Controversies between Stated Agricultural Policy Objectives and Policy Measures in the EU's CAP

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Abstract— **In general agricultural policies aim to achieve several objectives using different combinations of instruments. In this study, our aim is to analyse how efficiently policy instruments used in the EU's Common Agricultural Policy respond to policy objectives. We will present a formal framework to analyse the effects of instruments to a particular objectives. Our analysis will reveal that there are several controversies between stated agricultural policy objectives and policy instruments.**

Keywords— **agricultural policy, instruments, objectives**

I. INTRODUCTION

In agricultural economics literature agricultural policies are often divided under two categories. Redistributive policies aim to transfer income from consumers to farmers. The most common example of redistributive policy measures is different types of price supports. The second category is policies implemented to correct market failures. Market failures associated to agriculture are i.e. environmental concerns, rural viability, food safety and food security. These elements have played an important role in agricultural policies; especially in developed countries [1]. Yet, these two categories of policy objectives are often brought more concrete with stated policy objectives.

The stated objectives of the EU's Common Agricultural Policy are set in the Treaty of Rome signed in 1957. According to article 33, the objectives of the Common Agricultural Policy are: 'To increase agricultural productivity, by promoting technical progress, ensuring the rational development of agricultural production and by ensuring the optimum utilisation of the factors of production, in particular labour, and thus; to ensure a fair standard of living for the agricultural commodity, in particular; by increasing the individual earnings of persons engaged to agriculture; stabilise markets; assure the availability of supplies; and to ensure that supplies reach consumers at reasonable prices' [2].

To achieve stated policy objectives a set of policy measures need to be defined. From early 1960s until early 1980s the main policy measure in the EU's CAP was price support supplemented with trade restrictions, tariffs and export subsidies. Rapidly increased production due to technological development and productivity growth, as well as the enlargement of the EU from EU6 to EU10 challenged the policy and its measures. During this 20 year period, the EU shifted from food importer to major food exporter. Yet, internal markets were facing increasing overproduction and agricultural expenditures. The main policy response was that price supports were supplemented with production controls, such as set-aside and production quotas. Also export restrictions and co-responsibility levies were used [3].

In order to permanently decrease production, reduce expenditures and minimise trade distortions, a fundamental reform was needed. A major shift started in 1992, when price supports were reduced and compensated with direct acreage based payments. In 2003 these payments were decoupled on production.

According to Tinbergen [4], for policies to be efficient at least one policy measure is needed for each objective. A review on the stated objectives of the CAP and the policy measures used since 1957 indicate, that the CAP fails to respond to Tinbergen's rule. Until 1980s price support was dominant policy measure. At the same time there were several objectives set in the CAP. In addition, price support had controversial effects with respect to different policy objectives. In example, price

support was implemented to increase producers' incomes. It led, however, also to higher consumer prices. Thus, price support made it more difficult to keep consumer prices at reasonable level, as stated in the Treaty of Rome.

II. OBJECTIVE OF THE STUDY

In this study, we will empirically estimate how well past and current agricultural policy instruments have been able to respond to the stated objectives of agricultural policies. The analysis will reveal the trade-offs between and within stated agricultural policy objectives and policy instruments. The additional value of this study is that instead of deadweight losses, it measures the efficiency of different policy instruments in terms of their effects on stated policy objectives. We define this as the political efficiency of agricultural policies. Thus, it differs from a traditional welfare economics policy analysis that measures efficiency in terms of social costs. Theoretical background is in welfare economics and in economic policy.

Stated agricultural policy objectives in the European Union and in Finland are quantified to comparable indexes. Using these indexes an objective function is constructed. Sophisticated estimation procedures are used to reveal the relative efficiency of different policy vector on the stated objectives.

The analysis covers time period from 1980 to 2006. We will construct an objective function (or a political preference function) to describe stated agricultural policy objectives in the EU and in Finland. The results of this study can be used to improve policy efficiency in future agricultural policies. In addition, it will reveal evidence on which instruments could be used more efficiently to achieve particular policy objectives.

