WORLD AGRICULTURAL MARKETS: IMPLICATIONS FOR U.S. FOOD AND AGRICULTURAL POLICY

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In the absence of agricultural policy, the behavior of the agricultural sector is dictated by market forces. Any agricultural policy, other than one of "hands off—let the market forces rule," is dependent upon programmatic tools which in one way or another attempt to interfere or modify behavior of the sector. If it is government's objective to design and implement a set of programs which will distort market behavior so as to achieve policy goals with minimum negative side effects, it is essential that policymakers understand the kind of market environment within which the U.S. farm sector exists and how this market is likely to behave, given alternative interferences.

In this paper I attempt to accomplish three tasks. First, I will briefly describe the market environment within which U.S. agriculture must currently function. Second, the primary characteristics of world markets which most seriously affect the response to traditional agricultural policy programs will be discussed. And finally, constraints that are imposed on the ability of the United States to formulate and implement farm policy by this environment will be discussed.

THE MARKET ENVIRONMENT

World agriculture is an interdependent global system with U.S. agriculture as a component of that system. The agricultural economies of the individual countries of the world are linked by world commodity markets, world financial markets, a relatively efficient world transportation and communications system, and a weakly linked agricultural research system. The existence of an interdependent world agricultural system is a relatively recent phenomenon. It has clearly emerged since the end of World War II, and many of the changes, which have brought about the emergence of a highly interdependent world agriculture, occurred in the 1960's and 1970's.

International agricultural commodity markets have existed for a long time. However, until recently, a relatively small proportion of world agricultural production moved in international markets and with poorly developed international financial markets it was relatively easy for individual countries to isolate their agricultural economy from the rest of the world. Several developments, such as the move of the U.S. off the gold standard; the emergence of the dollar as the primary international exchange currency; the change from fixed to floating exchange rates; and the emergence of the Eurodollar market brought into being a true international financial market. The events leading to the emergence of a world financial market are primarily phenomena of the 1960's and 1970's. The technological explosion in electronics and satellite communications has come into being in the last two decades. The development of a system of international agricultural research centers is a post-World War II phenomenon that loosely links agricultural sciences in a worldwide system.

These changes in technology and financial markets have resulted in a world in which not only do commodities flow among countries more freely but also a world in which money, market information, knowledge, and technology flow more freely than ever before. The combined emergence of more effective commodity and financial markets has linked not only the agricultural but also the general economies of the countries of the world. In this kind of a world, it is much more difficult and more costly for a country to isolate its agriculture from the world.

One of the more visible signs of the emergence of the global agricultural system was very rapid expansion of agricultural trade during the 1960's and especially the 1970's. In the early 1950's, only 6 percent of world grain production entered into international markets. By 1980, this percentage had increased to 17 percent. The growth in importance of international agricultural trade is even more striking when it is considered that total agricultural production grew at an annual rate of 2.4 percent between 1960 and 1980. During this period of rapid

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growth in world agricultural production, agricultural trade grew more rapidly in all but one year (1967). The phenomenal growth in agricultural trade has been interrupted during the last 2 years. This interruption in the growth trend in trade during a period of economic recession and turbulent international financial market conditions is further evidence of the existence of a global agricultural system closely linked to world financial markets.

The United States is a key participant in world agricultural markets and world markets have become vital to the economic well-being of its agricultural sector. The United States accounts for 16 percent of the world's production of foodgrains, one-third of the world's feedgrains, and nearly one-half of the world's oilseeds production. However, as a share of world exports, the United States accounts for more than two-fifths for foodgrains, three-fifths for feedgrains, and 50-55 percent for oilseeds. The U.S. exports 53 percent of its wheat, 22 percent of its corn, and 40 percent of its soybeans. In total, the U.S. accounts for roughly 18 percent of world agricultural exports. Export revenue accounts for 20 percent of gross farm receipts to the U.S. agricultural sector. Not only is the U.S. the number one agricultural exporter but it is also the second most important importer of agricultural commodities accounting for 7.2 percent of world farm commodity imports in 1982.

CHARACTERISTICS OF WORLD AGRICULTURAL MARKETS

World agricultural markets can be described in terms of a wide variety of structural and performance characteristics. The discussion in this paper will be limited to those characteristics of world markets that are most critical to understanding the constraints placed on U.S. policymakers by this country's participation in world markets. The discussion will focus on five market characteristics. These are:

1. Thinness of most world agricultural markets;
2. Imperfection of world agricultural markets;
3. The degree of price responsiveness of world markets;
4. Volatility of world markets; and
5. The close linkage that exist between world commodity and world financial markets and the resulting closer linkage of world markets to agricultural, trade, and general economic policies of individual countries.

