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THE MACROECONOMIC DIMENSION OF AGRICULTURE
AND FOOD POLICY REFORM

by

Gordon C. Rausser

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Key words: Reform, macroeconomic policies, less-developed countries,
flexible agricultural policies, overshooting, market linkages,
transactions costs, compensation schemes

THE MACROECONOMIC DIMENSION OF AGRICULTURAL AND FOOD POLICY REFORM

Gordon C. Rausser

1. Introduction

The world now seems prepared to seriously consider agricultural trade liberalization and domestic food and farm policy reform. The economic summits of the major western countries, the Organization for Economic Cooperation and Development (OECD), the World Bank, the International Monetary Fund, the General Agreement on Tariffs and Trade (GATT), and numerous other international agencies now recognize the necessity of multilateral and phased liberalization. In other words, a dramatic reduction in protection for agriculture throughout the world would appear to be the right answer. Simple economic analysis has demonstrated that, in a world in which pure competition maximizes net economic payoff, the deadweight losses resulting from current policy interventions in food and agriculture are enormous. Unfortunately, we do not live in such a world: Only second-best outcomes are possible, governments do not maximize social welfare, pure nondistortionary--that is, decoupled--transfers do not exist, political and economic markets are not separable, and policies for other sectors--especially general macroeconomic policies--are not perfectly designed and implemented.

Simply put, there are many complications in evaluating agricultural and food policy reform. This paper will examine one in particular--the macroeconomic risk nations face in the implementation of food and agricultural policy reform.

In all of the recent studies of agricultural trade liberalization and agricultural policy reform, little if any attention has been paid to the

macroeconomic environment that might exist during the implementation phase of various proposals. This is indeed surprising because the origins of many farm policies can be traced directly to the macroeconomic environment. Moreover, the dynamic adjustment paths that would evolve following the implementation of particular reform proposals would be heavily dependent upon macroeconomic conditions, such as the level of real interest rates and exchange rates, the nature of monetary and fiscal policies--whether expansionary or deflationary--and so on.

This paper focuses on four major themes. First, macroeconomic and international linkages are significant and must be recognized in any framework for policy design and reform. Second, the intercountry linkages of both agricultural and macroeconomic policies are especially important for less-developed countries (LDC). Third, political economic markets for policy reform exist and governments throughout the world have an opportunity to supply reform through the reduction of transaction costs. Transaction costs can be reduced through alternative compensation schemes which are motivated by behavioral analysis of political economic markets. And fourth, macroeconomic and international linkages are a major component in the design of flexible agricultural policies that can respond to changing conditions. These themes are used to examine agricultural policy reform and trade liberalization in the current environment.

2. Macroeconomic and International Monetary Linkages

Throughout much of the developed world, macro policies in the two decades following World War II afforded a unique period of macroeconomic stability. As a result, concern regarding the macroeconomic linkages with food and

agricultural systems largely disappeared. In the early 1970s with the major changes in monetary policies and central bank behavior, macroeconomic linkages were once again recognized as prime factors complicating agriculture and food policy.

The roller coaster ride that agriculture has experienced over the last two decades has been significantly influenced by macro and international linkages (Rausser et al. 1986). Agriculture's prosperous condition in the 1970s was followed by a recession in the early 1980s. Recent history stands in sharp contrast to the basic stability of the 1950s and 1960s. This roller coaster is not unprecedented. For example, the period 1900 through 1915 is surprisingly similar to the 1970s, and the late 1920s through 1930s have some of the same characteristics of the 1980s.

A longer historical perspective demonstrates that macroeconomic disturbances and their links to agricultural sectors throughout the world were central to the emergence of direct governmental intervention in food and agricultural systems. For example, in the case of OECD countries, there have been abrupt increases in governmental intervention during periods of macroeconomic contractions accompanying downward movements in agricultural prices. The first major wave of increasing intervention in agriculture occurred during the last quarter of the 19th Century, following several decades of trade liberalization. Prior to this, agricultural trade had expanded dramatically due to the removal of tariffs and import quotas and to the increasing availability of low price grain from the United States and Europe. The protectionism following this trade expansionary period was motivated by what was then referred to as Europe's great depression.

Policy responses varied across countries. England alone maintained a staunch free trade position while Germany, France, and Italy restored agricultural tariffs from the mid-1880s onward. In Denmark and the Netherlands, falling grain prices encouraged the expansion of livestock activities. In the United States, despite expanding grain exports, farmers did not ignore depressed prices. The period from 1873 to 1896 witnessed increasing levels of farmer mobilization through the Grange and populace movements. Farmer demands were wide ranging, but a major objective was a change in banking policy to promote inflationary expansion of money supplies. Lobbying efforts to this end continued into the Twentieth Century and were partially responsible for the institutional changes that created the Federal Reserve in 1913 and the federal land banks in 1916. The U. S. government's massive intervention in agriculture in the 1930s (with, for example, the Agricultural Adjustment Act) followed a farm crisis that had its origins in the macroeconomic adjustments after World War I.

Despite the emergence of tariffs throughout the world before World War I, the degree of agricultural protection in European countries was in the modest range of 20 percent to 30 percent. These tariff duties did not prevent the expansion of agricultural trade. At the end of World War I, a substantial international division of labor continued in the production of agricultural goods.

The second wave of expansion of government intervention in agriculture took place during the economic crisis of the 1920s and 1930s. The pattern of a particular nation's response to the crises followed lines associated with its net position in international trade. Net importers of a good tended to protect domestic producers by increased tariffs. For example, in France,

Germany, and Italy rates of protection on foodstuffs more than doubled between 1927 and 1931. Even Britain converted to protectionism in 1931, although the free entry of produce from its empire meant that tariff protection was of limited importance to domestic agriculture.

