Working Paper Series

WORKING PAPER NO. 526

ECONOMYWIDE IMPLICATIONS OF AGRICULTURAL LIBERALIZATION IN THE UNITED STATES

by

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BERKELEY

CALIFORNIA AGRICULTURAL EXPERIMENT STATION

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Giannini Foundation of Agricultural Economics
February, 1990

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Abstract

Agriculture is a relatively small part of the U.S. economy, but public expenditures supporting agriculture are large in both relative and absolute terms. Given this combination, changes in agricultural policies may have significant economywide effects. These effects will depend on the degree of factor mobility, the disposition of the saved farm program expenditures, and the nature of existing sector-specific distortions. We use a 10-sector computable general equilibrium (CGE) model to analyze unilateral and multilateral agricultural liberalization under various assumptions about factor mobility and macroeconomic closure. We find that assumptions at the microeconomic level about land and labor mobility (but not necessarily capital mobility) are critical in determining economywide gains from liberalization. At the macroeconomic level, the important assumption in determining the magnitude of the gains is whether or not the saved program expenditures are used to reduce the Government deficit and/or the trade deficit.

Keywords: CGE analysis, general equilibrium analysis, trade liberalization, agricultural policy, economic modeling.

Acknowledgments

This paper is a revised version of a paper prepared for the symposium, Bringing Agriculture into the GATT, sponsored by the International Agricultural Trade Research Consortium (IATRC) in Annapolis, MD, August 19-20, 1988. The research on which this paper is based was sponsored by the U.S. Department of Agriculture, Economic Research Service. We wish to thank Philip Abbott, Ken Hanson, Thomas Hady, and Gerald Schluter for helpful comments on various drafts. We also wish to thank Linda Felton for her diligent work in word processing and Karen Thierfelder for graphics. Any views expressed herein are those of the authors and do not necessarily represent the views of the U.S. Department of Agriculture.

Introduction

The United States spends a significant amount of public funds to support its agricultural sector, as do most developed countries. In 1986, for example, Federal outlays for agriculture totaled $31.4 billion (U.S. Office of Management and Budget). This sum represents 6.5 percent of the nondefense and noninterest spending, targeted to less than 2.2 percent of the population.[1] By contrast, $17.8 billion was spent on unemployment compensation that year. Most of the outlays on agriculture, $26 billion (83 percent), were intended to support and stabilize farm incomes.

The annual cost of farm supports tripled between 1980 and 1986, reaching an all-time high in 1986. With some volatility, relative domestic prices of agricultural products fell throughout the period. The appreciation of the U.S. dollar hurt agricultural exports, and the U.S. share in world markets declined dramatically.[2] World grain prices also fell by more than half over the same period. The effects of reduced demand from debt-strapped importing countries and excess supply in exporting countries combined to force world prices down. Furthermore, in addition to domestic support policies, the European Community introduced variable levies on agricultural imports and aggressive export subsidy programs (Newman, Fulton, and Glaser). Responding to these developments, the Farm Security Act of 1985 introduced a new round of U.S. export subsidies (export enhancement programs) targeted at perceived unfair trading policies of other nations.[3]

The high costs of farm sector support and the threat of continued agricultural trade wars have motivated the quest for liberalization of agricultural trade. U.S. farm programs that affect trade include: deficiency and diversion payments (contingent upon setting aside farmland) to support income with respect to a perceived fair price; nonrecourse and reduced-interest loans intended to stabilize farm cash-flow; Government and subsidized private inventory accumulation to support market prices; import quotas and tariffs to support domestic prices; and export enhancement programs to reduce stocks, support domestic prices, and recapture lost international markets. The price support schemes raise returns to farmers, increasing supply incentives. Meanwhile, the land set-aside constraints reduce production. The stocking schemes raise U.S. prices and hurt exports. In contrast, the export subsidy program lowers the cost to importers of U.S. goods and encourages exports. In sum, the various U.S. programs have mixed effects on trade and returns in agriculture. Determining the net effect of existing agricultural policies is a complex empirical question.

An analysis with a computable general equilibrium (CGE) model suggests that agricultural support programs cost the United States almost $10 billion in lost gross national product (GNP) due to

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[1]Budgetary data in the paragraph are from U.S. Office of Management and Budget (1988), Tables 2 and 3. Population data are from U.S. Department of Commerce (1988), Table 1053.

[2]See Haley and Krisoff (1988).

[3]See Newman, Fulton, and Glaser (1987), Paarlberg (1987), and OECD (1987). The program was quite small in 1986, but has grown considerably. See Seitzinger and Paarlberg (1989) for estimates on the value of export subsidies for wheat.

misallocation of resources economywide.[4] This amount represents the real product increase that could be achieved through the reallocation of farm labor and capital, given the unilateral termination of all U.S. farm programs. In the model used for that analysis, labor and capital were assumed to be freely and costlessly mobile across sectors. The results thus reflect full market adjustment. Assuming limited factor mobility would lead to different results.[5] In addition, the analysis assumed that the program savings are used to reduce the Government budget.

While both partial and general equilibrium analyses indicate that liberalization may cause the farm sector to contract, only economywide general equilibrium analysis can indicate which nonfarm sectors expand. Furthermore, changes in economic activity across sectors are not limited to employment changes. Both aggregate performance (the level of GNP) and the sectoral composition of economic activity are sensitive to variations in private consumption, investment, Government consumption, and trade. Agriculture, small in terms of employment, is large in terms of its contribution to net exports and the Federal deficit. Accordingly, the major economywide effects are expected to follow from liberalization's effect on the balance of payments (trade), Government savings (fiscal policy), and aggregate investment.

