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EVALUATION OF COMPETITION IN THE BRITISH LOCAL BUS INDUSTRY

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ABSTRACT

The British bus industry has been organised as a system of strictly regulated route monopolies for over fifty years. Suggestions that this monopoly has lead to inefficiencies and the stifling of innovation have prompted a critical appraisal of how a competition structure might be generated. This paper attempts to determine the economically optimal market structure for the local (stage) omnibus industry in the United Kingdom, both by the development of appropriate models of bus markets, and by empirical observation of how bus markets operate.

The paper concludes that competition between bus companies 'on the road' is liable, in the short run, to lead to a social welfare disbenefit to society. In addition, at present levels of service, and the present subsidy regime, incentives to enter the market are absent in a large proportion of the stage carriage network. Whilst competition, which will be more prevalent on profitable routes and timings, will reduce internal cross-subsidy, and thus affect users of other, unremunerative services, the research concludes that this reduction can lead to a social welfare improvement if there is a curtailment of activities which, at present costs of provision, outweigh consumers benefit, or if direct subsidy is substituted for cross-subsidy.

There are, however potential gains from competitive stimuli in the form of lower cost operation, either by removal of previous inefficiencies or by the replacement of high cost operators by lower cost ones. The institutional problem is how to obtain the long run benefits without the short run costs of unfettered competition 'on the road'.

This would indicate that in the bus industry competition for the market rather than competition in it, is required. The paper concludes that for effective potential competition in the bus industry, a regulated system with low entry barriers such as franchising or contracting of services should result.

1. HISTORICAL BACKGROUND

Following intense competition on local (known as "stage carriage") bus services in the 1920s, regulation was introduced in the form of the 1930 Road Traffic Act. In addition to 'quality' controls on operators and vehicles, the Act set up a protected monopoly on each route, using a licensing system administered by regional Traffic Commissioners.

The basis for the granting of the licenses had two profound effects on the structure of the bus industry. Firstly, the protected monopoly was granted partially in return for an undertaking by the bus companies to provide unremunerative services out of the profits generated on other activities (known as cross-subsidy). Secondly, a principle of granting licenses was 'priority'. This implied that if an operator was already operating a route (within the law), then he would have priority if the license was challenged by a potential entrant.

This latter point gained significance due to the formation of territorial monopolies, as a result of amalgamations and company take-overs, in the 1930s. In recent years, it was suspected that these large companies, who were by 1968 all in the public sector, and who provided 92% of the local bus miles, had been cosseted by the priority principle from effective competition and thus inefficiences had arisen and innovation had been stifled.

A Conservative government was returned in 1979 with a policy of encouraging a competitive atmosphere throughout the public sector, and the bus industry has no exception to this. The 1980 Transport Act removed all 'quantity' controls over long-distance (express) services and allowed a limited de-regulation of local services. With regard to the latter services, the Act removed the regulatory controls over fares, and encouraged competition of the direct 'on the road' kind by stipulating that entrants would be granted licenses unless it could be proved that their activities would be against the public interest.

The Conservative's were re-elected in 1983 and a year later produced a 'White Paper' setting out their intentions for the stage bus industry (Department of Transport 1984b). They considered that only a complete de-regulation would allow free-testing of innovation, and secure and sustain cost savings. They thus proposed to remove the licensing system. However the monitoring of the 'quality' of operations and vehicles was to be retained and strengthened, to protect the public from any "foolish" behaviour by operators. In addition, due to concern about the amount of money devoted to subsidy, the government proposed that public money control only be used to sustain services on routes or at times of day that would not be provided in the free market. Competitive tender would be introduced for the allocation of such support. Finally, the large, publicly owned bus companies are to be

reorganised into smaller free-standing parts, and transferred to the private sector.

The purpose of this paper is to determine the most optimal, in the economic sense, market structure appropriate to the stage carriage bus industry. It is thus concerned with the form of regulation, rather than with the issues of optimum subsidy levels or ownership.

2. THE ISSUES

Several issues emerge as being crucial in the analysis of the regulation of stage carriage buses. In the 1920s, the unruly competitive driving practices and suspect maintenance had initiated public interest in regulation. In the subsequent investigations leading to the 1930 Traffic Act, the issue of resource allocation became more prominent. In the discussion of whether monopoly or competition produced a more optimal fare/frequency output combination, it was alleged that duplication caused by direct competition was "wasteful". Thus the main objectives of the 1930 regulation were to introduce 'quality' controls and the avoidance of direct competition.

By the 1970s, this regulatory system was itself believed to have stifled innovation and protected inefficient or high cost operators. Moreover, it was argued that the cross-subsidy it produced was both distorting individual bus markets and disguising services that were being provided needlessly.

In Sections 3 to 7 of this paper, the issues are analysed in depth. Conclusions and policy prescriptions are drawn in sections 8 to 10.

3. STATIC RESOURCE ALLOCATION 'ON ROUTE'

The analysis focuses on two market forms, monopoly and competition. In the latter case, it has been assumed that the market trends move towards oligopoly rather than perfect competition. Using a comparative static model, the author attempted to conclude which market structure is most likely to result in an optimal allocation of resources 'on route'.

