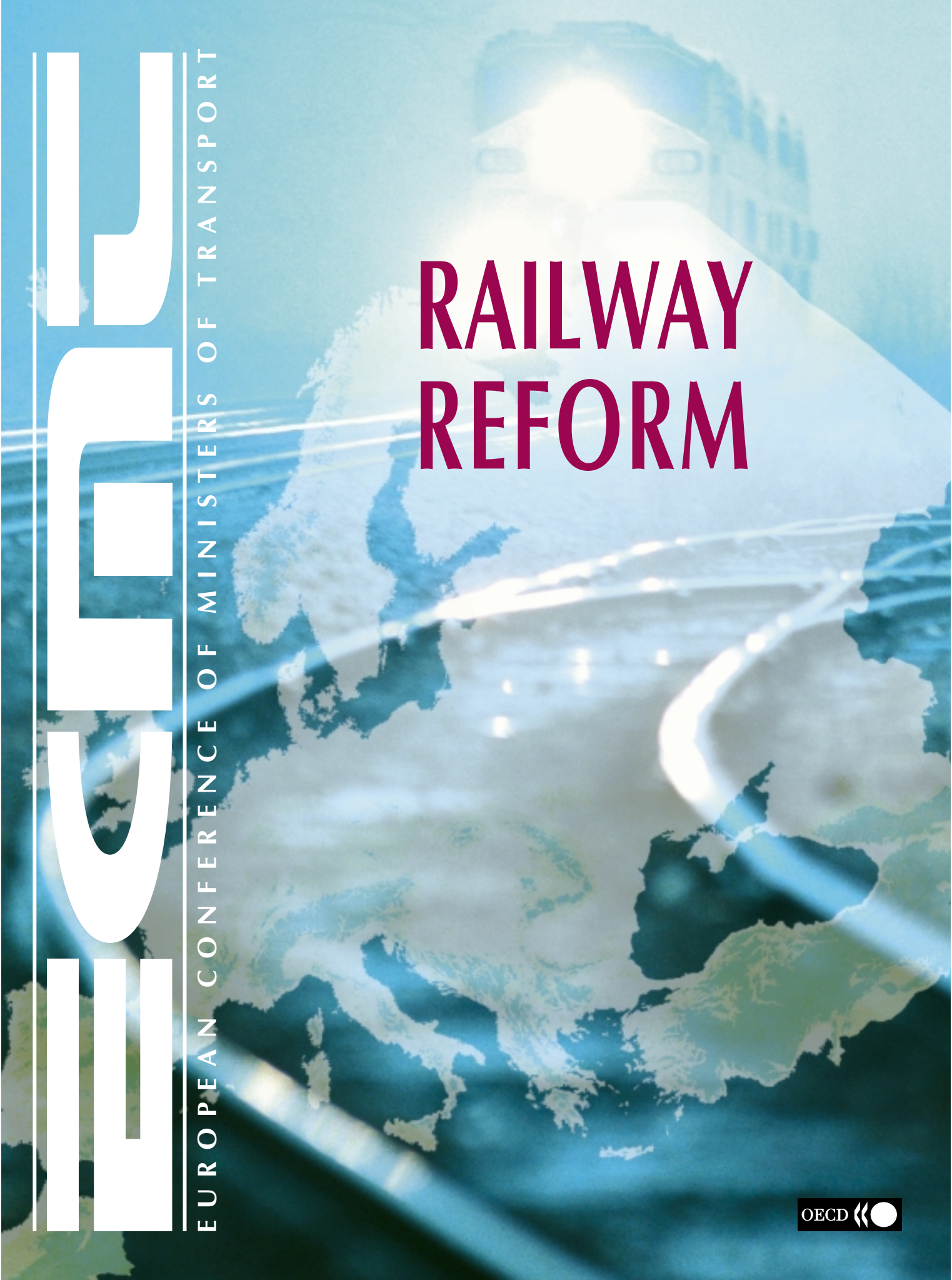
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RAILWAY REFORM

Regulation of Freight Transport Markets

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EUROPEAN CONFERENCE OF MINISTERS OF TRANSPORT (ECMT)

The European Conference of Ministers of Transport (ECMT) is an inter-governmental organisation established by a Protocol signed in Brussels on 17 October 1953. It is a forum in which Ministers responsible for transport, and more specifically the inland transport sector, can co-operate on policy. Within this forum, Ministers can openly discuss current problems and agree upon joint approaches aimed at improving the utilisation and at ensuring the rational development of European transport systems of international importance.

At present, the ECMT's role primarily consists of:

– helping to create an integrated transport system throughout the enlarged Europe that is economically and technically efficient, meets the highest possible safety and environmental standards and takes full account of the social dimension;
– helping also to build a bridge between the European Union and the rest of the continent at a political level.

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A Committee of Deputies, composed of senior civil servants representing Ministers, prepares proposals for consideration by the Council of Ministers. The Committee is assisted by working groups, each of which has a specific mandate.

The issues currently being studied – on which policy decisions by Ministers will be required – include the development and implementation of a pan-European transport policy; the integration of Central and Eastern European Countries into the European transport market; specific issues relating to transport by rail, road and waterway; combined transport; transport and the environment; the social costs of transport; trends in international transport and infrastructure needs; transport for people with mobility handicaps; road safety; traffic management; road traffic information and new communications technologies.

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FOREWORD

This report was presented to Ministers of Transport at the Prague Council in May 2000, to provide the basis for a discussion of key current issues for regulatory reform of rail freight services. It addresses questions of improving quality of service, competition and consolidation, infrastructure access and charges, cross subsidies, ownership and financing of investment. In a context of progressive liberalisation of rail freight markets at international level, the debate in Prague revealed the following main points of agreement :

- Revitalising railways will be an essential part of achieving more sustainable transport systems and for this a truly integrated rail network must develop across Europe.
- Liberalisation is essential for an efficient operation of the railways. Ministers underlined the importance of ensuring day to day management freedom for railways which must have full commercial responsibility for developing their business and indeed for possible failure.
- More seamless international services are vital, and this requires close co-operation both between train operators and between infrastructure managers. It also requires a greater degree of technical interoperability which is equally important for development of a single market in rail equipment. Whilst international co-operation is essential between rail companies, for example through alliances between operators, competition rules have to be respected and any abuses of dominant market powers curtailed by regulatory intervention.
- For efficient transport important rail infrastructure investment will be required. Much of this needs to be focussed on eliminating bottlenecks – clear priorities in this respect must be identified.
- Finally, Ministers underlined that ensuring safety is a primordial priority behind whole railway reform. The objective is to promote rail freight through development of successful businesses providing quality, safe and reliable services.

The debate also revealed the importance of recognising the fundamental differences between national railways and the markets they operate in. For example, if the US Minister underlined the tremendous impact of deregulation in turning around US railways from decline to growth, he also identified ownership of infrastructure by the train operating companies as a key factor in the success of the American reforms. On the other hand, the European Commissioner for Transport indicated that the European Union intends to focus on achieving an integrated transport system with a clear separation of railway services from infrastructure. In the end there was wide agreement that there should be room for some flexibility in the models followed for regulatory reform at national level in developing an efficient and truly pan-European railway market.

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EXECUTIVE SUMMARY: PRINCIPAL QUESTIONS FOR REGULATORY REFORM AND THE DEVELOPMENT OF RAIL FREIGHT MARKETS

Introduction

This report presents a summary of issues for regulatory reform in rail freight transport. These are complex questions to which there are no simple answers. The analysis does, however, provide a framework for working towards the most effective balance between economic efficiency and financial constraints. Although the optimum solution will vary with circumstances, these questions need to be addressed at international level if international rail freight is to meet its potential in Europe.

Principles of subsidiarity and proportionality

The circumstances (geography, population, industry, levels of income, efficiency of existing rail services, etc.) influencing performance of the transport system vary considerably from one country to another in Europe. Best practice in one country is not therefore necessarily the best solution in another country. For example, solutions to congestion may be very different from strategies adapted to managing railways with low traffic flows. A Europe-wide standardisation in the approach to regulatory reform may cause avoidable problems. The EU principle of subsidiarity is important as is the question of proportionality – are the costs of measures proposed in proportion to the results expected? Only where the advantages of international harmonisation are large are uniform rules appropriate.

Improving Quality of Service

Opportunities for expansion

Advances in logistics and information technology and the creation and expansion of a single market in the European Union present major opportunities for rail freight services to develop in Europe. To exploit these opportunities, rail must compete with other modes on both price and quality of service.

Seamless services and reliability are essential to competitiveness

Quality of service depends crucially on reliability, where good labour relations based on competitive contractual conditions are as important as effective logistical management. Equally, structural consolidation in the European rail industry will be important to create the conditions for continent-wide seamless services to develop (*i.e.* service that avoids customers having to deal with more than one rail service provider, and avoids protracted negotiations between different territorial rail entities).

Competition and consolidation are both important

In the regulatory field, two broad routes to fostering adaptability and thus improving the overall performance of rail freight services are most relevant in Europe:

- increasing competition within the industry;
- and ensuring freedom to rationalise and concentrate investment where returns justify.

A continent-wide restructuring, to replace national frontiers with more commercial logic, is important in both respects.

Fostering intra-modal competition may provide an effective route to innovation in the European rail sector in two ways. First by the entry of new companies focussed on specific markets and better adapted in terms of structures and costs to serve these markets as they evolve. Second, and possibly more significantly, through making rail markets contestable and providing the necessary stimulus and rationale for incumbent operators to innovate, even where competition is in practice limited.

In terms of price, the overall impact of introducing competition between rail companies may be somewhat limited, given the intense competition from road in most European rail markets. However, competition coupled with the international consolidation of the industry that is beginning and is facilitated as an incidental effect of recent regulatory reforms, should lead to lower costs and better quality, more seamless international services.

Objectives of Regulatory Reform

The need for regulation differs by market

There is no single model for regulatory reform that can be applied to all railways. Different rail markets are likely to require different forms of regulation to maximise efficiency and the mix of markets for rail services differs from country to country. However, the following objectives need to be considered in designing regulatory frameworks for most rail markets:

- preventing pricing abuses in captive markets (bulk coal transport where coastal or inland waterways are not available, for example);
- ensuring transparency in the provision and use of public subsidies;
- providing for an adequate level of investment in rail infrastructure and rolling stock;
- ensuring fair conditions for inter-modal competition;
- encouraging intra-modal competition, where feasible;
- minimising potential losses from reduced competition arising from mergers.

Economies of scale need to be preserved

The likelihood of different structures and regulatory systems achieving these objectives needs to be balanced against the likelihood of their preserving the welfare gains arising from the major economies of scale, scope and density inherent in parts of the rail system (especially infrastructure for scale economies and passenger operations for economies of density).

The underlying task of regulatory reform in Europe is thus to achieve balance: in introducing competition through regulatory intervention whilst otherwise preserving management freedom to run the business commercially (free from government intervention); and in preserving and enhancing as much of the substantial economies of scale inherent in rail services as is compatible with introducing an effective degree of competition.

Intrusiveness of Regulation

Explicit regulatory codes should replace government intervention in management decisions

De-regulation of railways in countries as diverse as the United States of America, Japan and New Zealand suggests that relatively light touch regulatory regimes are more successful than detailed prescriptive regulation in achieving the correct balance between these objectives. For freight railways in particular, the North American record suggests that an effective route to improving performance is to restrict detailed intervention to cases where there is an appeal to the regulatory authorities from an aggrieved party (and constraints on the behaviour of a company are sought); or railway companies wish to merge and there is a need to preserve competition. In the latter case, intervention to constrain the structure of the market (for example requirements to divest parts of the merged business) will generally be more effective than constraints on the behaviour of the merged company.

In regions where there is little or no existing competition between rail companies and Government policy is to introduce competition in the rail market (as opposed to for the market through tenders for exclusive concessions) more extensive intervention will be required to prevent the exercise of access rights being obstructed by incumbent operators, and possibly to impose structural changes such as separation of rail infrastructure from train operations.

Competition and Consolidation

Europe needs international alliances as well as competition to improve international freight services

Mergers have been a dominant feature of the US rail industry since deregulation in 1980. They have given the industry a more efficient structure, enabling costs to be reduced through cutting out duplicate capacity and reducing overheads. More importantly, services have improved as a result of the ability of the merged operator to provide a seamless service. Mergers *have* enhanced the market power of some rail firms by reducing the number of competitors. This might be expected to have resulted in excessive prices in some markets but this does not seem to be significant given the low rates of return experienced by the industry in the US (despite the rapid increase in productivity) and the fact that average rates have fallen by about 50% since deregulation. For the future, mergers to create transnational railways are less likely to meet objections from shippers and the regulatory authority than a merger creating a monopoly in one region of the country. This is because, for mergers between companies in different regions of the country, the benefits to shippers of one company providing through services are likely to outweigh the potential loss of efficiency through reduced competition. The balance between allowing the development of seamless services whilst preserving adequate competition has been achieved by the regulator exercising his powers to require divestments of parts of the network or impose trackage (access) rights in specific parts of the merged operation where the impact of reducing competition could be significant.

Thus if the creation of access rights improves efficiency through competition, mergers can improve efficiency through economies of scale and seamless service. The draft Directive and amendments to Directives adopted in principle by the EU Council in December 1999 cover international access rights but both national and EU competition authorities (and rail regulators where they exist) will have a decisive role to play in the conditions they attach to approving mergers. Explicit policy at the European level towards mergers needs to be developed, particularly with respect to introducing requirements to divest parts of merged businesses

to promote competition. Such conditionality could be employed to protect competition without preventing mergers that bring structural improvements to the industry with associated benefits for international services.

Commercial alliances are needed in rail infrastructure even more than in train operations

Seamless service on the infrastructure side of the business is possibly even more important than in freight operations. Infrastructure integration is being addressed partially in the European Union through the draft 1999 Directive on Interoperability, which seeks mainly to ensure a greater degree of technical harmonisation together with standardisation of operating procedures through regulatory oversight. The Trans European Rail Freightways initiative addresses fostering closer commercial ties between infrastructure managers and has made gradual progress in developing faster international train paths for freight and "one-stop-shops" for customer contacts on a number of routes. This may not prove sufficient, however, to prevent barriers to more efficient use of infrastructure persisting, which even merged freight operators may not have powers to resolve. Routes to fostering greater commercial integration of infrastructure management in Europe need to be developed further.

Opening rail operations to competition can also increase costs. Evidence of economies of scale, scope and density suggests that fragmenting rail freight businesses can make them uneconomic. This is borne out by the results of international comparisons of productivity coupled with the difficulties of implementing the original model for competition in Britain's freight railways. However, it does not rule out the development of efficient new businesses as a result of regulatory reform, especially where incumbents are inefficient – typically as a result of factors partly beyond their control such as rigidities in existing employment structures. New entrants moving significant quantities of freight have emerged in Germany and Scandinavia, efficient niche market operators providing innovative services have entered the interstate market in Australia, and competitive short line operations are widespread in North America and exist in several European countries. And as already noted, the impact of intra-modal competition in mobilising the resources of incumbent railways should not be underestimated.

Infrastructure Access

Obtaining adequate train paths for international freight will remain a vital issue

The future growth of rail freight in Europe will depend on how effectively access issues are addressed, particularly:

- obtaining adequate train paths for freight in competition with passenger services (on the basis of relative value in terms of socio-economic welfare);
- establishing an efficient non-discriminatory pricing system for infrastructure.

The first of these concerns requires that the systems for pricing and allocation of the use of rail infrastructure both account for the value of different rail services competing for space on the network. Negotiation will be the most effective way of revealing relative values.

Regulatory authorities or courts are needed to arbitrate access rights

Non discrimination has to be the basis for implementing access rights. Independent arbitrage is necessary to resolve conflicts of interest. Recourse to regulatory authorities and the courts in cases of dispute is essential to ensuring fairness. In a light-handed regulatory system arbitrage is provided by regulatory authorities or the courts only on appeal. In contrast, the system adopted by the EU Council in December 1999 is that an agent fully independent from any rail freight operator has the legal responsibility for allocating capacity and awarding

train paths – even if the detailed work of planning timetables and day to day operational management of rail traffic (which inevitably departs substantially from planned schedules) might be contracted to the infrastructure management of a vertically integrated company or group of companies under a holding structure.

Is reciprocity needed to prevent abuse of access rights until these are enforced in all Member countries?

Internationally, progress in the rate of development of access rights differs. In the European Union, until such time as major barriers to entry under the terms of the amendments and draft Directives adopted in principle by the Council in December 1999 are satisfactorily removed in all countries, reciprocity might prove a necessary instrument for ensuring non-discrimination. Thus there could be reason to establish grounds for rail regulators or competition authorities to block the entry of operators owned by a foreign incumbent that enjoys protection in its home market through the existence of significant barriers to the exercise of access rights.

Cross Subsidies

Eastern European freight to passenger cross-subsidies must end

On the operations side of the business, cross-subsidies from freight to passenger services – common in the newer ECMT Member countries – must end when access rights are created for new entrants. Otherwise the financial solvency of incumbent operators will be unfairly compromised, since new entrants providing freight services do not bear a burden of subsidising passenger services. Thus in the countries of Central and Eastern Europe and the new independent states, separation of freight and passenger accounts (both balance sheets and profit and loss statements) is essential when access rights are introduced. Organisational separation would further increase the transparency needed to end such cross-subsidies.

Infrastructure Charges

Equivalent conditions for road-rail competition are essential

It is important for rail and road freight operations both to be charged efficient prices for the use of infrastructure (failing efficient prices they should at least be priced according to the same principles, to avoid distorting competition). The efficient price of any good is its marginal cost of production. For purely private goods, the production of which follows the normal characteristics of constant or decreasing returns to scale, competition from rival producers will tend to keep prices to the efficient level. For industries with increasing returns to scale, such as railway infrastructure, the efficient price level is no different but competition can not be relied on to reach this price level, as a single firm will be able to supply all production at the lowest cost. Increasing returns to scale (*i.e.* declining costs) also mean that the marginal cost of production is lower than the average cost, and pricing at marginal costs will not enable the producer to cover his total costs. This does not mean that the efficient level of price is actually above marginal costs – the efficient level of prices is always at the level of marginal cost. For a theoretically efficient outcome a transfer is required from Government to make up the difference between total costs and the revenues from efficient pricing.[1]

Such transfers should not be confused with state-aids or with a subsidy that distorts trade. They are not designed as compensation for inefficient performance or as a bridging arrangement while a firm improves its performance. These transfers are a permanent feature of a rail system that maximises economic welfare. The size of the transfer is determined by the size of the rail system, which in turn is determined by the cumulative result of investment and

closure decisions. The quality of cost benefit assessments on which these decisions are made is therefore crucial. And the key determinant in the assessment is the calculation of expected demand that results from prices set at the efficient level – *i.e.* at the level of marginal costs. Demand is limited by the price of substitute services, road, shipping and air transport, as well as related to the utility of transport relative to other products and services.

Efficient infrastructure charges across Europe will be vital for expansion of international rail freight

Governments may be unwilling to provide the necessary transfers, for example because public finances are under pressure, or because it finds it difficult to assess the real level of marginal costs or because it believes that the existing structure of the industry results in poor decision making. Some Governments also pursue infrastructure cost recovery as a matter of principle. If the transfers required for efficiency are not available, alternative pricing strategies have to be adopted by the railway. The least inefficient approach is Ramsey pricing where prices are marked up in proportion to each customers price sensitivity. The volume of traffic is reduced and lines closed to the point where revenues are sufficient to cover costs. In principle this is not efficient pricing as customers that would be prepared to pay the marginal costs of transport are denied services by the higher than marginal prices charged. The modal share of rail in freight markets will be undermined if infrastructure charges are set substantially above marginal social costs.

Ownership and Financing of Investment

But attracting private finance complicates marginal cost pricing

The application of marginal cost pricing creates particular problems with obtaining private sector finance for railway infrastructure. In order to attract private sector finance, it will be necessary:

- either to make exceptions to allow higher charges for new infrastructure, as under the draft EU Directive on the allocation of railway infrastructure capacity and the levying of charges for its use;
- or to provide public sector support to supplement private financing of investment.

There is evidence that transferring ownership of the railways to the private sector can have a considerable impact on the efficiency and competitiveness of rail services, especially when private ownership is combined with deregulation. However, where there is private ownership of infrastructure that is owned separately from operations, it is essential to provide adequate contractual and regulatory incentives to ensure that investment is at an optimum level. This has already proved to be a difficult regulatory issue in Britain following restructuring and privatisation of the railways and may prove to be the toughest to resolve.

Replicability of Models

US model cannot be transplanted to Europe but some experience can be transferred

Deregulation in the USA has been highly successful in improving the efficiency of the rail system and has been accompanied by a significant reduction in rail freight rates. Its strengths lie in enabling an industry structure to develop that reaps the benefits of the fundamental economies of scale of rail services and in avoiding intrusive regulatory intervention where possible. Competition between vertically integrated freight railways is the essential feature. The US model will, however, be difficult to replicate unless both the following conditions are met:

- the economic value of passenger services is insignificant compared to freight – if passenger services are important, then they should not be dependent for infrastructure on vertically integrated freight operators as they have different and often conflicting requirements;
- most major freight markets are served by more than one line, thereby permitting the railways to be operated as competing vertically integrated transport companies – if there are no potentially competing lines, competing operators would need to use the same track, which is not the norm in the US.

These conditions are rarely met simultaneously in countries outside North America. Even in western Russia, where there may be potential for vertically integrated freight railways to compete, the importance of passenger services may rule out the US model.

A permutation on the US model, but adapted to a passenger dominated railway, was developed internally within British Rail before it was restructured in a different form for privatisation. This consisted of vertically integrated passenger operators. However, each section of track would have been controlled by the "prime user" (the operator that used the section of track most). This might have disadvantaged other operators, usually including freight operators, which are rarely the prime users.

One way in which the US model could be replicated would be through the development of "freight only" lines with vertically integrated freight companies. However, whilst freight only lines have merits in corridors with a high density of freight traffic on most lines, they would usually lead to losses of economies of scale in infrastructure, especially if vertically integrated freight companies were to compete. For most corridors in most countries, therefore, it is more economic for freight and passenger trains to share the same line, which eliminates this option.