Thinness of Markets

Most world commodity markets are thin in the sense that the share of total world production and consumption which flows through international markets is small. For example, the following proportions of major commodity production entered international trade in 1980; wheat, 22 percent; corn, 20 percent; soybeans, 33 percent; sugar, 33 percent; and beef, 7.5 percent. With such thinness of markets, the more important individual countries as producers or consumers may be large relative to the volume of world trade. In these cases, if important individual countries elect to shift the full burden of production or demand shocks onto the world market, wide fluctuations in demand or supply and therefore in price can occur. For example, a 10-percent change in U.S. corn production is equivalent to 30 percent of world trade in corn.

Markets can be said to be thin in a second sense also. While there are more than 160 countries in the world, agricultural trade tends primarily to be made up of flows among a relatively few of those countries. For example, 94 percent of exports of wheat are accounted for by only five exporters (the U.S., Canada, Australia, Argentina, and the EC); 93 percent of corn exports are accounted for by five countries (the U.S., South Africa, Argentina, Thailand, and France); and 95 percent of soybean exports are accounted for by three countries (the U.S., Brazil, and Argentina). On the import side, seven countries account for 56 percent of wheat imports; six countries account for about half of corn imports, and two importers (Japan and the EC) account for 60 percent of soybean imports.

A related consideration is the number of decisionmakers who participate directly in buying and selling in world agricultural markets. Even in the U.S. where trade is conducted by private sector firms, the bulk of U.S. agricultural trade is conducted by a relatively few large firms. In most of the less-developed countries, all of the centrally planned economies and many of the developed market economies, imports, and exports of agricultural commodities are handled totally or in large part by government agencies or by state sanctioned monopolies. Thus, the number of actors involved directly in world agricultural trade is relatively small.

Imperfection of Markets

Thinness of world agricultural markets contributes to a second characteristic. International markets for agricultural commodities fall far short of meeting conditions for being perfectly competitive. The number of entities in most of the major agricultural commodity markets probably falls far short of the number required to meet the condition that no one buyer or seller be important enough to influence price. Certainly, there are individual countries, such as the United States in corn, soybean, and wheat markets, which hold a sufficiently large share of the market to influence world price.

Market entry appears to be relatively free. There are of course resource, climatic, and technological forces which preclude or impede entry of some countries into particular markets. However, there are no really effective institutional barriers to entry over the long run. This has been clearly demonstrated by every attempt to maintain international agricultural cartels. It is, of course, possible for a country to block entry of foreign goods into its domestic market. What has not been demonstrated is the ability of exporting countries, individually or collectively, to maintain an effective cartel.

Knowledge of market conditions is certainly not perfect in international agricultural markets just as it is not perfect in domestic agricultural markets. However, recent technological developments in communication have made world market information more quickly and more uniformly available than ever before in history. It is true that there are no international public institutions which have responsibility for keeping the world informed of current, short-term market conditions. The U.S. Department of Agriculture probably comes as close to serving this function as any other.

While world agricultural markets are not perfectly competitive, there is considerable evidence that they are price responsive. All attempts to measure demand elasticity either for the world or for foreign demand for U.S. commodities indicate that demand is relatively elastic. The recent loss of market share by the U.S. can be partially explained by the relatively high prices of U.S. commodities which resulted, in part, due to the value of the dollar and domestic price support programs. The loss of market shares is another very real indication of price responsiveness by decisionmakers in world markets.

There is less empirical evidence of the price responsiveness of world supply. However, the rapid growth in agricultural production in the European Economic Community resulting from high domestic prices, the rapid growth in world productive capacity in the late 1970's in response to high world commodity prices, and the apparent significant expansion of production by major competitors of the U.S. during the last couple of years would all tend to indicate significant supply responsiveness in the world. There is considerable debate about the degree of elasticity of world supply and demand. But, economists are in general agreement that world markets are more elastic than individual country markets and that, given time to adjust, world supply and demand are quite elastic.

Volatility of World Agricultural Markets

There have been many expressions of concern by policymakers and economists in the U.S. in recent years that the volatility of world agricultural markets will introduce unbearable levels of instability in U.S. commodity markets as our participation in world markets increases. It has been argued that world markets not only are unstable but that they are becoming more volatile as production expands into more marginal areas. There are three potential sources of instability in world commodity markets—production variation, demand fluctuations, and policy.