3.1 Appropriate Market Structures

The research initially considered whether a priori any market form would be particularly appropriate to the bus industry. It concludes that as there are no economics of scale in local bus operation, the bus industry is not a natural monopoly in the classical sense, and thus monopoly need not necessarily be the most optimal market form. However, local natural monopolies due to economies of scope, such as the interworking of vehicles, are identified, which means that where price is divergent from costs (ie. for the purposes of cross-subsidy) then a regrime of discriminate entry can result in entry and the loss of some local cost benefits.

Where there are incentives to enter the market, competition appears very likely to be sustainable, especially

if traffic is heavy or if the capacity offered is small in relation to the existing operation. This is due to the nature of local bus competition with low entry and exit costs, free access to the market and no pre-booking. Qualifications are that there would appear to be a need to regulate terminals to avoid monopoly returns to their owners, and also that competition needs to occur on enough fronts to stop blatant victimisation of entrants. However it is suspected that, at present levels of service and subsidy regrime, incentives to enter the market are absent in a large proportion of the stage carriage network, and thus the effects of competitive stimuli will not be fully felt.

3.2 Monopoly

The analysis of a monopoly regime is difficult as, in practice, a monopolist can select one of many fare/frequency combinations to offer on a route. Nash (1978) identifies four likely management objectives; social welfare maximisation, profit maximisation, passenger mile maximisation and bus mile maximisation. Of the latter three, only the first with passenger-miles are weighted according to their social function (Glaister & Collings 1978) which is a proxy for social welfare optimisation. A profit maximising monopolist will not therefore select a fare/frequency combination consistent with an optimum allocation of resources. Indeed, it would appear that unless a welfare maximising, subject to budget constraint, management objective is adopted, then there is not a priori reason why a monopolist will select an optimum allocation of resources in preference to any fare/frequency combination. Thus, the decisive factor in the evaluation of competitive market forms is whether they will apply pressure on a sub-optimal allocation to converge on the welfare maxima.

3.3 Competition

It would appear realistic that actual competition in the bus industry will tend towards oligopoly (competition among few) rather than perfect competition (competition among many). In the case of oligopoly, the inappropriateness of existing theory meant that the author had to develop a game theoretical approach to the policy decisions made by the competitors.

The analysis of decisions by operators indicated two tactics would generally be favoured in competitive situations. Firstly, each operator would wish to time his bus to 'headrun' the opposition, whereby an operator locates close in front of the opposition and takes all the traffic. This is a version of the well known Hotelling (1929) principle. Secondly, there is in strong pressure, when competition is based on a homogenerous product, not to let fare differentials persist and thus, matching of fares is noted. Bearing these points in mind it is possible to analyse whether the move to oligopoly from a base monopoly fare/frequency combination will produce increased social welfare.

An analytical tool can be developed from an underlying bus route cost/benefit model (described in detail in Savage (1984a)

Chapter 5). A diagram can show the relationship between frequency offered (per period of time) and the social welfare level resulting, for a given fare level. This is shown in Figures 1 and 2, in which fare level F2 is greater than fare level F1, and so on. For a given fare level, additional buses at low frequencies produce an increase in social welfare as waiting times are significantly reduced and considerable traffic generated. An optimal level is then reached and after that, social welfare declines as additional buses are put on. This is because the benefits of reduced waiting times are now much smaller (and the amount of generated traffic much less) and these are outweighed by the additional resource cost of the additional capacity provided.

The level of producer surplus (or profit) can also be represented in the diagram. This is shown by the broken contours. The most important of these is labelled π_0 and represents the breakeven position. All fare/frequency combinations outside of this contour represent a loss on the bus route. If the fare/frequency pair on a route is on the breakeven contour (or because of indivisibilities, up to one bus per unit of time inside it), it would not be possible to expand capacity without incurring a financial loss on the route. Unless it is taking predatory action, no bus company will be willing to move the route (and hence itself) into a loss making position. The most favourable routes for entrants are those generating a surplus. Thus, it can be expected that the routes on which competition is likely to occur are those on which the present fare/frequency combination is well within the breakeven contour.

Oligopolistic competition is now introduced into the model. In the succeeding analysis the following initial assumptions have been made:

(i) fare matching occurs.
(ii) the competitors have similar costs.
(iii) except when buses are full, the greatest advantage to the consumer accrues when buses are inserted equally between existing departures.

Assumptions (ii) and (iii) will later be relaxed.

To observe whether competition will bring a social welfare gain or not, it is necessary to look at two general cases. The first of these is where the monopoly frequency was originally less than the optimum, as it may be, particularly in some peak periods. This is illustrated in Figure 1. The monopoly fare/frequency combination is at point E. A feasible region for competition can be defined by applying two criteria:

(a) that fares cannot increase
(b) that frequency must increase by at least one bus per unit of time, as the competitor has to introduce some capacity. The representation of this in Figures 1 and 2 will depend crucially on the horizontal scale adopted.

