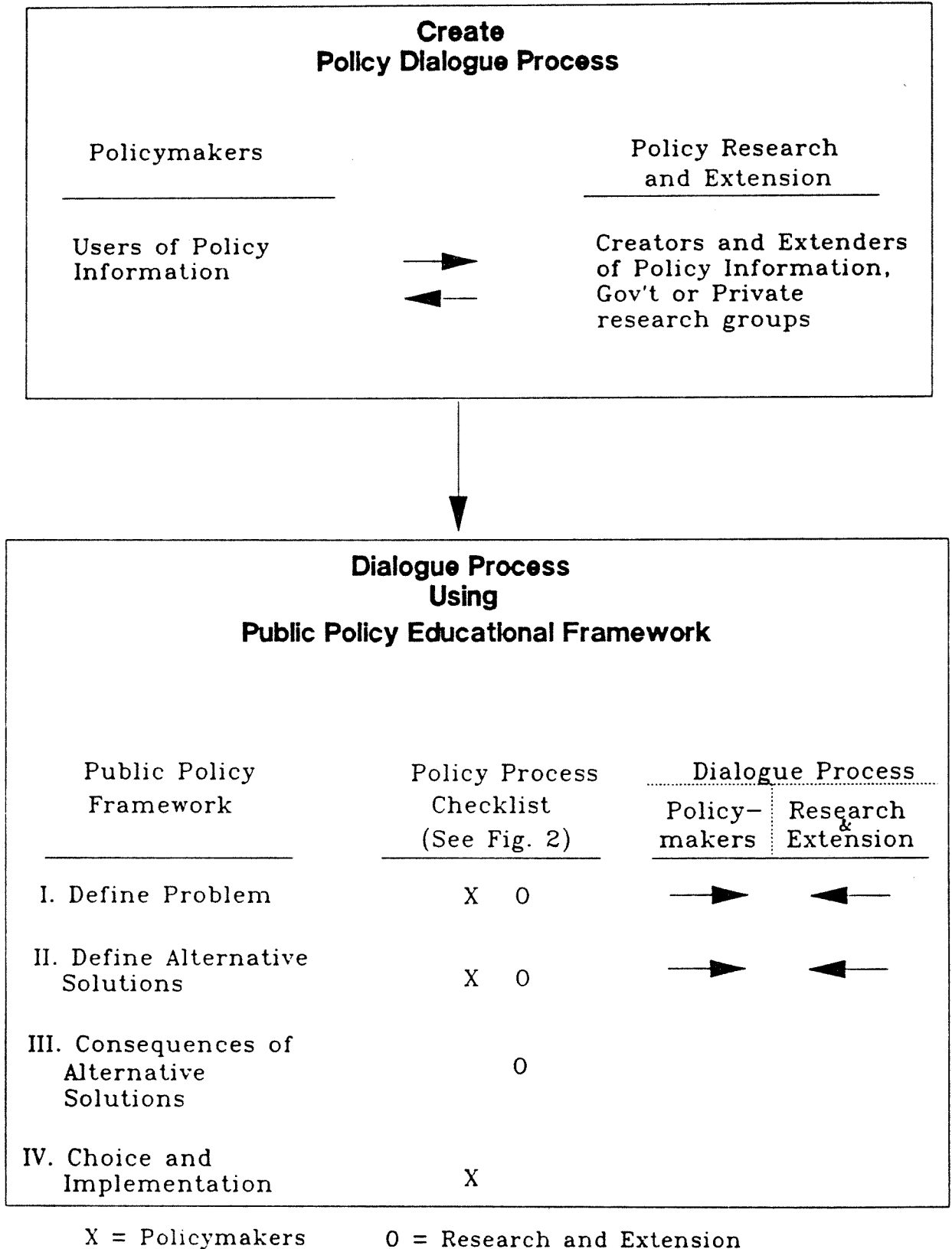
I propose that some insight to these questions and the possibility of developing a trading strategy from either the point of view of Brazilian importers or U.S. exporters for the next five years can be obtained within a dialogue process between policymakers (decision makers such as yourselves) and researchers who are providing essential economic analytical information for economic or business decisions. I propose that the dialogue process be carried out within a system called a public policy educational framework (See Figure 3).

To further simplify matters, assume that the forms of market competition will not change significantly in the current or future five-year projection period. Therefore, we can concentrate on trying to appraise the role of major domestic and foreign economic policy variables (Figure 2) on trade outcomes. Let's see how this might work. But first, we need some definitions.

A. Policy Dialogue Process

A communications process must be established between policymakers or decision makers and policy researchers who create information useful

**Figure 3 Flowchart of Dialogue and Public Policy
Educational Model Processes**



for public and private policy decisions. The reasons are obvious. Most policy decisions can be improved by better information. But policy research information likely will be more relevant and useful to policy decision makers if researchers are in communication with decision makers or users of such information. The dialogue process can be most effective within a public policy educational framework. It is proposed that the public policy model is appropriate for both public and private research groups providing decision information to decision makers.

B. Public Policy Model

The public policy model proceeds as follows:

1. Defining the problem

Policymakers and policy information users should jointly define the problem of interest, so that it is of value to decision makers and also researchable. This will take more than one round of discussion (Hathaway, 1981; Lambert, Grunewald, Flinchbaugh, Kelley, Hajda, 1987).

2. Alternative Solutions

Policymakers, researchers, and extension workers jointly agree on proposed alternative solutions to the problem. Researchers will probably take much of the lead in this process. Preliminary research is conducted to demonstrate that the proposed solutions are indeed feasible. Proposed policy solutions are restricted to a manageable set (Johnson, Womak, Meyers, Young, and Brandt, 1988).

3. Consequences of Alternative Solutions

Impacts and consequences of each proposed policy alternative are appraised. What are cost and benefit impacts on importer or exporter governments, if subsidies or taxes are involved? What are the impacts on

foreign domestic producers and consumers? Researchers probably will take the lead in developing this information in dialogue with policy users.

4. Choice of Solution(s) and Implementation

A role of the policy decision maker is to choose among alternative solutions and implement the chosen solution. In many situations, decisions will be made for strategic political reasons rather than economic or business concerns. In these cases, the economic cost or benefits of the decision at least can be identified.

C. Brazil, a Case Study - Wheat Imports

Let's assume that the dialogue process is in place. Each of you, as participants in this workshop, are representatives of policy decision makers. Your task is to define the Brazilian wheat import problem since 1983 from the point of view of Brazilian policymakers charged with import policy. Suggest solutions, evaluate solutions, and your decision about this problem. (See Appendix D for data on Brazilian wheat trade).

D. Use of Policy Checklist

Since we will not have time to do a detailed "computer analysis" of the problem (See Appendix C), we will use the checklist of policies and instruments of Figure 2 to suggest:

- a. What went wrong in the 1980s.
- b. How we can improve the current situation, and
- c. What is the most likely Brazilian wheat import scenario in the next 5 years, if Brazil does adopt your policy recommendations.

The flow chart of Figure 3 may be helpful to summarize how to proceed with this analysis. Given more time and money, more sophisticated

computerized models can be used. These are noted in some detail in Appendix C.

VI. SUMMARY

First, it is asserted that analysis of competitive behavior of firms or nations in predicting trade outcomes in world grain and oilseed markets must include interactive intervention effects of governments. It is important to form a reasonable judgment of the future direction and magnitude of government intervention in these markets, if successful long-term trading strategies are to be developed by either buyers or sellers. Buying or selling strategies appropriate to today's markets may be outdated in the future, if major impacts result from the role of current or future governmental strategies of market intervention.

Second, a preliminary listing is developed of major domestic and foreign economic policy areas that buyers and sellers should track to determine appropriate changes in either current or future buying or selling strategies.

Then, an example is presented of the importance of worldwide macro events in shaping worldwide grain market events and the types of governmental policy response to those events in the 1970s and early 1980s.

