Is government efficient? An illustration from U.S. agricultural policy

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David S. BULLOCK

Klaus SALHOFER

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Institut für Wirtschaft, Politik und Recht
Universität für Bodenkultur Wien

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Bestelladresse:

Institut für Wirtschaft, Politik und Recht
Universität für Bodenkultur Wien
Gregor Mendel-Str. 33
A – 1180 Wien
Tel: +43/1/47 654 – 3660
Fax: +43/1/47 654 – 3692
e-mail: h365t5@edv1.boku.ac.at

Internetadresse:

http://www.boku.ac.at/wpr/wprpage.html
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Is government efficient?

An illustration from U.S. agricultural policy

David S. BULLOCK and Klaus SALHOFER*)

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June 1995

*) David S. BULLOCK, Assistant Professor, Department of Agricultural Economics, University of Illinois, 305 Mumford Hall, 1301 W. Gregory Drive, Urbana, IL 61801, email: dsbulloc@uiuc.edu. Klaus SALHOFER, Research Associate, Institut für Wirtschaft, Politik und Recht der Universität für Bodenkultur Wien, Gregor Mendel-Straße 33, A-1180 Wien, email: salhofer@edv1.boku.ac.at.
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Summary

Agricultural programs are often criticized as being expensive and wasteful. However, spurred by the ideas of Nobel Prize winner Gary BECKER many studies in agricultural policy have implicitly assumed or tried to test whether, given the political constraint it faces, government is as efficient as it possibly can be. Given the importance of this Efficient Redistribution Hypothesis (ERH) in the prevailing agricultural economics literature, proper understanding of this hypothesis and how it might be tested are important. This paper illustrates the meaning and ramifications of the ERH. We critique one of the two methods commonly used to examine empirically the validity of the ERH, and we illustrate our critique with an empirical example from U.S. agricultural policy.

Key-words: agricultural policy, political economy, efficient redistribution hypothesis

Z u s a m m e n f a s s u n g

Die Stützung des Agrarsektors wird oft als teuer und unwirtschaftlich bezeichnet. Trotzdem nehmen viele Studien im Bereich der Agrarpolitik, angeregt durch die Arbeiten des Nobel Preisträgers Gary BECKER, implizit an, daß unter den gegebenen politischen Zwängen die Regierung so effizient wie möglich ist, oder versuchen dies zu testen. Aufgrund der Bedeutsamkeit dieser Hypothese der effizienten Umverteilung (ERH) in der aktuellen agrarökonomischen Literatur ist es wichtig zu verstehen, was diese Hypothese beinhaltet und wie sie getestet werden kann. Dieser Artikel veranschaulicht die Bedeutung und die Problematik der ERH. Wir kritisieren eine von zwei Methoden, die oft verwendet werden, um die ERH empirisch zu testen. Wir illustrieren unsere Kritik anhand der Agrarpolitik der USA.

Schlüsselwörter: Agrarpolitik, Politische Ökonomie, Hypothese der effizienten Umverteilung

1 Introduction

At a glance, the title of this paper must seem ridiculous to many readers. In cafes and pubs throughout the world, a favorite pastime of patrons is to point out and lament the obvious inefficiencies of government. In the U.S. of late, while degree of faith in the effectiveness of government is a fundamental divider between "liberals" and "conservatives," it is simply not possible to find a politician, liberal or conservative, who does not decry the "wanton waste of a bloated bureaucracy." In the face of these political trends, over the past decade a considerable number of political economists, spurred by the ideas of Nobel Prize winner and conservative neoclassical economist Gary BECKER, have paradoxically hypothesized that given the political constraints it faces government is actually as efficient as it possibly could be.

This efficient redistribution hypothesis (ERH) is the subject of our paper, which focuses on the implications of the ERH on agricultural policy. The ERH is especially interesting in the case of agriculture for two reasons. First, to claim that government agricultural programs are efficient seems to reject the common wisdom that government inefficiency is nowhere more prevalent than in industrialized nations' agriculture, which benefits from huge distortional government programs that redistribute income from other economic sectors. Second, the ERH has been a key theoretical (often implicit) assumption in many of the political economy models that have dominated the agricultural economics literature over the past decade (BULLOCK 1994, 1995a). Given the importance of the ERH, proper understanding of this hypothesis and how it might be tested empirically are important to research in the field of political economy, especially in agriculture. It is the purpose of this paper to illustrate the meaning and the ramifications of the ERH, and to lay open and discuss difficulties in testing this hypothesis.

In the next section, BECKER's ideas are reviewed, and the importance of the ERH in new political economy models, especially those in the agricultural economics literature, are

discussed. In section III we present a general model of redistributionary government policies, which we use to rigorously define the ERH and related issues. In section IV we survey how the ERH has been applied and tested in the agricultural economics literature, and we critique one of two methods commonly used to examine empirically the validity of the ERH. In section V we further illustrate our critique by applying the general model of redistributionary policies to an economic model recently used by GISSER (1993) to test the ERH. We discuss our findings and conclude the paper in section VI.