III. FORMAL FRAMEWORK

Political preference functions (PPF) are used to measure relative political power or social welfare weights of political interest groups, first introduced by Rausser and Freebairn [5]. PPF is assumed to incorporate both the political preferences and the influence activities of political actors and groups involved. The PPF models assume that the interest group pressure forces the government to consider a set of criteria that roughly corresponds to the desires of the various interest groups. Thus, these criteria are arguments in governments PPF. In a PPF model the government chooses the types and degrees of intervention to maximise an objective function dependent on these multiple criteria [6]. The political preference weights are often revealed from policy outcomes that are assumed directly or indirectly reflect the impact of various actors on governmental decision-making [7].

In the PPF approach to modelling political economic decision-making, a policy-maker chooses levels of policy instruments to maximise a function of special interests' welfare subject to feasible constraints [8].

Government's objective is to maximise a political preference function. According to van der Zee [9] the arguments appearing in the PPF typically represent performance measures which reflect the economic well-being of each interest group. The fundamental assumption behind PPF is that government is rational. Following Bullock [10] we can write government's maximisation problem (PPF-max) as

$$Max_x \, g(u) \ s.t. \ u = h(x,b) \in F(b) \qquad (1)$$

where g represents government preferences as a function of overall utility in society and F is a set of technically feasible policy instruments available, given the market parameters b [10]. In other words, government chooses some set of politically and technically feasible policy instruments to maximise overall welfare in society. This welfare maximisation is measured in terms of interest groups' welfare given that policy-makers may weight different interest groups differently.

According to Gardner [7] PPF studies assume that policies influence the level of the political preference function only by influencing peoples' incomes. Yet, this is done to evade the problems relating to utility measurement. However, the level of PPF which is an indicator of political objectives

depends upon the way in which peoples' incomes enter it.

A. Target-Instrument Approach (The Theory of Economic Policy)

The theory of economic policy holds the normative premises that the government can pursue an optimal economic policy by operating a set of instruments and by fine-tuning the instrument levels in order to reach a priori well-defined targets [9]. The welfare economic policy analysis defines optimality in terms of maximising social welfare function and thus individual welfare and ranks policies based on Pareto criteria. Target-instrument approach allows the comparison of different policies based on their ability to achieve particular objectives. As in our case in agricultural policies, it is easy to define several stated objectives and thus, to measure policy efficiency in terms of these objectives. According to Bullock et al. [11], stated policy objectives are indicators of policy success while the end of each policy is to increase social welfare. Thus, achieving stated policy objectives leads to higher social welfare.

Tinbergens' target-instrument approach can be formalised as follows. Let

$$y = (y_1, y_2, y_3, ..., y_n) \qquad (2)$$

be a vector of well defined policy objectives. Yet, let

$$x = (x_1, x_2, x_3, ..., x_n) \qquad (3)$$

be a vector of policy instruments and

$$z = (z_1, z_2, z_3, ..., z_n) \qquad (4)$$

vector of exogenous variables. Now, the economy is presented as

$$y = Ax + Bz \qquad (5)$$

where A and B are reduced form matrices of coefficients. If the number of target variables equals the number of instruments variables and if matrix A is non-singular, it is possible to express x in terms of y such that

$$x = A^{-1}\left[y^* - Bz\right] \qquad (6)$$

where y* can be interpreted as the vector of optimal target levels.

Policy solutions are to be found only if the number of policy instruments is equal to or larger than the number of targets. When the number of instruments is smaller than the number of targets, the targets cannot be met simultaneously. When different sets of instruments are available to attain the same target levels, the Tinbergen approach offers no selection criteria [9].