In more recent U. S. history, the recession of the early 1980s, the associated high real rates of interest, high exchange values of the dollar, and slow world economic growth put enormous pressure on agriculture. The macro-economic environment combined with intervention designed in the 1981 Farm Bill to create embarrassing surpluses and unacceptable levels of resource misallocation.

The 1981 U. S. Farm Bill set support and target prices at levels designed for a strong export and price performance in the grain sectors. Due to macro-economic conditions, however, this scenario failed to materialize. More importantly, the 1981 Bill did not allow for flexibility and, as a result, programs sustained high production which led to accumulations of government-owned stocks and agricultural expenditures of crisis proportions. This mess can be referred to as a "policy disequilibrium." Response to this specific policy disequilibrium was the Payment-In-Kind Program of 1983. PIK led to even greater expenditures and failed to alleviate the serious problem of surplus stocks.

The path followed by agricultural commodity markets over much of the last two decades closely resembles other markets for freely traded commodities such as gold, silver, platinum, copper, and lumber. Stocks also accumulated for these commodities during the 1970s and early 1980s, suggesting that sectoral conditions and government policies are only a part of the explanation for the behavior of agricultural commodity markets. The search for a complete

explanation leads to a multimarket perspective and an investigation of external linkages with other markets.

Since 1972, conventional wisdom has placed increasingly less emphasis on the inherent instability in commodity markets and more emphasis on external linkages with other markets. Deregulated credit and banking has resulted in greater exposure of agriculture to conditions in the domestic money markets. Also, the shift from fixed exchange rates to flexible rates, in much of the Western world, exposed commodity markets to international money and real trade flows. The emergence of well-integrated, international capital markets meant that agriculture, through domestic money and exchange rate markets, became more dependent on capital flows among countries.

The linkages between commodity and money markets are indeed pervasive. In the United States, farming is extremely capital intensive and debt-to-asset ratios have risen dramatically over the last 10 years. As a result, movements in real interest rates have a significant effect on the cost structure facing agricultural production. Storage and breeding stocks especially are sensitive to interest rates. On the other hand, the influence of interest rates on the value of the dollar affects the demand side for farm goods. The close connection between agriculture's health and interest rates suggests that this sector is vulnerable to monetary and fiscal policy changes. It has been argued, with much justification particularly since 1980, that the instability in monetary and fiscal policy has contributed greatly to the instability of agriculture markets.

2.1. Overshooting

Unstable macroeconomic policies are thought to impose sizable shocks on commodity markets. This would be especially true if agricultural commodity

markets have flexible prices while other markets have stickier prices. And, indeed, without governmental price supports, agricultural prices are generally more flexible than nonagricultural prices. This is true in part because contracts for agricultural commodities tend to be written for shorter duration and because biological lags tend to cause agricultural supply to be unresponsive to price changes in the short run.

This fixed/flex price model of markets is necessary, but not a sufficient condition, for money nonneutrality to imply overshooting agricultural prices (Rausser 1985). Overshooting in this context is defined as a price path which exceeds (in an upward or downward direction) the new eventual price equilibrium. Flex-price commodity markets and fixed-price nonagricultural output markets combined with "small" output responses mean that overshooting in agricultural sector markets will occur even if expectations are formed rationally. Such overshooting results from the spillover effects of monetary and fiscal policy on commodity markets.

Given a world of fixed- and flex-price markets, the driving force behind overshooting is the real rate of interest and the ability to arbitrage across markets. When in the short run real interest rates rise above (fall below) long-run equilibrium rates, immediate pressure arises to drive flexible commodity prices downward (upward). In much of the 1970s, real interest rates were below their long-run equilibrium levels and, for some periods in the 1980s, real interest rates were above. Overshooting combined with "myopic" expectations means that "macro externalities" will be imposed upon the agricultural sector (Rausser et al. 1986).

In the case of interest rates facing U. S. agriculture, interest rate disequilibrium was even more pronounced due primarily to the relative importance

of the Farm Credit System. The System's organizational structure amplifies the disequilibrium and generates more overshooting than would otherwise result. Within the Farm Credit System, borrowers are, in fact, owners and no dividends are paid to stockholders. As a result, during favorable economic periods, the only way owners might extract benefits generated by the system is by increasing borrowing levels at interest rates below those for the rest of the economy. Indeed, through much of the 1970s, interest rates to farmers were dramatically below general market rates while, during the 1980s, the opposite result was true.

2.2. Some Empirical Evidence

Empirical evidence supports the view that agricultural output responses are not sufficiently flexible to counter the tendency for prices to overshoot, and that expectations are, at best, only "myopically" rational. Bordo (1980) has shown empirically that prices of raw goods respond more quickly to changes in money supply than do prices of manufactured goods. Andrews and Rausser (1986) have shown that, during the large cyclical downturns of the early 1930s and the early 1980s, prices fell more and quantities less in the agricultural sector than in any of nine other sectors of the U. S. economy. In the case of interest rates, numerous studies (e.g., Cumby and Obstfeld 1984) have shown that real rates vary significantly across countries, refuting the old view that they remain constant. These results also suggest that the purchasing power parity assumption does not hold, even approximately. In other words, exchange rate changes do not offset changes in relative price levels across nations.

Frankel and Hardouvelis' (1985) study on monetary surprises rejects the flex/flex specification in favor of the fixed/flex specification. (A

flex/flex view holds that the prices of all commodities and goods respond quickly to changing market conditions.) Their empirical results show that, when announced money supply turns out to be greater than the public expected, nominal interest rates tend to rise and the prices of basic commodities tend to fall. If the flex/flex specification were correct, then interest rates and commodity markets would either both rise (if the announcement were to cause an upward revision of expected future money growth) or both fall (if a downward revision of expected growth). The only hypothesis that explains the reactions in both interest rate and commodity markets is that increases in nominal interest rates are also increases in real rates. The public anticipates that the Federal Reserve will reverse any recent fluctuation in money stock, thus increasing interest rates and depressing the real prices of commodities.