Finally, a dialogue model is developed between policymakers or policy users (such as represented by participants in this conference) and policy researchers. It is suggested that this dialogue process proceed within a public policy educational approach. That is, define current and future grain marketing problems for specific countries, identify alternative marketing solutions, define consequences and implications of alternative solutions, and finally, suggest that it is the responsibility

of policymakers to choose and implement a specific alternative marketing or trade strategy. The impact of the role of governments, especially impacts of macroeconomic policy, is evaluated in this dialogue and public policy educational process.

The obvious bottom line is that policies of governments exert powerful influences over trade outcomes in world grain and oilseed markets. Some of these outcomes can be predicted with a reasonable degree of certainty, if a tracking and evaluation system as proposed here is established within countries to aid buyers and sellers develop their longer-term trade strategies.

REFERENCES

- CARD, Report of the Center for Agriculture and Rural Development, Vol. 2, No. 1, Iowa State University, Ames, Feb. 1988.
- Chattin, Barbara L., Ann Marie Hulbert, and Forest D. Holland, PC WHEATSIM: Model Description and Computer Documentation, Purdue University Station Bulletin No. 477, Sept. 1985.
- Dixit, Praveen M., and Vernon Oley Roningen, Modeling Bilateral Trade Flows with the Static World Policy Simulation (SWOPSIM) Modeling Framework, ERS Staff Report No. AGES 861124, International Economics Division, Economic Research Service, USDA, Washington, D.C., Dec. 1986.
- Ehrlich, Everett M., and Elliot Schwartz, The GATT Negotiations and U.S. Trade Policy, The Congressional Budget Office, The Congress of the United States, Washington, D.C., June 1987.
- Hathaway, Dale E., Agriculture and the GATT: Rewriting the Rules, Institute for International Economics, p.1-2, Washington, D.C., Sept. 1987.
- Hillman, Jimmie S., Nontariff Agricultural Trade Barriers, University of Nebraska Press, Lincoln, 1978.
- Holland, Forest D., and Jerry A. Sharples, Wheatsim: Model 15. Description and Computer Program Documentation, Purdue University Station Bulletin No. 319, 1981.
- Houck, James P., Grain Markets and the United States: Trade Wars, Export Subsidies, and Price Rivalry, Working Paper, International Agricultural Trade Research Consortium, Dept. of Agricultural and Applied Economics, Univ. of Minnesota, Minneapolis, Dec. 1987.
- Johnson, D. Gale, and G. Edward Schuh, Editors, The Role of Markets in the World Food Economy, Westview Press, Boulder, Colorado, 1983.
- Johnson, S. R., Abner W. Womack, William A. Meyers, Robert E. Young II, and Jon Brandt, FAPRI Ten-year International Agricultural Outlook, Center for National Food and Agricultural Policy, Univ. of Missouri, Columbia and Center for Agricultural and Rural Development, Iowa State Univ., March 1988.
- Josling, Timothy E., "Introduction," p. 1-8, and "Domestic Agricultural Price Policies and Their Interaction through Trade," pp. 49-68 in McCalla, Alex F., and Timothy E. Josling, Editors, Imperfect Markets in Agricultural Trade, Allanheld, Osmun, and Co., Publishers, Inc., Montclair, NJ, 1981.

- Krissoff, Barry, and Nicole Ballenger, Agricultural Trade Liberalization in a Multi-Sector World Model, International Agricultural Trade Research Consortium, Dept. of Agricultural and Applied Economics, Univ. of Minnesota, Minneapolis, Dec. 1987.
- Lambert, Charles D., et al., "The National Agricultural Policy Commission Act: The Kansas Connection," Choices, American Agricultural Economics Association, 2nd Quarter, 1987, pp. 30-31.
- Lambert, Charles Duane, Economic Impacts on the U.S. Wheat Sector of Alternative Export Demand Scenarios and Stocks Management Programs Utilizing PIK Marketing Certificates, Unpublished PhD. Thesis, Department of Agricultural Economics, Kansas State University, Manhattan, Dec. 1987.
- Liu, Karen, A Grain, Oilseeds, and Livestock Model of Japan, ERS Staff Report No. AGES 850627, IED, ERS, USDA, Washington, D.C., Aug. 1985.
- Manalo, Alberto, and Paul L. Kelley, Evaluation of WheatSim as a Model for Analyzing Alternative U.S. Wheat Policies, Research Report No. 3, Dept. of Agricultural Economics, Kansas State University, Manhattan, 1987.
- McCalla, Alex F., "Structural and Market Power Considerations in Imperfect Agricultural Markets," pp. 9-28 in McCalla, Alex F., and Timothy E. Josling, Editors, Imperfect Markets in Agricultural Trade, Allanheld, Osmun, and Co. Publishers, Inc., Montclair, N.J., 1981.
- McCalla, Alex F., and Timothy Josling, Agricultural Policies and World Markets, MacMillan Publishing Co., New York, 1985.
- McCalla, Alex F., T. Kelley White, and Kenneth Clayton, Embargoes, Surplus Disposal and U.S. Agriculture, Agricultural Economics Report No. 564, ERS, USDA, Washington, D.C., Dec. 1986.
- OECD, Synthesis Report, National Agricultural Policies and Trade, Organization for Economic Cooperation and Development, Paris, 1987.
- Paarlberg, Robert L., Food Trade and Foreign Policy, India, the Soviet Union and the United States, Cornell University Press, Ithaca, N.Y. and London, 1985.
- Roningen, Vernon O., John Waino, and Karen Liu, The World Grain, Oilseeds, and Livestock Model - A Microcomputer Version, ERS Staff Report No. AGES 850826, IED, ERS, USDA, Washington, D.C., Sept. 1985.
- Root, Franklin R., International Trade and Investment, Theory, Policy, Enterprise, pp. 260-263, 3rd. Ed., South-Western Publishing Co., Cincinnati, Ohio, 1973, Also see 4th. Ed., 1978.

- Sarris, Alexander H., "Empirical Models of International Trade in Agricultural Commodities," pp. 87-112 in McCalla, Alex F., and Timothy E. Josling, Editors, Imperfect Markets in Agricultural Trade, op. cit., 1981.
- Schuh, G. Edward, "Markets and Governments in the World Food Economy," pp. 281-288 in The Role of Markets in the World Food Economy, edited by D. Gale Johnson and G. Edward Schuh, Westview Special Studies in Agricultural Science and Policy, Westview Press, Boulder, Colorado, 1983.
- Schuh, G. Edward, "U.S. Agriculture in an Interdependent World Economy: Policy Alternatives for the 1980's," pp. 157-182 in D. G. Johnson, ed., Food and Agricultural Policy for the 1980's, American Enterprise Institute for Public Policy Research, Washington, D.C., 1981.
- Shane, Matthew, and David Stallings, The World Debt Crisis and Its Resolution, pp. 2-3, Foreign Agricultural Economics Report No. 231, Agriculture and Trade Analysis Division, ERS, USDA, Aug. 1987.
- Shapouri, Shala, and Nancy McKaig, Economic Response to Devaluation in Selected Developing Countries, ERS Staff Report No. AGES 870921, Agriculture and Trade Analysis Division, ERS, USDA, Washington, D.C., 1987.
- Sharples, Jerry A., and Praveen M. Dixit, Forces that Could Expand U.S. Wheat Exports: Estimates from a World Wheat Trade Model, Agriculture and Trade Analysis Division ERS, U.S.D.A., Report No. AGES 870811, Jan. 1988.
- Tierney, William, G. Art Barnaby, and James Mintert, "Ag Update", KSU Extension Agricultural Marketing/Management Telenet Conference, pp. 1-29, Dept. of Agricultural Economics, Kansas State University, Manhattan, April 6, 1988.
- Tomek, William G., and Kenneth L. Robinson, Agricultural Product Prices, 2nd ed., Cornell University Press, pp. 92-95, 1972.
- Yeutter, Clayton, and Richard Lyng, Press Briefing, Statement of the U.S. Delegation Presenting a Proposal for Negotiation on Agriculture, Negotiation Group on Agriculture, Office of the Press Secretary, the White House, Washington, D.C., July 6, 1987.
- Yeutter, Clayton, and Richard Lyng, Statement by Ambassador Yeutter and Secretary Lyng on the European Community's Proposal for Trade Reform in the Uruguay Round, Office of the United States Trade Representative, Executive Office of the President, Washington, D.C., Oct. 26, 1987.