The economywide effects of agricultural trade liberalization will occur through changes in prices and supplies of agricultural products, returns to labor and capital in farming, demand for intermediate goods, factor utilization in agriculture, the balance of trade, and either the Government deficit or private savings and investment or both. The first four mechanisms are microeconomic in nature, reflecting market adjustments to changes in incentives. When producer incentives change, mobile factors reallocate to maximize their returns, resulting in a different structure of employment, output, and trade. The last two changes work through macroeconomic linkages, which affect the structure of aggregate demand. The effects on GNP and sectoral performance depend on how easily factors relocate and on the nature of macroeconomic adjustment to the change in aggregate Government expenditure.

This report explores how different mixes of fiscal, trade, and agricultural liberalization policies affect the economy. It demonstrates the interdependence among adjustments in foreign trade, domestic product markets, factor markets, and macro-economic balances, given a change in agricultural policy. A 10-sector CGE model of the United States is used to conduct the empirical analysis.

We start from a baseline solution for 1986 that incorporates the major agricultural policies in place at that time. We then analyze two major changes in agricultural policies, unilateral and multilateral liberalization. Each of these policy changes is considered under different assumptions about micro and macro adjustment mechanisms.

We specify three micro and three macro adjustment scenarios todefine some plausible alternative economic environment, within which liberalization may be undertaken, totaling nine combined scenarios. In the first micro scenario, labor and capital are assumed to be sector-specific and fully employed regardless of changes in policy. Only land use adjusts (both aggregate and sectoral allocation), so this micro scenario is called LAND. In the second micro scenario, labor is also assumed to be mobile in response to changes in factor returns, but capital remains sectorally fixed. This scenario is called LABOR. In the third, land,

[4]See Robinson, Kilkenny, and Adelman (1989).

[5]See, for example, Hertel and Tsigas (1988).

labor, and capital are all mobile, allowing full factor market adjustment to the policy change. This micro scenario is called FULL (mobility).

In the first macro scenario, Government expenditures on farm programs are redistributed as transfers to households so that there is no change in the Government deficit or the balance of trade. This is called the TRANSFER macro scenario. In the second macro scenario, the farm program savings are assumed to be saved, reducing crowding-out in the loanable funds market. The result is an increase in aggregate investment, so the second macro scenario is called the investment (or INVEST) scenario.

In the third scenario, the budget is reduced by the savings on agricultural programs, and the program savings are used to offset foreign savings, reducing the deficit on the current account. The overall current account balance is exogenous in the model and, in this scenario, is assumed to improve by the amount of program savings. The scenario is called the balance of payments macro scenario (BOP). In all the scenarios, labor and capital are fully, if not efficiently, employed. We assume no feedback from macro adjustment to aggregate employment.

The CGE Model

The basic CGE model used for the analysis is documented in Robinson, Kilkenny, and Hanson (1990). It is similar to the trade and development models described in Dervis, de Melo, and Robinson (1982). The model equations describe the behavior of the various economic agents in the markets for factors, commodities, and investable funds. It is neoclassical and Walrasian in spirit. The solution is a set of relative prices, including the real exchange rate, that achieve flow equilibrium in all product and factor markets in an environment of aggregate full employment.

Table 1: Economic Structure and Model Parameters, 1986 Base Year

	Sectoral Composition:			Trade Shares:		Elasticities:		Ratio to Average:	
Sector	Value Added	Exports	Imports	E/XD	M/XD	Import Subst.	Export Trans.	Profit	Wage
	percent			percent				percent	
Dairy and meat	0.6	0.1	0.1	0.2	0.9	4.0	0.5	121.2	58.7
Grains & oilseeds	0.4	4.0	0.0	18.3	0.1	4.0	4.0	105.1	43.5
Other agriculture	0.7	0.5	1.1	3.5	10.4	4.0	2.0	78.0	56.3
Light consumer	7.0	7.6	10.1	3.6	6.9	2.0	2.0	223.3	99.6
Basic intermediate	10.0	11.9	34.5	4.5	18.5	0.8	2.0	155.8	138.4
Capital goods	5.2	20.5	20.6	13.0	18.5	0.8	2.0	50.7	145.4
Construction	4.9	0.0	0.0	0.0	0.0	0.9	1.5	204.1	142.4
Electronics	2.0	5.0	9.6	11.5	31.2	1.1	2.0	84.6	77.9
Trade and finance	16.9	6.7	0.0	2.4	0.0	0.2	0.6	128.6	96.2
Other services	52.3	43.7	24.0	5.8	4.5	0.2	0.6	86.1	91.4
Agriculture	1.7	4.6	1.2	7.7	3.0			106.2	53.7
Industry	29.1	45.0	74.8	5.5	13.0			154.1	126.8
Services	69.2	50.4	24.0	4.9	3.3			90.1	93.9
Total	100.0	100.0	100.0	5.3	7.4			100.0	100.0

Notes:
All composition shares, trade shares, and ratios are in percent. E/XD is exports over domestic production. M/XD is imports over domestic production. The import substitution and export transformation elasticities are defined in the text. Source: 1986 model solution.

The model distinguishes 10 sectors. Of these, three are agricultural sectors: dairy and meat, grains and oilseeds, and other agriculture. There are five industrial sectors: light consumer goods (which includes food processing), basic intermediates, capital goods, construction, and electronics. Finally, there are two

service sectors: trade and finance, and other services. The sectoral structure of the economy in the base year, 1986, is shown in table 1.

