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Comment

A critical assessment of the political preference function approach in agricultural economics

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1. Introduction

The political preference function (PPF) approach has been used often in the agricultural economics literature in attempts to explain the causes of farm policy. The fundamental assumption of PPF studies is that government selects levels of policy instruments such that it maximizes a function of interest groups' welfare measures for the purpose of acquiring maximum political support. PPF studies often use the familiar neoclassical constrained maximization problem to measure relative political powers of interest groups involved in policy determination.

Some weaknesses of the PPF approach have been discussed in the literature (Gardner, 1989; Alston and Carter, 1991; and von Cramon-Taubadel (VCT), 1992 **). While each of these critiques provides valuable insight into PPF methodology and its limitations, none of them clearly explains the simple, fundamental structure of the PPF framework. This neglect of certain fundamentals has led to confusion in the literature. The purpose of this comment is to present the fundamental structure of the PPF framework and to discuss implications thus far neglected in the literature. Then using the fundamental structure of the PPF framework as a basis, we discuss and elaborate on VCT's critique of the PPF approach, which recently appeared in this journal. This comment is meant to complement as well as critique VCT's paper.

2. Fundamental structure of PPF studies and their measure of political power

The fundamental assumption of PPF studies is that government solves a maximization problem of the form:

$$\max_{x \in X} G(\omega(x)) \tag{1}$$

where x is a vector of policy instruments, X is the set of policy instrument levels from which government can feasibly [1] choose x, $\omega = (\omega_1, \ldots, \omega_n)$ is a vector whose elements show the

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** von Cramon-Taubadel, S., 1992. A critical assessment of the political preference function approach in agricultural economics. Agric. Econ., 7: 371–394 [AGECON 01004].

[1] Here by 'feasible' is meant technically feasible, not necessarily politically feasible. For example, a $10 per bushel target price for corn is technically feasible, but not currently politically possible in the USA.

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welfare levels of interest groups $1, \ldots, n$ (where each group's welfare depends on the level of each policy instrument), and G is a *political preference function*, generally assumed to be monotonically increasing in ω.

Defining F as the set of technically feasible policy outcomes, $F = \{\omega \mid \omega = \omega(x),\ x \in X\}$, we can rewrite (1) as (2):

$$\max G(\omega) \text{s.t.} \omega \in F \tag{2}$$

Stating the maximization problem with its constraint explicit as in (2) clarifies that PPF methodology has two 'sides', and reveals an important implication of the fundamental assumption. In (2) there is a 'substitution' side, reflected in the PPF function itself, G. (Characteristics of G show how government is willing to substitute one group's welfare for another's.) There is also a 'transformation' side, reflected in the set if technically feasible policy outcomes, F. (F shows how government can 'transform' one group's welfare into other groups' welfare by changing policy.) By separating the PPF framework into its transformation and substitution sides, we see that the Pareto frontier which forms the 'northeast' boundary of F is a crucial concept in PPF analysis. Government preferences are not directly observable. Available data only allow the researcher to directly observe characteristics of the transformation side. PPF methodology infers characteristics of the unobservable objective function G from characteristics of the observable F. First-order conditions imply that at the observed welfare outcome ω^0, the contour of G which contains ω^0 must be tangent to the frontier of the constraint F; therefore a direct implication of the fundamental assumption is that observed policies are Pareto-optimal. If we know the coefficients of the hyperplane tangent to F at the observed ω^0 (the coefficients may be thought of as marginal rates of transformation along the Pareto frontier), we also know the coefficients of the hyperplane tangent to the contours of G at ω^0. We can term these coefficients marginal rates of substitution along the contour of the political preference function G. PPF studies generally term these marginal rates of substitution 'political power weights'. Under the assumption of maximization, first and second-order conditions hold. Therefore, the coefficients of the political preference function contour, the political power weights, are inferred from market data by measuring marginal rates of transformation along the Pareto frontier.