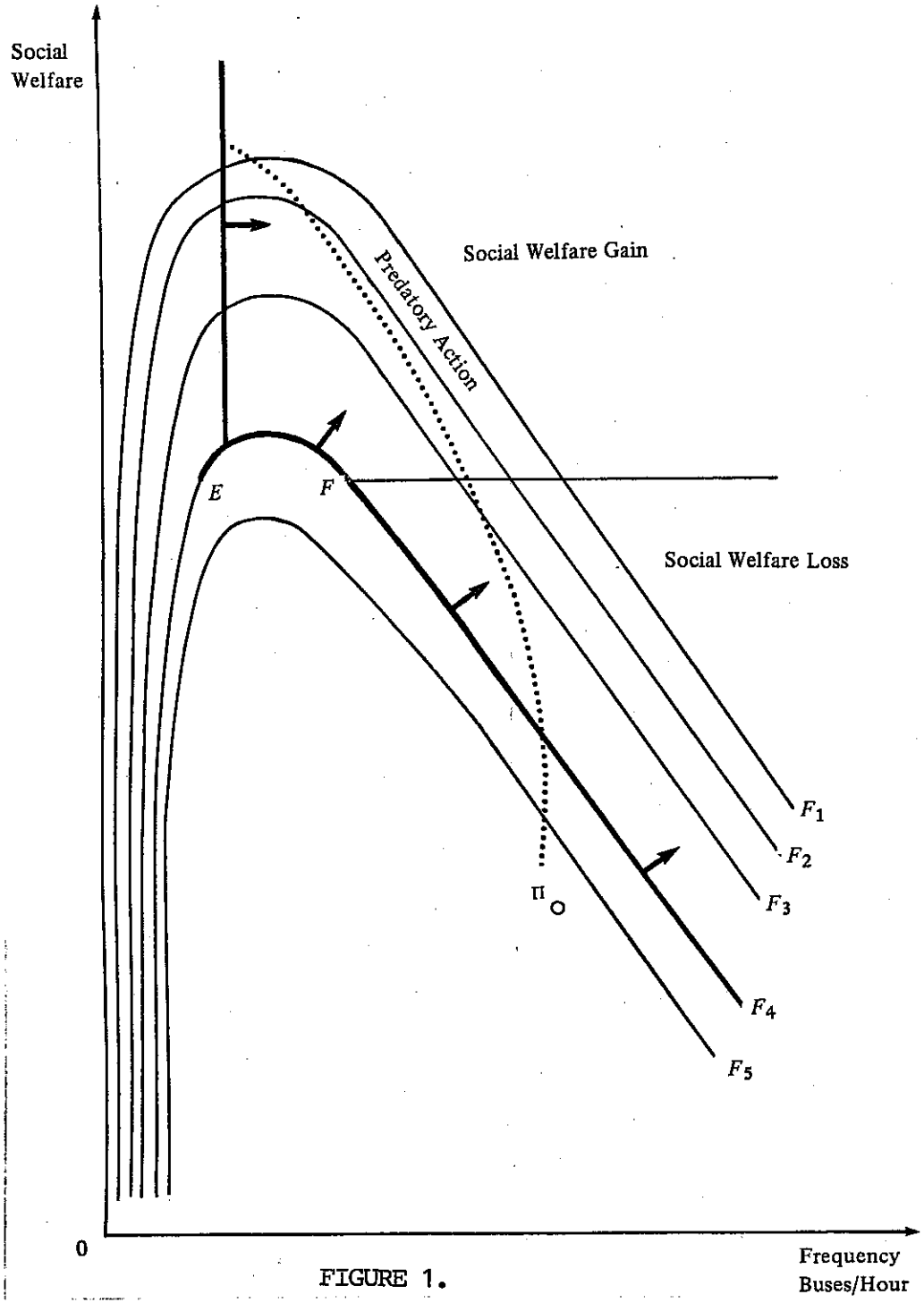

FIGURE 1.

