The Political Economy of Climate Change Policy in the EU: Auction and Grandfathering

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Abstract

Based on the political support function model by Hillman (1982), we consider the choice of policy instruments in environmental regulation. More specifically, we extend the Hillman model so that it can incorporate the connection between the relative strength of lobby groups, the chosen level of regulation and the choice of instrument to facilitate the achievement of this level. We apply this model to explain the shift from auction to grandfathered emission trading in the EU. When explaining this shift in policy, we focus on climate change policy and the three main interest groups, namely industry, consumers and environmentalists. From a pure economic point of view, taxation or auctions are clearly preferable to grandfathering. However, from our political economy model, the opposite conclusion might emerge, suggesting the counter-intuitive result that grandfathering, compared to taxation and auction, might give a stronger pressure to increase the emission target level.

Keywords: Political support function, political economy, environmental regulation, lobbyism, rent-seeking, taxation, auction, grandfathering, emission trading, European Union, interest groups, industry, consumers, environmentalists.

JEL Classification: Q28, H2, H4

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1. Introduction

In the following we will offer an explanation of the choice of instruments to control environmental problems from a political economy perspective, i.e. where the relative strength of influential interest groups determines policy. We will apply this model to the European Union (EU) policy to implement its Kyoto target level. In particular, we set out to offer a theoretical explanation for why the EU suddenly shifted from green taxation to a grandfathered permit system.

We furthermore analyse the likely consequences of this shift on the prospect of achieving the Kyoto target. This is an important analysis, since there exists a complex interaction between choice of instrument and the resulting support for a given level of environmental protection, resulting in 'counter intuitive' results, which not support common sense reasoning. In particular, common sense suggests that when it becomes less costly for the regulated party to comply with the regulation, then such a party will display less resistance to the regulation. This, goes the logic, makes it easier to achieve the stated target or even enables the regulator to get support for stricter regulation. Our analysis shows that under realistic conditions, this logic is not supported, implying serious implication for the EU climate change policy.

Our theoretical starting point is a political economy perspective and the political support function model by Hillman (1982). The contribution is to extend this model to include the relative strengths of competing interest groups. Different interest groups often have conflicting interests in situations where the choice of instrument is determined by the relative strength of groups. Becker (1983, p 380) states that 'the political effectiveness of a group is mainly determined not by its absolute efficiency, but by its efficiency relative to the efficiency of other groups'. Competing interest groups will lobby to achieve rents, and therefore an understanding of lobbyism is crucial to an understanding of distortive EU policies. Therefore, we incorporate lobby group interests in the political area of environmental regulation, enabling the analysis of the connec-

tion between the relative strength of a lobby group and the determination of both the level of environmental regulation and the choice of instrument. The lesson is that choice of instrument and choice of environmental target level cannot be seen as independent due to political resistance and support.

The connection between choice of instrument and level of environmental protection has been analysed in several papers. Boom (2001) shows, in the case of a tradable permit system market, that it is rational for potential selling countries to opt for higher emission levels and for potential buying countries to accept a more stringent emission ceiling (compared to the situation without trade). This is explained by the fact that increases in the total trade volume imply lower reduction costs for the buying country and higher total payments to the selling country. The existence of a connection between type of instrument employed and prospect of achieving a given reduction target is analysed in, e.g., Brandt and Svendsen (2002). They argue that the costs of implementing the Kyoto-targets have significantly effects on the prospect of actually achieving the original targets. We provide a theoretical framework based on lobbying activities to analyze such a connection.

Environmental regulation is often analysed in a principal-agent relationship. In such a framework, the idea is to design an efficient regulation from the principal's point of view, subject to participation constraints. When the principal is the government, the use of (pigouvian) taxes has received much attention, as the "superior" way to internalize the external costs of pollution. In principal, the use of an emissions trading system where the permits are auctioned is equivalent to taxes. The superiority of these instruments from the point of view of society, compared to, e.g., an emissions trading system where the permits are grandfathered is noted by Cramton and Kerr (2002). Such systems can result in reduced tax distortions (see i.e. Goulder, Parry and Burtraw, 1997), provide more flexibility in distribution of costs, provide greater incentives for innovation and reduce the need for politically contentious arguments over the allocation of rents.

However, such an approach neglects important features of the regulatory relationship. As pointed out by Spulber (1989), the actual adoption of a policy is preceded by a so-called regulatory process, the outcome of which determines how the regulation will be structured. Dijkstra (1999) and Svendsen (1998; 1999) argue that one major difficulty when putting theory into practice is the absence of political acceptability of environmental taxes within producer communities. Internationally, the use of taxes as an instrument to regulate pollution has proved almost impossible. Moreover, as a financial measure, a tax must be adopted unanimously in the Council of Financial Ministers. Owing to strong opposition from industry and key member states, it has so far proved impossible to achieve such a consensus. According to Stavins (1998): "many actors in the system have reason to favour freely allocated tradable over other market-based instruments" (p. 75). The approach that Stavins uses is what he calls a political market framework, which consists of the demand for environmental policy instruments by individuals, firms, and interest groups, and their supply by the legislature and regulatory agencies. Based on the US SO_2 allowance trading system, he then lists which instruments different agents prefer. Brandt and Svendsen (2003) show, by invoking rent-seeking theory and by analysing the Green Paper hearing replies from the main industrial groups, that rent-seeking (or lobbyism) affects the design of environmental regulation and energy policy in favour of well-organized industrial interest groups. They argue that some firms are likely to reap a net gain from being regulated by a grandfathered emission trading system. This is so because total costs of emission reduction and lobbyism are likely to be smaller than the total rents from having this type of regulation.

