Environment and Planning A 2003, volume 35, pages 615 – 624

DOI:10.1068/c19s

Goal conflicts in political decisionmaking: a survey of municipality politicians' views of road pricing

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Received 16 October 2001; in revised form 9 October 2002

Abstract. An ongoing discussion concerns road-pricing schemes as measures to abate traffic congestion and air pollution in metropolitan areas. If such measures are to be effective, road-pricing fees must be set sufficiently high. However, municipalities are likely to have other goals besides reducing car use, such as upholding fairness among citizens and financial goals such as creating revenues. If conflicts prove to exist between different goals, road-pricing schemes are not likely to achieve the environmental goal. To investigate the degree to which these goal conflicts exist, members of the local governments in the three major metropolitan areas of Sweden responded to a survey questionnaire. In the questionnaire they rated a number of principles guiding the setting of road-pricing fees hypothesized to correspond to the three goals. The results showed that, for the political majority, the hypothesized goal conflicts existed in that no single goal was optimized. It is concluded that in particular fairness may prevent road pricing achieving the environmental goal.

It is widely agreed that particularly in urban areas individual road users impose serious negative consequences on others, including congestion and air pollution (Greene and Wegener, 1997). Finding effective means to abate these problems is a current key issue in many countries. Some means are technical, such as reducing emissions by substituting gasoline-powered cars with more environmentally friendly alternatives (for example, A Gärling and Thøgersen, 2001). However, technical fixes are not sufficient. Other means leading to a reduced demand for private car use must be implemented (T Gärling et al, 2002a; 2002b).

If driving a private car is more beneficial than using other less environmentally damaging modes of transport, the individual has a choice between acting in self-interest and acting in the interest of the collective. The choice thus has the characteristics of a social dilemma (Dawes, 1980), where the payoff for each individual to act in self-interest (called defecting) is higher than the payoff for acting in the interest of the collective (called cooperating) regardless of what others do, but where all individuals receive a lower payoff if all defect than if all cooperate.

A large body of research has been devoted to determining under which conditions people choose to cooperate in social dilemmas (Komorita and Parks, 1995). This research has revealed a number of social – psychological factors that increase cooperation. One of the most important factors is communication (Dawes et al, 1977; Jorgenson and Papciak, 1981; Liebrand, 1984) that promotes the establishment of contracts

(Kerr and Kaufman-Gilliland, 1994), reduces anonymity (Fox and Guyer, 1978), and creates a group identity (Brewer and Kramer, 1986). Yet, the prospects for cooperation in an urban road-transport setting are not very promising because there are a large number of geographically widespread agents with small possibilities of direct communication (Van Lange et al, 2000).

Another possible course of action for solving conflicts between self-interest and the interest of the collective would be to introduce structural solutions (Samuelson and Messick, 1986), that is, to introduce incentives or disincentives that change the payoff. Indeed, economic sanctions have been found to be an effective tool in ensuring cooperation in social dilemmas (Yamagishi, 1986), and are generally recommended by economists for allocation-efficiency reasons (Baumol and Oates, 1988). Furthermore, support for economic sanctions has also been shown to increase with the seriousness of the problem (Yamagishi, 1988). However, despite the fact that they are generally considered to be an efficient way to cope with externalities from traffic, various kinds of road-pricing schemes are often unpopular (Emmerink et al, 1995; Jakobsson et al, 2000), implying that politicians who are concerned about election outcomes may be hesitant to implement them. Indeed, for several decades economists have advocated road pricing (Vickrey, 1963; Walters, 1961). Yet, politicians face several goal conflicts when they attempt to implement a road-pricing scheme.

A perspective on conflicts of interest is the principal-agent theory (Arrow, 1970; Eisenhardt, 1989; Wilson, 1968). The theory applies to situations in which one party (the principal) strives to ensure that another party (the agent) will act in the interest of the principal. It is assumed that the agent will only do so if it is in his or her interest. Thus, the principal must offer the agent incentives for acting in the interest of the principal or disincentives for acting against the interests of the principal. Stated in another way, the utility for the agent acting in the interest of the principal must at least be as high as the utility the agent can derive from alternative options. The relationship between municipality politicians who decide on fee levels and municipality citizens who must pay the fees may be framed as a principal-agent problem. Given that the aim of the politicians is, for instance, to reduce car use, they must take into account that individual road users may have very different objectives, and that in general politicians can only use imperfect policy instruments to affect behavior.

