The London congestion charge: A Tentative Appraisal

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A political success

A technical success:

Veh*km : -15%
Speed: +17%

An economic success ?

Difficulties

1) Charge is recent

2) Charge + bus supply

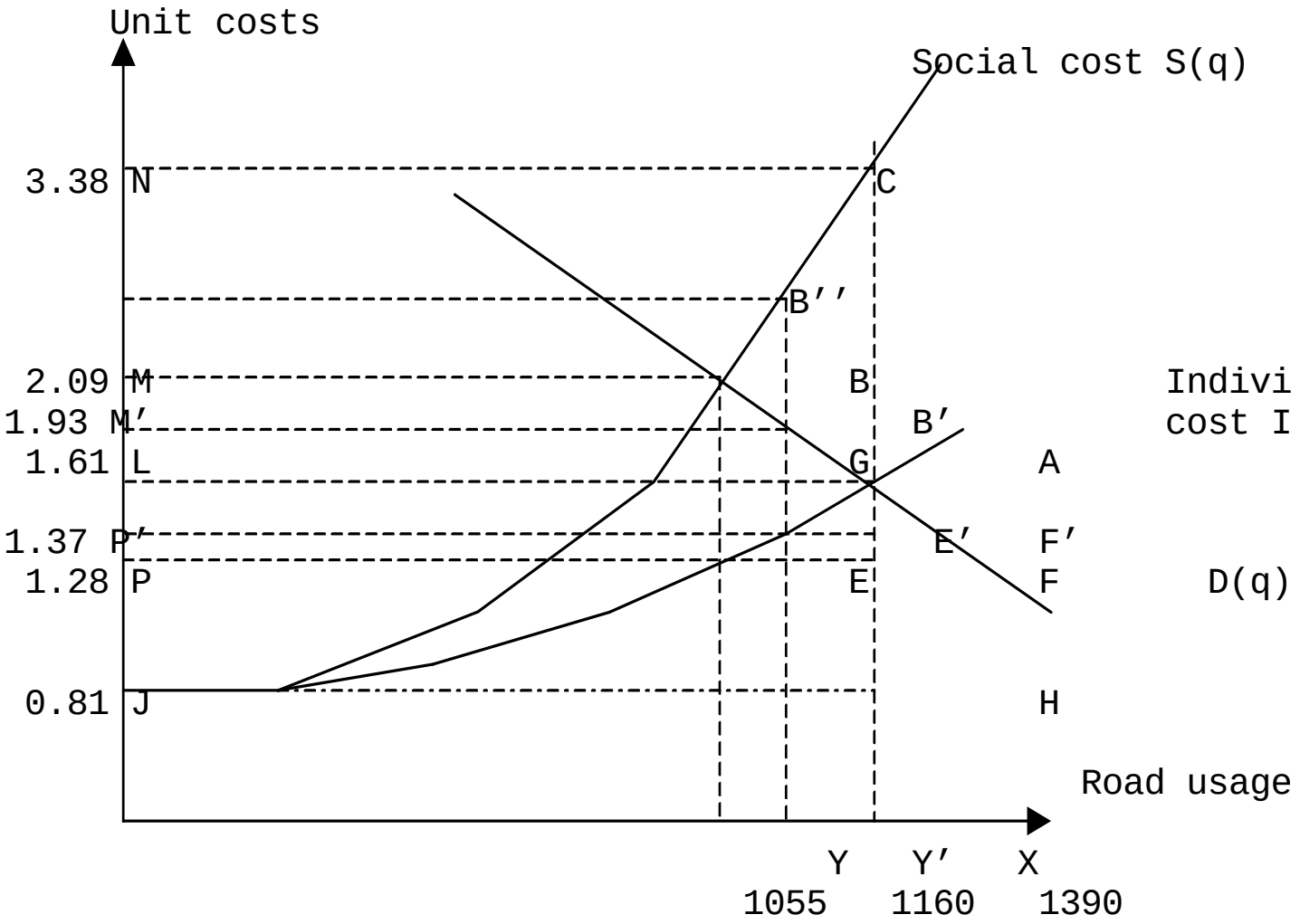
3) Causality problems

4) Zone/Rest of London

—> Prudence

Limits of London Charge

	Tolled zone as a share of	
	Greater London	Agglomeration
in area	1.5%	0.3%
in population	5.2%	3.0%
in employment	26%	20%
in traffic (veh*km)	1.7%	1%


Unit costs
Social cost S(q)
3.38 N
C
B''
2.09 M
B
Indivi
1.93 M'
B'
cost I
1.61 L
G
A
1.37 P'
E'
F'
1.28 P
E
F
D(q)
0.81 J
H
Road usage
Y
Y'
X
1055
1160
1390

Implications

1) Notion of optimal use & of optimal congestion

2) A function of road characteristics, and of demand

3) Can be reached with a tax or toll

4) Shows what can be gained by moving to optimum =
= congestion costs = rationale for toll

5) Toll proceeds much greater than congestion costs

Calculations

We know A (before charge) and E' (after charge)
We know the charge E'B'
Which gives us B'
A and B' gives us:
D(q) = 3.54-0.00139
I(q) = 0.15 + t*v = 0.15 + v/s(q) with t = time for 1 km
v= value of time (20.9/veh)
s= speed = a-b*q

= 0.15 + 20.9/(31.6-0.124*q)

S(q) = I(q) + I'(q)*q

=0.15+20.9/(31.6-0.1245*q)+0.26/(31.6-0.1245*q)^2

Which makes it possible to calculate the coordinates of all the points as well as the surface of interesting areas.

Economics of the London Charge

	Before	Present	Optimal
Congestion costs	74	24	-
Benefit from Charge	-	68	74
Charge proceeds	-	162	213
Implementation costs	-	172	172
Benefit minus cost	-	-104	-98

Makes it Possible to Answer 4 Questions

1) How important were congestion costs in the tolled zone ?
Small: 74 M€/year = 0.1% of GDP of tolled zone.

2) Is toll level optimal ?
Nearly so.

3) Are charge proceeds larger than charge benefits ?
Yes. 2.4 times larger.

4) Is the London charge economically justified ?
No: implementation costs > congestion benefits

Other Benefits from the Charge

1) Environmental benefits:
   - Real: less veh*km at a higher speed = less pollutants, CO2
   - But small: 4.9 M€/year

2) Benefits for bus users:
   - Δ speed 7% = 1.34 min * 356,000 bus users = 31 M€/yr
   - Δ bus = Δ subsidy of about 53 M€/year = an economic, welfare cost of 7 M€/year

Summary Estimates

	M€/year
Benefits	
Reduction congestion costs	69
Increase in bus speed	31
Environmental benefits	5
Total, estimated benefits	104
Costs	
Implementation costs	172
Welfare cost of Δ bus subsidy	5
Total, estimated costs	177

Value of Time

Findings very much a function of value of time

Value of time utilized: 15.6 €/hour

On the high side. For Paris: 9.3 €/hour

Redistributive Impacts

4 groups:

1) Residents: net gainers: rich or very rich

2) Bus users: net gainers: rich, not so rich, few poors, no very poor. Time saved: for them or for their firm?

3) Those who gave up their car: loosers: the poorest (least rich) of the car users.

4) Remaining car users: a net gain for the very rich, a net loss for the not so rich. Or their firms.

Conclusions

1) A charge can reduce traffic to an optimal level. Theory confirmed.

2) Economic gain of this reduction is modest, contrary to common opinion. Even in congested London.

3) Implementation costs are high. Ignored by economists. But high in the case of London.
Can they be reduced is anybody's guess.