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TRADE ADJUSTMENT ASSISTANCE AND THE U.S. SUGAR INDUSTRY

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ABSTRACT

Previous U.S. sugar policy and the alternative of trade adjustment assistance are outlined. The impact of eliminating the tariff on imported raw sugar under 1977 conditions is evaluated, with particular emphasis on the losses incurred at producer and processor levels. The ability of the current adjustment assistance program under the 1974 Trade Act [P.L. 93-618] to compensate for these losses is assessed. Compensation would primarily be limited to the provision of trade readjustment allowances (supplemental unemployment insurance) to labor employed in beet processing and cane milling. Eligibility criteria would limit payments to a relatively small number of displaced workers who are not seasonally employed (i.e. for more than 26 weeks). Despite the limitations of the existing program, the adjustment assistance concept could be applied in an agricultural context. It is suggested that the major features of an agricultural program would focus on compensating for losses in income and asset values at the farm and possibly processing levels, and would cope with displaced seasonally-employed labor.

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SUGAR INDUSTRY

by

Lloyd S. Harbert and David Blandford*

Since the early 1900's the United States has continually faced the problem of how much import protection should be provided for the domestic sugar industry. Political debate on the issue has taken up many hours of Congressional time and spawned numerous publications. It has become quite fashionable to consider sugar protection a political rather than an economic question. Emphasis is on the "optimal" level of protection, i.e., the level necessary to maintain a specific degree of self-sufficiency. Despite the fact that protection imposes significant costs on consumers and benefits a relatively small number of producers, the impact that trade liberalization might have upon this politically vocal group has militated against liberalization (Johnson). As a result, the idea of unilateral reduction of U.S. tariff barriers is rarely, if ever, seriously considered.

Since the early 1960's, there has been increasing interest in mechanisms for compensating U.S. industries affected by import competition, in order to reduce demands for protection and promote economic adjustment. "Adjustment assistance" provisions were first introduced by the U.S. in the 1962 Trade Expansion Act (P.L. 89-794). They were strengthened and extended in the 1974 Trade Act (P.L. 93-618). Although the potential use of adjustment assistance in agriculture has been discussed (Bale), there has been no attempt to evaluate its applicability to specific U.S. agricultural industries, such as sugar or dairy, which have traditionally been heavily protected. The purpose of this study is to provide such an evaluation for the sugar industry. The study has two principal objectives:

(1) to estimate the costs and benefits of sugar trade liberalization under 1977 conditions, at both regional and national levels; and

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(2) to evaluate the degree to which the adjustment assistance provisions of the 1974 Trade Act could compensate those in the industry for the losses incurred through liberalization.

In order to facilitate the achievement of these objectives, the first section of the study briefly outlines the structure of the U.S. sugar industry, previous sugar policy, and the nature of adjustment assistance.

1. THE U.S. SUGAR INDUSTRY, SUGAR POLICY, AND ADJUSTMENT ASSISTANCE

1.1 A Brief Description of the Sugar Industry.^{1/}

U.S. consumption of sugar, at roughly 11 million short tons, represents 10-11 percent of world consumption. Although world sugar demand increased by an average of just over 2 million tons per year during the 1970's, U.S. consumption remained relatively stable. Per capita use fell from 102 pounds (refined basis) in 1970 to 91 pounds in 1979. This was partly due to increased use of corn sweeteners, which rose from just over 19 pounds per capita in 1970 to an estimated 37 to 38 pounds in 1979. Industrial uses of sugar account for nearly two-thirds of total annual deliveries in the U.S. The largest uses are in beverages; bakery, cereal and related products; confectionery; and in fruit and vegetable processing. The fact that the bulk of U.S. sugar is consumed indirectly rather than in its crystalline form, is one of the major reasons why alternative sweeteners, such as high fructose corn syrup, now have considerable potential for substituting for sugars from beet and cane. U.S. sugar demand as a whole is both price and income inelastic (Gemmill). Given that the average consumer spends less than one tenth of one percent of his/her total income on sugar and sugar products, sizable movements in retail prices are required before significant adjustments in consumption are made.

The U.S. is a relatively high cost producer of sugar and has typically relied on imports to meet 45-55 percent of its domestic needs. In recent years, U.S. imports have accounted for 15-18 percent of world imports (IBRD). Roughly half of the U.S. total is supplied by three countries--the Phillipines, Dominican Republic, and Brazil. In 1978, these countries provided 18, 16 and 13 percent, respectively of total U.S. imports. Between 1974 and 1977, sugar accounted for roughly 20 percent of the total value of agricultural imports or 2 percent of total U.S. merchandise imports (USDA-ESCS).

1/ Several comprehensive descriptions of the U.S. sugar industry already exist (e.g., USDA-ERS), the treatment here is therefore brief. Unless otherwise indicated, data used were obtained from the Sugar and Sweetener Reports (USDA-ESCS/AMS/FAS).

Out of the 6 million tons of sugar produced domestically, approximately 55 percent is derived from sugarbeets. Although beets are grown in significant quantities in at least 17 states, over 60 percent of beet production in 1978 was located in four states --Minnesota (19 percent), California (19 percent), North Dakota (12 percent), and Idaho (11 percent). The remaining 45 percent of total production is derived from sugarcane grown in Hawaii (18 percent), Florida (17 percent), Louisiana (9 percent), and Texas (1 percent). In 1974, roughly 12,000 farms in the U.S. grew sugarbeets with an average of 105 acres per farm. Approximately, 4,300 farms grew sugarcane with an average of 189 acres per farm (USDA-ERS). In total, roughly 2 million acres of beets and cane are harvested annually.

In 1975, there were 55 sugarbeet processing factories in the United States. The majority of these plants (32) were built before 1920 (United Beet Sugar Association). In 1976, approximately 18,000 persons were employed in beet processing and 7,500 in the milling of cane. A further 6,000 people were employed in the refining of cane sugar (U.S. Dept. of Labor). Unlike beet processors, who produce refined sugar directly, cane sugar milling and refining are separate activities. The refineries, of which 23 existed in 1975, are located mainly near centers of population and close to major ports, since they use imported raw cane as well as that produced domestically.

1.2 U.S. Sugar Policy.

Between 1934 and 1974 U.S. sugar policy was expressed in a series of sugar acts. Through this legislation, Congress tried to achieve several objectives: (i) guarantee a price which would provide an adequate return to farmers; (ii) maintain a level of self-sufficiency that would produce a reasonable degree of supply security and price stability; and (iii) allow enough foreign imports to provide reasonable prices to consumers. A mixture of policy instruments, including domestic and foreign marketing quotas, direct payments to producers, and tariffs and excise taxes was used to achieve these objectives. Because of historical circumstance, a well-organized and vocal producer lobby, and the threat of curtailment of foreign supplies on several occasions --the Korean War, the Cuban Missile crisis, and the more recent 1974 oil crisis--Congress has generally ranked the objectives of stable farm incomes and domestic self-sufficiency above low consumer prices.

