Abstract

This thesis consists of a summary and four papers. The first two papers address political economy and industrial organization aspects of agricultural policy, and the last two international aspects of environmental policy.

Paper [I] explains Common Agricultural Policy (CAP) subsidies to farmers by the influence of farmer interest-groups with an EU-wide membership. The analysis is based on panel-data for fifteen commodities over the period 1986-2003. Because the CAP is set as an overall EU policy, effective lobbying presents a collective action problem to the farmers in the EU as a whole. Indicators of lobbying, which are based on this perception, are found to explain part of the variation in agricultural support.

In Paper [II], the Bresnahan-Lau framework is used to analyze whether policy reforms, i.e. the two-price system (an input quota, 1986-1991) and a general deregulation of dairy policy (1991-1994) had any market power effects on the Swedish butter market. The results show that the null hypothesis of no market power cannot be rejected, for any of the specific policy reforms, at any reasonable significance level.

Paper [III] concerns the welfare consequences of environmental policy cooperation. It is assumed that countries finance their public expenditures by using distortionary taxes, and that they differ with respect to competition in the labor market. It is shown how the welfare effect of an increase in the expenditures on abatement depends on changes in the environmental damage, employment and work hours. The welfare effect is also related to the strategic interaction among the countries in the prereform equilibrium.

In Paper [IV] environmental policy in an economic federation, where each national government faces a mixed tax problem, is addressed. It is assumed that the federal government sets emission targets, which are implemented at the national level. It is also assumed that the economic federation is decentralized. The results highlight a strategic role of income and commodity taxation, i.e. each country uses its policy instruments, at least in part, to influence the emission target.

Keywords: agricultural policy, political economy, lobbying, cooperatives, market power, policy cooperation, distortionary taxes, labor market, Nash game, Stackelberg game, income and commodity taxation, economic federation, environmental policy.
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Thomas Jonsson
This thesis consists of a summary and the following four papers:


1 Introduction

This thesis consists of four self-contained papers.

Papers [I] and [II] are empirically orientated and cover two interrelated topics; political economy and industrial organization aspects of agricultural policy. Paper [I] studies the political economy of the Common Agricultural Policy (CAP) of the European Union (EU), and more specifically deals with lobbying by EU-wide interest groups. In Paper [II], Swedish data is used to study whether input supply control and the 1991 general dairy market deregulation had any effects on the ability of dairy cooperatives to exercise market power in the Swedish butter market.

Papers [III] and [IV] are theoretical and focus on international aspects of environmental policy. Paper [III] concerns the welfare consequences of environmental policy cooperation, where the countries differ with respect to competition in the labor market, and Paper [IV] deals with environmental policy in a decentralized economic federation.

The remaining part of this introductory chapter is structured as follows. Section 2 presents the background to and summarizes Papers [I] and [II]. Section 3 presents the background to and summarizes Papers [III] and [IV].

2 Agricultural Policy

Developed countries tend to support their producers of agricultural commodities heavily. For example, the CAP consumes about 40% of the total EU budget, while the agricultural sector employs less than 2% of the EU’s workforce. The first two papers in this thesis are attempts to shed some light on the determinants and consequences of the support to agriculture. Paper [I] deals with determinants of agricultural subsidies. More specifically, the study assesses the influence executed by transnational EU lobby groups (so called Euro-groups) on the CAP. As such, it relates to the literature on the political economy aspects of agriculture. The second paper concerns the effects of agricultural support policies. More specifically, the problem addressed is whether such policies made it possible for domestic food producers to exercise market power. The paper studies the case of Swedish pre-EU agricultural policies, and whether specific reforms had any market power effects for dairy cooperatives on the market for butter. This paper is primarily related to the literature on cooperatives and
In the following, these two strands of the literature are reviewed and the respective paper summarized.

2.1 The Political Economy of Agriculture

Olson (1965) developed a framework of analysis (and applied it extensively to farm policy) that depicts a passive government responding to lobby activities by interest groups, who organize themselves for collective action. The policy outcome hinges critically on the ability to overcome costs of organization and free-riding. According to this framework, successful collective action is related to demographic factors, where the number of firms within the industry attempting to organize itself is the main indicator. The intuition is that the more firms there are within the industry, ceteris paribus, the greater the incentives for the individual firm to free-ride. Thus, the more likely it is that the effort made by any such firm is suboptimally low from the perspective of the industry as a whole. A negative relationship between the number of farms and agricultural support has been found by Olper (1998) on national European data, Helfand (2000) on Brazilian data, and Miller (1991), Fulginiti and Shogren (1992), Sarker et al. (1993), van Bastelaer (1998) and Swinnen et al. (2000) on cross-country data.