There has recently been a rather remarkable change in EU's position on the use of GHG emissions trading in climate policy. Why did the EU suddenly support emissions trading? This question is addressed in Gagelmann and Hansjürgens (2002). They state that while the progress of all member states seems to indicate that half the Kyoto commitment had been achieved by 1999 (-4%), a closer look reveals that this was mainly due to considerable reductions in two large countries, namely Germany and the UK. The current performance of most other

countries seems to fall short of their targets.[1] The European Commission (CEU, 2000b) recognized that any further potential reductions in Germany and the EU would not be at the same level.[2]

Christiansen and Wetterstad (2003) argue that the main reason for the Commission to propose the use of grandfathering is largely due to the perception that the chances of getting a system in place by 2005 could be undermined by opposition from key member states and lobby groups representing incumbents that would have to pay for allowances. Therefore, grandfathered emissions trading and free initial allocation of permits could prove instrumental for ensuring a cost-effective implementation of abatement policies across the EU. Thus, political reality implies that policy makers are confronted by special interest groups that pursue private goals, which may conflict with the overall goals of society. If dominant interest groups do not like a particular proposal, they may block it and policy makers will not succeed in achieving the desired environmental target levels.

The paper is organized as follows. In the theoretical part (section 2), we present a model for an influential function approach to an environmental target level. It shows how lobby groups can determine the level of environmental regulation and the choice of instrument. Finally, we discuss the implications of combining the determination of target level and instrument choice. In the empirical part (Section 3), we look at the innovative case of EU climate change policy. After discussing EU lobbyism in general, we present interest group activities and combine these with the theoretical findings from the first part. Section 4 concludes the paper.

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1 This view is supported in Christiansen and Wetterstad (2003), who note that the Commission projects that by 2010 total GHG emissions will increase by 1% and CO_2 emissions by 4% relative to the base year of 1990, compared to the Kyoto target of an 8% reductions. Without Germany and the UK, the remaining countries have experienced an increase in emissions of 7.1% from 1990 to 1999.

2 Schleich et al. (2001) make an in-depth analysis of the German case and conclude that the likelihood of it achieving the more ambitious national target without additional policy efforts appears to be rather slim.

2. The model: Influential function approach

2.1. Introduction

Traditionally, relationships between industry and environment policy have been examined in terms of impact. In such an approach, environmental policies are given and firms react to them. The firms simply comply with the laws. However, environmental standards, taxes and subsidies do not come out of the blue. They are the end result of a series of consultations and negotiations between policy makers and interested parties (industrial associations, consumers, associations, green groups). According to Lévêque and Nadaï (1995) a firm's involvement can take several forms. Firms can, e.g., support public authority intervention, hinder public authority intervention by making use of their obstructive power, take voluntary action under the threat of government intervention or cooperate with the government in defining environmental policies.

In this paper we take the political economy point of view that environmental policy is determined by the relative strength of stakeholder groups, called lobby groups. We will call any such actives by interest groups as lobby activity**.** However, different interest groups have different (and sometimes) opposing objectives (like the industry and the environmental groups on environmental regulation). In such a situation the relative strength of the lobby groups determines the outcome.

The relative strength of a particular interest group depends on numerous factors, including the policy maker's preferences and the cost or benefit of the proposed regulation. However, lobbyism is also determined by the size of the group: The smaller the group size, the more effectively it can lobby. Support for this is that the marginal benefit of an average individual's effort falls with the aggregate effort of others. Olson (1965) states that the commonality of the goals of an interest group's members makes the achievement of these goals a public good for the group, which thus gives rise to the same incentives to free-ride as exist in all public good-prisoners' dilemma situations. Two important conclusions can be

drawn from this observation: (1) It is easier to form an interest group when the number of potential members is small than when the number is large; and (2) Thus, the establishment of an organisation that effectively represents large numbers of individuals requires that "separate and 'selective' incentives" be used to curb free-riding behaviour. The obvious conclusion is that groups of small size, with homogenous members with comparable goals will be more effective than groups representing a large number of heterogeneous individuals with only partly comparable goals. We come back to the effectiveness of interest groups in section 6, when analysing the EU case.

In the following, we assume a political economy framework, where the politicians who decide the environmental policy only care about how to achieve maximum support for their policy. In a political support function approach, it is asserted that the political support depends upon the welfare levels of gainers' and losers' (in our case determined by the severity of environmental regulation). In the model we consider three different interest groups. First, the industry groups actually undertake the reductions and bear the direct costs of regulation. Besides wanting to avoid the regulation, their objectives are to receive as high rents as possible from regulating by lobby for regulation (instruments) that yields a comparative advantage over either competitors or entrants.

Second, consumer groups that suffer from increased product prices due to costs induced by the regulation on the producers of goods must be expected to support regulation that yields the smallest spill over to consumer prices. Third, the environmental groups (the ones that benefit from cutbacks on emissions) support as high environmental quality as possible.

2.2. Choice of environmental target

The political support function in Hillman (1982) is defined as:

$$\tilde{M} = M(\Pi(Q), P(Q), Q)$$

Here Q is the level of reduction of the pollutant in question compared to the situation without any regulation, Π is the profit to the industry facing the regulation (including the rent from regulation), P is the consumer price (could be a price index).