A major change in policy occurred with the expiration of the last act on December 31, 1974. Because of the relatively high domestic prices for sugar during 1973/74, consumer groups were strongly opposed to renewal of protection on the grounds that the existing act had proved a failure in protecting their interests. High prices also made abandonment at that time less serious for producers. Congress, sensitive to press coverage of intensive lobbying efforts and allegations of unethical practices surrounding the passage of previous legislation, was unwilling to revitalize the old system of protection. Consequently, a new sugar act was not passed.

Even without the protective umbrella of an explicit sugar program, other legislation existed through which the industry could receive protection.^{1/} This provided an acceptable substitute for approximately two years. However, due to rapid accumulation of world stocks of raw sugar from 1973/74, imports into the United States increased. Because tariff levels were not high enough to restrict this increase, domestic prices fell below average costs of production. Acreage planted to sugarbeets and cane declined, and workers engaged in beet processing and cane milling began to lose their jobs.

On March 17, 1977 the United States International Trade Commission (ITC) recommended that the sugar industry be granted import relief (protection from imports) through the re-imposition of quotas. Instead, the President chose a program of income support through direct payments. An interim program was introduced in September 1977 under which the support price was paid to processors, who then paid this price to producers. In November, a price support loan program under the 1977 Food and Agriculture Act was implemented. The program was similar to many other previous support programs (e.g., for wheat) in which the product was used as collateral for a loan provided by the Commodity Credit Corporation (CCC). If market prices did not rise above the loan rate plus interest charges the CCC would take title to the sugar, otherwise, the processor would redeem the loan (sell the commodity and pay back the CCC). In order to remove any incentive for low-cost imported sugar to be sold to the CCC, import duties and fees were increased to raise the price of imported raw sugar above the support level.

The program operated for the 1977-79 crops. During this time, the support price objective was increased and tariffs/duties were altered in response to changes in domestic and import prices. Considerable debate occurred in Congress on a new sugar program, with major differences centering on the level of the price support objective and hence on the level of protection. U.S. approval of the International Sugar Agreement, which was concluded in 1977, was delayed while the debate on new legislation continued. The change in sugar market conditions in

1/ Section 301 of Title III of the Agricultural Act of 1949 authorized the Secretary of Agriculture to support prices at a level not in excess of 90 percent of parity through loans, purchases or other operations. In order to guarantee that this price objective was maintained, the Secretary could request the imposition of quota or tariff limitations on imports under Section 22 of the Act. In addition, the President by virtue of Section 204 of the Agricultural Act of 1956 could negotiate voluntary export quotas with foreign governments.

1979, as world supplies tightened in 1979 and prices rose, made the proposed legislation largely irrelevant and it failed to become law.

The recent history of sugar policy has demonstrated the increased resistance that proposals for agricultural protection can generate. Consumer groups are becoming an increasingly vocal and active lobby. The costs of extending protection to a relatively small number of agricultural producers are more visible and controversial, particularly in a period of persistent price inflation. Yet, there is little doubt that the U.S. sugar industry could be faced with significant adjustment costs should low-cost imports be allowed to enter the country for a sustained period of time. Recognition of such costs, and the need to provide mechanisms to facilitate economic adjustment, lies behind the development of adjustment assistance as an alternative to import protection.

1.3 Adjustment Assistance.

Even if the term "adjustment assistance" is restricted to cover only those public sector programs which facilitate domestic adjustment to import-competition, the range of potential programs is broad. It is useful therefore to have some method of classifying programs so that the objectives underlying their use are not obscured. Governmental efforts to facilitate internal adjustment to import-competition can be separated into two broad program categories according to the degree of intervention. A passive program is defined as one designed to compensate for income losses resulting from import-competition. An active program, in contrast, is one which facilitates resource transfer from import-sensitive (internationally uncompetitive) areas of employment to more viable (internationally competitive) alternatives.

Passive adjustment assistance programs are similar to other programs which are directed toward income maintenance. By compensating for the losses caused by import-competition, they seek to redistribute the gains from trade and indirectly reduce demands for protection. They are relatively short-run programs which enhance the success of implementing a liberal trade policy by creating a visible link between potential injury due to imports and redress for this injury. Active adjustment assistance programs, on the other hand, are similar to other programs that seek to directly promote changes in resource use, e.g., regional development programs. These are not, however, generally as effective in reducing demands for protection, as their benefits are not as visible to those injured by import-competition and tend to be spread over a longer period of time.

There is no theoretical reason why trade-related adjustment should be distinguished from that necessitated by other changing economic conditions. Most arguments for trade-related assistance apply equally well in the case of general assistance program. Basically, the symptoms--falling output, prices and profits, increasing inventories and

rising unemployment--are the same whether they are caused by changes in general economic conditions or are the direct result of an increase in imports.

Nevertheless, there are several practical reasons why a trade-related program may be more desirable than a general aid program. First, it allows aid to be targeted toward those groups with the greatest need. A recent survey, for example, found that trade displaced workers tended to have lower levels of education than other unemployed workers. This fact, and their age, made it harder for them to find new jobs and resulted in longer periods of unemployment (Neumann).

A second reason is that changes in imports are often sudden and unpredictable. If fluctuations in economic activity caused by changing trade patterns are large and difficult to forecast by the private sector, the potential benefits to society from increased productivity can be lost because of the influence of private costs and risks to workers in changing jobs, and to owners in shifting capital investment. Here, adjustment measures act as a government insurance scheme to encourage a more efficient allocation of resources in the face of risk and uncertainty.

Another plausible reason for granting assistance is to compensate those injured by a public policy decision. Past efforts to protect certain industries may have given improper market signals to firms and workers. Such signals lead workers toward inappropriate career decisions and induce investment in areas where returns are artificially high. Although the decision to compensate workers and owners of fixed capital depends ultimately on value judgments, it could be interpreted as a decision in the national interest. Trade adjustment assistance could be viewed as a compensatory payment which redistributes the gains from freer trade such that no one is made worse off. In the jargon of welfare economics, a potential pareto improvement is converted into a strict pareto improvement.

In the United States, an adjustment assistance program was first introduced in the Trade Expansion Act of 1962 (P.L. 87-794). Under this act, an industry, firm, or group of workers could petition for temporary protection (four years maximum) by citing serious injury due to increased imports resulting from trade concessions. If the Tariff Commission ruled in favor of the petitioner, the President could designate firms and workers within the industry eligible to apply for adjustment assistance. An alternative route was for firms and workers to bypass the import relief request and apply directly for adjustment assistance. Under the Act's provisions, workers could apply for trade readjustment allowances (supplemental unemployment insurance), retraining, and relocation allowances. For firms, there were three forms of financial assistance--a direct loan, a guaranteed loan, and tax deferral--and several types of technical assistance to help affected parties prepare an adjustment proposal.