The model captures agricultural programs explicitly. The modeling approach is described in Kilkenny and Robinson (1988). In the sectors, dairy and meat and other agriculture, the domestic market price is supported by import quotas, Government stocking, and export subsidies. In the grains sector, the signal price is the target price stipulated by Government policy, when it is greater than the market price.[6]

Given the fixed signal price, the *ad valorem* rate of subsidy varies inversely with the market price. If the market price rises above the signal price, the subsidy falls to zero. We calculate the deficiency payment as the difference between the stipulated signal price and the higher of the loan rate or the endogenous market price, multiplied by output. This approach better captures the deficiency payment program than other models, which specify a fixed *ad valorem* subsidy.[7] In addition, Government demand for stocks of grains is a function of the ratio of the loan rate to the market price. The model thus captures, in a stylized way, price stabilization policies in the grains sector. Unique to this CGE model, the explicit modeling of the program is crucial for correctly measuring both the budgetary cost and the resource-pull effects of U.S. agricultural programs.

Market distortions in other sectors are embodied in the base year data. The last two columns of table 1 show that average rates of return to factors differ among sectors. These differences may be due either to underlying structural rigidities or to other tax and subsidy distortions. In the agricultural liberalization experiments, these distortions are left unchanged, so the experiments do not allow the achievement of a first best situation. The variations in returns shown in table 1 imply that labor productivity is highest in nonagricultural sectors. These stylized facts are embodied in the model. Any changes that induce labor to move out of agriculture will raise economywide productivity and increase modeled GNP.

There are three primary factors of production: labor, capital, and cropland. The aggregate supplies of labor and capital are assumed fixed, but both factors may be mobile among sectors, depending on the micro scenario. Land is supplied to maintain the base year rate of productive return. Land is used only in the two crop sectors, grains and other agriculture.

The land set-aside aspects of the farm programs are modeled as reducing the available acreage. A land supply function is calibrated to generate a 16-percent expansion of acreage planted if set-aside constraints are lifted. This is equivalent to the 12 percent actually idled in 1986, assuming a slippage rate of 25 percent.

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[6]Participation of 100 percent is not assumed, although participants and nonparticipants are aggregated. Total producer activity is the sum of participant and nonparticipant activity. Thus, the signal to producers, the target price, is computed as the weighted average of the actual target and market prices of the crops in the grains sector. Participants' soybean production is evaluated at the loan rate. The weights are the proportions of participant and nonparticipant output in the base year at market prices.

[7]The *ad valorem* rates are based on information on "producer subsidy equivalents" or PSE's. See U.S. Department of Agriculture (1988).

Real value added is a Cobb-Douglas function of labor, capital, and (in the two crop sectors) land. Intermediate input demands are determined by fixed input-output coefficients. The value of output is the sum of intermediate input costs and value added.

Sectoral supply is determined by assuming profit maximization by producers. In general, the signal price to producers is the market price plus subsidies and net of indirect taxes. Given the assumption of fixed input-output coefficients, a sector whose relative value-added price rises, whether due to an increase in the signal price or a decrease in intermediate input prices, will tend to pull primary resources away from other sectors.

The CGE model is closed in the sense that returns from production determine income flows to various agents who then demand goods. All income is channeled to households, Government, and savings. These agents, in turn, purchase goods for consumption, Government, and investment. The final agent is the rest of the world, which buys exports, supplies imports, and provides foreign savings. The model determines only flow equilibria and does not include any assets or asset markets.

There are three types of households categorized by income class. They have capital and own land and receive income from wages, profits, rents, and Government transfers. They pay taxes and save according to different average saving rates, and they allocate their consumption expenditures according to a simple linear expenditure system. Aggregate investment equals total savings net of the Government deficit. In effect, there is a loanable funds market that gathers savings from all sources (private, Government, and foreign) and allocates these savings to the purchase of investment goods. Government savings, or deficits, are determined endogenously, given nonagricultural Government expenditures, endogenous farm program expenditures, and endogenous Government tax revenue. Reducing the Government deficit increases the amount of savings available for investment.

The rest of the world is characterized very simply. The United States is assumed to be small in import and nonagricultural export markets. For two agricultural sectors, grains and other agriculture, world demand is a function of endogenously determined U.S. export prices relative to exogenous rest-of-world prices. An Armington assumption is invoked to distinguish domestic from foreign goods in demand. Consumers purchase composite commodities, which are constant elasticity of substitution (CES) aggregates of the imported and domestically produced goods.

Producers in each sector supply a composite commodity that has to be transformed for it to be shifted between domestic and export markets. The sectoral composite output is a constant elasticity of transformation aggregate of exports and domestic-market goods. Thus, sectoral export supply is a function of the relative price of sectoral exports to domestic sales.

Foreign savings are given exogenously in the base run but are endogenous in some of the experiments, depending on the macro closure assumptions. Thus, the balance of trade is specified exogenously in the base run, and the model is solved for the equilibrium real exchange rate. The numeraire in the model is the GNP deflator, so the model solves for the equilibrium nominal exchange rate relative to this given price index. In some experiments, the nominal exchange rate is also fixed and the model solves for the equilibrium value of the balance of trade in goods and services. An improvement in the balance of trade is associated with real depreciation.