An analysis of deviations of aggregate world agricultural production from the trend reveals amazing stability of production and little evidence that production is becoming less stable over time. Arguments for increasing production instability are usually based on expansion into more marginal land and adoption of more intensive technology both of which may lead to larger weather effects. However, technology also has stabilizing effects through more tolerant varieties, greater timeliness of operations, and better protection against insects and diseases. Of course, as one disaggregates by commodity and geographic area production becomes significantly more volatile. However, within reasonable groupings of substitute commodities world agricultural production variability does not appear to be a major source of market instability. That is, if world commodity markets were allowed to operate freely, world production variations could be absorbed with relatively minor price shocks.

Demand as a source of volatility in world agricultural markets has probably been significantly more important than has supply as a source of shocks. The very rapid growth in agricultural trade during the decade of the 1970's was associated with a period of rapid income growth, especially in the less developed and middle income countries of the world; a period of rapid monetary expansion and inflation; and a period of extremely rapid growth in international credit. Likewise, the slowdown in international trade of the early 1980's has been associated with a global recession, contraction in credit availability, and a slowdown in inflation and international liquidity.

Government policy is of even more importance than either supply or demand, and closely related to demand as a source of instability. Government policy contributes to volatility of world markets in two important ways. First, much of the variation in demand grew out of macroeconomic policy in the U.S. and other major countries of the world. A second important way in which government policy contributes to market volatility is through attempts of individual countries to insulate their producers or consumers or both from world markets. As

countries insulate their domestic agricultural sector from the world market and use the world market to absorb excess or deficit production and as they attempt to shelter their economies from the adjustments required to respond to changing world market conditions, the amount of adjustment required by the remaining world market is increased. Research shows that wealthier countries successfully stabilize consumption through trade, and to a lesser extent, through stocks. Poor countries, on the other hand, cannot afford to maintain stocks or to offset production shortfalls with imports. Thus, they adjust to production variability by adjusting consumption. As the LDC's become wealthier, they too may attempt to transfer more domestic instability onto world markets. It is ironic that as more countries attempt to utilize the world market to absorb supply and demand shocks, the ability of the world market to serve this function declines and the instability imposed on those market participants allowing world market forces to enter domestic markets suffer increased volatility.

The important conclusion with respect to market volatility is, that as the market currently operates, countries participating in the market and allowing domestic adjustment to world market conditions do experience shocks from the world market to their domestic sectors. Secondly, and possibly more important, is that the volatility in world agricultural markets is considerably greater than it need be. If all countries would open their borders and participate in the adjustment to changes in world supply and demand, the degree of instability in world markets would be greatly diminished.

The United States is both a contributor to and a victim of the increased volatility of world agricultural commodities. The U.S. insulates some of its agricultural markets from world forces—examples are sugar and dairy—and therefore transfers adjustment onto the world market. The U.S. has also contributed to instability through macroeconomic policies which have caused fluctuations in exchange markets, interest rates, and economic growth rates around the world. On the other hand, the U.S. has left its markets for grains and oilseeds relatively open. Given the set of domestic agricultural policies adopted with respect to these commodities, the U.S. tends to serve as the major adjustor to shocks in world markets for these commodities. It is the effect of world market volatility upon U.S. supply and demand conditions and therefore price and income that have created the greatest concern—not the volatility of world markets per se.

Linkage to Other Markets

The final characteristic of international agricultural commodity markets that should be discussed before looking at implications for U.S. farm policy is simply a reminder that world agricultural commodity markets are one component of a rather tightly integrated system of all commodity and financial markets. Equally important to remember is that policies—agricultural, economic, and trade—all affect the performance of world agricultural markets and the way that a particular country participates in that world market. The United States has learned only too well recently the effect that its exchange rates can have on its competitiveness in world markets. The U.S. has also learned firsthand that, in an open economy with efficient world financial markets, attempts to manage the domestic economy with macroeconomic policy tools very quickly have effects on world financial markets, on exchange rates, and upon agricultural commodity markets.

The drastic change that has occurred in rate of expansion of world liquidity, availability of credit, and interest rates, and the effect that these factors have had on the rate of economic growth and demand for agricultural commodities in the world is further evidence of the integration of commodity markets, financial markets and general economic policy in the world. The U.S. has also learned that agricultural markets are not independent of other international commodity markets. The Chinese were quick to point out to the U.S. that attempts to protect our textile industry at their expense could be directly linked to their demand for U.S. grains and oilseeds.