2 BECKER and the efficient redistribution hypothesis

It may seem paradoxical that BECKER, an economist from the Chicago school famous for its support of reducing the size of government, in his 1983 paper should have developed a theory predicting that government is efficient. But BECKER's ideas are founded not on the assumption that more government is good. Rather, they stem from the idea of STIGLER (1971), PELTZMAN (1976), and much earlier BENTLEY (1908) that government, rather than being a force for public good, is better described as an agent of private interests, driven and manipulated by political pressures from social groups.

It is interesting that this same view of government driven by social group pressure that caused STIGLER and PELTZMAN to conclude that government will often be captured by those very groups it is supposed to regulate caused BECKER to conclude that government will be efficient. But no contradiction exists between the views of STIGLER, PELTZMAN, and BECKER. Roughly, the logic behind BECKER's conclusion is as follows. Government policies are ultimately determined by political pressures from social groups. If there were a policy change that could make all social groups better off (or at least make one group better off while making none worse off), at least some groups would support such a policy change, no groups would oppose it, and therefore government would enact said change. It is reasonable to assume that

given time social groups will accurately perceive the effects that government policies have on them. Therefore, if we observe policy at any point in time, it would be unusual for there to exist a policy change that has not been enacted, yet would make all social groups better off. In this sense, then, observed government policies are efficient (what economists term "Pareto efficient"): there are no imaginable policy changes which would make all social groups better off (for if there were, they would have been enacted already.)[1]

Casual observation can lend credence to BECKER's efficient redistribution hypothesis. Politicians love "win-win" situations, and commonly speak as if the policy changes they enact make everyone better off. It is rare indeed, for example, to hear an economist state that proposed policy changes will help some and hurt others. Yet the fact that it is a rare policy change that does not create victims is evidence in support of the efficient redistribution hypothesis. Moreover, whether it is possible to enact a policy change that would make all groups better off is a question central not only to all policy economics, but to any discipline which makes policy recommendations — "Is there a better policy?" is the seed of all political debate.

That conservative economists would declare government efficient is interesting in its own right. But as BULLOCK (1994, 1995a) argues, the ERH is actually an essential, though sometimes implicitly assumed, idea in many new political economy models, especially those in the agricultural economics literature. From models that try to explain why certain social groups are more politically powerful than others (e.g. GARDNER 1987; CARTER et al. 1990; MILLER 1991), to models that actually attempt to measure the relative political powers or social standings of social groups (e.g. SARRIS and FREEBAIRN 1983; OEHMKE and YAO 1990; HOFREITHER et al. 1995), efficient redistribution is an essential maintained hypothesis. Given the importance of the efficient redistribution hypothesis in models of political economy, its

proper understanding is important. A more analytical definition of the ERH will aid in its proper understanding, and is offered in the next section.

3 A general model of redistribution: surplus transformation curves and the efficient redistribution hypothesis

People and social groups care about government policy because changes in policy change their well-being. But government programs and their effects are complex. No citizen uniformly benefits or is harmed by government; all citizens are in some ways subsidized and in other ways taxed. Because any government program that provides benefits must be paid for, government policy is inherently redistributionary. To rigorously model government policy, we must account for the fact that the many policy instruments that government has at its disposal to use simultaneously[2] (e.g., the many taxes, subsidies, and regulations) affect many groups simultaneously, and we must account for the fact that the relative efficiencies of different policies may depend on the characteristics of the economic markets in which government intervenes.

Following BULLOCK (1994, 1995a), the general case of how government affects social groups may be modeled with government using m policy instruments to change the well-being of n social groups. Let $\mathbf{x} = (x_1, \ldots, x_m)$ be a vector describing levels of government policy instruments 1, . . . , m. (For example, policy instrument x_1 could be the sales tax rate, policy instrument x_2 could be an agricultural support price, x_3 could be an industrial import tariff, etc.) Let $\mathbf{u} = (u_1, \ldots, u_n)$ be a vector the elements of which are measures of the well-being of n social groups 1, . . . , n. (Social groups might be wheat farmers, income tax payer, consumers, etc.) Let $\mathbf{b} = (b_1, \ldots, b_z)$ be a vector of variables which government cannot control, which describe the economy and market conditions. (Examples of **b** might be supply and demand elasticities, as well as parameters describing weather and technology.) Group

well-being levels are functions of market conditions and government policy: $\mathbf{u} = (h_1(\mathbf{x},\mathbf{b}), \ldots, h_n(\mathbf{x},\mathbf{b})) = \mathbf{h}(\mathbf{x},\mathbf{b})$. Given some level $\mathbf{b}$ of the parameter vector, a set of feasible policy outcomes may be defined:

$$F(\mathbf{b}) = \{\mathbf{u} \mid \mathbf{u} = \mathbf{h}(\mathbf{x},\mathbf{b})\}. \qquad (1)$$

$F(\mathbf{b})$ contains all well-being outcomes that government could technically achieve.[3] Following GARDNER (1983), a surplus transformation curve (STC) is a set of well-being points $\mathbf{u}$ contained in $F(\mathbf{b})$ which is derived by continuously changing only one of the *m* policy instruments, leaving all other policy instruments constant at given levels. In the set of points $F(\mathbf{b})$ is a subset of Pareto efficient well-being points $P(\mathbf{b})$, where for any point in this subset, no government policy exists which will make all groups better off (or at least make one group better off while making none worse off) than they are at that point. The efficient redistribution hypothesis is that actual government policies lead an economy to a well-being point contained in $P(\mathbf{b})$.