3. Discussion of von Cramon-Taubadel

Although the PPF literature generally has failed to clarify the fundamental assumption and relationships between the Pareto frontier and PPF, VCT (pp. 377–378) recognizes two "sides" of PPF models, which he terms the demand side and supply side. His demand side is made up of a political indifference curve (PIC) map. His supply side is made up of a surplus transformation curve (STC) (p. 378). He correctly argues that the changes in measured PPF "weights" can be caused not only by shifts in the PIC map but also by changes in the STC (fig. 3, p. 377). VCT also correctly argues that PPF studies often neglect identification of subinterest groups, and that this neglect can lead to problems of misspecification (p. 382) [2]. VCT argues that PPF studies also ignore the concepts of predatory government and importance of bureaucrats. This important weakness of PPF studies is also recognized by Gardner (1989, p. 1168) and is generally pointed out as a topic for future study (Moor, 1990, p. 160).

3.1. PPF studies assume that global maximum conditions are satisfied

Though VCT provides helpful critical assessments of PPF studies, some of the implications of

[2] This problem of correctly identifying which interest groups are important in a political economy is discussed elsewhere in the literature. For example, Anderson (1986) argues that Japanese and Korean beef policy cannot be explained unless it is recognized that beef wholesalers and government bureaucrats make up important interest groups that compete in the political process with producers, consumers, and taxpayers. Similarly, Alston and Carter (1991) argue that one should consider the lobbying efforts of middlemen and the use of farm policy as an instrument of foreign policy in order to explain the causes of U.S. farm programs. They incorporate in their model middlemen as well as the traditionally cited farmers and consumers-taxpayers (p. 108).

his analysis can be clarified with reference back to the fundamental structure of PPF studies. He claims that results shown in his table 1 (p. 388) imply that the second-order maximization conditions fail. He states (p. 389), "Formally, the problem is that the PPF in equation (9) is not necessarily strictly (quasi-)concave in the variables P_x and P_y... Hence we do not know ex ante whether the PPF has a global maximum..." He interprets that this result may be caused by omission or inappropriate aggregation of interest groups, or by inappropriate specification of the constraints on policy makers' choices. But VCT's assertion that second-order conditions fail is a direct result of his implicit assumption that the PPF is linear in the welfare levels of interest groups. Instead, to remain consistent with the fundamentals of PPF methodology, VCT should allow what the data show about the constraint, F, to reveal characteristics of the PPF, G. What VCT's table 1 implies is that at the observed ω, the frontier of F is not concave to the axes. The satisfaction of second-order conditions is an implication of the fundamental assumption of PPF studies. The question of satisfying the maximum condition is of no concern in the PPF maximization problem; it has been already assumed away to find the political power measures. Under this assumption, we can infer from the data that there exists a PPF contour which runs through the observed welfare outcome ω^0, such that the global maximum condition holds. Therefore, if we believe PPF methodology is valid, second-order conditions imply that the assumption of the linearity for PPF function is invalid. The data tell us that the PPF contour which runs through ω^0 is at least more convex than the constraint (the Pareto frontier) even in the case of a convex constraint. As in Fig. 1, if the Pareto frontier (labeled STC) is convex at the observed ω, then the data and second-order conditions imply that the PPF contour must be even more convex at that point, as is PPF_1. It is invalid to assume a priori that the PPF and its contours are linear, as is PPF_0. It is unfortunate that VCT implicitly assumes a linear PPF when discussing failure of second-order conditions – for he dedicates much of his paper (pp. 377–381) to arguing that the PPF is probably not linear, and that

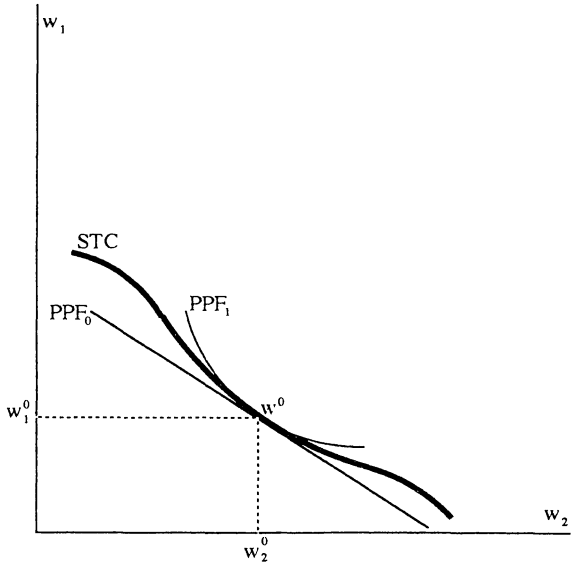

Fig. 1. If the Pareto frontier is not concave at the observed welfare point, the data reveal that the political preference function and its contours are not linear.

assuming that it can lead to invalid conclusions. More careful consideration of the fundamental structure of the PPF framework would have made his valid critique of PPF assumptions even sharper.