The aggregate effects of money supply on raw agricultural product prices, retail prices of food products, and the nonfood Consumer Price Index (CPI) also support empirically the idea of overshooting. Consistent with money non-neutrality and raw agricultural prices being generated by flex-price markets, Stamoulis et al. (1986) found the money supply to be a more important determinant in explaining raw product prices than in explaining the nonfood CPI or the index of retail food prices.

2.3. Forward vs. Backward Linkages

The linkages discussed above run from the macroeconomic sector to the agricultural food sector. These causal influences may be defined as forward linkages. The most important forward linkages include those observed in the cost structure of production (i.e., in supply response), in general economic conditions and food demand, in inventory behavior and the demand for storage,

and in animal breeding stocks. The macroeconomic variables included in these linkages are interest rates, personal income, and nonfood and general inflation rates.

There are effects that run from agriculture to the general economy. These linkages may be defined as backward linkages. There are three main influences on macroeconomy reflected backward from agriculture: on the general inflation rate, on governmental deficits or surpluses, and on the balance of trade. These three components can, in turn, have dramatic effects on employment real interest rates, investment, economic growth, and so on.

Food prices are a major component of any general price index, and this linkage is important everywhere that the general rate of inflation influences macroeconomic conditions. This is true not only in the demand for money balances, and the willingness of individuals to hold productive and speculative assets, but also in the determination of real wages, real income, and the demand for exports.

The linkage through government deficit arises because the outcome for prices, production, private storage, and other variables endogenous to agriculture, determine in part the level of federal spending. As government deficits and expenditures rise, there is a positive effect on consumption and investment. Over the short run, there are multiplier effects leading to further increases in economic activity and in tax revenues, which are a positive function of economic growth.

Interestingly, the operation of government storage and deficiency payments are examples of expenditures that are endogenously determined. This feature is in contrast to much of the nonfarm components of the federal budget that are fixed in dollar terms.

Finally, a third major backward linkage occurs through the contribution of agriculture to the trade balance. Ceteris paribus, an increase in agricultural exports can be expected to increase domestic economic growth, domestic employment, and the value of the domestic currency. The export/ import balance can also indirectly affect the general level of inflation, the level of government deficits, and the real interest rates facing long-term investments throughout the economy.

2.4. International Monetary Linkages

In addition to these more direct forward and backward linkages within the domestic economy, there are important interdependencies between the monetary policies of different countries. These also represent indirect linkages between a domestic macroeconomy and agriculture. Monetary linkages between nations have important implications for exchange rates and worldwide recessions. For example, as U. S. monetary policy changes, responses in the rest of the world affect to some degree foreign economies, exchange rates, and prices which, in turn, translate into shifts in the export demand facing domestic farmers.

Under fixed exchange rate regimes, such as the monetary system set up by the Bretton Woods agreement, central banks are compelled to intervene to maintain a fixed value of their domestic currency vis-à-vis foreign currencies. With flexible rates, no such intervention is necessary. While monetary authorities may still intervene from time to time in foreign exchange markets, such actions have become discretionary.

Under fixed exchange rates, expansionary monetary policies in one country cause similar expansionary policies in others as they observe their currencies

appreciating. The country beginning the expansionary process is said to have "exported" its inflation. When exchange rates are flexible, no obligation exists to maintain exchange rates by domestic inflation. Only if nations keep rates within a certain range in a "managed float" can inflation be exported.

McKinnon (1981) and others have emphasized in recent years that the argument for monetary independence between nations under flexible exchange rates involves an untested assumption about the portfolios of moneyholders. A monetarily independent country must be an "insular" economy, at least as far as money demand is concerned. Moneyholders must not substitute for foreign currency holdings when the domestic currency becomes less desirable, nor vice versa. If this is not true, currency substitution implies that the effects of domestic monetary policy are exported even under perfectly flexible rates.

This exporting of monetary policy and the resulting loss of independence can occur in two ways. First, when there is substitution between currencies, money growth rates are conditional on expected money growth abroad. For example, suppose the United States engages in some unanticipated monetary policy, say, expansion. There will be an increase in the demand for the foreign currency, if domestic expansionary policies are expected to depreciate the value of the dollar. Accordingly, foreign monetary authorities will underestimate their own money demands, and their policy will turn out to be more restrictive than desired. Foreign monetary independence from U. S. policies is lost.

A second possibility is that foreign authorities recognize unanticipated shifts in U. S. monetary policy quickly. They may act to maintain the value of their currencies rather than allow them to appreciate. They accommodate the U. S. money growth by responding with the same policy. Money is no longer as tight in the rest of the world, but the result is an even greater increase

in the world money supply. This is exactly the phenomenon McKinnon (1981) has claimed was responsible for the rapid worldwide inflation of the 1970s.

As foreign monetary policy is more or less restrictive than originally intended, without monetary independence agricultural exports either fall or rise. The magnitude of changes in foreign income effects, and the resulting changes in export demand, will depend on the failure abroad to anticipate changes in domestic monetary policy. As long as money growth is not perfectly anticipated, there will be real effects on income and other variables.

The changes in domestic money growth rates can be thought of as sterilizing the effects of unanticipated money shocks abroad. In this context, it is important to clarify the conventional view of the sterilization of reserve flows. The usual interpretation involves a central bank intervening in currency markets to prevent its currency from, for example, depreciation. Since this involves buying its currency with bonds or foreign exchange, there is a reduction in the money stock. Sterilization would involve an offsetting expansion of domestic money so as to maintain previous money growth targets. There is no clear reason, however, for such an operation. As long as capital is mobile, the sterilization operation will indeed leave the total money stock unchanged; but the situation of excess currency supply, pressuring a depreciation, is also unchanged.