IMPLICATIONS FOR U.S. AGRICULTURAL POLICY

In the preceding sections of this paper, I have attempted to emphasize the rapid growth of international agricultural markets, the increasing integration of agriculture among countries, and the integration of agriculture with other sectors. The importance to and dependence upon the world economy of the U.S. agricultural sector was also stressed. And, finally, world agricultural markets as they exist today were characterized. In the remainder of the paper I will attempt to identify the important constraints imposed by U.S. participation in world markets on policymakers as they attempt to formulate new agricultural legislation to take effect in 1985.

Two things have become clear to anyone who has evaluated the performance of U.S. agriculture within a world market economy under the 1981 farm legislation. The first is that the impact of the various provisions of the legislation on U.S. agriculture depend strongly on the state of

world agricultural markets, that the cost of the programs varies significantly depending on state of world markets and finally that performance of U.S. agriculture in world markets is directly affected by provisions of the farm legislation. The second general observation is that conditions in world markets change, and that neither economists nor policymakers are very effective at anticipating either the direction or magnitude of changes in world agriculture. Consequently, legislation which is enacted assuming a particular world market scenario is extremely risky and likely to have perverse consequences.

Two broad policy decisions need to be made early in the 1985 Farm Bill process. First, we need to establish the broad objectives of farm policy. Second, we must decide whether we want U.S. agriculture to continue to be a major participant in world markets based on comparative advantage rather than on prices and resource allocations grossly distorted by artificial incentives and disincentives. The alternative is to significantly withdraw from world markets, become primarily dependent on domestic markets, and build a protective wall around U.S. agriculture. Given decisions on these two broad policy issues, it will be possible to construct a set of programs to pursue these goals. However, depending upon the decisions made with respect to U.S. involvement in world markets some options for domestic policy objectives may well be ruled out and vice-versa.

If the U.S. agricultural sector is to be a major actor in world markets on the basis of its comparative advantage and compete without major government interferences in the form of subsidies, domestic farm policy must be structured in such a way as to allow changing world market conditions to be perceived by U.S. producers and consumers. Farm programs, which are rigid with respect to domestic price movements, will effectively filter out signals of changing supply and demand conditions in the rest of the world. Without ties to the world market, U.S. producers and consumers are likely to receive false signals and fail to make necessary short or long-term adjustments. Domestic policy-determined prices may well give U.S. producers signals which lead them to act perversely relative to real market conditions in the rest of the world. Under these conditions, U.S. competitiveness in world markets will vary widely and discontinuously and the cost of government programs will likely be high in this situation.

A quick appraisal of the impact of our rigid price support program under the current legislation with changing world market conditions gives an indication of some of the problems resulting from rigid policy prices in a flexible world market context. In the early 1980's, with growth in world demand for agricultural commodities slowing, bumper crops around the world, and rising value of the dollar, world market prices began to signal the need for a reduction in production. However, the U.S. farm legislation with mandatory and increasing minimum loan and target prices signaled U.S. farmers to continue expanding production. With the loan rate acting to set a minimum price at which commodities could be purchased, the U.S. found itself priced out of many foreign markets and accumulating huge stocks. Not only did loan rates and target prices give U.S. producers the wrong signal, they also served to maintain higher world prices than would otherwise have prevailed, signaling expansion of foreign production and further exacerbating the problems confronting U.S. commodities in foreign markets.

The possible perversity of consequences of rigid price supports is further illustrated when one considers that when world price falls below the U.S. loan rate, the loan program works as though it was a tax on exports. That is, it raises the price of U.S. agricultural exports to the rest of the world, reduces the volume of U.S. exports, and, yet, signals producers in the rest of the world to increase production. On the other hand, when world price is above the loan rate, but below the target price, U.S. target prices act the same as an export subsidy. That is, they establish a domestic producer price higher than world price, stimulate production, and force the world price down. This is the same as an export subsidy. Thus, U.S. domestic policy programs have the perverse effect of subsidizing exports when world demand is relatively strong (price above loan) and taxing exports when world demand is weak (price below loan).

If the U.S. wishes to remain important in world markets and participate in growth, with limited fluctuations in volume and value of exports, U.S. domestic price policy must be flexible enough to allow for transmission of world market signals. Only then will domestic producers and consumers have incentives to take actions consistent with changing world market conditions. Granted, this may expose the domestic sector to more variability in price and thus increase risk exposure by farmers. It may also expose producers to commodity prices which will force inefficient producers out of business and result in farm income levels for smaller producers at levels which society deems unsatisfactory. However, if the U.S. wishes to maintain stability in world market participation and remain competitive, it's policies must allow for price flexibility.