Yeutter, Clayton, and Richard Lyng, Statement by Ambassador Yeutter and Secretary Lyng on the Cairns Group and the Canadian Proposals on Agriculture, Office of the United States Trade Representative, Executive Office of the President, Washington, D.C., Oct. 27, 1987.

Appendix A: Policy Linkages Through Trade

The interested reader is referred to standard references on international trade for relevant theory. One of the more concise and clear expositions is that of McCalla and Josling, 1985, page 36 ff.

Appendix B: Possible Appropriate Roles for Governments in International Grain Markets (a)(b).

Social Issue or Activity	Role of Government	Role of Markets
International Monetary Order Issue -Assist in stabilizing world monetary markets to stabilize world price levels.	Perhaps establish an international bank to keep monetary reserves growing at steady rate.	Provide reasonable price stability in such markets over time.
Maintain Competitive Input and Product Markets Issue - Who will do the planning: a few in governments or many decentralized individuals?	Provide and distribute information to make markets more competitive.	Competitive markets allow decentralized planning.
Social Welfare	Appropriate government role; health, nutrition, disadvantaged, etc.	Same role for markets, i.e., retirement programs, etc.
Education	Appropriate role for much of educational process.	Private markets can provide some competitive education, i.e., private schools and universities.
Skill Enhancement	Major role for governments.	Private markets find it profitable, if labor mobility does not erode investment benefits.
Stable Civil Order	Major function of government.	Not a function of markets.

Appendix B (continued)

Social Issue or Activity	Role of Government	Role of Markets
Capital and Labor Markets.	1. Provide market information.	Enhance appropriate signals for efficient use of these resources over time.
	2. Subsidize labor mobility.	
	3. Invest in formal schooling.	
	4. In some cases, decentralize the industrialization process.	
	5. Create appropriate capital instruments to encourage savings at appropriate levels.	
	6. Reduce transaction costs of capital to small producers.	
	7. Subsidize transaction costs of capital for small producers.	
	8. Ensure proper land titles.	
	9. Make policy to discourage land fragmentation.	
	10. Maintain open land markets.	
	11. Create policies that do not distort development objectives of land, labor, and capital markets.	

Appendix B (continued)

Social Issue or Activity	Role of Government	Role of Markets
Police and Justice System	Main function of government.	Not a function of markets.
Public Utilities	Where natural monopolies exist in public interest create public utilities.	
Divergence between Private and Social Costs	<p>1. When firms or individuals impose costs on society that society in general does not incur, i.e., pollution, etc.</p> <p>2. When benefits to societies of action taken by firms or individuals are greater than gains to individual firms or persons.</p>	
Reduction of Market Risk and Uncertainty	Provision of improved decision information can lead to more efficient allocation of society's resources.	
Futures Markets	Expanded role of government to expand use - an appropriate role to improve resource allocation.	
Improved Community Stock Policies		Perhaps best provided by private markets.
Food Security	<p>1. Reduce barriers to trade.</p> <p>2. Improve GATT negotiating mechanisms for agribusiness.</p>	

Appendix B (continued)

Social Issue or Activity	Role of Government	Role of Markets
Food Aid	Channel to facilitate investment in human capital.	Do not use as an excess supply dumping procedure.
International Government	Improve roles of GATT.	
Redistribution of Income	<ol style="list-style-type: none"> 1. Proper role of government. 2. No technical basis for redistribution strategy. 	Decouple redistribution of income from market functions.
Alleviate Poverty	Raise human capital, predominantly of disadvantaged.	Where market failure exists, use appropriate government intervention.
Human Capital Enhancement	<ol style="list-style-type: none"> 1. Schooling, etc. 2. Nutrition programs. 3. Health programs. 	

(a) Adapted from G. Edward Schuh "The Role of Governments in the World Food Economy," pp. 277-299, in The Role of Markets in the World Food Economy, edited by D. Gale Johnson and G. Edward Schuh, Westview Special Studies in Agricultural Science and Policy.

(b) The alternate appropriate role of governments and markets is an empirical issue that must be decided by voters within a particular country or social unit (i.e., even collections of countries).

Appendix C: Computerized Trade Models, Big and Small

Given sufficient time, funds, facilities, and research staff, several small-scale and several large-scale models exist that can be assessed for appraising alternative solutions to a particular trade problem. Discussed in the following section are a useful micro computer model called SWOPSIM (Dixit and Ronigen, 1986) and a larger "main frame" computer system complex named MATRIC (The Midwest Agribusiness Trade Research and Information Center at Iowa State University). These systems have been chosen to represent the current state of the arts in small- and large-scale analytical systems for trade analyses.

The following extracts from the publications describing SWOPSIM and MATRIC can serve to illustrate the types of trade policy problems that can be addressed within the framework of these models.¹⁰

SWOPSIM

The static world policy simulation (SWOPSIM) modeling framework developed by Roningen follows the logic of a nonspatial price equilibrium model, which assumes that domestic and traded goods are perfect substitutes in consumption. While such nonspatial models are used extensively in the literature for trade policy analysis, their usefulness is often limited by their inability to address issues concerning bilateral trade. For such purposes, it is common to resort to either spatial price equilibrium models or trade flows and market share models.¹¹

¹⁰Much of the discussion on SWOPSIM is either a direct quote or an abstract of the discussion by Dixit and Roningen, 1986.

¹¹The terminology describing the various types of models are explained in Thompson (Thompson, 1981).

Both of these models endogenize trade flows and market shares and provide a means to introduce discriminatory tariff and nontariff barriers, which are particularly important in agricultural trade. Spatial price equilibrium models explain trade flows for homogeneous commodities based on the differences in transportation costs. These models, however, have not historically explained trade flows adequately. A majority of empirical spatial price equilibrium models suggest considerably more specialization in trade than actually exists in the real world. One hypothesis for this poor performance is that an agricultural commodity like beef, which is produced in many countries, is not a perfectly homogeneous product as assumed in spatial price equilibrium models. Therefore, the law of one price does not hold.

This lack of support for the law of one price and the failure of the spatial price equilibrium models to replicate trade flows adequately provided the motivation for developing bilateral trade flow models of agricultural trade. One subclass of such models is the Armington-type model, which explains bilateral trade flows by assuming that commodities exported by different countries are not homogeneous. In this framework, importers discriminate among products on the basis of their geographic origin.

Armington-type models are gaining greater acceptance in the agricultural economics literature as a means of explaining agricultural trade flows. Despite this broader acceptance, the Armington approach has shortcomings. Limitations of the approach are well chronicled in the literature.

The following section explains how to create an Armington-type trade flow model from the nonspatial price equilibrium framework embedded in SWOPSIM. The SWOPSIM framework has been modified to allow the generation of an Armington-type bilateral trade flow model. This modification will allow the framework to endogenously generate bilateral trade flows and address issues relating to bilateral trade, such as the establishment of a free trade area.

The Structure of SWOPSIM Models

SWOPSIM is a framework that can be used to create static world policy simulation models. The models created by the framework reside in spreadsheets and are modified and solved as spreadsheets. SWOPSIM models are designed to simulate the effect of changes in policies on production, consumption, and trade. The framework allows the construction of single commodity or multi-commodity world trade models.

The models generated by SWOPSIM are characterized by an economic structure that includes constant elasticity supply and demand equations and summary policy measures. Trade is the difference between supply and demand, as is the case in standard neoclassical net trade models.