These concepts are illustrated in figure 1, for the simple case of n = 2 social groups and $m \geq 2$ policy instruments. The vertical axis measures the well-being of group 2, and the horizontal axis measures the well-being of group 1. The shaded area is $F(\mathbf{b})$, which shows the (u_1, u_2) well-being points to which government policies could take the social groups. Each point in this shaded area represents the outcome of different policy instrument combinations. For example, if group 1 is consumers and group 2 is farmers, the well-being of these two groups described by point A might be achieved by free trade of agricultural products, whereas point B might be achieved by a policy promoting high floor prices and import quotas for agricultural products. An STC is a subset of the feasible set, a curve which lies inside the shaded area. The "northeast" border of the shaded area shows the set of Pareto efficient well-

being points, the "Pareto frontier." Once on the Pareto frontier, there is no way government can improve the well-being of any group without harming another group, since points "northeast," of the Pareto frontier are not feasible.

According to the ERH, one should actually observe policy outcomes which lie on the Pareto frontier. If government would enact a policy that results in a well-being outcome like point B, both groups would support a policy change that results in a point like C, since this would increase the well-being of both groups. A government wishing to maintain its popularity would therefore choose policies that have outcomes one the Pareto frontier, like point C, not point B.

Figure 1: Feasible set, surplus transformation curve, and Pareto frontier

4 The efficient redistribution hypothesis applied in the agricultural economics literature

Over the past decade, a number of empirical and theoretical studies have appeared in the agricultural economics literature attempting to determine either whether observed government policies are efficient, or whether the existence of observed policies can be explained by the ERH. These papers take one of two approaches: (1) They attempt to test the ERH by testing whether agricultural policy response to changes in market parameters in a manner consistent with the comparative static implications of the ERH (GARDNER 1987; CARTER et al. 1990); or (2) they show that an actually observed policy is more efficient than some hypothetical alternative policy (PARISH and MACLAREN 1982; ALSTON et al. 1993; BABCOCK et al. 1990;

GISSER 1993). While BULLOCK (1995a) extensively discusses the limitations of approach (1), in this paper we concentrate our critique on approach (2).

Studies that take approach (2) tend to be limited in several ways. A problem in many of these studies is that they compare observed policies to a small set of hypothetical policies instead of to the complete set of all alternative policies. Additionally, they often compare the efficiency of policies which employ only a single policy instrument at a time, when in reality governments usually use multiple policy instruments simultaneously. Last, these studies tend not to be statistical in nature. That is, they use point estimates of parameters of econometrically estimated economic models to judge the efficiencies of various policies. But the point estimates have standard deviations; since the relative efficiencies of policies can depend heavily on model parameters, a method of judging *statistically* whether a program is efficient is needed.

PARISH and MACLAREN (1982) point out that while the conventional wisdom is that output subsidies are more efficient than input subsidies for transferring income from nonfarmers to farmers, fertilizer subsidization is an observed agricultural policy in many nations. They explain the existence of this observed policy of input subsidization by showing how, when dead weight costs of taxation are accounted for, input subsidization can actually be more efficient than output subsidization. The authors only compare the efficiency of input subsidization to that output subsidization; the many other policy instruments and their combinations that could be used to transfer income from nonfarmers to farmers are not considered.

ALSTON et al. (1993) use the concept of efficient redistribution in an attempt to explain why governments are observed using export subsidies. They argue that while the conventional wisdom is that export subsidies are less efficient than output subsidies in transferring income to producers, that due to distortions in other markets arising from general tax collection, export

subsidies when used alone may be more efficient than output subsidies, and export subsidies may be used as one instrument in a combination of instruments which make up an efficient income transfer policy. While the authors do consider that multiple instruments may be used simultaneously, they compare the efficiency of the observed policy to a limited set of alternative policies, instead of to the whole set of alternative policies.

BABCOCK et al. (1990) study the 1985 U.S. farm bill in order to understand why a policy of higher producer prices, lower consumer prices, and high taxes was chosen over a policy of mandatory production controls which would have led to high producer prices, high consumer prices, and low taxes. They claim that the adopted policy was consistent with BECKER's theory of efficient redistribution among competing social groups, as long as it is understood that agricultural input suppliers and grain marketing firms are groups that have important influence on the political process. The authors do not ask whether it could have been possible to combine production controls, price supports, and funding of public expenditures in order to derive a policy more efficient than the observed policy.