Using the classification suggested above, the 1962 program contained both passive (income transfer) and active (resource reallocation) components. However, it also contained potentially protective elements. Firm assistance was primarily aimed at making U.S. firms more competitive with their overseas counterparts by subsidizing new capital investment. This intent is largely outside the theoretical rationale for adjustment assistance, either as a form of compensation or an inducement for the movement of resources into alternative productive activities.^{1/}

The results of the adjustment assistance program under the Trade Expansion Act were disappointing. Seven years passed before the assistance provision was first used. Prior to granting aid to employees at a mill producing butt-weld pipe and tubing in November 1969, the Tariff Commission had ruled negatively on six firm and six worker petitions. One of the reasons for the lag was that prior to 1969, tariff concessions granted by the United States under the Kennedy round of GATT negotiations had little impact. Furthermore, a buoyant economy reduced the need for adjustment assistance. Secretary Dillon testified in 1962 that payments were anticipated to be as high as \$70 million per year by 1967. No payments were actually made until 1970, and total payments at the program's expiration in 1975 had amounted to only \$85 million (Frank, pp. 45-46). Consequently, several original supporters of adjustment assistance--notably the AFL-CIO--changed their earlier position and opposed its continuation.

As the Tokyo Round of negotiations under the General Agreement on Tariffs and Trade approached, several bills were introduced into Congress which sought to revise and expand the adjustment assistance program. Although the Trade Reform bill introduced in early 1973 by the Nixon administration cut benefit levels sharply, Congress rejected these cuts in Title II of the 1974 Trade Act (P.L. 93-618) by increasing benefits, easing eligibility criteria, and adding a new program to assist communities.

As in the previous program, there are two routes by which a group of workers, a firm, or a community can apply for, and receive, adjustment assistance under Title II. One route is to petition the International Trade Commission for import relief (temporary protection) by citing serious injury or a threat thereof due to increased imports. The ITC, upon determination of the extent of injury, can either recommend import relief (duty or tariff, quantitative restriction, or orderly marketing agreement) or adjustment assistance when it conveys its decision to the President. If the President disagrees with the ITC recommendation, he can take alternative action, but such action can be subject to Congressional veto. A more direct route to obtain assistance is to submit a petition directly to the administrative

1/ Investment subsidies could be justified theoretically if capital markets are imperfect or on infant industry grounds. Neither seems particularly relevant to the U.S.

branch that certifies and delivers the benefits under Title II. Since a firm, or a group of workers, must re-petition for adjustment assistance regardless of whether the industry was certified for, or denied, import relief, this second route can minimize the administrative lag and hasten the delivery of benefits.

Another point relates to the eligibility criteria. Although the wording is slightly different for each group, each set of criteria focuses on establishing two facts: (i) injury (or threat thereof) and (ii) the extent to which the injury was due to increased imports. For example, if an industry is to be certified for import relief, the ITC must find that increased imports are a "substantial cause" of serious injury or threat of injury. The term "increased imports" is interpreted as either an increase in actual import levels or the volume of imports relative to domestic production. Injury, in turn, is demonstrated by significant idling of productive facilities, the inability of a significant number of firms to operate at reasonable profit, and a significant level of unemployment or underemployment in the industry. A threat of injury is signaled by a decline in sales, a higher and growing inventory, and a downward trend in production, profits, wages, or employment.^{1/}

Most of the benefits available under Title II are also provided under alternative programs in the areas of employment, manpower, and regional development. The distinguishing features of the former are the eligibility criteria and the level of benefits available per worker (firm). The basic reason for this duplication is to be able to distinguish non trade-related unemployment so that benefit delivery can be expedited for the former.

For the workers, there are several types of assistance:

- (a) a trade readjustment allowance (70% of weekly earnings for a period up to 52 weeks),
- (b) counseling, testing, and placement services,
- (c) on-the-job and vocational training,
- (d) job search allowance, and

1/ The criteria for receiving certification of eligibility to apply for community, firm, or worker assistance are similar to those for the industry. A major difference is that increased imports need only have "contributed importantly" to the injury. Thus the criteria for receiving assistance are seemingly less restrictive than those for import relief.

- (e) relocation allowances (80% of necessary expenses and a lump sum payment equivalent to three times the worker's average weekly wage, up to \$500).

For firms, there are two types of assistance--technical and financial. Technical assistance covers 75% of the costs of consultants to develop, prepare, and assist in implementing the firm's "economic adjustment proposal." Financial assistance includes both loans (\$1 million up to 25 year maturity) and loan guarantees (\$3 million up to 25 year maturity) for working capital, modernization, construction, and acquisition of land, plant, buildings, and machinery. For communities, the benefits include technical assistance, improvements in public works, and measures designed to attract new investments (Frank, p. 63).

2. FREER TRADE AND ECONOMIC ADJUSTMENT IN THE U.S. SUGAR INDUSTRY

In order to evaluate the potential applicability of the trade adjustment assistance program to the sugar industry, this section provides a numerical illustration of the impact of liberalizing U.S. sugar trade. Data for 1977 are employed to derive estimates of the impact of eliminating the tariff on imported raw sugar (1.875 cents per pound at that time) at primarily the producer and processor levels. The basic scenario is one in which removal of the tariff causes a fall in domestic farm and retail sugar prices, a reduction in domestic production, expansion of domestic use, and an increase in imports. A comparative static approach is used to derive estimates of economic impact. Instantaneous long-run adjustment to the fall in domestic price is assumed to occur. No allowance is made for the fact that the expansion of U.S. imports could increase world prices and reduce the size of the fall in domestic prices. Since the purpose of the estimates is to provide a vehicle for the evaluation the U.S. adjustment assistance program, these simplifying assumptions are not unreasonable. Better data and improved methods could be adopted but their added contribution in the current context would probably not outweigh their additional cost.

Estimates are derived for four sugarbeet producing regions and three sugarcane regions. The four beet regions--Region 1, an aggregate of the USDA-ASCS Red River Valley and Great Lakes regions; Region 2, the Great Plains; Region 3, the Northwest; and Region 4, the Southwest--conform to those used by Gemmill, whose supply elasticities are employed in the analysis. The states, which are represented under each of these regional aggregates, are similar both in average cost of production and in the geographic market they supply. Because the three sugarcane producing regions (Florida, Louisiana, and Hawaii) differ in terms of farm size, degree of mechanization in production and processing, and in costs of production, each is dealt with separately.

2.1 Effects at the Producer Level.

Table 2.1 contains information on 1977 production of sugar (raw value) in the seven regions and their respective shares of the total. Also listed are estimates of long-run elasticities of supply derived from the recent study by Gemmill. These range from a low of .76 in region 6 (Louisiana) to a high of 3.16 in regions 4 (Arizona, California) and 5 (Florida). Differences in the size of the elasticities reflect the degree to which substitute crops are significant in the regions.