It is therefore concluded that the US model is only replicable in limited circumstances that are unusual outside North America. However, as already noted, there are important lessons from the US regulatory experience for other models.

Most of European track network to be opened to competition for international freight

In the EU, regulatory reform initially focussed *inter alia* on vertical separation[2] and the introduction of access rights for certain categories of rail freight operations. The revised directives (drafts adopted in principle by EU Council in December 1999) focus more directly on the key problem for international freight – the fragmentation of the industry by national boundaries. It was agreed that any licensed operator in the EU should be able to gain access to the principal network[3] in any EU country. This should increase the competitive pressures on incumbent railway undertakings and may encourage the further development of strategic alliances, possibly through mergers. Merger activity has already begun with the formation of Railion (German DB Cargo and Dutch NS Cargo), the proposed CargoSI joint operation of the freight businesses of Swiss SBB and Italian FS and other initiatives. The formation of such integrated international operators will allow the provision of a seamless service to customers but raises issues of monopoly concentration.

The EU model appears to be the most appropriate solution in regions comprising mainly small countries with significant trade between them. In these countries, the disadvantages of vertical separation should be more than offset by the benefits of horizontal integration of freight operations across borders (provided integration happens). The case for the EU model therefore

seems strong for most of Central and Eastern Europe, where international traffic usually dominates. There may, however, be exceptions were demand is dominated by domestic traffic, as for example in Poland, where the advantages of horizontal integration across borders are less relevant. The weight of the economic argument in such cases may be in favour of vertical integration because the high transaction costs and loss of economies of scope arising from separation may outweigh the advantages from greater competition.

Australian flexibility could be a model for parts of Europe

The current Australian model successfully combines elements of both EU and US approaches to regulation. It consists of an interstate railway that has rights to negotiate access across a number of State networks exhibiting a wide variety of structures and regulatory regimes. This represents a compromise between the open access provisions of the EU directives and the flexibility of the US model. The Commonwealth lays down minimum requirements for state access regimes in a way that can be applied more flexibly than is the case with the EU directives. Also the rail companies have a right of appeal to the Courts against State and Commonwealth decisions. This greater flexibility may have particular merits for some Central and Eastern European countries and countries of the former Soviet Union, where the higher modal share of rail and the importance of freight relative to passenger traffic (compared to the EU) and the more dense networks (compared to North America), mean that a variety of approaches should be considered.

Conclusions

Europe needs rail businesses adapted to the emerging single market

There is no single model for regulatory reform that can be applied to all railways. Different rail markets are likely to require different forms of regulation to maximise efficiency and the mix of markets for rail services differs from country to country.

Under any model, the primary challenge in defining the regulatory framework is to manage the risks of monopoly abuse effectively whilst avoiding intervention that stifles the functioning of the rail freight market. The risks of over and under regulation have to be balanced in order to maximise the benefits for the economy as a whole.

International consolidation needed as well as competition

The key implication of this report is that a railway industry structure needs to be created or encouraged that, whilst preventing the development or abuse of captive markets, will provide the necessary balance between:

- improvement of services to customers and the achievement of economies of scale in the movement of freight through international consolidation;
- the provision for intra-modal competition to develop and provide stimulus for innovation, improved cost control and service quality.

Explicit merger policy required

Explicit policy at the European level towards mergers and acquisitions that significantly undermine competition needs to be developed to guide the actions of national and EU competition authorities. This applies in particular with respect to requirements to divest parts of the merged businesses rather than simply blocking problematic mergers and also policy towards companies that enjoy protection in their home market but seek to enter markets or acquire companies in other countries where there are no barriers to their entry.

Lessons from Associate Countries

De-regulation of railways in countries as diverse as the USA, Japan and New Zealand suggests that relatively light touch regulatory regimes are more successful than detailed prescriptive regulation in achieving the correct balance between these objectives. For freight railways in particular, the North American record suggests that an effective route to improving performance is to restrict detailed intervention to cases where: there is an appeal to the regulatory authorities from an aggrieved party; or railway companies wish to merge and there is a need to preserve competition. In regions where there is little or no existing competition between rail companies intervention will, however, be required where the exercise of access rights can be obstructed by incumbent operators.

Infrastructure regulation is challenging

In the EU and some other places intervention has included separating infrastructure management from train operations. The task of regulating vertically separate infrastructure companies has proved difficult, for example in the United Kingdom, and satisfactory incentive regimes have yet to be developed. This is not to say that effective regimes cannot be developed, but in some respects achieving an effective regulatory regime for separate infrastructure managers may be more difficult than for vertically integrated railways.

Charges for infrastructure use will remain high on the political agenda

Where infrastructure has been separated from operations, charges for the use of infrastructure are regulated and marginal social costs have generally been adopted as the basis for determining charge levels for freight. However, studies[4] suggest infrastructure charges at marginal social cost levels will fall short of covering total infrastructure costs by as much as 40% or more. To cover the shortfall, there is a range of options from full public subsidy to various charging systems that do cover total costs with a lesser degree of efficiency in terms of infrastructure charges.

Notes

1. This is a *prima facie* case for Government subsidy that was first given a formal exposition by Hotelling in 1938 drawing on the work of Dupuit 1849.
2. Vertical separation = separation of infrastructure management from train operations.
   Horizontal separation = separating freight operations from passenger operations, regional services from intercity services, etc.
3. More precisely, the Trans-European Rail Freight Network (TERFN) defined by maps annexed to the amendment to Directive 91/440/EEC, mainly covering connections between ports and main freight terminals, together with feeder lines at both ends to a distance of 50 km or 20% the length of the port-terminal connection whichever is the larger (there are exceptions for Luxembourg and Belgium due to the small surface area of these countries).
4. See CEMT/CS(2000)15.

REGULATORY REFORM
AND THE DEVELOPMENT OF RAIL FREIGHT MARKETS

REGULATORY ISSUES

Introduction

The purpose of this report is to examine what form regulation should take in rail freight markets in order to promote the efficiency of the rail industry and the wider economy. It also examines related issues of industry structure. These issues are important because experience in some countries suggests that significant gains in social welfare and a reduced burden on public finances can be achieved through successful regulatory reform.

The report focuses on freight. For passenger services the issues are different, largely because of public service obligations and the dominance of timetabled services, which exhibit strong economies of density. Different solutions, such as competition "for the market", to obtain efficiency gains from competition without losing economies of scale, may represent the best approach to regulatory reform for passenger rail markets.

Trends in Regulatory Reform

Trends in regulatory reform over the last two decades have moved unambiguously towards liberalisation but, initially, they encountered stiff resistance. Established utilities and railways, almost without exception, emphasised the advantages of co-ordination and vertical integration. It was only in a small number of countries with a strong ideological commitment to microeconomic reform, and in a larger group of poorer countries in which such reform was a condition of structural assistance, that substantial changes occurred.[1]

More recently, the advantages of reform have been demonstrated and an increasing number of countries are deregulating and privatising industries that had previously been considered natural monopolies. However, the number of countries that have completely reformed their railways is still relatively small.

Economic Characteristics of the Railway Industry

The self-interested origins of the counter-arguments against liberalisation do not mean that they are without merit. There are well founded reasons (declining costs, the long life of assets, the size of sunk costs, capital intensity, network benefits and joint costs) for questioning the feasibility and effectiveness of competitive markets in the provision of rail services.

The economic characteristics of the rail industry, particularly the substantial and unavoidable elements of natural monopoly arising from increasing returns to scale, mean that governments need to retain a regulatory role beyond the scope of general anti-trust regulation. Indeed, it is certainly not the case that the role of government ceases, or necessarily becomes less complex, when private ownership or management is introduced or when the industry is fragmented.

To survive, grow and make profits for investment, railways need predictable financial conditions. Railway management also requires the freedom to make commercial decisions promptly and to take strategic decisions if they are to adapt to changing markets. These are the fundamental conditions that rail regulatory regimes have to fulfil if they are to be successful in the long term.

Large cost savings can be brought about by creating a regulatory framework that gives management the freedom to optimise investments and the size of the network.[2] Significant improvements in service should also be achieved through a framework that successfully promotes international integration of rail

markets to enable a seamless service.[3] This is particularly true in western and central Europe, where international traffic represents a high proportion of traffic carried in most countries. At the same time, increased transparency and accountability is needed to secure more investment in the rail system. Investment is essential for achieving a transfer of freight from roads to railways in order to reduce the environmental impact of transport, a stated goal of transport policy in many European countries.

Objectives of Regulatory Reform

There is no single model for regulatory reform that can be applied to all railways. Different rail markets are likely to require different forms of regulation to maximise efficiency and the mix of markets for rail services differs from country to country. However, the following objectives need to be considered in designing regulatory frameworks for most rail markets:

- preventing pricing abuses in captive markets;
- ensuring transparency in the provision and use of public subsidies;
- providing for an adequate level of investment in rail infrastructure and rolling stock;
- ensuring fair conditions for inter-modal competition;
- encouraging intra-modal competition, where feasible;
- minimising potential losses from reduced competition arising from mergers.

The likelihood of different structures and regulatory systems achieving these objectives needs to be balanced against the likelihood of their preserving the welfare gains arising from the major economies of scale, scope and density inherent in parts of the rail system (especially infrastructure for scale economies and passenger operations for economies of density).

Rail Industry Trends by Region

A decline in freight market share is one of the main reasons cited for political interest in regulatory reform for the railways. Figure 1 shows that rail's part of the modal split has fallen in western Europe, Central and Eastern Europe and Japan, but that it has been maintained in the US.

Figure 2 compares rail freight traffic with real GDP for OECD Europe and the US, further demonstrating the relatively poor performance of European railways. The rail freight business in Europe has not expanded with GDP, in contrast to experience in the US since deregulation.

EU *Member States*

Figure 3 shows the evolution of freight traffic in present EU countries since the years after World War II.

Freight traffic increased by about 25% over the period. It reached its highest level during the 70's and 80's before reducing during the early 90's, due to the closure of many heavy industries and the general trend towards the production and transport of goods with high value to weight ratios. Since then, rail freight has declined by about 20%.

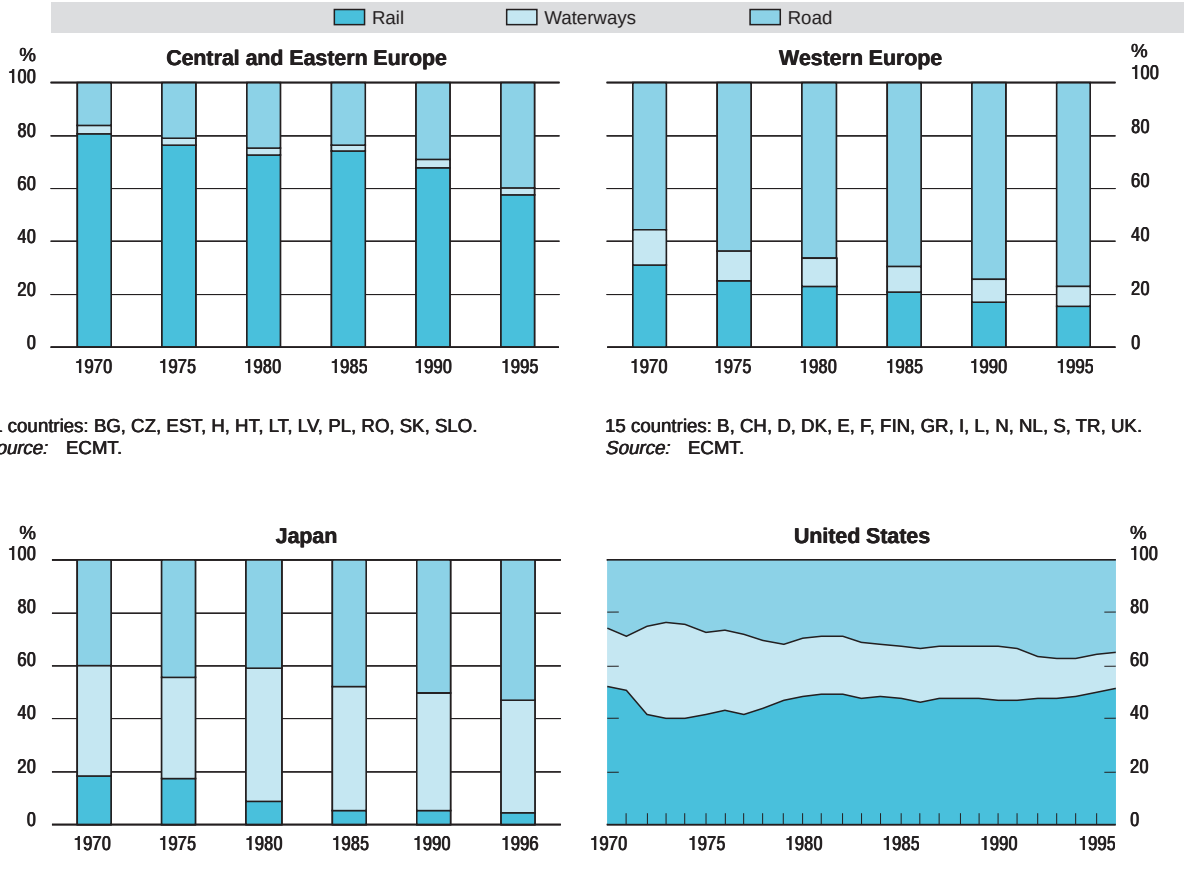
Over the same period, the length of rail lines in the EU has been reduced by a quarter (Figure 4). Figure 4 also shows that the staffing levels of the railways have fallen dramatically, with a 70% reduction on 1950 levels. The trend is likely to continue downwards as labour productivity increases in the future.

Thus despite significant traffic increases, of 25% for freight and 50% for passengers, both network size and staff numbers have declined over the period 1950 to 1997. The net result is that the density of traffic on the network has increased substantially, affecting freight as well as passenger traffic in terms of productivity and congestion. Labour productivity has increased even more.

Central and Eastern Europe

Figure 5 shows rail freight traffic trends in the countries of Central and Eastern Europe[4] and in a group of countries to the east: Ukraine, Belarus, Moldova and the Baltic States. Traffic in both regions increased

Figure 1. **Freight Transport Modal Split (% of tonne-kilometres)**



11 countries: BG, CZ, EST, H, HT, LT, LV, PL, RO, SK, SLO.
Source: ECMT.

15 countries: B, CH, D, DK, E, F, FIN, GR, I, L, N, NL, S, TR, UK.
Source: ECMT.

Source: IRF, World Road Statistics.

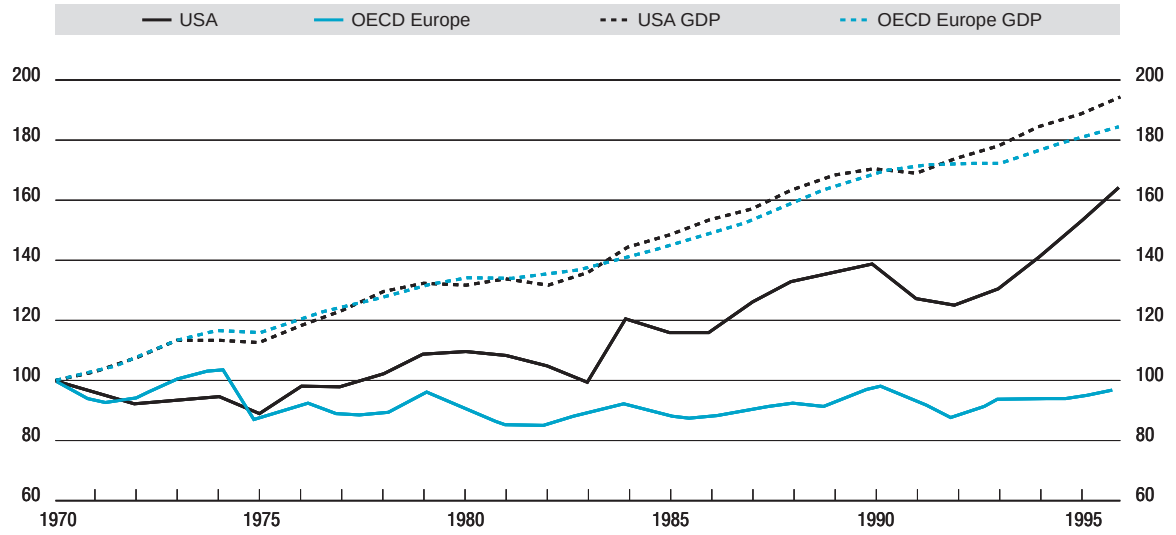
substantially up to around 1990, but has since declined dramatically as these countries experienced recession and began to restructure their economies along market lines. As a result, traffic in 1997 was about 40% below the level of 1965.

In contrast to the EU states (and in even greater contrast to North America), there have been few line closures in CEECs (7% of the network between 1965 and 1997) and line lengths have increased slightly in the second group of countries.

Figure 6 shows that staffing levels in CEEC railways increased gradually to 1990 and then declined by 40% to 1997. In the second group of countries there has been a gradual decline in staff numbers over the period since 1980.

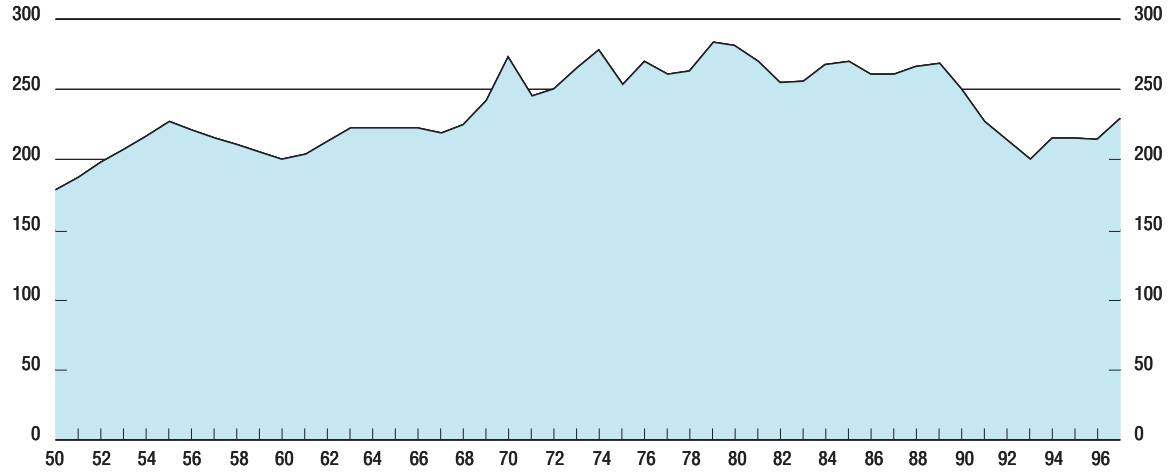
In contrast to the EU, rail traffic on CEEC railways has experienced significant decline since 1965, but track length and staff numbers have fallen by less. Both traffic density and productivity have therefore declined. However, the drop in output is recent and CEEC railways have not yet completed their restructuring.

Figure 2. **Index of Rail Freight Traffic (t-km) and Real GDP**



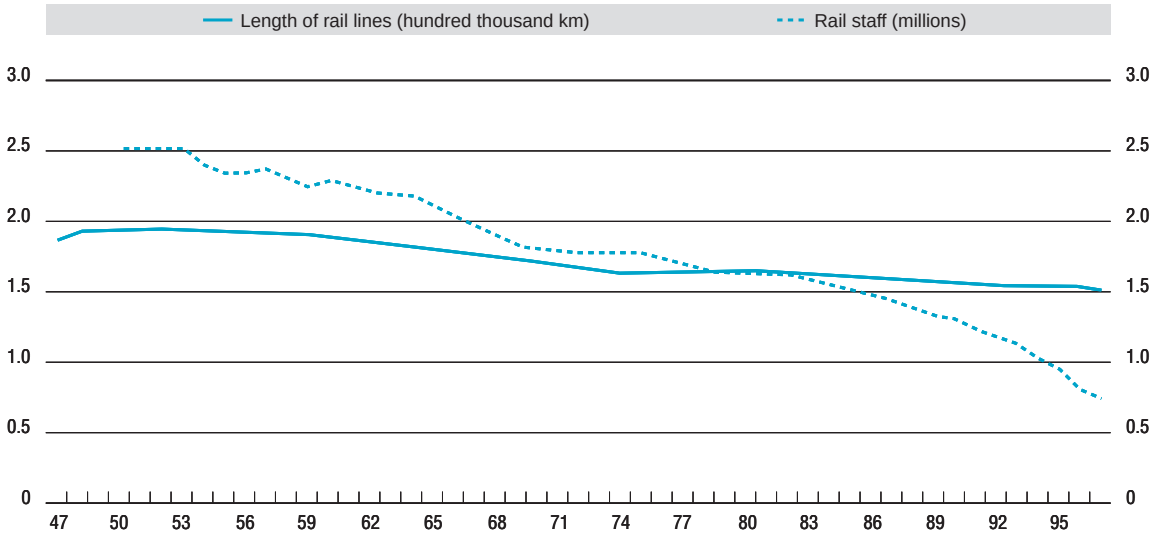
Sources: ECMT database; IRF, World Road Statistics (for US traffic); OECD National Accounts 1960-1996.