Local municipalities are also in a principal-agent relationship to the federal or regional government. In this relationship the government is the principal while the municipality is the agent. The government can, for instance, authorize the municipality to make its own decisions about road pricing. Assuming that one of the government's (the principal's) objectives is to abate environmental degradation from car use, it must take into account that the municipality politicians (the agent) may have other priorities.

Generally, if municipality politicians are faced with conflicting goals, pursuing one goal will lead to other goals being downplayed. Political decisionmaking (Matheson, 1998) is an area where goal conflicts are particularly salient. Politicians who make decisions must weigh the interests of different groups with different goals. Sometimes it is not possible to optimize certain goals, and compromises that are politically realistic must be found. In the political arena, federal politicians can often be assumed to adopt a national perspective while regional or local politicians are more inclined to emphasize local interests. However, environmental problems have no regional or national boundaries. It is easy to see that municipality politicians can pursue regional self-interest goals (for example, financial) while negative consequences stemming from this pursuit (for example, environmental) are diffused over several other actors (for example, nationally or internationally).

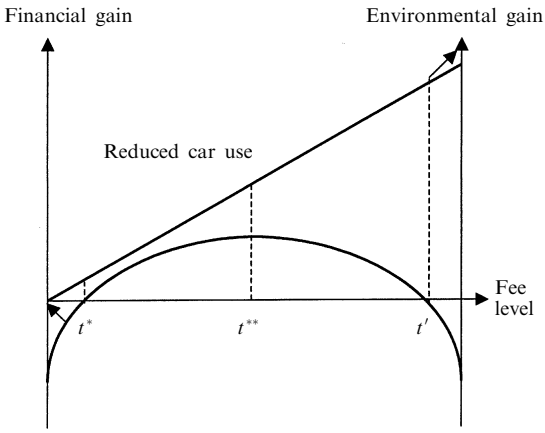

Figure 1. A simplified case of municipality decisionmaking about the level of the road-pricing fee.

Besides the financial and environmental goals, one can also distinguish a third goal: fairness. When structural solutions such as pricing private car use are implemented, different groups will be affected differently. Assuming that the fee is equal for all, low-income citizens will be hit harder than high-income citizens. From the perspective of a municipality, this can be viewed as a conflict of interest where financial goals directly relevant to the local municipality and/or fairness goals are given more weight than environmental goals.

In the present study we investigate a scenario where the government decides that local municipalities are authorized to implement road pricing in their respective municipalities. Given that the government's goal for doing this is reduced car use, different types of goal conflicts are faced by municipality politicians who may share this goal at the local level (for example, reducing negative health risks for the municipality citizens) but are likely to also have other goals.

Figure 1 illustrates a simplified case of municipality decisionmaking about level of road pricing where for simplicity the environmental gains are assumed to increase linearly with the level of road pricing (the number of drivers not using their cars). (See appendix for derivation of the functions illustrated in the figure.) At the same time the net revenues for the municipality increase to a maximum (t^{**}) after which they decline. The municipality also has to bear the fixed costs so that there are no net revenues when the fee level t is equal to or less than t^* or equal to or greater than t'. If the municipality politicians pursue the goal of maximizing net revenues, this goal is achieved by setting the fee to t^{**}. But note that this is in general different from maximizing the social net benefit, where the road-user benefits as well as the social costs of congestion and the environment are taken into account. A likely constraint is to avoid net financial costs, that is, make sure that the fee is within the interval $t^* - t'$. However, politicians who are concerned about disadvantaged citizens may be reluctant to increase the fee above t^* if this means that these citizens will suffer.

The specific aim of our empirical study is to investigate the existence of the conflict between the governmental goal of reducing car use, the interest of the municipality politicians in obtaining revenues from road pricing, and the interest of the municipality politicians in upholding fairness among citizens. Another issue that will be investigated is whether politicians belonging to political parties with different agendas are subject to these conflicts in varying degrees.