Industry motives are given by $\frac{\partial M}{\partial \Pi} > 0$ and $\frac{\partial^2 \mathrm{M}}{\partial (\Pi)^2} \leq 0$. (Diminishing marginal industry support). $\frac{\partial M}{\partial \Pi} > 0$ implies that the more profitable a policy from the point of view of the interest groups, the more support this policy receives from the interest groups. However, marginally, this effect is declining.[3] The Industry groups dislike regulation, since the effect of regulation on the industry profit is $\frac{\partial \Pi}{\partial Q} < 0$. Although higher regulation increases prices, the net effect on profit is still negative. Hence, higher regulation leads to increasing resistance from industry groups.

Consumer motives are determined by $\frac{\partial M}{\partial P} > 0$ and $\frac{\partial^2 \mathrm{M}}{\partial (\mathrm{P})^2} \leq 0$. (Diminishing marginal consumer support). Consumers support policies that reduce consumer prices, but marginally this effect is declining. The effect of regulation on output price is $\frac{\partial P}{\partial Q} > 0$, and hence, consumers also dislike environmental regulation.[4]

Environmentalist motives are given by $\frac{\partial M}{\partial Q} > 0$ and $\frac{\partial^2 \mathrm{M}}{\partial (\mathrm{Q})^2} \leq 0$. (Diminishing marginal environmentalist support). Environmentalists support higher Q, but at a diminishing rate.[5]

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3 An argument for this is that given that the marginal reduction costs are strictlt convex in Q, then the higher the regulation, the higher the reduction costs.

4 This is the case for all downward sloping demand curves.

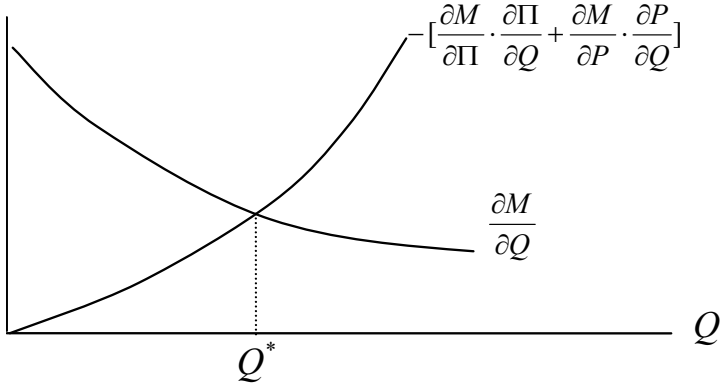
5 An argument for this is its connection with strict convex damage costs (in emission levels). From a given point of emission, the additional environmental benefit from reducing emission is declining.

If the only choice variable for the policy maker is Q, then a political equilibrium is achieved when the marginal influence or the marginal support from the different interest groups is balanced, so as to maximise political support:

$$\frac{\partial \tilde{M}}{\partial Q} = 0 : \frac{\partial M}{\partial \Pi} \cdot \frac{\partial \Pi}{\partial Q} + \frac{\partial M}{\partial P} \cdot \frac{\partial P}{\partial Q} + \frac{\partial M}{\partial Q} = 0 \qquad (1)$$

$\frac{\partial M}{\partial \Pi} \cdot \frac{\partial \Pi}{\partial Q}$ measures how changes in Q alter the support from interest groups through its effect on profit. The expression is negative, since higher regulation leads to lower profits and hence, lower support. $\frac{\partial M}{\partial P} \cdot \frac{\partial P}{\partial Q}$ measures how changes in Q alter the support from consumers through its effect on consumer prices. The expression is negative, since higher regulation leads to higher prices and hence, lowers support. Finally, $\frac{\partial M}{\partial Q}$ is positive. The optimal Q is given by the point where the total support is maximized, indicated by Q^* in figure 1.

Figure 1. The level of environmental regulation that maximizes support



Small increases in Q (from $Q = 0$) yield high marginal support from environmentalists, but small negative support from both industry and consumers.[6] At Q^*, the highest total support is achieved.

6 Interestingly, producers and consumers have the same interest to get as small an increase in product prices as possible.

In order to proceed, it will be easier to assume a linear support function of the type $\tilde{M} = \alpha\Pi(Q) + \beta P(Q) + \gamma Q$. The first order condition now reads:

$$\frac{\partial \tilde{M}}{\partial Q} = 0 : \alpha \cdot \frac{\partial \Pi}{\partial Q} + \beta \cdot \frac{\partial P}{\partial Q} + \gamma = 0 \qquad (2)$$

The advantage of this linearization is that the constants α, β and γ can be interpreted as the weight that the policy makers put on the three different groups, hence, let α be the weight put on industrial interests, β the weight put on consumer interests, and γ the weight put on environmental interests.

Using expression (1), we can determine how changes in the relative weights that the policy makers put on the interest groups, change the level of regulation. The comparative static results are:

$$\frac{\partial Q^*}{\partial \alpha} < 0 \quad \text{(a)}, \qquad \frac{\partial Q^*}{\partial \gamma} > 0 \quad \text{(b)}, \qquad \frac{\partial Q^*}{\partial \beta} < 0 \quad \text{(c)}. \qquad (3)$$

These can be interpreted as, the higher the weight of the industry group or the consumer group, the smaller the regulation, and the higher the weight of the environmental groups, the higher the regulation. In figure 2 these effects are shown.[7]

7 These weights can be interpreted as political weights, i.e. dependent on type of government. Typically, for a right wing party, α/β is higher than for a left wing party (see Daugbjerg and Svendsen, 2001).