Figure 3. **Rail freight traffic in the 15 countries now forming the EU 1950-97 (billion t-km)**



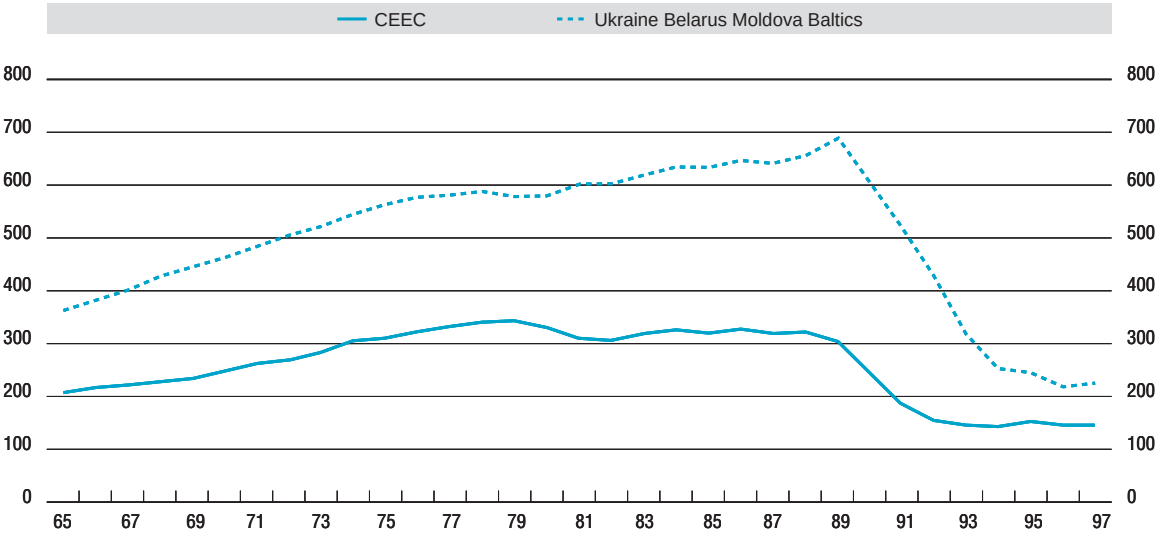
Source: UIC.

Figure 4. **Length of rail lines and staffing levels in 15 countries now forming EU 1947-97**



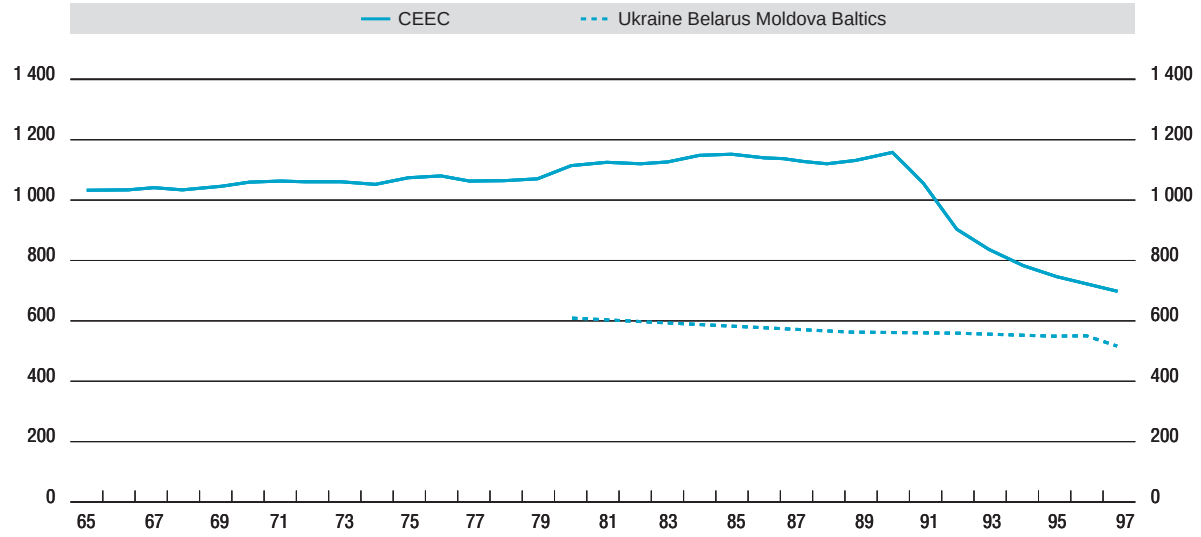
Source: UIC.

Figure 5. **Rail freight traffic in Central and Eastern Europe 1965-97 (billion t-km)**



Source: UIC.

Figure 6. **Rail staff in Central and Eastern Europe 1965-97 (thousands)**



Source: UIC.

The United States

Trends in the US are shown in Figure 7. In the 16 years prior to 1980, rail freight volumes had increased by only about 30%. However, since 1980, there has been a turnaround in the industry, partly as a result of massive investment. Between 1980 and 1997, traffic volumes have increased by over 50% and productivity increased by over 150%.

Employment on the major US railroads fell from 753 000 in 1965 to 532 000 in 1980 and 252 000 in 1997, *i.e.* at a faster rate after 1980 than before. Since 1997, however, net employment has been growing.

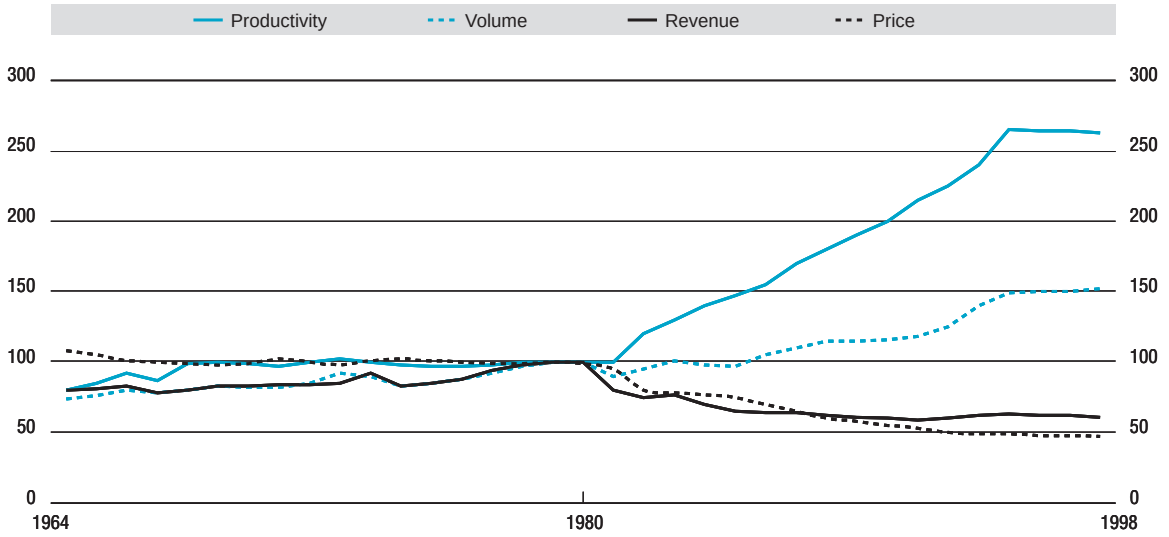
Railway Performance

One way of evaluating government policies regarding regulation, subsidy, investment and employment is to compare railway performance. However, measuring the performance of railways is not easy. Railways produce a multiplicity of outputs (transport of varying quality between a variety of origins and destinations at various times of day/week/year), using a multiplicity of inputs, subject to joint costs and major economies of scale and scope. Moreover their performance is heavily influenced by the geography of the area in which they operate (gradients, distances between markets). There will therefore be difficulties with interpreting any set of indicators of operating, commercial and financial performance.

Partial Productivity Measures for EU *railways*

The benchmarks most widely used for comparing railway performance, both over time and internationally, are partial productivity measures (PPMs).[5] PPMs relate a firm's output to a single input, for example traffic units per train km (load factors). They are easy to calculate, easily understood and require limited data. They include financial indicators, which have the advantage of reflecting several aspects of railway performance.

Figure 7. **Performance of major railroads in the United States, 1964-1998**



Note: Index 1981 = 100. Staggers Act passed October 1980.
Productivity = Indexed revenue tonne miles per constant dollar, operating expense with special charges removed.
Volume = Indexed revenue tonne miles.
Revenue = Indexed constant dollar operating revenue.
Price = Indexed constant dollar freight revenue per revenue tonne mile.
Source: Association of American Railroads (AAR).

Data in the Appendix shows that there is a wide variation in the levels of financial indicators within EU railways with operating costs per train km, receipts per traffic unit and cost recovery each varying between countries by a factor of about 3. This indicates that, despite the productivity gains of EU railways as a whole, there appears to be considerable scope for improving the financial performance of railways in many EU countries towards the level of the best performing railways.

Total Factor Productivity Analysis – North America and Australia

Partial productivity measures fail to give a comprehensive measure of economic output. Increases in the productivity of one output often come at the expense of lower productivity from other inputs, making comparisons between different companies complex. Because of these weaknesses, measures of total factor productivity have been developed. Various methods have been devised to add together different inputs and outputs and derive a single measure of outputs per input.

Analysis of the performance of freight railways in Australia, the United States and Canada (see Appendix for details) reveals the improvement in railway performance in each country over the period since 1990 and confirms the widely held perception that US railways are more efficient than other freight railways. It also suggests that much of the difference in efficiency arises from the scale of operations rather than from differences in technical efficiency.

In part, the economies of scale derive from market and geographical characteristics but crucially they have also resulted from the freedom of the Class I railways in the US to restructure over the last two decades through mergers. Costs have also been reduced by divestment of short lines to smaller operators who, despite or perhaps because of their small size, have lower costs than Class I railways and also local presence.

Rail Freight Markets and Regulation

Rail is best suited to transporting large and regular loads of freight and to serving long distance markets. Whilst the market for large and regular loads of freight has declined over the past 50 years, the market for long distance freight has increased, particularly in the European Union. The net result is that, in absolute terms, rail freight traffic has increased over the last 50 years in the OECD as a whole, but rail's share of the total freight market has declined in most countries.

Strong competition from road haulage has also been a key factor in the relative decline of rail. In market economies, much of the growth in freight transport in the 1980s and 90s has been in markets where rail is simply not a potential carrier on the basis of technical characteristics. Changes in the overall freight market structure, with a trend towards smaller loads and a premium on speed and reliability of delivery has favoured road transport in most countries. Heavy investment in road infrastructure has enabled road transport to grow.

In many countries, these trends were compounded by inefficiencies within the rail sector. Frequently, antiquated organisation, labour rigidities, poor marketing and cumbersome administrative procedures resulted in low productivity. In addition, non-commercial objectives were imposed by public authorities without corresponding compensation. Outside North America, even in markets where road offered no overwhelming technical advantage, the rail sector has often failed to capitalise on its unit cost advantages for large loads and long distances.

In transition economies, similar rigidities have been exposed by the collapse of heavy industries that relied exclusively on rail transport. The decline in rail freight transport in these countries may continue beyond the period of general industrial restructuring unless the rail sector is also reformed.

In considering the appropriate regulatory framework for railways, it is helpful to consider each freight market separately. Different freight markets raise different regulatory issues, as identified below:

- ***Intensive transport of bulk commodities* (e.g. *coal*).** Railways have some monopoly power in these markets although road haulage still imposes a ceiling on the price in many cases and, in the long term, water, pipeline or simply switching to other sources of energy also restrict monopoly power. The extent of monopoly power varies between countries: in Western Europe, where distances are short and road infrastructure good, railways have less monopoly power than in say Russia. However, some monopoly rent can be extracted from this market and used to finance fixed costs. This can be beneficial to the rail system and in some circumstances provide a net benefit to the economy. On the other hand, this rent can also sustain inefficient rail operations. Regulatory intervention may therefore be required.
- ***Less intensive transport of bulk commodities and general cargoes*.** There is usually intense competition from road haulage in this market (Russia being a major exception). This reduces the need for regulatory intervention and makes competition in the rail market less important as a stimulus to efficiency. Innovation to reduce costs – particularly in regard to marshalling wagons – is the key to growth in this market but, without some price discrimination (with low prices maintained in the most price sensitive markets), rail may not be able to compete with road in parts of the market.
- ***Container traffic*.** This tends to be concentrated on ports. The economies of scale of railways give them a technological advantage but there is strong competition from road haulage, reducing the need for regulatory intervention.
- ***High value goods*.** Where volumes are high on fixed routes, rail has proved a successful competitor with road haulage, even for just-in-time delivery schedules such as in delivering parts to car plants and in transporting automobiles (*e.g.* the SNCF subsidiary STVA transports 4 million vehicles per year in Europe by road and rail with 1 500 rail wagon movements per day between 470 destinations). Inter-modal competition is, however, intense reducing the need for regulatory intervention.
- ***Inter-jurisdictional traffic*.** International or inter-state transport across different regulatory jurisdictions and across the tracks of different rail companies raises regulatory issues relating to the compatibility of regulatory regimes and barriers to market access, as well as technical issues relating

to interoperability. Whilst discrimination on the basis of economic characteristics can improve overall welfare, discrimination on the basis of nationality and geographical origin will seriously undermine the efficiency and competitiveness of the industry.

These distinctions provide the basis for focussing regulatory intervention where it is necessary.

Rail Industry Structure and Regulation

Regulation of the railway industry must be considered together with issues of industry structure, since the need for regulation partly depends on industry structure and the extent of competition and policy towards its introduction. Regulation can also affect structure. Despite common underlying economic characteristics, the structural organisation and regulation of rail freight transport varies markedly from one region to another. Geopolitical circumstances and the relation of freight to passenger transport continue to be at least as important as the economics of rail freight in determining the structure and regulatory framework for the rail freight transport industry in most countries.

Table 1 shows the current position in selected countries regarding:

- the separation of infrastructure (a key aspect of industry structure);
- the legal provision for access to infrastructure (a regulatory issue).

Ownership is considered together with separation because, for example, separate public sector entities have the same owner (the government) whereas separate private companies do not. This may affect the true independence of these separate companies.

Table 1 shows that full open access and no open access are each combined with a range of structural models. Limited open access, on the other hand, only exists where there are vertically integrated private companies, and is associated with lighter touch regulation involving regulatory intervention on appeal, or where mergers are proposed. In both the EU and Australia, open access has been imposed recently and the extent of external access in practice is more limited than in North America, where vertically integrated private railways have a history of providing each other with access to their tracks.

Table 1. **Ownership, Separation of Infrastructure and Track Access for Selected Countries**

Ownership and separation of infrastructure	Open access	Limited open access[1]	No open access
Separate private companies	Britain Victoria (Australia)[2]	–	Japan[3]
Separate public sector entities	Sweden Romania New South Wales and interstate (Australia)	–	France
Subsidiaries of common holding company owned by public sector	Germany Netherlands Poland	–	–
Vertically integrated public sector company	Italy Czech Republic Queensland (Australia)	–	–
Vertically integrated private companies	Southern Australia	US Canada Western Australia[4]	New Zealand

1. Limited means access is open only in certain circumstances such as where required by a regulator (US) or for customers within x km of another railway (Canada).
2. Track still publicly owned.
3. Oly JR Freight has access to network of passenger companies. It also uses its own network.
4. Interstate traffic only.

Source: Track still publicly owned.

Under any of these models, the primary challenge in defining the regulatory framework is to manage the risks of monopoly abuse effectively whilst avoiding intervention that stifles the functioning of the rail freight market. The risks of over and under regulation have to be balanced in order to maximise the benefits for the economy as a whole.

Monopoly

Railways have traditionally been regarded as natural monopolies:

- They are characterised by intense capital investment requirements for track and signalling infrastructure and in rolling stock.
- Sunk costs represent a very high proportion of total infrastructure costs.
- There are significant economies of density:
  - in infrastructure, for example, expanding from single to double track roughly quadruples capacity with a less than doubling of costs;
  - in rail operations, economies of density may be achieved by running longer, heavier trains and providing more direct connections.

These economic characteristics imply declining costs – the condition for natural monopoly – so that a single rail company can deliver rail services over a particular network at a lower cost than two or more companies. These monopoly characteristics have resulted in extensive public policy intervention through either regulation or public ownership.

Economies of scope may also be important in integrated rail companies that incorporate passenger transport and infrastructure management with freight transport.

Competition from other modes of transport is intense in most freight markets, as discussed above. The potential for monopoly abuse exists, however, in specific circumstances although it varies by country and commodity. Where competition is weak and a single rail company can influence the price for rail carriage (other than by increasing productivity), intervention may be justified to prevent monopoly pricing. Similarly, intervention is required should cartels of railway companies collude to influence prices. Traditionally Governments used to regulate all transactions in all rail markets to guard against these kinds of abuses. However, regulatory intervention can be more subtle and precise, targeting only the markets that actually need protection against monopoly abuse.

Various governments have identified different types of rail market for different degrees of regulation. The Surface Transportation Board in the US, for example, uses a highly targeted regulatory approach. It can intervene to cap freight rates in cases of dispute between shipper and railway. However, over half of all traffic is completely exempt from such regulation on the grounds that it concerns commodities or routes characterised by adequate competition.

Separation of Infrastructure

As discussed in the chapters on the US and Canada, there is competition between rail companies in some freight markets in North America. Outside North America, such competition is rare. Recent regulatory reforms in Europe and Australia have separated infrastructure from operations and sought to introduce a degree of on-rail competition for freight through rights of non-discriminatory access to infrastructure. This follows the theoretical logic that operations can be made contestable, even if infrastructure cannot.

Vertical separation should in theory reduce the core regulatory task to dealing with the natural monopoly supplier of infrastructure and allow competition to develop on the operations side in place of regulatory controls. However, new forms of regulation are then required to oversee the pricing of and investment in infrastructure and for determining conditions for access.

The task of regulating infrastructure managers has proved difficult. By virtue of their natural monopoly, as demand increases, rail infrastructure companies can increase incomes more easily by raising prices to manage congestion than they can by expanding capacity. Satisfactory incentive regimes

for infrastructure managers have yet to be developed. This is not to say that effective regimes cannot be developed, and current attempts in Britain to strengthen the regulatory regime, as described in the chapter on the United Kingdom, may be successful. However, evidence so far suggests that achieving an effective regulatory regime for separate infrastructure managers may be more difficult in some respects than for vertically integrated railways. There are also other costs associated with vertical separation – increased transaction costs and lost economies of scope.

Some aspects of infrastructure management can be made contestable even without vertical separation. Most railways use contractors for major construction and rehabilitation projects and, in some countries (*e.g.* Britain), maintenance is carried out under contract. This has the advantage of creating competitive pressures to drive down infrastructure costs. The limitation with this approach is that the monopoly owner of the infrastructure is not itself exposed to competitive pressure and may not pass on the cost savings to its customers.

Competition

Many governments seek to encourage competition between existing rail operators or from new operators to provide improved services in terms of quality, speed/timing, route or other innovation. The objective is that new entrants develop new markets and/or provide downward pressure on prices in existing markets through competition or the threat of potential competition.

Incumbent operators sometimes claim that this leads to "cherry-picking", whereby new entrants seek to introduce services in the most profitable segments of the market (*e.g.* coal), undermining the profitability of incumbent railway operators. It is argued that this in turn may threaten the viability of the existing network of services as a whole and may:

- reduce investment by the incumbent (the main argument of US commentators against open access);
- increase the need for public support;
- lead to the closure of the least profitable services run by the incumbent.

These arguments against open access may be valid for:

- vertically integrated railways, which need to cover the high fixed costs of infrastructure;
- passenger railways with a strong public service element and regular timetabled services, for which the marginal cost of meeting additional demand is low and new entrants may time their services just before those of the incumbent.

Fundamentally, the problems arise because "cherry picking" limits the scope for price discrimination by an incumbent railway that is obliged to increase cost recovery above the efficient level of pricing (at the level of marginal costs). If the incumbent railway were able to price efficiently the problem of "cherry picking" would not arise (see chapter on intermodal competition and infrastructure charges for details).

The arguments against open access are weaker for vertically separated freight railways since there are few economies of scale or density in rail freight operations alone (*i.e.* excluding infrastructure provision). The benefits of competition are likely to exceed any losses of economies of scale in vertically and horizontally separated freight operations (and the problems of cost recovery occur in the separate infrastructure business).

On the operations side of the business, cross-subsidies from freight to passenger services – common in the newer ECMT Member countries – must end when access rights are created for new entrants. Otherwise the financial solvency of incumbent operators will be unfairly compromised, since new entrants providing freight services do not bear a burden of subsidising passenger services. Thus in the countries of Central and Eastern Europe and the new independent states, separation of freight and passenger accounts (both balance sheets and profit and loss statements) is essential when access rights are introduced. Organisational separation would further increase the transparency needed to end such cross-subsidies.

Regulatory authorities should monitor the development of competition and may have to intervene actively to promote it. However, the potential use of competition as a regulatory tool depends on industry structure. Fostering competition between vertically integrated rail freight companies (*i.e.* the US approach) may be a less costly route to curbing monopoly power than vertical separation. However, this model may be difficult to apply in much or all of Europe because of:

- the dominance of passenger services which, under the US model, would run on tracks owned by freight railways;
- the current ownership of track along national lines which, if unchanged, means that competition would be limited to that between different national freight companies.

In order to promote competition in a vertically separated rail system, regulation is needed to create a level playing field between incumbent operators and new entrants, especially initially. This requires establishing access rights that can be exercised in a non-discriminatory way and ensuring that incumbents do not bar access in practice to infrastructure including track, rail heads and freight yards or to locomotives, trained crew, rolling stock, maintenance depots and other essential services.

Full accounting separation between infrastructure management and rail operations is a prerequisite for fair competition in this model. European Union rules (Directives 91/440/EEC, 95/18/EC and 95/19/EC) already require this. The amendments to these directives go further and would take train path allocation decisions out of the hands of incumbent operators. Agents fully independent from any rail freight operator will be given the legal responsibility for allocating capacity and awarding train paths – even if the detailed work of planning timetables and day to day operational management of rail traffic (which inevitably departs substantially from planned schedules) might be contracted to the infrastructure management of a vertically integrated company or group of companies under a holding structure. This will lessen the potential for incumbents to create barriers to entry and have preferential access to information.

Fragmenting rail operations order to introduce competition can also increase costs. In the early stages of privatisation in Britain, great emphasis was placed on creating competition between railway operators. The core freight business was split into three companies and passenger operations were split into 25 companies for franchising. In practice, the market determined otherwise. The three main freight companies could only be sold together to a single buyer that has since bought all the other freight services except containers. This experience suggests that, at least below a certain size, many markets cannot support more than one operator since because economies of scale and scope mean that a single producer can supply rail services most economically.

However, this does not rule out the development of efficient new businesses as a result of regulatory reform to promote new entrants, especially where incumbents are inefficient – typically as a result of factors partly beyond their control such as rigidities in existing employment structures. New entrants moving significant quantities of freight have emerged in Germany and Scandinavia, efficient niche market operators providing innovative services have entered the interstate market in Australia, and competitive short line operations are widespread in North America and exist in several European countries. The impact of intra-modal competition in mobilising the resources of incumbent railways should not be underestimated.