Unilateral Agricultural Liberalization

The United States is unlikely to dismantle its agricultural support programs unilaterally. Nevertheless, we analyze unilateral liberalization in order to answer how much of the gains from policy reform arise from the removal of domestic distortions alone. The policy experiment involves eliminating the $26 billion worth of farm income and price supports, along with the constraints on land use. The different assumptions about the use of the program savings had little effect on the results for the agricultural sectors. Figure 1 presents an average across the three macro scenarios of the effect on signal prices in the agricultural sectors. Although the loss of subsidies reduces the signal price to the market price, the reduction in supply raises that market price. For example, the base year (1986) market price for grains is only 71 percent of the signal price. After adjustment, however, unilateral liberalization does not lead to a 29-percent fall in the signal price to farmers. For example, in the mobile labor scenario at the new equilibrium, the signal price falls by only 11.5 percent (the new equilibrium market price compared with the old signal price), as shown by the fifth bar in figure 1.

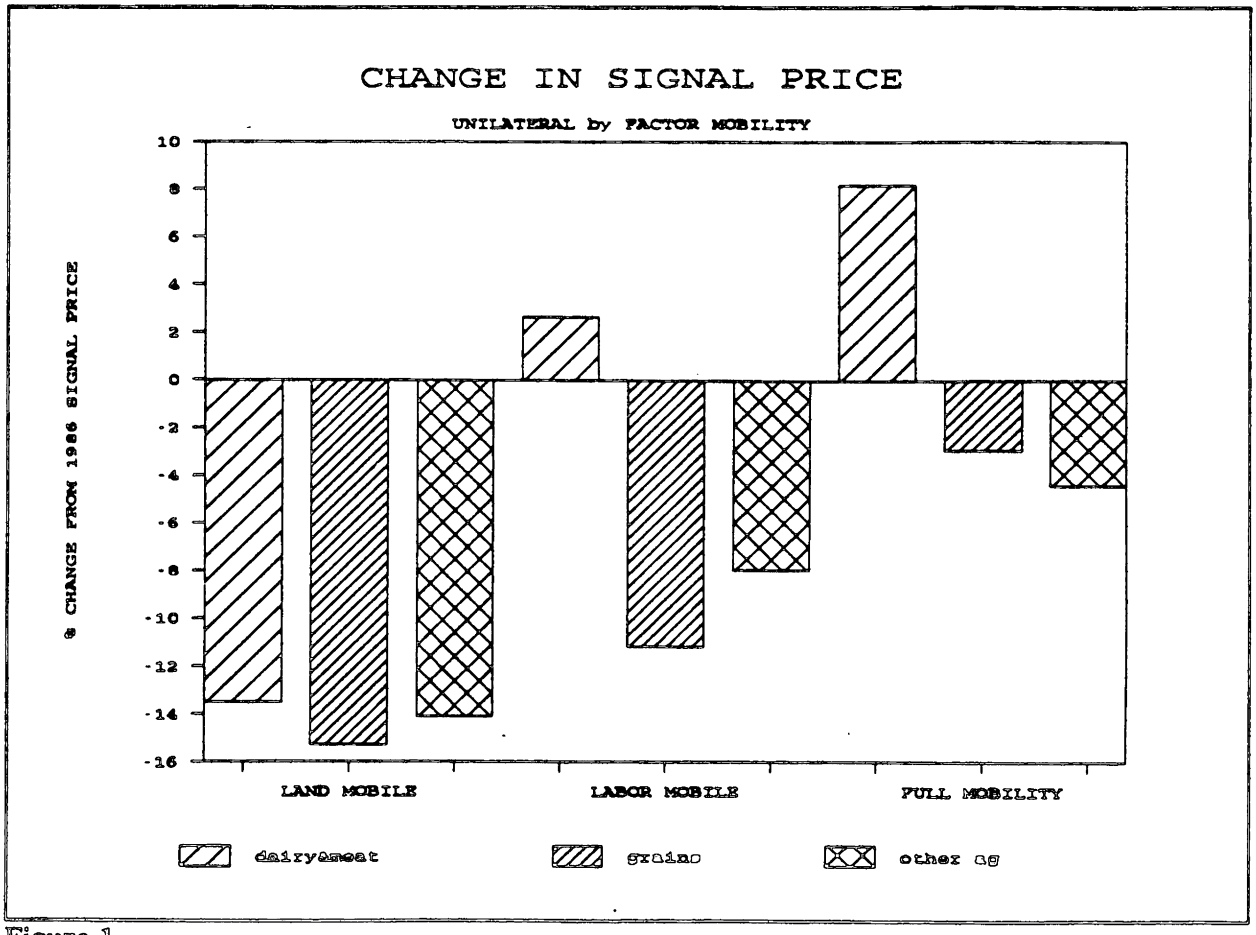


Figure 1

In the dairy and meat sector under the two mobility scenarios, the signal price actually rises with the removal of all trade barriers and domestic agricultural support. The sector contracts, however, with factors leaving when allowed. The mechanism yielding this apparent anomaly is the rise in the price of grains,

which drives up intermediate costs in the dairy and meat sector. Although the market price rises, the value-added price falls, and the sector contracts.

A partial-equilibrium analysis of the effect of protection of dairy and meat products indicates that the 80-percent tariff equivalent on dairy imports and the 14-percent tariff equivalent on meat imports distort the factor market, protecting over 36,000 production jobs in the sector.[8] Our general-equilibrium analysis indicates that under unilateral liberalization 37,000 workers would leave the sector. The congruence suggests that our results are robust, although the general-equilibrium liberalization scenario is more complex than that considered in the partial-equilibrium study.

