Rent Seeking and the Common Agricultural Policy: Do member countries free ride on lobbying?

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Abstract

The Common Agricultural Policy is modelled as a club good providing the European Union (EU) farmer with financial benefits. We build an economic model which explains how much farmers in individual EU countries invest in rent-seeking activities in order to test for free-riding behaviour on lobbying costs. For our investigation we group the EU member countries by farm structure, and the type of benefit received. We explain the fees paid by farmers for lobbying by other countries fees, political variables, and country and regional agricultural characteristics. The model shows that some member countries free ride on others. This suggests a form of policy path dependency and leads to a suboptimal investment on lobbying of 7.5%.

JEL: D72, Q18 **Keywords:** free-riding, rent-seeking, Common Agricultural Policy

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Introduction

There are few European Union (EU) policies that have drawn as much national and international attention as the Common Agricultural Policy (CAP). The original six EU member countries agreed to implement the CAP in support of the agricultural sector and to forgo national agricultural support policies, to demonstrate the 'single' European way of making policy. One result of the CAP is the historically high level of economic support received by some farm commodities, which is in part the result of lobbying by farm organizations (Nedergaard, 2006).[1] While all farmers in the EU contribute to the lobbying effort some may free ride on the cost of lobbying, which implies that less than the optimal quantity of resources are invested in rent-seeking activities. An examination of the allocation of resources spent by EU farmers on lobbying has received scant attention in the economics literature; however political scientists have examined the role of political influence through rent seeking activities for a number of years e.g. Pappi and Henning (1999). Assuming that at least some of the CAP support is attributable to the lobbying efforts of the EU farm organizations, we assess whether their efforts have been optimal from the point of view of the economic benefits earned for their membership.

The rent-seeking activities by EU farm organizations are important when the programs and policies made available to farmers through the CAP are determined (Nedergaard, 2006). The main actors in the CAP decision-making process are the EU Commission (hereafter referred to as the Commission), which proposes CAP changes, and the Council of Ministers, which is the main decision making body.[2] The EU supplies many farm commodity groups with some form of economic protection (eg. subsidies and tariff protection). Lobbying requires the expenditure of resources. From a societal point of view rent-seeking is a waste of resources (Buchanan and Tullock, 1974), however from an individual or organized group perspective it can be economically rational. The question we address is do EU farmers invest the optimal (from their point of view) amount of

[1]Historically some of the CAP subsidies are a result of the need to raise farm incomes and secure the food supply. We do not concern ourselves with that portion.

[2] The main responsibilities of the Commission are to initiate changes to the EU regulations in the form of legislation, budgetary and program proposals. The Commission has the sole right to propose changes to existing laws for all policies under the 'first pillar' where supranational cooperation is conducted. The first pillar includes the CAP, the internal market and the EURO among others (Nedergaard, 2005; Egeberg, 2002; Edwards and Spence, 1994). The CAP development is guided by the European Council, but in the end everything has to be agreed upon in the Council of Ministers. The European Parliament has currently no formal decision-rights in the CAP decision-making process."

resources in lobbying for farm support payments. Because of the institutional manner in which the CAP is developed and applied it has the characteristics of a club good for European farmers. As stated by Nedergaard (2006) one of the institutional characteristics of the EU is that it can be considered as one multi-level decision making entity for agricultural policy, and therefore subject to rent seeking. Rent seeking for a club good can lead to free riding by some of the beneficiaries. Free riding refers to the situation where firms or individuals take into account the behaviour of other firms or individuals and adjust their rent-seeking expenditures accordingly. Thus, there is strategic behaviour among the members of the lobbying group. When firms or individuals free ride it leads to a sub-optimal expenditure on lobbying (Grossman and Helpman, 1996). One way to determine if the optimal expenditure is being made on rent-seeking activities is to test for the existence of free-riding behaviour on the cost of rent seeking by members of the lobbying group.

Olson (1965) was one of the first to identify the implications of free riding. When comparing the effectiveness of two lobby groups Olson argued that the more concentrated group would be better able to control free-riding behaviour and thus be better able to achieve its objectives. He used agricultural lobby groups as a prime example of this situation. Farmers are concentrated in rural areas and by commodity group as opposed to consumers who live in all parts of the country. Consumers are extremely poor at organizing and thus have a difficult time resisting the farm lobby. Additionally Olson (1965) points to the fact that powerful lobbies (like the agricultural lobby) are anchored in organisations that perform other functions than pure rent-seeking activities, and this is how these organisations obtain their strength and reduce the incentives for free riding. The multi-purpose objectives of farm lobby organisations are referred to as selective incentives. In the case of the agricultural interest organisations in the EU Nedergaard (2006) identifies the following selective incentives: First of all, the national interest organisations are integrated into the body of public administration. An example is the administration of milk quotas. Also the partly publicly financed consulting services are frequently administered by the interest organisations, and access to these services requires membership. Second, the secretariats of the interest organisations are often partly financed by funds that were originally created by public funds, so the cost of membership is limited making the organizational costs lower in the agricultural sector than in the consumer sector.

We analyse free-riding behaviour in COPA (Comité des Organisations Professionelles Agricoles de la CEE), which is the farmers' European Union level interest

organisation where the national interest organisations are members. Here the free-rider problem is among countries[3] and not among individual farmers contributing to an interest group, as originally examined by Olson (1965). At this level there are fewer selective incentives than at the national level, as the prime objective of COPA is rent-seeking, but the per-farmer COPA fee is low (see table 2). Therefore we will expect to observe some level of free-riding on the membership fees.

Nedergaard (2006) and Clark and Jones (1999) suggest COPA (Comté des Organisations Professionelles Agricoles de la CEE) is the principle European farm organization that lobbies for economic protection at the Commission (for a detailed description of COPA see Kohler-Koch (1992)). It was founded in 1958 and as of 2007 is made up of around 58 organisations from the 27 EU countries representing around 11 million farmers. It also has partner organisations from Iceland, Norway, Switzerland and Turkey. Organizationally, COPA is led by a Presidium which consists of one representative per member organisation including the president of COGECA (General Confederation of Agricultural Co-operatives in the European Union), the president of the European Council of Young Farmers and the Chairman of the COPA Women's committee.

In addition to lobbying through COPA, farmers also lobby through their national farmers' unions most importantly vis-a-vis their national governments and their representatives in the Council of ministers, and in Brussels where many national farmers' unions have their representatives. As pointed out by Pappi and Henning (1999) these channels of lobbying are of significant importance in the EU farmers' decision-making process. Nevertheless the only European lobby group that includes all EU farmers is COPA thus it is the principal farmer's lobby organization that unifies the interest of European farmers.[4]

The primary objectives of COPA are to *"examine any matters related to the development of the CAP; to represent the interest of the agricultural sector as a whole; to seek solutions which are of common interest and to maintain and develop relations with the Community authorities and with any other representative organisations or social*

[3] Some countries have more than one national farmer's organisation, but the membership fee to COPA is paid per country and not per organisation, which is why our unit of analysis is countries instead of national farmer's organisations. How the COPA membership fee is distributed between member organisations from the same country is a national issue and it is as such not interesting for the European level of analysis that is undertaken in this paper, even though some interesting games are most likely played at the national level too.

[4] In this paper we focus on the European level farmers' organization. One useful extension of this paper would be to include individual country lobbying, however that would require data collection activities for which we did not have resources.

partners established at European level" (COPA, 2007 p. 1-2). COPA uses many channels to reach these objectives at different levels in different EU institutions with the prime focus being the Commission. Historically the success of COPA was based upon a close working relationship between the Director General of Agriculture for the Commission and COPA. It was based on mutual organisational interests, and it ensured that the policy adequately served national, regional and local farming interests (Clark and Jones, 1999).

One of Nedergaard's contributions was to demonstrate the link between the political institutions and economic policy in the functioning of the CAP. Using a rational choice model he argues that to understand the CAP it is necessary to incorporate rent-seeking behaviour into the decision making process. However he provides no empirical evidence for his hypotheses. To analyze the impact of rent-seeking activities of EU farmers this paper follows the path laid out by Nedergaard, but goes further in two important ways. First, we extend the Nedergaard paper by formally modeling the rent-seeking process, to accommodate the potential for free-riding on the cost of lobbying in the EU. Second, we empirically test for free-riding behaviour by some member EU countries on the cost of lobbying.[5] We provide empirical evidence that farmers under-invest in rent-seeking activities.

A thorough review of political economy models has been provided by Persson and Tabellini (2000), and for agricultural policy De Gooter and Swinnen (2002). Daugbjerg and Swinbank (2007), Coleman and Tangermann (1999), and Swinnen and van der Zee (1993) all provide an excellent review of the economics and politics of European farm policy, however none model rent-seeking or free-riding behaviour. Interestingly, Nedergaard (2006) recognizes the potential for free-riding when farmers organize to acquire political influence in order to make economic gains in the common interest. No empirical work has been reported in the literature that examines the lobbying activity of EU farm organizations at the EU level.