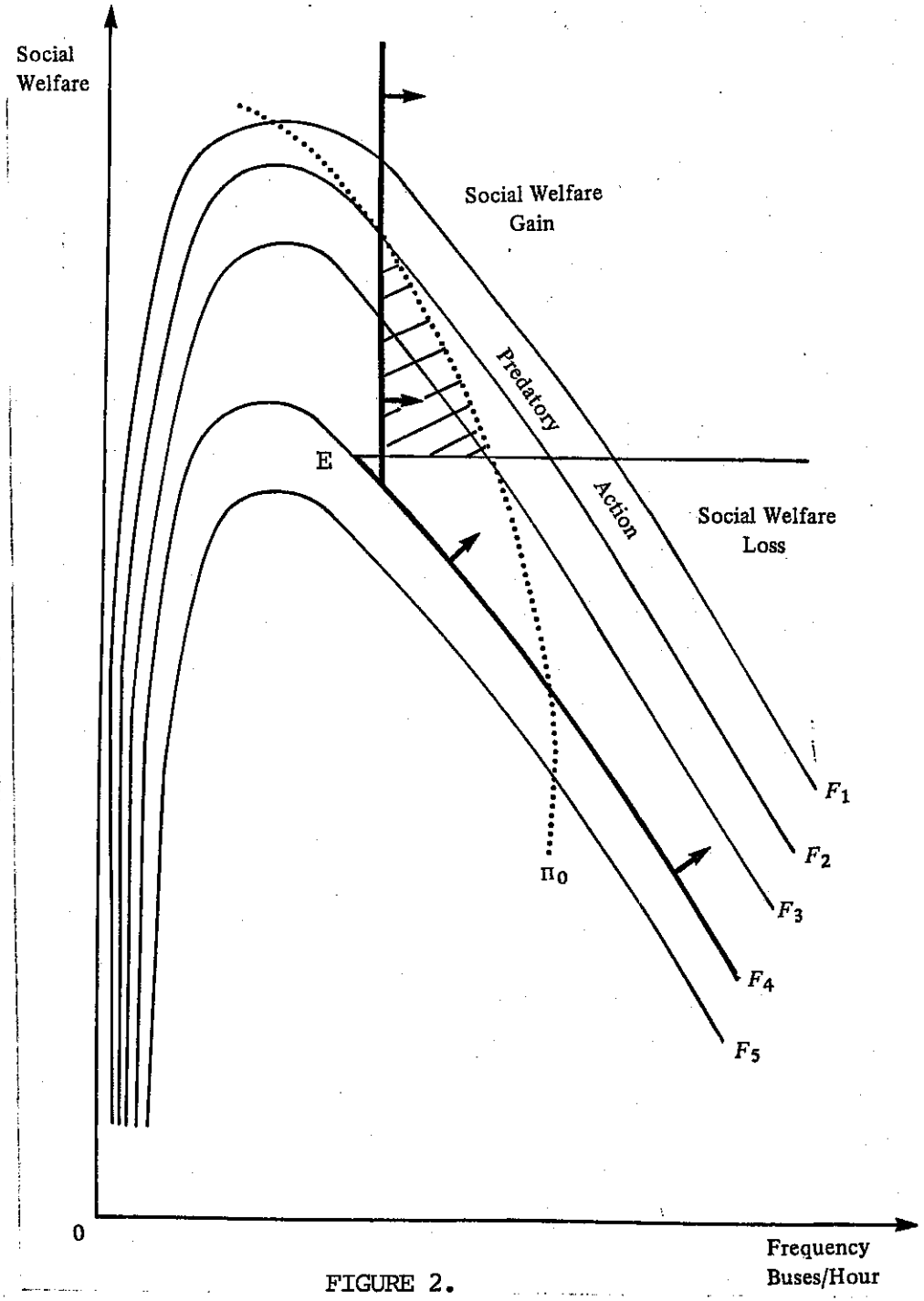

FIGURE 2.

This is the area above and to the right of the bold line. The part of the area beyond the break even contour represents fare/frequency combinations which would make the route unprofitable. Thus, fare cuts or frequency increases, which move the route into this region, depict predatory action on behalf of one of the bus companies. The area inside the breakeven contour, however, represents fare/frequency combinations where all firms are making a profit and thus oligopoly is more stable.

If a horizontal is drawn through the feasible region at the same level of social welfare as point E, it is observed that all points above this line represent a welfare gain and all points below, a loss. In this particular case, it is noted that, on the frequency/welfare function between points E and F, social welfare can be increased by introducing new capacity alone, without the need for reductions in fare. It is only in the case where monopoly fare/frequency is sub-optimal, and competition takes the route to the optimal point, that oligopoly can be welcomed by all parties and fulfil the evaluation criteria that competitions might move a sub-optimal monopoly resource allocation towards the welfare optimum.

However, in an industry with declining demand, a dynamic version of the model would have the frequency/welfare functions moving downward and to the left. Attempts to maintain capacity in the face of declining demand would lead to the monopoly frequency being greater than the optimum (Figure 2). It is observed that the fare/frequency combinations where a social welfare benefit, without losses (depicted by the shaded area) is much smaller. For a welfare gain, an increased frequency must be matched by a cut in average fare levels. However, for any given increase in competitive capacity, the entrant will maximise his constrained profit by pricing close to the existing fare. This is not compatible with moving to the shaded area. This rule remains valid, however far the point E may be from the optimum frequency.

When the assumptions on costs and timings are relaxed, it is observed, in the case of the entry of a lower cost operator, that the area where a welfare gain can be experienced without financial loss, increases marginally but does not alter the overall conclusion of the analysis. However if, as has been observed, entrants have located themselves close to existing timings (known as 'headrunning'), then society will gain very little consumer benefit at the expense of additional resource costs. In this case, it is extremely unlikely that there will be any scope for social welfare gain, even if massive fare reductions were offered.

