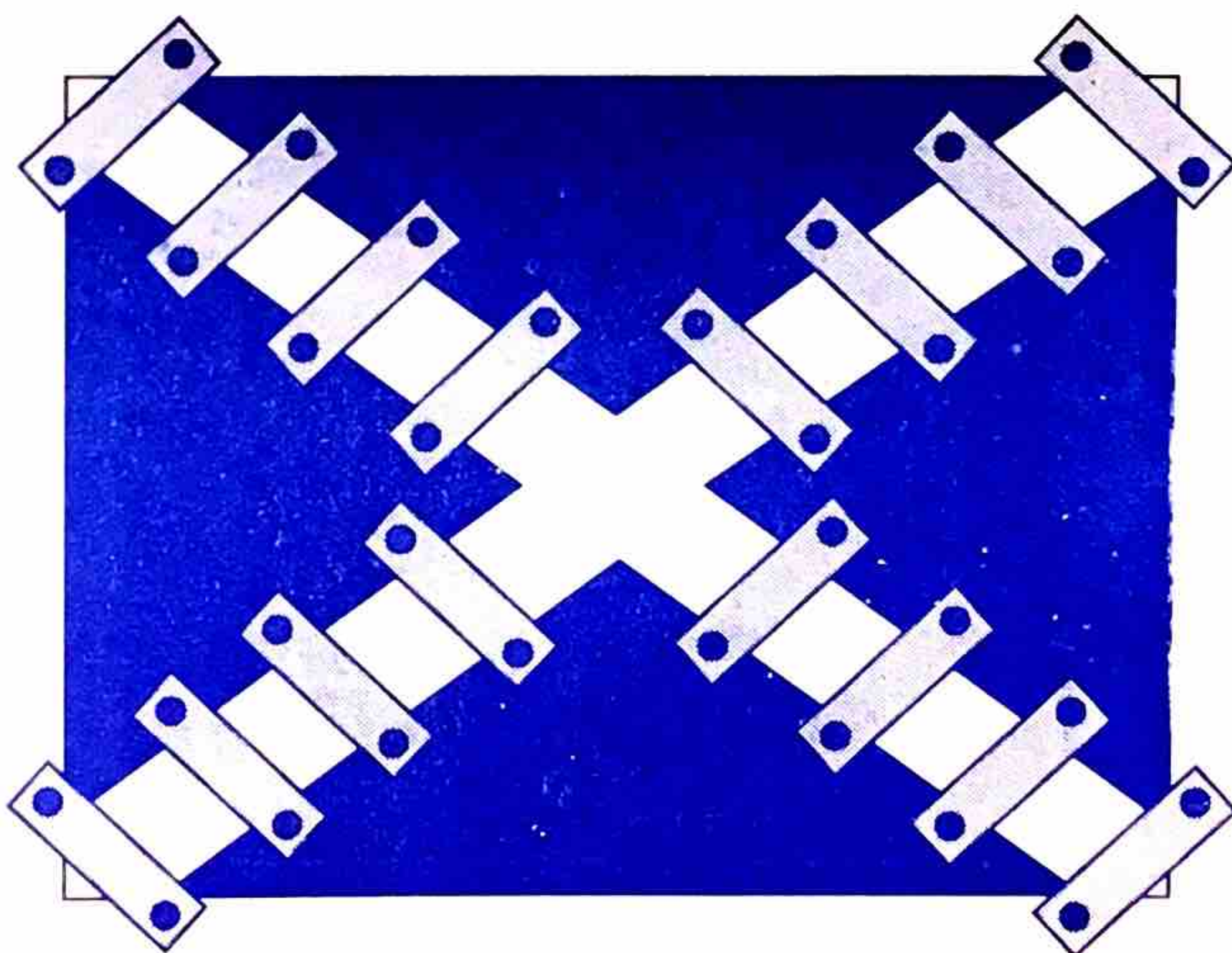


THE ECONOMICS OF SCOTTISH RAILWAYS

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CONTENTS

	Page
Foreword <i>Tom Hart, Chairman, Scottish Transport Studies Group</i>	1
Acknowledgements	2
Abstract	2
1. Introduction	3
2. The Structure	3
3. The Market for Rail in Scotland	10
4. The Financial Performance of ScotRail	17
5. The Technical Efficiency of Scotland's Railways	22
6. The Future	25
7. Conclusions	31
References	32

The views in this Occasional Paper are those of the Author, they are presented as a valuable contribution to discussion and should not be taken as being endorsed by the Scottish Transport Studies Group.

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FOREWORD

Much of the debate on the future of railways in Scotland has been clouded by generality and a lack of detailed evidence on the economics of particular groups of services. With the imminence of a ScotRail passenger franchise and the political need for all parties to formulate their views on the future of rail services in the run-up to a General Election, this paper sheds valuable light on the nature of railway economics in Scotland. Geoff Riddington and his associated researchers, C P Duke and J Cowie, are to be congratulated on providing information which will undoubtedly raise the quality of decision-taking on the rail role in future transport systems.

Despite confirmation of a strong Scottish performance in terms of comparative rail efficiency, the paper casts doubt on the economic value of most rural Scottish rail services with several urban services also coming under severe criticism. It concedes that such rail services may offer wider benefits but queries whether these are sufficient to justify their continuation in their present form within expected limits on public funding. The conclusion that decisions on the future of such services ought to be decentralised to Transport and Planning Boards established for the main Scottish regions had many attractions and could strengthen effective democracy. However, acceptable outcomes will be affected by the financial arrangements made for such Boards and by the full implications of policies for sustainable transport - important topics which are not directly addressed within the paper.

Attention is drawn to opportunities for improvements in Scottish rail services, notably in areas affected by increasing road congestion. In such cases, structures allowing regionalised decision-taking could permit more rapid action on such improvement, reshaping rather than fossilising the pattern of rail services.

The issues raised are real and substantive with a direct bearing, not only on economics, but on future structural arrangements. The paper offers a powerful, and well-supported contribution to the current debate on present and future options for Scottish railways within a changing framework for transport and land use policy.

Tom Hart
Chairman, Scottish Transport Studies Group

19 July 1996

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ABSTRACT

This paper looks at the rail industry in Scotland using a traditional Structure-Conduct-Performance framework. After explaining the new "privatised" structure, it examines the market for rail and the way ScotRail try to meet that demand. It concludes that ScotRail is probably pursuing the most cost effective strategy for meeting the service requirements laid upon it.

In the next sections the performance of ScotRail is analysed. At a simple financial level the services are very unprofitable and likely to remain so. It is found that some routes fail to even cover direct operating costs let alone make contributions to rolling stock and track costs. On the other hand an efficiency analysis confirms earlier impressions that ScotRail is a very efficient organisation by both UK and European standards. This depressing conclusion is that service withdrawal is the only way to produce major financial savings. On the other hand, given a change of approach placing rail pricing and investment appraisal on a similar basis to road evaluation, there are opportunities for viable service improvement within Central Scotland and on the routes to Aberdeen and Inverness.

The final section examines the costs and benefits of service withdrawal and suggests that on some routes costs so exceed benefits that there can be little justification for continuation.

Elsewhere, however, there are prospects for radical improvement which could be pursued within the new framework of franchised passenger services and "challenge" funding. Because these issues of contraction and expansion are controversial and sensitive to local views, it is strongly suggested that this sort of decision is best taken by communities who have most understanding of their own needs. Consequently, Transport and Planning Boards for all principal areas of Scotland are advocated.