In order to estimate the production effects of freer trade, the removal of the 1977 tariff was translated into a percentage reduction in the import price of raw sugar (16.9 percent). This percentage fall in price was multiplied by the price elasticity to derive an estimate of the associated percentage change in production and, by application to actual 1977 production, the estimated reduction in tonnage. In using this method, it is assumed that sugar prices in all regions would fall by the same percentage as the import price. The fall in production ranges from a low of 13 percent in region 6 to a high of 53 percent in region 5. Total production falls by 28 percent or 1.6 million tons. The production percentages were also applied to actual 1977 acreage to derive an estimate of the reduction in the land used to produce sugar. Over half a million acres is estimated to move out of the crop.

There are likely to be three principal farm-level effects of a reduction in sugar production: (1) a loss in farm income; (2) a reduction in the value of specialized sugar-producing farm machinery; and (3) a fall in the payments to, and employment of farm labor.

The losses incurred by producers as the result of the removal of a tariff have typically been estimated by computing the change in "producers' surplus"--the change in the area above the supply (marginal cost) curve as producer price falls (Corden). For a linear supply curve, this can be calculated from the following formula

$$PS = \frac{-2tQ_p P_f + 2t^2 Q_p - e_s t^2 Q_p}{2(P_f + t)} \quad (2.1)$$

where PS = change in producers' surplus
 t = tariff
 Q_p = quantity produced under protection
 P_f = free trade price
 e_s = elasticity of supply

Table 2.1 Production Effects of Tariff Removal, 1977.

Producing Regions	States Included	Actual Production ^{a/} 1977		Supply ^{b/} Elasticity	Estimated Production ^{c/}			Estimated Acreage Reduction ^{d/} '000
		'000 s. tons raw value	Percent of total		'000 s. tons raw value	Change '000 s. tons raw value	Percent Change	
<u>Beet Sugar</u>								
1	Michigan N. Dakota Ohio	1,220	21.0	.88	1,039	-181	-14.9	- 79
2	Colorado Montana Texas	664	11.5	.94	559	-105	-15.9	- 44
3	Idaho Utah	496	8.5	2.63	276	-220	-44.4	- 85
4	Arizona California	744	12.8	3.16	397	-347	-46.6	-108
Total Beet		3,124	53.8	1.71	2,271	-853	-27.3	-316
<u>Cane Sugar</u>								
5	Florida ^{e/}	982	16.9	3.16	458	-524	-53.4	-169
6	Louisiana	668	11.5	.76	582	- 86	-12.8	- 39
7	Hawaii	1,034	17.8	.89	878	-156	-15.0	- 15
Total Cane		2,684	46.2	1.69	1,418	-766	-28.5	-223
Grand Total		5,808	100.0	1.65	4,189	-1,619	-27.9	-539

^{a/} From USDA-ESCS/AMS/FAS.^{b/} Derived from Gemmill. Beet elasticities are from table 4.1. Cane elasticities are calculated from table 4.3 on the basis of a reduction in the raw sugar import price from 11.12 cents/lb. to 9.245 cents/lb.^{c/} Calculated by applying percentage reduction in raw sugar price (16.9%) to 1977 production, given the elasticity of supply.^{d/} Percentage reduction in production applied to acreage harvested from USDA-ESCS/AMS/FAS.^{e/} Also includes a small amount of cane produced in Texas.

Although constant elasticity functions were assumed in computing the change in production, the linear approximation (2.1) was applied to derive an estimate of the change in regional producers' surplus. Since the supply elasticities used were originally derived with respect to regional farm prices for beet and the NY import price for cane, these prices were also employed in deriving the surplus estimates (table 2.2). The total loss in surplus is estimated at roughly \$174 million. The largest loss of \$36 million (21 percent of the total) is in region 7 and the smallest, \$13 million (7 percent of the total), is in region 3.

Producers' surplus, despite widely acknowledged limitations, is a useful concept (Currie, Murphy and Schmitz). It provides a relatively simple way to estimate the reduction in returns to "fixed" factors of production as the result of a fall in the price of output. Different producers within a region will probably produce at different levels of marginal cost. As the result of the fall in output price, higher-cost producers will move out of sugar production and therefore experience an income loss. Lower-cost producers who remain in production will also experience a loss because the factors they employ will earn a reduced rate of return. Since the producers' surplus calculation captures both these effects (both marginal and intramarginal losses), it is a useful overall indicator of the impact of the price fall. However, in the current case it does suffer from a number of limitations.

First, it implies an assumption that regional producer aggregates are realizing a positive return on their "fixed" factors prior to the change in policy--an assumption that may not be justified in all cases. Second, it does not take into account the possible offsetting effects on producer welfare of the movement of displaced factors (particularly land) into alternative crops. Although separate calculations could be made of offsetting gains in producers' surplus from other products these would prove to be complex. Finally, the loss of producers' surplus captures the reduction in returns to all "fixed" factors, whereas adjustment assistance programs have typically been oriented to displaced factors. For these reasons, two additional indicators of income loss were derived on the basis of representative farm budget data (USDA- ESCS/AMS/FAS; Oklahoma State University).

The first is an estimate of the gross loss of farm income from acreage displaced from sugar production. It is computed by multiplying the regional return per acre from sugar production (difference between receipts and production expenditures excluding an imputed charge for land) given in table 2.3 by the number of acres displaced in each region (table 2.1). The second is an estimate of the net loss of farm income under the assumption that land displaced from sugar production moves into the next best alternative crop. Regional returns per acre in alternative crops (table 2.3) were used to compute the income gained by moving displaced sugar acreage into alternatives, and then subtracted from the gross loss figure to yield the net loss estimate.

Table 2.2 Effects of Tariff Removal on Farm Income, Value of Equipment and Payments to Labor.

Producing Regions	Income			Equipment Loss of Value	Labor	
	Loss of Producers' Surplus a/ Sugar Acreage	Gross Loss of Income From Displaced Sugar Acreage	Net Loss of Income With Diversion to Alternative Crops		Gross Reduction in Payments	Net Reduction With Diversion to Alternative Crops
-----Thousand Dollars-----						
1	31,602	9,216	3,290	12,324	5,678	4,855
2	22,252	4,576	1,584	10,868	5,001	4,400
3	13,456	3,655	3,096	22,270	10,622	9,961
4	20,260	13,068	2,808	11,556	16,434	14,494
5	27,014	18,083	10,058	27,547	19,195	16,648
6	23,445	0	0	6,357	5,071	4,474
7	35,866	4,080	4,080	2,445	1,561	1,561
Total	173,895	52,678	24,917	93,367	63,552	56,213

a/ Calculated by using average regional prices per ton of beet of 1: \$20.72; 2: \$26.9; 3: \$25.8; 4: \$26.3 obtained by weighting state average prices for 1977 (USDA-ESCS/CRB) by state production. Free trade prices were calculated by reducing these prices by 16.9%, the percentage reduction in the import price of raw sugar with tariff removal. For cane regions the pre-free trade price of \$222.4 per ton, actual import price NY duty paid (U.S. Congress, 1978), and a free trade price of \$184.9 per ton were used.