GISSER (1993) attempts to utilize the ERH and a simple economic model of U.S. agriculture to explain the observed use of acreage controls in U.S. agricultural policy. He shows that the observed policy of the U.S. government, which uses target prices and acreage controls simultaneously, is more efficient than a policy which uses target prices alone, and he claims that his results provide support for the ERH. But as in all of the studies reviewed, the accuracy of GISSER's conclusions depend on the accuracy of the point estimates of the parameters of his economic model.

All the reviewed papers try to confirm government's efficiency by showing that the well-being outcome of the observed policy, depicted for example by point B in figure 1, does lie to the northeast of the well-being outcome of a hypothetical alternative policy, depicted by point D. But finding a policy less efficient to than the policy actually used is not sufficient to verify

the ERH. Rather, if the ERH holds the observed policy must result in a point on the Pareto Frontier. Therefore, an accurate test would answer the question, "Is there a more efficient policy than the observed policy?" rather than, "Is the observed policy more efficient than some hypothetical policy?"

5 An illustration of our critique with an empirical example

To illustrate our critique with a more concrete example, we apply our general model of redistribution to a fairly typical economic model, which first appeared in GISSER (1993). GISSER's work is typical in that it addresses the question "Is the actual policy efficient?" Like all such economic models, to answer this question pertinent social groups must be identified and the policy instruments which government has available to it to redistribute income (or "well-being") among these social groups must be defined. GISSER's model is specific to U.S. agricultural policy. His social groups are called producers, consumers and taxpayers. Policy instruments identified are government support prices ("target prices") and acreage controls. We first restate those parts of GISSER's model which are necessary to apply it to our general model.

In this model supply of an agricultural commodity is given by a constant elasticity of substitution production function:

$$Q = Z\left(\alpha A^{-\rho} + \beta B^{-\rho}\right)^{-\frac{1}{\rho}}, \qquad (2)$$

where Q denotes agricultural output, B land, A encompasses all other inputs, and Z, α, β, and ρ are production function parameters describing technology. Because land is considered to be fixed, either by government or by nature, and the input price of the variable factor (P_a) is

constant throughout the analysis, the production function can be immediately inverted to obtain a derived conditional demand function for input A. The fixed factor is assumed to be owned by the firm. Total variable costs of production equal the cost of the purchased factor, C = AP_a. The first derivative of the cost function with respect to Q gives us the marginal cost function or the short run supply function:

$$P = \alpha^{\frac{1}{\rho}} P_a Z^{\rho} \left(Q^{-\rho} Z^{-\rho} - \beta B^{-\rho} \right)^{-\frac{1+\rho}{\rho}} Q^{-(1+\rho)}, \tag{3}$$

where P denotes the price received by suppliers of the commodity.

Total (domestic plus the rest-of-the-world) demand is described by the constant elasticity demand function:

$$Q = HP_d^{\eta}, \tag{4}$$

where η, is the price elasticity of demand, H is a shift parameter, and P_d is the world market price as well as the domestic demand price.

Producer quasi-rents are given by revenues minus costs:

$$PS = PQ - P_a A . \tag{5}$$

Following GISSER (p. 600), we compute the change in consumer surplus (ΔCS) as a linear approximation of the ΔCS observed from the constant elasticity demand function:

$$\Delta CS = (1 - E)\left[(P_e - P_d) \frac{(Q_e + Q)}{2} \right], \tag{6}$$

where E denotes the exports as a proportion of total production, P_e is the nonintervention price, and Q_e is the nonintervention quantity. Taxpayers' burden of taxation is given by the difference between the supply price and demand price times quantity supplied:

$$T = (P - P_d)Q . \qquad (7)$$

The outlined model can be applied to a specific agricultural commodity market by inserting the particular values of market parameters (Z, α, β, ρ, P_d, H, η, E) in equations (2) through (7). As does GISSER, we utilize the model for five major U.S. crops (corn, feed grains, wheat, rice, and cotton), but illustrate our points by focusing on the corn market.

Next we apply the general model of redistribution to GISSER's model. For the specific problem analyzed by GISSER, we may divide society into n = 2 groups, namely the subsidized group (farmers or producers) and the subsidizing group (consumers/taxpayers). Producers' well-being is measured by producer quasi-rents, and consumers/taxpayers' well-being is measured by consumer surplus minus taxpayers' costs CT = CS - T.[4] Market conditions are given by $\mathbf{b} = (Z, \alpha, \beta, \rho, P_d, H, \eta, E)$. If government can use both the target price policy instrument (P) and the acreage control policy instrument (B), then the vector of policy instruments is $\mathbf{x} = (B, P)$. Groups' well-being depends on market conditions and government policy: $\mathbf{u} = \mathbf{h}(\mathbf{x},\mathbf{b}) = (CT(Z, \alpha, \beta, \rho, P_d, H, \eta, E), PS(Z, \alpha, \beta, \rho, P_d, H, \eta, E))$.