The effect of unilateral liberalization on economywide GNP depends strongly on the extent of factor mobility. With only land mobile, nonagricultural sectors continue to produce the same output, regardless of policy shock and macro scenario. Liberalization induces a reduction of cropland and crop output, so agricultural production falls. The net effect is a reduction in GNP when only land is mobile. Under both of the remaining factor mobility scenarios, there are GNP gains arising from the reallocation of factors to sectors where they are more productive.

Multilateral Agricultural Liberalization

To model the implications of multilateral agricultural liberalization (the second policy experiment), we use world price and trade estimates derived from a global agricultural sector model, SWOPSIM.[9] There are no explicit factor markets or economywide aggregates in SWOPSIM. To determine which of our scenarios best fit the SWOPSIM model, we compared the results from the unilateral liberalization experiment under the nine scenarios with the results from a comparable experiment in SWOPSIM. Regardless of the macro scenario, the best fit between the two models is under the micro assumption of land and labor mobility but no capital mobility, so we restrict ourselves to the mobile labor micro scenario from here on.

Multilateral liberalization consists of terminating U.S. farm programs in an environment of increasing world prices. The increased demand facing the United States in world markets should spill over into domestic markets, offsetting the negative effect of liberalization of domestic subsidy programs on signal prices in agriculture. The results of the simulation experiments illustrate this link. Figure 2 presents a comparison between multilateral and unilateral liberalization on signal prices in the grains sector, assuming land and labor mobility.

The bars indicate the percentage fall in the signal price to the grains sector, following both unilateral and multilateral liberalization. In general, the signal price falls much less under multilateral liberalization. The effect also varies across macro scenarios. In particular, the smallest fall in grain sector signal prices is observed in the BOP macro scenario, which assumes that the saved program expenditures are used to reduce foreign capital inflows. In this case, a real depreciation stimulates U.S. grain exports. The increase in foreign demand strengthens market prices so that the signal (market) price after multilateral

[8]See Hufbauer and Rosen (1986), Table 2.1.

[9]See Roningen (1986). Roningen and Dixit (1989) describe SWOPSIM results with which we compare our results. See also Mageira and Herlihy (1988).

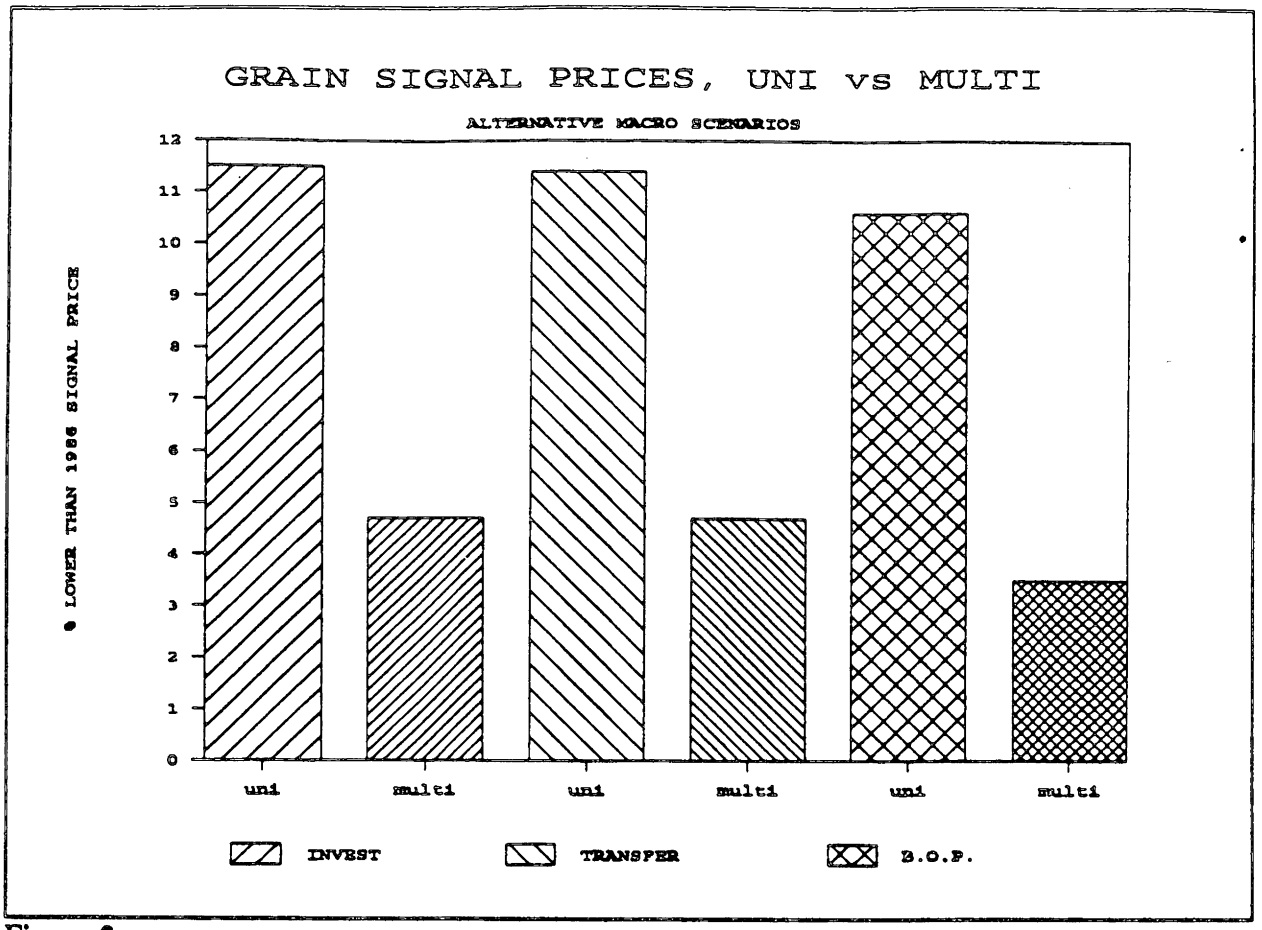


Figure 2

liberalization is only 4 percent lower than the signal (target) price in the base year, 1986.

