

A NOTE ON THE DISTRIBUTIONAL EFFECTS OF ROAD PRICING

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Since the traffic problems of central cities seem to be getting no better and may even be deteriorating, there has been a recent revival of interest in the instrument of direct road pricing. Despite the theory of second best, few would quarrel with the argument that its introduction would improve the efficiency of resource allocation, though there might be more disagreement on whether road pricing is the most appropriate solution when political feasibility and administrative costs are taken into account. Also, it is usually recognised that road pricing is inequitable between car owners, since the same charges are levied on car use regardless of the incomes of motorists. A new twist to the recent discussion has been the suggestion that direct road pricing may have progressive effects.¹ The purpose of this note is to show that this is most unlikely: on any plausible sets of assumptions road pricing must be regressive between motorists. When we take all road users into account (and particularly bus passengers) it is probable that there is some degree of relative gain by low-income travellers. But we still cannot speak about an overall progressive effect, since what happens is that a large middle income group loses most (the relatively low-income motorists) while gains or minimum losses accrue to both the poor (non-motorists) and the rich (wealthy motorists). Since economists have no satisfactory method of measuring whether redistributive effects of this kind (relative improvement in both tails of the income distribution curve) represent a move towards or away from greater equity, the results have to be judged on more vague social criteria. The conclusion is that the case for road pricing should be based on its many efficiency merits rather than on any attempt to build up a spurious equity case.

C. D. Foster argues that, considered as a tax, road pricing is progressive: "The richer a car-owning family, the more car trips it will make. . . . It is usually argued also that richer families on average make longer car journeys. They are therefore likely to spend more on car use; and, other things being equal, they will pay more per family per annum in road pricing charges. Hence on these assumptions, road pricing regarded as a tax will be progressive" ([1], para. 2). This argument is clearly wrong by the standard definition of progressiveness—that a progressive tax is one in which the rate increases with increasing income (i.e. a *more than* proportional tax). Thus to argue that the tax effect of road pricing was progressive it would be

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¹See for example C. D. Foster [1] and K. M. Gwilliam ([3], paras. 1387–9). The GLC reply to Foster is given in [2].

necessary to show that the ratio of the road charges paid by the rich motorist to those paid by the poor motorist was higher than the ratio of their incomes. Even if we accept the argument that the wealthy motorists make more trips, longer trips, trips on more congested streets and trips at times closer to peak hours (and the evidence is not clear-cut on any of these propositions [2]), it is inconceivable that the higher road charges would outweigh the relative income ratio (which might easily be a factor of 3).

If road pricing is regressive among car owners as a tax, its overall regressive impact is much more severe when benefits are taken into account. The main benefit to car users left on the road is in the form of reduced congestion. Since travel time is valued more highly by higher income groups, the gains of reduced congestion are reaped by the higher income motorist. Road congestion may not be the most efficient solution to the urban transport problem, but as an equitable solution it is hard to beat! The effects of road pricing will be to force relatively poor motorists off central city roads (because of inability to pay), to impose a highly regressive burden on those who choose and can afford to pay,² and to provide much smaller compensating benefits to the low-income car owner because time savings are less valuable to him.

If we widen the scope of the analysis to include all road users, the analysis is less clear-cut. For instance, suppose we assume that there are two categories of users, bus passengers and motorists,³ and that bus passengers may be treated as a whole as a "low income group" and motorists as a "high income group". It is possible that bus users would be the main beneficiaries from direct road pricing: congestion may affect buses more than other road traffic because they are tied to congested roads and have no flexibility to change their routes or times in response to traffic delays; higher bus occupancy rates would mean a lower road price per passenger;⁴ less congested roads resulting from road pricing could facilitate improvement in traffic management, e.g. special access lanes for buses. On these assumptions, bus passengers as a group will probably benefit in net terms (the scale of benefits will probably outweigh their low *per capita* road charge), while car owners as a group clearly lose. Thus, it might be argued that the redistributive effects of road pricing are towards greater equity because they bring about a relative shift in welfare from the high income group to the low income group.