Figure 2a. Higher weight to industrial interests decreases Q^*

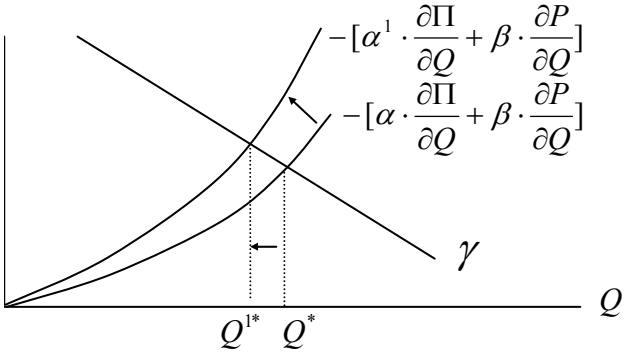
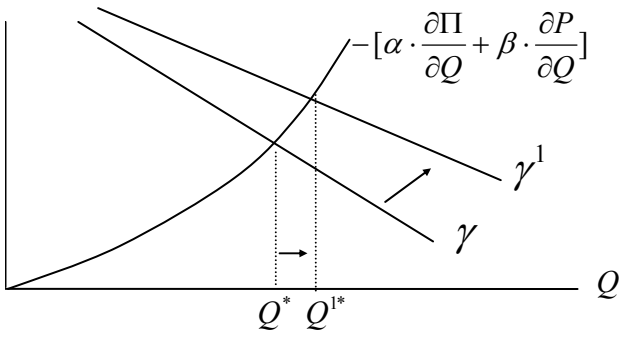


Figure 2b. Higher weight to environmental groups increase Q^*



2.3. Choice of instrument

In order to determine the choice of instruments, we cannot apply the above model, since it builds on marginal changes. Switching from one instrument presumably yields a non-marginal change in the payoffs for the agents. However, as long as reduction targets are chosen independently of choice of instruments then the reduction target can be thought of as being fixed, and the question remains, how to implement this. (This could be the case when considering the choice of instrument to implement the Kyoto-target, since the level of reduction is already determined by the 1997 Kyoto Agreement. (In section 5 we try to compare choice of instrument and choice of reduction level in order to give a hint about how easy it will be to actually implement the Kyoto-target).

We consider two types of instruments, one based on a grandfathered tradable permit system (TPS) and one based on auction. Our intention is to be able to analyse the choice of instruments.[8]

8 This approach can be used to compare any instruments.

Definition: An instrument (I^1) is called superior to another instrument (I^2), if: $\Pi(Q^a)|_{I^1} \geq \Pi(Q^a)|_{I^2}$ and $P(Q^a)|_{I^1} \leq P(Q^a)|_{I^2}$, for all $Q^a \in Q$ and at least one strict inequality.

We will apply the above definition to compare the grandfathered and auctioned approaches. The way to do this is to ask, for the same level of environmental quality, which type the industry and the consumers prefer. In order to combine the two instruments, we can use the following result:

Result 1: Given fully competitive markets, for same the level of regulation, the grandfathered system yields higher rents to industry, but equal output prices (Brandt and Svendsen, 2003).[9]

As shown in Brandt and Svendsen (2003), the incumbent firms receive a rent from regulation under the grandfathered system. The rent comes from holding a factor that is scarce, in this case the permits.[10] The value of this holding is given by the market evaluation of the value of the endowment of permits that the incumbent holds. Hence, the incumbent firm clearly prefers the grandfathered approach, since no rent is available in the case of an auction. Although the incumbent firms (the ones that receive the permits for free) have lower costs of production than potential entrants equipped with similar technology to the incumbents, the endowment of permits has an opportunity cost that adds to the incumbent firms' costs (the firm is wasting the potential revenue from selling the permits). However, this value can only be realised by not using the permits (and selling them). If a firm uses its permits, it loses (foregoes) this opportunity. Hence, using the permit has an opportunity cost equal to the value of the endowment of the permits. In this case, the costs for the incumbent are equal in both cases (grandfathered or auctioned tradable permit systems).

9 This result hinges on several assumptions, including perfectly competitive product and permit markets and perfect capital markets.

10 See Koustaal, 1997, for more examples of this type of rent.

The grandfathered permit system does *not* yield a cost-advantage to the incumbent firms compared to (potential) entrants, because the grandfathered permit system does not create any barriers to entry and does not reduce the pressure coming from potential profit seeking entrants, thus the incumbent firms still have incentives to act efficiently in the product market.[11] Therefore, product prices can be expected to be equal in both situations.

We conclude that $\Pi(Q^a)|_{I^1} > \Pi(Q^a)|_{I^2}$ and $P(Q^a)|_{I^1} = P(Q^a)|_{I^2}$, for all $Q^a \in Q$. This implies:

Proposition 1: A Grandfathered TPS is strongly preferred to Auctioned TPS for the same level of environmental quality.

2.4. Implications

In the previous section we argued that for a fixed environmental target, none of the three interest groups would object to choosing grandfathered over an auctioned TPS approach. Let's now ask the following question: if *Q* is determined on the presumption of an auctioned approach, would this level of Q also maximize the overall support if switching to a grandfathered approach?

Common sense would suggest that since interest groups strongly prefer a grandfathered to an auction system, while the other interest groups are indifferent, a higher level of reductions of emissions would be the equilibrium outcome. In this case, since the interest groups are better off in the grandfathered case, it could also be argued that it will be easier to achieve the pre-determined emis-

11 The grandfathered system does not create a barrier to entry. To verify this claim, let us be more specific about what is meant by a barrier to entry. There exists no uniformly agreed upon definition of what an entry barrier is. However, in our case it has been argued that a grandfathered system yields a cost advantage to the incumbent firms. A useful and satisfactory definition is given by Bain (1965, p.3): 'A barrier to entry exists where established sellers in an industry have an advantage over potential entrant sellers, where this advantage is reflected in the extent to which established sellers can persistently raise their prices above the competitive level without attracting new firms to enter the industry'.

sions target. We have to remember, however, that the support function is based on marginal gains, which in turn might differ from the absolute gain a group might achieve from different instruments.