Method

Sample

Questionnaires were mailed to 243 municipality politicians in three Swedish metropolitan areas (Stockholm with about 736 000, Göteborg with about 462 000, and Malmö with about 258 000 residents). A total of 152 (63%) respondents answered the questionnaires. Of these 81 were men and 71 were women. Their mean age was 47.8 years (ranging from 21 to 75 years old). They were 58 Social Democrats, 43 Conservatives, 9 Liberals, 14 Christian Democrats, 21 Left Party members, and 7 Green Party members. The distributions across parties in the different metropolitan areas closely resembled the actual distributions, $\chi^2(5) = 2.22$, $p = 0.82$.

Questionnaire and procedure

The questionnaire[1] consisted of a number of questions to which the respondents responded on four-point scales. Two more general questions concerned how interested they are in traffic policy, and how much time they devote to traffic-policy issues. A set of additional questions concerned the respondents' attitudes toward reduction of car use, need for political action, and road pricing. Furthermore, respondents were asked to rate the extent to which six different principles that may govern the setting of road-pricing fees favored the three goals of a good economy for the municipality, fairness to municipality citizens, and a good environment. Finally, respondents were presented with a scenario in which the government requires that the municipality implements a road-pricing system letting the municipality decide the fee levels. The municipality would also be allowed to keep any net revenue. The respondents were then again presented with the six different principles that may govern the fee level. They were asked first to rank order each principle to which extent they favored it, then to rate each principle on a scale with the verbally defined categories 'unacceptable', 'barely unacceptable', 'barely acceptable', and 'acceptable'. The principles were: (1) compensates the costs; (2) affordable for a majority of car users; (3) finances new road infrastructure; (4) finances infrastructure for other traffic; (5) reduces car use; and (6) finances other municipality services.

Results

On the basis of differences between parties with regard to their attitudes towards road pricing, the respondents were split into three groups. One group (L) consisted of politicians from the Left and Green Parties. The second group (C) consisted of members of the Conservative Party, the Liberal Party, and the Christian Democratic Party. The Social Democrats (S) made up a third group. In the analyses reported below, from 1% to 19% of the responses were missing. The missing values were replaced by the means for the corresponding group. This appeared to be sufficient because analyses without replacement of missing values did not yield different results.

Table 1 shows the answers to the background questions. Statistical significance tests were performed by means of one-way analyses of variance (ANOVAs) followed by Tukey post hoc t-tests at $p = 0.05$. As the results indicated, group L devoted somewhat more time than the other groups to issues related to traffic policy, although this difference did not reach statistical significance. Groups L, S, and C differed significantly with respect to their attitudes towards reduction of car use, need for political action, and road pricing. Group L was more positive than group S which was more positive than

[1] The questionnaire questions were pretested in personal interviews with fifteen key politicians in the Göteborg area (Johansson et al, in press). These politicians were not recruited to the sample that received the mail questionnaire.

Table 1. Interest in and amount of time spent on traffic-policy issues, attitudes towards reduction of car use, need for political action, road pricing, and governmental control expressed by groups consisting of members of different political parties.

	Group [a, b]			dfs [c]	*F*	*p*
	L	S	C			
Time devoted to traffic policy [d]	2.54	2.21	2.33	2, 149	1.94	0.150
Reduction of car use [e]	3.57_1	2.93_2	1.95_3	2, 147	43.03	0.001
Need for political action [e]	3.86_1	3.38_2	2.08_3	2, 147	53.13	0.001
Road pricing [e]	3.29_1	2.39_2	1.94_3	2, 145	20.28	0.001
Governmental control over net revenues [e]	2.15_1	2.04_1	1.31_2	2, 145	17.22	0.001
Governmental control over fee level [e]	2.15_1	2.04_1	1.33_2	2, 145	17.64	0.001

[a] Group L consists of 28 Left and Green Party members, group S of 58 Social Democrats, and group C of 66 Conservatives, Christian Democrats, and Liberals.
[b] Means with different subscripts differed significantly between party groups in Tukey post hoc tests at $p < 0.05$.
[c] dfs—degrees of freedom.
[d] Rated on a four-point scale ranging from 'very little' (1) to 'very much' (4).
[e] Rated on a four-point scale ranging from 'very negative' (1) to 'very positive' (4).

group C to all these issues. Both groups L and S were significantly more positive than group C towards governmental control over use of net revenues and fee levels.