SWOPSIM models are static; they do not model the changes over time of endogenous variables. Supply quantities are functions of input and/or product prices, and if desired, other endogenous demand quantities (joint products). Demand quantities, on the other hand, are largely functions of own- and cross-product prices, and under certain circumstances, supply quantities of endogenous variables in the model. Linkages across products can occur via cross-price relationships and technological parameters that

describe input-output types of specifications, while linkages across countries and regions take place through domestic-international price equations and world trade.

The policy structure of SWOPSIM models is embedded in equations linking domestic and world prices. The standard policy structure is designed to allow flexibility in characterizing policies that might affect production, consumption, and trade. Policies are inserted as subsidy equivalents at the producer, consumer, export, or import level. Alternatively, price transmission elasticities can be used to characterize the degree of connection of domestic and world prices. Exchange rates translate world prices to trade prices denominated in a country's domestic currency to link up with consumer and producer prices also denominated in the domestic currency.

The Logic of Armington Bilateral Trade Flow Models

Armington has developed the theory for a class of trade models in which consumers discriminate among commodities on the basis of their geographic origin. His hypothesis is that a commodity like wheat or beef is not perfectly homogeneous, and therefore, the law of one price does not hold exactly; instead, varietal and quality differences exist. Consumers differentiate by place of production of otherwise physically similar commodities. For instance, U.S. consumers may distinguish between high quality beef produced in Canada and lower quality beef produced in Argentina. Beef, in this illustration, would be defined as a good, while beef produced by a particular country would be called a product.

Armington's approach assumes that utility is weakly separable, so that the consumer's decision process may be viewed as occurring in two

stages. The total quantity of a commodity to be imported is first determined, and then this quantity is allocated among competing suppliers. U.S. consumers, in our example, would determine, in the first stage, how much total beef to consume, and in the second stage, allocate this total among domestic, Canadian, Argentine, or other beef suppliers.

MATRIC

A more sophisticated approach to modeling solutions to trade policy problems can be considered, given sufficient staff and funds. The following program, recently introduced by the Center for Agricultural and Rural Development of Iowa State University, is a major example. While the emphasis is on U.S. firms, there appears to be no reason, other than data base problems, etc., why foreign firms or nations could not avail themselves of this type of analytical capacity.¹²

CARD (The Center for Agricultural and Rural Development) is affiliated with a new research center that will provide assistance to small and medium sized midwestern agribusinesses in exporting agricultural products. CARD is designing and implementing a user-friendly information system on trade and exports to be accessed by these businesses and by researchers at Iowa State University conducting trade, policy, and marketing studies. Because of the high cost and special expertise required to assemble and analyze the relevant information and the uncertainty about foreign markets, many producers, manufacturers, and distributors have been hesitant to trade in international markets.

¹²Much of the material presented in this discussion on MATRIC is either a direct quote or an abstract from CARD, Vol. 2, No. 1, Iowa State University, Ames, February, 1988.

The Midwest Agribusiness Trade Research and Information Center (MATRIC) draws upon the research capabilities of CARD and three other Iowa State University research units, in addition to the Greater Des Moines Chamber of Commerce Federation, to provide essential data, studies, research, analysis, and training. Appendix Figures 1 and 2 show the organization of MATRIC and the affiliated research and training units.

Smaller firms, because of uncertainty about foreign markets and an inability to make trade information proprietary, will under-invest in market research and development. The availability of critical information on export market opportunities, market impediments, and marketing strategies and techniques gives these companies the impetus to investigate international trade. MATRIC is based on the concept that the economy will benefit from a wide public dissemination of this information.

In addition to the information system and associated feasibility analyses, MATRIC will undertake trade and export policy studies designed to impact legislation on and administration of foreign markets. Examples of these studies are evaluations of bilateral trade agreements, counter-trade, and removal of trade barriers, as prescribed by proposals tabled in the Uruguay round of GATT negotiations.

The Information System

The information system developed by CARD employs Relational Data Base Management Systems (RDBMS) using structured query language (SQL). This approach, along with use of fourth generation languages (4GL) and application development tools, allows users greater flexibility in accessing and manipulating MATRIC and other CARD data bases.

A RDBMS allows for the storage of large amounts of data in logical tables. Relationships between data tables are stored in catalogs or dictionaries. The system depends on its "relational" intelligence to respond to queries of data requests whether data are drawn from one table or many. SQL is a standardized set of English-based commands and relational verbs used to interact with the RDBMS in a conversational manner. This command and relational set is small yet powerful. Users can readily adapt to the RDBMS.

Fourth generation languages and relational application development tools will allow CARD programming staff and research analysts to develop additional aids for the external users. These aides will include named access to data tables, preformatted report tables and graphs, and instructional "help" messages. The tools are also useful for producing specialized reports and performing statistical and graphical analysis from within the information system.

The use of RDBMS, SQL, 4GL, and other applications will allow CARD to develop a flexible user- (not programmer-) oriented information system with the availability of powerful centralized analytical tools.

Organization of MATRIC

The first year of a five-year proposal, which CARD Administrator Stanley R. Johnson developed (along with Robert W. Jolly and other ISU administrators), was funded in October 1987 by a Congressional research grant. The grant is administered through the U.S. Department of Agriculture. Similar grants are anticipated over the next four years for continued support of the center. "This is a long-term venture," Johnson says. "We have to get ourselves positioned to carry through a program that

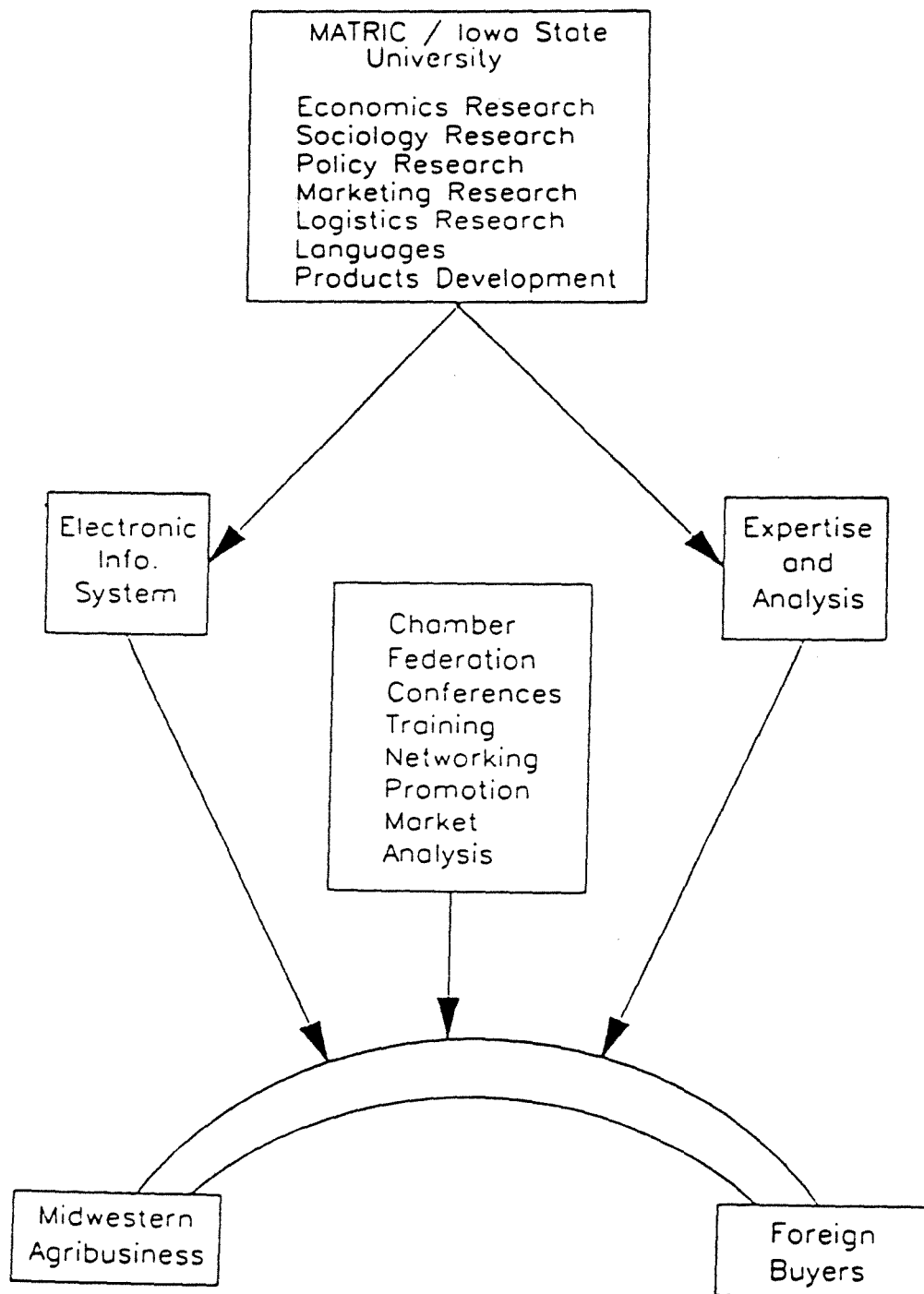
can lead to positive results." During the first year, MATRIC is conducting assessment of the needs of midwestern agribusinesses that are, or plan to be, engaged in exporting activity. Staff is being hired and computer hardware is being acquired to develop and accommodate the information system.