The same model was later extended to cover also flexible targets. Instead of maximising ex ante chosen target variables, focus was on maximisation of social utility or welfare function U, which depends on target (y) as well as instrument variables (x) [4], [12]. This welfare function is represented as

$$U(y, x) = U(y_1, ..., y_n; x_1, ..., x_m) \qquad (7)$$

Given the restrictions imposed by the modelled relationships in economy, we can now explicitly analyse the policy-makers preferences' with respect to the levels of targets x and instruments y. Thus, taking the first order condition with respect to policy instrument x

$$\frac{\partial U(y, x)}{\partial x_1}, \quad i = 1, ..., m \qquad (8)$$

and re-writing to show the optimal change of a policy instrument in two steps, we get

$$\sum_{k=1}^{n} \frac{\partial U}{\partial y_k} \frac{\partial y_k}{\partial x_i} + \frac{\partial U}{\partial x_i} \qquad . \qquad (9)$$

The first term of the equation represents the overall change in social welfare, that occurs when a marginal change in policy instrument has affect on a particular target variable y_k and the marginal change in target variable y_k affects on the other y_{k-1} target variables. As stated by Gardner [7] the relevant aspect of the function for most policy questions is its partial derivatives with respect to different policy objectives, such as individuals' incomes.

Evaluating policies means assessing a change in policy. Optimal policy is arrived at when any change reduces U. The partial derivatives can be thought of as weights. If a change in instrument has the same size affect on all the objectives, then all the objectives are weighted equally and no trade-offs are present. The theory of economic policy requires that the set of policy instruments includes only those variables under the direct control of the policy-maker. For example, one should specify the tariff instead of the tariff revenue, and the discount rate instead of interest rate [9].

As shown above, the policy objective function can be considered either as a policy target functions as perceived by the policy maker or as a social welfare function. It is similar to PPF that makes explicit trade-offs among various economic groups. According to van der Zee [9] there exists five different approaches to trace the arguments and/or weights of an objective function: (i) the direct method in which the decision maker is invited to write down preference function directly; (ii) the

interview method in which the expert establishes the function on the basis of hypothetical questions to policymakers concerning preference comparisons between alternative states or results (iii) the imaginary interview method, according to which preferences are inferred on the basis of actual deliberations of decision-maker before policy decisions are made, followed or taken part by an expert, (iv) the inference method in which the preferences are retrieved from planning documents and (v) indirect revealed preference method.

IV. EMPIRICAL MODEL

Our empirical analysis will reveal the marginal effects of a single policy measures with respect to particular policy objectives. We will construct policy objective functions to describe the development in agricultural policies both in the EU and in Finland. The period analysed is from 1980 until 2006. Using the estimated marginal effects, we can find different combinations of policy measures that will improve the policy efficiency in terms on stated policy objectives of the CAP. We use data from agricultural statistics in the EU and in Finland. Econometric software used is Limdep. Currently, we are in a stage of final data collection and preliminary estimations.

Table 1. Measurement of policy variables

Policy objective	Measurement of Y	Policy vector, endogenous variables X	Exogenous variables Z
Securing farmers' income	Agricultural income	Price support, direct payment, production quota, set-aside, co-responsibility levy, import tariff, export quota, import quota, export subsidy, compensation payments, investment support, research expenditures	Share of agriculture in GDP, share of agriculture in employment, total expenditure on agriculture, technological development
Increase productivity	Productivity growth		
Structural development	Farm size, agricultural labour		
Market stabilisation	Price volatility, production volatility		
Reasonable consumer prices	Food price index		
Environmental concerns	Environmental Benefit Index		
Availability of supplies	Self-sufficiency in relevant food stuffs		

V. CONCLUSIONS

In this paper, we present a formal framework to analyse controversies between agricultural policy instruments and policy objectives. Based on the theory only, our expected results are that the measures of the CAP have controversial effects on the different stated policy objectives. These controversial effects are expected to be stronger in Finland than in the EU. That is mainly because of different farm structure and structural development during the period under consideration. In order to improve the efficiency of the CAP, more targeted and directed policy measures are needed. Yet, the CAP fails to fulfil Tinbergen's rule that at least one policy measure is needed for every objective.

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