1. Introduction

Rail privatisation has brought with it substantial misinformation at all levels and from all sources, including and particularly government. This has inevitably led to differing perceptions of what might happen as a result of these huge changes. The objectives of this paper are fourfold. Firstly it seeks to describe as clearly as possible the proposed restructuring and identify the major problems that are still to be resolved. Secondly it aims to analyse the market for rail services in Scotland and relate this to current and likely future conduct of the privatised company. Thirdly it provides what are believed to be the best estimates available of the financial costs (and benefits) on a route by route basis and, for the first time, analyses on an aggregate basis the relative technical efficiency of ScotRail. Finally the social costs and benefits of the rail service and, in the light of the earlier analysis, possible futures for Scottish Railways are identified.

Because freight services are, and will be, a peripheral source of income for rail operators in Scotland, the paper does not include consideration of freight services. If lines are retained for passenger traffic, there will be some opportunities for freight expansion but freight in itself cannot justify an extensive Scottish rail network.

2. The Structure

2.1 Background

The corporate structure of BR, as with all large organisations has been continually changing. In the sixties and early seventies the main subdivisions were regional, with the Scottish Region taking responsibility for track and trains.

The first major change was the development of Businesses. Prior to the 1993 Railway Act, most railways in Scotland were part of the Rail "Business", Regional Railways. The Anglo Scottish services Carlisle-Glasgow/Edinburgh and Newcastle-Edinburgh-Glasgow were however part of the InterCity Business. Before 1985 these businesses purchased track and signalling from BR on a "Prime User" basis. This system levied the fixed costs initially against InterCity if they were a significant user of a route, then Regional (PSO), then Local Urban (Passenger Transport Executive (S20) and Network South East) and finally Parcels and Freight. Once the fixed costs had been allocated, the other

businesses were allocated only the marginal costs of their activities. Arguments did inevitably occur. As an example there were serious disagreements about who should fund a diamond crossing at Cowlares used East-West by one InterCity sleeper per day and North-South by around 100 trains leaving Queen St. At this time cost allocation was seen primarily as providing an information system and thus could be resolved without too much rancour. The difficulties however was indicative of the problems to come.

In 1985 the new chairman, after reviewing the success of the French TGV, accepted that there was sense in co-ordinating the technology of track and rolling stock and that, as a result, "ownership" should be transferred from BR to the businesses again on a "Prime User" basis. The secondary users now paid their marginal costs to the prime user. At about the same time the EEC (as was) issued a Policy document (1191/69) that required separate accounting for infrastructure and operations. The underlying policy of the Transport Commissioner was to separate track from trains in order that, for appraisal purposes a rail network similar to the road network could be developed. It was envisaged that fixed infrastructure costs would be picked up by governments whilst nationally and privately owned companies operating and competing throughout the EU paying would pay the operational costs.

In 1990 this policy was reinforced by the present programme to develop a sustainable transport policy, which requires comparable costing and pricing systems for road and rail.

Under the Business structure InterCity was meant to be self supporting. In Scotland Regional Railways received a block "Public Service Obligation" grant from the Dept of transport to cover all routes outside those supported by Strathclyde PTE. The SPTE supported service operation with grants made under Section 20 of the 1969 Act. Infrastructure charges for freight and "extension" services by InterCity to Aberdeen, Inverness and Fort William (Sleeper) were made on a marginal cost basis. Capital expenditure outside the SPTE area was appraised using standard BR procedures and prioritised on a UK wide basis. Finance came either from internally generated BR funds or from government. Because these were included in the PSBR they were subject to general economic/monetary controls and, as a result, sensible commercial investment opportunities were, on occasions, not pursued.

Within the SPTE area the substantial investment was the result of extensive collaboration between ScotRail and the SPTE. Electrification, new rolling stock, resignalling, station refurbishment and route development were either paid for or significantly assisted by the PTE, with the help of grants from the DoT and the EU Social Fund. Loans raised by the region within their own borrowing constraints with interest paid by the region (albeit included in the needs assessment) provided a not unreasonable belief that they were "owned" by the region and not BR.

2.2 The 1993 Act

The 1993 Act again separated ownership of the infrastructure from operations producing a separate business RailTrack including a Scottish Division. The operational functions associated with the infrastructure (e.g. track maintenance and signalling) were identified as separate in-house companies ready for sale. By May 1996 the Scottish Infrastructure Services companies had been sold to management.

Before the sale private companies had successfully tendered for some of this work leading for a short period, to the rather strange situation where work had been won from the BR owned company RailTrack by a private concern who then subcontracted it back to a BR owned Infrastructure Services (BRIS) company.

In an even more contentious move, ownership of the passenger rolling stock used in Scotland was transferred to 2 (of 3) Rolling Stock Leasing Companies (ROSCOs) with the idea that a leasing market would develop similar to the international markets for ships and planes and that these would provide the rolling stock to any new Train Operating Companies (TOCs). The ROSCOs have been sold to consortia involving existing managers and financial institutions.

A complication that has arisen has been the original SPTE part funding of new Rolling Stock and infrastructure. The value of the loans raised by the SPTE for investment in the infrastructure and rolling stock has been redefined as an equivalent loan to BR and consequently to the new companies. Since the notional interest payments from RailTrack are simply added to SPTE revenue they reduce the S20 grant from the government. Not surprisingly the SPTE is unhappy at the transfer of what it believed it owned to private companies without consent. There

are now indications that Strathclyde Passenger Transport will retain control over former investment made by the SPTE but the situation with respect to new investment remains confused following legal advice that Strathclyde Passenger Transport has no power to give capital grants to a privatised RailTrack.

2.3 Asset Valuation

Both RailTrack and the ROSCOs are commercial in that they are expected to make charges that cover costs and make a return on the "Mean Equivalent Asset Value." The acceptability of these charges from effective monopolies are determined by the Rail Regulator.

The concept of the Mean Equivalent Asset Value (MEAV) was introduced to equate the costs associated with different levels of investment. For example the current cost of the line to Stranraer is substantially higher than the line to Fort William because there has been massive investment in signalling in the Highlands and subsequently lower wage costs.

Written Down Costs were rejected out of hand because so much of the infrastructure and equipment has zero book value and thus should be free. For rolling stock TOCs would then have been encouraged to use this equipment despite high maintenance and low quality. For the infrastructure the asset value associated with RailTrack would have been minimal, giving charges based on its minimal value and consequently a minimal sale price.

Economic theory provides a valuation framework that has even less practical utility although it provides far more insight. The value of an asset which in use in the long term generates private costs rather than profits can only be determined by looking at the social costs and benefits.

Unfortunately such an approach is wholly out of line with the privatisation philosophy and MEAV has emerged.

The effect of MEAV has been to produce a "standard charge" for use of the infrastructure obtained rather crudely by adding up total costs and adding a percentage of this fictitious asset value. A second, potentially more damaging effect is to make investment in new rolling stock unattractive as the MEAV has been set at a level to make use of existing assets attractive.

The asset price of both the ROSCOs and RailTrack is dependent upon the MEAV since the charges acceptable to the regulator are based on the asset values. The collapse in the apparent value of the infrastructure from £6bn to £1.5bn in order to ensure eventual sale on the market place (and an injection of funds into the Treasury to provide tax cuts) is all part of a financial game in which the travelling public appear to be the only losers.