William H. Meyers is research administrator of MATRIC, and John W. Helmuth is the assistant administrator. Meyers and Helmuth retain their administrative and faculty appointments in CARD and the ISU Department of Economics.

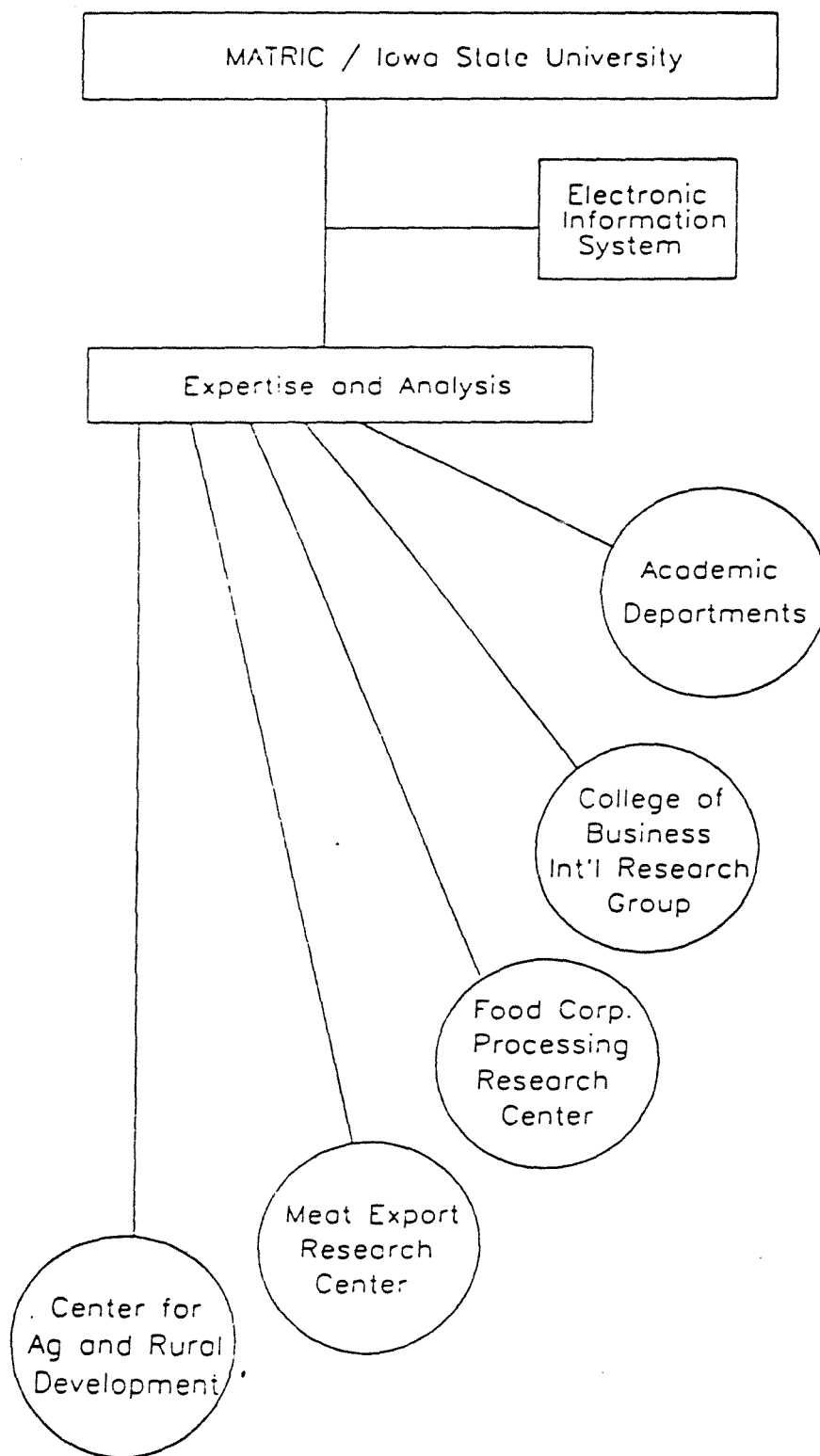
A unique aspect of this trade research and information enterprise is that it "forges new collaboration between research centers at the university and the business community," says Meyers. It is also a vehicle to integrate the excellent high technology and educational resources in Iowa, including ISU's computer center and satellite uplink facility. MATRIC offices are located at ISU and in the International Trade Center building in Des Moines.

The immediate objective of MATRIC is to improve the quality and reduce the cost of information to small- and medium-sized firms, providing increased incentive for private sector initiatives in trade and export markets. The long-range goal is to encourage economic growth by developing an institution soundly grounded in technical and economic concepts that will stimulate the level of economic growth in the United States (CARD Report, 1988).