Alliances and Mergers

Mergers have been a dominant feature of the US rail industry since deregulation in 1980. They have given the industry a more efficient structure, enabling costs to be reduced through cutting out duplicate capacity and reducing overheads. More importantly, services have improved as a result of the ability of the merged operator to provide a seamless service. Mergers *have* enhanced the market power of some rail firms by reducing the number of competitors. This might be expected to have resulted in excessive prices in some markets but this does not seem to be significant given the low rates of return experienced by the industry in the US (despite the rapid increase in productivity) and the fact that average rates have fallen by about 50% since deregulation.

Mergers between rail companies need to be assessed to determine whether the potential gains in terms of cost savings outweigh the loss in competitive stimulus to efficiency. There can be better ways to preserve competition than preventing a merger and the industry regulator in the US (the Surface Transportation Board – STB) normally instead requires that:

- lines serving markets where the merging companies had competed be sold to a third party;
- trackage (access) rights on the tracks of the merged railway be granted to third parties.

For the future, mergers to create trans-national railways in the USA are less likely to meet objections from shippers and the regulatory authority than a merger creating a monopoly in one region of the country. This is because, for mergers between companies in different regions, the benefits to shippers of one company providing through services are likely to outweigh the potential loss of efficiency through reduced competition. The balance between allowing the development of seamless services whilst preserving adequate competition has been achieved by the regulator exercising his powers to require divestments of parts of the network or impose trackage rights in specific parts of the merged operation where the impact of reducing competition could be significant.

Thus if the creation of access rights improves efficiency through competition, mergers can improve efficiency through economies of scale and seamless service. The draft Directive and amendments to Directives adopted in principle by the EU Council in December 1999 cover international access rights but both national and EU competition authorities (and rail regulators where they exist) will have a decisive role to play in the conditions they attach to approving mergers. Explicit policy at the European level towards mergers needs to be developed, particularly with respect to introducing requirements to divest parts of merged businesses to promote competition. Such conditionality could be employed to protect competition without preventing mergers that bring structural improvements to the industry with associated benefits for international services.

Seamless service on the infrastructure side of the business is possibly even more important than in train operations. Infrastructure integration is being addressed partially in the European Union through the draft 1999 Directive on Interoperability, which seeks mainly to ensure a greater degree of technical harmonisation together with standardisation of operating procedures through regulatory oversight. The Trans European Rail Freightways initiative addresses fostering closer commercial ties between infrastructure managers and has made gradual progress in developing faster international train paths for freight and one stop shops for customer contacts on a number of routes. This may not prove sufficient, however, to prevent barriers to more efficient use of infrastructure persisting, which even merged train operators may not have powers to resolve. Routes to fostering greater commercial integration of infrastructure management in Europe need to be developed further.

Impact of Passenger Transport on Rail Freight

Passenger transport on the railways can complicate regulatory issues for freight services in two main ways. Firstly, as already noted, monopoly rents from freight transport are still used to cross-subsidise passenger transport in Central and Eastern Europe, Russia and the new independent states. Incumbent operators thus bear a burden that increases costs for their freight operations. Open access operators would bear no such burden, giving them an unfair advantage in this respect.

Elimination of cross-subsidies is partly a political decision. However, the practice will be discouraged by increasing transparency. At a minimum, separate accounts should be produced for freight, as required by the draft EU Directive adopted in principle by the EU Council in December 1999 to replace Directive 95/19/EC. The creation of separate freight businesses would further increase transparency.

Secondly, passenger services can have a negative impact on freight services as passenger trains are normally given priority in path allocation. This is a serious problem on busy parts of European networks, especially around major urban centres where freight services are excluded for key parts of the day. Passenger services are given preference partly as they attract more support from state funds. There is rarely any attempt to calculate relative value in terms of overall social welfare of passenger versus freight train paths in making allocation decisions. The decisions of the independent path allocation

managers required under the amendments to EU Directives will have to be made on transparent consideration of these relative values.

The seriousness of these issues results from the technical characteristics of railways. The carrying capacity of a railway link is a function of the number of tracks in a section, average train speeds, geometry, signalling and safety systems, length of trains, etc. However, over and above all these factors, the mix of train speeds and the precise order in which trains are run is crucial. For instance, on a predominantly high speed line an additional slow freight train may remove the paths of several high speed passenger trains. Capacity is also maximised by grouping trains of like speeds, with a "flight" of fast passenger trains followed by a flight of slow freight trains. However, this conflicts with providing a good service of well spaced trains at regular intervals for passengers. More complicated still is the interaction of trains on different routes or between different origins and destinations. The result of all these considerations is that the impact of an additional train of a particular type on the paths available to other trains will differ enormously according to the precise mix of traffic on the line. At the same time, the value of a slot to other commercial operators or to government bodies providing social services will also differ enormously in time and space.[6] A role for negotiations (as opposed to regulatory formulae) appears essential to revealing relative value.[7]

Ownership

Most railways began as private enterprises. Financial crises, particularly as a result of the two World Wars and the depression of the 1930s, resulted in many railways being nationalised. Improved regulation of rail monopolies was generally only a secondary consideration in the decision to nationalise. However, in some countries, regulation and/or exploitation of monopoly power later became the reason for retaining state control of the railways.

In the United States, the response to monopoly power was to regulate prices and levels of service with freight rail companies generally remaining in private ownership. Elsewhere, public ownership generally resulted in *de facto* self-regulation by the railways under the oversight of Transport Ministries (in contrast to application of public regulatory codes by independent regulatory authorities). Under public ownership, deficits became chronic in most countries, leading to a variety of regulatory reform initiatives.

Pressure for reform of state-owned monopolies increased in the 1980s with the revival in faith in free markets and a squeeze on government finances following years of low growth. Reducing the impact on government budgets became a priority, both as a way to minimise borrowing and to protect new investment in infrastructure. The national orientation that goes with state-ownership also increasingly came to be seen as a handicap as the sourcing of inputs is internationalised. This trend has been reinforced by political change, most notably the development of the European Union's Single Market for goods and services and the collapse of communism in Central and Eastern Europe.

State-ownership has also increasingly come to be seen as associated with weak corporate governance. Management in a state-owned railway is liable to be subject to political pressures that conflict with their commercial responsibilities. Governments influence decisions on a whole range of issues, making it difficult later to hold management accountable for the results of decisions that were influenced by government and sometimes by organised labour.

For these reasons, even governments that intend to retain railways under state-ownership seek to increase the separation of management from government. Such changes in management responsibility are only likely to be effective when combined with a change in risk allocation, as a result of either the introduction of competition or an effective structure of incentive based regulations (see section on "Impact and Issues" in the chapter on the United Kingdom for examples).

There is evidence that transferring ownership of the railways to the private sector can have a considerable impact on the efficiency and competitiveness of rail services, especially when private ownership is combined with deregulation. Some research in Japan[8] shows that there, private railways are more efficient than public sector railways due to the ability of the private sector to set clearer objectives, uncompromised by government interference and to raise finance for investment. One Japanese

observer[9] attributes almost all improvements in efficiency following restructuring of the Japan National Railway to the partial transfer into private ownership, arguing that this gave management the freedom to pursue commercial and business development targets, independently of government bureaucracy, and removed the reliance on regulations and subsidies to secure markets.

However, where there is private ownership of infrastructure that is owned separately from operations, it is essential to provide adequate contractual and regulatory incentives to ensure that investment is at an optimum level. This has already proved to be one of the biggest problems with the British approach to restructuring and privatisation and may be the most difficult to resolve.

Inter-Modal Competition and Infrastructure Charges

Distortion of Competition

Rail freight services generally face intense inter-modal competition:

- from road in almost all markets
- from inland and coastal shipping (where available), for bulk commodities
- from road and air for mail and package delivery services.

Distortions of inter-modal competition in freight markets have arisen through two main routes: discriminatory regulations and discriminatory pricing of infrastructure. Freight railways have in the past enjoyed protection by discriminatory regulations in bulk markets such as grain and forest products in a number of countries. Regulations took the form of banning certain categories of commodity or load from road transport, sometimes in order to guarantee income to the railways. In New Zealand, freight transport beyond a certain distance was until recently required to travel by rail.

There are still regulations that require certain goods, such as some categories of petrochemicals, to be carried by rail, where possible, on the grounds of public safety. Though such regulations do not always distort competition, they can do so if the range of goods covered is made too large. However, these regulations are becoming less common and a far more important issue now is the pricing of infrastructure

Market Failure and Infrastructure Charges

Whatever its origin, a market distortion can be defined and measured only in relation to a definition of an undistorted state. Economics provides a reference point: the "perfectly competitive" equilibrium where the prices and quantities at which goods are supplied ensure that the marginal social benefit gained from the last unit consumed equals the marginal social cost of the last unit produced.

The consensus view amongst policy-makers is that, at least in the developed market economies of the countries of the OECD, most markets *sufficiently* approximate perfectly competitive markets so as not to warrant direct and detailed government intervention. It is only in cases where markets fail in a manner which is systematic and predictable and to a degree which is measurable and large that governments are best advised to intervene directly. For the rest, general competition policy and the institutional apparatus to enforce it are relied upon to address insufficient competition at any given time.

In the field of transport, markets do fail in a manner which is systematic and predictable and to a degree which is measurable and large. This is for two main reasons (two types of market failure):

a) the provision of transport infrastructure is characterised by increasing returns to scale, which implies significant elements of natural monopoly, whereby one firm can supply the entire output required more efficiently than many;

b) the use of transport infrastructure entails external costs (uncompensated costs imposed by one party on others). These include air and noise pollution, accidents, and the marginal external costs of congestion imposed by new users on all existing users whenever the infrastructure is operating at or above optimal capacity.

Thus, the technical characteristics of transport infrastructure provision mean that its marginal social cost can lie far *below* its average cost. On the other hand, the external costs arising from the use

of infrastructure mean that the marginal social cost of transport can also rise far *above* its average cost. These two effects need not coincide to off-set each other. The first effect is most acute in rail and rural roads, and the second most acute in urban roads.

In the absence of government intervention, the private producer will continue to supply the market only if the revenues derived from users enable him fully to recover all producer costs, including fixed costs, as well as provide for normal profit. At the same time, he will be indifferent to the recovery of external costs which he himself does not have to bear. Hence, in the absence of government action to correct both types of market failure, the result would be the inefficient use of existing infrastructure – in particular, the over-pricing and under-use of rail and rural roads, and the under-pricing and over-use of urban roads. The long run result would be a wrong investment mix in infrastructure capacity. In order to prevent the emergence of welfare losses, government intervention in transport pricing is therefore desirable to ensure a welfare-maximising price at or close to the marginal social cost price.[10]

Cost recovery and Financial Issues

Since marginal social cost lies below average cost for rail, pricing at marginal social cost will yield under-recovery of total costs. This will require government to make transfers to enable the infrastructure provider to break even. Econometric studies[11] have demonstrated that the marginal social cost of vertically integrated rail lies in the range of 60-70% of average cost. Where rail services are separated from infrastructure, the marginal social cost of rail infrastructure alone will be even further below its average cost.

The alignment of prices to marginal social costs will result in a subsidy being required. The question of how best to raise the revenues required to provide the necessary subsidies is separate. Essentially revenues should be raised through charges and taxes with the lowest welfare-reducing impact, starting with taxes on externalities. Competition for public funds between rail and other areas (health, education, defence etc.) is another separate issue.

Such transfers should not be confused with state-aids or with a subsidy that distorts trade. They are not designed as compensation for inefficient performance or as a bridging arrangement while a firm improves its performance. These transfers are a permanent feature of a rail system that maximises economic welfare. The size of the transfer is determined by the size of the rail system, which in turn is determined by the cumulative result of investment and closure decisions. The quality of cost benefit assessments on which these decisions are made is therefore crucial. And the key determinant in the assessment is the calculation of expected demand that results from prices set at the efficient level – *i.e.* at the level of marginal costs. Demand is limited by the price of substitute services, road, shipping and air transport, as well as related to the utility of transport relative to other products and services.

Governments may be unwilling to provide the necessary transfers, for example because public finances are under pressure, or because it finds it difficult to assess the real level of marginal costs or because it believes that the existing structure of the industry results in poor decision making. Some Governments also pursue infrastructure cost recovery as a matter of principle. If the transfers required for efficiency are not available, alternative pricing strategies have to be adopted by the railway. The least inefficient approach is Ramsey pricing where prices are marked up in proportion to each customers price sensitivity.

Price discrimination is used by both private and state-owned railways to recover joint and fixed costs and is permitted, within bounds, under many regulatory regimes, although proper Ramsey pricing has generally proved too complicated to apply in practice.[12] The result is increased cost recovery within the railway, at the cost of losses in overall welfare.

The US regulatory system relies on competition to limit the use of price discrimination by rail companies. The draft replacement for Directive 95/19/EC requires that access charges be "set at the cost that is directly incurred as a result of operating the train" (Article 8.3). A higher charge may be set through mark-ups for individual market segments, through individually negotiated contracts or through a system of fixed and variable charges, providing these higher charges do not prevent the running of services that

could pay marginal costs from using infrastructure capacity (Article 9.1). This implies that Ramsey-Boiteaux price discrimination is permitted but it is difficult to conceive of circumstances in which full cost recovery or anything approaching it would be achievable under mark-ups that do not affect demand.

Subsidies to cover the shortfall in total cost coverage for rail should only cover fixed costs and not spill over to cover the marginal costs of operations. This requires that payments in compensation for operations under public service obligations, usually for passenger services, should be clearly and transparently separated from general infrastructure subsidies.

Current practice for infrastructure charging in the EU varies as discussed in detail in a later chapter. A report by NERA on access charges[13] classified charging systems into three types:

- The Marginal Cost approach which bases charges on short run marginal cost. This approach has been adopted in Sweden, Finland, the Netherlands and, to a large extent, in Denmark. Cost recovery is low (typically 15-30%).
- The Adjusted Average Cost approach, which bases charges on average rather than marginal costs. The Adjusted Average Cost Approach has been adopted in Germany, France, Belgium, Italy and Austria. The level of cost recovery is generally higher than with the marginal cost approach, though not necessarily 100%. Variable charges are therefore sometimes well above marginal cost, even for price sensitive traffic, and fixed charges are sometimes also imposed;
- The British approach, whereby access agreements are negotiated between Railtrack (the private infrastructure owner/manager), and rail freight undertakings. These agreements are approved by the Rail Regulator, whose policy is that any mark-up on marginal cost should only allow Railtrack to recover those of its fixed costs that are attributable to freight and that charges must not be excessive.

EU Directives require that there be no discrimination between operators. The Marginal Cost approach meets this requirement. Countries applying the Adjusted Average Cost Approach have also devised structures that are designed to prevent discrimination:

- discrimination against smaller users is reduced by applying fixed charges only for the part of the network used;
- discrimination against new or irregular users is avoided by providing the option of a one tier structure with variable charges only.

The potential difficulty with the Adjusted Average Cost approach is with ensuring that any service that can pay the costs it gives rise to is able to gain access to the network. Some EU Member states using this approach may need to reduce variable charges in order to ensure that traffic is not priced off the railway.

Under the British approach, variable charges for the period up to 2001 are very low and access charges for freight are negotiated with individual operators. One of the Rail Regulator's duties under the Railways Act, which he must consider in approving an access agreement, is to promote the use of the railway. This is consistent with the provision in the draft EU directive adopted in principle by Council in December 1999 that traffic should not be priced off the railway. However, the Regulator also has a duty not to make it unduly difficult for Railtrack to finance its activities. It is therefore possible that, in balancing his duties, the Regulator might approve access charges that do price traffic off the railways and are therefore in contravention of the Directive.

If, in order to comply with the requirements of EU directives, access charges are set close to marginal cost, this will widen the gap between cost and revenue in some countries. This could exacerbate the rail financing problem unless governments are willing to increase subsidies or accept line closures.

The application of marginal cost pricing creates particular problems with obtaining private sector finance for railway infrastructure. In order to attract private sector finance, it will be necessary:

- either to make exceptions to allow higher charges for new infrastructure, as under the draft replacement for EU Directive 95/19/EC;
- or to provide public sector support to supplement private financing of investment.

Other Aspects of the Regulation *of* Infrastructure Charges

The wide range of prices charged for the use of rail infrastructure in EU countries is proving a difficulty in price negotiations for international movements of freight. There are important lessons from the US where single points of negotiation for intercontinental carriage have for many years been a feature of US railways. The companies selling train paths have a wide margin of freedom and responsibility in setting access charges. Light touch regulation, based on intervention on appeal, has proved largely satisfactory.

In the EU, an earlier proposed replacement to Directive 95/19/EC that each infrastructure manager publish a list of regulated prices has been replaced in current proposals by a more flexible approach whereby the infrastructure manager:

- prepares a statement of charges and charging schemes, in consultation with interested parties;
- provides the regulatory body with cost information to justify those charges.

Negotiation of charges is beneficial as it provides a way of reflecting the scarcity value of train paths from information about the volume of traffic and the characteristics of routes. Estimation of the scarcity value of specific slots requires a way of revealing the value placed on the slots by alternative possible users, either of commercial rail operators or government bodies wishing to provide social services for passengers. It may be possible to reveal these values by auctioning the slots but this may be difficult given the different ways in which the infrastructure may be used. Some pre-packaging of slots is probably necessary, in order to offer attractive combinations to alternative bidders. An iterative process for allocating infrastructure capacity appears the most practicable approach. This process might be as follows:[14]

- train operators would register their aspirations;
- infrastructure manager would use these "bids" to produce packages of paths and charges;
- further negotiation would then take place to determine whether operators would be prepared to pay more to improve their package of paths or to surrender some of their paths in return for a reduced charge. Such negotiations would encompass investment in enhanced capacity and the sharing of the development costs.

Elements of this approach to allocating infrastructure capacity are already used in Britain.

Replicability of Models

Recent experience of regulatory reform is described in the later chapters of this report in a number of major economies in Europe, North America and the Pacific rim. Conclusions on strengths, weaknesses and challenges for further reform are presented in each chapter. What follows here is a short description of lessons that can perhaps be transferred between the different approaches to regulation employed.

Deregulation in the USA has been highly successful in improving the efficiency of the rail system and has been accompanied by a significant reduction in rail freight rates. Its strengths lie in enabling an industry structure to develop that reaps the benefits of the fundamental economies of scale of rail services and in avoiding intrusive regulatory intervention where possible. Competition between vertically integrated freight railways is the essential feature. The US model will, however, be difficult to replicate unless both the following conditions are met:

- the economic value of passenger services is insignificant compared to freight – if passenger services are important, then they should not be dependent for infrastructure on vertically integrated freight operators as they have different and often conflicting requirements;
- most major freight markets are served by more than one line, thereby permitting the railways to be operated as competing vertically integrated transport companies – if there are no potentially competing lines, competing operators would need to use the same track, which is not the norm in the US.

These conditions are rarely met simultaneously in countries outside North America. Even in western Russia, where there may be potential for vertically integrated freight railways to compete, the importance of passenger services may rule out the US model.

A permutation on the US model, but adapted to a passenger dominated railway, was developed internally within British Rail before it was restructured in a different form for privatisation. This consisted of vertically integrated passenger operators. However, each section of track would have been controlled by the "prime user" (the operator that used the section of track most). This might have disadvantaged other operators, usually including freight operators, which are rarely the prime users.

One way in which the US model could be replicated would be through the development of "freight only" lines with vertically integrated freight companies. However, whilst freight only lines have merits in corridors with a high density of freight traffic on most lines, they would usually lead to losses of economies of scale in infrastructure, especially if vertically integrated freight companies were to compete. For most corridors in most countries, therefore, it is more economic for freight and passenger trains to share the same line, which eliminates this option.

It is therefore concluded that the US model is only replicable in limited circumstances that are unusual outside North America. However, there may be important lessons from the US regulatory experience for other models.

In the EU, regulatory reform initially focussed *inter alia* on vertical separation[15] and the introduction of access rights for certain categories of rail freight operations. The revised directives (adopted in principle by the EU Council in December 1999) focus more directly on the key problem for international freight – the fragmentation of the industry by national boundaries. It was agreed that any licensed operator in the EU should be able to gain access to the principal network[16] in any EU country. This should increase the competitive pressures on incumbent railway undertakings and may encourage the further development of strategic alliances, possibly through mergers. Merger activity has already begun with the formation of Railion (DB Cargo and NS Cargo), the proposed CargoSI merger between the freight businesses of SBB and FS and other initiatives. The formation of such integrated international operators will allow the provision of a seamless service to customers but raises issues of monopoly concentration.

The EU model appears to be the most appropriate solution in regions comprising mainly small countries with significant trade between them. In these countries, the disadvantages of vertical separation should be more than offset by the benefits of horizontal integration of freight operations across borders, provided international integration happens. The case for the EU model therefore seems strong for most of Central and Eastern Europe, where international traffic usually dominates. There may, however, be exceptions where demand is dominated by domestic traffic, as for example in Poland, where the advantages of horizontal integration across borders are less relevant. The weight of the economic argument in such cases may be in favour of vertical integration because the transaction costs and loss of economies of scope arising from separation may outweigh the advantages from greater competition.

The current Australian model successfully combines elements of both EU and US approaches to regulation. In addition to private or government owned railways in each State, it consists of an interstate railway that has rights to negotiate access across a number of State networks exhibiting a wide variety of structures and regulatory regimes. The model represents a compromise between the open access provisions of the EU directives and the flexibility of the US model. The Commonwealth Government lays down minimum requirements for State access regimes in a way that can be applied more flexibly than is the case with the EU directives. Also the rail companies have a right of appeal to the Courts against State and Commonwealth decisions. This greater flexibility may have particular merits for some Central and Eastern European countries and countries of the former Soviet Union, where the higher modal share of rail and the importance of freight relative to passenger traffic (compared to the EU) and the more dense networks (compared to North America), mean that a variety of approaches should be considered.

Conclusions

There is no single model for regulatory reform that can be applied to all railways. Different rail markets are likely to require different forms of regulation to maximise efficiency and the mix of markets for rail services differs from country to country.