In conclusion, unless peak inadequacy is relieved or substantial traffic generated, which in practice is unlikely, it would appear that in the short run, the oligopolistic market structure will not cause a previously sub-optimal monopoly resource allocation to converge on a welfare maximum. Furthermore, it is probably that an oligopolistic regime will lead to a waste of resources because:

(i) If the oligopolistic phase results in a return to monopoly, or collusion, there would appear to be no a priori reason why the competitive phase will necessarily influence the final fare/ frequency choice. Where the final outcome is not welfare superior to the monopoly resource allocation, the intervening oligopolistic period, on the basis of the analysis, will probably have been wasteful. If the intervening competitive phase does lead to a welfare superior final outcome, there is likely to be a 'pay back' period in which the benefits of the new monopoly solution compared with the original one are cancelled out by the wastes of the competition. In these circumstances, it would be more welfare efficient if the monopolists were encouraged to adopt a more socially desirable management objective, without the competition 'on the road' interlude.

(ii) If the oligopolistic game results in continued competition, the above analysis concludes that in general, except when peak adequacy is relieved, in the short run, the additional competitive capacity is likely to lead to a reduced level of social welfare, especially when the favoured competitive tactic of 'headrunning' is employed.

3.4 Conclusion

With regard to resources allocation 'on route', different market structures can be judged according to whether they will converge on a social welfare maximising solution. However, the difference between the units of demand and supply in bus operation, meaning that operators can choose both the fare they charge and the output they produce, result in there being many possible fare/frequency combinations which satisfy any particular budget constraint. In none of the market forms studied (monopoly and oligopoly), was there any reason why the social welfare maximising combination, rather than any other combination, would necessarily be chosen. In order for an optimal allocation, managements would have to adopt a particular social welfare maximising policy.

In addition, the introduction of competition is not likely to make a previously inefficient monopoly allocation coverage on the social optima and is also likely to be 'wasteful' in the short run. In conclusion, it would therefore appear that to obtain the optimal allocation 'on route', it is better to use a policy that would encourage a monopolist to act in a socially efficient way rather than a policy of unfettered competition 'on the road'

4. STATIC RESOURCE ALLOCATION 'OFF-ROUTE'

It may be presumed that entrants to the stage bus industry, being primarily private companies, will seek to make a profit. They may thus be expected to attack the routes and timings of the existing network operators where they can make the most money. Surpluses from these operators are currently being used to cross-subsidise other timings/services. Thus, abstraction of revenues from a network bus operator will lessen the amount of finance available for cross-subsidy and therefore have spill-over effects on his other activities. In particular, this will require either adjustments to markets which the network operator currently supplies unprofitably, or an increase in external financial support.

This section considers how a reduction in cross-subsidy might affect the efficient allocation of resources 'off route'. Chapter 9 presents methodologies for calculating welfare changes resulting from the 'spillover' effects of competition, which are then illustrated in chapter 10.

4.1 Definitions of Cross-subsidy

The definition of internal cross-subsidy is problematic. It exists because 'profits' on some activities are used to support 'loss making' activities. It is therefore particularly important to define 'profits' and 'loss making'. This will depend crucially on the assumptions made concerning costs. For management purposes, the true definition of a cross-subsidised service must be when avoidable costs exceed avoidable revenues. Thus the Ponsonby (1969)/Hibbs (1982) test of "Would we be better off if we did not run service X" would be the most appropriate. The problem of data has meant that traditionally a system of fully allocated costs and revenues has been used.

On this basis, certain characteristics of financial links can be identified. The cross-subsidy between routes in widely recognised. Recent Institute for Transport Studies (ITS) work (1984) indicates that generally, the inter-urban routes support rural, and to a lesser extent, urban routes. Cross-subsidy between times of day individual routes, is less well known, and depends crucially on the allocation of costs adopted. The recent ITS work, using a "preferred" allocated cost system, identifies that weekday, inter-peak and Saturdays were the main surplus generators, with the peaks and the Sundays being generally unremunerative. A third area for cross-subsidy is between individual parts of a route. However, data is not available on this. The implication is that not only will there be a transfer of surplus between passengers on different routes at different times of day, but there will also be a transfer between different person types and journey purposes.

It can be observed that cross-subsidy is not only wide-spread but also, as the ITS work illustrates, can be more important than external subsidy in maintaining unremunerative activities.

4.2 'Services Making A Positive Contribution'

There are some services which, whilst unremunerative on an allocated cost and revenue basis, can be commercially justified, on the basis of contributory costs and revenues. These contributory revenues arise when some activities share the same inputs, not only those of overheads, but also the interworking of vehicles. Thus, in the event of curtailment, not all the costs of providing a service will be saved. Similarly, contributory revenues arise when the existence of a service generates revenue on other services due to interchanging passengers. These indirect revenues (classically on feeder routes) may be lost in the event of curtailment. Therefore, it is appropriate to define only activities which fail the avoidable costs and revenues test as 'cross-subsidised'. The former type of service which, whilst not covering allocated costs does make a contribution to the fixed costs of the bus company, will be termed 'making a positive contribution', and is considered in this section.