To illustrate government redistribution possibilities with the current model, we first investigate the hypothetical case in which government only considers changes in the target price, leaving acreage controls constant at the nonintervention level $B^1 = 1.2136$ in the case of corn (calculated in GISSER, p. 597). Letting market conditions be described by $\mathbf{b^1} = (Z^1, \alpha^1, \beta^1, \rho^1, P_d^1, H^1, \eta^1, E^1) = (1, 0.763, 0.237, 5.0976, 0.9774, 1, -0.75, 0.224)$ (GISSER, p. 597), the set of feasible policy outcomes is defined as in (1) as

$$F^{P|B=1.2136}\left(\mathbf{b^1}\right)=\left\{(CT,PS)|\,(CT,PS)=\left(CT\left(B,P,\mathbf{b^1}\right),PS\left(B,P,\mathbf{b^1}\right)\right),B=1.2136,P>0\right\} \qquad (8)$$

BULLOCK (1995b) discusses why if only one policy instrument is changeable, the resultant set of feasible policy outcomes is a one-dimensional submanifold (a "curve" — GARDNER's surplus transformation curve) in R^2. This surplus transformation curve is labeled ($STC^{P|B=1.2136}$) in figure 2. Point E in figure 2 describes the PS and CT that result when government does not intervene in the corn market (i.e., B = 1.2136 and P clears the market with no price support). As government increases the target price above the nonintervention price level while maintaining acreage controls at the nonintervention level, producers gain and consumers/taxpayers lose, moving (CT, PS) northwest along the $STC^{P|B=1.2136}$. Under the actual target price of 1.281 (GISSER, p. 597), producers' well-being is \$4,796 million (Table 1, column (1)) and hence the transfer to Producers (ΔPS) amounts to \$3,517 million (column (2)). The change in consumers/taxpayers' well-being (ΔCT) from this intervention level sums to -\$5,010 million. Therefore, dead weight losses (DWL = -(ΔPS + ΔCT)) are \$1,493 million. Point A specifically reveals the well-being results from setting P = 1.281 without using acreage controls — that is, point A is the result of policy (B, P) = (1.2136, 1.281).

We may trace out a different STC by holding the acreage control policy instrument constant at the level at which it was actually held by U.S. policy, and then allowing the target price to change. Since 17.6% of land under corn was set aside in actuality, policy instrument B is now 1 instead of 1.2136 as in the hypothetical case of no acreage control. Then allowing government to choose different levels for the target price P, the feasible set is

$$F^{P|B=1}\left(\mathbf{b^1}\right)=\left\{(CT,PS)|\,(CT,PS)=\left(CT\left(B,P,\mathbf{b^1}\right),PS\left(B,P,\mathbf{b^1}\right)\right),B=1,P>0\right\}, \qquad (9)$$

which is again a one-dimensional submanifold, a surplus transformation curve, labeled $STC^{P|B=1}$ in figure 2.[5] Along $STC^{P|B=1}$ a producer well-being level of \$4,796 million is reached when consumers/taxpayers' well-being is \$2,975 million (column (4)) at point B. Along $STC^{P|B=1.2136}$ a producer well-being level of \$4,796 million is reached when consumers/taxpayers' well-being is \$2,098 million, at point A.[6] Since point B lies to the right of point A, it is clear that in GISSER's model the introduction of the acreage control program indeed has improved the redistribution efficiency. Dead weight losses have been diminished by the distance between A and B, equal to \$877 million.

Figure 2: Surplus transformation curves, and Pareto frontier for different government policies

Table 1: Producer and consumers/taxpayers' well-being for different government policies

Let us examine the effects of government using the target price and acreage control instruments simultaneously. The set of feasible policy outcomes is defined as

$$F(\mathbf{b^1}) = \left\{(CT, PS) \mid (CT, PS) = \left(CT(B, P, \mathbf{b^1}), PS(B, P, \mathbf{b^1})\right), 0 < B \leq 1.2136, P > 0\right\}, \quad (10)$$

a two-dimensional submanifold in R^2. It is clear from the definitions in (8), (9), and (10) that surplus transformation curves $STC^{P|B=1}$ and $STC^{P|B=1.2136}$ are contained in $F(\mathbf{b^1})$, as are all other surplus transformation curves generated by holding any one of the two policy instruments constant at some level while changing the other. The northeast boundary of $F(\mathbf{b^1})$ is a Pareto frontier, which envelops all the surplus transformation curves, including $STC^{P|B=1}$ and $STC^{P|B=1.2136}$, as is seen in figure 2.