The increases in the market prices for agricultural products, however, are passed on to the food processing sector in the form of higher costs for intermediate goods. Thus, the light consumer goods sector, which includes food processing, suffers a fall in net value added along with the agricultural sectors. Factors tend to move out of agriculture and food processing into other sectors.

The effect on the nonagricultural sectors is sensitive to the macro scenario. This sensitivity is illustrated in figure 3, which presents the changes in sectoral employment arising from multilateral liberalization under the three macro scenarios and the mobile labor micro scenario. In each case, labor moves out of agriculture and into heavy manufacturing or construction. Manufacturing is favored under the BOP scenario, while construction and capital goods industries are favored under the INVEST scenario. More workers stay in agriculture or move to the other export sectors (electronics and basic intermediates) under the BOP scenario because the accompanying depreciation stimulates exports and import substitution.

The economywide effect of multilateral liberalization also depends critically on the macro adjustment to the change in farm program expenditure. Figure 4 presents the changes in real GNP under the three macro scenarios. The fourth bar in each set represents the total economywide change in real GNP measured in constant 1982 dollars. If the unspent farm program expenditures are not saved, there are virtually no

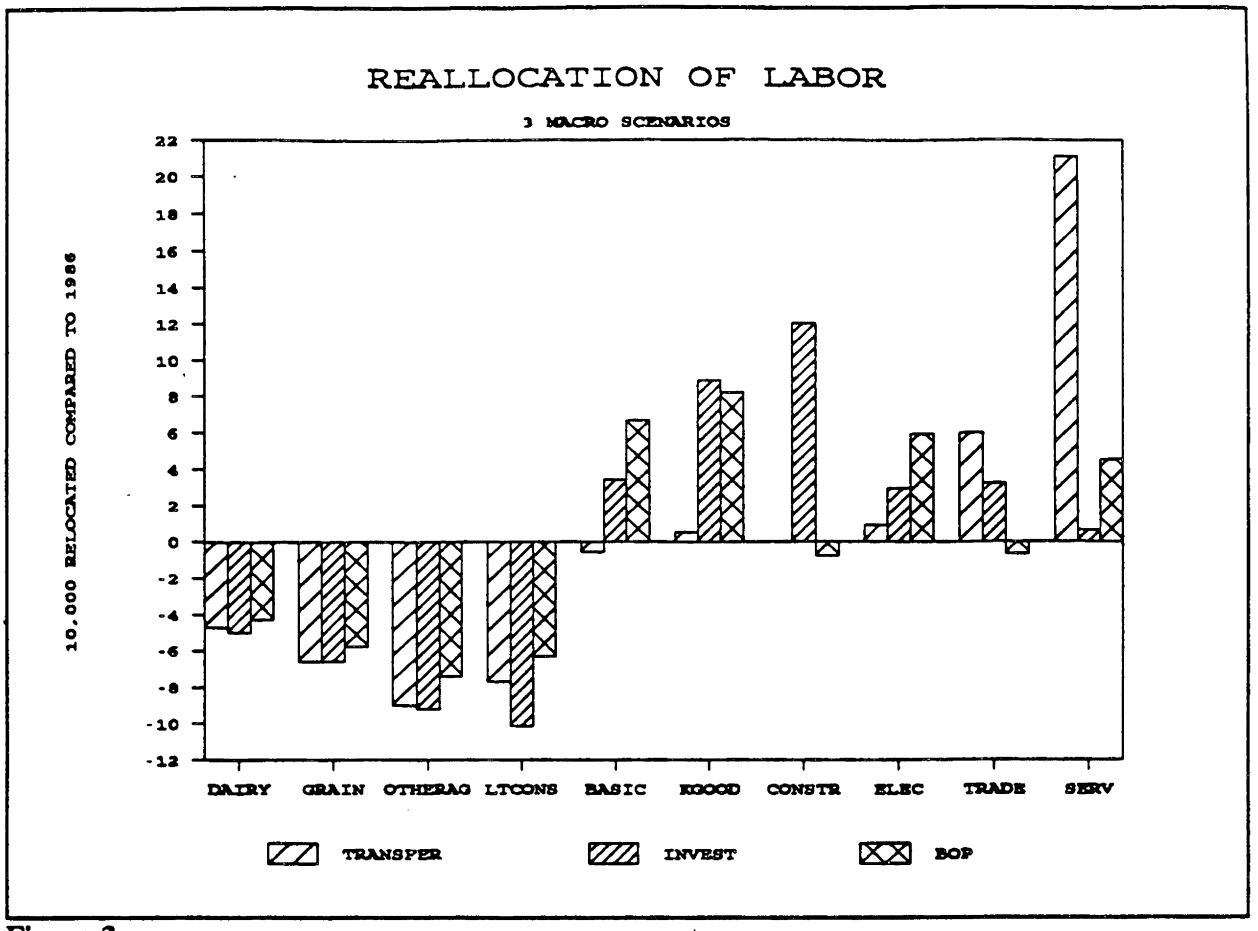


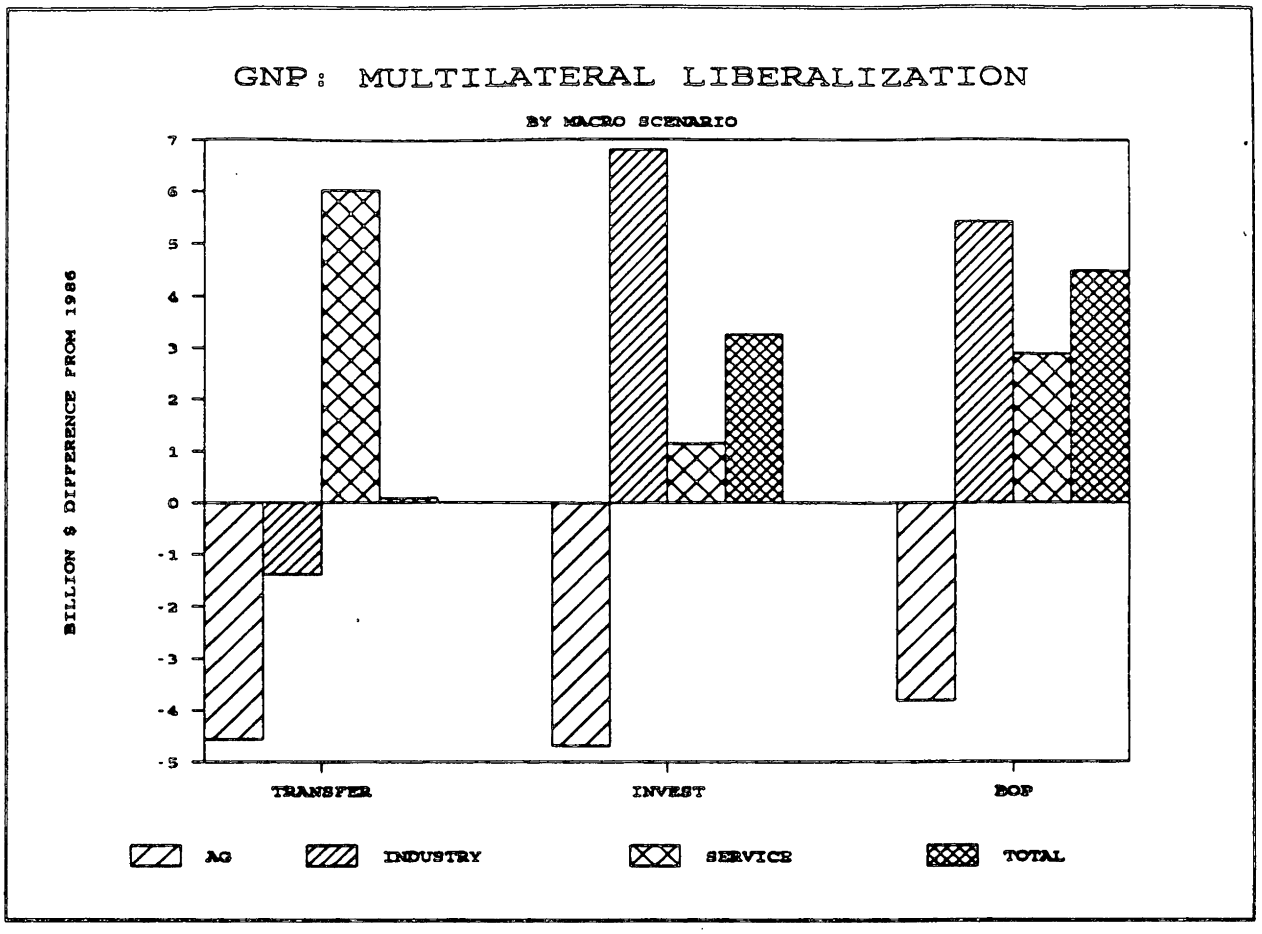
Figure 3

economywide gains (the TRANSFER scenario, fourth bar). If saved, they can either be invested domestically or used to offset foreign capital inflows (reduce the current account deficit).

