POLICY DETERMINATION IN AGRICULTURE:
ARE DIFFERENT WELFARE WEIGHTS NEEDED?

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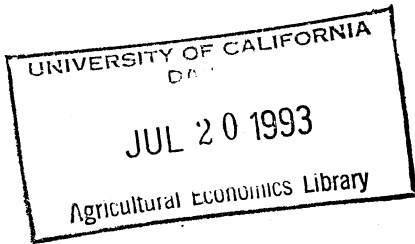
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ABSTRACT

Policies imposing net costs on society are commonly modeled as resulting from a weighted policy preference function representing the disproportionate influence of special interests. Recent U.S. sweetener policy demonstrates that equal weights are not necessarily inconsistent with such policies, due to varying regional effects and the institutional details of policymaking.

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I. INTRODUCTION

The conclusion of most analyses of political policymaking is that the adoption of net cost policies is the result of the disproportionate influence of special interest groups in the policymaking process. As Stigler claimed, an industry may "acquire" government regulation that is "designed and operated primarily for [the industry's] benefit" (p. 3). The relative influence wielded by the various groups comprising the country's political economy is often represented by a weighted social welfare or policy preference function. For example, Rausser and Freebairn concluded that the imposition of quotas on imported beef revealed a policy preference function that gave greater weight to the welfare of beef producers than to consumers.

We present a case study of recent U.S. sugar policy suggesting that a one-to-one weighting of the welfare levels of various interest groups is not necessarily inconsistent with the adoption of policies resulting in net social costs. We illustrate this hypothesis by demonstrating how varying regional effects combined with regional representation and the structure and process of Congressional policymaking may explain the adoption of a net cost policy. House and Senate voting records on eight pieces of sugar and sweetener legislation proposed over the past decade are compared with each state's economic gain or loss from the sugar program and are shown to be supportive of our hypothesis and consistent with the regional effects of the sugar program.

II. REGIONAL EFFECTS OF U.S. SUGAR AND SWEETENER POLICY

The sugar program is arguably the most criticized of all U.S. farm programs. Criticism has focused on the alleged high net domestic social cost of the program which, by imposing quotas on imports of sugar and sugar-containing products, provides benefits to sweetener industries at the expense of consumers. Using a variety of assumptions about the quota price premium, the elasticity of the world excess supply curve, and the substitutability of sugar and high fructose corn syrup (HFCS), Leu et. al. estimated that the U.S. sugar program cost consumers between $372 million and $4 billion in 1983. Their estimates of the net societal cost varied considerably, between $203 million and $3.1 billion, depending upon the assumed world sugar price.

Most analyses of the effects of U.S. sugar quotas have focused on the United States in aggregate. These studies, including that of Leu et. al., use a model similar to that shown in Figure 1, where the U.S. is depicted as a net sugar importer. Under a free-trade regime at a world sweetener price of P^*, U.S. consumers demand an amount Q_c^* of sweeteners, domestic producers provide an amount Q_p^*, and $Q_c^* - Q_p^*$ is imported. A policy that supports a domestic price of $P^T > P^*$ causes a loss of consumer surplus equal to areas $a+b+c+d$, while producer surplus is increased by area a. There is a net welfare loss of $b+c+d$ to the U.S. as a whole, as sugar quota rents c go to foreign sugar exporters.[1]

It is in explaining the adoption of such net cost policies that differentially weighted social welfare or policy preference functions are offered. However, analysis of the effects of the sugar program on a region-by-region rather than an aggregate basis suggests another reason why support has generally been available for U.S. sugar legislation. The effect on the economies of net sweetener exporting regions can

be analyzed with the aid of the model shown in Figure 2. Here, the implementation of a support price increases producer surplus by areas $e+f$; this is larger than the loss in consumer surplus of area e. Consequently, the model shown in Figure 1 does not apply to major sugar and sweetener producing regions, and legislators representing net exporting regions may be hypothesized to back sugar support legislation.

In summary, if a commodity program causes a net loss to the United States as a whole, it does not necessarily follow that each region in the United States experiences a net loss. Because most Congressional representatives and senators support economic policies perceived to be beneficial to their constituencies, we hypothesize that in a region where the loss to consumers from sugar quotas is less than the gain to producers and processors, a sugar program will generally have regional political support. Since policy is determined by a simple majority in each house of Congress (excepting the presidential veto), it is possible for a net cost policy to be adopted if the representation from benefitting regions is numerically superior to that of regions suffering a net loss. Note that such action may be explained without reference to disproportionate levels of special interest group influence or a weighted social welfare function.