In order to compare the two approaches, let's fix the reduction level at the optimal level in the auction case, denoted $Q_A^* = \arg\max[M(\Pi(Q), P(Q), Q)]|_{Auchion}$.

It is obvious that $\left[\frac{\partial P(Q_A^*)}{\partial Q}\right]_{Grandfathered} = \left[\frac{\partial P(Q_A^*)}{\partial Q}\right]_{Auction}$ since there is no difference between the effects of the two approaches on the product prices. This means that the consumer groups are indifferent between the two approaches.

In the auction market, when less permits are issued, then all firms buy fewer permits (which reduces costs), but on the other hand, the price of the permits increases, which makes the demanded permits more expensive. In the grandfathered approach, when firms are given less permits, then, since the permit prices increase, the value of the permits increases, but the number of permits is reduced, and, depending on how the permit price changes when Q changes, the incumbent will support more or less emission reductions compared to the auction approach. Moreover, in the presence of entrants, the holders of the permits earn more rent.

Let's look into this issue. Let z_0 be the number of permits (one permit represents one unit of emission) that an incumbent firm receives, while z measures the number of permits this firm holds after trading in the permit market. Let p_z be the permit price. If $(z_0 - z)>0$, then the firm is a seller of permits, and if $(z_0 - z)<0$, then it is a buyer. Abatement costs are given by $c(e_0 - z)$, where e_0 is the initial level of emissions. Output is denoted by y and its price is p_y.

Profit for the firms given regulation in the two situations is:

$$\Pi_{GF} = p_y \cdot y + p_z(Q) \cdot (z_0(Q) - z(Q)) - c(e_0 - z(Q)) \qquad (4a)$$

$$\Pi_A = p_y \cdot y + p_z(Q) \cdot z(Q) - c(e_0 - z(Q)). \quad (4b)$$

Since output prices are equal under the two approaches, the difference in profits is: $\Pi_{GF} - \Pi_A = p_z(Q) \cdot z_0(Q)$, which is equal to the rent to the incumbent firms in a grandfathered system.

How does the profit change when Q changes? In order to analyse this, differentiate 4a and 4b, with respect to Q and evaluate the difference:

$\left[\frac{\partial(\Pi_{GF})}{\partial Q} - \frac{\partial(\Pi_A)}{\partial Q}\right] = \frac{\partial p_z}{\partial Q} \cdot z_0 + p_z \cdot \frac{\partial z_0}{\partial Q} = -\frac{\partial p_z}{\partial z} \cdot z_0 - p_z$, since $\frac{\partial z_0}{\partial Q} = -1$. ($\frac{\partial p_z}{\partial z_0} < 0$, since the more permits, the lower the permit price.) Note that $-\frac{\partial p_z}{\partial z} \cdot z_0 - p_z$ Q 0. $\frac{\partial p_z}{\partial z} \cdot z_0$ is negative, since higher z reduces the permit price, and this reduces the value of all permits a firm holds. This effect gives incentives for the firm to lobby for fewer permits. The gain from receiving one more permit is p_z, which gives the firm an incentive to lobby for more permits. Note that this is the same trade off a monopoly faces when choosing its level of output. Rewrite $-\frac{\partial p_z}{\partial z_0} \cdot z_0 - p_z$ as $-p_z[1 + \frac{1}{\varepsilon}]$, where $\varepsilon = \frac{\partial z_0}{\partial p_z} \cdot \frac{p_z}{z_0} < 0$ is the elasticity of the permit price function. To recapitulate, $\left[\frac{\partial(\pi_{GF})}{\partial Q} - \frac{\partial(\pi_A)}{\partial Q}\right] = -p_z[1 + \frac{1}{\varepsilon}]$, where $\frac{1}{\varepsilon}$ measures how much the price changes when the initial endowment changes. When $\frac{1}{\varepsilon} < -1 (0 > \varepsilon > -1)$, then the price effect is strong, and $\left[\frac{\partial(\pi_{GF})}{\partial Q} - \frac{\partial(\pi_A)}{\partial Q}\right] > 0$, which implies that $Q^*_{GF} > Q^*_A$. Here reducing z_0 will increase p_z significantly. And the incumbent will lobby for fewer permits, which is illustrated in figure 3a.

***Figure 3a**: Switching from auction to grandfathered increases Q^* when* $0 > \varepsilon > -1$

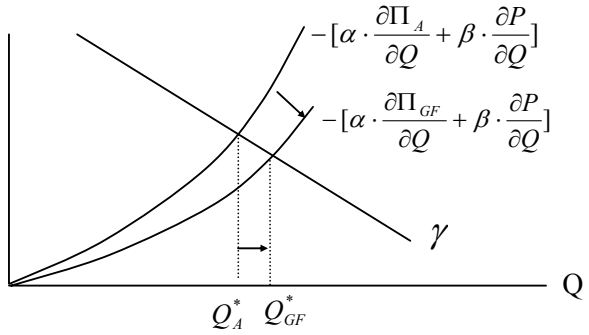
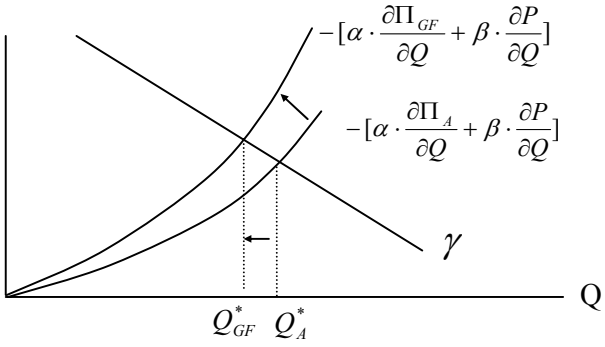