In either the INVEST or BOP scenario, there is an overall economywide real GNP gain. The eighth and twelfth bars of figure 4 indicate economywide GNP gains of approximately $3.0 billion and $4.4 billion (1982 dollars). The real GNP gain is largest in the BOP scenario in which the farm program savings are used to reduce the trade deficit. The GNP gain in that case amounts to $17,000 of additional real output per worker who changes jobs.

Using farm program savings to reduce either of the twin deficits amounts to reducing current income flows to private households, increasing either investment or the trade balance. The accompanying rationalization of resource allocation brings about real output gains which offset some of the reduction in income. In general, household income falls by less than 1 percent under the INVEST and BOP scenarios, (tables 2, 3, and 4).

From table 2, aggregate farm sector income falls by 15.1 percent, or $14.4 billion. Some of the $26 billion in subsidy income forgone is made up by price increases. Thus, nominal value added rises 17.6 percent although real value added (GNP) falls 5.2 percent. The near doubling of value added in the grain and oilseeds sector further illustrates the point. A large part of the return to land, labor, and capital in



those crops arises from Government payments and price supports. With liberalization, the combination of supply and demand shifts help push post-liberalization market prices up almost to the preliberalization signal prices. These results are consistent with Paarlberg who argues that liberalization should strengthen market prices and reduce the need for Government support. While value added at market prices increases, nominal sectoral income falls, the price rise is not enough to offset totally the loss of the program.