It will, therefore, be necessary to adjust monetary growth to accommodate, or sterilize, unanticipated changes in money demand. To the extent that monetary authorities are able to make this adjustment, and to the extent that moneyholders do not perceive this as a shift in policy (but merely a response to other central banks' policies), there will be no real effects on economic activity. More likely, however, there will be shocks in real variables, such

as income and the real rate of interest, as unanticipated money growth is discovered by moneyholders.

3. Implications for Less-Developed Countries

The importance of the disincentives typically inflicted upon agriculture by LDCs can be best dramatized when those disincentives are removed. The reforms in the People's Republic of China provide the clearest example of what happens when policies become more market oriented. After two decades of sluggish growth, Chinese agricultural output soared after 1978 when regulations were liberalized and prices were allowed to rise and approach market-determined levels. This remarkable expansion, making China now the largest wheat producer in the world, was achieved almost entirely through productivity gains. The amount of land under cultivation (including irrigated land) and the use of tractors for farming declined between 1978 and 1983--the major change was clearly to the incentive system.

Some observers have argued that such policy changes lead to reduced export demand for agricultural products from the developed economies of the world. This is not necessarily the case. By fueling domestic growth and increasing rural income, many of these countries become better customers for some agricultural products for which only developed nations can provide. Studies have shown that the "crowding out" of U. S. agriculture by expanding developing country production are exaggerated. Thus, there may be a basis for cooperation in agricultural trade reform between developed and developing nations.

Nations that have not liberalized their agricultural policies, particularly those in Africa, have suffered from food shortages, and even widespread malnutrition and famine. When the enormous surpluses of the developed

economies are juxtaposed with the situation of poorer developing countries, the world agricultural imbalance seems particularly galling. The problem is not one of agricultural supply, however, but one of allocation and distribution. The poorer countries are not poor because they need more agricultural production but because they lack the income to buy more food on world markets. By liberalizing their agricultural policies and allowing market incentives to spur their farmers, poorer LDCs can not only increase domestic production in products for which they have comparative advantage, but they can increase rural incomes so they may trade for the essential foodstuffs.

Our particular concern here, however, is not with the internal policies of LDCs but with the links between industrialized country policies and economic conditions in the developing world. Monetary and fiscal policies, distortionary agricultural policies, and other macroeconomic policies in the developed world affect general economic conditions in LDCs. The implications of these policies for a specific nation depend largely on its internal economic structure. Essentially, industrial country policies can affect an LDC, especially a commodity-exporting LDC, through real rate of interest, the terms of trade, and the stocks of primary products. The effect of these forces will vary with the degree of openness in a particular LDC's trade structure and its level of initial indebtedness.

3.1. Intercountry Linkages: Agricultural Policies

Even though an industrialized country's agricultural policies may be aimed at domestic problems, their effects spill over onto the rest of the world. For example, protection against import competition (such as quotas in the United States and variable levies in Europe), price-support programs,

subsidized loan programs, and quotas on domestic marketing, all induce greater production that has depressing effects on world prices. This is particularly evident when governments sell unwanted stocks on the world market at less than the domestic price, or make concessional sales, or simply donate the food as aid.

One glaring example of the international cost of industrialized-country policies is the case of sugar. The European Community (EC) and the United States have not adjusted their sugar policies to changing economic conditions. Both have accepted increasing market distortions and dramatically growing economic cost. Moreover, because the United States has been dominant in the world sugar trade, the imposition of import quotas has lowered world sugar prices. Not surprisingly, EC and U. S. sugar policies have placed a great burden of adjustment on many developing countries. The World Bank's 1986 World Development Report has estimated that sugar policies of industrialized countries cost developing countries about \$7.4 billion in lost export revenues during 1983, reduced their real incomes by about \$2.1 billion, and increased price instability in the residual (world) market for sugar by approximately 25 percent.

Schiff (1985) estimates that the variability of world wheat prices could be reduced by 48 percent if all countries were to end their subsidization of wheat. Tyers and Anderson (1986), using a model simulating policy reform in more than a half-dozen commodity markets, have calculated that the liberalization of agricultural policies of industrial countries would substantially reduce the international price variability of all major temperate zone commodities: wheat by 33 percent, coarse grains by 10 percent, rice by 19 percent, sugar by 15 percent, and dairy products by 56 percent.

Furthermore, Loo and Tower (1988) recently conclude that such liberalization improves agricultural export prices for LDCs, enhancing their ability both to repay international debt without the risk of impoverishment and to import developed nations' goods.

The trade policies in industrialized countries work against exports of basic commodities. Indeed, the large stockpiles of minerals and food held by the OECD governments are a major explanation for depressed prices. In the face of such policies, it is particularly difficult (and in the case of some LDCs impossible) to run trade balance surpluses. To service their debt, however, many countries must generate trade balance surpluses for foreign exchange. Protectionism also limits LDC's ability to import, and, as a result, it hurts U. S. exports of goods where we have a comparative advantage, both in agriculture (e.g., corn, but not sugar) and manufacturing (e.g., capital goods, not textiles).

In essence, the agricultural protectionist policies of industrialized countries, by expanding output and depressing domestic demand, reduce world prices and distort the relative prices of agricultural versus other goods. Ironically, when industrialized countries grant special trading privileges to mitigate the harm of internal farm policies, they often make matters worse. Their policies amplify rather than dampen commodity price fluctuations and thus destabilize international markets.

Protectionism not only depresses the overall level of world prices but also distorts relative prices among agricultural productions. These distorted prices make the use of resources in world agriculture even less efficient. If Japan, for example, were to reduce its protection of rice varieties in which other Asian countries have a comparative as well as a competitive advantage,

Japan could produce even more of other products. And when farmers in the Netherlands grow vegetables in greenhouses because energy is subsidized, they discourage Mediterranean countries from pursuing their natural advantages in the production of these products.