***Figure 3b**: Switching from auction to grandfathered reduces Q^* when* $0 > \varepsilon > -1$

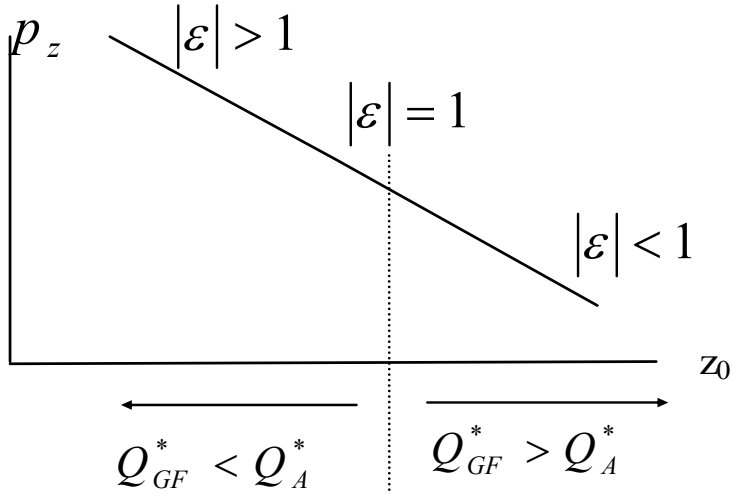


When $\frac{1}{\varepsilon} > -1 (\varepsilon > -1)$, then the price effect is weak, and $\left[\frac{\partial(\pi_{GF})}{\partial Q} - \frac{\partial(\pi_A)}{\partial Q}\right] < 0$, which implies that $Q_{GF}^* < Q_A^*$. In this case reducing z_0 will not increase p_z significantly. And the incumbent will lobby for more permits, which is illustrated in figure 3b. These results are summarized in proposition 2:

Proposition 2: Let $\varepsilon = \frac{\partial z_0}{\partial p_z} \cdot \frac{p_z}{z_0}$. When $|\varepsilon| > 1$, then $Q_{GF}^* < Q_A^*$, that is, the incumbent firms lobby for more permits, and when $|\varepsilon| < 1$, then $Q_{GF}^* > Q_A^*$, the incumbent firms lobby for less permits.

Given a linear relationship between the price of the permits and the number of permits grandfathered, as shown in figure 4, we have that when the number of permits is small ($|\varepsilon| > 1$), then $Q_{GF}^* < Q_A^*$, that is, the incumbent firms lobby for more permits, while when the number of permits is large ($|\varepsilon| < 1$), then $Q_{GF}^* > Q_A^*$, that is, the incumbent firms lobby for fewer permits.

Figure 4. Elasticities in the linear case



Are their certain cases where it is more likely that incumbent firms lobby for more (less) permits. When marginal reduction costs are high (low) (at z_o), then reductions in z_o increase prices by a lot (a little) and it is more likely that incumbents lobby for less (more) permits. When there are many entrants, changes in z_o have a larger effect on permit prices, since entrants have to buy their way into the market, and it is more likely that the incumbents lobby for fewer permits.

When marginal reduction costs are low and the number of entrants is small, then the incumbent will lobby for more permits and Q will be smaller (less strict regulation), while when marginal reduction costs are high and the number of entrants is large, then the incumbent will lobby for fewer permits and Q will be larger (more strict regulation).

Our overall conclusion from section 2 is that the industrial groups have the highest relative strength. In the notation of equation (2), $\alpha > \beta$ and $\alpha > \gamma$, which implies from (3) that Q^* should turn out to be relatively small. This can explain the observation that most EU countries fall short of their Kyoto targets. The initial instruments of CO_2 tax and an auctioned permit trading system would have implied high costs on the most important interest group. As noted by Christiansen and Wetterstad (2003), emissions trading could prove instrumental

for insuring a cost-effective implementation of abatement policies across the EU. However, our results do not necessarily support such an argument. While switching from auction to a grandfathered system is obviously preferred by the industrial groups, the effect of this on the longer run support for the Kyoto target depends on how the permit price responds to changes in the number of grandfathered permits. This is particularly important since the industry group, as will be seen in section 3, is the group with the most influence on environmental regulation in the EU.

3. The case of the EU climate change policy

3.1. EU lobbyism

Does lobbying matter for the choice of (environmental) policy in the EU? In order to answer this question, note that interest groups can be defined as a range of organisations outside the formal institutions that seek to influence decision-making (George and Bache, 2001). They can be informative and bring attention to concerns otherwise neglected. However, they can also seek to influence regulation in their own favour by maximizing their share of the EU income 'pie'. This happens in a pluralist system with competitive lobbying similar to that of the United States. Therefore, Brussels is more like Washington DC than the national capitals in the EU.[12] Each interest group seeks, by lobby activity, to influence policy making in its preferred direction.

In fact, one may argue that pluralism in the EU is less 'pluralistic' than that of the United States because the EU Commission as the agenda-setter has much greater control over the entire process of interest representation, in comparison with the United States where any interest that organises itself is regarded as legitimate so long as it can make itself heard. In the EU, only those interests the Commission chooses to legitimise, and thus allows into the process, will be heard (Schmidt, 1999 and Varming et al., 2000).

12 The same idea can be used when explaining why the EU cannot implement, for example, CO_2 taxation rather than the economically less efficient CO_2 trading system.