The paper is organized into seven sections. The second section presents the motivation and hypotheses. The third section provides an economic model of free riding. The fourth and fifth sections discuss the data employed and the econometric model estimated. The sixth and seventh sections give a discussion of the model results and conclusions.

[5] There are two aspects of the COPA fees that national interest groups can possibly affect; i) which country grouping they belong to, and ii) fees charged to that particular country grouping. While both of these avenues are a bit 'sticky' or 'difficult to change quickly' they do offer negotiation potential.

Motivation and Hypotheses

Preliminary evidence of free-riding behaviour on COPA lobbying costs is shown in table 1. Three of the large original EU members, i.e. France, Germany, and Italy all receive a higher percentage of the total CAP subsidies than their portion of COPA costs.[6] Countries that pay substantially more in COPA costs than they receive in benefits include among others Belgium, Luxemburg, and the Netherlands. The relationship between the CAP payments (direct subsidies and structural payments) can be calculated on a per-farmer basis or a per-country basis. The correct way to make this calculation depends upon how the country COPA representatives see their political objectives. In this paper we argue that COPA represents farmers and not countries, thus we report our data on a per-farmer basis.[7]

An additional point of interest from table 1 is that some of the larger beneficiaries of CAP subsidies appear to be free-riding on countries which benefit less. This is not the usual case reported in the literature. This result can be explained by the institutional factors used to allocate EU farm benefits. For example, the decision-making process in the EU may make it difficult to alter the original allocation of CAP benefits. This would suggest a type of policy 'path dependency' as suggested by Nedergaard (2006).

A number of economists have modelled free-riding behaviour on lobbying in the agricultural sector, but few have attempted to measure it in any meaningful manner. Calzolari and Immordino (2005) use hormone beef and chlorinated chicken, as illustrative examples, to model free-riding behaviour in the release of information by countries regarding consumer health effects in international trade disputes. By allowing for the innovative good to be produced, countries gain information on the health outcomes of such goods. The free-riding behaviour occurs because each country would like the other country to allow its product to be tested first, thus avoiding possible costs if there are health problems. Baylis and Furtan (2003) estimated the presence of free riding in the Canadian dairy sector. They found that smaller provinces free rode on the contributions of the large provinces in terms of the lobbying expenditures made to protect the tariffs and production quotas. Lochman, Quesnel and Babb (1996) used experimental techniques to determine if demand bids were affected by the indirect vs. direct benefits in a winner take

[6] There are other economic benefits that producers receive from the CAP such as tariff protection and production quotas. These benefits are important but no data exists as to their magnitude or distribution among countries. We thank an anonymous reviewer for this point.

[7] This assumes a farmer in each country is somehow equivalent, which is not likely the case. However, to use any other normalization, say hectares or countries, would be more problematic. The data on a country basis is available from the authors. It shows the same result as the per-farmer data in table 1.

all game. While they found no impact of the nature of the payments, when the payments were higher demand bids increased. They attribute this behaviour to free riding.

There are a number of other strands of literature that examine free-riding behaviour. Ludema and Mayda (2006) demonstrate the presence of free-riding behaviour in the Most-Favoured Nation clause of multilateral trade negotiations. The free-riding behaviour is demonstrated as a negative relationship between the magnitude of a tariff in an industry and the market share of the countries participating in the negotiations. Countries with a smaller market share free ride on those with a large share in the cost of negotiation. One of the more prominent examples of free-riding behaviour is the allocation of financial resources to joint defence alliances. Sandler and Hartley (2001) report the presence of free-riding among NATO countries in the sharing of the cost of military deferment. They attribute this behaviour to the different demands for defence in that some countries feel more threatened and thus demand more defence. Those countries that feel less threatened demand less of the public good (i.e. defence) and thus are able to free ride on the cost of providing the public good.

Using the theory presented below and our preliminary evidence we model and test for free-riding behaviour by some EU member countries on the cost of lobbying the EU institutions for farm subsidies. We first demonstrate that rent-seeking activities are highly correlated with farm subsidies. Our conjecture is that increased COPA payments should result in increased subsidies to producers.[8] We then test three hypotheses for free-riding behaviour on the lobbying expenditures. Our first hypothesis is that countries with an agricultural sector that produces farm commodities which were the most protected in the original CAP design will free ride on those countries that produce other commodities (e.g. cereals versus vegetables). Our second and third hypotheses are that free riding also occurs by the type of CAP benefit received: i) direct producer subsidies and export subsidies (or guaranteed payments), and ii) structural adjustment payments. The argument is that there exists a policy path dependency in the CAP given the institutional structure of the political-learning process.

Finally, we test if lobbying increased prior to the Fischler reforms in 2003. Because the 2003 CAP changes had the potential to destroy rents, we expect lobbying expenditures will be larger prior to changes being introduced. We also control for a number of political variables and country characteristics, such as the political leaning of the government and the size of the economy. We expect conservative governments

[8] To test a rent-seeking model we need to show that the potential rents have been dissipated by lobbying expenditures. We do not test for rent dissipation.

(generally with a stronger rural base) to support farm payments more than socialist governments. Also, the larger the economy the higher the level of economic protection afforded the agriculture sector.

Model of the collective action problem

To test the free riding hypothesis we develop a mathematical model of how farm organizations make their decisions with regards to investing in lobbying activities. We assume that individual country farm organizations play a non-cooperative game.[9] The farmers agree to make annual payments to COPA based on the expectation of subsidies from the CAP and knowledge of the lobbying expenditures of other member countries.[10] The information as to the Commission's response to lobbying and other countries lobbying expenditure is known with certainty.

Assume that farmers in country *i* (hereafter called country *i*) agree to make a contribution l_i to the lobbying effort such that the total lobbying expenditure $L = \sum_i l_i$.

We assume that all farmers within a country behave in the same manner. The Euro value of the Commission budget allocated to the CAP subsidies is θ, with country *i* receiving θ_i .[11] Thus $\theta = \sum_i \theta_i$ and country *i* receives a share equal to $\delta_i = \theta_i / \theta$. In this non-cooperative game country *i* will choose l_i to maximize the farmers expected profit, net of the lobbying expenditures:

$$Max \delta_i \theta(L) - l_i \text{, subject to} \sum_i l_i = L. \qquad [1]$$

Substituting the constraint into the objective function we can find the first order condition (i.e. best response function) for profit maximization by country *i* as:

$$\delta_i \frac{\partial \theta}{\partial L}\left(1 + \sum_{j \neq i}^{n} \frac{\partial l_j}{\partial l_i}\right) = 1 \qquad [2]$$

[9] Rather than specify the lobbying in the model as a country level aggregate we could specify it as a commodity aggregate by country. This would allow us to test for counter active lobbying among commodities between countries. However, this would require a data set which is not currently available. This is research for another paper.

[10] COPAs rent-seeking efforts are complex and it is obvious that the model we built in this section is simplistic compared to the actual process. COPA is not the only organization lobbying for agricultural interests at the EU level; most national farm associations also lobby their national governments and national representatives in the Council of ministers and have their own offices in Brussels. These groups are also important players.

[11] θ_i is itself an endogenous variable but not one that is a function of lobbying by COPA. In the empirical model we instrument for θ in a 2SLS procedure.

Each country *i* will use its knowledge about how other countries will change their lobbying expenditures to its own i.e. $\partial l_j / \partial l_i$, to determine its optimal lobbying expenditure. The optimal lobbying expenditure is achieved by setting the marginal benefit from lobbying equal to the marginal cost of one more unit of lobbying. (We assume the second order conditions for the maximization problem hold.) The equilibrium to the economic problem is a Nash equilibrium.[12]

The effect of free riding on country *i* is captured in the term $\partial l_j / \partial l_i$. If the sign of $\partial l_j / \partial l_i$ is negative then country *j* will respond to an increase in country *i* lobbying expenditures by cutting back its own lobbying expenditures. Thus, country *j* free rides on the lobbying expenditures of country *i*. Following the argument made by Flowers (1987) if the term $\sum_{j \neq i}^{n} \partial l_j / \partial l_i$ is less than the ratio of the subsidies to other EU countries to the country *i* i.e., $\sum_{j \neq i}^{n} \theta_j / \theta_i$, there will be less lobbying because of the institutional nature of the EU decision-making structure. The variable $\partial l_j / \partial l_i$ allows us to test if some countries or groups of countries free ride on other countries. We are likewise able to test if countries which receive a larger share of the CAP benefits free ride on those which receive a smaller share. In the empirical model we estimate the best response function for each group of countries[13]. We express the individual country COPA fees as a function of the share of the Commission subsidies it receives (endogenous variable) and a number of variables which control for the political environment, farm structure and the farmers ability to pay the COPA fee.