Especially difficult for developing countries is the case when rates of protection are higher for processed agricultural products than for raw products. In industrialized countries, tariffs are indeed higher the more processed a good, and for many agricultural goods, the higher tariffs are supported by a wide array of nontariff barriers. As agricultural goods embody more labor and capital services, developing countries face greater barriers to sales in world markets.

As a result, escalating protection of agro-processing severely disrupts the process of development by blocking the most natural step toward industrialization. Such policies have resulted in industrialized countries exporting larger quantities and importing smaller quantities of processed products than of related raw materials. For example, the EC accounts for 11.4 percent of world wheat exports but 48.9 percent of wheat flour exports. Developing countries respond to such policies by subsidizing local processing industries. Inevitably, such policies encourage further inefficiencies and compound the direct harm arising from industrial countries' tariffs.

At a given moment in time, an LDC's competitiveness depends less on its own efficiency than on the political decisions of other countries. The ability to compete may be undermined at any time by increased export subsidies on industrialized countries' exports. In many instances, industrialized countries have provided market opportunities which they have shortly thereafter limited or withdrawn. For example, high grain prices in the EC created new

markets for feed grain substitutes such as cassava, corn gluten feed, and citrus pellets. But China, Indonesia, and Thailand, which produce cassava, had to sign "voluntary" export restraint agreements with the EC to continue their access to this market.

Policies affecting consumption can also destabilize world markets. A shortfall in world output will not affect demand in a country which insulates its domestic markets. Under these circumstances, however, someone's consumption must be reduced. If a large group of countries refuse to cut their consumption, others must reduce theirs disproportionately. To ration the world output, world prices would have to rise even more than they otherwise would without insulated domestic markets. Developing countries which hold producer prices constant regardless of sharp upward movements in world prices also create greater instability than would otherwise exist.

Conceptually, of course, world prices could be stabilized even if most countries insulated their markets as long as some countries (or private individuals) operating on free markets held sufficiently large stocks. The size of individual stockpiles needed, however, increases with the number of countries which insulate their economies. Johnson and Sumner (1976) found in a study of 14 regions that stocks had to be eight times larger if the regions completely insulated their economies than if they instituted free trade. Clearly, stocks are one source of potential gain from trade liberalization.

The large export subsidies for a number of commodities implicit in the 1985 Food Security Act have led to some dramatic spillover costs. For example, Thailand's heavily dependent rice exports have been severely threatened by the large cut in the U. S. export price of rice. The movement to rice marketing loans and the U. S. government's attempt to reduce its surpluses,

imposed rapid huge short-run costs on Thailand. The fall in rice prices led both to significantly lower incomes for Thai farmers and to lower tax revenues for their government. Similarly, the marketing loan for cotton has generated like affects (although not as dramatic) for Egypt, Mexico, Guatemala, Paraguay, and other cotton-exporting countries.

3.2. Intercountry Linkages: Macroeconomic Policies

Macroeconomic policies also affect the level of trade and the competitive advantage of other countries. The major macroeconomic variables are income growth rates, real interest rates, and exchange rates, with the rate of income growth being the most important of these three. Most notably, the income growth of OECD countries is crucial to the growth of world trade in general and of LDC exports in particular. World demand for typical LDC goods is particularly procyclical, explaining why exports of such goods fell sharply from 1980 to 1982 after the rapid growth in the 1970s. LDC export volumes responded well to the U. S. recovery that began in 1983 and spread weakly to other industrialized countries in 1984. Prices of LDC exports, however, which began to fall during the recession, continued a downward trend through 1985. This was true whether measured in terms of dollars or in terms of LDC import prices. In part because of high real-interest rates, prices of LDC exports, particularly of commodities, have remained depressed throughout the 1980s. The increase in world interest rates, in the early 1980s was primarily the result of U. S. monetary and fiscal policies. This increase has had three major effects on commodity-exporting LDCs. The first effect has been a depressing effect on the price of commodity exports. Since storable commodities are viewed as a portfolio asset, real interest rates will represent the

opportunity cost of holding a commodity and will affect the demand for storage. Higher real rates cause the demand for primary goods to fall. Consequently, the relative price of commodities will decline until the expected rate of change in the product's value is equated with the real interest rate.

The second effect has been an increase in the debt-service burden of the debtors. An estimated 80 percent of all major LDC debt is under variable rate agreements. As real interest rates crept upward in the early 1980s, so did the interest payments portions of their debt service. Additional principal also accumulated with the occurrence of current account deficits due to falling exports receipts (if these were financed externally).¹ A debtor carries an additional burden when the value of the debt is fixed in one currency, and the export receipts are valued in another. When the debt currency appreciates relative to the export currency, the value of the LDCs' external liabilities rises. This was a common occurrence with the huge dollar appreciation in the 1980s.

Finally, higher interest rates can also affect internal economic performance by reducing investment in favor of increased saving. Capital flows to countries with higher real rates, and it is not uncommon for real differentials to exist between the developing countries and the United States due to regulated financial markets in the LDCs. Although not easily quantifiable, this channeling of savings may have important consequences for future LDC debt prospects as the stock of capital goods dwindles and with it future production possibilities. This was as important as the loss of export revenue during the early 1980s in the creation of increases in the current account deficit, the external debt, and the debt/export ratio. The third and final effect of higher world-interest rates is the direct effect on interest rates within each LDC

because of arbitrage opportunities. For many LDCs, the magnitude of capital flows in response to interest rate differentials helps explain why local LDC interest rates eventually must adjust.

Another major variable, the exchange rate, is influenced not so much by the level of macroeconomic policies but by the differences between macroeconomic policies in the United States and other countries. Although the influence of exchange rate on agricultural trade is indeed complex, a number of direct effects have been captured empirically (Nishiyama and Rausser 1986). These include price effects, cross-price effects associated with substitutable commodities, and policy-distortion effects.