Table 3 presents the changes in industrial sector incomes and output from multilateral liberalization. These sectors increase their share of GNP with multilateral agricultural liberalization. Labor is released from the agricultural sectors, reducing wages economywide and expanding employment in the industrial sectors by about 0.2 percent. Real industrial output increases by an average of 0.3 percent. Table 4 provides the same information for the trade, finance, and other service sectors, which account for over 69 percent of real economic activity. Table 4 also includes the economywide results. Service sector employment and output expand under multilateral liberalization. Nominal value added and incomes fall, along with the fall in wages. In the aggregate, the effect of liberalization is almost imperceptible in percentage terms, although positive in real terms.

Table 2: Agricultural Sectors, Results from Multilateral Liberalization

Sector	Real GNP	Value added	Sector income	Labor
	- - - - - Billion dollars - - - - -			Millions
Dairy and meat				
1986 base run	12.2	25.0	23.4	0.4
BOP and INVEST	11.9	22.5	20.6	0.4
Percent difference	-2.8%	-10.0%	-11.8%	-11.1%
Grains and oilseeds				
1986 base run	43.1	17.0	40.2	0.3
BOP and INVEST	39.9	33.8	32.0	0.3
Percent difference	-7.5%	98.5%	-20.5%	-20.1%
Other agriculture				
1986 base run	34.0	31.2	31.8	0.9
BOP and INVEST	33.0	29.8	28.4	0.8
Percent difference	-3.1%	-4.5%	-10.8%	-10.0%
Total agriculture				
1986 base run	89.3	73.2	95.4	1.7
BOP and INVEST	84.7	86.1	81.0	1.5
Percent difference	-5.2%	17.6%	-15.1%	-12.2%

Notes:

The entry for BOP and INVEST is the average of the levels in the BOP and INVEST macro scenarios for the multilateral liberalization experiment and the LABOR micro scenario.

Table 3: Industrial Sectors, Results from Multilateral Liberalization

Sector	Real GNP	Value added	Sector income	Labor
	------ Billion Dollars ------			Millions
Light consumer goods				
1986 base run	240.0	296.0	277.0	8.04
BOP and INVEST	238.1	292.1	272.7	7.95
Percent difference	-0.8%	-1.3%	-1.6%	-1.1%
Basic intermediates				
1986 base run	346.8	422.5	380.1	6.27
BOP and INVEST	347.3	424.1	379.2	6.28
Percent difference	0.1%	0.4%	-0.2%	0.2%
Capital goods				
1986 base run	209.7	222.5	215.1	5.67
BOP and INVEST	211.3	224.9	215.9	5.72
Percent difference	0.8%	1.1%	0.4%	0.8%
Construction				
1986 base run	202.4	207.8	201.9	5.13
BOP and INVEST	204.5	209.2	203.3	5.18
Percent difference	1.0%	0.7%	0.7%	1.2%
Electronics				
1986 base run	74.6	82.7	80.8	3.86
BOP and INVEST	75.0	83.3	80.9	3.87
Percent difference	0.5%	0.7%	0.1%	0.5%
Total Industry				
1986 base run	1073.5	1231.5	1154.9	28.95
BOP and INVEST	1076.2	1233.5	1151.9	29.00
Percent difference	0.3%	0.2%	-0.3%	0.2%

Notes:

The entry for BOP and INVEST is the average of the levels in the BOP and INVEST macro scenarios for the multilateral liberalization experiment and the LABOR micro scenario.

Conclusion

We find that the combination of trade liberalization and removal of agricultural programs leads to higher market prices in agriculture, lower signal prices, and lower output. The percentage increase in prices is greater than the fall in output, so nominal value added rises. The price increases, however, do not suffice to offset the loss of income from termination of agricultural support programs. The farm sector contracts, even under the multilateral liberalization scenario where there is assumed to be a significant improvement in export markets.

A robust result from our analysis is that the economywide gains from agricultural liberalization arise primarily from the movement of labor out of agriculture. The sectoral reallocation of capital is less important. Another important implication is that the economywide gains from agricultural liberalization are insignificant unless the savings are used to reduce the existing Government and trade deficits. Both the size and sectoral incidence of the gains depend on the nature of the macroeconomic adjustment. The effect of liberalization on the agricultural sectors, however, is much less sensitive to different macro scenarios. Under all scenarios, factors leave agriculture.

Table 4: Service Sectors, Results from Multilateral Liberalization

Sector	Real GNP	Value added	Sector income	Labor
	- - - - - - Billion Dollars - - - - - -			Millions
Trade and finance				
1986 base run	658.8	714.5	617.5	20.7
BOP and INVEST	659.9	711.9	616.0	20.8
Percent difference	0.2%	-0.4%	-0.2	0.2%
All other services				
1986 base run	1890.2	2216.1	2049.6	54.6
BOP and INVEST	1892.7	2208.1	2043.4	54.7
Percent difference	0.1%	-0.4%	-0.3%	0.2%
Total services				
1986 base run	2549.0	2930.6	2667.1	75.4
BOP and INVEST	2552.6	2920.0	2659.4	75.5
Percent difference	0.1%	-0.4%	-0.3%	0.2%
Total, economywide				
1986 base run	3711.8	4235.3	3917.4	106.0
BOP and INVEST	3715.5	4239.6	3892.3	106.0
Percent difference	0.1%	0.1%	-0.6%	0.0%

Notes:

The entry for BOP and INVEST is the average of the levels in the BOP and INVEST macro scenarios for the multilateral liberalization experiment and the LABOR micro scenario.

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