A second indicator for successful collective action has been derived by Bombardini (2005). According to her results, and given the size of the industry as a whole, the less homogenous the firms are in size, the greater the overall lobbying effort. This is because of certain minimal fixed-costs of lobbying, which only the larger firms may be able to cover. With a more homogenous grouping, none may be able or motivated to lobby, whereas with a more heterogenous grouping at least large firms may be able to. Hence, the size-heterogeneity of an industry is a potential determinant of lobbying effort. Bombardini (2005) confirms this result empirically.

Although a large empirical literature exists on assessing the influence of lobby groups on agricultural policy, there has not been much research dealing with the CAP. One exception is Olper (1998), who finds that indicators of the national lobbying-strength of farmers explained part of the variation in total agricultural support (CAP support and domestic support) in seven EU member states. However, as indicated in several studies (predominantly within the area...
Summary

of political science; see e.g. Pinjenburg, 1998 and Woll, 2006), the influence of Euro-groups, i.e. lobbying groups with an EU-wide member base, plays a significant role in the CAP lobbying structure. This idea constitutes a starting point for Paper [I].

2.2 Cooperatives and Competition

A marketing cooperative is an arrangement that enables a large number of small sellers to coordinate strategies (such as price) when selling a good and to exploit returns to scale. This arrangement is normally considered legal and, in many cases, is actively promoted by the legislative authorities, even though marketing cooperatives have many features in common with marketing cartels.

However, the marketing cooperatives are typically organized in such a way that their ability to exercise market power is limited. Most marketing cooperatives’ output levels are determined by the production decisions made individually by each member, and membership in such cooperatives is voluntary. As shown by e.g. Sexton and Lavoie (2001), this way of organizing a marketing cooperative makes it generally ill-suited to exercise market power. On the other hand, if the cooperative is able to restrict supply, a dominant market position may be used for anticompetitive purposes. Supply may be restricted through quotas imposed on the members of the cooperative or via price discrimination. Bergman (1997), building on a model by Helmberger and Hoos (1962), shows that price discrimination between a foreign market, where the cooperative is a price taker, and the domestic market where the cooperative has a dominant market position, may lead to a price higher than marginal cost on the domestic market.

There exists a vast literature on the extent of imperfect competition in the food industry (for an overview, see Sheldon and Sperling, 2003). However, for dairy products there is only a limited number of studies. Gohin and Guyomard (2000) study the French dairy retail industry, and they strongly reject the hypothesis that French food retail firms behave competitively. Madhavan et al. (1994) find evidence of market power exercised by American dairy cooperatives in monopoly position. According to their findings, the dairy cooperatives discriminate between the markets for processed milk products, since the price elasticity of demand differs between markets.

In the Swedish dairy market, prior to the EU accession in 1995, attempts
to control domestic supply of dairy products were made. In 1986 a voluntary quota (referred to as the "two-price system") was established. The two-price system prescribed an individual quota to each farmer participating within the program. Moreover, prior to 1991 when Swedish dairy policy was regulated nationally, export of butter was subsidized. Hedberg (2002) measures the extent of imperfect competition in the Swedish dairy market for one particular year, 1990. She finds no evidence of mark-up over marginal cost. In fact, she finds that prices of fluid milk, cheese, butter and milk powder are close to modelled competitive prices. On the other hand, Bergman (1997) finds evidence of price discrimination between domestic and foreign consumers in seven OECD countries (including Sweden).

When measuring market power, it has been common since the late 1980’s to use structural econometric models. The methodology developed by Bresnahan-Lau (Bresnahan, 1982 and Lau, 1982) has become popular, particularly in research on the competitiveness of food markets (see e.g. Applebaum, 1982; Lopez, 1984; Schroeter and Azzam, 1990 and Bettendorf and Verboven, 2000). The Bresnahan-Lau method measures the conjectural variation elasticity at the industry level, which can be interpreted as the average of the individual firm’s conjectural variation elasticities. The latter is a measure of all firms’ output responses to a price change relative to a change in the individual supplier’s output, as conjectured by this individual supplier. This methodological framework provides the basis for Paper [II].

2.3 Summary of Papers [I] and [II]


The purpose of Paper [I] is to assess the influence on CAP exercised by farmer interest groups with an EU-wide member base, Euro-groups. The main motivation for studying EU-wide lobbying in the context of the CAP is that an implemented regulation becomes a public good for the beneficiaries. With the CAP, the collective-action problem thus becomes EU-wide.

The study uses a panel dataset with a total of 270 observations, which is based on fifteen commodity groups over the 18-year period 1986-2003. Following earlier literature, agricultural support is related to indicators of the effectiveness of lobbying. The main indicators of effective lobbying are the number of farms
and their size-dispersion.