If the value of the dollar were to increase by 10 percent, it would make very little difference to the importers of corn in Japan if the price of corn were to fall by an equivalent amount because the net cost in Japanese yen to an importer would remain the same. In the early 1980s, however, with a rapid increase in the value of the dollar, a corresponding fall in the price of U. S. corn was not possible. U. S. support prices were simply too high, and there occurred a so-called policy distortion effect. When the price of corn from other origins is downwardly flexible and currency is arbitrated, the export demand naturally falls for commodities with "high" price supports.

There are a number of secondary, or indirect, effects of exchange rates that exert influence on agricultural trade. Indirect influences on income and growth affect export demand. One of these indirect effects is from foreign central banks' systematic intervention in exchange rate markets to influence the value of their currency. When such intervention is not sterilized, it changes money supplies of the intervening countries and, in the short run, also changes the rates of income growth. Another effect is when a change in

trade balance due to movements in the exchange rate increases growth in income, a part of which is spent on imports. A third, indirect effect is from wealth transfers associated with current account imbalances. Current flow payments are equivalent to wealth transfers, and such transfers require movement in interest rates to restore equilibrium in money markets. A new equilibrium causes changes in investment income and (ultimately) in export demand for agricultural products.

In addition to all of the above effects of exchange rates, there can be additional effects on the debt/export ratio if the currency composition of the denomination of debt differs from the currency composition of the exports. For example, many debtor countries suffered from the sharp appreciation of the dollar when their debts were in dollars, while their exports were in other currencies as well. This phenomenon occurred regardless of whether or not a shift occurred in a debtor country's terms of trade during the 1980s. For this reason, the dollar's appreciation has often been listed as one of the three macroeconomic shocks, along with the recession and the increase in real interest rates, that helped precipitate the debt crisis of 1982.

The shift to a more restrictive monetary policy and the unprecedented expansion of the fiscal deficit in the early 1980s pushed up real interest rates both in the United States and abroad. This rise in rates of return directly enlarged the LDC debt service obligations and indirectly drove down commodity prices via overshooting and dollar appreciation. Expansionary fiscal policy can, however, also increase demand for LDC agricultural goods, thereby, producing an offsetting effect on the terms of trade. The net effect on the terms of trade depends upon the relative strength of the three influences:

exchange rate, interest rate, and the relative demand shifts on commodity prices.

Because of inadequate domestic savings, current and foreseeable budget deficits will continue to be a major force behind the United States' large existing trade imbalances. The so-called twin-deficits problem will continue plaguing the export performance of U. S. agriculture. Few policymakers realize that the large budget outlays for farm policy are partially responsible for the dismal trade performance of the sector. The causal flow moves from subsidization of agriculture, to government budget deficits, to the need of foreign countries to generate trade surpluses that will finance their capital flows into the United States. The latter capital flows finance U. S. credit demands.

Agriculture contributes to the trade imbalances not only through the current account but also through the taxpayer cost of farm programs. Since federal government deficits are partially responsible for current trade imbalances, the huge subsidization to the agricultural sector by the federal government has contributed to the U. S. trade deficit. This trade deficit has been the cause of some instability in nominal and real interest rates in this country as well as exchange rates. It has also contributed to political instability by providing a formal justification for protectionist trade legislation, actively debated by both the House and Senate and opposed by the Reagan Administration.

4. The Design and Reform of Public Policies

The gains to LDCs from industrial countries' elimination of agricultural protection are potentially large. The recent study by Loo and Tower (1988)

estimates that LDCs would gain \$26 billion (current dollars) and would experience a 2.4 percent per year reduction in external public debt. Coincidentally, industrial countries would gain \$17 billion from reduced needs of LDCs for aid. Other studies have captured large domestic employment effects of farm policies. For example, Stoeckel and Breckling (1988) have estimated that, by removing both the Common Agricultural Policy of the EC and individual government protection, about three million additional jobs could be generated in the four largest EC countries. Manufacturing output would increase by over 1 percent and manufacturing exports would rise by 5 percent. For the United States, Robinson, Adelman, and Kilkenny (1988) have estimated that the unilateral removal of agricultural protection would generate a \$10 billion gain in the U. S. GNP, a \$26 billion reduction in government deficits, and a \$36 billion increase in investment. These general equilibrium effects identify a number of other potential losers to current agriculture and food policies in the developed world. In addition, a recent study by OECD estimates the burden placed on consumers and taxpayers by the agricultural policies of industrialized countries to be approximately \$200 billion in 1986. Moreover, less than half of this burden reaches farmers in the way of subsidization.

In light of the large potential benefits of policy reform, why is it as yet unrealized? Evidently, current protectionism is not unanimously condemned. Individual farm policies are usually claimed to serve some social good. In some instances, the agriculture and food policies are motivated by perceived market failures or imperfections and, in other cases, they are motivated by the desire to redistribute income and wealth.

Unfortunately, not only are markets sometimes imperfect or incomplete, but government policies are also less than perfect or complete in their design and implementation. Corresponding to the notion of market failure is government, or political, failure. In a prescriptive or normative sense, policies serving the public interest should minimize the adverse effects of both types of failure. This perspective is especially important in evaluating policy reform. Given the distinction between political and economic markets, simply knowing the adverse effects of current distortionary policies is not sufficient to motivate reform. Policies are in place, in part, because they serve the interest of those with relative political power and influence. Political or government failure is the tendency of the legislative or policy-making process to be influenced by self-interested private groups. To the extent that government intervention is directed by such groups, the public interest is not adequately served.