Other information used in the derivation of this table is contained in tables 2.1 and 2.3.

Table 2.3 Farm Income, Equipment Value and Labor Costs Per Acre.

Producing Regions	a/ Net Return Per Acre- Sugar Alternative Crops		b/ Value of Sugar- Equipment Per Acre		c/ Value of Labor Used- Sugar Alternative Crops	
	Sugar	Alternative Crops			Sugar	Alternative Crops
	Dollars					
1	126	75	156		72	10
2	104	68	247		114	14
3	43	13	262		125	8
4	121	95	107		153	18
5	107	75	163		114	15
6	NA ^{d/}	NA	163		130	15
7	272 ^{e/}	0 ^{f/}	163		104	0

NA = not applicable.

a/ For sugar net return per acre by state was derived by averaging 1975 and 1976 prices received per ton (USDA-ESCS/CRB), converting this to a per acre value using 1971-75 average yield, and subtracting the cost of producing an acre of sugar (USDA-ESCS/AMS/FAS). Regional figures were derived by weighting state figures by their share in 1977 acreage harvested. For alternative crops, net returns per acre were derived from 1976 farm budgets for representative sugar growing counties in each state (Oklahoma State University). Regional figures were derived by weighting state figures by their share in 1977 sugar acreage harvested. The alternative crops assumed were: soybeans--Minnesota, Ohio, Louisiana; soybeans (irrigated)--Nebraska; corn for grain--North Dakota, Michigan, Colorado; winter wheat (irrigated)--Kansas, Texas, California; barley--Montana, Idaho, Oregon, Utah, Washington; and barley (irrigated)--Arizona.

b/ Calculated by dividing regional interest charge on machinery (USDA-ESCS/AMS/FAS) by 0.08. Original data were derived by multiplying the average interest rate for equipment loans in each state by the remaining value of machinery. Since these interest rates were not specified, the rate of 8% was used to capitalize machinery payments.

c/ Sugar data from USDA-ESCS/AMS/FAS, alternative crops from Oklahoma State University.

d/ Figure for 1976 unavailable but 1975 net return given as -\$5 per acre. A zero net return was assumed.

e/ Figure for 1976 unavailable. 1975 net return was \$621 per acre. The ratio of average net return in Florida/Texas to the 1975 value used to estimate Hawaiian value.

f/ No alternative assumed.

These estimates indicate a gross loss in income under 1977 conditions of \$53 million, or 30 percent of the loss of producers' surplus. Because available data indicate that Louisiana (region 6) had a negative net return to sugar production on the average in 1977 its loss was set at zero. The net loss calculation yields an aggregate estimate of \$25 million; less than half the gross loss figure.

When acreage is diverted from beet or cane production, specialized farm equipment used in the planting and harvesting of these crops is displaced. In order to evaluate the costs of this displacement, regional estimates of the value of farm equipment used in the production of an acre of sugar were derived (table 2.3). It was assumed that machinery would have negligible resale value if displaced. The per acre value of existing equipment used in sugar production multiplied by the number of acres displaced was adopted as an estimate of the loss of its value (table 2.2).^{1/}

Changes in sugar production also affect the use of farm labor. Using the same farm budget data employed to derive gross and net farm income losses (USDA-ESCS/AMS/FAS; Oklahoma State University), the value of labor used to produce an acre of sugar or alternative crops (table 2.3) was combined with the reduction in acreage (table 2.1) to derive estimates of both gross and net reductions in payments to farm labor. The gross reduction was estimated at roughly \$64 million and the net reduction at \$56 million. Insufficient data were available to estimate the number of workers that would be displaced as the result of these adjustments. As discussed below in section 3, detailed estimates of labor displacement at the farm level are not required to evaluate the applicability of the current adjustment assistance program to those displaced.

2.2 Effects at the Processor Level.

The reduction in sugar production resulting from freer trade could be expected to lead to the closure of sugarbeet processing plants and sugarcane mills. This would create a loss of employment, profits, and the value of capital assets represented by the beet and cane factories. Cane refineries, unlike cane mills, would not be affected negatively

1/ It may be noted that the net loss of farm income plus the loss in equipment value exceeds the producers' surplus estimate in some regions. These measures are not directly comparable and should be considered as alternative (although complementary) measures of adjustment costs. It should also be noted that no estimates of possible losses in land value are made. In most cases sugar land is not so specialized that its value would be substantially reduced if used for other crops. However, some reduction in land values could occur.

and in fact would probably benefit from an increase in imports, since this would create an expansion in the demand for cane refining capacity. No estimates are made of these benefits; attention is focused on the costs imposed on beet processors and cane millers.

In order to estimate the loss of processor profits, the average profit rate in sugar processing in the U.S. for 1977 given by Citibank was combined with an estimate of per unit processing costs (USDA-ERS) to derive an estimate of processor profit per ton. The reduction in regional production multiplied by the rate of profit yields an estimate of regional profit losses. As table 2.4 indicates, total losses amount to roughly \$30 million. The profit estimates were then used to estimate the loss in the value of assets resulting from plant closure. Profits (the return to fixed assets) were capitalized using the rate of return on all assets employed in U.S. manufacturing in 1977 given by Citibank.^{1/} Using this procedure the estimated loss of asset value is roughly \$200 million.

The impact of freer trade upon labor employed in sugar processing is difficult to estimate. A study by the U.S. Department of Labor provides some data on the characteristics of the labor force which provide a starting point. Two useful pieces of information were available--the total number of workers employed in beet processing (all U.S.) and in cane milling (by region), and the proportion of workers employed by length of employment in each of these aggregates. These are contained in sections B and C of table 2.5. Using these data a profile of employment characteristics was constructed.

First, assumptions were made about the total number of hours worked by an individual in each length of employment class (table 2.5A). On the basis of a standard 40 hour work week, it was assumed that a worker employed for less than 3 months would work 13 weeks (520 hours); one employed 3-6 months would work 26 weeks (1,040 hours); 6-10 months--39 weeks (1,560 hours); and over 10 months--48 weeks (1,920 hours). These end-point assumptions on length of employment were used in preference to mid-points because Department of Labor survey information on total hours worked suggest that the choice of mid-points would result in estimates that would be too low.

Second, information on the proportion of workers by length of employment (table 2.5B) was combined with that on the total number of workers by region (final column of C in table 2.5) to derive an estimate of the number of workers by region in each employment class

1/ This approach parallels that used in section 2.1 to estimate the value of specialized farm machinery displaced from sugar production.

Table 2.4 Effects of Tariff Removal on the Processing Sector.