Table 2 shows the mean ratings of the degree to which different principles lead to a good economy for the municipality, fairness to the municipality citizens, and a good environment. Separate two-way ANOVAs on the ratings of each principle yielded significant main effects of goal and party group. Bonferroni-corrected *t*-tests at $p = 0.05$ showed that, as expected, for the principle 'compensate the costs' the goal 'a good economy' was rated significantly higher than 'fairness'. However, there was no significant difference between 'a good economy' and 'a good environment'. Also, for the principle 'finances road infrastructure' the goal 'a good economy' was

Table 2. Mean ratings of the degree to which different principles lead to a good economy, fairness, and a good environment.

Principle [a]	A good economy	Fairness	A good environment	dfs [b]	*F*	*p*
A good economy						
Compensate the costs	2.98_1	2.74_2	2.96_1	1.96, 292.39	6.50	0.002
Finances road infrastructure	2.96_1	2.61_2	2.74_2	1.98, 294.52	14.28	0.001
Finances other municipality services	2.29_1	1.98_2	2.17_1	1.88, 280.82	9.84	0.001
Fairness						
Affordable for a majority of car users	2.77_1	3.08_2	2.52_3	1.99, 296.63	43.85	0.001
A good environment						
Finances infrastructure for other traffic	2.84_1	2.58_2	2.99_3	1.88, 279.87	25.76	0.001
Reduces car use	2.59_1	2.30_2	3.11_3	1.91, 284.15	83.42	0.001

Note. Means with different subscripts differ significantly between the goals of 'a good economy', 'fairness', and 'a good environment' in Bonferroni-corrected *t*-tests at $p < 0.05$.
[a] Rated on a four-point scale ranging from 'very bad for' (1) to 'very good for' (4).
[b] dfs—degrees of freedom.

Table 3. Mean ratings[a] and rank orders by three groups[b] of preference for principles guiding the road-pricing fee.

Principle [a]	Group [b, c]		
	L	S	C
A good economy			
Compensate the costs	3.18 (3.51)	3.43 (2.55)	3.31 (2.28)
Finances road infrastructure	1.49_1 (5.26)	2.83_2 (3.79)	2.93_2 (2.56)
Finances other municipality services	2.33_1 (4.19)	1.69_2 (5.60)	1.15_3 (5.75)
Fairness			
Affordable for a majority of car users	2.84_1 (3.62)	3.39_2 (2.65)	3.32_2 (2.24)
A good environment			
Finances infrastructure for other traffic	3.48_1 (2.66)	3.04_1 (3.11)	2.19_2 (3.90)
Reduces car use	3.77_1 (1.77)	3.18_2 (3.06)	2.17_3 (4.19)

Note. Means with different subscripts differ significantly between party groups in Tukey post hoc *t*-tests at $p < 0.05$.
[a] Rated on a four-point scale ranging from 'unacceptable' (1) to 'acceptable' (4).
[b] Group L consists of 28 members of the Left and Green Parties, group S of 58 Social Democrats, and group C of 66 Conservatives, Christian Democrats, and Liberals.
[c] Mean rank orders are given in parentheses.

rated significantly higher than the other goals. Furthermore, for the principle 'finances other municipality services' the goal 'a good economy' was rated significantly higher than 'fairness', but there was no significant difference between 'a good economy' and 'a good environment'. As expected, for the principle 'affordable for a majority of car users' the goal 'fairness' was rated significantly higher than the other goals. Finally, as expected, for the principles 'finances infrastructure for other traffic' and 'reduces car use' the goal 'a good environment' was rated significantly higher than the other goals.

The party groups were in agreement about which of the three goals the different principles attain. The only exception was observed for the principle 'affordable for a majority of car users'. In this case a separate ANOVA yielded a significant interaction effect between party group and goal, $F(3.98, 296.63) = 7.33$ [after Geisser–Greenhouse correction of the degrees of freedom (dfs)], $p < 0.001$, mean standard error (MSE) = 0.31. Bonferroni-corrected *t*-tests at $p < 0.05$ showed that the ratings of the economic and fairness goals did not differ reliably for group C whereas the ratings by the other groups differed.

As table 3 shows, the groups differed in how they ranked and rated the principles. Whereas group L favored the principles linked to the environmental goal, groups S and C favored principles related to the economic and fairness goals. Thus, group L ranked 'reduces car use' as the most important and 'finances infrastructure for other traffic' as the second most important principle; group S ranked 'compensate the costs' as the most important and 'affordable for a majority of car users' as the second most important principle; and group C ranked 'affordable for a majority of car users' as the most important and 'compensate the costs' as the second most important principle.