The number of farms producing a given commodity and the size-heterogeneity of the industry are found to explain part of the variation in support for that commodity. In addition, the effects are in line with the theoretical predictions, i.e. the number of farms has a negative effect and size-dispersion a positive effect on agricultural support.

This suggests that Euro-group lobbying has been able to influence the CAP. To some extent, the results diverge from what is found in earlier studies, particularly on American data, where an inverted U-shaped relationship between subsidies and number of farms is found. The American results may combine a variety of policy-mechanisms. Politicians favour large groups because of their voting power, so the inverted-U relationship is one possible outcome as the voting-power effect (better with large numbers) counteracts the collective-action effect (better with small numbers). But the voting-power explanation is not equally applicable to the CAP, since supranational EU decision-making is more detached from voter influence. The results in Paper [I] confirm this.

Moreover, some evidence is also found suggesting that Euro-groups, representing different food commodities, compete for resources within a given CAP budget.

Paper [II]: Market Power Effects of Supply Control and Dairy Market Deregulation

The purpose of Paper [II] is to analyze the extent to which Swedish dairy cooperatives were exercising market power on the market for butter prior to the EU accession in 1995. The study period is 1980-1994, mainly due to the specific dairy policy reforms that took place over that time interval. Until 1991, prices of dairy products were regulated, and butter was subsidized to make exports to the world market easier. Moreover, during the period 1986-1991, a voluntary quota for raw milk input supply to processing dairies was in operation. Since butter was the sole dairy good exported, it is of special interest from a market power point of view. Together with the input supply quota, the ability to price discriminate may have given the Swedish dairy cooperatives abilities to exercise market power on the domestic market. Since only data for retail price and quantity are available for processed dairy products, changes in dairy regulations over the period of study are accounted for in order to distinguish the market power exercised by cooperatives from that exercised by retailers.
The Bresnahan-Lau method is adopted to measure market power both in terms of a static and a dynamic (error correction) specification. Due to its ability to account for non-stationarity among the variables and for autocorrelation, the dynamic model is preferred. No significant market power effects due to the specific reforms are found. Possible explanations for the lack of significant market power effects are that the farmers had a weak bargaining position (relative to the consumer representatives) when the prices of dairy products were decided upon; that the quota rule was inefficient, or that the butter price was affected by competition from substitute goods.

3 Environmental Policy

Environmental problems are often transboundary, meaning that emissions generated by a country do not only affect the welfare of the domestic residents; the emissions also affect the welfare of residents in other countries. To deal with such problems, some kind of cooperation between countries is generally required. In the international political scene of today, we see several international arrangements, ranging from voluntary agreements between politically independent countries, such as the Kyoto protocol, to arrangements within given institutional structures, such as the environmental policy cooperation within the EU. The last two papers in this thesis address issues related to transboundary environmental problems in a policy cooperation context. Paper [III] deals with environmental policy cooperation between two (independent) countries, where the countries differ with respect to competitiveness in the labor market. Paper [IV] addresses environmental policy within a more structured institutional environment, i.e. an economic federation with decentralized leadership.

The existing literature in each of those two fields is reviewed briefly below and, thereafter, the two papers are summarized.

3.1 Environmental Policy Reforms in the Presence of other Tax Distortions

Market economies are characterized by a number of distortions, each of which may influence the welfare effects of projects aimed at improving the environment. How distortions in the labor market are interrelated with environmental externalities in this context has been thoroughly analyzed in the literature.
In particular, the idea that governments can use the revenues from pollution taxes to decrease other, distortionary taxes, such as e.g. the labor income tax, has received much attention (see e.g. Oates, 1991, Pearce, 1991 and Aronsson 1999). However, as shown by e.g. Bovenberg and de Mooij (1994) and Bovenberg and Goulder (1996), environmental taxes are likely to exacerbate, rather than alleviate, preexisting tax distortions - even if revenues are used to cut preexisting distortionary taxes. This body of literature is typically based on one-country model economies, in which transboundary environmental problems do not arise.\footnote{See also the literature dealing with environmental policy reforms in economies with imperfect competition in the labor market, e.g. Schneider (1997), Bovenberg and van der Ploeg (1998), and Koskela and Schöb (1999)} One exception is Hoel (1997), who considers international environmental policy in combination with imperfect competition in the labor market. Hoel studies whether international environmental targets should be supplemented by coordination of the policies used to implement these targets. Another exception is Aronsson and Blomquist (2003), who consider redistribution and environmental policy in a two-country model, where each national government faces a mixed tax problem.