2.4 Operations

Rail services are provided by Train Operating Companies. These companies collect revenues and directly pay staff, fuel, regular maintenance. They also pay for the lease of the rolling stock (which includes periodic, substantial maintenance) and Access Charges for the right to run over x specified tracks and use specified stations at specific times.

Of the 35 TOCs only one, Gatwick Express, is expected to cover costs. For this one "commercial" operator the published access charges from RailTrack are surprisingly low being approximately one third of the norm per km for journeys over the busiest, most complicated stretch of line in Europe. The projected early sale of this "profitable" route has, in reality, been stalled by the difficulties of formulating an Access agreement simply because of the number of crossings on the route and the priority to be afforded to trains from different companies.

For the other 34 operators finance is provided by the Franchise Director who defines a minimum service level that he deems is required by the public. Independent companies, which exclude the current British Rail TOCs, then offer to run these services. If the Franchise Director accepts that the company has the expertise to actually successfully carry out the operations, the companies are required to stipulate the subsidy required. Non-Compliant Bids, where the company offers to run services in a way not stipulated in the tender are possible.

For the time being no other passenger companies are allowed to run competing trains over franchised routes, but the operator can run trains additional to the Minimum Service Requirement of the eventual contract. They will do so if the extra services are commercially viable. The access charge for these additional services (and for any freight or charter operator) is negotiated directly with RailTrack. This charge may vary from operator to operator in the range from marginal cost to full

cost (i.e. equivalent to the charge being paid directly by the Franchise Director for the franchised passenger services).

Although there is no new competition on routes, routes and particularly terminal stations are shared. "Paths" at stipulated times have to be negotiated by the TOCs. The PTE's, who have a direct statutory interest in defining the timetables, are not actually included in the process and this again is a cause of legal dispute between the SPTE and the government, in the form, this time, of the Franchise Director. Access for other operators such as a privatised freight operator, requires to be negotiated directly with RailTrack.

One obvious question is how does RailTrack prioritise. Should an express on the East Coast Main Line have priority over a local Glasgow-Edinburgh via Shotts. If undefined in a contract a privatised RailTrack will give priority to "additional" as opposed to guaranteed franchised services.

In a similar vein how is a guaranteed time actually guaranteed. What happens if a train owned by company A, is significantly delayed by a breakdown of a train of company B and is occupying a platform guaranteed to company C for its hourly departure.

Currently (May 1996) five operations have been franchised; South-West trains to the bus operator StageCoach, Great Western to an institutionally backed MBO, Gatwick Express and Midland Main Line to another bus operator National Express and East Coast Main Line to Sea Containers. The offer of a sixth, LTS, to its managers was withdrawn after financial irregularities were discovered.

The enormous contractual problems have slowed the whole franchising process. The government still talks optimistically of all services, including ScotRail, being franchised by Spring 1997. With a general election due and the signature of the PTEs required, this appears optimistic. On the other hand, government desperation to complete franchising may lead to early agreement on a ScotRail franchise package which includes definite orders for new rolling stock and elements of 'Challenge' funding and service expansion over a 15 year franchise period.

2.5 Line and Service Closures

Rail passenger services can only be closed under regulations agreed by parliament. There is a continuing requirement to hold a rail users committee enquiry into the effects of any proposal but this need not cover the costs and benefits and may be over-ridden by new regulation allowing closures to proceed where the Franchise Director and Operating Company have insufficient funds to maintain services as originally specified.

However calculated the subsidy per passenger on the sleeper service to Fort William was/is out of line with any benefit. If the service had been withdrawn in 1992 at the same time as the overnight seating, the opposition would have been minimal.

The political battle that ensued in 1995 when the Sleeper was not included in the original draft Minimum Service Requirement and notice of withdrawal was announced was fundamentally about the new structure. In particular it was another aspect of the "agency" problem: who determines closure, a Franchise Director based in London who is not answerable to parliament, or parliament via established procedures. The fundamental question of what happens if the Franchise Director withdraws finance from a service making it commercially impossible for the company, was answered clearly in the law courts. It is required to run it.

Nevertheless, if government decides that the annual funding made available to the Franchise Director must be reduced, the Director has power to arrange service contraction provided that this has no adverse effect on the profit and loss account of the Franchise company

2.6 Short Term Effects of Structural Change on Scotland

Although the costs and bureaucracy associated with these changes has been large, in Scotland in most respects they will have little effect on passengers. With the exception of the Edinburgh- Glasgow service the service requirements stipulated by the Franchise Director matches the services that, it is claimed, would have been provided. Contractions identified in the summer service relate to planned ongoing cost cutting, in particular the removal of diesel haulage used on tourist services from Inverness to Kyle. Units from here had in the previous year been diverted to increase summer capacity on the West Highland line which included

an additional service. Administratively "prime user" charges from Railtrack, which will constitute 99% of the charges will be paid directly by the Franchiser. Any charges for services on the Glasgow-Edinburgh line on the current timetable but above the minimum specification will be negotiated directly.

Most passenger fare increases have been fixed at the rate of inflation, further eroding any attempt to react to market demand.

As will be argued later the present structure makes it unlikely that services additional to minimum requirement will be operated in Scotland, with the Edinburgh-Glasgow route being the sole exception.

3. The Market for Rail in Scotland

3.1 The Demand

The passenger market can be segmented into three: Tourist, Commuter and Business/Work and, in Scotland, the routes roughly correspond to these divisions being defined as Rural, Urban PSO/SPTE and InterCity. There are two notable exceptions Glasgow-Edinburgh and Stirling-Edinburgh/Glasgow where there are both substantial commuter and business flows. In addition there is a small and declining number of Business/Work passengers on rural lines.

The factors that determine demand are common but the elasticities, the relationship between change in price and change in demand, vary substantially. The dominant factor is the size of the market served. Large origins and destinations guarantee large flows. Unfortunately in Scotland some of our lines such as Inverness-Kyle and Inverness-Wick/Thurso serve very small populations only. However much the other factors are modified (e.g. the introduction of a £1 flat rate) flows on these lines will still be small.

The size of the rail network and the distance of the nearest station from the actual start and finish points is also an important determinant. Scotland has a relatively large number of small towns such as Wick and Elgin (on the railway) and Peterhead or Galashiels (no longer served) that are not large enough to justify rail services. However passengers from these towns can contribute significant flows on the InterCity routes if there is a good rail connection, but are often lost if the local station closes.

The second factor is price. Goodwin(1987) found some 92 estimated elasticities with a mean of -0.79. The range however is large. Jones and Nichols (1983) found price elasticities ranging from -1.18 for Glasgow-London to -0.11 Preston-London. These London based journeys clearly varied with the quality of the competing air service, although Edinburgh had a surprisingly low elasticity of -0.6. This may well reflect both the better train service to London and the major traffic problems in the capital particularly between centre and airport.

The size of the elasticity is extremely important when formulating fares policy. If the market is elastic ($e > 1$) then a rise in price will decrease revenue, and a fall in price increase revenue. Conversely if the market is inelastic ($-1 < e < 0$) then price rise will increase revenue, price fall decrease revenue.