Because of the ability to price services individually to reflect the cost of supply, the author concluded that the jointness in demand is more important in the study of how competition might affect these markets. The introduction of indiscriminate competition might destroy the ability of a monopoly operator to realise jointness in demand, by making financial transfers between routes. Thus, activities, which are only commercially justified because of the revenue they generate elsewhere, may be endangered.

4.3 Cross-Subsidised Services

Internal cross-subsidy has been subject to a large amount of criticism, in particular that it can cause a misallocation of resources. This is because:

(i) Passengers on remunerative activities are paying higher prices or receiving lower frequencies than they would if capacity was expanded to remove abnormal profit.

(ii) On some unremunerative activities, cross-subsidy is presently supporting a level of provision which does not reap sufficient consumer benefits to outweigh the resource costs.

The distortion to efficient allocation of resources caused by cross-subsidy has been analysed by Gwilliam (1984).

The implication is therefore that if competition on remunerative activities reduces the level of cross-subsidy, then in these circumstances, there will be a better matching of demand and supply in all bus markets, and therefore, a more efficient allocation of resources.

However, not all unremunerative activities reap insufficient consumer benefits to justify their existence. In these cases, the crucial issue becomes whether it is more efficient to financially support these services by raising abnormal profits on inherently profitable activities, or by direct payment from public funds.

The cost of raising public funds is not clear cut, as any increased local authority support might come from a variety of sources. Browning (1976) reviewed the shadow price of taxation and found it to lie in the region of 1.1, depending on the form of taxation used. This can be compared, on a purely allocative basis, with the welfare cost of raising abnormal profits on inherently profitable operations.

The distributional consequences are arguably the more important. Obviously, due to the relative numbers of people involved in the two scenarios, the burden of losses per person on the passengers in the subsector where finance for cross-subsidy is drawn, is probably larger than the welfare losses of whatever taxation system provides the alternative. Therefore, if unremunerative activities are now provided by a general taxation system, then there would be a shift from raising money from (primarily) women on shopping trips to the community in general. It can be argued that this is certainly more equitable and maybe 'better' distributionally.

The author concludes that on an allocative basis, it is not clear which of direct subsidy or cross-subsidy is preferable. However, on a distributive basis, evidence suggests that, in general, direct subsidy is welfare superior. Thus, the 'off route' effects on cross-subsidised services cannot generally be used as an argument against competition, as activities which have higher consumer benefit than resource cost can potentially be funded by direct subsidy, which is liable to be preferable to cross-subsidy on a distributional basis.

5. LOWER COST OPERATION

There are potential welfare gains from competition in the form of lower cost operation. However, only part of the reduction in costs will be a welfare gain, if there is a reduction in labour wages and conditions. In these circumstances, there will be a transfer from workers to producers', or consumers' surplus, and the split between transfer/social welfare gain will depend on the amount of traffic generated, as a result of lower cost operation being passed on to the consumer in lower fares. This will itself depend crucially on the price elasticity of demand. The lower cost operation can result either by existing firms becoming more efficient (X-efficiency), or by the replacement of high cost operators by lower cost ones.

5.1 X-Efficiency

Some economic writers, such as Leibenstein (1966), suggest that welfare losses due to inefficiency (or 'X-efficiency' as it is known) in monopoly are greater than the resultant allocative efficiency dead weight loss. It is argued that when profits are high, or there is no competitive pressure, slack working practices result.

The author attempted to observe the most likely source for

X-efficiency gains in existing bus operations. Following studies of both a labour market (bus drivers) and a capital factor market (the market for buses), it was concluded that the former market had the most scope for an X-efficiency gain.

In the market, it was observed that, because wages are determined nationally, then any local effects will manifest themselves in the productivity dimension. The author's investigations have tended to support this. Analysis of national wage data, and also econometric work on wage data for National Bus Company (NBC) subsidiaries, identified no perceptible changes following the liberalisation of licensing in 1980. However, descriptive analysis of the determinants of productivity indicate that there is room for efficiency gains, particularly in liberalising staff scheduling constraints at a local level. The National Board for Prices and Incomes (1967) noted in this respect that:

> "there is evidence . . . that the scope for negotiable change may well be considerable"

With regard to productivity, empirical investigations, using econometric analysis for the period up to the end of 1982, did not detect any generally statistically significant changes for NBC subsidiaries that could be attributed to the change in licensing. However, the general paucity of potential entrants to the market under the 1980 legislation, might suggest that greater X-efficiency reductions may only result from a market regime in which the threat of potential entry is more real and effective.

5.2 Lower Cost Operators

In traditional economic theory, a benefit of competition occurs when a genuine lower cost firm replaces a higher cost one. In the bus industry, this concept is somewhat problematic as interworking of activities means that on an individual service or timing, the level of costs depends on how it 'fits' into a governed set of other operations. Due to these 'economies of scope', route costs do not necessarily reflect the underlying differences in unit costs between operators. Thus, the cost of operation by two operators need not be ranked the same on all routes. However, it is argued that if sizeable parts of networks were passed to independent operators, then there would be a saving in resource cost.