The ratings of acceptance followed the same pattern. A 3 (group) by 6 (principle) ANOVA on these ratings with repeated measures on the last factor yielded a significant main effect of party group, $F(2, 149) = 20.22$, $p < 0.001$, MSE = 0.86, a significant main effect of principle, $F(4.48, 668.07) = 75.27$ (Geisser–Greenhouse corrected dfs), $p < 0.001$, MSE = 0.69, and a significant interaction between party group and principle, $F(8.97, 668.07) = 23.63$ (Geisser–Greenhouse corrected dfs), $p < 0.001$, MSE = 0.69. Bonferroni-corrected *t*-tests at $p < 0.05$ showed that

group L rated 'reduces car use' significantly higher than all the other principles except 'finances infrastructure for other traffic', 'finances infrastructure for other traffic' significantly higher than 'finances other municipality services', and 'finances road infrastructure' and 'compensate the costs' significantly higher than 'finances other municipality services' and 'finances road infrastructure', and 'affordable for a majority of car users' significantly higher than 'finances road infrastructure'. Group S rated 'compensate the costs' and 'affordable for a majority of car users' significantly higher than 'finances road infrastructure' and 'finances other municipality services', and 'reduces car use', 'finances infrastructure for other traffic', and 'finances road infrastructure' significantly higher than 'finances other municipality services'. Group C rated 'affordable for a majority of car users' significantly higher than the other principles except 'compensate the costs' and 'finances road infrastructure', 'compensate the costs' significantly higher than all the other principles except 'affordable for a majority of car users', 'finances road infrastructure' significantly higher than 'finances infrastructure for other traffic', 'reduces car use', and 'finances other municipality services', and 'finances infrastructure for other traffic', and 'reduces car use' significantly higher than 'finances other municipality services'.

As indicated in the table, there were also the following significant party-group differences on the ratings of acceptance. Group L rated 'finances road infrastructure' and 'affordable for a majority of car users' lower than did groups S and C. Furthermore, group C rated 'finances other municipality services', 'finances infrastructure for other traffic', and 'reduces car use' lower than did groups S and L. Finally, group L rated 'finances other municipality services' and 'reduces car use' higher than did groups S and C.

Discussion

The results confirmed that the hypothesized goal conflicts exist in that no single goal was optimized. As expected, the environmental goal was found to be in conflict with the other goals, and especially with the fairness goal. However, this conflict appeared to be confined to Social Democrats, Conservatives, Liberals, and Christian Democrats (representing the majority in the three municipalities). The conflict was expressed in placing a higher priority on the fairness and to some extent on the financial goal. For these politicians it appears that goals related to their political ideology dominate over the environmental goal. Yet, these conflicts did not prevent the Left and Green Party representatives from prioritizing the environmental goal. Perhaps this can be explained by their political ideology being more consistent with this goal.

In politics it is often argued that the best way to deal with goal conflicts is to compromise. In the current context this would mean setting the fees so that financial and environmental goals are reached to some extent, without deviating too much from the fairness goal. One such compromise that has been proposed is to use road pricing primarily as a tool to reduce traffic congestion. This may lead to more efficient use of road infrastructure, thus reducing or even eliminating the need for new road capacity. Most likely, it would also generate a nonnegligible financial surplus to the municipality, as well as reducing local air-pollution and noise problems. It is, however, unlikely that such a compromise would be very helpful in fulfilling the governmental goal of reduced CO_2 emissions. On the other hand, it can be argued that there are other policy instruments, such as fuel taxes, which are more closely targeted to this goal (Johansson-Stenman and Sterner, 1998).

Given the results of the survey, an important question that also needs to be addressed is what measures could be chosen to reduce or eliminate the type of conflicts that are likely to lead to inefficient actions. The government's task is to use incentives

or disincentives that are effective in forcing the municipalities to pursue the overall goals of the society, including the environmental goal. The fiscal goal could of course be counteracted if the government confiscated any revenues. However, given that fairness is another, probably even larger, obstacle, this will not completely solve the conflict. Given the apparent strength of the conflict between the environmental goal and fairness, it appears important to reduce this conflict. One way would be to link road pricing to changes in taxes that offset perceived negative distributional impacts. One may also consider disincentives, such as a reduction of governmental subsidies if the municipality fails to reach specified environmental goals. Of course, whether these measures will work or not needs to be addressed empirically. Although the effectiveness is difficult to assess in field settings, the social dilemma paradigm has in the past been successfully applied in experimental research that addresses policy-relevant issues (for example, Komorita and Parks, 1995). Findings from such experiments may in fact prove to be very useful also as guides for what measures should be applied in order to solve interest conflicts in municipality political decisionmaking regarding road pricing.