Within Scotland, where most inter-city services are relatively short and alternative air services are consequently poor, on the above evidence we might expect a low elasticity in the order of -0.7. However, because of the relative lack of road congestion, there is fierce competition from buses (and cars) and the evidence suggests that they will follow any price cuts on the railway. These factors together suggest an inter-city market with an elasticity such that a general price cutting policy would simply reduce revenue, unless of course there was also a rise in road costs.

Commuter demand in the London area specifically from High Wycombe, was studied by Glaister(1983). One purpose of the study was to analyse the effect of differential price changes on different ticket types. Two models were developed; one, using an average price obtained by Revenue/Number, gave a price elasticity of -0.74 whilst a second, using an "Inclusive" Fares Index developed from ticket type choice, gave a far higher estimate of -1.38. High Wycombe is on the M40 and as a result there is relatively good road access. This is not untypical of Glasgow commuting and though there are problems on the M8 at the Kingston Bridge the relatively low prices charged by the SPTE reflect the relatively good quality of the Clydeside Road Network. Edinburgh commuters however face severe road traffic congestion and a far lower elasticity should be expected.

Goodwin(1987) reported that the Provincial sector used a price elasticity of -0.9. Tourists however because they have genuine choice are known to be very price conscious and hence routes such as the West Highland

may actually be price elastic. Tourist demand is however very seasonal and capacity is very limited. In these circumstances higher fares can be utilised to restrict demand to capacity and actually increase revenue.

Varying price elasticities between segments coupled with varying demand by time of day and season has inevitably led to a complex systems of price discrimination. This is exhibited by the range of ticket types and discount railcards available for specific groups and specific times.

The third factor determining demand is journey time. Again the elasticities for journey time vary with passenger segment; commuters and business travellers being very conscious of time. Wardman (1994) estimates an overall InterCity journey time elasticity of -0.9.

Closely linked with journey time is frequency. Ending business and having to wait an hour for a train effectively increases the journey time by 1 hour. On a route such as Aberdeen-Glasgow this is an increase of 40%. Wardman however estimates a frequency elasticity of only between -0.11 and -0.16, which suggests an ability of individuals to plan effectively.

A fifth extremely important factor is reliability. If a route is uncongested and there is a better chance of arriving on time by road then road will often be the preferred option on those grounds alone. Reliability is itself a function of the age of the rolling stock used not only on the specific service but on all services that may use a stretch of track.

A sixth and rather elusive factor is quality. Spare seats, Leg Room, Luggage Space, Tables and an at seat refreshment service have all been shown (by Stated Preference techniques) to add substantial value to longer distance travel.

Finally, and most relevant for the through services to England, Wardman (1994) has shown that direct services (avoiding the need to change trains) are seen as a major factor in choice of mode and he has estimated an elasticity of around 1.3. This effect has been recognised for journeys south and to Europe but not in general within Scotland. Passengers from Wick, for example, still have to change at Inverness. More importantly there are no through services to Paisley (for Glasgow Airport), Prestwick Airport and the South-West (Ayr and Stranraer) from the North and East of Scotland.

The estimates above refer to the short term but there is some evidence (Owen and Phillips (1987)) that rail transport is much more elastic in the long term, indeed may actually be elastic. Arguments for a general reduction in price relative to road and air charges may eventually make sense in the long term.

3.2 Competition

Rail faces stiff competition in all areas. On rural and InterCity lines substantial investment in the road network such as the dualling of the carriageway from Glasgow to Aberdeen have made both car and the bus far more attractive options than 20 years ago. Indeed as Table 1 shows in many cases the bus is both faster and cheaper, with the car with two people being again faster and cheaper than the train.

TABLE 1: Comparative Public Transport in the Highlands
(based on SuperSaver Return)

SERVICE	TRAIN		COACH	
	Time	Price	Time	Price
Glasgow-Oban	2hr55	£24.50	3hr	£16.00
Glasgow- Fort William	3hr45	£28	2hr50	£14.20
Glasgow-Wick	7hr45	£42.50	7hr00	£20.00
Glasgow-Inverness	3hr20	£30	3hr45	£10.80
Inverness-Thurso	3hr45	£19.50	3hr15	£13.50

Table 2 shows that although the car is more expensive in full cost terms, to the driver it is perceived on an incremental basis as substantially cheaper (and quicker) than either alternative.

TABLE 2: Comparative Return Cost by Car for 2 people

ROUTE	PETROL	@30p per mile	Journey Time
Glasgow-Oban	£8.46	£28.20	2hr30
Glasgow- Fort William	£9.27	£30.90	2hr40
Glasgow-Wick	£25.20	£84	6hr20
Glasgow-Inverness	£15.48	£51.60	3hr15
Inverness-Thurso	£10.26	£33.20	3hr

For most of the business/work users such as students who do not have cars, the bus has become the normal mode. Train services however still attract large numbers of tourists for two basic reasons. First trains

are perceived by those outside the immediate environment as providing a more comfortable and reliable service. Secondly the integrated railway provides a very effective information system at each of the hundreds of manned stations. The disintegration of the Railway and the associated communication problems will destroy this advantage at exactly the same time as bus operators are beginning to market the provide information more effectively. Symptomatic is the almost complete ignorance in stations of EuroStar services, in particular the EuroStar service from Edinburgh to Waterloo, because of the separate location in the timetable.

3.3 Pricing Policy

Maximum Prices are dictated to ScotRail by OPRAF (the Franchise Director) for non SPTE services. In the SPTE area all prices are set by the SPTE who, as a result, agree to meet any deficits.

Within these constraints ScotRail attempts to maximise its revenue using price discrimination and price discounting. Table 3 shows potential variance faced by Glasgow-Inverness traveller.

TABLE 3 : Cost of Return Glasgow-Inverness October 1995

Ticket Type	Price
Two Single Tickets	£51
Two Single Tickets with Railcard	£34
Saver Return	£33
Saver Return with Railcard	£22
Super Saver	£30
Super Saver with Railcard	£20
APEX	£22
Senior Citizen Special	£8

Price per mile is very variable for both bus and train, referring back to table 1, for train it is as low as 12p per mile on the North Line to 24p per mile on the Oban route. For bus 6p per mile to Wick, 16p per mile to Oban. Much of the variance appears to have developed from competitive pressures. A measure of the strength of the relationship is the correlation coefficient, the closer the value being to 1 the stronger the connection. The correlation coefficient between the bus price per mile and the train cost per mile on each route is 0.85. Variation from a mean ratio of 2:1 occur when the railway is either significantly faster (Inverness) or slower (Wick) without scenic compensations (Fort William).

What this effectively implies is that under present structures the supplier of Rail services is unable to compete on price with bus or car.

Within Scotland there is little competition with Air. The time required to Check-In and travel City-Centre to Airport has led to equivalent journey times for road or rail at very substantial prices. Glasgow-Inverness by air, for example, costs £73 (+£5 tax). The exceptions are when the airport is being used as a transit (e.g. Oil Workers going offshore via Aberdeen or businessmen returning from Brussels to Inverness via Glasgow) and the journey to Wick or the remoter islands where there are very substantial time savings.

3.3 Supply and the Sprinter Strategy

The nature of the market for rail services has effectively dictated the nature of the service supplied by ScotRail. If ScotRail is to be competitive then frequency has to be high. However, given population size this means small numbers on any train, and consequently railcars rather than loco-hauled coaches. With a high premium on reliability this also implied new rolling stock. To minimise costs standardized units and large purchases were required together with low maintenance and running costs. The "Sprinter" strategy was the result.

