briefing notes

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THE DISTRIBUTIONAL EFFECTS OF THE PROPOSED LONDON CONGESTION CHARGING SCHEME

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THE INSTITUTE FOR FISCAL STUDIES
Briefing Note No. 11

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Published by
The Institute for Fiscal Studies
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ISBN 1-903274-12-5

Published online at http://www.ifs.org.uk

This note uses the 1991 London Area Transport Study to estimate the distribution of charging liabilities amongst households living within the M25 arising from the proposed London congestion charging scheme.[1]

Different households will have differing liabilities to the charging scheme according to the many and varied factors that together determine their travel patterns – where they live, where they work, where their children go to school, whether they have a car or van, the number of members in the household and so on. And one thing that can be guessed about the final effects of the scheme on households is that these effects will be extremely heterogeneous. Many households will be, on the face of it, unaffected by the charge. Many others, if their present travel patterns persist, may be faced with very large bills.

The aim in this study is to analyse the potential progressivity or regressivity of the scheme – in other words, to look at the link between the level of charges that households are likely to face and their ability to pay those charges.

The plan of the note is as follows: it first discusses the way in which the distributional effects of a tax or charge can be measured; it then describes the data used to make this calculation; finally it presents the results with a discussion.

1. Measuring the Burden

Charges and taxes are defined as *progressive* if the average charge/tax rate increases with income, or if the marginal charge/tax rate is higher than the average rate at all levels of income, which amounts to the same thing (the average rate is the total charge/tax paid as a proportion of income; the marginal rate is the increased charge/tax associated with a small increase in income). Charges and taxes are defined

[1] The author is very grateful to James Banks, Martin Richards, Tony Travers and members of the GLA's Scrutiny Panel for helpful discussions, and to Charles Buckingham of the Greater London Authority for his help in gathering the trip data from the 1991 London Area Transport Study. The income data were drawn from the Family Expenditure Survey and were made available by the Office for National Statistics through the ESRC Data Archive and have been used by permission of the Controller of HMSO. Neither James Banks, Martin Richards, Tony Travers, Charles Buckingham, the GLA, the ONS nor the ESRC Data Archive bears responsibility for the analysis or the interpretation of the data reported here. The views expressed here are those of the author and not of the Institute for Fiscal Studies, which has no corporate view. The author is responsible for all errors. This study has been funded by the Economic and Social Research Council as part of the research programme of the ESRC Centre for the Microeconomic Analysis of Fiscal Policy at IFS.

as *regressive* if the average rate falls with income. An average charge rate that rises with income means that the total charge levied takes a larger share of a richer household's income than of a poorer household's income. The notion of progressivity/regressivity links the level of a household's liability to the charge with their ability to pay as measured by household income. A poll tax is an example of a regressive tax scheme in which the tax level is independent of the ability to pay. By way of contrast, the current system of direct income taxation, with its tax-free allowances and with marginal tax rates that increase with income, is an example of a progressive tax scheme.

2. Data

The 1991 London Area Transport Study (LATS) covered the area within the M25 motorway. The survey involved over 1,000,000 roadside and 60,000 household interviews, 250,000 interviews on the then British Rail and 280,000 interviews on the London Underground. These data describe the use of all modes of transport and provide information about the origins and destinations of journeys, purpose of travel, trip lengths and frequencies. The survey also described the people making the journeys, giving information about gender, ethnic origin and banded household income.

On the basis of the LATS data, the number of trips by members of households using modes of transport that will attract the proposed charge and that terminate inside the proposed charging zone during the proposed charging periods on a typical weekday can be calculated by household income band. Note that it has not been possible to take account of journeys that start and end outside the proposed zone but that may pass through it *en route*. Note also that, because the 1991 data are the most recent available, no account can be taken of any changes in travel patterns that may have taken place since then. Trip data are based on 'main mode', i.e. the mode on which the longest distance was travelled as part of a multi-stage journey. The figures will not, therefore, relate very well to single-mode-based counts of trips entering central London. However, the extent to which this is true varies according to mode. Car and walk trips are more likely to be single-mode. In performing this analysis, it was also clear that the number of trips was affected by the comparative absence of trips terminating in the congestion charging area between the hours of 06.00 and 07.00 and