Appendix Figure 1. Organization of MATRIC



Appendix Figure 2. ISU Components of MATRIC



Appendix D: Brazil Wheat Imports 1962-85

Appendix Table 1. Brazil Wheat Imports by Exporting Country and Year 1962-85

Appendix Figure 3. Brazil Wheat Imports by Exporting Country 1971-85

Appendix Figure 4. Brazil Wheat Imports by Country 1962-85

Appendix Figure 5. Brazil Wheat Imports from U.S. 1962-85

Appendix Figure 6. Brazil Wheat Imports from Argentina 1962-85

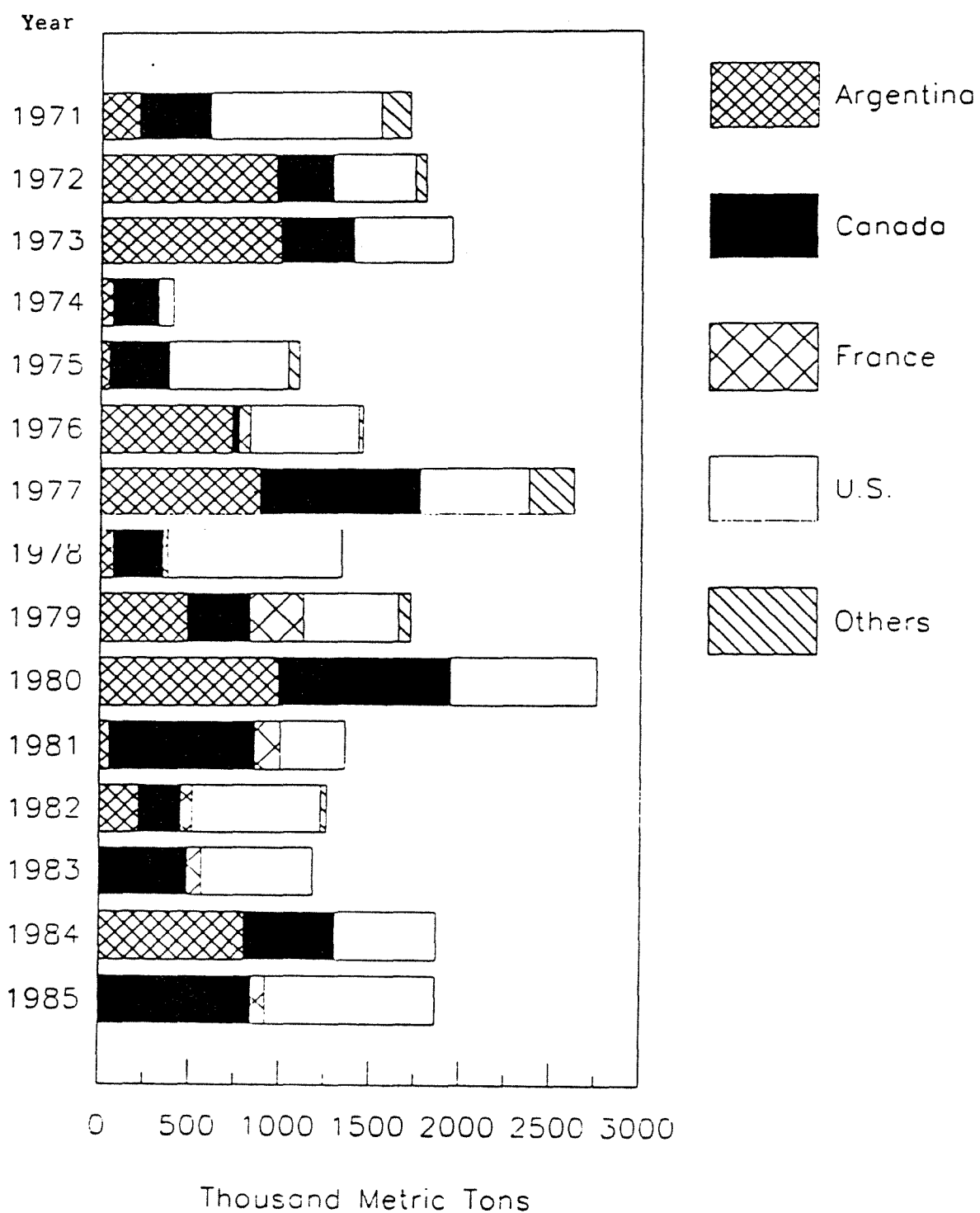
Appendix Figure 7. Brazil Wheat Imports from Canada 1962-85

Appendix Figure 8. Brazil Wheat Imports from France 1962-85

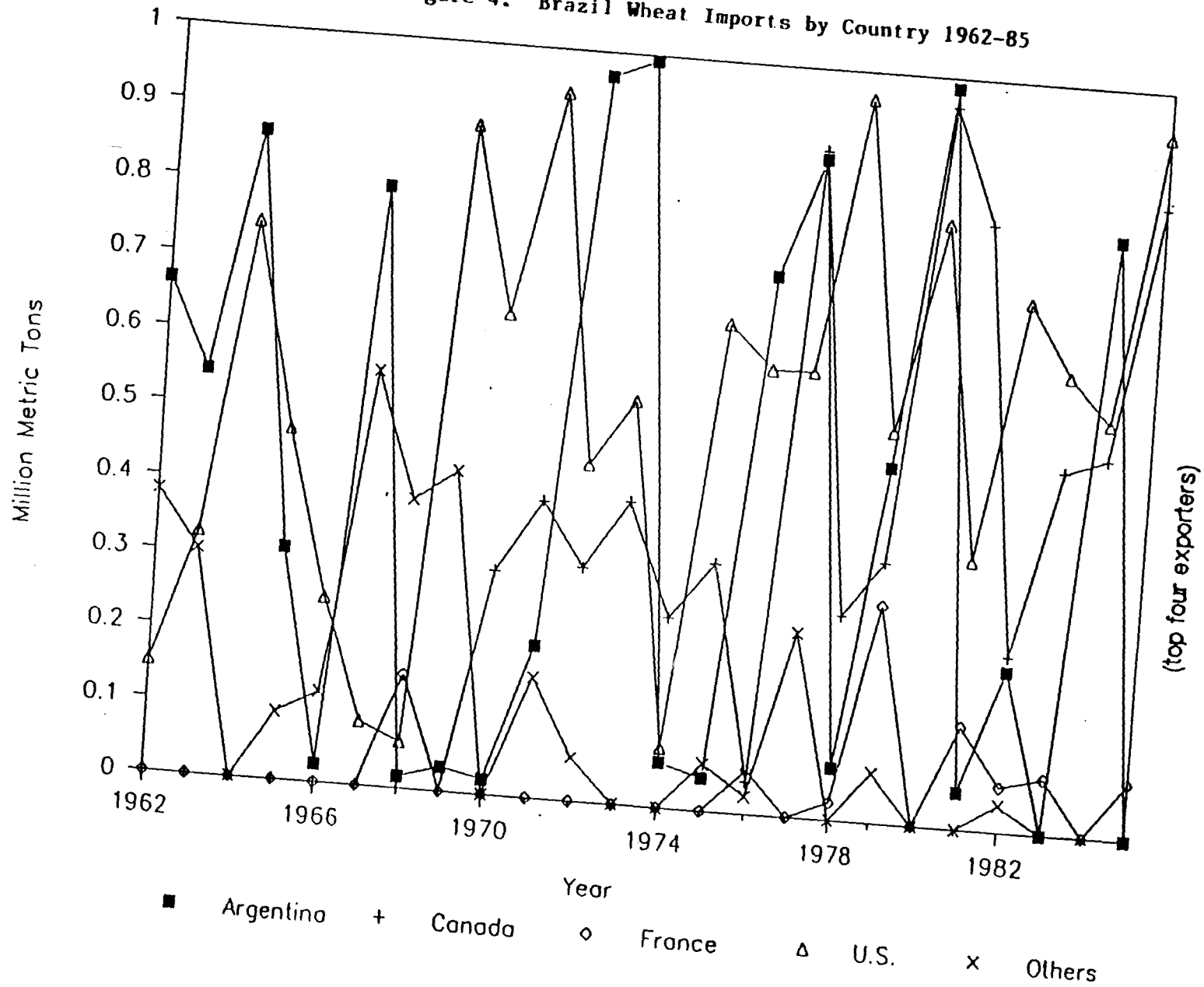
Appendix Table 1. Brazil Wheat Imports by Exporting Country and Year 1962-85

Year	Totals	Argentina	Canada	France	U.S.	Others
Thousand Metric Tons						
1962	1191.8	663.0	0	0	149.4	379.4
1963	1175.6	544.9	0	0	326.9	303.8
1964	1609.0	864.4	0	0	744.6	0
1965	876.2	313.0	0	0	472.3	90.9
1966	394.5	24.3	0	0	248.7	121.5
1967	1446.1	802.0	0	0	86.3	557.8
1968	620.9	16.3	0	153.0	62.5	389.1
1969	1355.5	32.8	0	0	891.2	431.5
1970	969.2	20.7	302.0	0	646.5	0
1971	1710.5	205.5	400.5	0	942.1	162.4
1972	1796.9	968.8	315.0	0	454.5	58.6
1973	1945.6	992.9	408.0	0	544.0	.7
1974	399.2	61.5	256.8	0	80.9	0
1975	1097.8	44.6	334.1	0	655.8	63.3
1976	1449.5	723.8	43.7	59.0	599.5	23.5
1977	2624.1	881.4	892.8	0	600.8	249.1
1978	1334.9	70.1	276.3	23.8	964.7	0
1979	1719.1	479.7	351.7	293.1	527.8	66.8
1980	2755.2	986.3	961.7	0	807.2	0
1981	1360.1	50.0	810.1	138.0	362.0	0
1982	1259.6	216.2	236.2	60.6	710.9	35.7
1983	1182.1	0	489.4	75.4	617.3	0
1984	1867.9	800.3	509.5	0	557.8	.3
1985	1864.5	0	847.3	76.3	940.9	0