Data

The data used to estimate the economic model came from a number of public and private sources. Data on CAP benefits received by farmers in each country and by benefit category are reported in *Agriculture in the European Union-Statistical and Economic Information (various issues) and European Commission (2006)* which are both available on the web. We define the benefit categories as: 1) direct producer subsidies plus export subsidies (i.e. guaranteed payments), and 2) structural adjustment payments. No attempt was made to estimate the benefits from reduced market access, for example tariffs. From

[12] If the equilibrium were a Cournot-Nash no free riding would occur in equilibrium. We thank a reviewer for this making this point.
[13] How and why we aggregate countries is discussed in the data section of the paper.

the same source we collected total country contributions to the EU and the support received by farmers. We divided the benefits reported for each country by the number of farmers in that country. Through necessity we use average lobbying costs and benefits per farmer because it is not possible to match the farmer COPA fee to the CAP benefit received. The data is summarized in table 2.

The political variables were collected from a World Bank publication by Beck et al. (2007). Two political variables were created from this data. First, the data reports if the Chief Executive Officer (CEO) of the government is right, centre, left, no party, or not applicable. From this we created a binary variable indicating the political leaning of the CEO. Second, the data reports if the largest party in government is right, centre, left, no party, or not applicable allowing a second binary series to be developed. This data exist for all 25 member countries for the period 1990 to 2005.

Data on the size of the economy and the percent the rural population makes up of the total population was taken from the *World Development Indicators* (World Bank, 2006). This data is available on the World Bank CD Rom. Data for U.S. commodity prices and world commodity production was taken from the USDA-ERS website (USDA-ERS, 2007). Finally, data on agricultural prices and production in the EU was collected from *Agriculture in the European Union*.

We test for free riding on lobbying costs (i.e. fees paid to COPA) by creating three sets of EU member countries with three groupings in each set.[14] How much farmers from a given country contribute to COPA is not for them to decide but results from COPA's regime for determining 'membership' fees, which is a bargaining process between the member country farm organization and COPA. The COPA contributions per farmer by the various groups are summarized in table 3. In the first set we group EU countries by agricultural structural characteristics as suggested by Jensen et al. (2007). We label the groups northern, southern and eastern member states. In the second and third set we group the countries by the share of direct subsidies and structural payments received each year per farmer respectively, for each country. If they received over 7.5% they are in the large group, between 7.5% and 3% they are in the medium group, and less than 3% in the small group. These groupings are somewhat arbitrary, however when the shares were calculated countries clustered around these share percentages.[15] The COPA contribution by member countries for the period 2000-2006 (table 2 shows the years 2000-2005) was provided by the Danish Agricultural Council and the German Farmers Organization. COPA

[14] We would have chosen to have each country included separately, however due to our degrees of freedom we needed to reduce the number of variables.
[15] Alternative clusters were used in the estimation and produced similar economic results.

contributions prior to 2000 were not made available even though we requested the data from numerous sources.[16] The countries in each grouping are shown in appendix A.

Econometric Modeling

Our modeling efforts consist of a number of steps. First we demonstrate a correlation between the lobbying expenditure on COPA and the CAP subsidies per farmer in different EU member states. Second, we model member states' free-riding behaviour by accounting for possible endogeneity of lobbying related variables and, third free-riding behaviour is modeled by accounting for the underlying dynamics in the lobbying process. The equilibrium level of lobbying for each EU country can be determined by solving for the best response function for each group of countries. We write the best-response function for each group as:

$$l_i = H_i\left(L_{-i}, S_i, Q\right) \qquad [3]$$

where L_{-i} is a vector of lobbying expenditures made by all countries except i, S_i is the share of the CAP subsidies going to country i, and Q is a vector of exogenous variables that alter the total CAP subsidies. Finally, we aim to account for possible systemic correlations in the variables of our dataset characterized by a relatively small number of years and a relatively large number of cross-sections (i.e. member states).

Bootstrapped Seemingly Unrelated Regression

To test for a possible correlation between the direct subsidies or structural subsidies paid to each member state and its lobbying expenditure we formulate a multiple equations regression system as shown in [4]:

$$\begin{aligned} \mathrm{dbenf}_{it} &= \mathrm{copapayf}_{it} + \sum_k \delta_{kit} x_{kit} + \varepsilon_{1it} \\ \mathrm{stenf}_{it} &= \mathrm{copapayf}_{it} + \sum_k \delta_{kit} x_{kit} + \varepsilon_{2it} \end{aligned} \qquad [4]$$

where the endogenous variables dbenf_{it} and stbenf_{it} denote the direct subsidies per farm, and the structural subsidies per farm respectively, paid to member state i in year t. The exogenous variable $\mathrm{copapayf}_{it}$ is the lobbying expenditure per farm paid to COPA by member state i at time t. The subscript k relates to different additional exogenous variables x controlling for the official payments made to the EU as well as the total

[16] A lot of time was spent trying to attain more years of COPA data. Most country farm organizations stated they only retained the data back to 2000. The COPA office has been very reluctant to provide any data. In addition it would have been ideal to have data for the national farmers' organizations CAP lobbying costs but such data are not easily accessible. Even if it were possible to get the financial statements of all European-farm lobby groups it would be difficult to distinguish between CAP lobbying activities and other types of lobbying.

agricultural expenditure per farm by the individual state, different general economic and agricultural sector related indicators as well as the overall political structure of member state *i* at time *t*.

As the endogenous variables are assumed to be affected by the same exogenous variables the variation in the unexplained error terms are linked over the single regressions due to country specific factors. Consequently a system estimation technique (seemingly unrelated regression SUR) is used (Greene, 2003) and a Breusch-Pagan test is applied to test for the significance of this underlying modeling hypothesis.

Different contributions have shown that all panel data estimators perform badly when both panel dimensions – unit of observation and unit of time - are small, especially when the true value of the autoregressive parameter is close to 1 (see e.g. Chang, 2003; Kapetanios, 2004; Emerson and Kao, 2005). Corrected estimators e.g. bootstrap procedures generally perform better at estimating the coefficients of the exogenous variables (Everaert and Pozzi, 2007). In dynamic panels with a small or moderate time dimension the bias of the estimator may be substantial. Hence, to test for the robustness of our estimates obtained by [4] we further apply a simple stochastic re-sampling procedure based on a nonparametric bootstrapping technique to obtain the standard errors of our estimates (Efron and Tibshirani, 1993). This seems to be necessary as our panel data sample consists of a (rather) limited number of observations. As is extensively discussed by Horowitz (2001) the bias of the bootstrap as an estimator is itself a feasible estimator of the bias of the asymptotic estimator of the true population parameter. By using a bias corrected bootstrap we aim to reduce the likely small sample bias in the initial estimates.

Bootstrapped Instrumental Variables Regression

Next we model member states' free-riding behaviour by accounting for possible endogeneity in the explanatory variables. As outlined above the equilibrium level of lobbying for each member state can be determined by solving for the best response function with respect to each group of states. Member state *i's* lobbying expenditure l_i can be modelled as a best response function defined by

$$l_i = R_i(\mathbf{L}_{-i}, S_i, \mathbf{d}, \mathbf{z}) \qquad [5]$$

where $\mathbf{L}_{-i}$ is a vector of the lobbying expenditure by a group of member states except state *i*, S_i as the share of CAP subsidies/rents (i.e. direct benefits, structural benefits) going to state *i*, **d** as a vector of exogenous EU and state specific political variables

respectively (i.e. Fischler reform, governing party: left wing or central orientation), and $\mathbf{z}$ as a vector of country specific structural economic variables (i.e. % of rural population, agriculture related GDP, GDP per capita) both affecting l_i. $\mathbf{d}$ and $\mathbf{z}$ are the elements of Q in equation 3. The explanatory variables S_i as well as $\mathbf{L}_{-i}$ are reasonably assumed to be endogenously determined, however, in order to use an instrumental variable estimation approach (IV), instruments have to (i) be correlated with the endogenous variable to be instrumented, and (ii) be correlated with the disturbance terms.

By performing an augmented regression test (DWH) following Davidson and MacKinnon (1993) we can reject the null hypothesis of complete exogenous determination for all explanatory variables tested. This leads us to the conclusion that an IV regression procedure would be more consistent than simple OLS. Hence, the estimation model is based on an instrumental panel regression by assuming a log-linear functional form and estimating

$$\ln l_i = \alpha + \delta \ln \mathbf{L}'_{-i} + \beta \ln S'_i + \chi \ln \mathbf{d} + \gamma \ln \mathbf{z} + \varepsilon_i \qquad [6]$$

as well as the instrumental equations

$$\ln \mathbf{L}'_{-i} = \gamma \ln \mathbf{z} + \chi \ln \mathbf{d} + \lambda \ln \mathbf{c} \qquad [7]$$

$$\ln S'_i = \gamma \ln \mathbf{z} + \chi \ln \mathbf{d} + \lambda \ln \mathbf{c} \qquad [8]$$

where $\mathbf{c}$ is a vector of exogenous general and country specific economic variables (i.e. agricultural input price index, USD/Euro exchange rate, US wheat price, China wheat quantity, Soviet Union/Russia wheat quantity, US soybean price, milk produced per country, beef produced per country, cereals produced per country). The explanatory variables S'_i as well as $\mathbf{L}'_{-i}$ are assumed to be endogenously determined by [7] and [8] respectively. The equations [6] to [8] are simultaneously estimated based on per farm ratios to control for the differing size of the agricultural sector between member states.