Producing Regions	Capital		Labor		
	Loss of Profit a/	Value of Assets b/	Estimated 1977 Employment c/	Estimated 1977 Wages Paid d/	Reduction in Hours Worked e/
	'000 \$	'000 \$	Persons	'000 \$	Persons
1	3,334	22,227	7,663	56,554	2,316
2	1,934	12,893	4,171	30,783	1,309
3	4,052	27,013	3,116	22,994	1,973
4	6,392	42,613	4,674	34,502	3,043
5	9,652	64,347	2,449	19,304	1,656
6	1,584	10,560	1,923	12,468	513
7	2,874	19,160	3,027	32,476	619
Total	29,822	198,813	27,023	209,083	11,429
					56,476

a/ Profit rate in sugar processing of 11.4% from Citibank applied to total processing cost of 9c/lb. from USDA-ERS to give estimated profit of \$18.42/ton.

b/ Calculated as capitalized value of estimated 1977 profits at 15% interest rate, the rate of return in all manufacturing in 1977 (Citibank).

c/ From table 2.5.

d/ Hours worked from table 2.4 multiplied by wage rate of \$5.96/hr. This is an estimate of the 1977 rate paid in beet sugar processing derived from U.S. Dept. of Labor. Average percentage increase in hourly wage from 1975 to 1976 applied to 1976 data to estimate 1977 level. Cane sugar processing wage rate unavailable.

e/ Derived from multiplying reduction in 1977 sugar output in table 2.1 by labor-output ratios of 7.8 for regions 1-4, 3.3 for region 5, 3.1 for region 6, and 5.3 for region 7. Labor-output ratios were obtained by dividing regional hours worked from D in table 2.5 by total regional sugar output in table 2.1.

f/ Derived by distributing reduction in hours worked across the labor force using D and C in table 2.5.

g/ Reduction in hours worked x wage rate of \$5.96/hour.

Table 2.5 Characteristics of Processing Employment.

Item	Producing Regions	Length of Employment (Months)				Total
		< 3	3-6	6-10	> 10	
A. Hours Worked Per Worker ^{a/}	All	520	1,040	1,560	1,920	NA
B. Proportion of Workers by Employment Group (Percent) ^{b/}	1-4	25	34	9	32	100
	5	7	53	9	31	100
	6	54	7	4	35	100
	7	6	2	5	87	100
C. Estimated Number of Workers ^{c/}	1	1,916	2,605	690	2,452	7,663
	2	1,043	1,418	375	1,335	4,171
	3	779	1,059	281	997	3,116
	4	1,168	1,589	421	1,496	4,674
	5	172	1,298	220	759	2,449
	6	1,038	135	77	673	1,923
	7	182	61	151	2,633	3,027
	Total	6,298	8,165	2,215	10,345	27,023
D. Estimated Hours Worked (Thousands) ^{d/}	1	996	2,709	1,976	4,708	9,489
	2	542	1,475	585	2,563	5,165
	3	405	1,101	438	1,914	3,858
	4	605	1,653	657	2,872	5,789
	5	89	1,350	343	1,457	3,239
	6	540	140	120	1,292	2,092
	7	95	63	236	5,055	5,449
	Total	3,274	8,491	3,455	19,861	35,081

NA = not applicable.

^{a/} Calculated using 40 hour work-week and duration of employment by class of 13, 26, 39, and 48 weeks respectively.^{b/} U.S. Department of Labor, for cane regions-growers and millers combined.^{c/} Derived by applying proportions given in B above to totals. Totals are based on data for 1974-76. For regions (1-4), 6 and 7 estimated 1977 employment derived by applying calculated average rate of increase/decrease during 1974-76 to 1976 figure. For region 5 estimate is the average for 1974-76. Individual totals for beet regions derived on the basis of their proportionate share in 1977 production.^{d/} Derived from A and C.

(remainder of C in table 2.5). Since data for the separate beet regions were unavailable, employment in each region was assumed to reflect their share of total 1977 raw sugar production.

Finally, information on the hours worked per worker in each employment class (table 2.5A) was combined with the estimated number of workers (2.5C) to derive an estimate of total hours worked and their distribution by employment class (2.5D).

The estimates of employment by region are given in table 2.4. Total processing employment is roughly 27,000 persons. Using an average wage rate derived from the U.S. Department of Labor and hours worked, the estimate of total wages paid is \$210 million.

To calculate the likely reduction in processing employment as the result of tariff removal, the data on regional employment in table 2.4 were combined with those on production in table 2.1 to derive regional labor-output ratios. The calculated reduction in production under freer trade given in table 2.1 was then converted to an estimate of the reduction in hours worked. To transform this information into an estimate of the number of individuals displaced, the reduction of hours worked was distributed across the employment classes in section D of table 2.5 by assuming that employees having the shortest duration of employment would be the first to be laid-off.^{1/} For example, in region 1 production under freer trade declines by 181 thousand tons. With a labor-output ratio of 7.8 hours per ton this means a reduction in hours worked of 1,412 thousand hours. This would imply that all 1,916 workers employed for less than three months, working a total of 996 thousand hours, would be displaced. The remaining 416 thousand hour reduction would imply a loss of a further 400 jobs in the 3-6 month employment group (416 divided by the 1.04 thousand hours worked per employee in this group). The total calculated displacement for region 1 is therefore 2,316 employees.

On the basis of this procedure, estimated total displacement is roughly 11,500 persons. The greatest loss occurs in region 4 (27 percent of the total) and the smallest in region 6 (just over 4 percent of the total). Table 2.4 gives an estimated reduction of wages paid of roughly \$56 million.

1/ This is a simplistic assumption which may not be fully appropriate. Plant closings are likely to be "lumpy", with the reduction in output implying that some plants are forced to close while others continue to produce close to capacity. In this case, a smaller number of workers would be displaced than calculated by the method adopted. If better data were available on plant characteristics such as age, capacity, and costs, a more sophisticated estimate of displacement could be made.

2.3 Other Effects.

The reduction in the sugar tariff would have a number of other effects, of which the two most important are a reduction in government revenue and the lowering of consumer prices. The loss of tariff revenue is estimated by multiplying the rate per ton (\$37.50) by 1977 imports (6.138 million tons) and totals roughly \$230 million. The gain to consumers from lower prices can be estimated by computing the change in consumers' surplus from the price reduction.^{1/} For a linear demand curve this is given by

$$CS = \frac{2tQ_c P_f + 2t^2 Q_c - e_d t^2 Q_d}{2(P_f + t)} \quad (2.2)$$

where CS = change in consumer's surplus
 t = tariff
 Q_c = quantity consumed under protection
 P_f = free trade price
 e_d = elasticity of demand

The linear approximation was used with a price elasticity of demand for refined sugar of -.24 from George and King and a retail price of sugar of \$432.4 per ton from U.S. Congress (1979) to derive an estimated gain to consumers from removal of the \$37.5 per ton tariff of roughly \$458 million.^{2/} Subtracting the loss of producers' surplus (\$174 million) and tariff revenue (\$230 million) from this value gives an estimate of the "net welfare gain" from liberalization of \$54 million.