Under any model, the primary challenge in defining the regulatory framework is to manage the risks of monopoly abuse effectively whilst avoiding intervention that stifles the functioning of the rail freight market. The risks of over and under regulation have to be balanced in order to maximise the benefits for the economy as a whole.

The key implication of this report is that a railway industry structure needs to be created or encouraged that, whilst preventing the development or abuse of captive markets, will provide the necessary balance between:

- improvement of services to customers and the achievement of economies of scale in the movement of freight through international consolidation;
- the provision for intra-modal competition to develop and provide stimulus for innovation, improved cost control and service quality.

Explicit policy at the European level towards mergers and acquisitions that significantly undermine competition needs to be developed to guide the actions of national and EU competition authorities. This applies in particular with respect to requirements to divest parts of the merged businesses rather than simply blocking problematic mergers and also policy towards companies that enjoy protection in their home market but seek to enter markets or acquire companies in other countries where there are no barriers to their entry.

De-regulation of railways in countries as diverse as the USA, Japan and New Zealand suggests that relatively light touch regulatory regimes are more successful than detailed prescriptive regulation in achieving the correct balance between regulatory objectives. For freight railways in particular, the North American record suggests that an effective route to improving performance is to restrict detailed intervention to cases where there is an appeal to the regulatory authorities from an aggrieved party or where railway companies wish to merge and there is a need to preserve competition. In regions where there is little or no existing competition between rail companies intervention will, however, be required where the exercise of access rights can be obstructed by incumbent operators.

In the EU and some other places this intervention includes separating infrastructure management from train operations. The task of regulating vertically separate infrastructure managers has proved difficult, for example in the United Kingdom, and satisfactory incentive regimes have yet to be developed. This is not to say that effective regimes cannot be developed, but in some respects achieving an effective regulatory regime for separate infrastructure managers may be more difficult than for vertically integrated railways.

Where infrastructure has been separated from operations, charges for the use of infrastructure are regulated and marginal social costs have generally been adopted as the basis for determining charge levels for freight. However, some studies[17] suggest infrastructure charges at marginal social cost levels will fall short of covering total infrastructure costs by as much as 40% or more. To cover the shortfall, there is a range of options from full public subsidy to various charging systems that do cover total costs with a lesser degree of efficiency in terms of infrastructure charges.

Notes

1. Professor John Kay, *Efficiency and Private Capital in the Provision of Infrastructure*, in Infrastructure Policies for the 1990s, OECD 1993.
2. What constitutes optimum network size varies greatly according to the accounting perspective. From a purely commercial perspective (with a need to cover all costs and make a reasonable return on investment) the optimum can be much smaller than when maximising socio-economic welfare is the test. In this latter case, public subsidies will cover the shortfall in revenues to cover the costs of maintaining the larger network that maximises economic welfare. The point is examined in the section on Inter-Modal Competition and Infrastructure Charges.
3. That is service that avoids customers having to deal with more than one rail service provider and avoids protracted negotiations between different territorial rail entities.
4. The countries of Central and Eastern Europe in the group known as CEEC, comprising Albania, Bulgaria, former Czechoslovakia (now Czech Republic and Slovak Republic), Hungary, Poland, Romania, former Yugoslavia (now Croatia, Bosnia Herzegovina, Slovenia, The Former Yugoslav Republic of Macedonia, and Yugoslavia).
5. The discussion on Partial Performance Indicators is based on C. Nash, *Benchmarking of European railways – an assessment of current data and recommended indicators*, ECMT/EC Benchmarking Conference, November 1999.
6. This paragraph is based on *Calculating Transport Congestion And Scarcity Costs* final report of the Expert Advisors to the High Level Group on Infrastructure Charging to the European Commission, May 1999.
7. See also the last section of the chapter on Inter-modal Competition and Infrastructure Charges.
8. Mizutani, F, Japanese Urban Railways – A Private Public Comparison, Avebury, Aldershot, 1994.
9. See Yukihide Okano, President of the Japan Society of Transportation Economics, in Japan Railway and Transport Review, June 1994.
10. This *prima facie* case for Government subsidy was first given a formal exposition by Professor Hotelling, *The General Welfare in Relation to Problems of Taxation and Railway and Utility Rates*, Econometrica, July 1938, drawing on the work of Dupuit in 1849. The issue has been revisited notably by: Samuelson, *The Pure Theory of Public Expenditure*, 1954; Musgrave, *The Theory of Public Finance*: A *Study in Public Economy*, 1959; The European Commission, *Options for Transport Tariff Policy*, Allais, Del Viscovo, Duquesne de la Vinelle, Oort and Seidenfus,1965; Kessides and Willig, *Restructuring Regulation of the Rail Industry for the Public Interest*, The World Bank 1995; and Roy, *Infrastructure Cost Recovery under Allocatively Efficient Pricing*, UIC/CER 1998.
11. Quoted in Roy, Infrastructure Cost Recovery under Allocatively Efficient Pricing, UIC/CER Economic Expert Study, March 1998, UIC Paris, (1998), p. 21.
12. Known sometimes as Ramsey-Boiteux pricing after Marcel Boiteux one of the pioneers of Ramsey pricing. However, even when he was president of Electricité de France Ramsey pricing was not attempted in this utility and instead the simpler "Allais doctrine" of uniformly increasing prices above marginal costs was adopted.
13. An Examination of Rail Infrastructure Charges, Report for the European Commission DGVII, May 1998.
14. See the report *Calculating Transport Congestion an Scarcity Costs*, Final Report of the Expert Advisors to the EU High Level Group on Infrastructure Charging, May 1999.
15. Vertical separation = separation of infrastructure management from train operations. Horizontal separation = separating freight operations from passenger operations, regional services from inter-city services, etc.
16. More precisely, the Trans-European Rail Freight Network (TERFN) defined by maps annexed to the amendment to Directive 91/440/EEC, mainly covering connections between ports and main freight terminals, together with feeder lines at both ends to a distance of 50 km or 20% the length of the port-terminal connection whichever is the larger (there are exceptions for Luxembourg and Belgium due to the small surface area of these countries).
17. See CEMT/CS/(2000)15.

REGULATORY REFORM IN SELECTED COUNTRIES

EUROPE

RAILWAY REFORM IN THE EUROPEAN UNION

The Need for Reform

Rail freight traffic in the current EU member states as a whole fell by 10% between 1970 and 1990, and its modal share declined from 32 to 19% (by 1997, the share had fallen to 14%). The main cause of the decline has been the contraction of heavy industry.

In the faster growing passenger market, modal share fell from 10% in 1970 to 6% in 1990 (the share was still at 6% in 1997). This was mainly due to rising car ownership and the increasing competitiveness of road transport. However, in absolute terms, rail passenger traffic grew by over 25%.

Over the same period, revenue per unit of traffic (in real terms) had hardly changed but unit costs increased.[1] As a result, cost recovery declined, on average from about 70% to 54%. Subsidies were not increased sufficiently to fill the gap, and the financial position of the railways weakened. The debt equity ratio of EU railways as a whole was 1.34 in 1990, far higher than is normal for a commercial company. Even after subsidies representing 40% of costs, EU railways as a whole were loss making in 1990.

It was in this context of rising unit costs and deteriorating financial position that the reform of the railways began at the level of the EU.

Impact of Directive 91/440/EEC

In 1991, the Commission of the European Communities issued Directive 91/440/EEC on the "Development of the Community's Railways". This remains the most important community measure for improving the competitiveness of rail transport. Paraphrasing the recital in the directive, its principle objectives were:

- to facilitate the integration of the Community's transport sector which is an essential element of the internal market;
- to render the railway system efficient and competitive in relation to other modes of transport.

The main objective was therefore to make the railway system competitive with other modes of transport through integration. Creating on-track competition through open access was a means of achieving this objective, rather than an objective in its own right. The reference to integration indicates that co-operation between railway undertakings to provide international services, rather than competition between them, was considered to be the main means of increasing the competitiveness of rail.

The directive covered four areas:

- financial strengthening in order to place railway undertakings on a sound financial footing;
- management independence so that railway undertakings are run as commercial organisations independently from government;
- separation of infrastructure from operations, at least in accounting terms;
- access to railway infrastructure, which should be open for railway undertakings engaged in international combined transport and international groupings of national railway undertakings (this was perhaps the least developed part of the Directive and the part that took longest to be transposed into national legislation).

Whilst the directive has been transposed into national law in all 15 member states, progress in implementation was initially slow in many countries, particularly in making provision for access to new operators. On the other hand, some countries have introduced laws that do not simply transpose the directive but that go well beyond its requirements.

Two related directives were approved in 1995:

- Directive 95/18 on the licensing of railway undertakings;
- Directive 95/19 on the allocation of railway infrastructure capacity and the levying of charges (see chapter "Pricing of Infrastructure for Rail Freight in EU Member States").

These have also been transposed into law in most countries.

Common Transport Policy and the Strategy for Revitalising the Community's Railways

In 1992, a White Paper on the Common Transport Policy was published. The Common Transport Policy aimed at reversing rail's long-term decline in market share in order to help achieve the wider goal of sustainable mobility.

Some of the concepts behind the directives were developed further in the EU Commission's White Paper entitled "A Strategy for Revitalising the Community's Railways", published in 1996, which presented a possible scenario if railways were not reformed.

The paper examined the problems of the community's railways that needed to be resolved to avoid this continued decline, which was considered undesirable because of increasing road congestion, pollution and accidents. Increasing rail market share was therefore viewed as an objective with the ultimate goal of reducing the environmental impact of transport. The paper identified the need to:

- strengthen the finances of railways and apply rules on State aid in order to ensure railways are run as commercial organisations;
- use market forces more and progressively introduce access rights;
- use contracts to replace untargeted subsidies for public services;
- integrate national systems through interoperability and technical harmonisation;
- improve the management of the social and employment aspects of reform.

There was some overlap between the Railway White Paper and Directive 91/440 but the directive had not addressed all the issues raised in the White Paper, such as subsidies, interoperability and the social aspects of reform. Interoperability is closely related to the open access provisions of Directive 91/440 because different technical standards and operating rules represent an obstacle to the development of Europe wide services.

Interoperability

In 1996, a Directive was introduced on the interoperability of high speed rail. In November 1999, the Commission published a Communication on integrating conventional rail systems.[2] The proposals had three elements, each dealing with successive levels of integration:

- Improving the organisation of international services, particularly freight at border crossings;
- Allowing locomotives and drivers to cross borders;
- Developing a single market for railway equipment.

The proposals covered all technical standards, including those of both equipment and infrastructure, concentrating on those inputs which are key to increasing rail's competitiveness, such as signalling and control.

Amendments to Directives

In 1998, the European Commission published a Communication on the "Implementation and Impact of Directive 91/440/EEC" (COM(1998) 202). This communication contained criticisms of the original

provisions of 91/440/EEC (discussed below) and proposed drafts for their replacement with directives that addressed these criticisms. Following a first reading by the European Parliament and discussions with the Council of Ministers, the Commission produced revised proposals for the three directives in what has become known as the Railway Package, COM (99) 616.

These proposals were approved by the Council of Ministers in December 1999, subject to minor observations, and are now being finalised. The proposals are as follows:

- Directive 91/440/EEC was subject to several amendments – progress to date and current proposals in each of the four policy areas covered in Directive 91/440/EEC are set out below.
- Directive 95/18/EC on licensing has been amended, widening its scope.
- Directive 95/19/EC on allocation of capacity has been replaced by a much more complex directive which defines the principles on which charges should be set (see the following Chapter on the pricing of infrastructure).

Financial strengthening

In the first half of the 1990s, the debt position of EU railways improved, particularly due to the transfer of railway debt to the states in Germany, Italy and the Netherlands. As a result, the debt equity ratio of EU railways as a whole fell from 1.34 in 1990 to 1.04 in 1995. The ratio for North American railways, by comparison, for 1997 was 0.72, suggesting that further reductions in the debt of EU railways are needed.

Despite a reduction in state support from ECU 26.4 to 25.5 billion between 1990 and 1994,[3] the financial position of EU railways improved and cost recovery increased from 54% to 64% over the same period.[4] Recent work for the Commission[5] suggests the position has further improved since 1995 although there are difficulties with comparing figures because of the different treatment of subsidies.

COM(98)202 noted that some progress had been made in this area in most countries. The only amendment to this section of 91/440/EEC, as contained in the latest proposal, is to ensure greater transparency in the use of funds by requiring that:

- separate profit and loss accounts and balance sheets be kept for freight and passenger services;
- funds paid to either of these activities be shown separately with transfer of funds between the two prohibited.

Management independence

The Commission noted that the degree of management independence of railways varies considerably between countries. It added that state intervention in railways may be justified in two areas:

- infrastructure management, especially where separate entities have been established for infrastructure and operations, as there is a need to ensure investments in these two areas are co-ordinated and meet public policy aspirations;
- negotiation of public service contracts, providing that resulting losses are compensated by the state.

However, in many countries, intervention still goes much further, restricting the commercial freedom of railways through:

- unnecessary regulation of passenger services and fares in situations where services could be run commercially;
- preventing adjustments to the size of the network, particularly closures: between 1980 and 1997, the length of lines in the EU fell by 6% whereas they fell by 37% in the US, despite the growth of the traffic there;
- influencing procurement decisions and senior management appointments.

Nevertheless, progress has been made in a number of countries, particularly the UK, Germany and the Netherlands. No material amendments to the directive have therefore been proposed in the area of management independence.

Separation of infrastructure

All EU member states have complied with requirement to establish separate accounts and many have gone beyond this requirement. Several have established separate divisions or subsidiaries for infrastructure and others have established entirely independent organisations.

However, as noted in COM(98)202, the requirement to establish separate accounts was:

- ambiguous, as it did not state which parts of the accounts should be separated – in practice, in many member states, only profit and loss accounts have been produced separately without separate balance sheets;
- insufficient, since separation of accounts alone leaves incumbent railway undertakings closely linked to infrastructure managers which control access.

COM(98)202 further noted the ability of integrated railways to block entry through control of access to the network and through licensing. In order to ensure that access is provided on a fair and non-discriminatory basis, the amendment requires that separate legal entities should be created for infrastructure and for transport service provision.

Access to infrastructure

It was required under Directive 91/440/EEC that an international grouping be formed in order to be eligible for access. However, this did not go far enough as railway undertakings continued to provide those parts of services on their own territory and seamless international movement and competition was therefore still difficult.

Also, there are major obstacles for any potential new operator, given the difficulty of competing with incumbent operators. As a result, there are very few open access operators in practice.

The eligibility of operators to gain access has been widened under the amended Directive 91/440/EEC through provisions requiring that:

- control of access be the responsibility of a body independent of any railway undertaking;
- there should be open access to railway infrastructure for all international freight services, initially just on the Trans European Rail Freight Network (TERFN), which is defined as part of the new directive.

TERFN includes railway lines defined on maps in an Annex to the Directive, diversionary routes, particularly on congested infrastructure, and access to terminals and ports. Together these already account for a very large majority of the network. The Commission states that it sees full liberalisation, also covering domestic freight and passenger services and not limited to TERFN, as the final goal.[6]

Mergers

The structure of the rail freight industry in the EU has in practice been changed more by recent merger activity than by open access. The industry is beginning to consolidate with the merger of DB Cargo and NS Cargo to form Railion and the proposed joint operation of the Swiss (SBB) and Italian (FS) railways' freight businesses.

These mergers might not have occurred had it not been for the establishment of separate freight subsidiaries in DB and NS and separate accounts for freight in SBB and FS. It is also possible that the separation of freight would not have occurred in all cases had member states not needed to comply with the requirements of Directive 91/440/EEC for separation of infrastructure. This suggests that Directive 91/440/EEC may have been instrumental in the starting the consolidation of the European rail freight industry.

In assessing the likely impact of consolidation, guidance may be obtained from Railion, which states that its prime objective is "to make the best possible use of internationally integrated timetables and production systems".[7] This merger should therefore benefit shippers since it will allow railways to provide shippers with seamless international services. On the other hand, it clearly limits the scope for competition.

Impact of Amendments

The amendments to the directives are likely to have an impact on:

- competition;
- the finances of incumbent railway undertakings;
- industry structure, including the ability to provide a seamless service;
- the size of the network and the rail freight service offer;
- infrastructure management.

Each of these impacts is considered below.

Competition

The amendments are intended to increase competition through open access to infrastructure for all international freight operations, initially limited to the TERFN. It is hoped that the number of new operators will increase as a result of:

- Award of responsibility for control of access to a body independent of any railway undertaking;
- Broadening of the definition of circumstances in which open access is required;
- Measures to minimise the possibility of discrimination against new entrants.

However, new entrants will continue to face significant barriers in those countries that limit provisions to those required by the amendments. First there is the potential barrier to entry of access charges, either from fixed charges or from higher variable charges for new entrants. These are discussed in the chapter on access charges. Other barriers to entry are also likely to continue, including difficulties with:

- acquisition of rolling stock, given that the supply industry is geared towards the needs of incumbent operators which it does not wish to offend – also the second hand market for rolling stock is undeveloped in the EU;
- obtaining the services of qualified drivers with route knowledge;
- gaining access to depots for maintenance.

Once the issues of track access are resolved, consideration may need to be given to measures to provide open access, or at least improved access, to rolling stock, drivers and depots. The example of Britain, where separate private rolling stock leasing companies (ROSCOs) have been established, may represent a useful model.

Incumbent Railway Undertakings

The increase in competition either from actual open access operation or the threat of competition (contestability) may also have a material effect on incumbent railway undertakings, given that rail freight is a not a very profitable activity in Europe. The most likely outcome of the amendments in most markets is that the threat of competition will bring down the rates charged by incumbent railway undertakings. This is because railway undertakings will find it more difficult to discriminate between customers if a customer could operate services itself or use another undertaking to do so. Lowering rates will reduce the profits of incumbent railway undertakings, as happened in the UK following privatisation, and may reduce investment by those undertakings.

In the longer term, if successful, the expansion of open access should not only introduce newer, more efficient operators but also increase the efficiency of the incumbent operators. A recent OECD Round Table concluded that the predominance of "soft" budget constraints in railways represented the major obstacle in many countries preventing improved railway performance.[8] The fragmentation of the industry implied by the amendments may improve the performance of rail freight through the hardening of budgets, as accountability is strengthened through contractual relationships between independent commercial entities. However, these improvements may take time to materialise.

Impact on Industry Structure

Industry structure is relevant, not just because of its effect on efficiency but also, and probably more importantly, because it determines whether a seamless international service can be provided. Deregulation of rail freight in the US has led to the evolution of a highly efficient industry. The industry structure that has emerged there is largely the result of market forces, since regulatory intervention has been minimal. The structure is currently as follows:

- Seven Class I railways (defined according to whether annual revenue is in excess of about Euro 250 million), compared with 40 in 1980;
- Four of the Class I railways are very large with annual revenues in excess of Euro 5 billion;
- Over 500 regional or small railways, which carry about 30% of rail traffic (in tonne km), most of it feeding traffic to the Class I railways at low cost.

Although consolidation has allowed railways to cut costs through improvements in productivity, procurement and overheads, consolidation is above all a response to the needs of shippers to have a seamless service across North America.

Whether the precise nature of the structure that has developed in North America represents the optimum type of structure for the EU rail freight industry is unclear given the dominance of passenger traffic and the shorter distances in the EU. Also there are major differences over access arrangements since, in the US, track and property belong to private operating companies, raising issues of property rights. The requirement to provide "trackage rights" is therefore only imposed by the regulator in limited circumstances, such as where it is a condition of approving a merger.

However, the basic structure that has evolved throughout North America, with large carriers increasingly providing through services and small carriers providing low cost feeder services in areas of low demand, may be partly replicable in Europe, for example with continent wide operators providing international services. US experience also shows that an efficient industry structure can emerge through a combination of mergers and new entrants although again there are differences:

- In the US, the new entrants have been short line operators that have taken over lines abandoned by Class I railways;
- In the EU, new entrants are more likely to be open access operators competing with incumbents, although these may also be short line operators, where such operators exist, as in Germany.

The future structure of the industry in the EU will be determined by the following:

- the entry of open access operators (the main focus of the EU Directives, both existing and proposed);
- the emergence of short line operators (neither promoted nor prevented by EU directives);
- the merger of existing operators (the amended EU directives provide more favourable conditions for mergers through the requirement to produce separate accounts for freight).

The future structure of the industry may also be influenced by the application of EU merger policy towards railways.

The impact of the new Directives combined with policies towards merger could lead to a variety of outcomes. For example, the new directive:

- may lead to increased open access but have little effect on mergers, whereas mergers would have led to the development of a more seamless service;
- on the other hand, it may fail to create significant open access operations and mergers will therefore lead to increasing concentration of the industry.

The Directives are based on the position that the potential benefits of competition are more significant than potential economies resulting from alliances. To maximise the benefits of regulatory reform, however, it will be important to improve efficiency through both routes. Thus hand in hand with ensuring effective implementation of the access rights provided for in the Directives it will be important to ensure that the emerging structure of European rail operations is closer to optimal – allowing alliances to achieve increases in productivity, bigger leverage in purchasing and savings through rationalisation

of procedures in cross border transport – but preventing market concentration that is destructive to the competition the Directives seek to introduce to an unacceptable degree.

Size of Network and Rail Freight Service Offer

Another determinant of the future efficiency of the rail freight industry is whether the optimum size of network and of the rail freight service offer will emerge under the amended directives. In a commercial environment, a key freedom of management is its ability to adjust the size of its plant in order to cut costs. Two factors determine this freedom in the context of rail freight:

- the policy of governments towards line closures, which is a particularly sensitive issue where there are passenger services;
- the extent to which governments:
  - require a universal rail freight service covering the entire network, which will be expensive and may detract from overall service quality; or
  - allow railway undertakings to cease unprofitable activities and provide services only for markets where they can provide a good service profitably.

The amendment to Directive 91/440/EEC may have an indirect effect on closure and service decisions since the separation of accounts for freight and passenger services will make the losses on passenger services more transparent. Governments are therefore more likely to approve the closure of branch lines, or uneconomic services, where their costs are known.