3.2. Discontinuity of government welfare transformation

The separation of the PPF model into its substitution and transformation sides is especially helpful to illuminate VCT's argument about his figure 5 (p. 386). VCT argues that the observed changes in political weight in PPF studies could be misleading since they ignore the "discrete nature of institutional changes" (p. 385). Particularly in fig. 5, he argues that the actual political indifference curve could be B′B′ not CC, because the STC is "cut off" at point A′ "by a constraint" (p. 385). VCT cites us an example that the STC could be cut off at A′ because tax revenue necessary to finance movement further southeast along the STC "is, after tortuous negotiations, not slated to increase until next year" (p. 385). Here it seems crucial to distinguish between policies that are not politically feasible and policies that are not

technically feasible, and to contemplate how length-of-run affects political and technical feasibility. These issues have been insufficiently addressed in the literature, and VCT provides a service in bringing them to the fore. But VCT's example can be further clarified by emphasis on the substitution and transformation sides of the PPF framework. From the transformation side, changing fundamental institutions in a short period of time is costly. Institutional rules of government can take hundreds of years to form, and many interest groups may incur great costs if institutions are overthrown overnight. Therefore, the reason that the STC in fig. 5 may be truncated at point A′ is not because it is physically impossible to raise taxes before next year. Given sufficient political support for revolution, whole governments can be overthrown before next week. But institutions serve purposes, and when they are changed it can be costly. At point A′ in fig. 5, if increasing PS requires an institutional change that would cause net harm to both consumers and producers, then it would be impossible to move southeast from A′, at least in the short run. In the longer run, if institutional changes were less costly, the transformation side of the model could change, and movement southeast from A′ would be possible.

Such transformation side constraints should not be confused with substitution side constraints. For if every citizen were to rise up, demanding that a tax increase be implemented by next week, and threatening a general strike and violent street riots unless taxes were increased by then, then taxes would be increased. But if political support to raise taxes in not sufficient, then tax increases before next year may be impossible because of substitution side constraints. Thus, it can be misleading to solely focus on the transformation side, truncating the surplus transformation curve at point A′ in order to illustrate the effects of length-of-run on the ability to achieve policy change. The policy change may be prevented on the substitution side; the policy may be politically, rather than technically, infeasible.

This technical criticism of fig. 5 made, it should be emphasized that VCT's general point, that the PPF framework inadequately considers the effects of length-of-run on both the transformation and substitution sides, is a very good one. As in the case of New Zealand agricultural policy liberalization, a sudden change in policy does not necessarily reflect a sudden dramatic change in political power, or a sudden change in the technical feasibility of a policy. How and why policies change over time is a rich and difficult issue, and has not been captured well within the PPF framework.

3.3. Problems with VCT's tests of revealed preference theory

Von Cramon-Taubadel tests, using the Weak and Strong Axioms of Revealed Preference (WARP and SARP), whether the data generated by his PPF model "could be rationalized by a continuous, concave, and monotonic PPF function" (p. 380). Using these tests and his empirical model, he fails to reject that government preferences are stable over time. However, issues of *dimensionality* and the shape of the Pareto frontier cause there to be a technical difficulties in applying WARP and SARP to VCT's data.

The following conditions allow the application of VCT's test of WARP and SARP: (1) in both states $i = 0, 1$, the set of technically feasible policy outcomes, F^i, has interior points; (2) in both states $i = 0, 1$, the Pareto frontier is concave to the axes. Given these conditions, a violation of stable preferences that would be revealed by VCT's test of WARP is illustrated in Fig. 2, where the welfare levels of two interest groups, ω_1 and ω_2, are charted on the axes. As in VCT, it is assumed that some change in market parameters takes place to change the transformation side of the political economy between two states, state 0 and state 1. STC^i is the Pareto frontier in state i, and the set of technical feasible welfare outcomes, F^i, is assumed to be all points 'southwest' of STC^i. As drawn, in both states i both policy outcomes $\omega^0 = (\omega_1^0, \omega_2^0)$ and $\omega^1 = (\omega_1^1, \omega_2^1)$ are technically feasible. Therefore, if ω^0 were 'chosen' by government in state 0 and ω^1 were 'chosen' in state 1, ω^0 would be revealed preferred to ω^1 and vice versa, which is a violation of the hypothesis of stable preferences. Furthermore,