Criticisms reflect the inability of standard units to reflect the local demands of a route. There is a need, for example, for far more luggage and bicycle carrying capacity on the tourist routes in summer in the Highlands. Similarly introduction of Sprinter units on the Glasgow-Edinburgh route led to an increase in journey time and occasional overcrowding. Significant increases in peak time prices has limited overcrowding and it is hoped that time disadvantages will be mitigated by introducing a quarter hourly service. There is however some difficulty in finding paths. Electrification of the Glasgow-Edinburgh route has been under review for the last 15 years. Over that period the costs of running electric and modern diesel units have converged to such an extent that there is now even serious discussion about commissioning new high speed diesel units for the electrified West Coast Main Line north of Preston. Electrification makes considerable sense for heavy trains with numerous stops or where it provides an ability to "extend" the journey of a train and gain demand. The case for the electrification of the Edinburgh route currently appears to be very marginal or to a privatised RailTrack completely non existent.

Given the constraints of franchise specifications it is difficult to see any privatised company operating in a significantly different manner. It is also difficult to visualize any private company having either the will or financial capacity to renew the rolling stock to maintain the key competitive advantages of quality and reliability. The only progress may be through non compliant bids and closer integration between service plans, infrastructure maintenance and new investment.

3.4 Cost Reduction

The cost and revenue structure for Scottish Rail, with access costs and support outside the control of the operating company and a supply pattern which is fixed suggests that the number of ways a privatised company could increase profit is limited. First and foremost revenue generation is of minor importance compared to negotiation with the Franchise Director on the levels of support. The major effect would appear to be even greater emphasis on political action, albeit in a more concealed way, and a massive increase in transaction costs. The best way to make profit is to inveigle more money from the Franchise Director than stipulated in the original bid. The Director is unlikely to respond unless under substantial political pressure: pressure possibly brought about by threat of service reduction or withdrawal from contract.

With revenue only a fraction of variable and semi-variable costs, the next best strategy is to reduce costs, even if this reduces revenue. An obvious example is to hold no "spare" train set to cover for failure and to reduce maintenance and depot manpower. Cancellation will undoubtedly reduce revenue but not as significantly as the reduction in leasing costs hence profit will rise. In the case of some empty winter trains the revenue may not even cover fuel and overtime costs and profit will actually rise for the cancelled service. Such a strategy could trigger penalty payments, but again the operator would plead financial stringency and demand more finance or suggest closure.

To allay the possibility of reliability collapse the Franchise Director would need to take the risk costs upon his budget, again increasing cost and reducing management flexibility. In the present financial and political climate it is difficult to believe this strategy will be followed and hence a deterioration in service is likely. The other source of cost reduction is manpower. Over the last few years, however, the operating companies have increased labour productivity dramatically but there is probably some saving possible in support and HQ staff and some through reorganization of the payment systems.

Some slimming down of depots and roster rearrangements are also possible but could affect service quality. As an example the removal of the Thurso depot necessitated a "turnaround" at Georgemas and significantly increased journey times to Wick.

In suburban/inter-urban areas manpower reductions are possible by removing early and evening trains unless the Franchise Director and SPTE stipulate otherwise. However, the marginal costs of such services are often low and there is social (if not financial) justification for their retention if a line is otherwise remaining open.

4. The Financial Performance of ScotRail¹

4.1. Revenues

Revenue estimates were derived using a number of sources. The two primary sources were the Report on Supported Services in the Strathclyde Region (SPTE 1987) and the use of multiplicative gravity type models developed for an undergraduate project (C.P. Duke 1994). The produced estimates were also compared with any figures quoted in the rail press.

As with the access charges for Railtrack, the Rail Regulator has also capped rail fares. This capping will affect about two thirds of the tickets currently available. Tickets that will be exempt from such a regime are deeply discounted fares and premium tickets mainly used by commuters and business travellers. However these tickets cannot freely increase as this would distort the overall pricing policy of the franchisee. The capping imposes a price increase ceiling from January 1996 equivalent to the rate of inflation for the next three years. The four following years after this time will be capped at 1% below the retail price index.

4.2 Costs

4.2.1 Access Charges

The method used by Railtrack to calculate the access charges is not known. Nonetheless, the charges are effectively comprised of the attributed costs plus a return on the capital employed. The rate of return has been open to press speculation with the figure ranging between 5 to 8%. The cost element of the charge can be divided in two components, fixed and variable. The latter

reflects such items as the wear and tear from track usage, plus any traction current required for electric trains. The former amounts to 90% of the total cost.

In January, the Rail Regulator decided to peg access charges. This has resulted in these charges being cut by 8% for the current financial year. The Regulator has also stipulated that all future charges, for the next five years, cannot increase by more than the retail price index minus 2%.

Ford(1994) identified an access charge of 9p per mile on ScotRail. Since 90% of Railtrack's costs are stated to be fixed, the marginal cost is estimated at 0.9p per mile although it is known to be considerably larger for the loco hauled sleeper services.

4.2.2 ROSCO Charges

The estimated leasing costs were initially calculated using the MEAV quoted in the press (Modern Railways (1994)). These values were subjected to modification and reappraisal by taking the known historical and replacement costs of the newer units into consideration. The level for the remainder of the pricing regime was then adjusted to reflect the stated total value.

4.2.3 Maintenance

Maintenance costs have been estimated by updating values quoted in the 1987 Electrification Study (Riddington et al (1987)). The aforementioned report included in the maintenance cost such items as heavy maintenance etc. These overheads are now the responsibility of the ROSCO and are absorbed into their lease charge. Accordingly, these items were re-estimated and deducted from the revised maintenance costs. This analysis suggests that the annual maintenance costs are of a magnitude of approximately 5% of the unit's capital cost².

4.2.4 Fuel Costs

Industry sources indicated that fuel / motive power costs could not be derived from simple calculation using, quoted consumption figures. The actual cost for a given mileage can

differ greatly because the costs vary with the nature of the route. The amount of acceleration and deceleration affects the train's performance and thus also affects the motive power / fuel costs.

Thus a train on a short route with many frequent stops will need to accelerate and decelerate more often than that of a counterpart which runs on a long route that has a few stops and will have far higher fuel costs. These factors are taken into account in the estimates used.

4.2.4 General Cost Methodology

The general methodology used in this study was to obtain estimates obtained from as many sources as possible, then, if these were aggregates, they were apportioned using mileage and train characteristics. If unit specific they were aggregated again using train miles. Consolidation of the figures has led, it is believed, to estimates which are both robust and sufficiently similar to actual figures to allow route comparisons.

4.3 General Financial Position

Table 4 gives the approximate aggregate costs of ScotRail. The fares revenue covers more than the operating costs, but only starts to contribute to any other costs. This would be similar to a bus company running its buses without being able to fully pay for either buses or the road tax. Whilst scheduled buses do not face the same compulsory vehicle hire and accounting regimes as rail and also receive rebate on fuel tax, it is still clear that - even if evaluated on the same basis - rail passenger services are making a smaller contribution to costs than is the case in the bus sector.