General procedures for finding Pareto frontier policies are presented in BULLOCK (1995b). Applying these general procedures to the specific case of GISSER's model, we can say a policy (B^*, P^*) is Pareto efficient only if it simultaneously solves constrained maximization problems (11) and (12):

$$\max_{\substack{0<B\le 1.2136\\ P>0}} PS\left(B, P, \mathbf{b^1}\right) \text{ s.t. } CT\left(B, P, \mathbf{b^1}\right) \ge CT\left(B^*, P^*, \mathbf{b^1}\right) \tag{11}$$

$$\max_{\substack{0<B\le 1.2136\\ P>0}} CT\left(B, P, \mathbf{b^1}\right) \text{ s.t. } PS\left(B, P, \mathbf{b^1}\right) \ge PS\left(B^*, P^*, \mathbf{b^1}\right). \tag{12}$$

Points on the Pareto frontier in figure 2 were derived by assuming an initial value of CS and employing (2) - (7) to repeatedly solve (11) and (12) for various values of the constraints, using GAMS software (BROOKE et al. 1988).[7]

GISSER states (pp. 584, 600) that the demonstrated increase in redistribution efficiency which results from combining target price and acreage controls lends strong support to the efficient redistribution hypothesis (ERH) of BECKER (1976, 1983) and GARDNER (1983). That is, GISSER claims that because the actual policy (B, P) = (1, 1.281) leading to point B in figure 2 is Pareto superior to a hypothetical alternative policy which does not use acreage controls (B, P) = (1.2136, 1.2269) leading to point A, then government use of acreage controls lends credence to the ERH. But for the ERH to hold it is not enough that the government choose a more efficient policy; rather government must choose a most efficient policy. Efficient policies lead to points on the Pareto frontier in figure 2. Inspection of figure 2 demonstrates that using GISSER's model, many policies existed that were more efficient than the actual policy GISSER reports. For example, point C is a feasible point Pareto superior to B. At point C, the well-being outcome (CT, PS) = (3338, 4796) results from policy (B*, P*) = (0.799, 1.3563). At point C consumers/taxpayers' well-being is $3,337 million (column (5)) and hence the reduction in DWL between pints C and B is $362 million (column (6)). Table 1 also reports that according to GISSER's model government also failed to find the most efficient support policies for all other commodities. Given the level of transfers to producers generated by the actual programs, DWL could have been decreased considerably if government had used Pareto

efficient combinations of target prices and acreage controls. According to GISSER's model, implementation of Pareto efficient combinations of target prices and acreage controls for all commodities studied could have maintained producers' well-being at the level achieved under the present policies, $9,296 million, improving consumers/taxpayers' well-being by $1,514 million.

Our conclusion that government policy was not efficient ultimately depends upon the econometric estimates of the model's parameters in vector **b**. Because of errors in the data, nonzero standard errors in the econometric estimates of the model's parameters, and government uncertainty about the actual well-being effects of its policies, it can hardly be hoped that the well-being outcome of the actual policy (point B) lie exactly on the Pareto frontier. That is, point B is just a "point estimate" of the true well-being outcome of the actual government policy, and we cannot reject the ERH in a statistical sense by examining a point estimate alone. Rather, a statistical test, such as the one introduced in BULLOCK (1995a) would need to be applied to GISSER's model and the data underlying its estimated parameters. But until such a statistical test is applied, whether the ERH holds or not remains a statistical question.

6 Discussion

Whenever a policy change proposal is made, the first question that must enter a politician's mind is, "Who's this going to help, who's it going to hurt, and by how much?" Politicians would love to make Pareto efficient policy changes — those that make all interested parties better off, for popular policy changes make popular politicians. Therefore it has been hypothesized that government programs, "wasteful" as they might be, are at the same time as efficient as they might be, in the sense that there is no way that they could be changed to make all interested parties better off. Much recent political economy literature has its foundations,

either explicitly or implicitly, in this efficient redistribution hypothesis. But whether actual policies are efficient is an empirical question which must be addressed with statistical methods.

Notes

[1] Note that a government program may be Pareto efficient and yet still bring dead weight losses to an economy. For example, say that a production subsidy raises producer income less than it lowers consumer/ taxpayer income. Then there is a net loss in social income ("dead weight"). But this does not necessarily imply that another program exists which could make producers and consumers/taxpayers better off than under the production subsidy. It may be argued that if lump-sum transfers are possible, then the same amount of income may be transferred to producers with smaller loss to consumers/taxpayers, since lump-sum transfers by definition carry no dead weight. But lump-sum transfers are in general not possible: taxes must be raised somehow, and conventional methods of taxation are distortionary, and carry dead weight. A true lump-sum tax is difficult to imagine; government would have to tax individuals randomly and without notice in hopes of not distorting workers' labor/leisure decisions, and it would be necessary that tax programs not entail administrative costs. (For a discussion of the dead weight costs of taxation in the total costs of agricultural programs, see ALSTON and HURD (1990).)

[2] Studies in agricultural policy which account for the fact that government can use many policy instruments simultaneously are still rare. A few counter examples are GARDNER (1992), SALHOFER (1993, 1994), BULLOCK (1995b), and BULLOCK and SALHOFER (1995).

[3] Technically feasible well-being outcomes are not necessarily politically feasible. For example, a $20/bushel support price for corn is a technical possibility, and so the well-being outcome of such a policy is technically feasible. But given the current strengths of social groups in U.S. agriculture, such a well-being outcome is not politically feasible.