3. ADJUSTMENT ASSISTANCE AND THE SUGAR INDUSTRY

The previous section demonstrated that significant losses could be generated from trade liberalization at both the farm and processing levels of the sugar industry. The current section evaluates the extent

1/ Simply multiplying the change in price (tariff reduction) by 1977 total consumption would give a relatively good estimate of the consumer gain from tariff removal.

2/ It is assumed that the entire reduction in the wholesale price of \$37.5 per ton would be passed on to consumers.

to which the adjustment assistance provisions in Title II of the 1974 Trade Act could be used to offset these losses and facilitate industry adjustment. It also assesses the limitations of the current program for sugar and other agricultural industries, and outlines the basic features of an adjustment assistance program for agriculture.

3.1 Application of the Title II Program to Sugar.

As indicated in section 1.3, the Title II program provides for assistance to both firms and workers. Technically, a sugar farmer could apply for firm assistance under the Title II program. However, because such farmers generally have the ability to shift to alternative crops they would probably not pass the injury test (section 1.3), and therefore would be ineligible to receive the low interest loans and grants provided under the program. Moreover, the intent of the firm assistance program is not to compensate for economic loss but to improve firm efficiency by upgrading plant and equipment, and improve profitability by promoting diversification. Income losses and decline in the value of specialized farm equipment identified as the major effects of liberalization in section 2.1, would not be dealt with under Title II. Similarly, the economic losses incurred by processors (profits and value of assets) would also fail to be compensated. Although sugar processors might conceivably pass the injury test since their plant has few alternative uses, the ability to obtain loans for upgrading plant and equipment would be of little relevance if the supply of their raw material (beet or cane) is eliminated because farmers choose not to produce sugar.

Despite the fact that the Title II program would not compensate for farmer and processor losses, it could still provide some assistance to farm and processor labor. In theory there is no legislative distinction between this labor and other industrial workers. However, eligibility criteria would limit the extent to which these groups could gain access to the program's benefits. First, because the program excludes workers who have not been employed for a least 26 weeks prior to losing their jobs, seasonal labor would not be eligible to receive benefits under the program. A recent report (U.S. Congress, 1978) estimates that roughly 75 percent of the 53 thousand workers involved in U.S. sugar production (excluding Puerto Rico) in 1977 was seasonally employed. Second, in some areas a substantial proportion of the total workforce is foreign. In Florida, for example, 86 percent of the 10 thousand seasonal workers in 1977 were from outside the U.S. Third, some of the labor displaced is likely to be operator and family labor. It is difficult to see how these could be compensated under Title II.

Some of the sugar production workforce would probably be able to establish eligibility, most notably in Hawaii. Because of the favorable climate these workers are employed year-round. Furthermore, they possess the advantage (in terms of gaining access to the program) of

being unionized. Of the 4,550 production workers employed in the Hawaiian sugar industry in 1977 (U.S. Congress, 1978), the 15 percent reduction in production under free trade (table 2.1) would imply the elimination of approximately 675 jobs (calculated by multiplying the 1977 labor-output ratio by the fall in production). All these workers would be eligible for supplement unemployment payments equal to 70 percent of their annual wage for a maximum period of 52 weeks. Assuming an average wage rate of \$6 per hour and a 40 hour workweek this would imply payments of roughly \$8.4 million (\$12,400 per worker).^{1/}

To some extent, labor employed in sugar processing would be affected by the same seasonal labor exclusion that would limit access by production labor to Title II assistance. On the basis of the results derived in section 2.2, an estimate of the number of workers eligible for supplemental unemployment compensation can be derived. In table 2.5 a profile of processing employment was presented. This information was used to estimate the number of workers displaced by trade liberalization. In table 3.1 the number of displaced workers who were estimated to be employed for more than 26 weeks, and therefore who would be eligible for assistance is given. Total costs of fully compensating these workers for both the hours they would actually have been employed in 1977 and at 70 percent of their weekly wages for the 52 week maximum under Title II is presented, as is parallel information for all displaced workers.

As table 3.1 demonstrates, because of the seasonal employment rule (less than 26 weeks) the coverage under Title II would be limited. Of the total of over 11 thousand workers displaced, less than one thousand would be eligible for assistance. In three regions (1, 2 and 6) no workers would receive compensation. Because of the higher proportion of full-time workers in Hawaii (region 7) displaced labor in this area fares much better than in other areas--60 percent of those displaced would be eligible for compensation.

Payments to workers under Title II would amount to a maximum of \$8.5 million. This represents only about 15 percent of the total loss in wages of \$57 million. Under the 52 week maximum, eligible workers would receive payment equal to 87 percent of their loss in wages. If all displaced workers were to be compensated at the 52 week rate, the total cost would be almost \$100 million and would be roughly 75 percent higher than the actual loss of wages.

1/ U.S. Dept. of Labor gives a wage rate for Hawaiian field workers in 1973 of \$4.09 per hour, plus \$1.56 in fringes. The \$6 rate assumed is probably conservative.

Table 3.1 Labor Displacement in Sugar Processing and Adjustment Assistance Payments.

Region	Number of Workers		Eligible ^{b/}	Payments to Eligible Workers		Costs of Compensating All Displaced	
	1977 Estimated ^{a/}	Displaced ^{a/}		Actual c/ Wages Lost	Maximum of 52 Weeks d/	Actual c/ Wages Lost	Maximum of 52 Weeks d/
----- '000 \$ -----							
1	7,663	2,316	0	0	0	8,416	20,098
2	4,171	1,309	0	0	0	4,881	11,360
3	3,116	1,973	135	1,256	1,172	10,227	17,121
4	4,674	3,043	286	2,659	2,482	16,134	26,407
5	2,449	1,656	186	1,730	1,614	10,304	14,371
6	1,923	513	0	0	0	1,591	4,452
7	3,027	619	376	4,193	3,263	5,137	5,372
Totals	27,023	11,429	983	9,838	8,531	56,690	99,181

^{a/} From table 2.4.^{b/} Those displaced who were employed for over 26 weeks during 1977.^{c/} Actual hours of employment lost x \$5.96.^{d/} Title II compensation, 70% of weekly wage for 52 weeks.

3.2 Assessment of the Program and Suggested Modifications.

Changes in the eligibility criteria and increasing awareness of the adjustment assistance program have resulted in substantial increases in Title II expenditures relative to those under the previous Trade Expansion Act (TEA) program. During the first two years of its operation (1975-77) expenditures were more than twice as great (\$220 million) as under the entire twelve years of the TEA (\$85 million). These benefits have taken the form of supplemental unemployment compensation (trade readjustment allowances) to displaced workers, a high proportion have gone to a few states e.g., Michigan, Ohio, and Pennsylvania, and to a limited number of industries, mainly automobiles, apparel, steel, electronics, and footwear (U.S. Congress, 1977).