Some existing farm and food policies do serve the public interest (PERTs), and some serve only the self-interests of particular economic groups (PESTs). PERT policies (political economic resource transactions policies) attempt to correct market failures by offering a set of rules that reduce transaction costs associated with an unregulated market. The purpose of PERT policies is to increase economic efficiency. In contrast, PEST policies are political economic-seeking transfers and lead to government failure. In the formation of these policies, interest groups compete by spending time, energy, and money on the production of pressure to influence both the design and tactical implementation of policies. Most governments employ a portfolio, or mixture, of PERT and PEST policies. There is a wide scope of possibilities to interchange the use of PESTs and PERTs so as to acquire and maintain political power.

Understanding the role and formation of PESTs and PERTs is especially important in the evaluation of various reform proposals. In a world of rational policymakers, the actual selection of policies reflects a governing criterion or political-preference function (Rausser and de Gorter 1988). Current policies maximize a political objective, not the public interest, nor a social welfare function (a notion widely embraced by academic economists). Policies cannot be designed by some fictitious utilitarian criterion function or be based on laws written de novo on a "clean sheet of paper." Such a model is a guide for public policy in the Garden of Eden where only the public interest is given any weight. In reality, optimal policy reform must take as its starting point the existing policy system, including the governing criteria function that rationalizes whatever PEST and PERT policies are in place. Operationally, policy reform is piecemeal and dynamic in contrast to the once-and-for-always character of utopian policy design. Simply put, the mechanics of reform must be conditioned by the existing policies.

The governing criterion function in the context of political economic markets plays much the same role as Samuelson's net-social-payoff function plays in pure economic markets. In the case of pure competition, Samuelson showed that maximizing the net social payoff is equivalent to finding the price equilibrium in a particular market. Similarly, actual policy settings maximize the political-preference function reflecting the relative weight and influence of various interest groups (and the degree of government autonomy) in the policy formation process.

Conceptually speaking, there is a political economic market for policy reform. The reason that reform does not occur is because of the political-preference function, institutional constraints, and the transaction costs

faced by various groups entering and exiting this market. The demand for reform is potentially from diverse and unorganized persons who, because their per capita burden of current policy is very small, do not have sufficient incentive individually to reveal their demand for reform. The total benefits of reform to these groups would, however, outweigh the associated total costs of supplying the reform. This is a classic market-failure outcome in which a market (for reform) is missing.

Collective action, orchestrated by the government, can play a major role in the market for reform by lowering the transaction costs facing various interest groups. A change in the transaction costs will alter the makeup of the political-preference function. Moreover, to the extent it has some separate autonomy, the government can structure alternative compensation schemes that leave no interest group worse off as a result of reform. Structuring such compensation schemes requires economic modeling to identify winners and losers of reform. Based upon some initial crude estimates of gains and losses, the government can facilitate the negotiations between losers and winners by bearing the cost of eliciting their "willingness to pay" or "willingness to accept" reform. To the degree that the empirical results outlined at the beginning of this section are correct, the willingness to "pay" and "accept" negotiated compensation schemes can be found that lead to a positive supply of reform.

The more credible is government, the lower will be the cost of supplying reform and the less waste will be generated by the strategic behavior of various interest groups. A government with sufficient credibility can also design expenditure-minimizing compensations that would counter the opposition to propose reform. Such compensation to losers of reform would be less than the

capitalized loss of whatever rents such groups might be receiving from current policies.

There are, of course, many problems that must be faced in the practical implementation of compensation. Determining eligibility and interest group representation, fair compensation under uncertainty (ex post versus ex ante), financing compensation, designing credible threats, and reducing moral hazard concerns make implementation schemes difficult to structure. Nevertheless, there are a number of feasible alternative approaches, three of which have been developed in the literature with agricultural policy reforms specifically in mind (Rausser 1987).

5. Concluding Remarks

Reform of agricultural policies in industrialized countries will be a long and arduous process. This process, however, will be simplified by a GATT code for agricultural trade. To the extent that this code is successful in imposing binding constraints on individual countries, it will incorporate multilateral and phased reductions in (coupled) subsidies over time. To facilitate internal country reform and to enhance the probability of successful multilateral reform, proposals should recognize the significant dynamic adjustment costs that are faced by each country.

The effects of reform on output and input markets, especially land markets, cannot be isolated from a country's domestic macroeconomic conditions, nor from world economic conditions that arise during the process of joint reductions in coupled subsidies. To illustrate the importance of domestic and international economic conditions, consider U. S. agriculture in the early 1980s. Suppose that a GATT code had been established with phased reductions

in coupled subsidies of 20 percent in 1980, 20 percent in 1981, 20 percent in 1982, and 10 percent thereafter per year for the next four years. This "reform" would have been indeed difficult to implement in the face of high real rates of interest, an appreciating dollar on world markets, slow growth in worldwide income, and a domestic recession. During this three-year period, market overshooting would have driven agricultural prices to unbelievably low levels creating a "policy disequilibrium." Interest groups would have to exert pressure to change any orderly plan to phase out coupled subsidies. This would have added to the inherent instability of the market and detracted from the credibility of governments in implementing reform.

The credibility of governments in implementing reform can be enhanced by the design of "flexible" agricultural policies. Flexible policy rules can explicitly incorporate macro and international linkages into automatic adjustment rules. The design of such policies should make clear what the adjustments will be so that changes can be anticipated by producers, processors, distributors, consumers, and others involved in the sector. This would result in smooth, orderly changes in prices insulated from overshooting. Accordingly, investment within the sector will be more stable and more nearly optimal and thus will not contribute to oscillating adjustments in related markets.

Flexible policies imply some conditionality and admit the possibility of some variance in the implementation of reform, depending upon a country's external economic conditions to its agricultural sector. Total liberalization by a fixed time, without some conditionality or variance, is indeed a very risky proposition. It threatens government credibility directly, and endangers the implementation of reform strategies. An inability to implement reform in a few countries can even undermine an externally binding GATT code.