Unfortunately, this argument is also defective because it is not permissible to

²The higher income car user may also be more likely to receive subsidy support from his employer

³I say nothing about the impacts of road pricing charges on commercial vehicles: these are hard to identify, though they may be far-reaching. How the incidence of the effects of road pricing is distributed between producers and consumers will vary, of course, from commodity to commodity. Most of the arguments can be found in [4].

⁴This is on the assumption that buses are not exempt. If public transport is exempt, the arguments apply *a fortiori*. This raises a much more general point. We are unable to evaluate the distributional, or indeed the allocative, effects of road pricing unless we specify the type of scheme to be adopted, whether or not it discriminates between particular types of road users, how far the rates charged are graduated according to intensity of traffic use and distance from the central business district, and so on. The arguments discussed in this note are so general, however, that they are probably valid independently of the details of the scheme.

treat bus passengers and motorists as homogeneous groups. There are two reasons for this. First, the distribution of income within the groups is so wide that the labels "low income" and "high income" will not do. Second, the income ranges overlap; there are relatively well-off bus users⁵ and relatively low income car users.⁶ As a result, if we wish to examine the redistributive effects of road pricing we must classify road users by level of income *and* mode, not by mode alone. This makes the analysis very complicated, and the data requirements of an empirical test rather heavy. It is clear, however, that, even on assumptions that are generous to the progressive case, it is impossible to argue that direct road pricing will shift welfare from the higher to the lower income groups. This is because, although very low-income households (mainly bus passengers) will gain, at the same time the highest income groups (the well-off motorists) will also gain relatively to the poorer motorists. If this middle band of disadvantaged low-income motorists was very small it might not matter; but, given the current car-ownership rate among households and the spread of car ownership to lower income households, the number who would be adversely affected runs into millions. In this kind of case (where the Lorenz curves for the distribution of welfare before and after the change cross), standard measures of the degree of inequality such as the Gini coefficient cannot be used. Indeed, the impossibility of interpersonal welfare comparisons means that we can say nothing scientific about the equity direction of shifts in welfare benefiting the poor and the rich simultaneously, since we have no way of weighting the move towards inequity (the gain to the rich) against that towards equity (the gain to the poor).

These two findings, that road pricing is always regressive in its effects on car owners and is always ambiguous in its effects on all road users, imply that road pricing considered as a tax can never be simply justified on equity grounds. The improvements in allocative efficiency will have redistributive side effects, but we are unable to specify their direction *a priori*. A more definite conclusion is that the revenues from road pricing may be spent progressively instead of as a flat-rate reduction in the annual road licence. For instance, the revenues could be used to subsidise inner city bus services, and this could improve dramatically the overall progressive impact of a road pricing policy. Furthermore, there may be some possibility—in spite of administrative difficulties—of minimising the regressive impact of road pricing on car owners, for instance by imposing higher charges on larger cars or by a graduated road licence tax with low-income car owners paying a lower tax. However, since there is a strong case for road pricing on efficiency grounds, whereas the equity arguments are murky, the issue should be decided in the light of efficiency, goal achievement and political feasibility. We should not try to make a probably unpopular but effective measure more palatable by resorting to specious social arguments. The question of the equity of the tax among road users as a whole cannot be resolved, and hence is not critical to decisions on road pricing.

⁵Up to the £4,000 per annum income level, expenditure on bus fares increases with income, though the income elasticity of demand is certainly low ([5], Table 1, pp. 20–21).

⁶The purchase and maintenance of motor vehicles accounts for over 9 per cent of total expenditure even in the £25–£30 per week income group ([5], Table 1).

REFERENCES

- [1] Foster, C. D.: Evidence to the Greater London Development Plan Inquiry on the Regressiveness of Road Pricing. *GLDP Inquiry*, B654; 1972.
- [2] Greater London Council: Some Comments on Possible Income Distribution Effects of Road Pricing and Parking Restraint. *GLDP Inquiry*, 1972.
- [3] Gwilliam, K. M.: Evidence to the Environment and Home Office Sub-Committee of the Expenditure Committee. *Urban Transport Planning*, Vol. II, 1972.
- [4] Sharp, C.: "Congestion and Welfare—an Examination of the Case for a Corporation Tax." *Economic Journal*, 76 (1966), 806-17.
- [5] Department of Employment and Productivity: *Family Expenditure Survey, Report for 1972*. HMSO, 1973.