However, decisions on closures will continue to be essentially political ones in which the impact on local communities is balanced against the budgetary advantages of closure. The influence of the amended directives or any other intervention at EU level is therefore unlikely to be significant.

It is questionable whether the traditional pattern of cross-subsidies between rail freight market segments (Ramsey pricing) remains tenable under present conditions where there is a need to invest in profitable markets in a context of tight financial constraints. The Directives will have an impact in this area (see chapter on the pricing of infrastructure).

Infrastructure Management

A further driver of efficiency is the way in which infrastructure managers carry out their tasks under the amended directives since this will largely determine:

- whether railways remain predominantly a legacy of the epochs in which the infrastructure was built and services developed, as they remain in many markets; or
- whether they modernise to meet the competitive challenges of the future, moving out of markets that can be more efficiently served by road.

This issue cuts across a whole spectrum of infrastructure management activities ranging from prioritisation in the use of congested lines to the introduction of private sector management and finance.

Decisions on prioritisation in the use of congested lines at busy times of day, for example between a two car passenger train and an international freight train, have in the past been made by railway monopolies, influenced to a greater or lesser degree by governments. Decision making should become increasingly transparent under the new regime but may require intervention at the EU level.

Article 25 of the proposed replacement for 95/19/EC sets out the processes for dealing with those parts of the network that are capacity constrained. Under these processes, the infrastructure manager is required to:

- declare sections of infrastructure which are capacity constrained;
- carry out capacity analysis on these sections in order to identify possible enhancements;
- employ priority criteria to allocate capacity, taking account of the importance of freight services, particularly international freight.

However, if private sector management and finance are to be introduced, it is not clear whether these provisions will ensure adequate investment, given the difficulties of incentivising a private infrastructure owner to make investments for the long term. Public-private partnerships of some form may be the answer, although the contractual arrangements for these are often highly complex. However, this is not a matter for the EU and it would be up to each member state to develop its own solutions.

Conclusions

The main purpose of the 1999 amendments to EU Directives is to promote access rights for international traffic as a means of improving the efficiency of the railways. However, there is a risk that access or the threat of competition will reduce the already fragile profitability of incumbent rail freight undertakings, especially if infrastructure managers extract some of the surplus on more profitable traffic by charging significantly above marginal cost. If this occurs, this may reduce investment by incumbent rail freight undertakings. However, in the case that a new entrant makes capital investments, services are not threatened in this way. It will be necessary to monitor progress and may be necessary to take action to prevent such negative consequences.

The proposed amendments will facilitate international mergers between rail freight undertakings because of the requirement to produce separate accounts for freight, making the value of the freight part of the business identifiable. Mergers will reduce the scope for competition between railway undertakings but they should improve efficiency and service quality by providing for seamless continent-wide services. Because mergers reduce the scope for competition, they need to be combined with more open access operations in Europe in order to achieve a structure that makes the best of both scale economies and competition.

There are a number of areas that the 1999 amendments and draft Directives do not address:

- Ways that existing working arrangements for international traffic between national rail operators might be improved;
- Resolving conflicts for capacity between freight and passenger services.

Moreover the Directives do not cover domestic rail freight traffic thus they do not address promotion of short line operators with a local base for open access operation. All of these are areas where ECMT Member governments may wish to consider taking additional action at the appropriate institutional levels.

PRICING OF INFRASTRUCTURE FOR RAIL FREIGHT IN EU MEMBER STATES

Evolution of EU Policy

Directive 91/440/EEC required that international freight rail groupings and all railway undertakings engaged in international combined transport be granted access and transit rights on a non-discriminatory basis. Directive 95/19/EC set out the principles for allocation of capacity and for setting infrastructure charges but in practice these rules were too loose to represent an adequate basis for setting charges. They allowed quite disparate schemes to develop in different countries in terms of both the level and structure of charges and in terms of their predictability.

Since the publication of the directives, EU policy on infrastructure changes has gradually evolved. First, in 1996, the Commission published a White Paper on Railways,[9] which stated that:

- clear and consistent principles for infrastructure charges are needed;
- charges should be higher for services given priority on congested lines.

The Commission's 1998 White Paper on Payment for Infrastructure[10] stated that charges should be based on marginal social costs, that is including infrastructure operation and maintenance costs, congestion and external costs such as environmental and accident costs. The paper recognised that, in practice, marginal cost can be approximated by the average of variable costs. It recognised that charging systems would need to develop gradually and progressively.

The Commission's 1998 proposals on charging for the use of railway infrastructure[11] stated that the following are the main requirements of any charging system:

- charges should be non discriminatory;
- infrastructure charges should be set at the cost that is directly incurred as a result of the operation of the train (*i.e.* short run marginal costs);
- charges should include a sum which reflects the scarcity of capacity, where this is a constraint;
- Member States should ensure that charges are such that any service that can pay the costs it gives rise to, is able to gain access to the network.

In addition, the 1998 proposals contained the following options:

- charges could be modified to take account of external effects, including any reduction in the external costs of alternative modes arising from transfer of traffic to the railways (*i.e.* short run marginal social costs);
- charges could be averaged over a reasonable spread of trains and times;
- exceptions could be made to these principles:
  - in exceptional circumstances and for specific projects, charges could be based on the long run additional costs arising from investment, including a reasonable rate of return, providing the investment would not otherwise have been made and the investment and charging regime together result in an improvement in economic efficiency;
  - where a charging body wishes to recover more than marginal social costs, it could do so only under certain conditions and only for services other than freight – an exception was made for freight because of the importance of freight services to the single market.[12]

At a meeting of the Council of the European Union in October 1999, the wish of different member states to recover different proportions of infrastructure costs was recognised. A compromise was reached whereby:

- variable charges could be calculated using mark-ups (to marginal cost);
- fixed charges could be imposed.

It was agreed that these options should be based on clearly defined principles in order to optimise the volume of rail services and maximise cost recovery.

Draft Directive

The final version of the Commission's proposals[13] was discussed at a further meeting of the Council of the European Union in December 1999, and the main requirements were similar though not identical to those defined in 1998:

- charges should be non discriminatory (similar requirement in 1998);
- charges should be set at the cost that is directly incurred as a result of the operation of the train (similar requirement in 1998), without prejudice to other provisions listed below;
- Member States should ensure that charges are such that any service that can pay at least the costs it gives rise to is not prevented (by high access charges) from utilising infrastructure capacity (similar requirement in 1998);
- The level of charge should be determined on the basis of a methodology on which interested parties are consulted in advance (new requirement).

There was no specific mention of fixed charges but clearly any fixed charges must comply with the above requirements.

In addition, the proposals contained the following options:

- charges may include a sum which reflects the scarcity of capacity, where this is a constraint (in the 1998 proposal, this was a requirement);
- charges may be modified to take account of external effects (similar option in 1998);
- charges may be averaged over a reasonable spread of trains and times (similar option in 1998);
- in contrast, the circumstances in which exceptions can be made to these principles is more liberally defined than in 1998:
  - allowing charges to be based on the long run additional costs arising from the investment is no longer limited to exceptional circumstances and specific projects – however, exceptions are only permitted in situations where the investment could not otherwise have been made and the project would increase efficiency and/or cost effectiveness;
  - where a charging body wishes to recover more than marginal social costs, it may do so under certain conditions for any service (including freight which, under the 1998 proposals, had been excluded from this provision).

These proposals were accepted by the European Council subject to minor amendments agreed at the meeting. They have been adopted subject to agreement from the European Parliament. If agreement is forthcoming without further significant change the Directive is expected to enter into effect at the beginning of 2001 with member states required to comply by the beginning of 2003. The draft Directive represents a compromise between the purist view that marginal social cost should determine access charges and the wish of several Member states to recover high proportions of overall costs. Of particular significance is the exemption to allow charging above marginal costs for freight as well as passenger services.

Current practice

Current practice in each member state is summarised in Table 1. Practice has evolved and continues to evolve, both in response to the changing EU requirements and in response to the specific policies and needs in each country.

The NERA report on access charges[14] classified charging systems into three types:

- The Marginal Cost (or Scandinavian) approach;
- The Adjusted Average cost approach;
- The British approach.

These approaches are each discussed in turn below.

The Marginal Cost Approach

This approach bases charges on short run marginal cost. It has been adopted in Sweden, Finland and to a large extent in Denmark (Norway, outside the EU, also follows this approach). It will also be adopted in the Netherlands from 2000 although charges are only being gradually increased and will not reach marginal cost until 2007 for freight and 2005 for passenger services.

There are no fixed charges except in Denmark, where they are small. Variable charges are low and based on short run marginal costs (including external costs). Cost recovery is therefore low (typically 15-30%). The level of state contribution is determined by the difference between total infrastructure costs and the income from these charges.

No attempt is made to take account of opportunity costs, partly because congestion is much less severe in Scandinavia than elsewhere in the Union.

Adjusted Average Cost Approach

The Adjusted Average Cost Approach bases charges on average rather than marginal costs. This approach is distinguished by there being no attempt to base charges on marginal costs and to use Ramsey pricing to increase costs recovery. The Adjusted Average Cost Approach has been adopted in Germany, France, Belgium, Italy and Austria. However, in practice, charges do not reflect full average costs as:

- In France and Austria overall charges achieve only partial cost recovery;
- In Germany and France fixed charges are part of the overall tariff.

In each of these countries:

- the level of state contribution is determined by public sector spending priorities/limits;
- infrastructure charges are then set so as to recover the difference between infrastructure cost and state contribution.

Because the state contribution is usually small (zero in Germany), the level of cost recovery is generally higher than with the marginal cost approach. Variable charges are sometimes well above marginal cost, even for price sensitive traffic. Fixed charges are generally quite small and, in France, they represent less than 5% of overall charges since they are only imposed for suburban and main lines.

In France and Germany, operators that are not regular users have the option of paying a higher variable charge and no fixed charge. This reduces the entry cost for new operators as compared to the two tier system. There is no fixed charge in either Belgium or, since 1999, in Austria.

Until 1998, DB Netz in Germany had only imposed a variable charge but this was then replaced by a two tier system. Railway undertakings must now purchase an Infracard, which entitles the holder to use an agreed network for a period of between one and 10 years. The price of the Infracard depends on the size and quality of the network used, the type of traffic and the quality of the rolling stock. Whilst the new system in Germany is an improvement on the old one, because variable charges are lower, there are still complaints about the high level of infrastructure charges. The data in Table 2 shows that the level of charges depends on the lines used and the timetabling flexibility.

British Approach

The approach adopted for freight in the privatised rail industry in Britain is that access agreements are negotiated between Railtrack, the infrastructure owner, and the railway undertaking. These agreements then must be approved by the Rail Regulator, whose policies are that:

Table 2. **Summary of track access charging structure in EU member states**

	Fixed charge Euro/route km/ year	Fixed charge as % of total charge	Variable charges:		Other charges	Cost coverage	Comments
			Euro/1 000 gross tonne km	Euro/ train km			
Austria	–	1997: 27% 1998: 8%				Operation and maintenance cost plus 40% of investment costs, intended to reach 100% eventually	
Belgium	–	0%	–	Depends on: – Traffic volume; – Time of day; – Track characteristics; – Train weight; – Priority.		May be close to marginal cost	
Denmark:							
– Kastrup-Padborg	400/line km	Not known	–	2.7	Capacity charge Kobenhavn-Fredericia (200 km) for variation in average speed from 100 kph	20-25%	
– Other	200/line km	Not known	–	0.4	–	–	
Finland:							
– Freight	–	0%	1.7	–	Euro 0.13/ net tonne	75% of marginal cost	Marginal cost includes accidents and emissions but reduced because HGVs/buses fail to cover their marginal social cost
– Passenger	–	0%	1.5	–	–	78% of marginal cost	
France:							
– Suburban	1 700			3 – 15	0.25/ train km (reservation charge)		Charge/train km reflects congestion costs and varies by time of day
– High speed lines	10 000	About 5%		2.5 – 8			
– Major interurban	40-10 000			0.3 – 6			
– Other lines	–			–			
Germany	Varies with length and quality of line, kind of traffic and duration of contract	Not known	–	0.5 – 2.0 (depends on capacity utilisation)	Additional fee for sidings, marshalling and shunting yards	100% of overall cost (less allowances by state, especially for investments)	Low frequency users may pay alternative one tier tariff (VarioPreis)
Greece	–	–	–	–	–	–	No charges

Table 2. **Summary of track access charging structure in EU member states** (*cont.*)

	Fixed charge Euro/route km/ year	Fixed charge as % of total charge	Variable charges:		Other charges	Cost coverage	Comments
			Euro/1 000 gross tonne km	Euro/ train km			
Ireland	–	–	–	–	–	–	No charges
Italy	–	–	–	Average: 2.27 Depends on: – Time of day; – Track characteristics; – Train characteristics.	–	Direct costs (about 35% of overall costs)	Caution money for reservation up to 50% of charge
Luxembourg	–	–	–	–	–	–	No charges
Netherlands:							
– Freight	–	0%	–	2000: 0.05 rising to 2007: 0.93	–	Marginal cost only (Euro 0.93/ thousand train km) covered for freight in 2007, for passengers in 2005.	All figures according to 1999 plans. Lower charges for freight are based on ability to pay given relative competitive position with regard to other modes.
– Passenger	–	0%	–	2000: 0.14 rising to 2005: 0.93	Charge per station stop: Euro 1.5		
Portugal	–	–	–	–	–	–	Charges to be introduced from 2000
Spain	–	–	–	–	–	–	No charges
Sweden	–	0%	0.31 (freight) 0.45 (passenger)	0.10		Maintenance cost only (100% in 1998)	
United Kingdom[1]							
–Freight and non franchised passenger operations	Figure not known but large	85%	Not known	Not known	Not known	100% of costs plus profit margin (about 15%).	Variable charges depend on use of the network and performance
–Franchised passenger operations	Figure not known but large		–	Ranges from Euro 0.1 to Euro 6.0 per vehicle km, depends on type of rolling stock and length of train	–		

1. Refers to Britain only. Northern Ireland Railways not privatised.

Sources: An Examination of Rail Infrastructure Charges, Report for European Commission, NERA, 1998, supplemented by updated data obtained from infrastructure managers; Ministry of Transport and Navigation, Italy.

- any mark-up on marginal cost should only allow Railtrack to recover those of its fixed costs which are attributable to freight;
- charges must not be excessive when account is taken of standalone cost (the cost of a notionally efficient infrastructure provider operating the line, with costs split between all freight flows).

In practice, the negotiated agreement between Railtrack and English Welsh and Scottish Railways (EW&S), which carries over 90% of all freight in Britain, consists of a high fixed charge and low variable charge (the figures are commercially confidential). The level and structure of charges for the period 2001-6 are currently under review by the Rail Regulator. They are likely to involve higher variable charges to reflect:

- the discovery that variable costs had previously been underestimated;
- and, possibly, the advantage of giving an additional incentive to Railtrack to provide capacity to accommodate more traffic.

Compliance with the draft Directive

Referring to the requirements of the draft directive as set out above, non-discrimination is not an issue for countries adopting the Marginal Cost Approach since charges would not vary between users except for reasons of cost. Similarly the Rail Regulator in Britain has stated that he would not approve any access agreement that is discriminatory. Countries applying the Adjusted Average Cost Approach have also devised structures that are designed to prevent discrimination:

- against smaller users, by applying fixed charges only for the part of the network used;
- against new or irregular users, by providing the option of a one tier structure with variable charges only.

The potential difficulty with the Adjusted Average Cost and British approaches is with ensuring that any service that can pay the costs it gives rise to is able to gain access to the network. The draft directive allows mark-ups but requires they should be set so as to ensure that:

- traffic is not priced off the railways;
- competitiveness, particularly for international freight transport, is guaranteed.

Member states using the Adjusted Average Cost Approach generally have variable charges that exceed marginal costs:

- In Germany, there is no state support and fixed charges, though higher than in most countries, are insufficient to close the gap between marginal and average costs – also, because the price of the Infracard depends on the size of the network used, the variable cost of expansion into new parts of the network can be high;
- In France, although cost recovery is estimated to be less than 50%, fixed charges are low and variable charges are therefore estimated to be well above marginal costs, at least for suburban and high speed lines;
- In both countries, small operators face particularly high variable charges under the single tier option, making it difficult for them to compete with larger operators.

Variable charges in these countries may therefore need to be reduced in order to ensure that traffic is not priced off the railway.

The circumstances in which the draft directive would allow charges to be increased above marginal cost includes where they are increased through negotiation. In Britain, access charges for freight are negotiated with individual operators. One of the Rail Regulator's duties under the Railways Act, which he must consider in approving an access agreement, is to promote the use of the railway. This is consistent with the provision in the directive that traffic should not be priced off the railway. However, the Regulator also has a duty not to make it unduly difficult for Railtrack to finance its activities. It is therefore possible that, in balancing his duties, the Regulator will approve access charges that do price traffic off the railways and are therefore in contravention of the Directive.

CZECH REPUBLIC

Background[15]

Czech Railways (CD) were formed in 1993 following the break-up of Czechoslovakia. CD is a state enterprise and is owned 100% by the state. Rail infrastructure is currently owned by State and CD authorised to use and manage it. CD operates under the supervision of the Ministry of Transport and Communications, which appoints and has power to remove the whole board. The Chairman of the Board is the top ministerial official for rail transport.

In common with the other countries of Central and Eastern Europe, Czech Railways have experienced a reduction in traffic of over 50% since the fall of communism in 1989. In 1998, CD carried about 90 million tonnes, or about 20 billion net tonne km (CD estimates this is 40-45% of the freight market[16]). Traffic is evenly split between domestic and international with domestic representing nearly half of tonnes loaded and transit representing 6% of tonnes carried.

The major markets are bulk products such as coal (33% of tonnes carried in 1998, down from 47% in 1997), iron ore, construction materials and forestry products, although some machinery is also carried. It is difficult for rail to compete with road freight for non bulk markets because of the high level of competition between small road carriers that has driven rates for haulage to extremely low levels. CD has no strategy of price discrimination to meet this competition.

CD employed some 86 000 staff in 1998, down from 162 000 in 1989. This represents a reduction of nearly 50% which is, however, less than the reduction in traffic. Productivity has therefore declined over the period (although it has increased since 1993) and overcapacity remains a problem.

CD made a paper profit on its freight operations of about Kc1.6 billion[17] (€45 million) in 1998. However, freight would also be loss making if assets were valued at their replacement rather than their historic (mainly pre 1989) prices, which can be as little as 10% of replacement costs.[18] The most profitable business was trainload freight which represents 45% of tonnes loaded.

The paper profit in freight was used to finance part of the losses on passenger operations. Because of losses on passenger operations, CD has made an overall loss each year since its formation and by the end of 1998 had accumulated debts of Kc23 billion (€660 million). As a result, CD lacks funds to invest in its freight business and over 60% of its wagon fleet fails to meet RIV (UIC) standards and many wagons are in a poor state of repair or obsolescent.

Despite its financial difficulties, CD has been investing heavily, particularly in speed enhancements on major corridors. In 1998, CD invested Kc 11 billion (€315 million), which represented 40% of CD's revenue (excluding subsidies). Of this nearly 80% was invested in corridors. Most investment was financed through loans, mainly from state guaranteed loans from EIB and EBRD. Some investment was financed with grants from EU Phare. Passenger services stand to benefit more than freight services from investment in corridors. Also, the parts of the network that are not on corridors, on which freight is highly dependent, has suffered from a lack of investment and basic maintenance.

Reform

Under the Railways Act 1994, CD was also restructured to support open access through the establishment of two divisions, one for Railway Routes (infrastructure) and one for Business Operations.

There is internal accounting for each division. Within the Business Operations Division, there are separate departments for freight transport, passenger transport and rolling stock.

The Government's transport policy plans for change of the rail company towards a business organisation which has clear economic goals and harmonisation of the railways in line with EU policy. However, any reform that may lead to job losses will meet with resistance from the unions and there have been several strikes in recent years. As a result, earlier privatisation plans have been shelved.

An amendment to the Railways Act 1994 was passed in November 1999 to define the treatment of compensation for meeting public service obligations in passenger services. It will become law in 2000 and should improve the financial position of CD.

A new law on the Transformation of CD is under consideration by parliament. There appears to be a political consensus between the parliament, the Ministry, CD management and the trade unions that Czech Railways should be transformed into joint stock company, which will initially be 100% owned by the government. This will make Czech Railways more autonomous and facilitate the creation of joint ventures with private firms in areas such as freight forwarding. However, there is no consensus on government plans to write off CD's debts or to sell shares in the operations part of the business to strategic partners. It is therefore unlikely that the new law will be passed in 2000.

Provision for Open Access

The Railways Act 1994 provided for open access through the following provisions:

- the establishment of a Drazni Urad (Railway Authority), an independent Government office, to regulate access by granting licences to operators which meet conditions of professional competence and concessions to operate a particular track section, providing capacity is available;
- the requirement that the infrastructure manager provides access to carriers authorised as above and allocates capacity;
- the provision that operators or potential operators have a right of appeal to the Railway Authority on capacity matters.

The freight market is open to all external freight operators. External operators must obtain a licence from the Drazni Urad (Railway Authority) which tests drivers on regulations and carries out technical approval of vehicles.

CD cannot prevent competition from companies which have all their own equipment, terminals and depots and therefore need only access to track, which the law requires that CD provide. There are few formal barriers to entry and CD argues that there is a need to tighten up regulations and their enforcement to keep out operators which do not meet technical and safety standards. CD is also concerned that external operators are "cherry picking" the most profitable traffic with negative consequences for its finances.

Open access operators had a market share of 8% of tonnes and less than 1% of tonne-km in 1997. In 1998, their share of tonnage rose to 11%. The majority of external operators are domestic carriers of raw materials that were previously customers of CD. They entered the market initially to carry goods for themselves and now offer services to third parties.

There are about 35 external operators. The largest are OKD Dopravna Ostrava, the subsidiary of a coal mining company, and Viamont Usti nad Labem, an independent company. External operators have their own wagons, locomotives, handling equipment and depot facilities, which they originally used on dedicated non-public lines connected to Czech Railways. They have expanded and connected their operations by using CD track. Initially, these were mainly for short-haul (around 25 km) but recently average distances have been increasing.