TABLE 4: Overall Financial Positions of ScotRail

Costs (£m)		Income £m	
Operating Costs	66.8	Fare Box	89.1
Rolling Stock Charges	45.8	Franchiser	100.0
Access Charges	<u>160.5</u>	SPTE	<u>100.0</u>
Total	<u>273.1</u>	Total	<u>289.1</u>

Source: ScotRail/Modern Railways 1994

² MEAV is used

As can be clearly seen from the table, ScotRail has only about a quarter (24.5%) of their costs under their direct control. These costs account for approximately 74% of the fares revenue which itself is approximately one third of the required income needed to sustain ScotRail operations.

Within this over picture, the financial performance of individual line covers almost the complete performance spectrum (except profit!). These are detailed in the next two sections.

4.4 Ex PSO Services

Table 5 shows the financial performance of those routes that were supported under the PSO grant to Provincial Railways.

TABLE 5: THE FINANCIAL PERFORMANCE OF SCOTRAIL ROUTES

Route	Type of Cost as a % of Revenue		
	Operating Costs	Op+ROSCO Charges	Total Costs
Glasgow - Aberdeen	48.21%	69.25%	222.50%
Edinburgh - Aberdeen	61.62%	99.70%	258.75%
Aberdeen - Inverness	68.16%	111.84%	308.90%
Glasgow - Edinburgh	35.30%	60.53%	143.08%
Glw/Edin - Inverness	63.91%	114.26%	292.34%
Express Services	49.83%	81.17%	217.99%
Inverness - Wick/Thurso	195.99%	319.77%	894.21%
Inverness - Kyle	150.90%	258.33%	597.37%
Glw - Ft Wm/Mallaig/Oban	144.55%	265.91%	521.11%
Glw - Ayr/Stranraer	113.81%	175.97%	499.49%
Glw - Carlisle via Dumfries	88.37%	166.18%	375.11%
Rural Services	121.39%	212.00%	499.58%
Glw - H'ton - Shotts - Edin	112.57%	174.59%	434.36%
Glw - Stirling - Dunblane	51.94%	75.69%	251.09%
Edin - Stirling - Perth	73.62%	96.82%	361.83%
Glw - Falkirk G'ston - Edin	132.67%	210.17%	605.60%
Haymarket - Nth Berwick	176.30%	273.63%	830.55%
Edinburgh - Bathgate	55.84%	94.43%	224.07%
Fife Circular	60.42%	125.75%	257.99%
Urban Services	77.20%	125.52%	348.33%

In the InterCity category there are some reasonable performers, such as the Edinburgh to Glasgow line which covers the operating costs plus ROSCO charges and starts to contribute to Access charges. Similarly Glasgow to Aberdeen which goes through to the third largest city in Scotland via the fourth (Dundee), fifth (Stirling) and sixth (Perth), makes some contribution to fixed costs. The lines from Inverness south and east almost cover leasing costs and have well recognised prospects of further improvement through revenue growth and cost reduction. Such improvement however is contingent upon investment in resignalling, extra passing places, higher frequencies and shorter journey times.

Amongst the rural lines only Glasgow-Dumfries appears viable and manages to cover its operating costs. Prospects here are also good; in patronage terms the section to Kilmarnock has been showing a 5% increase in use over the past 10 years double the rate of traffic growth on the parallel A77.

The appalling performance of the Wick line, where revenue only just covers half the operating costs is discussed later.

There are major problems of attributing joint costs and revenues on routes like Glasgow/Edinburgh-Falkirk-Stirling and Haymarket-N.Berwick and particularly the division between the SPTE supported routes to Falkirk Grahamstown and Shotts and the PSO sections of the route.

4.5 SPTE Supported Services

Table 6 gives details of the financial position of the routes that were supported by grant from the Strathclyde PTE under the section 20 arrangements.

Overall, routes run under the SPTE are hardly "economic". Whilst nine cover operating costs, only 3 cover lease costs and make some contribution to access charges. Once again there are some notably bad performers. The worst are those reintroduced recently namely Maryhill, Whifflet and Paisley Canal. Although a number of years will be required before people fully adapt their travel and commuting patterns to reflect these new services it would appear very unlikely that they will improve sufficiently even to cover operating costs.

South Electrics, which were considered for modification to Light Rail running still appear to offer very poor value. Figures for the Glasgow-Kilmarnock route reflect difficulties in apportioning costs and revenues between the SPTE and the ScotRail Dumfries route.

TABLE 6: THE FINANCIAL PERFORMANCE OF SPTE ROUTES

Route	Type of Cost as a % of Revenue		
	Operating Costs	Op + ROSCO Charges	Total Costs
North Electrics	74.52%	140.11%	302.72%
Glw - Cumbernauld	134.49%	216.90%	567.02%
Glw - H'ton - Shotts - Edin	89.46%	138.74%	345.18%
Glasgow - Maryhill	630.28%	1183.39%	2224.06%
Glw - Striling - Dunblane	86.46%	126.00%	418.00%
Glw - Falkirk G'ston - Edin	147.91%	75.90%	218.71%
Argyle Line	104.01%	202.02%	409.71%
SPTE Services (North)	90.41%	167.85%	363.73%
South Electrics	150.90%	316.06%	520.58%
Paisley Canal	189.64%	342.33%	664.93%
Glasgow - Whifflet	342.86%	546.25%	1409.67%
Glw - East Kilbride	83.01%	121.61%	270.30%
Glw - B'Head - K'marnock	110.05%	161.69%	355.68%
Glw - Gourock	83.55%	113.53%	324.78%
Glw - Largs	56.72%	72.11%	244.89%
Glw - Ayr	46.73%	62.48%	187.91%
SPTE Services (South)	82.65%	129.28%	310.98%

5 The Technical Efficiency of Scotland's Railways ³

Efficiency is a term much used but seldom defined. Providing an accurate measure therefore is full of problems. Profitability is largely a matter of the geography of a route. 'There are major positive feedback effects relating volume, frequency and speed i.e. a route joining two large cities such as London and Bristol will generate volumes of traffic that will justify investment in high speed services and rolling stock which will, in turn, increase demands. Even if the service is operated with minimal efficiency it will be more profitable than a rural service. Profit therefore is not an appropriate measure.

Cost per train km or cost per passenger km offer more useful measures although the former would rate grossly under-utilised trains as efficient, whilst the latter again would be biased towards high density lines.

Costs again are also subject to geography. Owing to the terrain the operating cost of running a train from Inverness to Kyle or Glasgow to Fort William will be higher than from Glasgow to Ayr. Urban trains similarly incur higher costs because of stop frequency and congested paths.

One possible solution is based upon the technical efficiency as measured by the potential output given specified inputs of capital and labour and the geography of the country. However this still leaves unresolved the problem of the output that is to be maximised. Four measures of output are used in this analysis; Passenger Train Km per head, Coverage of the population defined as the percentage of towns of over 5000 inhabitants with a rail service. Average Speed of trains and the Normal Frequency of trains. Each measure reflects how different countries have different objectives for their systems. For example countries can use resources to maintain extensive coverage albeit with only one slow train per day but it does so potentially at the cost of fast frequent services on more popular routes. The choice is largely political.

Cowie (1995) uses a two stage process to determine efficiency. Firstly the outputs are adjusted for geographical effects using a multiple regression model that links factors such as coverage to the geography of the country. For example since if resource input was equal we would expect coverage to be higher in a densely populated flat country like the Netherlands than in a sparse mountainous area like Norway, we must correct for this by looking at the statistical relationship overall between coverage and terrain.