Lobbyism plays an important role in a pluralist system, and it is crucial for any interest group to hire the best lobbyists and to have a base in Brussels – 'the insider's town'. Why? Because personal contact and 'networking' is fundamental when building trust and social capital between lobbyists and EU bureaucrats. Bureaucrats are not fully informed about all issues and therefore they need relationships of trust where they can use the information that the lobbyist brings them as an objective source for getting access to background information before final decision-making (see Paldam and Svendsen, 2000 and 2004, concerning trust and the notion of social capital).

EU Parliament started a debate about how to regulate lobbyism in 1992. A self-regulatory code for interest groups was proposed but rejected after heated debates during the 1990s. In other words, the EU has not been able to introduce a self-regulatory code to regulate lobbyism. Furthermore what 'started life as a debate about the regulation of lobbying in the Parliament ended as a highly politicised contest between party groupings over the declaration of members' assets and receipts of gifts', Greenwood (1997, p. 97). This total failure to regulate lobbyism and prevent corruption, highlights the need for clear-cut rules and tough sanctions in case of illegal behaviour.

In 1992, the Commission estimated that 3,000 interest groups (Euro groups) and about 10,000 professional lobbyists were active in Brussels (CEU, 1992). At the same time, roughly 25,000 bureaucrats were permanently employed in EU institutions. This gives us what we could call a 'lobbyist-bureaucrat ratio' of 2.5, meaning that for each lobbyist there are two and a half bureaucrats employed.

The Commission has encouraged lobbying groups to register on the internet and to up-date their data. In 2002 this website run by the Commission contained about 1,000 interest groups (CEU, 2002a). Furthermore, the Commission provides information about EU interest groups on its own website (CEU, 2002b). As is evident from these websites, business interests clearly dominate the lob-

bying groups in Brussels, and they have been rapidly growing over time due to the growing competence of EU institutions. Kurrild-Klitgaard (1998, p. 289) writes, based on Naets (1990), that the number of European interest groups was 59 in 1954 and 546 in 1984. Compared to the level of 3,000 in 1992, the number of interest groups has increased more than five times since 1984 and more than 50 times since 1954.

Furthermore, most EU pressure groups (83 per cent) are involved in promoting business interests while only very few represent the large groups of consumers and taxpayers (Kurrild-Klitgaard (1998) based on Pierce (1991) and Vaubel (1994)). This development is in line with the maxim 'where power goes, interest groups follow' (George and Bache, 2001, p. 290). Greenwood and Aspinwall (1998, p.3) found, in their 1995 survey on 693 formal EU interest groups, that two-thirds of these interest groups were business groups, whereas only one percent of the formal interest groups investigated belonged to consumer organisations. One-fifth belonged to public interests, such as environmental groups or aid organisations.

3.2. Industry

The fact that business and multinationals dominate the political arena fits the logic of group size described in Section 2. These groups have small-number advantages and are also homogeneous and most powerful in terms of resources.

Six new powerful actors were created in the early 1980s and they are strongly influence decision-making in the EU. The most influential of those actors is the business group called the European Roundtable of Industrialists. Its members consist of 45 leading EU companies. The second group is the EU committee of AmCham, which is a group of American multinational corporations. The third actor is the Transatlantic Business Dialogue. It represents large companies seeking to shape the US-EU trade and investment agenda. Fourth, the ENER-G8 is a coalition of eight energy-intensive manufacturing companies such as BASF and Mercedes-Benz. This group has also placed pressure on national en-

ergy producers to organise at the EU level, and corresponds to the 'Seven Sisters' in the United States. Fifth, the International Communications Round Table is a diverse group (including IBM, Sony, Microsoft, Reuters and Macmillan) that tries to influence the development of an information society in the EU. The sixth actor is the Union of Industrial and Employers' Confederations, which is an important Euro-federation of national associations. It tries to influence specific policies, e.g. foreign policy and trade negotiations.

These multinational firms have more policy impact than national interest groups due to their size and international co-operation, allowing them to share the costs of lobbyism (see Greenwood and Aspinwall, 1998, for more evidence on this issue). Lobbying is necessary to keep one's position relative to competitors. Kurrild-Klitgaard (1998) concludes, based on Vaubel (1994), that a vast majority of the money spent by the EU is for transfers rather than for collective goods. For example, at least 72 per cent of the total EU budget is spent on transfer activities favouring interest groups, mainly industrial groupings.

3.3. Consumers

Consumer organisations are, as large groups, weak, due to the logic of group size in Section 2. Therefore, the EU Commission funds and promotes consumer organisations at the EU level.

The five main consumer organisations at the EU level are; The European Consumers' Organisation (which is the strongest), The Confederation of Family Organisations in the European Community, The European Trade Union Confederations, The European Community of Consumer Co-operatives, and The European Interregional Institute for Consumer Affairs. These groups receive about 1/3 of their budgets as subsidizes from the EU, for example, in 1994 the Commission gave €300,000 to The European Consumers' Organisation, and €200,000 to each of the other organisations (Greenwood and Aspinwall 1998). While it may be a good idea to counterbalance business in this way, so that the EU Commission can get information from both parties, the risk is that the con-

sumer organisations are 'bought' by the Commission, and in this way serve the bureaucratic interests of the Commission rather than the consumers.