External operators use the CD network only for domestic trainload traffic. International operators are hindered by the need to know Czech regulations and language and can enter the market realistically only with some local presence.

Whether "cherry picking" should be viewed as a problem or a welcome means of reducing freight rates for certain industries will depend on the balance sought in Government policy between the partly conflicting goals of improving the finances of CD and introducing pressure to improve the overall efficiency of the rail sector through competition (see page 31 Competition).

Allocation of Capacity and Access Charges

The freight planning process is managed by the Freight Transport Department of the Business and Operations Division. At the beginning of the planning period, it draws up graphs which allocate freight paths on the basis of historical experience and agreed expectations with bigger customers. Many are reserved specifically for single product / single or multi-destination loads of known big regular customers. Some fixed multi destination routes are reserved for unknown smaller multi-product / multi-customer mixed consignments. Smaller consignment orders are then fitted into these reserved paths.

The planning process is quite flexible and subsequent changes, additions and cancellations are quite normal. For bigger customers it is normal to meet monthly with CD and plan for use of the anticipated reserved capacity in the next period. There is excess capacity so the planning does not have to be particularly tight.

In principle, passenger transport has priority over freight. However, because freight is the profitable part of CD, sometimes freight express trains will overtake slow passenger trains. However, there are apparently no hard and fast rules.

The rules and maximum rates for external access to the network by domestic operators are set by the Ministry of Finance (in consultation with the Ministry of Transport and Czech Railways). Access charges are fixed on a combined cost per train km and cost per gross tonne km basis. The rates should cover the full paper costs of access provision. However, it seems that in 1999 the levels of access fees were low, as they reflected only maintenance costs and do so in an inaccurate and incomplete way. Access fees were expected to increase by 25% during the year 2000 to include part of investment costs.

Within CD the practice of using internal access charges was recently discontinued. This may raise issues of non-discrimination in the levying of charges for the use of infrastructure.

Conclusions

The Czech Republic has made rapid progress in the development of open access. The Government is scheduled also to enact legislation soon on public service obligations, which should reduce the need for CD's freight business to cross subsidise passenger services. This will place CD's freight business in a better position to compete with open access operators. However, given CD's weak financial position, which may worsen as external operators' share of the market increases, the impact of open access will need to be monitored to ensure that the government's priorities are reflected in the trade off between:

- CD's ability to finance its activities;
- and the efficiency advantages of open access.

The measures taken so far are not sufficient to create fair competition between CD and open access operators in freight and to transform the efficiency of rail freight operations. These objectives will only be achieved once:

- there is a clearer separation between the Ministry and CD;
- the Freight Department and Railway Routes Division of CD are transformed into separate companies.

The speed with which this occurs will depend on the outcome of the current debate on the proposed new CD Transformation Law.

FRANCE

The context

The railway companies which developed the French railway network in the nineteenth century were traditionally set up or formed into groups with state aid. Subsequent consolidation meant that by 1860 only six major companies remained, and five in 1934. These networks, experiencing major financial difficulties, were nationalised in 1938 when the French national railway company, the Société Nationale des Chemins de Fer (SNCF), was formed. Officially, the state held 51 per cent of SNCF's capital and the former rail companies the remainder. In practice, having survived bankruptcy only thanks to state intervention, the latter never took up their responsibilities as shareholders.

Under France's framework legislation on inland transport (Loi d'Orientation sur les Transports Intérieurs, LOTI) of 30 December 1982, SNCF became an Etablissement Public à Caractère Industriel et Commercial (EPIC), *i.e.* a public sector company operating on commercial lines. Under Article 24-I of the law, SNCF enjoys commercial management independence. Terms of reference set by decree from the Council of State after consultation with SNCF establish the company's duties, organisation, operating environment, financial and budget constraints and public service responsibilities. The same Article requires that a framework agreement (contrat de plan) be established between the State and SNCF setting objectives assigned to the company in the context of national planning and determining the measures to be employed in achieving them. SNCF receives financial contributions from the State, under the terms of Article 24-II of the law, in respect of public service obligations assigned it as a result of the role rail transport plays in satisfying rights of access to transport services and in contributing to energy conservation and enhancing energy supply security.

These arrangements account for the strong links that exist between SNCF and the State and result, in particular, in representatives of government ministries holding the majority of seats on the board of directors. The trade-off for this dependence is the *de facto* guarantee of solvency provided by the state. The advantage of this arrangement is that the operator benefits from a very high credit rating on the financial markets. This has sometimes been blamed for allowing the company to run long-term deficits and accumulate debts.

Just prior to restructuring in 1997, the SNCF was regarded as a technically very competent public sector company that provided safe transport and a satisfactory standard of service. On the other hand, it was acknowledged to have difficulties in controlling operating and infrastructure costs and managing finances satisfactorily and was viewed as insufficiently commercially-minded.

As a result of underlying structural economic change that has favoured road transport for both passengers and freight, and in the absence of sufficient productivity gains, rail's steady loss of market share to its competitors has been the dominant trend in the latter half of this century across Europe. The trend is frequently more marked in other European countries than in France, particularly for freight. Even major technical advances such as high-speed passenger trains (TGV) from the early 1980s onwards or the development of combined transport for freight have failed to reverse this overall decline. Trends observed over the period 1980 to 1996 are as follows:

- *passenger transport* increased only 20% for urban and suburban traffic and stagnated on inter-urban routes, whilst passenger car traffic increased 50%;

- *freight transport* declined 40% whilst road freight traffic increased over 20%. Rail transport declined from a market share of 29% to 18%. It should be noted, however, that rail performed better in international transport where it recorded growth in this period, maintaining a 33% market share for SNCF and generating over half of its rail freight revenues. These overall trends hide a number of contrasting developments: a fall in wagon load freight; stagnation of trainload services and regular growth in combined transport.

In the mid 1990s the situation could be summarised as follows:

- overall stagnation of the rail market, sustained essentially by growth in high speed services;
- very poor financial performance as a consequence of the weight of accumulated debt;
- serious questions about the future of the sector.

Reform of the Rail Sector

The reform of 1997

Reform in 1997 aimed at meeting four objectives:

- creating the conditions for a sustained renewal of rail transport, reversing the pattern of decline;
- finding durable solutions to the financial problems of the sector;
- clarifying the roles of each of the main agents involved in the sector and put in place a framework that meets the requirements of Directive 91/440/CEE on the development of railways, Directive 95/18/CE on the licensing of rail enterprises and Directive 95/19/CE on the attribution of rail infrastructure capacity and charging for its use;
- preparing for a decentralisation of regional passenger services.

The reform had the following main outcomes:

- Creation, as of 1 January 1997, of Réseau Ferré de France (RFF) as an EPIC responsible on behalf of the State for rail infrastructure previously assigned to SNCF. RFF took on ownership of this infrastructure. It is charged with development of the infrastructure in a coherent manner and required to exploit the network to good account, respecting principles of public service and with a goal of promoting rail transport in France in line with promoting sustainable development. RFF defines the goals and principles of rail traffic and train path management and the operation and maintenance of infrastructure and safety installations. Day to day management of these tasks is contracted to SNCF under an agreement, given the overriding concerns of safety and assuring the availability of public services.
- Transfer to RFF of the debt contracted by SNCF for the financing of infrastructure, 134.2 billion Francs, in counterpart to the infrastructure assets accorded to it. RFF receives income from three sources, the charges levied on trains using the national rail network, payments from the State and capital transfers in respect of its inherited debts. It can, moreover, receive payments from local government administrations, for example investment subsidies in the framework of regional development plans agreed jointly by the State and Regional authorities. RFF's expenditures principally concern investments in network development, debt related payments and payments to SNCF for infrastructure management.
- Preservation of an integrated rail enterprise charged, on the one hand with operating train services on the national rail network, and on the other hand with infrastructure management tasks on behalf of RFF. Under SNCF's terms of reference, trains are required to be operated under the best safety conditions resources permit and to provide the highest standards of access, speed, comfort and reliability possible with the resources available. SNCF's duties as delegated infrastructure manager mainly consist of a) train path planning and operational management of train movements in order to ensure and safe, regular and smooth running; b) management of safety and other regulatory systems and c) monitoring and maintenance of track and other infrastructure.

- Experimentation with the regionalisation of passenger services. On the basis of Article 22 of the law of 1982, a fruitful partnership has developed between SNCF and regional government administrations. This has provided SNCF with valuable means of developing a wider range of services for the regions. Success was sufficient to convince the Government to launch an experiment with decentralisaiton of the organisation and financing of passenger services from 1 January 1997 in six, and finally 7 of France's 22 regions.

Further reform in 1998

This round of reform sought improvement in certain key areas not resolved by the 1997 reforms.

- The first point was to address insufficient improvement in the financial situation of SNCF. This prevented SNCF from achieving a return to the durable financial balance necessary to assure development of rail transport and strengthening of its public services. Above all this required addressing the absence of finance to stabilise the long term debts of RFF and begin to reduce them. Lack of finance had prevented RFF from implementing Government decisions relating to renewal, modernisation and expansion of the national rail network. In 1998 the Government agreed to reduce the debt of SNCF, cutting its financing costs significantly. It also committed substantial resources to stabilising the debt of RFF through capital allocations.
- The second point concerned the threat to the coherence of public services arising from the creation of two separate entities for the management of the rail system. This led the Government to create the Conseil supérieur du service public ferroviaire (senior advisory council for rail public services) at the beginning of 1999. It is charged with overseeing a balanced development of the rail sector, coherence in public services provided by the railways and coherence in the way SNCF and RFF execute their responsibilities in respect of public service. The council is composed of elected representatives from local, national and European assemblies, representatives from the rail companies, representatives of the employees of the rail companies, representatives of users and consumer groups together with rail experts and representatives of the State. The council is charged with undertaking examinations and making proposals to Government in its areas of responsibility. It has begun work on issues such as further regionalisation, challenges for suburban transport, rail freight development and safety in train operations. The council is also required to report, in two years, on lessons arising from the new organisation of the rail sector to evaluate if further measures are required to implement the objectives set by the Government of reducing debts, ensuring coherence and improving labour relations in the sector.

Initial evaluation of the impact of reform

Several of the objectives of reform can be considered successfully achieved.

- The reforms have clarified the roles of the different agents involved :
  - The State determines the main lines of policy in respect of infrastructure;
  - RFF is responsible for developing and expanding the network;
  - SNCF is now free to concentrate on transport tasks.
- The reforms have improved the prospects of financial recovery for the sector. The reform of 1997, which transferred SNCF's infrastructure related debts to RFF, left open the question of long term financial responsibility for the debt. As noted, the Government decided to provide significant financial resources to manage RFF's debt, through capital allocations, enabling a stabilisation for the coming financial years. SNCF has now been put in a position to balance its accounts, and is on the point of doing so, thanks to the transfer of the major part of its debts and because of the moderate infrastructure use charges it pays to RFF.
- The experiment with regionalisation of passenger services has been a success. The experience of the seven regions involved has shown that rooting railway development locally is an essential guarantee for its future and that improving quality of service requires a clear distinction between

the responsibilities of political decision makers and the providers of rail services. The decentralisation of passenger services of an essentially regional nature is also viewed as facilitating the integration of national rail policy into the framework of global and intermodal transport policy in France. It has given full responsibility for the organisation and financing of regional passenger services to regional government, the political level closest to the users concerned. The success has led the Government to seek to extend the transfer of organisational and financial responsibility to all the regions. This is provided for from 1 January 2002 in a law currently before parliament.

- Implementation of policy towards development of rail services has been facilitated in the following ways.
  - The priority clearly given by government to public transport, particularly rail transport, in the framework of a modal re-balancing between rail and road and the promotion of sustainable development policy has been made concrete in the financial planning for rail services set out in the framework plans (contrats de plan) agreed between the State and the Regions;
  - Promotion of an expansion of rail freight transport. The Government has established the French part of the Trans-European Rail Freight Network which will enable any European Union rail company holding a licence to offer international freight services on this network through any kind of operation. The Government has, moreover, set itself the objective of doubling rail freight traffic by 2010.

Infrastructure charging system

The infrastructure charging system under which rates were capped in 1997 and 1998 was modified in 1999. The idea behind the system is to provide incentives, particularly where demand for paths is high relative to capacity, *i.e.* on urban and suburban lines (the part of the network designated R_0) and to a lesser extent on high-speed lines (R_1 and R_{2a}). On the remainder of the mainline network (R_{2b}), charges are low.

The fee system distinguishes between a monthly access charge (AC) per kilometre on the lines to which access is requested, a reservation charge (RC) per kilometre per path reserved and a traffic charge (TC) per train kilometre. There are different reservation charges for peak periods, normal periods and off-peak periods.

Table 3. **France's charging system**
(1999 unit charges in FRF)

Network category	R_0	R_1	R_{2a}	R_{2b}
AC	11 282	64 400	64 400	256
RC[1] (peak)	96.89	48	39	2.17
RC (normal)	42.63	39	29.78	2.17
RC (off-peak)	19.38	15	15	2.17
TC	1.5	1.5	1.5	1.5

AC = access charge per month and per kilometre of line (*i.e.* a fixed charge).
RC = reservation charge per path-km.
TC = train charge per train-km.
1. Figures for passenger train paths. For freight train paths the figure is multiplied by 0.484.

Conclusion

The reforms of rail transport implemented should ensure the following developments.

- They provide for SNCF to devote itself fully to its commercial objectives. This is the sense of the business plan established by SNCF, which takes into account the priorities set by the State and aims to attract back passengers and freight customers, achieve financial equilibrium in each area of SNCF's activities and improve the management of infrastructure undertaken for RFF.

- They provide for better control for RFF of its infrastructure accounts, with transparent profit and loss and balance accounts, which will enable more responsive management of debts and decisions on investment in modernisation and development of the network more effectively conditioned by the real financial constraints of the sector.

The reforms of 1997 and 1998, together with those concerning transfer to regional governments of organisational and financing responsibilities for regional passenger services, will result in a profound transformation of rail transport in France and should assure its renewal within the context of a re-balancing between rail and road modes and the promotion of sustainable development policies.

GERMANY

Background

Most of German railways were built in the 19th Century, some privately, some by the State. Private railways began to be taken over by the *Länder* in 1879, with bonds swapped for shares. In the early days of the *Reich* after unification in 1871, railways were an instrument of unification and military policy and a major contributor to state coffers. Nationalisation of the railways took place in 1920 and in 1924 the national railway (*Reichsbahn*) was formed.

About 40% of freight traffic is cross border. Because of its position, German railways were originally important for transit between east and west and this role was revived with the reunification of the country.

Following the division of the country after the second world war, the railways in the two parts of Germany were both administrations but they operated in different environments:

- In West Germany, *Deutsche Bundesbahn* faced an earlier decline in heavy industry, and increasing competition from road transport although this was tightly regulated to protect the railways
- In East Germany, *Deutsche Reichsbahn* continued for longer to serve heavy industry and faced less competition.

Reunification means that Germany now has the largest rail system in Western Europe (41 000 route km, compared to 32 000 in France, the second largest). There are also many small companies of which seven freight railway companies carry 1% of net tonne km.

Table 4 shows the breakdown of freight traffic between wagonload, trainload and combined transport.

Table 4. **Breakdown of freight traffic**

	Share of tonne km	Share of revenue
Wagonload	42%	50%
Trainload	38%	31%
Combined Transport	20%	9%

In contrast to France and the UK, rail freight in Germany is dominated by wagon load traffic which represents 42% of tonne km and over half freight revenue. This may be partly because Germany has not gone through the major rationalisations that have taken place in the UK and in France, at least in freight. Trainload traffic is slightly less important than wagonload in revenue terms. Combined transport represents 20% of tonne km but generates only 9% of revenue.[19]

In 1993, 40% of revenue of German railways was from freight, which represented higher proportion than in most other EU countries. Despite the reasonable balance between freight and passengers, the network is mixed, with freight and passengers, and different speeds and axle loads sharing the same sections of track. Passenger services tend to get priority in path allocation.

Table 5 shows the decline in rail freight between 1970 and 1989.

Table 5. **Decline in freight carried by Deutsche Bundesbahn (1970-1989)**[1]

	1970	1989	Change
Freight tonne km (total)-billion	72	62	–14%
Market share	33	22	–33%

1. *Railway Reform in France and Germany*, P. Bowers, University of Edinburgh Management School, 1994.

As in France, rail freight in former West Germany peaked in the 1970s. As recently as 1970, rail in West Germany had a modal share of 33%. Between 1970 and 1989, rail experienced an absolute decline of 14% and relative decline of one third. Between 1989 and 1993, rail freight traffic in West Germany fell by a further 16% to 52 billion tonne km.

In former East Germany, the railways experienced a more recent but far more rapid decline from 58 billion tonne km in 1985 to 12 billion tonne km in 1993.[20] This was mainly due to the decline in industrial activity leading up to and immediately following reunification.

During the 1930s, all facets of transport were placed under the control of the State. In East Germany this continued through the Communist era. In West Germany, there was some relaxation of these controls under minor reforms in 1961, but these mainly affected the road transport industry and Deutsche Bundesbahn remained an administration acting as a branch of Government until 1993.

Rail Reform

Rail reform has taken place as part of a trend towards deregulation in Germany. The origins of regulatory reform in the railways may be found in the reports of two important Commissions formed in the late 1980s:

- The Monopoly Commission, which published its report in 1989, criticised the fact that rail freight rates were subject to minima and maxima set by the Ministry, and that road haulage was so heavily restricted that rates exceeded free market rates by an estimated 20%.
- The Deregulation Commission whose report, published in 1991, strongly advocated deregulation throughout the economy. It argued that, with the opening of markets under GATT, the heavy regulation of the German economy would make German goods and services uncompetitive internationally. It further argued that the EU would force liberalisation in any case.

If these commissions provided the intellectual underpinning for change, it was the expense of the reunification of Germany, global recession, the increasing congestion and environment problems associated with road traffic and the spiralling losses on the railways that ensured a political consensus to act. The absorption of *Deutsche Reichsbahn* represented a particular problem:

- In 1991, *Deutsche Reichsbahn* had almost the same workforce as *Deutsche Bundesbahn* (230 000 compared to 242 000) but only half the network;
- Its rolling stock was outdated and the network was in poor condition and had poor connections to West Germany.

The Government Commission on the Railways published a report in 1991 in which it estimated that the annual financial requirements of the combined German railways would rise from DM27 billion in 1991 (about 14 billion ecu) to DM64 billion in 2000. The recommendations of this Commission were consistent with EU Directive 91/440, issued in the same year. They included:

- Complete management separation of the railways from the federal Government;
- The removal of any national economic responsibilities from the railways;
- Financial restructuring to ensure the viability of the business;
- Separation of accounts for infrastructure;
- Introduction of on rail competition (going beyond the requirements of 91/440).

Following these Commissions, five bills were passed in 1993, including the Railway Restructuring Act, the Act to establish the German Rail Joint Stock Company and the General Railways Act, and a process of reform was set in motion. In order to provide for the management independence of the railways:

- *Deutsche Bundesbahn* and *Deutsche Reichsbahn* were merged in 1993 to form the *Bundeisenbahnvermogen* (BEV – Federal Railway Authority), a transitional body;
- *Deutsche Bahn* AG (DBAG – German Rail Joint Stock Company) was created in 1994 to take on all the commercial activities of the railways – all of the assets required for this purpose were transferred from BEV to DBAG;
- A regulatory agency, *Eisenbahn Bundesamt* (the Federal Railway Office), was established;
- BEV retained liabilities such as excess staff, DM70 billion (35 billion ecu) of debt and the environmental legacy of DR;
- Freight rates are no longer subject to approval by the state.

Under the new system, *Eisenbahn Bundesamt*, a subsidiary body of the Federal Ministry of Transport, Building and Housing, is responsible for:

- ensuring non-discriminatory access to the railway;
- technical supervision and authorisation of all railway companies operating in Germany, including ones registered in foreign countries;
- preparation and implementation of funding agreements for investments by the Federal Government in railway infrastructure.

The railways are still subject to normal competition law including controls by the Federal Cartel Office.

Under the DBAG head office, four separate divisions were established in 1994: infrastructure, freight, short distance passenger and long distance passenger (a fifth was created in December 1997 concerned with passenger stations). These divisions generally produce separate accounts. This provides the basis for transparency of charges for access to infrastructure and complies with 91/440. DB *Netz* (the Network Division) was responsible for the planning, development and maintenance of infrastructure, apart from stations.

The General Railways Act provides for non-discriminatory open access to the DB network for:

- all railway undertakings registered in Germany;
- international groupings and rail operators wishing to provide international combined transport services;
- undertakings registered in countries within the European Economic Area which provide reciprocal arrangements for access to German operators;
- undertakings registered in other countries which have concluded inter-governmental agreements for the use of track.[21]

DB *Netz* is required to ensure that the network impact and timetabling requirements of all users are taken into account in carrying out its timetabling functions. The procedure is largely based on the European timetable conferences (Forum Rail Europe). DB *Netz* has a commercial rather than an administrative remit and endeavours to "achieve optimum track utilisation whilst satisfying customer demands for train paths as much as possible".[22]

Despite the liberal provisions of the law, new entrants claimed that they faced a number of obstacles:[23]

- The rail rolling stock market is tailored towards the needs of DB which still represents by far the largest demand potential and dominates the market for second hand rolling stock, especially for locomotives – this and the cost of rolling stock means that new entrants are buying second hand locomotives outside Germany.
- Potential entrants and rolling stock suppliers are reluctant to offend DB by competing with DB or supplying competitors although there are signs that suppliers are increasingly willing to provide rolling stock to DB's competitors.

- DB N*etz* is part of the DB group and DB operating companies have information advantages over open access operators.
- Potential entrants must clarify access arrangements and charges before bidding which may reveal to DB its bidding strategy.
- The access charges were discounted for volume and long term traffic.

However, the prime function of DB Netz is to ensure the efficient use of the network and there are preliminary signs that its establishment as a separate company in 1999 within the DB group (see below) is having the intended effect of opening up the network.