Evidence that independent operators have cost advantages when they are small is considerable (for example, Tunbridge and Jackson (1980)). However, valid comparisons can only be made if the operators were performing similar work. Thus, it should not be inferred that this advantage would persist if these operators gained a large stage commitment, which involves additional costs of bus stations, enquiry offices, bus stops etc., as well as operating at times which are traditionally relatively expensive (e.g. evenings, Sundays and the provision

of high peak/off-peak ratios), plus any changes in labour union attitudes. Nevertheless, a licensing system, based on longevity of operation and not level of costs, can preclude genuine lower cost operators if they emerge.

6. INNOVATION

Academic researchers have not proved conclusively whether a monopolistic or a competitive market structure produces more innovation (Arrow (1962), Dernsetz (1969)). However, it is contended that in this industry, it has been the form of monopoly, i.e. the issue of route licences, which has meant that there has been inflexibility to experiment and hence, innovate. The current research concludes that if strict route licensing was relaxed then innovation would be expected in urban rather than rural areas, and would take the form of new links in the network, product differentiation (especially 'paratransit'), and competition against the railways.

Whatever form innovation would take, it is likely to impinge on existing services in one form or another. Therefore, it is possible to compare the optimal provision, either without the innovated service, or by the innovated service running exclusively.. The analysis splits innovation into two types. The first is where the innovation is commercially viable due to the non-optimal current provision, but optimal provision by the existing service (exclusively) is welfare superior to the innovation. Entry of this type is likely to not only cause short run losses of 'on the road' competition (see section 3.3.) but could, if successful, lead to a non-optimal method of provision. It would have been preferable if the existing operator had been initially encouraged to adopt a more socially desirable output/price factor. The second case is where the innovation is commercially viable, and operating exclusively would be welfare superior to the optimal provision by the existing service. In these circumstances, it is desirable that the innovated service at least partially replaces the existing one. However, competition 'on the road' might lead to the innovation not coming to fruition (due to the financial dominance of the existing operators), or, even if successful, the competition during the innovation's introduction is likely to be wasteful in social welfare terms.

7. SAFETY

Safety can be divided into two aspects. The first is road safety, about which the author concludes that there is a possibility of unruly driving practices as a result of competition 'on the road'. The second aspect is the quality of operators, where a comparison of small operators, who might constitute the entrants to stage operation, and large network operators, indicate that whilst there are no grounds for believing that there is any difference in accident rates (Department of Transport (1984a)), there is an indication that the smaller firms tend to have a much higher number of faults on their vehicles. On the latter point, the author (Savage (1984b)) undertook a survey of vehicle

prohibitions and notices of defects issued by its licensing authority in Yorkshire for 1983. The information was tabulated by operator fleet size. The analysis is shown in table 1.

Table 1 : PROHIBITIONS AND DEFECTS PER MILLION MILES TABULATED BY OPERATOR FLEET SIZE

FLEET SIZE	NO. OF OPERATORS	FAULTS
1	131	6.5
2	63	5.6
3	61	6.4
4	54	3.4
5	29	1.4
6 - 9	71	2.1
10 - 14	35	2.5
15 - 19	16	1.7
20 - 49	7	3.1
50 +	11	0.7

The figures indicate that a typical one vehicle firm has over 9 times as many faults per vehicle kilometer as compared with a large operator, whilst a comparable figure for a 10-14 vehicle fleet operator is about three and a half times as many as the large operator. What becomes clear is that there is a continual (and statistically significant) decline in the number of faults as fleet size increases.

As the public cannot readily determine the quality of operators, drivers and vehicles, there would appear to be no case for lessening the 'quality' regulatory controls. Indeed, if a change in market regime leads to more similar operators undertaking stage work, there would be a case for more vigilance on the part of regulators. This would be particularly the case when fierce competition reduces financial returns to operators, who may then be forced to make economics in their maintenance.

8. REFLECTIONS ON THE 1930 AND 1980 MARKET STRUCTURES

8.1. 1930 -- Statutory Monopoly

The system of statutory monopoly with priority for (what became) large network operators is alleged to have led to inefficiency, stifled innovation and cross-subsidy. There would thus appear to be strong and undeniable arguments, based on X-efficiency gains, the introduction of low cost operators, greater control over the level of provision on unremunerative services, and encouraging innovation for the introduction of a competitive market structure into the stage bus industry.

8.2 1980 - Towards 'Unfettered Competition'

The 1980 Transport Act solution to this, which inherently encouraged direct competition 'on the road', does not appear to the most optimal way of dealing with the disadvantages of monopoly. Thus, liberalisation, or total removal, of licensing does not provide the answer. Unfettered competition has serious disadvantages :

- direct competition 'on the road' is likely to lead to a short run social welfare loss on the route, as consumer benefits are outweighed by the additional resource costs. In addition, oligopolistic competition does not necessarily produce a long run optimum resource allocation.
- some jointness of demand may be broken and thus endanger services (e.g. feeder routes), commercially justified as a result of contributory revenues.
- financial dominance of existing operators may impede the introduction of low cost operators or beneficial innovation
- some local economies of scope may be lost
- some non-beneficial innovation might be introduced and could, if successful, lead to a non-optimal service provision
- chance of unruly driving practice increased
- integration between services may be lost and public goodwill may be endangered by a bad operator.