3.4. Environmentalists

Public interest groups, such as environmental groups are weak too due to group size. As demonstrated by Daugbjerg and Svendsen (2001), consumer and environmental groups do not have much influence compared to business groups. This claim is documented, for example, by a detailed analysis of the actual design of CO_2 taxation in the five countries that, to date, have introduced CO_2 taxation, namely, Denmark, Norway, Sweden, Finland and The Netherlands. Here, Daugbjerg and Svendsen (2001) find a large difference between the CO_2 tax rate applicable to the consumers and the one applicable to producers. In general, CO_2 taxes were non-uniform and consumers, on average, pay a tax rate that is six times higher than that paid by producers. Furthermore, producers were subsidised by favourable refund systems. Therefore, these empirical findings on CO_2 taxation support the theoretical prediction that rent-seeking producers would influence political decision-making and avoid taxation. The authors argued that industry has been successful in seeking to obtain rent against green taxation, whereas consumers were less successful due to group size. The net benefits for individual consumers or environmentalists are clearly negative; it does not pay to take the initiative by organising the whole group into collective action in order to capture the total net benefits. Producers constitute a small group and are therefore well organised. It is even possible for individual group action to take place without any wider organisation occurring, as our example illustrated. Therefore, due to weak rent-seeking power, Daugbjerg and Svendsen (2001) argue that consumers are taxed at a much higher rate than the well-organised producers.

Because of the lack of capacity to organise among large groups, the EU Commission offers funding to public interest groups, and all of the seven environmental core organisations listed below have accepted funding, except for Greenpeace. This so-called 'Group of Seven' is an informal arrangement where

members can participate when it suits them, (see Svendsen, 2003). Officially, the EU Commission provides financial assistance to make the EU more aware of the environment. (Greenwood and Aspinwall, 1998).

The Group of Seven consists of the following members: First, The European Environmental Bureau, which was created in 1974 and was the first environmental organisation to be set up at the EU level. Second, Friends of the Earth Europe, representing 29 organisations in 28 countries. Third, Greenpeace has an EU unit in Brussels to help its mother organisation in executing various campaigns. It does not receive funding from the EU Commission because it wants to maintain its financial and political independence. Fourth, the World Wide Fund for Nature is the voice of 14 national organisations. Fifth, the Climate Network Europe is one of eight regional units in the international Climate Action Network. Their specific aim is to prevent the greenhouse effect. Sixth, BirdLife International lobby specifically on policies that relate to birds and their habitats. Seventh, The European Federation for Transport and the Environment addresses, in particular, as the name implies, road transportation and air quality. As noted, all seven environmental organisations, except for Greenpeace, are funded by the EU Commission.

4. Conclusion

Introducing a political economy framework into the analysis of instrument choice facilitates an explanation of motives behind the decisions of the EU and also offers an assessment of the prospects of the EU reaching, by use of the chosen instrument, its stated environmental target in the Kyoto-agreement.

One reason for switching to the grandfathered approach has been to reduce the costs of regulation for those groups that bear the main burdens of regulation, in our case the industry group, and in this way increase the support for meeting the Kyoto target. However, while all relevant interest groups either prefers grandfathered to auction or are indifferent between the two approaches, and, hence, clearly support this switch, this does not necessarily imply that there will be

more support for the Kyoto target. Our counterintuitive results stems from the fact that permit owners have an (strategic) incentive to increase the price of the permits. Only when the permit price is sufficiently increased as the numbers of permits are reduced, will incumbent firms lobby for fewer permits, and support a more stringent environmental target, compared to the auction case. But from a theoretical point of view, the opposite conclusion is valid as well. If the permit price is not sufficiently increased as the numbers of permits are reduced, incumbent firms will lobby for more permits, and support a less stringent environmental target, compared to the auction case. Which of the two situations will prevail is an empirical matter for future research.

The conclusion is interesting from both a theoretical point of view, showing the complex interaction between choice of instrument and support for a particular level of environmental regulation, as well with respect to the prospect of the EU meeting its Kyoto target level. Intuition suggests that by choosing the instrument that receives the most support of the influential interest groups, it will be easier to sustain (or even improve upon) the proposed environmental regulation. However, as shown in this paper, this is not necessarily true. The reason is that the rent that interest groups can capture by choosing among different instruments and the rent that such groups can capture from changes in the environmental target level is non-monotonic. In particular, while in the case of taxes or auctioned permits, incumbent firms always prefer less strict regulation, given a grandfathered approach, this preference will (or will not) be re-enforced depending on how the permit price changes as the environmental target level changes. For the particular case of the EU grandfathered permit system, this can only be determined empirically, and presumably first when the permit market is functioning. The issue of the connection between choice of instrument and the "politically feasible" level of emissions reductions is a very important one that deserves more attention.

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Appendix

Table 1. EU member states' greenhouse gas emissions*

	GHG emissions			
	1990	1999	Change 1990-99	Reduction target
Austria	76.9	79.2	2.6%	-13.9%
Belgium	136.7	140.4	2,8%	-7.5%
Denmark	70.0	73.0	4.0%	-21.0%
Finland	77.1	76.2	-1.1%	0.0%
France	545.7	544.5	-0.2%	0.0%
Germany	1206.5	982.4	-18,7%	-21.0%
Greece	105.3	123.2	16.9%	25.0%
Ireland	53.5	65.3	22.1%	13.0%
Italy	518.3	541.1	4.4%	-6.5%
Luxembourg	10.8	6.1	-43.3%	-28%
Netherlands	215.8	230.1	6.1%	-6.0%
Portugal	64.6	79.3	22.4%	27.0%
Spain	305.8	380.2	23.2%	15.0%
Sweden	69.5	70.7	1.5%	4.0%
Total EU-15	**4199**	**4030**	**-4.0%**	**-8.0%**

*Reproduced from Gagelmann and Hansjürgens (2002).

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