The estimates obtained for $\mathbf{L}_{-i}$ as the vector of the lobbying expenditure by a group of member states except state i are used to test the hypotheses on rent seeking and free-riding behaviour. Therefore the following lobbying expenditure oriented groupings of member states are used (see appendix A):

a. based on similar structural characteristics: L_{cn}, L_{cs}, L_{ce},
b. based on the relative share of direct CAP subsidies received (more than 7.5%, between 3 and 7.5%, and less than 3% of the total direct payments at time t): $L_{cd75}, L_{cd375}, L_{cd3}$, and

c. based on the relative share of structural CAP subsidies received (more than 7.5%, between 3 and 7.5%, and less than 3% of the total structural payments at time t): $L_{st75}, L_{st375}, L_{st3}$.

In addition to these groupings, other combinations were tested by a common likelihood-ratio (LR) test procedure (e.g. based on the relative share of the total payments or the date of accession to the EU). However, the results for these other subgroups were statistically insignificant.

Because of region-specific unobservable latent effects the classical two-stage least square (2SLS) estimator might not be efficient. Baltagi (1981, 2001) proposed an error components two-stage least square (EC2SLS) estimator as the IV analog of a general random-effects model based on a weighted combination of the between groups 2SLS; the between time-periods 2SLS and the within 2SLS (Baltagi, 1984). Consequently, we first regress the endogenous variables on the complete set of exogenous variables in the system (see [7] and [8]) modified by the 'within' as well as the 'between' transformation, plus the exogenous instruments $\mathbf{c}$ as outlined above. In the second stage, the outcome is then regressed on the exogenous variables and the predicted values ($\mathbf{L}', S'_i$) from the first stage regressions in place of the original exogenous variables. Beside testing for the validity of the chosen functional form by a Hausman specification test, different other diagnosis tests are conducted (i.e. White's heteroscedasticity test, Wooldridge's test for autocorrelation in panel data). Finally, as for the SUR model we again apply a nonparametric bootstrap to account for a possible small sample bias.

Robust System GMM

Besides showing the features of endogeneity, the lobbying process we are investigating may be dynamic with current realizations of the dependent variable influenced by past ones. Further, it seems reasonable to assume that the independent variables used are not strictly exogenous and are correlated with past and current realizations of the error term: the payments made to COPA per group are partly determined by subsidies received in the past as well as other structural and political variables and effects captured by the error term. In addition, arbitrarily distributed fixed individual effects could play a role with respect to the dependent variable (e.g. the informal decision by a member to lobby for anticipated policy changes in the future). The disturbances may show individual-specific patterns of heteroscedasticity and serial correlation, and finally our panel data set used is characterized by a relatively small

number of time periods. Consequently, [6] is re-formulated by assuming again a log-linear functional form

$$\ln l_i = \alpha + \varphi \ln l_{it-1} + \vartheta \Delta \ln l_{it,t-1} + \beta \ln S'_{it-1} + \eta \Delta \ln S'_{it,t-1} + \delta \ln \mathbf{L}'_{-it} + \chi \ln \mathbf{d}_{it-1} + \kappa \Delta \ln \mathbf{d}_{it,t-1} + \gamma \ln \mathbf{z}_{it-1} + \nu \Delta \ln \mathbf{z}_{it,t-1} + \varepsilon_i \quad [9]$$

including now lagged (t-1) as well as first differences (Δt,t-1) of the independents defined as above.

This model formulation leads us to consider, besides the previously described estimator, the difference and system linear generalized method of moments (GMM) estimators (Arellano and Bond, 1991; Blundell and Bond, 1998). Those estimators are based on the method of moments estimation procedure minimizing the Euclidian distance of $\left|\bar{m}_k(\zeta) - 0\right|$ with $\bar{m}_k(\zeta)$ as the moment k as a function of the vector of the parameters to be estimated ζ (see Greene, 2003 or Hansen, 1982). The GMM first-differenced estimator (GMM-DIF) uses an instrument matrix containing all the instruments for all the regressors where each instrument depends on the specific assumption made about endogeneity, predetermination and exogeneity of the corresponding instrumented variable (Arellano and Bond, 1991). Bond (2002) showed, however, that this estimator looses its efficiency when φ in equation [9] tends to unity as a consequence of persistent time series and when the ratio of the variance of the idiosyncratic component v_i to the variance of the overall error term ε_i becomes large due to short panels.

As both is the case for our data set we follow a system GMM (GMM-SYS) estimator approach (Blundell and Bond, 1998) and add untransformed level equations instrumented by first differences to the estimation model to account for this flaw. The GMM-SYS estimator exploits all information in the levels and difference equations based on [9] and is consistent if there is no second-order serial correlation in the error term of the first differenced equation, requiring $E\left|\Delta\varepsilon_{it}, \Delta\varepsilon_{it-2}\right| = 0$. We test for this by using the Arellano-Bond test for serial correlation (Arellano and Bond, 1991). Further, a Sargan and Hansen test for overidentifying restrictions is applied (Sargan, 1958) testing the hypothesis whether the overidentifying restrictions are close to zero. Finally, to account for likely heteroscedasticity we report White's robust variance-covariance estimator based standard errors.

Results and Discussion

The estimated models show a satisfactory overall significance, more than 80% of the parameter coefficients are significant for the EC2SLS and the GMM models (see

tables 4 to 6). The statistical robustness is further confirmed by the bootstrapped standard errors. The Breusch-Pagan test statistic confirms the assumption of dependent error terms underlying the SUR model specification. The DWE test on endogeneity resulted in a rejection of the exogeneity hypothesis for all variables tested, and the Hausman specification test rejects a fixed-effects modeling approach in favor of the chosen error components instrumental regression model (EC2SLS). However, whereas the null hypothesis of a possible autocorrelation is rejected, White's heteroscedasticity test procedure does not satisfactorily reject the hypothesis of heteroscedastic error terms. The latter result confirms, however, the additional estimation of a dynamic GMM-SYS model to generate further evidence on the statistical robustness of the estimates obtained by the EC2SLS estimation procedure. For the GMM estimation the Arellano-Bond as well as the Sargan and Hansen test results show the consistency of the model (i.e. no second-order serial correlation in the error term of the first differenced equation) as well as the validity of the instruments chosen (i.e. hypothesis of over identification is significantly rejected). Finally, with respect to the definition of the free-riding related variables, the performed LR-tests significantly reject the null hypothesis of no joint significance for all groups defined and models estimated.

Our first conjecture is that the COPA fees are a proxy for lobbying expenditures and thus will be correlated with CAP benefits. We test this by estimating a model where direct subsidies per farm and structural payments per farm are estimated simultaneously as a function of COPA fees per farm and other control variables. The results are shown in table 4 (equation 1 of table 4 shows the direct subsidy and equation 2 shows the structural subsidy). It is interesting to note that the elasticity for COPA expenditures in equations 1 and 2 is 0.001 and 0.0002, respectively, which is an order of magnitude different. This suggests that the COPA expenditures have a larger influence on the level of direct subsidies than on structural subsidies. This result is expected given that individual farmer benefits more from direct subsidies than structural subsidies, at least in the short term. Given the strong results in table 4 we conclude that COPA fees paid by member country farmers are a reasonable proxy for lobbying expenditures.

Second, we estimate two models to test our hypothesis regarding free-riding behavior, one static model and one dynamic model. The results for the static model are reported in table 5 and for the dynamic model in table 6. In the dynamic model variables are lagged one period and first differenced. We did not test longer lags because of the lack of a sufficient time series on COPA fees. The results between the two models are consistent.

We conduct three tests for free-riding behavior in the static model. Our test of free-riding behaviour is less definitive than we would have liked because of the need to aggregate individual countries into country groups. This was required because of our lack of a longer time series of data on COPA fees. First, we find that the northern and eastern group of countries free ride on the southern group of countries. This is shown in table 5 by the negative sign on the coefficient for the variable *lncsf*. This result is interesting for a number of reasons. First, the explanation for the free riding by the northern compared to the eastern countries is different. As pointed out by Jensen et al. (2007), in a cluster analysis grouping, the countries in the northern subgroup have a greater ability to capture CAP payments because they are the major cereal, oilseed, sugar and livestock producing countries. That is, the similar structure of their agriculture sector gives them similar lobbying interests. Eastern countries, which joined the EU after 2004 have little reason to lobby given their subsidy share, i.e. their share of θ, is lower than the countries which joined earlier.