III. THE POLICY-MAKING PROCESS

This section reviews some of the institutional details of sugar policy determination. These details are important because they tend to facilitate additional support for individual commodity support legislation.

Proposed sugar and sweetener legislation is developed by a coalition of advocates representing sugar beet and sugarcane growers, refiners of domestic beet and cane sugar, corn sweetener refiners, and, for the recent 1990 legislation, refiners of imported cane sugar. The proposed legislation that emerges from this coalition is

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introduced to the appropriate subcommittees of the House Committee on Agriculture and the Senate Committee on Agriculture, Nutrition, and Forestry.

It is in the subcommittees that proposed legislation effectively becomes policy, as subcommittee members and their staffs make crucial revisions. Producers, of course, find it desirable to have representatives sympathetic to their objectives on the appropriate subcommittees; indeed, the Senate Subcommittee on Agricultural Production and Stabilization of Prices is dominated by senators from leading agricultural states, and in the House, the Rice, Cotton, and Sugar Subcommittee (RCSS) is dominated by representatives from states producing those commodities.[2] Grouping several commodities in each subcommittee ensures that legislation supporting one commodity receives at least tacit approval from representatives of areas where other commodities are produced. Adoption of sugar policy by the House RCSS, for example, requires support not only from legislators representing sugar and sweetener constituencies, but also from those representing rice and cotton production areas.

Following subcommittee hearings, the bill is redrafted, approved, and forwarded to the respective House or Senate Agriculture Committee. The Agriculture Committees may make further minor amendments to proposed commodity-specific legislation before including it in the comprehensive farm bill, which is then forwarded to the House or Senate floor.

During floor debate on proposed farm legislation, a specific commodity program occasionally meets significant resistance and is singled out for a floor vote on an amendment intended to weaken or eliminate the commodity's support levels. The sugar program has been the subject of a floor vote eight times over the past ten years. In the following section, we examine these votes to illustrate that a socially

detrimental policy may nevertheless be adopted as a result of differential regional effects and Congressional voting rules.

IV. EVIDENCE FROM VOTING RECORDS

Natural sweeteners are produced from one of 3 crops: sugarcane, sugar beets, and corn (used in the refining of HFCS). The geographical dispersion of the growing and processing areas of these crops provides a strong foundation of support for sweetener legislation (Figure 3).

Eighteen states are estimated to be net exporters of sweeteners: 3 of the 4 sugarcane producing states (Hawaii, Florida, and Louisiana), 6 of 13 sugar beet producing states (Idaho, Montana, Wyoming, Nebraska, North Dakota, and Minnesota), and at least 6 states based upon their corn production (Illinois, Indiana, Iowa, Kansas, South Dakota, and Wisconsin.).[3] In addition, 3 states are estimated to be net exporters based upon some combination of producing and/or refining more than one sweetener (California, Colorado, and Michigan).[4]

To the support for the sugar program expected from the 18 states estimated to be net exporters of sweeteners must be added the support expected to result from the institutional structure of Congress and the procedural details of policy formulation and adoption. As suggested above, the organization of House Agriculture Committee subcommittees along commodity lines facilitates logrolling and widens the base of support for each commodity program administered by a given subcommittee. In the case of sugar, we hypothesize that support for sugar legislation will be forthcoming from Arkansas, Mississippi, and Texas, based upon their production of rice and cotton (and also sugar in the case of Texas). Furthermore, mixed support is expected from states where sweetener production or refining is important to local economies: Missouri, Ohio, North Carolina, and Tennessee. In the Senate, equal representation

by state results in a disproportionate over-representation of agricultural regions relative to urban areas. One would expect senators from states with large agricultural interests to support agricultural legislation. Specifically, we hypothesize additional support to come from senators representing Texas, Washington, Alabama, Mississippi, Oklahoma, Oregon, Arkansas, Kentucky, Vermont, New Mexico, North Carolina, and Missouri, 12 of the 24 states in which gross farm income exceeds 5% of total personal incomes (the other 12 were estimated to be net exporters of sweeteners).

Table 1 summarizes 8 Congressional votes on amendments to sugar legislation recorded between September 1981 and July 1990, 5 occurring in the Senate and 3 in the House of Representatives.[5] Support by legislators representing sugar-producing states was particularly strong. In all five Senate ballots, a total of 2 votes were cast against legislation favorable to sugar by senators from sugar-producing states. In the House, each sugar program vote received support from more than 75% of sugar-state Representatives.