In addition, the existence of artificial monopolies on unremunerative routes means that competition is unlikely on many parts of the present system.

9. REQUIREMENTS FOR AN OPTIMAL MARKET REGIME

A number of features of an ideal market regime can be identified.

9.1 Direct Competition to be Avoided

The disadvantages of competition 'on the road', particularly the short run welfare losses, the dangers from unruly driving practices, and the possible introduction of non-beneficial innovation, would indicate that a route monopoly system would be preferable.

9.2 No 'Priority' System

The problem with route monopolies is how to allow for a control of costs, and also ensure the monopolist maintains socially efficient fares/frequencies/methods, operation and reliability. Recent work (Baumol, Bailey and Willig (1977), Baumol (1982)) has indicated that the threat of potential

competition can be as effective as actual competition in achieving these objectives. The problem in this industry is how to make the threat of competition very real, yet preserve route monopolies. The solution would appear to be that any route monopoly should not be for perpetuity, as has been the case since 1930, but should be renewable after a certain period of time.

A system would have to be devised to decide between rival operators when route monopolies come up for renewal. There would appear to be two options. The first is where a controlling authority sets socially optimal fares and frequencies, and invites tenders on the basis of cost (known as 'contracting'), or secondly, when firms tender proposing a cost/fare/frequency combination, from which the controlling authority chooses the most optimal (known as 'franchising'). Mackie (1983) describes both of these systems. The optimal length of the contract/franchise would have to be determined with regard to the depreciation of capital (the most important being vehicles), in order to make bus operation attractive to operators.

This system will have the desired effects in the competing tenders for the franchise, or, determining the contract terms, will influence operators to act in a socially efficient way. This may include innovative routes/methods of operation, and the introduction of low cost operators due to the implicit cost competition in the tendering process. In addition, a short period contract/franchise system will mean that the threat of potential competition, when the routes are next put up for tender, will encourage monopoly incumbents to maintain efficient management objectives, be reliable in operation, and also to control X-efficiency. However, it may be necessary to word the contract/franchise in such a way (e.g. inflation linked cost allowances) so as to maintain pressure on costs during it's currency.

9.3 Recognition of Demand and Supply Side Links

Peacock and Rowley (1972) argue that where there are local natural monopolies, and/or demand side links, then groups of services, rather than individual services, should be the unit by which bus operations are put out for tender.

9.4 Unremunerative Services

It would be possible to put both profitable and unprofitable activities out to tender. In the latter case, routes would be tendered and evaluated on the basis of fares, frequencies and the amount of revenue support required. This would mitigate against artificial monopolies which would otherwise preclude competition on much of the present network. A feature of such a system is that the revenue from selling franchises/contracts on profitable activities can be used to fund unremunerative activities, 'explicit cross-subsidy', if the controlling authority chooses to do so.

9.5 Controlling Authority

There would need to be a controlling authority which, apart from unbiasedly administering the contracting/franchising system, can also maintain goodwill, and request through fares and other integration policies. As a result of the need to make revenue support available for unremunerative activities, integration or other policies, the body to undertake this work would preferably have to be directly publicly accountable, and able to raise public finance.

An additional task for a controlling authority, especially if a competitive stage carriage market leads to more smaller operators, is to monitor the quality of operators, vehicles and drivers. This need not necessarily be conducted by the contracting/franchising authority described above, although safety considerations must be an input to the outcome of a tendering exercise. At present, the Traffic Commissioners undertake such duties in the bus and coach market and, because stage services are a minority of total coaching operations, it might be sensible to leave 'quality' regulation of operators in their hands.

10. CONCLUSIONS

A market regime has to be found which would give the benefits of competitive stimuli without the disadvantages of direct competition. Baumol (1982) and others have argued that the benefits of competition can accrue from potential and not actual competition. He says

> "The heroes are the (unidentified) potential entrants who exercise discipline over the incumbents".

The institutional problem is how to make the threat of potential entry very effective (i.e. have low barriers to entry), but avoid direct competition. It would thus appear that in this industry, the optimal solution is competition for the market rather than competition in it. This would suggest that a system of competitive contracting or franchising of services should result.

This will bring the benefits of competitive stimuli, whilst avoiding the problems of the wastes of direct competition and the danger to the public through unruly driving practices. In addition, the authorities can monitor goodwill and safety standards, and request through fares or other integration policies. The benefits of demand side links or localised economies of scope can be realised, if necessary, by the controlling authority putting out to tender groups of, rather than individual, services. A competitive atmosphere can also be encouraged across all the network, by the controlling authority offering unremunerative services on a 'negative tender' system.

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