The second test for free-riding behavior examined countries grouped by their share of direct subsidies per farm. We do not reject the hypothesis that the groups of countries which receive the larger and smaller share respectively, free ride on those countries receiving a medium share of the direct payments. This is shown in table 5 by the negative sign on the estimated coefficient for the variable *lncd375f*. In most empirical examples of free-riding behavior, (Ludema and Mayda 2006, and Baylis and Furtan 2003) the players who gain the least from lobbying free ride on those who gain more. In our case we find that the largest and smallest players free ride on the medium sized players. It is understandable why the countries who gain the least per farmer free ride on those who gain more, but not so obvious why the largest beneficiaries free ride on the medium group. One explanation for this result is that there is path dependency in the CAP. The countries that benefit the most tend to be early participants in the EU. They were able to influence the design of the payment scheme to favour the type of agriculture in their country. For example, the support and subsidies to cereal crops, sugar beets and livestock were large compared to the payments for fruit and vegetable production, and olive oil.[17] Once the payment scheme is designed and placed in legislation it is difficult to change. In an environment where the benefit design is more or less fixed, countries that want the size of the club good to be expanded i.e. an increase in the direct payments to farmers who produce different products may be subject to free riding. As the proportion of the countries in the 'larger' grouping declines the 'old way of doing things' becomes less popular

[17] This statement applies to the CAP before the Fischler Single Payment Scheme was put in place.

among the farmers in the other member countries, i.e. it is difficult for COPA to represent such a diverse set of interests. This path dependency argument is consistent with the observation that COPA may be losing some of its ability to influence the Commission. We discuss this in more detail later in the paper.

The third hypothesis for free riding examines the question of lobbying for structural payments. We reject the hypothesis that there is free riding on structural payments. This is consistent with our expectation that COPA did not spend its lobbying resources on seeking increased structural payments to the extent they did on direct subsidies, because they do not benefit farmers directly. The sign on the estimated coefficients suggest that if free riding is occurring, it is the groups of countries who receive less of the benefit that free ride on group of countries that receive the largest share. Another possible explanation for this result is that structural payments benefit all the rural population and all rural residences do not pay the COPA fees.

The hypothesis that the lobbying effort would increase in the run up to the Fischler reforms can not be rejected. The estimated coefficient on the *fisch* variable is 0.029. This is a rational reaction of a lobbying group which wants to influence the outcome of the changes to the CAP. The Fischler reforms did significantly change the benefits of the CAP, i.e. for example through the creation of the Single Payment System (SPS). The SPS started the decline in the magnitude of the direct subsidies paid to farmers by setting a formula whereby the payments decline after 2008[18]. However, the SPS did not significantly change the distribution of the benefits between countries or between farmers and may be seen as a buyout of the direct payment benefits. The COPA lobby may see success in maintaining the distribution of CAP payments among countries, which may have been one of its objectives.

The sign of the estimated parameters on the variable for political parties (*partyc* and *partyl*) is consistent with our expectations. Conservative governments are generally more supportive of farmers which lead to greater direct subsidies while socialist governments are less supportive. We need to control for the fact that a conservative government is more likely than a socialist government to lobby the Commission for a continuation or increase in CAP payments to farmers, i.e. increase the amount of the Commission budget (θ) spent on agricultural support. It is possible that a conservative government would encourage farmers to maintain their financial support for COPA. Our empirical results are consistent with this perspective.

[18] The process of moving financial resources from direct payments to structural payments is called modulation. How this payment system evolves after it is reviewed in the 2008 Health Check of the CAP remains to be determined.

The estimated coefficients for the size of the rural population (*lnrurpopf*), and size of the agriculture sector (*lnaggdpf*) were both significant with the expected positive sign. As the share of the rural population increases the greater is the support for COPA. The larger the agriculture GDP per farmer the more able farmers are to pay COPA fees. These variables control for the ability-to-pay for lobbying and the political support arising from a country with a greater connection to the agriculture sector. The higher the total GDP per capita (*gdpp*) controls for the tendency of richer countries to support farmers more than poorer countries.

We now turn to the results presented for the dynamic model (table 6). In this model we control for the lagged effect and first difference of the variables. We do not reject the free riding hypotheses which are consistent with those from the earlier static model. When countries are grouped by their structural characteristics it is the northern and eastern groupings of countries that free ride on the southern countries. Also, we can not reject the hypothesis that the countries which receive the larger and smaller benefit per farmer of direct subsidies free ride on the medium grouping. One change from the static model is that the estimated coefficients are significant for the variables measuring the lobbying for structural benefits. The data suggest that the medium and smaller grouping (in terms of benefits per farmer from structural payments) free ride on the larger grouping. The countries that benefit the most per farmer from structural payments tend to be the southern and newer EU member countries (see appendix A). This result is consistent with other studies that show that the larger beneficiaries of a public good tend to pay more than their share (i.e. their share of the benefits) of the lobbying costs (Ludema and Mayda 2006).

The remaining estimated parameters in the dynamic model are consistent with those from the static model with the exception of the share of rural population per farm. The coefficient on this variable is now negative and significant. The explanation here may be that in a dynamic sense as more of the rural population is not directly associated with agricultural production their support for agriculture is diminishing over time. This is particularly the case in northern European countries where there is a lot of concern from rural manufacturers and residential households with the environmental problems brought about by agricultural production.

If free riding was not present the lobbying expenditures or fees paid to COPA by farmers would be larger. We calculate the increase in COPA resources if none of the groups of countries free rode. We do this by comparing the predicted lobbying expenditure with free-riding behaviour and the predicted lobbying expenditure without

free riding. The total increase in lobbying resources that would have been allocated to COPA is approximately 7.5% or Euro 400,000 for the 2005 COPA budget.[19]

In this paper we found only a low level of free riding within COPA. The most important factor in explaining the low level of free riding is that COPA has been successful in avoiding free riding due to selective incentives especially the very low per-farmer COPA fees (table 2). But the expectation that COPA's influence in the CAP decision-making process is declining does not completely confirm this result because COPA represents so many farmers from different countries that conflicting interests are unavoidable on some issues especially after the enlargement of the EU. COPA can only lobby for cases where its members do not have conflicting interests, which naturally decreases the number of common issues and the level of influence. From this perspective other channels of lobbying (i.e. other than COPA) will be more attractive. Also the low level of free riding can be explained by the fact that the COPA fees are so low (selective incentives) that they outweigh the incentive for free riding induced by COPA's declining influence. Finally, national lobbying groups have substantial amounts of CAP lobbying expenditures independent of COPA, which we do not include in our analysis. On these expenditures we would potentially observe a different free-riding pattern including substantial counter active lobbying.

Conclusions

The major contribution of this paper is that it uses a unique set of data on lobbying expenditures to provide an empirical estimate of the optimal lobbying expenditure by EU farmers. COPA lobbies the Commission for greater CAP benefits for farmers. The multi-level governance system used by the EU makes it subject to rent-seeking activity. This lobbying process has occurred at many levels of governmental activity, however at the EU level the farm organization COPA has been a principle player. While EU farmers have been successful in lobbying for substantial economic benefits for some farm commodities our analysis suggests farmers are under investing in rent-seeking activities due to the presence of free-riders. From the perspective of COPA, its ability to achieve the type of internal discipline that would reduce free-riding will determine its lobbying budget, and thus its effectiveness.

The CAP is a club good for farmers. Entry into farming has not been restricted, thus collective action problems are present in the funding of the rent-seeking activities. In

[19] This increase is much smaller than the 40-50 % increase in fees reported by Baylis and Furtan (2003) for the Canadian dairy sector in the absence of free riding.

this paper we have demonstrated that some member countries have been able to free ride on the cost of lobbying. This free riding was the strongest in the lobbying for direct payments and less so for structural payments. We also show that lobbying increased before the Fischler reforms in 2003. In a dynamic sense structural payments are becoming more important as direct payments decline. In the future COPA may place more resources into lobbying for structural payments for farmers. This effect may already be showing up in the data.

The current set of European agricultural policy has evolved from previous agricultural policies which have required a major political effort. Due to the design of the CAP decision-making process, the majority of the EU-member countries must agree before there can be any change to the design of the policy. Simultaneously, rent seekers like COPA try to influence decisions on the CAP. The institutional setup of the decision-making for the Commission and the Council of Agriculture Ministers induces a high degree of path dependency in the agricultural policy development process, and makes the initial choice of policy instruments fundamental in the sense that they are difficult to change.