Since countries typically differ with respect to preexisting distortions, policy coordination may result in asymmetries regarding the welfare consequences for the countries involved. For instance, European labor markets are to some extent characterized by union wage formation, whereas the labor market in the U.S. bears more resemblance to a competitive market. Since unemployment is a major social problem in many countries, the labor market is likely to play an important role in the choice of economic policy (including environmental policy) at the national level. Paper [III] adds to the environmental policy coordination literature in this particular context.

3.2 Environmental Policy and Federalism

An economic federation is often described as a multi-level government structure, where each level has its own responsibilities and policy instruments. This can be exemplified by the national and lower level governments within a given country as well as by supranational economic federation such as the EU. Economic federations in the world today plots a heterogenous picture, where the institutional structures typically differ with respect to the commitnt power
that might be exercised by the different levels of government. For instance, whereas the public decision-structure in a given country might be reasonably well described in terms of an economic federation with centralized leadership (provided that the central government is able to commit to its policies), the EU may exemplify an economic federation with decentralized leadership.

Earlier research on environmental policy in economies with transboundary environmental problems do not pay so much attention to the institutional structure when it comes to implementing a supranational arrangement. Instead, earlier literature that applies theories of optimal taxation to economies with transboundary environmental problems typically compares the outcome of a noncooperative policy regime with the outcome of full cooperation. Examples are van der Ploeg and de Zeeuw (1992), Aronsson and Löfgren (2000) and Aronsson and Blomquist (2003).

On the other hand, in their studies on economic policy and transboundary environmental problems, Silva and Caplan (1997) and Caplan and Silva (1999) pay explicit attention to the role played by a federal decision structure, involving a federal government and lower level (e.g. national or regional) governments. The federal government is assumed to control one specific policy instrument (e.g. abatement), whereas lower level of governments are assumed to control another (e.g. environmental taxes). In addition, the economic federation may either be centralized or decentralized\(^2\), depending on which level is able to make credible commitments (and they use the EU to exemplify a decentralized economic federation). In their studies, a major purpose is to characterize the environmental policy outcomes on the basis of (i) whether the economic federation is centralized or decentralized, and (ii) how the control over policy instruments is distributed between the levels of government.

This constitutes a starting point for Paper [IV], which deals with environmental policy and mixed taxation in an economic federation with decentralized leadership.

\(^2\)Other than environmental policy, studies concerning economic federation with decentralized leadership focus on public good provision (Caplan et al., 2000), tax competition (Köthenburger, 2004) and redistribution (Aronsson, 2007).
3.3 Summary of Papers [III] and [IV]


Paper [III] concerns the welfare effects of environmental policy reforms in a framework with transboundary environmental problems, preexisting tax distortions and imperfect competition in the labor market, and the analysis is based on a general-equilibrium model of a two-country economy. It is assumed that the countries finance their public expenditures by using distortionary taxes, and that they differ with respect to competition in the labor market. The contribution is to characterize the cost-benefit rule associated with environmental policy cooperation. The paper thus provides an understanding of the mechanisms that determine the welfare effects of such agreements.

The study shows how the welfare effect of the policy reform depends on changes in environmental damage, employment, and work hours. It also relates the welfare effect to the strategic interaction among the countries in the prereform equilibrium. First, a general cost-benefit rule that does not necessarily require that public policy be optimally chosen on a national basis prior to the reform is derived. Second, a situation is considered where the prereform equilibrium is a non-cooperative Nash equilibrium, implying that each national government has made an optimal choice conditional on the private and public decision variables in the other country. Finally, the welfare effects of policy cooperation under the assumption that the prereform equilibrium is the outcome of a Stackelberg game is derived.

Paper [IV]: Environmental Policy and Optimal Taxation in a Decentralized Economic Federation

This paper deals with environmental policy in the context of a mixed tax problem facing each national government in an economic federation. It is assumed that the federal government sets emission targets, which are implemented at the national level. It is further assumed that the federation is decentralized, meaning that the national governments are first movers vis-à-vis the federal government. The model is inspired by the decision structure underlying the environmental policy within the EU.

The purpose is to characterize the optimal tax structure chosen by the national governments, and the results suggest a strategic motive for tax policy
not discussed in earlier literature: if the lower-level (national) governments are able to commit to their policies, and the federal outcome is conditioned on the policy variables decided upon at the national level, tax policy at the national level will be used, in part, to affect the targets decided upon at the federal level. This has several implications: first, commodity taxes do not satisfy the so-called additivity property often emphasized in the literature\(^3\), and, second, it provides an argument for using distortionary labor income taxation. The basic intuition behind the lack of additivity is that the national government has fewer policy instrument at its disposal than it has variables to control. The non-zero marginal income tax rate (set at the national level) reflects a combination of two motives: (i) the desire to offset distortions due to commodity taxation, and (ii) the desire to relax the federal emission target.

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\(^3\)See e.g. Sandmo (1975).
Summary

References

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