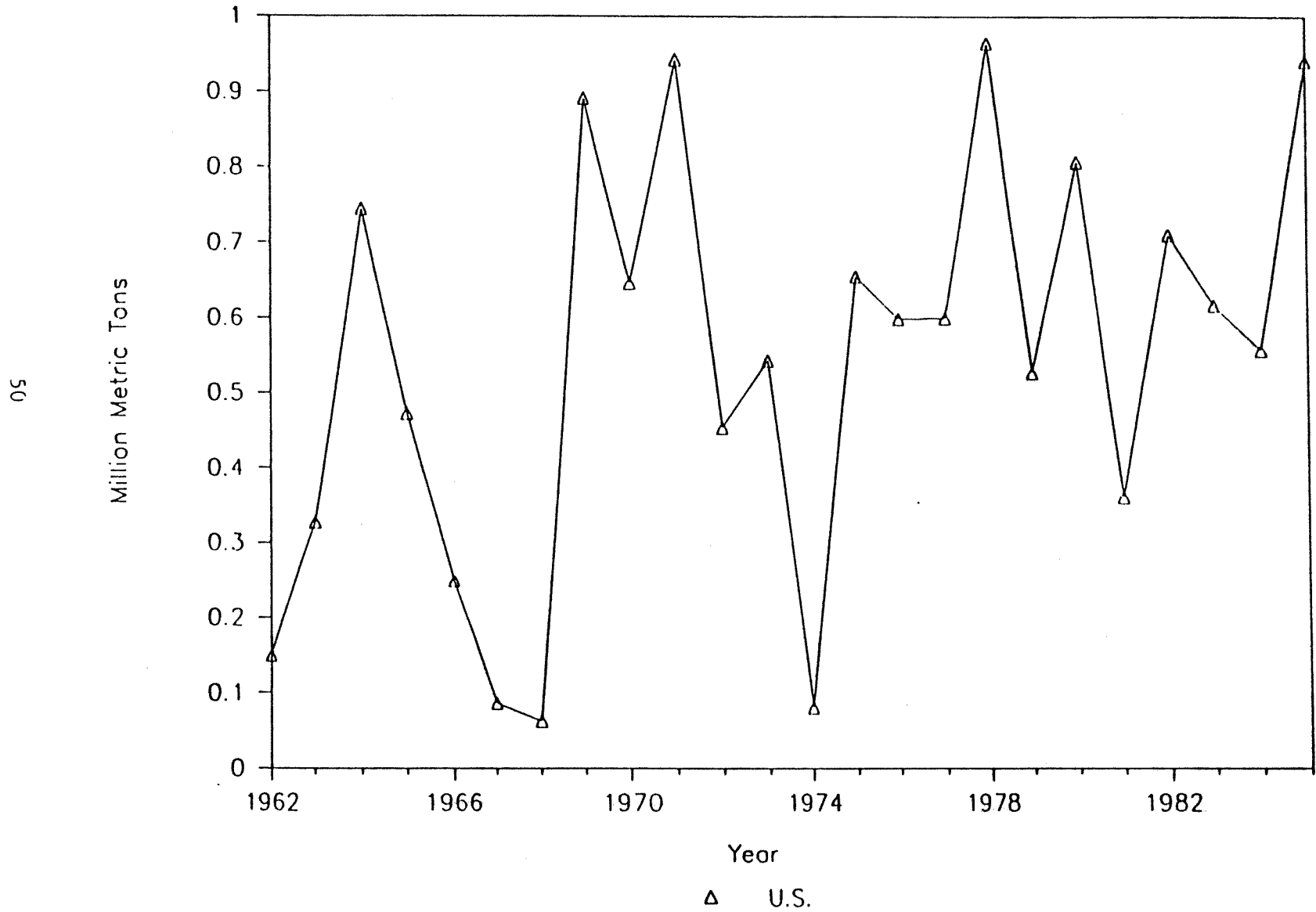
Appendix Figure 3. Brazil Wheat Imports by Exporting Country 1971-85



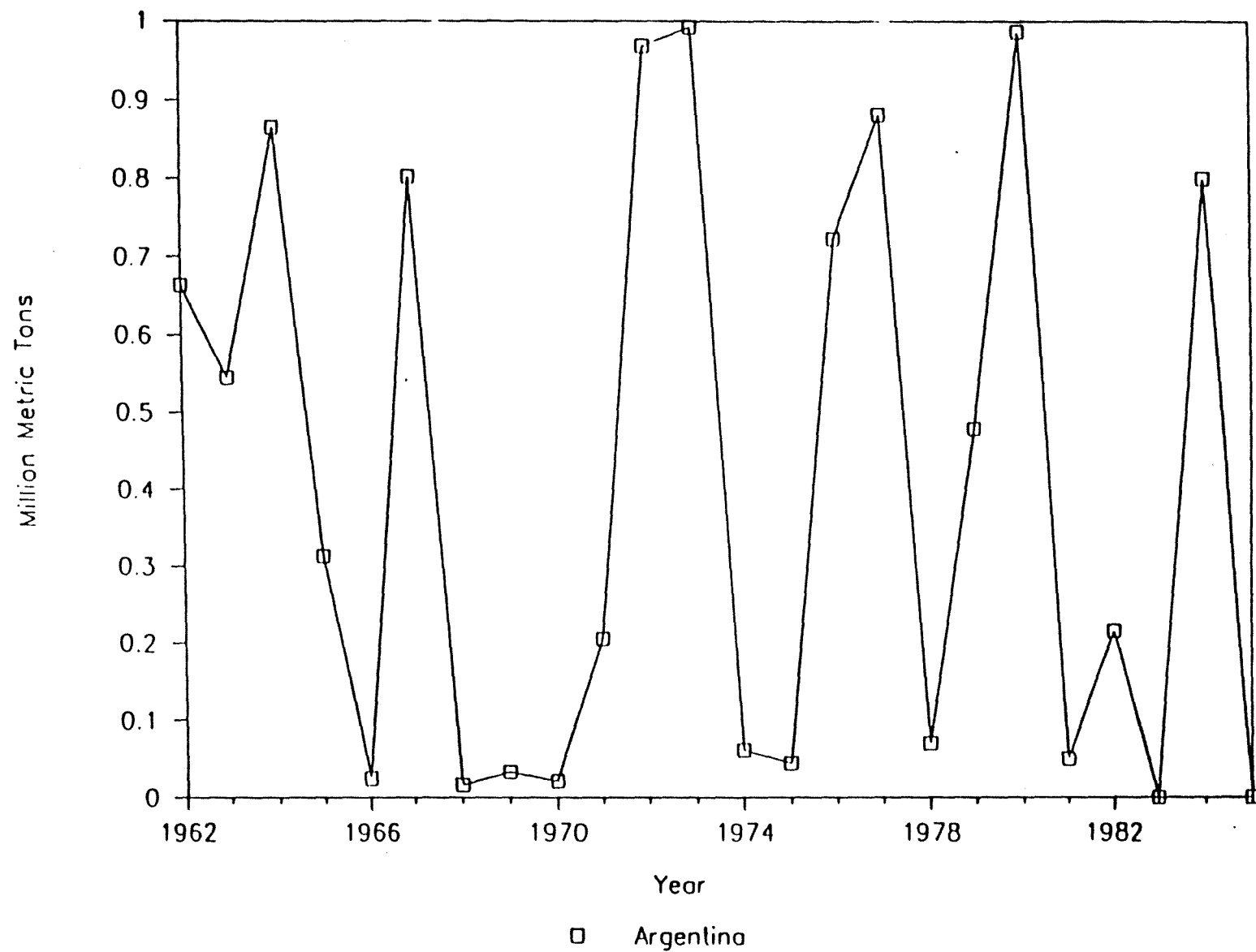
Appendix Figure 4. Brazil Wheat Imports by Country 1962-85