[4] Note that for a complete description of taxpayers' costs it would be necessary to consider the social costs of raising public funds (ALSTON and HURD 1990; ALSTON et al. 1993; CHAMBERS 1993; MAIER 1993; SALHOFER 1994), as well as the costs of program implementation and administration (HOFREITHER 1992; OECD 1994; MUNK 1989).

[5] Most STCs computed in the empirical literature are concave (BULLOCK 1992, 1994; KOLA 1993), because of increasing marginal costs of market intervention. In this case they seem to be linear but in fact are slightly

convex in most of their regions. The reason is that the supply function (equation (3)), derived from the CES production function, becomes more inelastic with increasing prices, causing taxpayers' marginal costs to decrease.

[6] Because the CS behind a constant elasticity demand curve may be infinitely large, we assume an initial level of CS. The particular level assumed for CS is immaterial, as it is ΔCS, not CS, which is important to the analysis.

[7] Similar Pareto frontiers are also calculated in BULLOCK (1995a, 1995b) and SALHOFER (1994).

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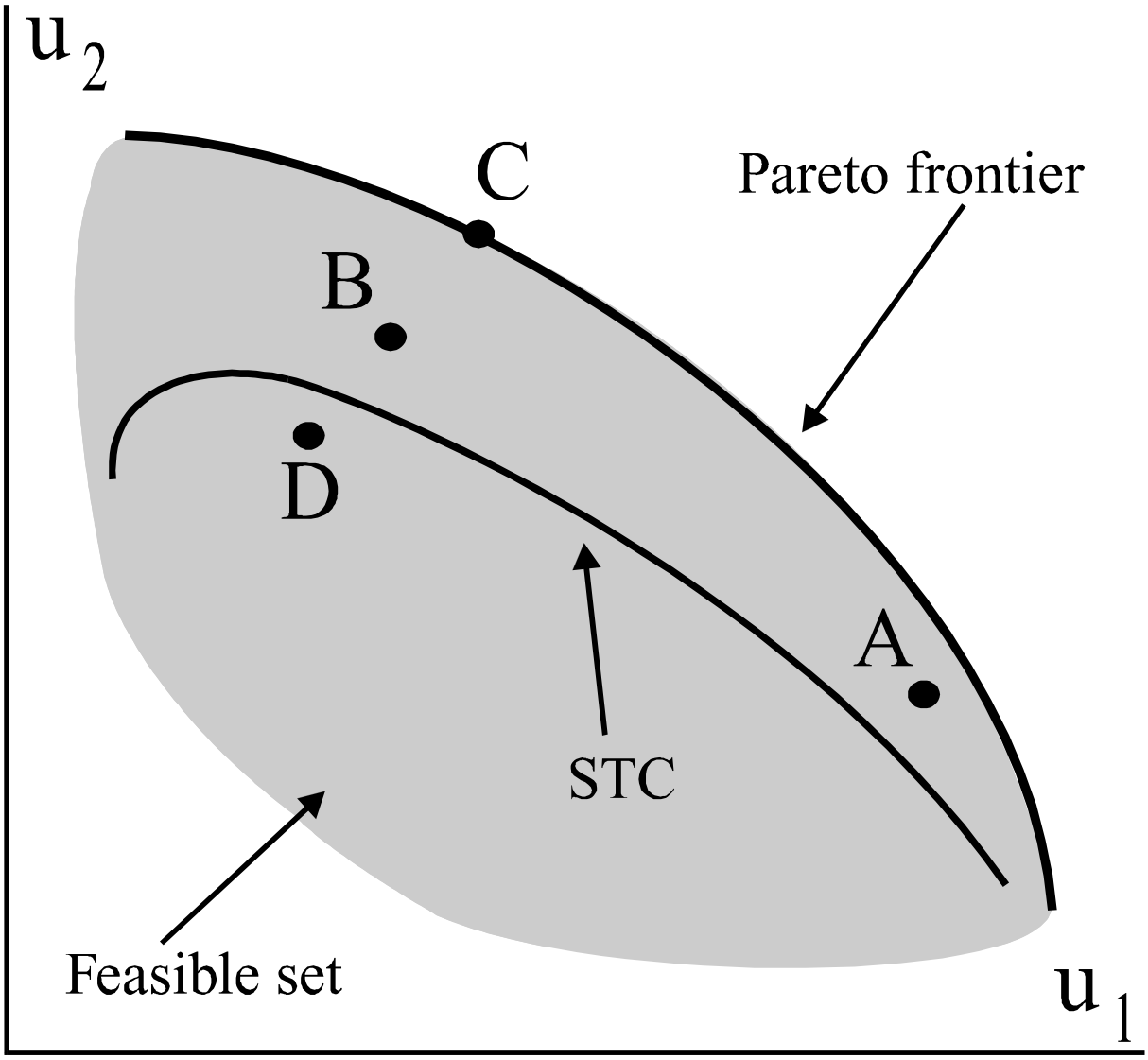