Some researchers have argued for the viability of road-pricing solutions in that some of the obstacles brought to attention in the present study can be overcome. For instance, Goodwin (1994) and Small (1992) proposed policy packages designed to increase acceptability by dividing the release of road space and the revenues stemming from pricing into different parts (goals). These include environmental improvement (for example, pedestrian areas), improvement of other traffic (for example, buses, emergency vehicles, and services), and reducing congestion delays for all remaining traffic. The use of the revenues would be divided between improvements of public transport, road infrastructure, and general tax revenues. These types of scheme would possibly take care of the problem of congestion and at the same time generate revenue. It is argued that, because potentially all types of travelers would receive a positive net benefit, road-pricing systems would be accepted as a part of such a package. However, the fairness motive will, as we have shown, still be a significant factor facing the politicians. This is because low-income car users will have no choice other than to reduce their car use. If a substantial number of these car users value their use of road space to the same extent as do high-income users, the former will perceive this situation as unfair.

In a similar vein Oberholze-Gee and Weck-Hannemann (2002) discussed whether compensatory measures for those priced out of the road space mitigate the fairness issue if these measures remain in the same domain as the priced resource (that is, road space). If this were the case, politicians might become more inclined to implement road pricing, believing that this would be generally accepted. However, this argument assumes that people are willing to accept being priced out of road space at specific times and being compensated by a larger quantity of road space at other times. The counterargument is similar here to that above in that this approach assumes that people value access to road space equally regardless of time and place. Furthermore, Oberholze-Gee and Weck-Hannemann (2002) argue that, as environmental protection is more accepted as a valid goal by the public than is congestion reduction, the improvement of air quality should be the cornerstone of policy. The problem here is to decide what level of the fee is high enough to ensure a reduced emission. The fee may actually have to be extremely high to make a difference. Particularly in congested metropolitan areas with inefficient public transport, drivers are probably not willing to use means of transportation other than the car on a daily basis. If there are no feasible alternatives to using the car, drivers will in effect be forced to pay whatever fee is determined, making the system environmentally ineffective.

A main obstacle to road pricing is that the public perceives it as an unfair way of allocating resources (Frey and Pommerehne, 1993). Even if citizens accept environmental gain as a valid reason for pricing air pollution, it seems unlikely that very high levels of road-pricing fees would be accepted. As long as a majority of municipality politicians perceive fairness to overshadow the environmental goal, it will be virtually impossible to reach that goal by using road-pricing systems.

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Appendix

Assume that the number of car drivers who suppress car use (Q_{red}) is proportional to the road charge or fee, so that $Q_{\text{red}} = kt$, where k is a positive constant, and t is the fee level. The net revenue (R) is then given by

$$R = (Q_0 - Q_{\text{red}})t - C = Q_0 t - kt^2 - C,$$

where Q_0 is the number of car drivers at a zero-fee level, and C are fixed costs. For the net revenue to be positive the charge can neither be too small nor too large, and we have that $R = 0$ implies that

$$t = \frac{Q_0}{2k} \pm \left(\frac{Q_0^2}{4k^2} - C \right)^{1/2}.$$

The condition for net revenue maximization is given by

$$t^{**} = \frac{Q_0}{2k},$$

implying

$$R_{\max} \frac{Q_0^2}{4k} - C.$$

At higher fee levels, the revenues decrease when fees increase, because the associated traffic reduction more than offsets the revenue increase per car driver. Note that an economically efficient charge level $\hat{t}$ is not directly related to t^{**} (figure 1), because according to conventional economic theory (for example, see Baumol and Oates, 1988) an efficient charge equals the marginal external costs, which are independent of tax revenues. Hence, this level can be either greater than or less than t^{**}. However, unless the external costs are extremely large (in equilibrium) it appears reasonable in most real cases to assume that $\hat{t} < t^{**}$.