The initial success of COPA was built on a very close relationship between COPA and the DG Agriculture, and the fact that the original COPA members largely agreed on the primary objectives of the rent seeking effort, namely to maintain a high level of farm income by the means of price support. The movement towards a higher degree of indirect subsidization in the form of structural payments, which favor less intensive agricultural production, has only gained momentum since the accession of the southern European countries and other new member countries with more extensive agricultural production patterns. Also, the move to freer world agricultural trade as a result of Uruguay Round Agreement on Agriculture in 1996 has impacted the type of support policies available to the EU. The movement from price support towards direct payments and decoupled direct payments in the Fischler reform tells yet another story. In the recent reforms of the CAP the northern countries wished to create a more market oriented agricultural policy (much in line with what was proposed by the Commission) whereas the southern countries wanted to be sure to keep their newly acquired benefits of the CAP. A more market oriented CAP will benefit the highly productive and competitive farming structure in the north, whereas it will be of less benefit to smaller less competitive farms which typically exist in the south. For this reason the southern countries have strong incentives to keep status quo and to secure the benefits for the smaller farmers. Therefore, the southern farm organizations have a strong incentive to contribute to the rent seeking effort in COPA. As

the Commission proposals (i.e. Fischler reforms) were much in line with the wishes of the northern countries, only weak incentives existed for northern countries to invest in a rent seeking effort. The diverging interests of the increasing number of COPA members is as previously mentioned the key to the free riding on the southern members by the northern and eastern European members.

As the EU becomes more complex due to the addition of new countries lobbying for specific farm policies will be more difficult. Farmers in different countries have different factor endowments, different technologies, different managerial abilities, and different economic and social objectives. This may make it more difficult for farm organizations like COPA to control free-riding behaviour by its members. The observation that COPA is less influential in the CAP decision-making process than it once was should be of no surprise.

References

Agricultural in the European Union-Statistical and Economic Information. Various years, Published by the EU Commission, Brussels.

Arellano, M. and S. Bond. 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies* 58: 277 – 97.

Baltagi, B.H. 2001. *Econometric Analysis of Panel Data*. 2nd ed., New York: John Wiley and Sons.

Baltagi, B.H. 1984. "Short and Long Run Effects in Pooled Models." *International Economic Review* 25: 631 – 645.

Baltagi, B.H. 1981. "Simultaneous Equations with Error Components." *Journal of Econometrics* 17: 189 – 200.

Baylis, K. and H. Furtan. 2003. "Free-Riding on Federalism: Trade Protection and the Canadian Dairy Industry." *Canadian Public Policy* 29(2): 147 - 162.

Beck,T., P.E. Keeter, G.R. Clarke, P. Walsh, and A. Groff. 2007. Database of Political Institutions (2005), World Bank, Washington.

Blundel, R. and S. Bond. 1998. Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics* 87: 11 – 143.

Bond, S. 2002. *Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice.* Working Paper, 09/02. Institute for Fiscal Studies. London.

Buchanan, J.M. and G. Tullock. 1974. *The Calculus of Consent*. Ann Arbor, MI: University of Michigan Press.

Calzolari, G. and G. Immordino. 2005. "Hormone beef, chlorinated chicken and international trade." *European Economic Review,* 49: 145 - 172.

Chang, Y. 2003. "Bootstrap Unit Root Tests in Panels with Cross-Sectional Dependency" *Journal of Econometrics,* 120: 263 - 293.

Clark, J. R. A. and A. Jones. 1999. From policy insider to policy outcast? Comité des Organisations Professionnelles Agricoles, EU policymaking, and the EU's 'agri-environment' regulation. *Environment and Planning C: Government and Policy 1999.* Vol. 17, pp. 637-653.

COGECA. 2007. *COGECA's representativity.* About COGECA – Objectives. Available online at: http://copa-cogeca.be.en/cogeca_objectifs.asp

Coleman, W. D. and S. Tangermann. 1999. "The 1992 CAP Reform, the Uruguay Round and the Commission: Conceptualizing Linked Policy Games", *Journal of Common Market Studies,* 37(3): 385-405.

COPA. 2007. *COPA: The dynamic force of European farmers.* About COPA - Objectives. Available online at: http://copa-cogeca.be.en/copa_objectifs.asp

Daugbjerg C. and A. Swinbank. 2007. "The Politics of CAP Reform: Trade Negotiations, Institutional Settings and Blame Avoidance", *Journal of Common Market Studies,* 45(1): 1-22.

Davidson, R. and J.G. MacKinnion. 1993. *Estimation and Inference in Econometrics*. New York, Oxford University Press, 1993.

De Gorter, H. & J. Swinnen.2002. "Political Economy of Agricultural Policy." In: *Handbook of Agricultural Economics, Volume 2B, Agricultural and Food Policy.* Eds. B. L. Gardner & G. C. Rausser. Elsevier, Amsterdam

Edwards, D. and D. Spence. 1994. The Commission in perspective. *In: The European Commission, eds. G. Edwards and D. Spence.* 1st edition. Longman Group Limited, Harlow.

Efron, B. and R.J. Tibshirani. 1993. *An Introduction to the Bootstrap*. Chapman & Hall, London. UK.

Egeberg, Morten, 2002. The European Commission – the evolving EU executive. *ARENA Working Papers WP 02/30.* Centre for European Studies, University of Oslo, Oslo, Norway.

Emerson, J. and C. Kao. 2005. "Bootstrapping and Hypothesis Testing in Non-Stationary Panel Data" *Applied Economics Letters,* 12: 313 - 318.

European Commission. 2006. *Allocation of 2005 EU expenditure by Member State.* http://ec.europa.eu/budget/documents/revenue_expenditure_en.htm - not directly cited.

Everaert, G. and L. Pozzi. 2007. "Bootstrap-Based Bias Correction for Dynamic Panels" *Journal of Economic Dynamics and Control,* 31: 1160 - 1184.

Flowers, M.R. 1987. "Rent Seeking and Rent Dissipation: A Critical View," *Cato Journal* 7(2):431-440.

Greene, W.H. 2003. *Econometric Analysis* 5th ed. Prentice Hall, Upper Saddle River, New Jersey, USA.

Grossman, G.M. and E. Helpman. 1996. "Rent Dissipation, Free Riding and Trade Policy," *European Economic Review* 40:793-803.

Hansen, L. 1982. "Large Sample Properties of Generalized Method of Moments Estimators." *Econometrica* 50 (3): 1029 – 1054.

Horowitz, J. L. 2001. *"The Bootstrap"*. In: Heckman, J. J., E., Leamer (Eds.), Handbook of Econometrics, Vol. 5, 3159 – 3228, Amsterdam: North -Holland.

Jensen, M.S., K.M. Lind, and H. Zobbe. 2007. "Enlargements of the European Union and Agricultural Policy Reform". Conference paper from the conference: Agricultural

Policy Changes: Canada, EU and the World Trade Organisation, 13-15 September 2007, University of Victoria, Canada.

Kapetanios, G. 2004. *A Bootstrap Procedure for Panel Datasets with many Cross-Sectional Units.* Queen Mary College, University of London, Working Paper Series, Oct. 2004: 15 pp.

Kohler-Koch, B., 1992. "Interessen und Integration. Die Rolle organisierter Interessen im westeuropaischen Integrationsprozess" *Politische Vierteljahresschrift*, 33: 81 - 120.

Loehman, E., F.N. Quenel and E.M. Babb. 1996. "Free-rider effects in rent-seeking groups competing for public goods," *Public Choice* 86:35-61.

Ludema, R.D. and A.M. Mayda. 2006. Do Countries Free Ride on MFN?, National Bureau of Economic Research.

Nedergaard, P. 2005. *Organiseringen af den Europæiske Union, Bureaukrater og institutioner: EU-forvaltningens effektivitet og legitimitet.* 4th edition. Handelshøjskolens.

Nedergaard, P. 2006. "Market failures and government failures: A theoretical model of the common agricultural policy", *Public Choice*, 127(3-4): 385-405 (May).

Olson, M. 1965. *TheLogic of Collective Action.* Cambridge, MA: Harvard University Press.

Paapi, F.U and Christian H. C. A. Henning. 1999. "Organization of influence on the EC's common agricultural policy: A network approach," European Journal of Political Research, Vol 36, pp. 257-281.

Persson, T. and G. Tabellini. 2000. *Political Economies: Explaining Economic Policy.* MIT Press, Cambridge Massachusetts.

Sandler, T and K. Hartley. 2001. "Economics of Alliances: The Lessons for Collective Action," *Journal of Economic Literature* 39:869-96.

Sargan, J. 1958. "The Estimation of Economic Relationships using Instrumental Variables." *Econometrica*, 26 (3): 393 – 415.

Swinnen, J. and F.A. van der Zee, 1993. "The political economy of agricultural policies: a survey," *European Review of Agricultural Economics,* 20:261-290.

USDA-ERS. 2007. Foreign Agricultural Trade Data**,**
http://www.ers.usda.gov/Data/FATUS/

World Bank. 2006. *World Development Indicators,* CD ROM, Washington.