Figure 1: Feasible set, surplus transformation curve, and Pareto frontier

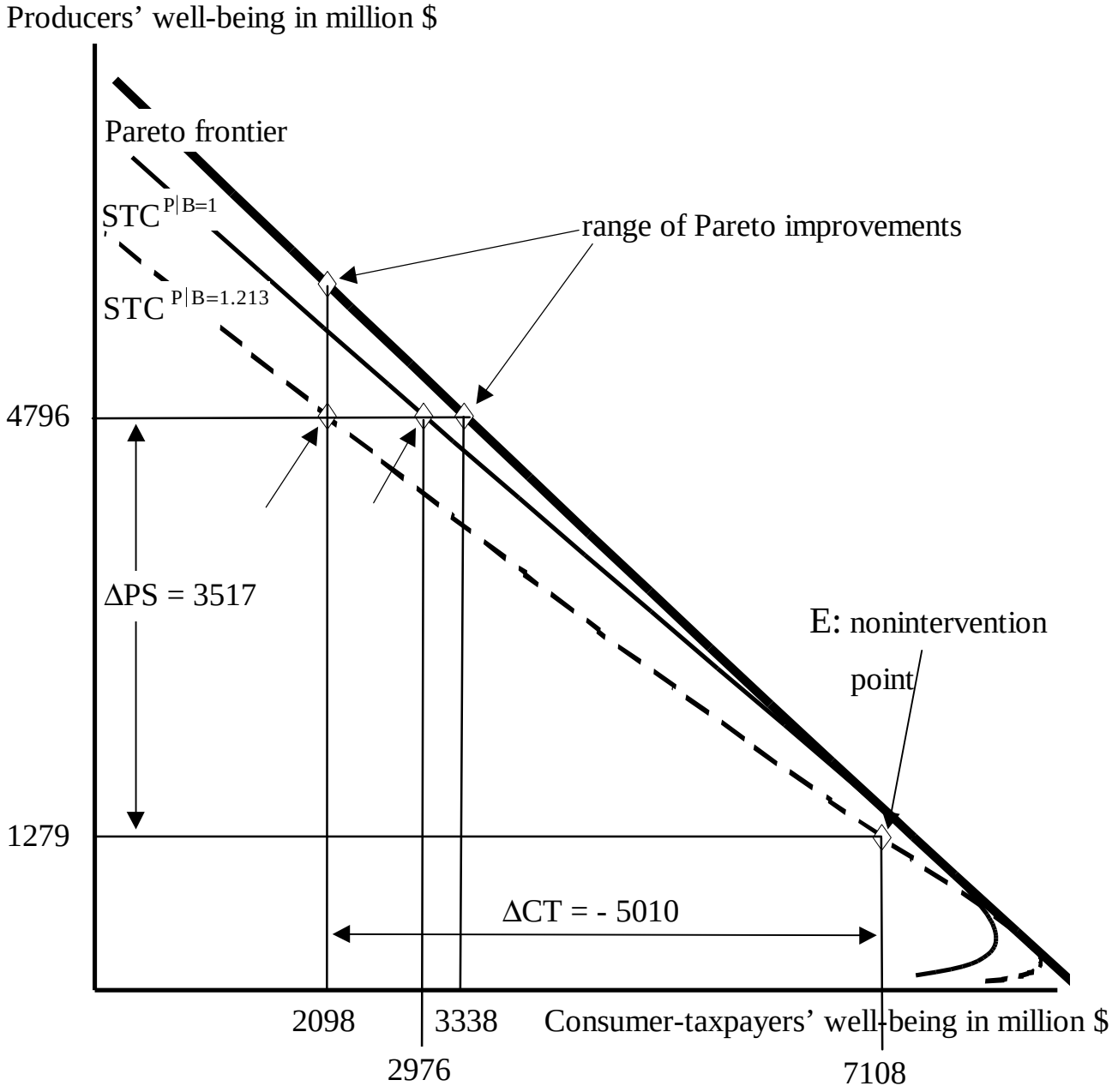

Figure 2: Surplus transformation curves, and Pareto frontier for different government policies

T a b l e 1

Producer and consumers/taxpayers' well-being for different government policies

Commodity	Actual producers' well-being million $ (1)	Transfer to producers million $ (2)	Hypothetical consumers/ taxpayers' well-being million $ (3)	Actual consumers/ taxpayers' well-being million $ (4)	Pareto efficient cons./taxpay. well-being million $ (5)	Impact of Pareto efficient policy million $ (6)=(5)-(4)
Corn	4,796	3,517	2,098	2,975	3,337	362
Feed grains	907	483	934	917	934	17
Wheat	2,120	1,845	460	864	1,104	240
Rice	365	363	-324	-129	32	161
Cotton	1,081	867	-142	597	1,331	734
Total	9,269	7,075	3,026	5,224	6,738	1,514