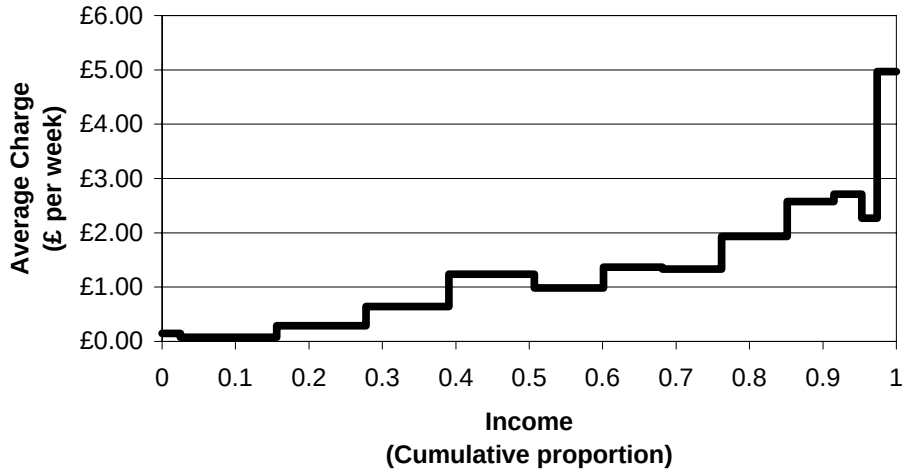
between 19.00 and 20.00. However, the source data have been confirmed as according with published sources[2] for the period 07.00–21.00.

In order to calculate the average incomes of households within each band, the income banding data are compared with household incomes from a corresponding geographical sub-sample of the Family Expenditure Survey for 1991.[3] The average income data have been updated to current 2000 values using an index of household income.[4] Households with incomplete income data in the LATS are excluded from the results.

3. Results and Discussion

Figure 1 shows how the average charge paid per week would vary with income. The income data are shown according to the household's position in the income distribution.[5]

Figure 1: Average weekly charges and income



The graph shows that, for example, households whose income places them between the fiftieth and sixtieth percentiles of the income distribution would pay about £1 per

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[2] London Research Centre, *Travel in London*, The Stationery Office, London, 1994.

[3] Households were selected from the FES according to whether they were resident in Greater London.

[4] *Economic Trends Annual Supplement*, HMSO, various years.

[5] The 'steps' occur because the income data are banded; the underlying picture, whilst having the same overall shape, is likely to be much smoother.

week on average. Households close to the bottom of the income distribution would pay very little on average, and households right at the top would pay around £5 per week on average. This pattern is mainly driven by the tendency of both vehicle ownership rates and vehicle utilisation rates to increase with household income.[6] It is important to note that these figures are averages for households within different slices of the income distribution. Within these groups of households that are banded together by income, there is likely to be a great deal of variation in their individual liabilities so that, for example, whilst the average liability amongst households that are just below the median income will be about £1, many non-car-owning/non-car-using households in this part of the income distribution would have no liability, whilst many others may face charge levels that are very much higher. The graph does not capture this variation within different income bands. What it does show is that, on average, households towards the top of the income distribution would face higher liabilities to the proposed charge than households towards the bottom. Whether or not the charge is progressive or regressive, however, depends upon whether the average level of the charge facing households increases faster, or less fast, than the ability to pay as we consider households in successively higher income bands.

Figure 2 indicates the progressivity/regressivity of the charge. It shows how the average charge rate changes with income.[7] The results from the very bottom of the income distribution indicate that, on average, there will be relatively high average charge rates for the households within the lowest 2.5% of incomes compared with households just above them in the income distribution. Although this may be a true picture of the average charging liabilities of poorer households, vehicle ownership rates right at the bottom of the income distribution are very low, particularly in