Table 1: CAP payments, and COPA costs (country per farmer, 2005)

Country	*% direct payments*	*% of structural payments*	*% of Total payments*	*% of COPA fees*
BE	9.56	2.69	8.31	11.61
CZ	3.57	8.6	4.49	6.79
DK	12.95	2.3	11.03	12.4
DE	7.98	5.13	7.46	3.07
EE	0.53	4.42	1.23	2.58
EL	1.22	0.47	1.08	0.44
ES	2.5	1.23	2.27	1.1
FR	8.19	3.77	7.38	2.1
IE	0.45	0.51	0.46	0.17
IT	17.52	12.7	16.65	9.02
CY	0.1	0.51	0.17	1.58
LV	0.11	1.76	0.41	0.55
LT	0.27	1.36	0.47	0.56
LU	6.35	16.16	8.13	14.69
HU	0.37	0.47	0.39	0.4
MT	0.01	1.82	0.33	1.56
NL	6.62	1.93	5.77	7.31
AT	2.28	6.99	3.14	3.5
PL	0.18	0.66	0.27	0.23
PT	0.97	1.38	1.04	0.92
SI	0.21	2.24	0.58	0.92
SK	0.82	3.82	1.36	2.09
FI	4.33	11.88	5.7	4.23
SE	5.6	5.6	5.6	7.89
UK	7.2	1.36	6.14	4.17

Source: Authors calculations

Table 2: Descriptive Statistics for the model

variable (n = 102, years 2000 - 2005)	**mean**	**std. dev.**	**min**	**max**
direct subsidies per farm (in '000 Euro)	8.691	7.992	2.76e-04	31.637
structural subsidies per farm (in '000 Euro)	1.564	1.658	0.083	6.857
COPA payment per farm (in Euro)	1.639	1.762	0.008	6.367
largest political party conservative ('0' else, '1' conservative)	0.453	0.499	0	1
largest political party leftwing ('0' else, '1' leftwing)	0.147	0.355	0	1
share of rural population (in %)	26.701	12.936	2.371	50.785
agricultural GDP per farm (in '000 Euro)	6.374	9.100	0.057	32.205
total GDP per capita (in '000 Euro)	20.484	8.786	2.366	58.100
Fischler reform ('0' pre-, '1' post-reform)	0.333	0.473	0	1
input price index (2000 = 100)[2]	100.094	5.007	87.5	136.0
USD/Euro exchange rate (nominal exchange rate)[2]	0.961	0.133	0.804	1.118
US wheat price (USD per bushel)[2]	3.193	0.358	2.62	3.56
China wheat produced ('000 tons)[2]	96020.5	8945.325	86490	113880
SU wheat produced ('000 tons)[2]	77260.67	14734.91	60910	96949
US soybean price (USD per bushel)[2]	5.555	0.977	4.38	7.34
EU milk production per farm (in '000 Euro)[2]	1.712	2.241	0.015	9.401
EU beef production per farm (in '000 Euro)[2]	0.915	1.409	0.003	6.652
EU cereals production per farm (in '000 Euro)[2]	1.179	1.665	0.010	6.965

1: all monetary values are deflated with respect to base year 2000.
Source: Agriculture in the European Union Statistics, USDA-ERS, Beck et al (2007), and The World Bank (2006).

2: These variables are included as instruments for the overall level of subsidy. Because of the SUR estimation technique these instruments must be exogenous and correlated with the subsidy.

Table 3: Groups of Members – group wise COPA payments per farm

variable (n = 76, years 2000 - 2005, in Euro)	**mean**	**std. dev.**	**min**	**max**
northern member states	1.259	0.163	1.039	1.503
southern member states	0.352	0.003	0.295	0.402
eastern member states	0.117	0.058	0.031	0.189
member states receiving large share of direct subsidies	0.951	0.335	0.607	1.492
member states receiving medium share of direct subsidies	1.455	0.246	1.061	1.785
member states receiving small share of direct subsidies	2.301	1.509	0.625	4.007
member states receiving large share of structural subsidies	0.696	0.307	0.339	1.196
member states receiving medium share of structural subsidies	1.793	0.650	0.939	2.589
member states receiving small share of structural subsidies	5.368	5.852	1.023	15.323

Source: Authors calculations and data from the Danish Agricultural Council, the German Farmers Organization, and Agriculture in the European Union Statistics.

Table 4: Bootstrapped SUREG – Per Farm Values

(n = 102) Independents	Equation 1 Dependent: Direct Subsidies per Farm (dbenf) coefficient[1]	z-value	standard error 95% confidence interval[2]	Equation 2 Dependent: Structural Subsidies per Farm (stbenf) coefficient[1]	z-value	standard error 95% confidence interval[2]
total agricultural expenditure per farm (agrexpf)	0.215	1.08	[0.121; 0.379]	-0.002	-0.02	[0.043; 0.107]
total payment to EU per farm (totpay)	-0.055	-0.61	[0.056; 0.184]	0.036	1.11	[0.019; 0.049]
COPA payment per farm (copapay)	**0.001*** **	**4.78**	**[1.61e-04; 3.83e-04]**	**1.86e-04** **	**1.96**	**[5.37e-05; 1.28e-04]**
input price index (inputs)	-2.893*	-1.65	[0.735; 5.266]	-3.665***	-5.73	[0.277; 1.584]
USD/Euro exchange rate (useu)	153.849**	1.86	[32.378; 141.551]	153.837***	5.09	[13.596; 44.282]
US wheat price (uswheatp)	5.125	0.34	[5.839; 27.858]	9.859*	1.81	[2.201; 10.649]
China wheat produced (cwheatq)	-2.45e-04	-0.42	[2.33e-04; 00.2]	-1.912e-04	-0.89	[9.06e-05; 3.85e-04]
SU wheat produced (suwheatq)	-4.68e-04	-1.11	[1.64e-04; 9.86e-04]	-6.84e-04***	-4.46	[6.42e-05; 3.47e-04]
US soybean price (ussoyp)	14.356*	1.59	[3.597; 16.061]	18.831***	5.72	[1.468; 6.139]
share of rural population (rurpop)	-1.915	-1.00	[1.172; 2.995]	7.607***	10.90	[0.395; 0.856]
largest political party rightwing (partyr)	2.261	1.09	[1.796; 2.769]	1.641**	2.17	[0.644; 1.002]
largest political party leftwing (partyl)	0.868	0.43	[1.717; 2.695]	1.966***	2.68	[0.587; 0.981]
largest political party conservative (partyc)	1.827	0.89	[1.752; 2.754]	2.344***	3.12	[0.575; 1.017]
EU milk production per farm (milk)	0.003	0.07	[0.026; 0.103]	-0.052***	-3.71	[0.009; 0.023]
EU beef production per farm (beef)	0.249**	2.10	[0.084; 0.194]	0.009	0.23	[0.029; 0.068]
EU cereals production per farm (cereals)	0.564***	11.91	[0.037; 0.117]	0.023	1.34	[0.013; 0.029]
agricultural GDP per farm (aggdp)	0.005	0.38	[0.008; 0.218]	0.003	0.71	[0.003; 0.007]
total GDP per capita (gdpp)	0.002**	1.96	[3.42e-04; 0.001]	0.002***	5.95	[1.56e-04; 5.29e-04]
constant	-0.624	-0.30	[1.749; 2.748]	-1.847**	-2.47	[0.604; 0.995]
Adj. R2	0.943			0.832		
LR chi2	1696.43***			507.00***		
Breusch-Pagan Test [chi2(1)]	57.57***					
Bootstrap Replications	1000					

1: *- 10%-, **- 5%-, ***- 1%-level of significance; 2: bootstrapped bias-corrected standard errors.