Comparative service levels for European railways adjusted for geography are given in Table 7 with each country ranked as a percentage of the best. Scotland, for example runs only 33.5% of the passenger train km as Switzerland given that the geography of Switzerland is even more difficult than Scotland's. For coverage Scotland covers 75% of the number of towns over 5000 as compared to Austria after allowance is made. Speeds on average between towns in Scotland are 88% of those in Switzerland after adjustment. Finally Scotland after adjustment offers on average more frequent services than any other country in Europe almost 6 times the frequency of the Irish republic.

TABLE 7: Comparative Adjusted Output of Europe's Railways (overleaf)

³ I am indebted to Dr Jon Cowie, University College, Scarborough who carried out the calculations

TABLE 7: Comparative Adjusted Output of Europe's Railways (overleaf)

Country	TrainKm	Coverage	Speed	Frequency
Austria	97.2%	100.00%	93.32%	89.00%
Belgium	51.97%	93.62%	87.63%	57.47%
Britain	42.87%	70.82%	58.92%	71.57%
Denmark	63.12%	83.03%	96.48%	97.90%
Finland	44.74%	64.56%	89.61%	53.05%
France	47.12%	76.53%	98.52%	36.65%
Germany	60.42%	99.64%	95.17%	53.43%
Ireland	21.90%	98.18%	70.61%	18.61%
Netherlands	44.16%	77.06%	97.14%	89.43%
Norway	43.27%	70.60%	78.61%	52.97%
Spain	27.22%	60.19%	71.69%	41.07%
Sweden	60.89%	76.79%	91.70%	57.56%
Switzerland	100.00%	94.43%	100%	87.54%
Scotland	33.5%	75.89%	88.2%	100.00%

Having established relative outputs, the relationship between the adjusted outputs and the inputs (Rail labour per cap and Rolling Stock per cap) is then modelled by a Cobb-Douglas production function.⁴ The constant term is then adjusted to ensure all errors are either zero or negative, a process known as Discounted OLS. The errors then represent the extent to which any country deviates from best practice output as given by the model ie. it gives a measure of the technical efficiency. Table 8 gives the results.

TABLE 8: Comparative Efficiencies of Europe's Railway

Country	TrainKm	Coverage	Speed	Freq.	Mean
Austria	86.94%	75.29%	86.98%	72.55%	80.44%
Belgium	66.99%	78.56%	82.66%	40.68%	67.22%
Britain	74.07%	66.42%	57.12%	76.15%	68.44%
Denmark	95.19%	75.58%	90.71%	70.24%	83.00%
Finland	71.01%	62.25%	88.03%	80.95%	75.56%
France	76.55%	65.99%	94.93%	45.46%	71.01%
Germany	100.00%	84.15%	94.61%	56.97%	83.93%
Ireland	82.25%	100.00%	78.21%	55.84%	79.08%
Netherlands	87.18%	72.58%	96.25%	81.04%	84.26%
Norway	71.59%	71.47%	79.52%	58.57%	70.29%
Spain	79.55%	60.44%	75.48%	75.30%	72.69%
Sweden	99.50%	68.32%	89.79%	68.40%	81.50%
Switzerland	82.43%	72.23%	94.00%	65.50%	78.54%
Scotland	83.41%	79.18%	100.00%	100.00%	90.65%

⁴ A translog was initially used but the higher order terms were not significant

Although there are data and modelling problems the results suggest quite clearly that ScotRail is amongst the most efficient railway systems in Europe. Railway systems such as Switzerland and Denmark, which are generally held in high regard, appear to achieve their results with greater resource inputs relative to Scotland. Unsurprisingly, given the recent build of most rolling stock, Scotland clearly outperforms British Rail in general.

6. The Future

6.1 Structural Change

6.1.1 RailTrack

The rail network, despite its loss of status over the years, is still a vital part of the economy. Although the privatization process has produced seemingly endless problems, solutions, often involving the Regulator and Franchise Director, are effectively maintaining the operational status quo. Albeit at increasing cost to the Exchequer. In the short term the predicted major catastrophe will not occur, although there may well be undeserving casualties, such as the ABB rolling stock plant at York.

A privatised RailTrack is likely to continue to subcontract the operational work. Given the demands for experience and safety, the BRIS companies, bought out by the managers, will continue to dominate the work. They will tender for work on the local authority model. Whilst Jonnson(1984) found that making the provision of local authority services contestable generated significant efficiency gains, Liu(1995) showed that that ownership itself was not important and that there was no difference between the efficiency of nationalized and privately owned ports.

White and Tough (1995) investigated the costs to local authorities associated with tendering for bus service contracts. Interestingly there was a reduction in cost of between 15% and 30% if the councils took over the risk of generating the revenue. They also found very significant savings if there was more than 3 tenderers.

The major worry with Railtrack is its capacity in the long term to generate sufficient investment funds to maintain let alone

improve the rail infrastructure. The economics of the industry, particularly in Scotland, demand government finance both of operations and investment. Private Finance alone could not be found for even the best prospect available, the Channel Tunnel Rail Link, until the government made a major contribution. The financial performance of EuroTunnel provides no great incentive to investors, the ongoing problems of financing improvements on the West Coast Main Line no comfort to passengers.

Whilst private finance will continue to have a role it is difficult to recognise the sense in making it the dominant factor and consequently imposing a narrow commercial accounting framework on a system which is and should not be solely commercial. Even without renationalisation more rational structures will emerge. For example, one of the most important but unnoticed events was the transfer of negotiations on Access payments away from the TOCs to the Franchise Director. Effectively the Director is paying the fixed costs leaving all operators to pay the marginal costs. This is close to the system that operates in Sweden and the Netherlands and is proposed for Germany, with an Infrastructure Agency similar to the UK government's Road Agency.

6.1.2 ScotRail

There is an efficiency argument for making the train operating market contestable and for freeing up access but the refusal to countenance "in-house" bids seems unduly disruptive and would not survive any change of government.

The major question however is whether the costs of regulation and more difficult planning, and the legal costs associated with making (and not meeting) contractual obligations can be justified by any efficiency gains. It would appear doubtful.

6.1.3 RoadTrack

The big imponderable is the extent to which changing policy for road track in Scotland may impinge on rail prospects. Much emphasis is being placed on the PFI for major Scottish roads schemes yet this will build up a substantial revenue burden on an increasingly hard-pressed Scottish Office budget. Though

traditionally enjoying high per capita levels of road spending, this practice is unlikely to continue and emphasis is already shifting to packages of urban and corridor improvements including larger elements of public transport investment.

In this context the new Challenge Fund is available for transport projects and, along with EU funding, offers substantial prospects for rail investment. The prospects of such funding are likely to be best in urbanised Central Scotland (and on the routes south) since it will be required to have a clearly identified impact in reducing car use and on improving the finances of the Railway.

Road Pricing and recycling of the income generated will further enhance the viability of rail based schemes. However it must be recognised that bus based packages may prove more attractive in many cases. On balance a mix of bus regulation (and integrated road/rail links), bus based schemes and some rail based improvements is likely to emerge in the urban areas and along key high density routes.

In terms of rail improvement, considerable interest is being expressed in an amalgam of heavy and light rail operation to enhance the value of the rail network. The final bids for the ScotRail franchise may well provide more pointers in this direction.