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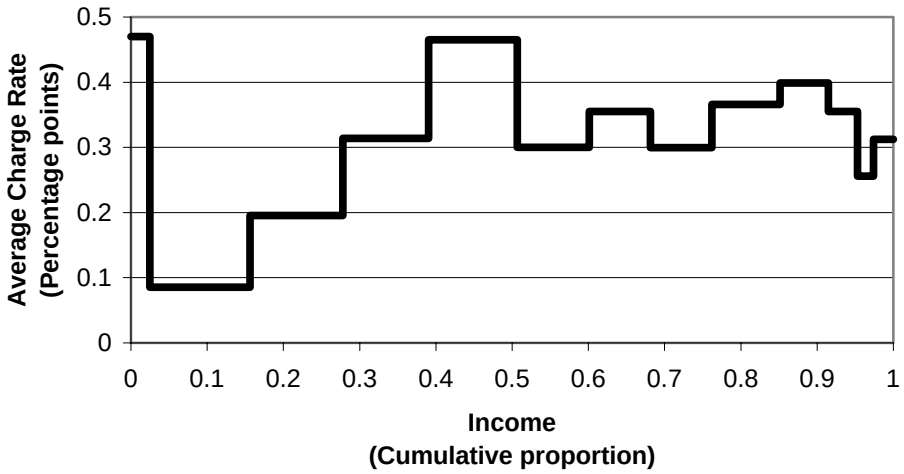
[6] It is worth noting that households at the top of the distribution of household incomes also tend, on average, to have more adult members than households lower down. Overall, 70% of the UK household population have cars. Amongst households in the poorest 10% of the UK income distribution, 25% have cars, rising to 98% in the richest 10% of the income distribution. In Greater London, car ownership rates are somewhat lower than in the rest of the UK, at 60%, but they also rise with income: 18% of households in Greater London who would be in the poorest 10% nationally have cars. This proportion rises to 94% for households in the richest 10%. (Source: Family Expenditure Survey, 1996–97 and 1997–98.)

[7] Again, the ‘steps’ are caused by the banded income data in the LATS; the underlying true picture, whilst retaining the same overall shape, will be smooth and is very unlikely to have such discontinuities.

London, and so it may be the case that what these data are showing is more to do with contamination of the data due to misclassification by income. This is a characteristic of many data on income distribution and is often largely driven by the very low incomes reported by many households with income from self-employment.[8] Setting this aside, Figure 2 reveals increasing average charge rates up to about the middle of the income distribution. That is to say, on average, the average charge increases with ability to pay as we move from poorer households to households in the middle of the income distribution. After this point, the average charge rate broadly drops as we move higher up the income distribution.

Figure 2: Average charge rate and income



Ignoring the very bottom end of the distribution, the roughly hump-shaped distributional effect (lower average charge rates at the top and bottom, with the highest charge rates concentrated in the middle of the income distribution) is generally in line with what we might expect, given the typical pattern of variations in vehicle ownership and usage with household income.[9] Again, it is important to remember that households within each range of the income distribution may face charge rates that are quite different from those of other households within the same

[8] A. Goodman, P. Johnson and S. Webb, *Inequality in the UK*, Oxford University Press, Oxford, 1997.

[9] L. Blow and I. Crawford, *The Distributional Effects of Taxes on Private Motoring*, Commentary 65, Institute for Fiscal Studies, London, 1997.

income band, and that this graph presents the way in which the average of these different rates varies with income.

It should also be noted that (setting aside the issues of timeliness and other drawbacks of the data discussed earlier) these calculations only indicate the initial pattern of *liabilities* to the proposed charging scheme. They do not take into account the effects on travel behaviour that the scheme is likely to have. These could take a number of forms: for example, the overall level of travel may decline, travel patterns may alter due to substitution between modes toward those that do not attract the charge, and in the longer term the planning role of local boroughs and the location decisions of households and firms may be affected by the charging scheme. Consequently, the results shown here are likely to represent an upper bound on the incidence of the charge. However, the extent of this depends on the possible effects on congestion within the charging zone. If congestion is greatly reduced, then this may increase the incentive to use the car in central London (compared with the case in which congestion were unaffected), thereby, in some measure, counteracting the incentive effect of the charge. Furthermore, to the extent that these behavioural effects might vary across the income distribution (poorer households may, for example, take more steps to reduce their liability to the charge than richer households), the pattern as well as the overall level of the distributional effects may be changed. It is also important to consider the potential impact of the revenues that will be raised through the charging scheme. If the revenue is recycled into improving public transport, this might be expected further to mitigate the final burden of the charge by giving additional encouragement to households to alter their choice of travel modes, thereby reducing their liability to the charge.