Support from corn sweetener states was not as strong, but it did increase over time, behavior which is consistent with the dramatic increase in the consumption of corn sweeteners over the period. The weak support of sugar legislation by the corn producing states on the earlier votes may be because these states then incurred a short-run net social loss from higher sugar prices, or it may be that the subsequent net gains were not foreseen.

In the House, support from rice and cotton producing areas was strong. As hypothesized, there was mixed support from representatives of states where the sweetener industry is important to local economies. Finally, senators from agricultural states were generally supportive of sugar legislation.

To test the hypothesized relationships regarding legislators' support or opposition to the program, chi-square statistics are presented in Table 1. Seven of the 8 votes are significant at the 1% level, with the eighth being significant at the 2.5% level. This implies a strong association between voting behavior and the impact of sweetener legislation on regional economies.

V. CONCLUSION

Legislative action over the past ten years on proposed sugar policy shows a strong correlation with the regional effects of the sugar program. High sugar support prices provide a net benefit to regions that are net exporters of sweeteners. Congressional backing from these states for sugar support legislation has been quite strong. Analysis of voting records also reveals evidence that additional support for the sugar program came from legislators representing interests tied to sugar legislation by the structure and process of Congressional policymaking. For example, senators from states with relatively large agricultural sectors tended to support sugar policy, as did representatives from states with interests tied directly to sugar legislation by subcommittee structure.

Additional commodity case studies are needed to correlate voting and net program effects by region, recognizing that Congressional unanimity is not required to pass policy legislation. Excepting a presidential veto, a simple majority of 51% is sufficient, which may be attained by regional representation combined with a policy formulation process such as that described above. Consequently, it may not be necessary to attach different weights to the welfare of various interest groups in order to explain the adoption of policies imposing a net cost on society.

FOOTNOTES

[1]A net domestic welfare loss would persist even if tariffs were to be substituted for the present quota system, although the government, rather than foreign exporters, would collect area c in the form of tariff revenues.

[2]The 1989-90 House RCSS subcommittee included 3 representatives from Texas, 2 each from Louisiana and California, and 1 each from S. Carolina, Mississippi, Idaho, N. Carolina, Georgia, Minnesota, Missouri, and Florida. Similarly, the 1989-90 Senate subcommittee included senators from Arkansas, Montana, Nebraska, Oklahoma, Alabama, Iowa, N. Dakota, N. Carolina, Kansas, Mississippi, Kentucky, Minnesota, and California. It may be argued that these legislators have a "more than equal" vote on bills passing through their subcommittees by the exercise of their power in drafting legislation and controlling the agenda.

[3]Minnesota, Nebraska, and North Dakota—and perhaps Idaho, Montana, and Wyoming—may also be net exporters of corn-based sweeteners, although estimates are not calculated for these states since it is established that they are net exporters of sweeteners based upon their sugar beet production.

[4]Details on all calculations are available from the authors upon request.

[5]All votes were decided in favor of the sugar and sweetener industry except the 1981 House proposal to eliminate the sugar program; it was struck in Conference Committee.

REFERENCES

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Rausser, Gordon C., and J. W. Freebairn. "Estimation of Policy Preference Functions: An Application to U.S. Beef Import Quotas." *Rev. of Econ. and Stat.* 56(1974): 437-49.

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TABLE 1.

Senate Vote 1

	Proponents			Opponents	
	Cane or Beets	Corn	General Agriculture		
Supported	20	9	13	19	61
Opposed	0	5	8	20	33
No Vote	2	0	3	1	6
	22	14	24	40	100

chi square (6 dof) = 19.122   (1%)

Senate Vote 2

	Proponents			Opponents	
	Cane or Beets	Corn	General Agriculture		
Supported	20	8	16	20	64
Opposed	0	6	7	17	30
No Vote	2	0	1	3	6
	22	14	24	40	100

chi square (6 dof) = 14.778   (2.5%)

Senate Vote 3

	Proponents			Opponents	
	Cane or Beets	Corn	General Agriculture		
Supported	20	9	15	16	60
Opposed	0	5	7	19	31
No Vote	2	0	2	5	9
	22	14	24	40	100

chi square (6 dof) = 18.513   (1%)

Senate Vote 4

	Proponents			Opponents	
	Cane or Beets	Corn	General Agriculture		
Supported	21	9	14	16	60
Opposed	1	4	8	19	32
No Vote	0	1	2	5	8
	22	14	24	40	100

chi square (6 dof) = 18.368   (1%)

Senate Vote 5

	Proponents			Opponents	
	Cane or Beets	Corn	General Agriculture		
Supported	21	6	14	13	54
Opposed	1	7	10	26	44
No Vote	0	1	0	1	2
	22	14	24	40	100

chi square (6 dof) = 25.588   (1%)

TABLE 1 (cont.)