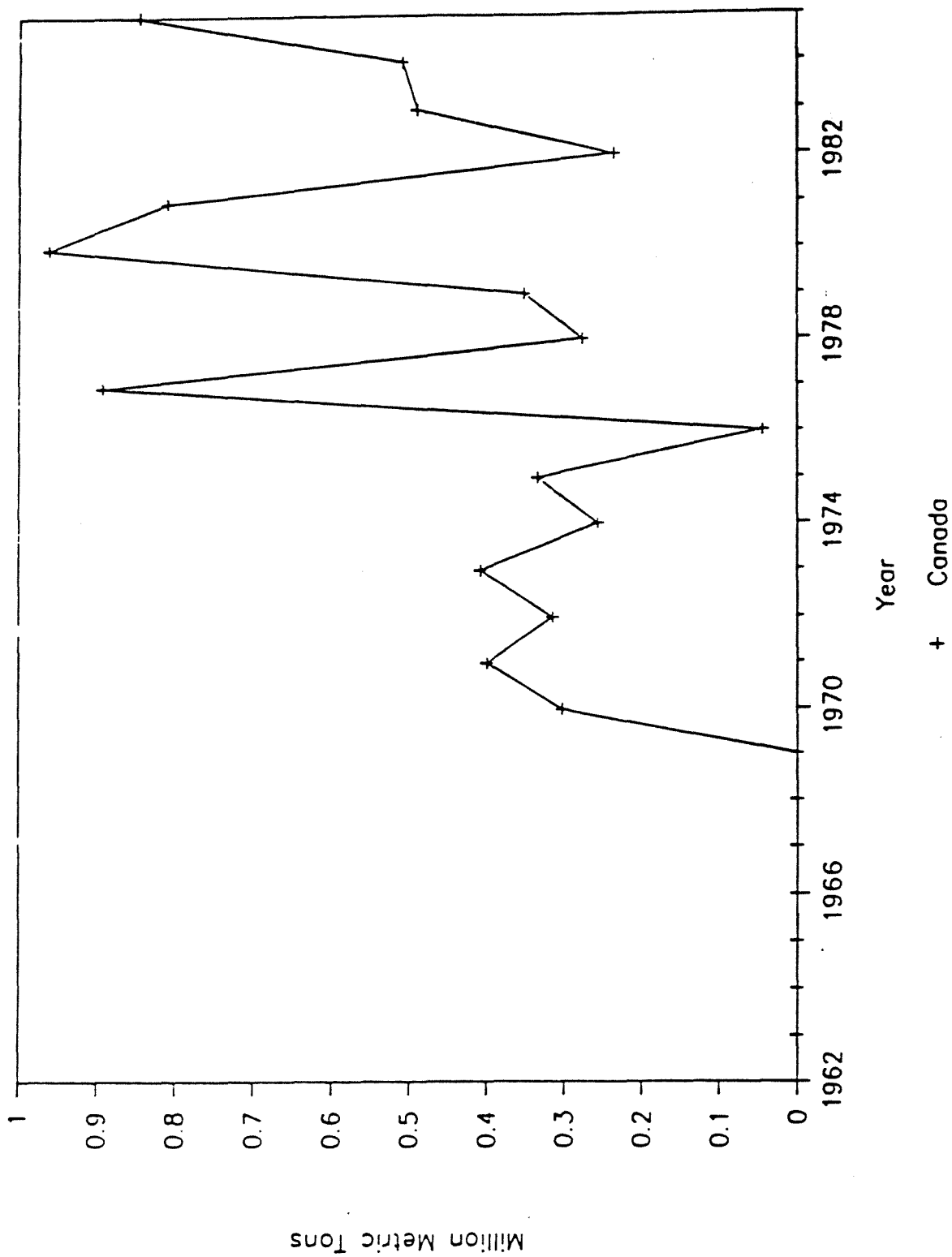
Appendix Figure 5. Brazil Wheat Imports from U.S. 1962-85



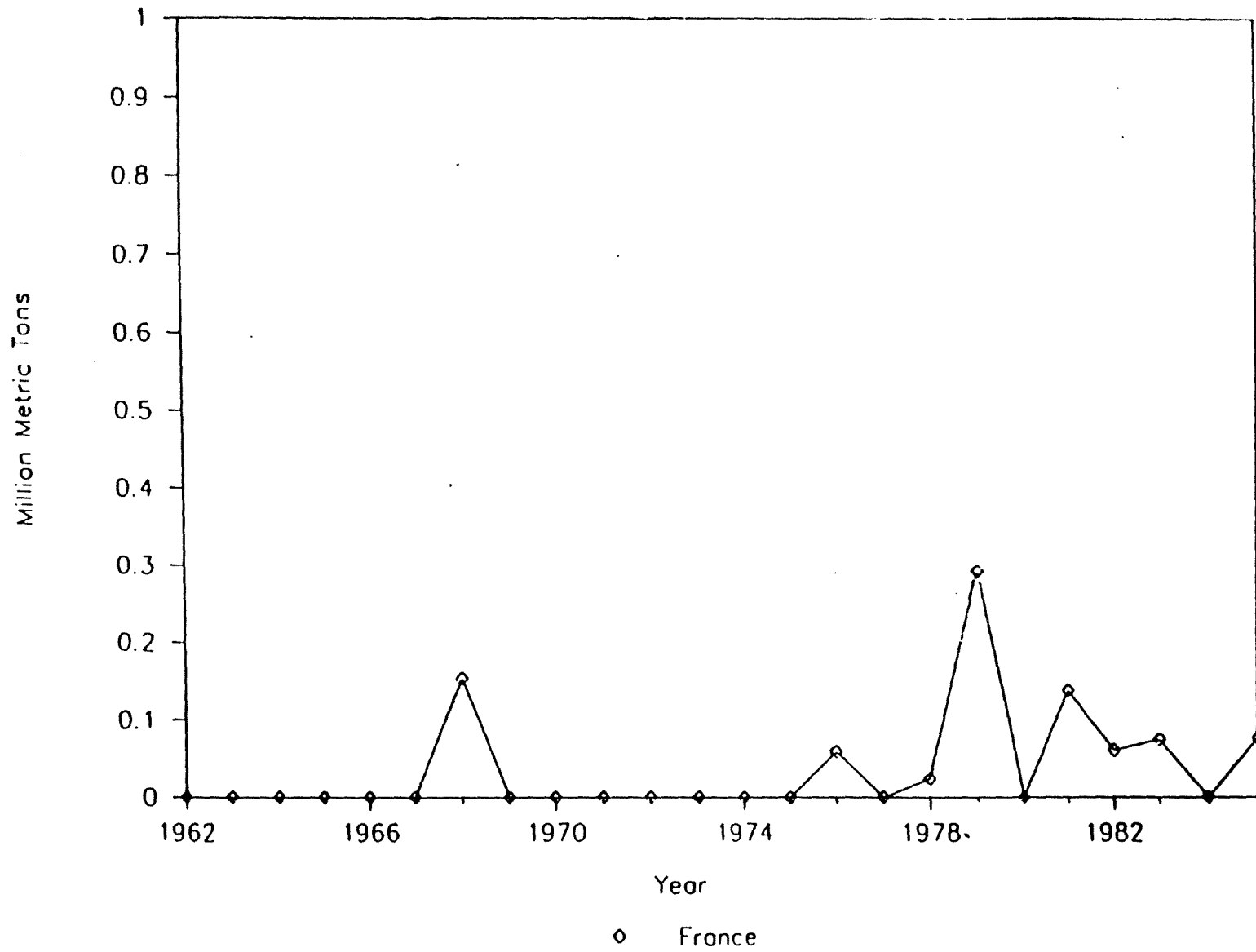
Appendix Figure 6. Brazil Wheat Imports from Argentina 1962-85



Appendix Figure 7. Brazil Wheat Imports from Canada 1962-85



Appendix Figure 8. Brazil Wheat Imports from France 1962-85





Agricultural Experiment Station, Kansas State University, Manhattan 66506

Department Report

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