Table 5: Bootstrapped IVREG (EC2SLS) – Per Farm Values

(n = 76) Independents	**Static Model 1** Dependent: COPA payment per farm (lncopapayf)		
	coefficient[1]	z-value	standard error 95% confidence interval[2]
direct subsidies per farm (lndbenf)	0.218	3.49***	[0.261; 0.540]
structural subsidies per farm (lnstbenf)	0.105	2.42***	[0.029; 0.128]
COPA payments p.f. northern member states (lncnf)	**22.252**	**2.00****	**[5.796; 57.682]**
COPA payments p.f. southern member states (lncsf)	**-49.720**	**-2.02****	**[13.033; 125.495]**
COPA payments p.f. eastern member states (lncef)	**28.157**	**2.08****	**[7.271; 67.831]**
COPA payments member states receiving large share of direct subsidies (lncd75f)	**4.573**	**3.80*****	**[0.785; 2.814]**
COPA payments p.f. member states receiving medium share of direct subsidies (lncd375f)	**-9.394**	**-3.75*****	**[1.626; 5.779]**
COPA payments p.f. member states receiving small share of direct subsidies (lncd3f)	**5.295**	**4.03*****	**[0.842; 2.931]**
COPA payments p.f. member states receiving large share of structural subsidies (lncst75f)	**-0.985**	**-1.16**	**[0.407; 2.578]**
COPA payments p.f. member states receiving medium share of structural subsidies (lncst375f)	**0.757**	**1.04**	**[0.380; 2.225]**
COPA payments p.f. member states receiving small share of structural subsidies (lncst3f)	**0.790**	**2.49*****	**[0.162; 0.939]**
pre/post Fischler reform (fisch)	0.029	2.76***	[0.008; 0.018]
largest political party conservative (partyc)	0.058	2.09**	[0.018; 0.663]
largest political party leftwing (partyl)	-0.068	-2.46***	[0.022; 0.243]
share of rural population per farm (lnrurpopf)	0.310	3.42***	[0.066; 0.143]
agricultural GDP per farm (lnaggdpf)	0.112	2.61***	[0.023; 0.055]
total GDP per capita (gdpp)	0.221	2.10**	[0.090; 0.209]
constant	391.687	3.14***	[82.484; 249.534]
σ_u 0.391	σ_e	0.029	P 0.994
Adj. R2 within 0.895	Adj. R2 between		0.879
Adj. R2 overall 0.848			
Wald chi2(18) 459.62***	Bootstrap Replications		1000
Instrumented: lndbenf, lnstbenf, lncnf, lncsf, lncef, lncd75f, lncd375f,lncd3f, lncst75f, lncst375f, lncst3f			
Instruments: fisch, partyc, partyl, lnrurpopf, lnaggdp, lngdppf, lninputs, lnuswheatp, lncwheatq, lnsuwheatq, lnussoyp, lnmilkf, lnbeeff, lncerealsf, lnagrexpsizef			
DWH Endogeneity Test			
H_0: variable considered is exogenously determined (F(1, 92))	*ndbenf: 4.73**, lnstbenf: 15.11***, lncnf: 15.50***, lncsf: 14.95***, lmcef: 6.25**, lncd75f: 3.11*, lncd375f: 16.82***, lncd3f: 3.36*, lncst75f: 3.74**, lncst375f: 14.05***, lncst3f: 24.14*** (rejected for all)*		
White's Heteroscedasticity Test *($chi^2(23)$)*	*35.17**		
Wooldridge Autocorrelation Test *(F(1,14)*	*6.393** (rejected)*		
Hausman Specification Test			
H_0: differences in coefficients are not systematic, i.e. random effects model specification is superior ($chi^2(18)$)	*8.65 (not rejected)*		
LR Tests on Specification			
H_0: regional location related free-riding variables have no significant effect ($chi^2(3)$)	*16.59*** (rejected)*		
H_0: direct benefits related free-riding variables have no significant effect ($chi^2(3)$)	*18.06*** (rejected)*		

H_0: structural subsidies related free-riding variables have no significant effect ($chi^2(3)$)	*9.65* (rejected)*

1: *- 10%-, **- 5%-, ***- 1%-level of significance; 2: bootstrapped bias-corrected standard errors.

Table 6: Dynamic Unbalanced Panel Model (One-Step Robust System GMM) – Per Farm

(n = 61)	**Dynamic Model 2** Dependent: COPA payment per farm (lncopapayf)		
Independents	coefficient[1]	z-value	robust standard error[2]
lagged variables			
COPA payments per farm t-1 (lncopapayf_l1)	1.001***	18.3e+04	3.54e-07
direct subsidies per farm t-1 (lndbenf_l1)	0.014***	2.56	3.31e-04
structural subsidies per farm t-1 (lnstbenf_l1)	-0.004	-0.94	0.005
total agricultural expenditure per farm t-1 (lnagrexpf_l1)	0.164**	1.86	0.088
total payment to EU per farm t-1 (lntotpayf_l1)	-0.162**	-1.82	0.089
agricultural GDP per farm t-1 (lnaggdpf_l1)	-0.025**	-2.15	0.012
first differences			
COPA payments per farm d1 (lncopapayf_d1)	0.999***	33.1e+03	2.47e-06
direct subsidies per farm d1 (lndbenf_d1)	0.185***	2.57	0.072
structural subsidies per farm d1 (lnstbenf_d1)	-0.006	-1.31	0.005
total agricultural expenditure per farm d1 (lnagrexpf_d1)	0.025**	2.46	0.006
total payment to EU per farm d1 (lntotpayf_d1)	-0.096**	-1.85	0.052
agricultural GDP per farm d1 (lnaggdpf_d1)	-0.024***	-2.66	0.009
other explanatories			
COPA payments p.f. northern member states (lncnf)	**3.322*** **	**2.77**	**1.197**
COPA payments p.f. southern member states (lncsf)	**-7.296** **	**-2.77**	**2.629**
COPA payments p.f. eastern member states (lncef)	**3.901*** **	**2.74**	**1.425**
COPA payments member states receiving large share of direct subsidies (lncd75f)	**0.010*** **	**2.52**	**0.004**
COPA payments p.f. member states receiving medium share of direct subsidies (lncd375f)	**-0.019*** **	**-2.55**	**0.007**
COPA payments p.f. member states receiving small share of direct subsidies (lncd3f)	**0.011* **	**1.57**	**0.005**
COPA payments p.f. member states receiving large share of structural subsidies (lncst75f)	**-0.015*** **	**-2.49**	**0.005**
COPA payments p.f. member states receiving medium share of structural subsidies (lncst375f)	**0.018*** **	**2.57**	**0.006**
COPA payments p.f. member states receiving small share of structural subsidies (lncst3f)	**0.006** **	**2.12**	**0.001**
pre/post Fischler reform (fisch)	0.004***	2.64	0.001
largest political party conservative (partyc)	4.47e-04*	1.76	2.53e-04
largest political party leftwing (partyl)	-0.002**	-2.15	-4.55e-04
total GDP per capita (lngdpp)	0.002***	2.59	6.19e-04
share of rural population per farm (lnrurpopf)	-0.005*	-1.73	-9.77e-04
constant	0.021*	1.86	1.09e-04
Wald chi2(20)	1.09e+15***		
Instrumented: lndbenf, lnstbenf, lncnf, lncsf, lncef, lncd75f, lncd375f,lncd3f, lncst75f, lncst375f, lncst3f			

Instruments: lninputs, lnuseu, lnuswheatp, lncwheatq, lnsuwheatq, lnussoyp, lnmilkf, lnbeeff, lncerealsf, lnagrexpf (lagged and first differences)	
Arellano-Bond Tests for Autocorrelation	
AR(1) - H_0: no autocorrelation in residual differences	*-5.85*** (rejected)*
AR(2) - H_0: no autocorrelation in residual differences	*0.48 (not rejected)*
Sargan/Hansen Test	
H_0: joint validity of instruments used ($chi^2(51)$)	*1.29 (not rejected)*
LR Tests on Specification	
H_0: regional location related free-riding variables have no significant effect ($chi^2(3)$)	*7.75** (rejected)*
H_0: direct benefits related free-riding variables have no significant effect ($chi^2(3)$)	*13.24*** (rejected)*
H_0: structural subsidies related free-riding variables have no significant effect ($chi^2(3)$)	*12.07*** (rejected)*

1: *- 10%-, **- 5%-, ***- 1%-level of significance; 2: robust variance-covariance estimator based errors.

Appendix A: Country grouping 2000-2005.

L_{cn}	L_{cs}	L_{ce}	L_{cd75}	L_{cd375}	L_{cd3}	L_{st75}	L_{st375}	L_{st3}
BE	EL	CZ	DE	DK	BE	DE	EL[4]	BE
DK	IT	EE	ES	EL	LU	ES	PT[5]	DK
DE	PT	LV	FR	IE	AT	FR	SE[6]	LU
FR	ES	LT	IT	NL[1]	PT	IE[2]	UK[7]	NL
IE	MT	HU	UK		FI	IT	PL[8]	CZ
LU	CY	PL			SE	AT		EE
NL		SI			CZ	FI[3]		CY
AT		SK			EE			LV
FI					LT			LT
SE					LV			HU
UK					HU			MT
					SI			SI
					MT			SK
					SK			
					CY			
					PL			

Countries moved between groupings over the data period. This table shows the initial category of each member country.

1. NL moved to $\mathbf{L_{cd3}}$ for the period 2001-2005.
2. IE moved to $\mathbf{L_{st375}}$ for years 2001, and 2003-2005.
3. FI moved to $\mathbf{L_{cd375}}$ for the period 2001-2005.
4. EL moved to $\mathbf{L_{st3}}$ for years 2001, and 2003-2005.
5. PT moved to $\mathbf{L_{st3}}$ in year 2005.
6. SE moved to $\mathbf{L_{st3}}$ in year 2005.
7. UK moved to $\mathbf{L_{st3}}$ for years 2004 and 2005.
8. PL moved to $\mathbf{L_{st75}}$ for year 2005.

Source: Authors' groupings