Although several agricultural industries, including sugar, have applied for adjustment assistance in the last few years, agricultural expenditures have been limited. As indicated above, there are several important limitations in using Title II in agriculture. First, the program is not designed to compensate fully for the major economic losses that result from increased import competition. Its primary role has been to provide supplemental unemployment compensation to workers. If a major justification for providing adjustment assistance is to promote adjustment at all levels, compensation should be provided for losses in farm income, in the value of capital equipment, and possibly land.

A second problem with the Title II program is that it was essentially designed for nonagricultural industries such as textiles, electronics, steel, and shoes. These industries tend to be concentrated geographically and employ workers throughout the year. In contrast, most agricultural industries are widely dispersed and are a major source of seasonal employment in rural areas.

These problems do not imply that adjustment assistance could not play an expanded role in dealing with agricultural import competition. However, special provisions would be needed that would recognize the unique characteristics of the sector. These provisions could be introduced as part of specific agricultural program legislation (e.g., a future Food and Agriculture Act).

A specifically agricultural adjustment assistance program would need to be small-firm oriented and designed to compensate for loss of income and asset value resulting from expanded import competition. A "passive" approach, employing lump-sum payments to offset losses, would seem to be the basic principle upon which specific legislative provisions could be developed. Similar provisions could be devised to compensate for profit or asset value losses in agro-industries (e.g., sugar processing). However, whether the degree of support (and possibly need) for such compensation would be as strong as at the farm level is not clear.

In terms of agricultural labor, the program would have to account for the seasonality of employment and the importance of operator and family labor. The 26 week eligibility rule of Title II would have to be relaxed and compensation criteria linked to habitual seasonal employment patterns. The retraining and relocation elements of Title II worker assistance could play a role, particularly in the case where hired or contract labor is dominant.

4. CONCLUSIONS

Adjustment costs and economic losses that might occur if import restrictions or tariffs on sugar were eliminated have been estimated. While current adjustment assistance provisions under Title II of the 1974 Trade Act could provide some compensation for these losses, the degree of coverage is likely to be small. Labor would be eligible for trade readjustment allowances (supplemental unemployment insurance) if employed for more than 26 weeks prior to being displaced. Since most sugar production and processing labor is seasonally employed (i.e., for less than 26 weeks) only a small proportion of the workers likely to be displaced would be eligible for compensation. Sizeable losses in income (profit) and asset value at both farm and processor levels would not be covered under existing legislation.

If the use of adjustment assistance as a means of compensating for trade-induced financial loss and thus a device to facilitate resource reallocation is accepted in principle, a program which would compensate the major affected groups in the sugar industry (or indeed in other agricultural industries) could be devised. Such a program would deal with income and asset value losses as well as seasonal nature of agricultural employment. Lump-sum compensation provided through the program would in the long run be cheaper than sustained import protection through tariffs or quotas, and the alternative of income support through deficiency payments.

Perhaps the principal stumbling-block to this type of program, particularly in the case of sugar, is not legislative complexity or the potential opposition of special interest groups, but the fundamental instability in the sugar market. The adjustment assistance concept is predicated on an assumption that a domestic industry that is currently uncompetitive is likely to be so, if not indefinitely, for a considerable period of time. Persistent supply and price instability in the world sugar market in recent years implies that such an assumption is not realistic. A necessary condition for the use of adjustment assistance in the sugar industry may be the functioning of an effective stabilizing mechanism (e.g., a domestic or international stock) to guarantee some stability in the terms of trade, under which long-term decisions can be made. Other agricultural industries, for example, dairy, which do not suffer from the same degree of price instability, may in fact be more suited to an adjustment assistance program as an alternative to import protection.

REFERENCES

- Bale, M., Adjustment in Agriculture and the Trade Act of 1974.
USDA-ESCS. Foreign Agricultural Economic Report #147, Washington,
D. C., 1978.
- Citibank, "Profits '77 -- Sales were the Spur," Monthly Economic
Letter. New York, April 1978.
- Corden, W. M., Trade Policies and Economic Welfare. Clarendon, Press,
Oxford, 1974.
- Currie, J. M., J. A. Murphy and A. Schmitz, "The Concept of Economic
Surplus and Its Use in Economic Analysis," Economic Journal.
81(1971): 741-799.
- Frank, C. R., Jr., Foreign Trade and Domestic Aid. The Brookings
Institution, Washington, D. C., 1977.
- Gemmill, G., The World Sugar Economy: An Econometric Analysis of
Production and Policies: Agricultural Economics Report #313,
Department of Agricultural Economics, Michigan State University,
East Lansing, Michigan, 1976.
- George, P. S. and G. A. King., Consumer Demand for Food Commodities in
the United States with Projections for 1980. University of
California, Giannini Foundation, Monograph #26, 1971.
- International Bank for Reconstruction and Development, Commodity Trade
and Price Trends. Report # EC-166/79, Washington, D. C., 1979.
- Johnson, D. G., The Sugar Program: Large Costs and Small Benefits.
American Enterprise Institute, Washington, D. C., 1974.
- Neumann, G. R., "The Direct Labor Market Effects of the Trade
Adjustment Program: The Evidence from TAA Survey," paper presented
at the Bureau of International Labor Affairs Conference on the
Impact of International Trade and Investment on Employment,
Washington, D. C., December 2-3, 1976.
- Oklahoma State University, Firm Enterprise Data System Budgets.
Stillwater, Oklahoma, Annual.
- United Beet Sugar Association, American Beet Sugar Companies,
1975-76--Directory. Washington, D. C., 1976.
- United States Congress, Subcommittee on Trade of the Committee of Ways
and Means, House of Representatives. Background Material on the
Trade Adjustment Assistance Program Under Title II of the Trade
Act of 1974. U.S. Government Printing Office, Washington, D. C.,
1977.

_____, Data and Materials Relating to the
International Sugar Agreement and Sugar Legislation, 1978. U.S.
Government Printing Office, Washington, D. C., 1978.

_____, Questions and Answers on the International
Sugar Agreement and Sugar Legislation, 1979 Edition. U.S.
Government Printing Office, Washington, D. C., 1979.

United States Department of Agriculture, Economic Research Service, The
Sugar Industry's Structure, Pricing and Performance. Agricultural
Economic Report #364, Washington, D. C., 1977.

_____, Economics, Statistics and Cooperatives Service,
U.S. Foreign Agricultural Trade Statistical Report, Calendar Year.
Washington, D. C. Various issues.

_____, _____, Agricultural Marketing
Service, Foreign Agricultural Service, Sugar and Sweetener Report.
Washington, D. C. Various issues.

_____, _____, Crop Reporting Board, Crop
Values. Washington, D. C. Various issues.

United States Department of Labor, Sugar: Public Version of Report to
the President, Investigation # TA-224-16. Washington, D. C.,
1977.