If, on the other hand, it is decided that it is in the public interest to maintain stable domestic agricultural prices, high farm incomes, and preserve the current structure of agriculture

by relying heavily on commodity price policy instruments, there are some very significant implications for the U.S. role in world agricultural markets. It is highly unlikely that the U.S. taxpayer will be willing, for long, to support farm incomes through price support mechanisms which become increasingly expensive because of transfers to producers and/or consumers in foreign countries through world commodity markets.

High and rigid prices for U.S. agricultural commodities can be maintained in the face of lower world prices, in the long run, only if U.S. agricultural markets are insulated from world markets. This can be accomplished through a structure of high guaranteed prices with import levies to keep out cheaper foreign goods and export subsidies to dispose of excess production. This is currently done in the European Economic Community. As the European Community has discovered, this becomes an increasingly expensive process. There are also political risks as consumers are asked to pay significantly higher prices for agricultural commodities than would otherwise be the case.

Likewise, artificially high domestic agricultural prices can be maintained through a system of protective levies to insulate U.S. producers from foreign competition and mandatory production controls to prevent excess production rather than relying on export subsidies for surplus disposal. Mandatory production controls have the advantage of lower treasury cost than export subsidies. They also tend to raise world prices in contrast to export subsidies which tend to depress world markets. Such controls are unpopular with farmers, distort resource use, and tend to slow structural adjustment within the agricultural sector. There is significant economic cost when agricultural resources are not efficiently utilized.

A third approach to interaction with world markets has been proposed by those who believe that the United State's large market share implies monopoly power that can be exploited to extract rents from foreign consumers. They propose that the U.S. unilaterally restrict exports raising world price, at least in the short run, and increasing returns to fixed factors in U.S. agriculture. The limited evidence available on supply elasticity in the rest of the world indicates that, in the longer term, foreign supply would increase, lowering world price, and forcing the U.S. to continually reduce exports. At some point, this alternative would likely result in a U.S. farm sector primarily dependent on domestic markets. Joining forces with other exporters would prolong the period over which monopoly rents could be extracted, but the history of agricultural cartels is not encouraging in the longer run. Such an approach would result in higher prices for U.S. consumers unless a two-price system was implemented.

The basic issue before the nation as it attempts to structure a new farm policy is whether we want an agricultural sector which participates fully in the world economy and is forced to adjust to changing market conditions in order to remain viable. If so, the U.S. agricultural sector can provide U.S. and foreign consumers with efficiently produced food and fiber, but this carries with it exposure to shocks from the world market. The extreme alternative is to withdraw from world markets in order to achieve income and stability objectives for agriculture. The two polar alternatives are to adopt policies which will tend to stabilize and facilitate U.S. participation in world markets, or to adopt policies which will tend to stabilize domestic prices and incomes but destabilize U.S. agricultural exports.

Neither of the two polar alternatives are likely to be politically acceptable. Agricultural exports have become too important in the use of agricultural resources, as a source of farm income, and as a source of foreign exchange to allow significant withdrawal from world markets without severe income and wealth consequences. On the other hand, there appears to be continuing strong political support for protecting farmers from sudden and severe price declines, and to ensure "acceptable" levels of income for farmers.

It has become increasingly clear, given the importance of world markets and the structure of U.S. agriculture, that rigid commodity price supports are inefficient and ineffective tools for achieving equity and risk goals. The benefit of artifically high commodity prices goes primarily to large producers and landowners (half the farmland in the U.S. is operated by renters)—not to disadvantaged, low income farmers. Not all small-farm operators have inadequate income. A large proportion are part-time farmers with significant nonfarm income. Also, it is recognized that government and government subsidized stocks programs with operating rules subject to change in response to political pressure are often destabilizing rather than stabilizing forces.

In the present context, it may well be possible to structure a policy set which will allow the U.S. to continue participating in world markets and achieve some of the equity and stability goals for agriculture at the same time. However, in order to do this, policymakers must find mechanisms for dealing with the stability and equity concerns of agriculture which are not dependent upon rigid commodity prices and which interfere as little as possible in the transmission of signals about world market conditions.

The decision that is made and the kind of agricultural policy adopted in the upcoming process not only has implications for U.S. agricultural producers and consumers but also for the health of world agricultural markets. By remaining an active participant in world markets with minimum government interference, the U.S., as a major economic force in world markets, can contribute to the realization of more efficiently functioning world commodity markets. If the U.S. chooses to withdraw behind protective barriers, the proportion of world agricultural markets left to adjust to changing conditions may be so small as to render world markets ineffective as an adjustment mechanism.