6.2 The Market

Each of the three markets, InterCity, Urban and Rural will differ. In the cities, particularly Edinburgh, greater emphasis on high quality, high speed public transport to beat increasing traffic congestion may lead to rail based solutions. In Glasgow, however, the breakup of Strathclyde and the spread of its road/land use functions to 11 unitary councils may hamper agreement on the funding for Glasgow based improvements. Much will depend on whether the new Strathclyde Passenger Transport Authority will be able to take a strategic view, including a strong approach to roads and traffic management issues. Despite the poor performance of the newly opened services to Whifflet and Maryhill, it has proved possible to secure rapid agreement on new services from Cumbernauld to Motherwell followed by improvements into Ayrshire and from Garelochhead. Given the rejection of the Strathclyde tram proposals, it may prove easier to devise a package of light rail/heavy

rail integration for Greater Glasgow giving efficiency gains and securing a broad measure of political support.

The InterCity market in Scotland is extremely competitive and it seems unlikely that there will be much, if any, underlying expansion unless there is a significant rise in road congestion and in the costs of road use. These conditions may eventually arise but their immediate prospects are less strong than in south-east England.

The rail share of the rural market has been low for many years with most routes - apart from the tourist market - being uncompetitive with car and bus use. Any resultant contraction in supply will accelerate the decline. Price falls are only likely to increase demand in the tourist market and in revenue terms would probably be neutral.

6.3 Supply

The efficiency ratings provided in section 4.6 suggest that within the resources available ScotRail is providing a good service. In part this reflects the low age of the rolling stock and the decision to standardise around the Sprinter. It is difficult to see any major advances in either markets or productivity that would seriously change the financial picture shown in tables 4, 5 and 6. The only method of improving the finances would appear to be service withdrawal.

6.4 Costs and Benefits of Service Changes

Service Withdrawals

It is difficult to justify the retention of services that fail to even meet their operating costs let alone the costs of rolling stock or infrastructure, unless there are substantial social benefits from the line. Table 9 identifies 9 routes where operating costs exceed revenues by 20%. To give some idea of what this means in personal terms estimates of the number of journeys per day and the subsidy for each of these journeys is also given.

TABLE 9: Cost per Journey vs Social Benefit

Route	J'neys per day	All Costs Costs Subsidy per jny	Op'ng Costs Subsidy per jny	Type	Benefits- Costs
Inverness-Wick	284	£43.40	£8.13	Rural	Small
Inverness-Kyle	146	£40.68	£9.64	Rural	Small
West Highland	627	£28.62	£9.34	Rural	Small
Nth. Berwick	1833	£11.62	£3.24	Suburban	Medium
Cumbernauld	1655	£6.56	£1.02	Suburban	Medium
Maryhill (NS)	370	£20.35	£9.38	Urban	Medium/ High
Sth Electrics	6122	£6.05	£2.81	Urban	High
Whifflet (NS)	680	£16.07	£4.23	Urban	Medium/ High

A journey in this context is an individual getting on the train, however short the journey. Thus the £43 subsidy on the North Highland Line is an average of the much smaller subsidy from Inverness to Dingwall and an even subsidy for those going all the way to Wick.

The Benefit-Cost column reflects a number of elements; Quality of alternatives, Number that would need to be transferred, Congestion and Effect on Economic Development. Data on unemployment rates since 1961 for towns on and off the rail network (Dumfries, Galashiels, Peterhead and Wick) suggest that the presence or absence of rail services has had little impact on employment. Table 10 gives more detail of the estimated employment impact of Highland Rail services. Figure 1 shows the effect on economic development of withdrawal of a service by simply comparing unemployment rates of towns on and off the rail network. It is clear that the effect is minor.

Table 10 gives total estimated benefits of Highland Railways.

Table 10: Estimated Benefits of Highland Railways

Source	Jobs	Income
Direct	626	£9.3m
Indirect	43	£0.56m
Induced	160	£2.5m
Total	829	£12.4m

Source: HIE (1995)

This benefit total, of which the majority is generated by jobs on the railway, has to be set against an estimated loss of £18.9m. Thus even if it is assumed that there is no benefit to leisure and no chance of reemployment in the area there is still a cost to society of the order of £6.5m per annum. At this level the opportunity cost of the services must be considered.

Service Improvements

Against these possibilities of service withdrawal, there are also some prospects of service improvements given new management attitudes and a change in Scottish Office and Local Authority perceptions of rail transport. Five examples are indicative:-

- Doubling of frequencies and tripling of seat capacity on Fife-Edinburgh corridor
- Raising of Glasgow-Edinburgh frequencies to four per hour
- Through services from Ayrshire to Edinburgh
- Phased light rail/heavy rail in Glasgow suburban area
- Station developments to improve modal and service interchange (eg. Glasgow Airport, Edinburgh West and Livingston Parkway)

In each case a key factor is to help improve situations where there is major problem of traffic congestion.

6.5 Opportunity Cost and PTEs

It is not the purpose of this paper to argue that funding for public transport in Scotland, particularly the Highlands, should be reduced nor to argue that funding for ScotRail should be reduced in total. Clearly there are areas of road congestion where new/improved rail services would warrant major investment and/or support. The argument is whether support of some of the rail services with very low levels of demand could be better directed to alternatives. Examples might be a high quality express bus service along the North and West Coasts or express bus services connecting with all the ferries from Harris, Uist and Orkney.

It is difficult to believe that the most appropriate location for decisions on the best allocation of public funds for public transport in the Highlands is the Franchise Director's Office in London, or even St. Andrew's House in Edinburgh. The success of the SPTE suggests that these decisions are best taken at a regional level within Scotland.

It is only at this level that the real social costs and benefits can be easily ascertained. The strengthening and extension of PTE's should therefore be a high priority. This was recommended in the October 1994 Report of the Royal Commission on Transport and the Environment with the important addition that regional strategy for achieving a transport/land use balance should be secured through Regional Planning Advisory Committees.

Arguably the time has come for a more direct approach i.e. the expansion of Passenger Transport Authorities (drawn from elected councillors) to become Transport and Land Use Authorities including major roads and traffic management within their functions. Scotland seems to need three or four such authorities rather than centralised decisions in Edinburgh. These authorities could take their own decisions on the balance between public and private financing; they would also be in a position to determine effective strategies which must be taken in a planned context (given the absence of any desire for a competitive market in roads).

7

Conclusions

The overall objective of this paper was to provide a factual analysis of the economics of Scottish Railways in order to provide the necessary background for decisions on the future organisation and funding of public transport. The fast changing ownership pattern has made such an analysis difficult.

Because of the relative efficiency of ScotRail, and the competition it faces from the road sector, it appears that, if a Conservative Government is returned there will be little immediate change in the pattern of service provision. Over time, however, a Conservative government may be willing to countenance the political storm of withdrawing "guaranteed" services, balancing this with a franchise granted over more than 7 years and including some undertakings for service improvement in urban and central Scotland.

A Labour government would face similar issues. It might well accelerate plans for reduced road spending and a faster improvement in central Scotland rail services but it would still have to face up to the apparent imbalance between social cost and social benefit on some rail services. Surprisingly, through an expansion of Transport/Land Use Authorities, a Labour government might actually reduce the Scottish rail network in the quest for improving public transport overall within cost limits. On the basis of the evidence presented here it would be hard to disagree with such a move.

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