House Vote 1

	Proponents			Mixed	Opponents	
	Cane or Beets	Corn	Rice, Cotton			
Supported	72	20	25	25	48	190
Opposed	22	39	7	25	120	213
No Vote	12	1	1	2	16	32
	106	60	33	52	184	435

chi square (8 dof) = 79.345   (1%)

House Vote 2

	Proponents			Mixed	Opponents	
	Cane or Beets	Corn	Rice, Cotton			
Supported	90	32	27	35	79	263
Opposed	14	16	7	14	91	142
No Vote	8	8	2	1	11	30
	112	56	36	50	181	435

chi square (8 dof) = 57.959   (1%)

House Vote 3

	Proponents			Mixed	Opponents	
	Cane or Beets	Corn	Rice, Cotton			
Supported	85	35	29	31	91	271
Opposed	23	21	7	18	81	150
No Vote	4	0	0	1	9	14
	112	56	36	50	181	435

chi square (8 dof) = 28.808   (1%)

Senate Vote 1:   To table amendment eliminate sugar program; passed 61-33; Sept. 17, 1981

Senate Vote 2:   To table amendment to reduce sugar loan rate; passed 64-30; Sept. 17, 1981.

Senate Vote 3:   To table amendment to reduce sugar loan rate; passed 60-31; Sept. 23, 1982.

Senate Vote 4:   To table amendment to allow reduction in sugar loan rate; passed 60-32; Nov. 22, 1985.

Senate Vote 5:   To table amendment to reduce sugar loan rate; passed 54-44; July 24, 1990.

House Vote 1:   Amendment to eliminate sugar program; passed 213-190; Oct. 15, 1981.

House Vote 2:   Amendment to reduce sugar loan rate; defeated 263-142; Sept. 26, 1985.

House Vote 3:   Amendment to reduce sugar loan rate; defeated 271-150; July 24, 1990.

Figure 1.
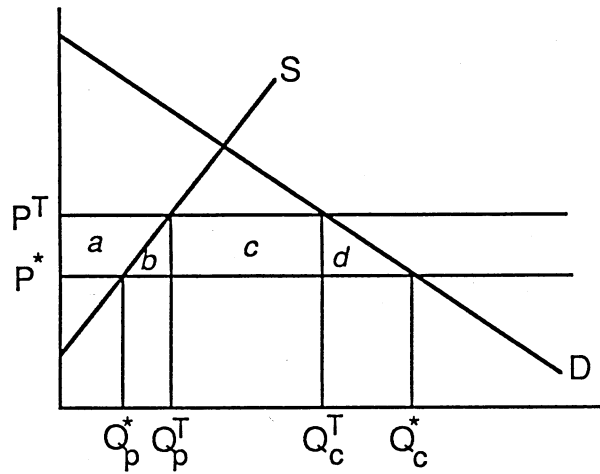## Effect of Sugar Policy on Aggregate U.S. Economy

Figure 2.
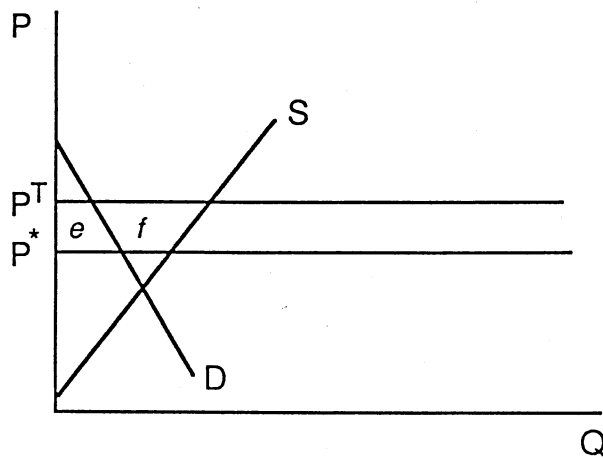## Effect of Sugar Policy on Sweetener Exporting Region

Figure 3.
U.S. Sugar Crops Production Regions and Processing Facilities

Sugarbeet

Sugarcane

▲ Raw cane sugar refinery

◉ Sugarcane processing facilities

▣ Sugarbeet processing facilities

★ Corn wet milling plants