Government or political failure in implementing reform in some nations could lead to revisions in a GATT code that would make once binding constraints totally ineffective. Of course, if fiscal, monetary, wage, and exchange rate policies are well managed, there would be no need for a flexible, conditional process of phased reductions in coupled subsidies. Unfortunately, history provides little comfort that such policies will be well designed and implemented. To be sure, these policies are also in need of reform.

Footnotes

¹Dornbusch (1985) defines this "debt effect" on LDC welfare as the initial debt plus the current account deficit times a real discount factor.

References

- Anderson, Kym, and Yujiro Hayami, eds. 1986. Political Economy of Agricultural Protection: East Asia in International Perspective. Boston, Massachusetts: Allen and Unwin.
- Andrews, Margaret S., and Gordon C. Rausser. 1986. "Some Political Aspects of Macroeconomic Linkages with Agriculture." American Journal of Agricultural Economics 68:413-417.
- Batten, Dallas S., and R. W. Hafer. 1984. "Currency Substitution: A Test of Its Importance." The Federal Reserve Bank of St. Louis Review 66:5-11.
- Bordo, Michael. 1980. "The Effects of Monetary Change on Relative Commodity Prices and the Role of Long-Term Contracts." Journal of Political Economy 88:1088-1109.
- Cumby, Robert, and Maurice Obstfeld. 1984. "International Interest Rate and Price Level Linkages Under Flexible Exchange Rates: A Review of Recent Evidence." In Exchange Rate Theory and Practice, edited by J. Billson and R. Marston. Chicago, Illinois: University of Chicago Press.
- Dornbusch, Rudiger. 1985. "Policy and Performance Links Between LDC Debtors and Industrial Nations." Brookings Papers on Economic Activity 2:303-68.
- Frankel, Jeffrey, and Dikas Hardouvelis. 1985. "Commodity Prices, Money Surprises and Fed Credibility." Journal of Money, Credity, and Banking 17:425-438.
- Grilli, Enzo R., and Maw-Cheng Yang. 1984. "Real and Monetary Determinants of Non-Oil Primary Commodity Price Movements." In International Agricultural Trade: Advanced Readings in Price Formation, Market Structure, and Price Instability, edited by Gary G. Story, Andrew Schmitz, and Alexander H. Sarris. Boulder, Colorado: Westview Press, Inc., pp. 3-44.

- Johnson, D. Gale, and Daniel A. Sumner. 1976. "An Optimization Approach to Grain Reserves for Developed Countries." In Analysis of Grain Reserves, edited by David J. Eaton and W. Scott Steele. Washington, D. C.: U. S. Department of Agriculture, Economic Research Service Report No. 634, pp. 55-76.
- Loo, Tom, and Edward Tower. 1988. "Agricultural Protectionism and the Less-Developed Countries." Conference paper, Agricultural Policies and the Non-Farm Economy, at the American Enterprise Institute, Washington, D. C.
- McKinnon, Ronald. 1981. "Currency Substitution and Instability in the World Dollar Standard." Stanford University, Stanford, California.
- Nishiyama, Y., and Gordon C. Rausser. 1986. "Multiple Effects of Exchange Rates on Import Demand: The Case of U. S. Agricultural Trade With Japan." Unpublished paper, Department of Agricultural and Resource Economics, University of California, Berkeley.
- Rausser, Gordon C. 1982. "Political Economic Markets: PERTs and PESTs in Food and Agriculture." American Journal of Agricultural Economics 64:821-33.
- Rausser, Gordon C. 1985. "Macroeconomics and U. S. Agricultural Policy." In U. S. Agricultural Policy: 1985 Farm Legislation, edited by Bruce L. Gardner. Washington, D. C.: American Enterprise Institute for Public Policy Research, pp. 207-56.
- Rausser, Gordon C. 1987. "Political Failure and Reform of Agricultural Policy." Opening plenary paper, National Conference of Australian Agricultural Economics Society, University of Adelaide, Australia.
- Rausser, Gordon C., and Harry de Gorter. 1988. "Endogenizing Policy in Models of Agricultural Markets." Paper to be delivered at the International Conference of Agricultural Economists, Buenos Aires.

- Rausser, Gordon C., James A. Chalfant, H. Alan Love, and Kostas Stamoulis. 1986. "Macroeconomic Linkages, Taxes and Subsidies in the U. S. Agricultural Sector." American Journal of Agricultural Economics 68:399-412.
- Robinson, Sherman, Irma Adelman, and Maureen Kilkenny. 1988. "The Effect of Trade Liberalization in Agriculture on the U. S. Economy." Conference paper, Agricultural Policies and the Non-Farm Economy, at the American Enterprise Institute, Washington, D. C.
- Schiff, Maurice. 1985. "An Econometric Analysis of the World Wheat Market and Assimilation of Alternative Policies, 1960-80." Washington, D. C.: U. S. Department of Agriculture, Economic Research Service, International Economics Division, Staff Report AGES-850827.
- Stamoulis, Kostas G., James A. Chalfant, and Gordon C. Rausser. 1985. "Monetary Policies and the Overshooting of Flexible Prices: Implications for Agricultural Policy." Paper presented at the annual meetings of the AAEA, Ames, Iowa (Department of Agricultural and Resources Economics Working Paper No. 372, University of California, Berkeley).
- Stoeckel, A., and J. Breckling. 1988. "Some Economy-Wide Effects of Agricultural Policies in the European Community." Conference paper, Agricultural Policies and the Non-Farm Economy, at the American Enterprise Institute, Washington, D. C.
- Tyers, Rodney, and Kym Anderson. 1986. "Distortions in World Food Markets: A Quantitative Assessment." Background paper for the 1986 World Development Report. Washington, D. C.: The World Bank, Table 6.9, p. 131.