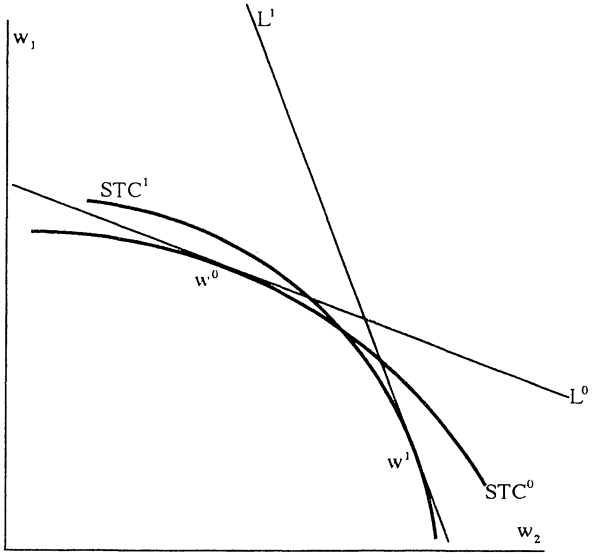

Fig. 2. If the set of technically feasible welfare outcomes has no interior points, von Cramon-Taubadel's test of preference stability faces difficulties.

since the Pareto frontiers are concave to the axes, this violation would be revealed by VCT's test, which 'linearizes' the surplus transformation curves. Linearized surplus transformation curves are shown as L^0 and L^1. (WARP and SARP are linear tests, designed to be used with consumer budget constraints, which are inherently linear in commodity space.) That is, both ω^0 and ω^1 are feasible in both states if the set of technically feasible policy outcomes in state i is assumed to be all points southwest of L^i, so WARP is violated in the linearized model, and since the Pareto frontiers are concave, this shows a violation of the hypothesis of stable preferences.

If either (1) or (2) does not hold VCT's test may not be appropriate. That (1) may not hold is clear from VCT's empirical results, since as was already discussed his Pareto frontiers are not always concave to the axes. Figure 2 can be used to illustrate consequences of (2) not holding. If we assume that only one policy instrument is available to change the welfare levels of two groups, then the resultant set of technically feasible policy outcomes will simply be a surplus transformation curve in R^2, and will have no interior points (Kaplan, p. 127; Bullock, 1994). Then points 'southwest' of each STC^i in Fig. 2 would not be technically feasible in state i: though ω^0 lies southwest of points on SCT^1, ω^0 is not a feasible policy outcome in state 1; similarly, ω^1 is not feasible in state 0. Therefore choices of ω^0 in state 0 and ω^1 state 1 do not reveal unstable preferences. Given the general case of m policy instruments and n interest groups, the resultant set of policy outcomes results from a mapping from R^m to R^n, and will have no interior points if $m < n$. Since VCT uses a model in which $m = 2$ and $n = 3$, his test of stable preferences faces this same technical difficulty. His sets of technically feasible policy outcomes are two-dimensional submanifolds ('surfaces') in R^3, and have no interior points.

3.4. Government considers intertemporal substitution of welfare transformation

An important contribution of the VCT paper is that it emphasizes the importance of time and length-of-run in matters of political economy, and it shows that PPF models have been limited by their static natures. Here we wish to concur with the spirit of VCT's critique by emphasizing that it may not be meaningful to measure annual PPF weights like in fig. 4 (p. 381) and in the discussion of fig. 5 in VCT's paper. Government typically considers intertemporal substitution when it decides on policy. For example, the Bush administration attempted to win the U.S. farm vote in 1992 by promising to support programs that encouraged the use of ethanol in the future. At the same time, the administration was allowing the agricultural budget to shrink. It might be hypothesized that the administration was substituting supporting farm welfare in one period for supporting farm welfare in another. Therefore, a snapshot of the political weight in each year can be biased since it ignores government's ability to substitute intertemporally among interest group welfares.

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