The second stage in the reform process, as provided for in the original legislation in 1993, was the transformation of divisions into subsidiaries. On January 1, 1999, the five joint stock companies were founded and they were entered on the commercial register on June 1, 1999. Each company must produce its own annual report and accounts and is responsible for its business performance. The DB holding company is responsible for the strategic orientation of the group, finance, property, passenger tariffs, environmental protection and legal affairs.[24] There are also several specialist service organisations (*e.g.* a group internal employment agency, Research and Development, Procurement and Property) under the direct control of the holding company.

As yet there is no timetable defined in legislation for further reform nor is the nature of such reform defined. At present, there are no plans to privatise any part of the DB group. If a decision is made to privatise a part of DB, new legislation will be required. In this respect, the Constitution makes provisions that the Federal Government must remain the majority shareholder of companies that build, maintain and operate certain infrastructure, currently DB Netz in the case of the railways.

Access Charges

DB N*etz* was given freedom to establish access charges within an evolving framework of regulations and ordinances. These regulations and ordinances require DB N*etz* to recover at least its operating expenses. DB N*etz* is allowed to negotiate charges with its customers. If agreement cannot be reached, E*isenbahn* B*undesamt* (the Federal Railway Office) arbitrates.[25]

DB N*etz* established initial charging arrangements in July 1994. There was no fixed charge. Variable charges were established according to track category and class of train. Discounts were available for volume. Another feature of this access pricing regime was that, in case of conflict for paths, priority was given to operators prepared to pay the higher user charge.

There was considerable criticism of the 1994 charging regime and it was described as inflexible and poorly oriented to the needs of the market and the needs of small operators. According to Link,[26] overall cost recovery on infrastructure was only 41% in 1995. However, there were complaints from potential entrants that access charges were too high. Complaints also came from short distance passenger operators that they were cross-subsidising freight for which track charges only covered 16% of costs. The volume discounts were also considered to be discriminatory in favour of the incumbent operator and against new entrants.

In 1997, the Federal Government issued an Ordinance specifying the principles for levying access charges, though it did not indicate the level of such prices. In May 1998, DB N*etz* replaced the single variable tier of charges with a two tier system of fixed and variable charges:[27]

- The fixed charge (InfraCard) is determined by the length of network the operator wishes to use and the type of traffic (freight, passenger).
- The variable charge depends on the level of congestion (it is higher in peak periods) and the timetable flexibility accepted by the operator.
- The variable charge varies with length and quality of line, kind of traffic and duration of contract.
- Discounts are no longer obtained for volume.
- Low frequency users may pay alternative one tier tariff (VarioPreis).

The use of two tiers should make it easier to reconcile cost recovery with the marginal cost pricing principles of the EU White Paper on Pricing[28] and the draft Directive replacing Directive 95/19/EC (see Annex on Infrastructure Pricing). This is because variable charges can be reduced to make them closer to marginal costs and the remaining cost can be recovered through the fixed charge. However, in practice, the variable charges may be well above marginal costs since total charges are intended to cover 100% of overall track costs (less allowances by the state, especially for investments). Entry costs are further increased by additional charges which are levied for the use of sidings, marshalling and shunting yards.

The high level of charges for the use of infrastructure is blamed for keeping potential international traffic off the railways and has been cited as one of the main reasons that very little traffic between the UK and Germany has developed since the opening of the Channel Tunnel. Another symptom of the financing difficulties of DB Netz is the diversion to covering track maintenance costs of funds provided from the Federal Government to regional governments for the purchase of passenger services from train operators (only a very small part of these federal funds was intended for spending on infrastructure). There are two main reasons why DB Netz has difficulty balancing its books mainly because of DB Netz's high costs, indicated by the fact that a number of abandoned lines that have been sold off are currently run at a profit.

Impact of Reforms

Any assessment of the impact of the reforms on railway performance needs to take account of the distorting effect of reunification on any trends. Also some of the improvement may be due to the very high levels of investment undertaken. DB invested DM 42 billion by the end of 1997 and the planned investment for the period 1998 – 2002 is DM 80 billion.[29] However, the full impact of these investments has yet to be felt.

Reform is still at an early stage and will take time to have its full impact. Hence, a recent study stated that, while experts in Germany agreed that the monolith needs to be broken up, "most were of the opinion that not much had changed".[30]

However, there are positive trends. Between 1993 and 1998, freight traffic on the railways increased by almost 15%, although revenue from freight has hardly changed because of falling prices (in nominal as well as real terms). Productivity has also increased by 94%. Some indications of possible impact may also be gleaned from the various initiatives that have been taken, both by the private sector and DB, in response to the reform:

- Many private freight operators, mainly existing short line industrial railways, have taken advantage of the open access opportunity, mainly to run simple services connecting their own plants or making short trips to ports;
- In June 1998, DB and NS announced their intention to merge their freight businesses to form a new company called Railion – this merger took place on January 1, 2000 with DB Netz taking 94% of shares and NS Cargo 6%. This will clearly reduce potential on rail competition between and within those two countries and this may be undesirable if there is limited road competition (for example if measures were introduced to force traffic on to the railways). However, it represents a major positive step in the development of pan-European operators. A joint venture (not a merger) for international freight has also been formed between Italian and Swiss Railways);
- A freight freeway was recently formed between Netherlands and Italy via Germany, Switzerland and Austria;
- A private rail freight operator, Express Shuttle, a joint venture between the German post office and United Parcels Service (UPS) is planning to operate rail services linking four German towns.

On the other hand there have been some setbacks. DB set up with Netherlands Railways (NS) and CSX Transportation, the US owned shipping and railway company, a joint venture called NDX in 1996 to run freight services from Rotterdam into Germany. NDX complained of the delays in getting paths through Germany and this joint venture has now been disbanded.

Concluding Remarks

Railway reform in Germany began only five years ago, compared to more than 15 years ago in the UK. The approach was systematic and ambitious and a long term plan was enshrined in legislation. Considerable progress has been made in a relatively short time in restructuring and establishing an open access regime, including a sophisticated system of track access charges. The preliminary indications are that the reforms are beginning to produce the intended effects:

- Railion is preparing to take on a role in freight transport across Europe – its formation is a rational market response to the regulatory framework in the EU and in Germany and the Netherlands
- Open access operators are beginning to enter niche markets.

However the high level of charges and other barriers may continue to inhibit entry of new operators, both for international and national traffic. Nevertheless, there are signs that the barriers are falling. For example, the new pricing regime should allow charges to be more sensitive to the needs of the market. The final test will of course be whether this leads to more traffic on the railways, both within Germany and, given Germany's position at the centre of Europe, throughout Europe as a whole.

POLAND

Background

Freight traffic in Poland reached its peak in 1980 at 135 billion tonne km. It then declined by over 50% in the period to 1991, when traffic stabilised at around 65 billion tonne km (around 225 million tonnes). Between 1997 and 1998, traffic fell by 9% to 206 million tonnes (62 billion tonne km) and by a further 9% to 187 million tonnes in 1999. This was due to a decline in coal traffic, reduced grain imports and problems in the metallurgy sector. According to national statistics, rail's average modal share was 58% in the period 1995-7 although this may be overstated due to under-reporting of private road haulage traffic.

Demand is dominated by domestic traffic (65% of tonnes loaded) and transit represented only 2% of tonnes. Wagonload traffic represented 51% of tonnes in 1997 and trainload 47%. PKP expects to lose some short distance trainload traffic to road. Commodity breakdown (tonnage carried) in 1997 was as follows:

- Coal 51%
- Construction materials 12%
- Metals, metallurgical products 8%
- Fertiliser and other chemical 7%
- Oil and oil products 6%
- Iron ore 6%

In the period 1980 – 1998, staff numbers fell by 42% from 365 000 to 212 000.[31] This reduction falls well short of the decline in traffic noted above. Also much of the decline was caused by the separation of non core activities. The Ministry plans that PKP reduce staff numbers to 145 000 by 2005.[32]

PKP's financial position varies from year to year. It was near breakeven (after subsidy) in the period 1992-97 but incurred a major loss in 1998 of PLZ 1.4 billion[33] (€300 million) on turnover of around PLZ 8.2 billion (€1.8 billion). PKP's losses are due to major losses on passenger traffic (PLZ 2.5 billion or €550 million in 1998).[34]

The deterioration in PKP's results in 1998 was due mainly to:

- increased costs due to depreciation, increased foreign loan repayments and labour, which meant that costs increased by 14% over the 1997 level;
- a major decline in freight traffic, which meant that revenue failed to grow and reduced the ability of the freight business to cross subsidise passenger business. This reflects PKP's vulnerability to fluctuations in the demand particularly for coal, which represents half of all tonnage carried.

Freight revenues exceed allocated costs by 60% although the basis for allocation of fixed and joint costs may favour freight. Profits from freight are used to subsidise passenger rail transport.

Insufficient funds have been made available for new wagons. The fleet consists mainly of:

- old standard wagons (average age 18 years) in poor operational condition;
- a limited number of wagons meeting international specifications (40% of coal wagons meets these requirements);
- lack of specialised wagons (with moving roofs etc.).

Massive investments are needed to modernise the infrastructure and rolling stock of PKP in order to match West European standards. The infrastructure budget of the Polish Railways for the year 1998

was about PLZ 2 billion (about Euro 0.5 billion). This represented a high proportion of PKP's revenue (nearly 25%). In 1999, investment was substantially reduced. Most funds for investment come from foreign credits guaranteed by the government. However, it is intended that loans will be repaid from the railway own resources. The financial position of PKP is therefore weak and may weaken further.

Early Reform

Under the 1995 statutes for PKP, the Ministry of Transport and Maritime Economy may limit the commercial freedom of PKP, including having control over freight rates for coal and iron ore. Members of the Supervisory Board of PKP are appointed by the Transport Minister. Members of the Management Board are then appointed by the Supervisory Board. The Supervisory Board consists of 9 people, of which 3 are representatives of the trade unions.

As part of Poland's preparations for entry into the EU, railway directives are being transposed into national law. As a result, the internal structure of PKP since 1/1/99 has comprised separate infrastructure, freight and passenger sectors. Separate accounts are produced for the infrastructure sector, in compliance with directive 91/440/EEC.

Open Access

The 1997 law on railway transport and subsequent decrees aimed at providing open access to the PKP network. Under this law, concessions can be licensed to:

- operate trains on networks run by other companies – as PKP runs almost the entire network, this amounts to providing external operators with access to the PKP network;
- manage a railway network (industrial railways are exempt unless they wish to sell spare capacity to other operators).

A concession document must describe the authorised activities of the concessionaire. Concessions for lines of national importance are granted by the Transport Minister, otherwise by the Voivodship or local government. The Chief Railway Inspector (Glowny Inspektor Kolejnictwa) must provide a licence to a concessionaire to run services based on technical/safety criteria.

Foreign railways can only obtain a concession if there is an inter-governmental agreement that provides for it. No such agreements have been entered into and there is reluctance to make agreements with neighbouring countries that have railway companies with access to much larger financial resources than PKP.

According to the draft law on PKP commercialisation, restructuring and privatisation (see below for details), the Chief Railway Inspector will be responsible for control of paths. Passenger services have no general priority over freight although Intercity and Eurocity trains do have priority. This does not represent a problem, however, because of the underutilised capacity on the network.

The rules for defining access charges are defined in a Ministerial decree. The rules are that charges should cover operation and maintenance costs plus a margin of no more than 5%. Depreciation may also be charged if the line has been constructed with capital provided by the infrastructure manager. Access charges will vary between line, time and train type. Discounts are possible depending on contract duration, the type of transport and ability to pay (but not volume). According to the decree, the details should be defined by the infrastructure manager and approved by Chief Railway Inspector. Disputes will be settled by the Chief Railway Inspector.

Other Operators

There were already about 20 external operators using PKP track by 1999. Many are coal mining companies (Kopalnia) which have own transport operations. These are now being established as separate transport companies. These companies their own sidings. One external operator, Chem Trans Logistic, is a forwarding company, which operates into Western Europe. The majority of the licensed carriers do not have their own engines or drivers and they would like to hire these from PKP but there

is nothing in the law requiring PKP to do so. External operators may therefore find it difficult to get access to engines and crew.

PKP have expressed concern that open access will lead to "cherry picking" as external operators take PKP's more profitable business. Whether "cherry picking" should be viewed as a problem or a welcome means of reducing freight rates for certain industries will depend on the balance sought in Government policy between the partly conflicting goals of improving the finances of PKP and introducing pressure to improve the overall efficiency of the rail sector through competition.

Draft Law before Parliament

A new law on PKP commercialisation, restructuring and privatisation was approved by the Council of Ministers in September 1999 and transferred to the Parliament. Opposition from the trade unions, as well as a rival proposal, is slowing down the process. A parliamentary transport commission is considering the options. The draft law envisaged by the government comprises the following main steps in the PKP restructuring process:

- *Commercialisation*: within 3 months of the passage of the bill, transformation of the state-owned PKP enterprise into a joint stock company (S.A.) with the State as sole owner.
- *Organisational, financial, assets and employment restructuring*: Within 6 months of establishing PKP S.A., separate passenger and freight companies would be created. A separate entity Polish Railway Lines PLK S.A., also a joint stock company, would be formed, in which PKP S.A. would keep a minimum of 51% of the shares.
- *Privatisation*: The privatisation of PKP would begin in 2001 based on privatisation procedures described a separate law on commercialisation and privatisation of state enterprises – the precise method of privatisation to be adopted for the different parts of PKP have not been defined.

Conclusions

Considerable progress has been made in reforming the railways in Poland. Once the draft law on the commercialisation, restructuring and privatisation of PKP is approved by parliament, Poland will have one of the most liberal regimes for open access in Europe. Privatisation, which largely follows the German model, will cover not only train operations but also infrastructure.

However, PKP is in a very difficult financial situation and facing problems with current financial obligations. A large number of analyses of the situation indicate the necessity of very deep organisational and financial restructuring with respect of assets and employment in the process leading to privatisation.

Passage through parliament of the draft law on PKP commercialisation, restructuring and privatisation is vital to resolve the problem of loss generating passenger transport traditionally cross-subsidised from freight revenues. The new law provides for financial compensation from county (*voivodship*) authorities for deficit generating regional passenger services. In 2000 a pilot project begins whereby a number of *voivodships* will begin financing regional passenger services from dedicated funds provided from the state budget.

ROMANIA

Background

In the 1990s, all Central and Eastern European countries (CEECs) had to reorientate their economies, in order to adapt to new economic and social realities. This re-orientation led to dramatic economic contractions and structural changes, that severely reduced the activity carried out by the railways. The modal share of railway transport also fell, in favour of road transport.

Romania was no exception. Rail's share of domestic freight fell from 83% in 1960 to 51% in 1996.[35] Even more dramatically, traffic fell from 75 bln net tonne km in 1980 to 24 bln net tonne km in 1996, a decline of nearly 70%. Despite this decline, the railway sector continues to be the main freight and passenger transport mode. At present, the Romanian railway network has a total length of 11 365 km, of which 25% are double track and 45% are electrified. About 140 000 freight wagons, 6,400 coaches and 3,200 locomotives carry:

- 24 billion net tonne km of freight traffic, second only to Poland in CEECs
- 18 billion passenger km.

Romanian railways began their restructuring process in 1991, starting from a similar situation to other railways in Central and Eastern Europe: a gigantic organisation, which was excessively bureaucratic and incapable of adapting rapidly and significantly to the domestic and regional changes.

The only way out of this situation was to replace the existing organisation structure, which had been exclusively focused on production, and to re-organise the railway to be able to meet customers' expectations, on a commercial basis. The main restructuring "models" were analysed (North America, New Zealand, South America, Sweden, Germany, Britain, France). The conclusion was that, whatever the starting situations and objectives of the solutions adopted in each country, none of them is by itself a guarantee of success.

Restructuring

The restructuring of Romanian Railways was a three-stage process:

- financial rehabilitation (1991-97);
- institutional reform (1998-);
- commercialisation and privatisation (1999-).

Financial rehabilitation (1991 – 1997)

Between 1991 and 1995, a number of non-core activities, such as track overhaul, cleaning of railway stations and passenger coaches, and rolling stock overhaul were institutionally separated, by restructuring them as private companies.

Between 1995 and 1997, the main railway sectors, respectively infrastructure, freight, passengers and real estate, were separated in accounting or financial reporting terms. The legal and operational frameworks for the introduction of infrastructure access fees were created and State responsibilities in supporting the railway infrastructure decided. In accordance with these new provisions, 25% of the financing of railway infrastructure was to be covered from State contributions and 75% from infrastructure access fees. At the same time, the railways started a painful staff reduction process that decreased SNCFR employees from over 190 000 in 1992 to about 106 000 employees at the end of 1998, having as a direct consequence a

near doubling in productivity. The percentage of personnel costs in the total SNCFR costs was reduced by 50%. In addition:

- Over 330 railway stations and about 1 000 km of lines were closed;
- 440 passenger trains were retired;
- 1 155 locomotives, 1 149 freight wagons and 4 500 coaches were scrapped.

The decline of the national economy made it impossible for the State Budget to support railway infrastructure to the required levels. Thus, the State contributions for supporting the railway infrastructure was reduced from 74% of current costs in 1994 to only 13% in 1998.

The State was not able to compensate the railways for the losses incurred on orders to meet public service obligations for social protection reasons. This shortfall in the State contribution offset all the favourable financial effects of restructuring and the railways therefore accumulated a debt of €300 million in only five years.

The railways had to cross-subsidise passenger transport from freight income. Each year, almost one third of the freight transport income was diverted to the passenger sector. These transfers prevented the renewal of the freight rolling stock (and the improvement in the quality of freight transportation services) and at the same time were insufficient to cover all the growing losses on the passenger sector.

Given that road transport was liberalised from 1990, postponement of the amendment of the legal framework for railway transport made it impossible for Romanian Railways to adapt to the market. In these conditions, with increases in freight rates and passenger tariffs by road permanently below inflation, rail could not compete on price and large segments of the railway market were thus to road transport.

Institutional reform

On 7 July 1998, Emergency Order Number 12 was passed which reorganised Romanian railways through the separation of infrastructure in accordance with the relevant EU legal framework. The main elements of this measure were:

- the commercial reorganisation into new railway companies;
- the definition of their public service obligation levels;
- managerial independence;
- capitalisation measures and the writing off of old railway debt.

It was acknowledged that a condition for the success of these reform measures was the concerted support of all political actors, as well as the need to maintain the current strategy for a period of at least three years.

Following this Governmental Decision, six railway companies were created on October 1, 1998:

- Caile Ferate Romane (CFR), the railway infrastructure company;
- CFR Marfa, the freight operating company;
- CFR Calatori, the passenger operating company;
- SMF, a Rail Management Services company that provides services on legal matters, foreign credits, financial and accounting assistance to the other five railway companies;
- SAAF, the Rail Asset Management company that will administer and dispose of surplus railway assets; and
- SNCFR, the remainder of the existing company, which will be responsible for managing and setting old railway debt.

The companies are run by:

- a General Assembly of Shareholders (5 members), appointed by the Minister of Transports (1 from the Ministry of Finance, the rest from the MoT);
- an Administration Board, appointed by the Minister of Transport, following the selection and recommendations made by the General Assembly of Shareholders.

The president of the Administration Board is also appointed as General Manager of the company.

This solution separates and protects the independence of the financial systems of the railway companies. SNCFR will retain all the debt, leaving the operating companies with clean balance sheets. This solution also eliminates the duplication of some administrative services.

Caile Ferate Romane (CFR), the railway infrastructure company, will manage two types of infrastructure:

- "Public infrastructure", such as main lines and marshalling yards, tunnels, viaducts, train control systems, on which it holds a 50 year concession from the Ministry of Transport.
- "Private infrastructure", such as land, buildings, other lines and stations, which it will own.

CFR will be free to close lines where its costs are not covered by access fees or government support.

CFR Marfa, the freight operating company, will have responsible for its own rolling stock. It will set its own rates but will need to compete with any open access operators as well as road hauliers.

In their new structure, the railway companies have full autonomy for introducing and withdrawing services, and entering into other economic activities.

The structure also creates the possibility of the emergence, in the near future, of other railway operators. At the same time, there is the possibility of privatising in the near future the maintenance of rolling stock and infrastructure, telecommunications and data processing services, inter-modal and freight transportation.

The consolidated financial results following the first three months of operating in the new structure, even in a situation where the State Budget could support only 45% of the needed passenger public service obligation expenses, were positive.

The methodology for licensing new railway operators was adopted in 1999 and applications for new freight operators have been received. State owned and/or private railway transport operators can obtain a licence, providing that:

- their main activity is rail transport for freight or passengers;
- they own or rent the necessary rolling stock, with the necessary technical characteristics to assure the safety and quality of transport service;
- they follow the technical prescriptions for circulation and manoeuvres of the trains;
- they have qualified staff for train driving, shunting, preparation, repairing, verification of the trains;
- they fulfil the technical, professional and financial capacities established by the MoT.

The role of government has undergone a fundamental change. The ministry no longer has responsibility for operating the railway. Its role is now to set policy, determine the railway's public service obligations and provide finance to support these obligations. The Ministry of Transport has a key role in overseeing the transformation to the new structure. A new regulatory body, the Public Railway Authority, was created in November 1998 to oversee safety and to handle licensing of operators.

Commercialisation and Privatisation

The minimal objectives of the new companies for 1999 are to operate without losses and to prepare the conditions for partial privatisation of the freight and infrastructure maintenance companies. The possibility of separating the short distance and long distance passenger transport services is also under study.

Access to infrastructure

Allocation of Capacity

CFR (infrastructure) has concluded a performance contract with the Ministry of Transport, under which it is required to allocate capacity to operators according to track access agreements, subject to the payment of track access charges. Paths are allocated by CFR without discrimination, to all railway operators. After obtaining a licence from the Ministry of Transport, the railway operators must make

bids to CFR for the paths it wishes to buy. These bids must be made a certain number of days before the implementation of the timetable.

These paths make up the basis from which annual timetables are worked out. If the number of bids exceed the capacity of existing infrastructure or if different operators are making conflicting demands, the Ministry of Transport must arbitrate according to rules, taking into account a number of factors such as the nature of the public service and other similar considerations.

At the moment, only two railway operators, CFR Freight and CFR Passengers, are operating in Romania. For the 1999-2000 railway timetables, capacity allocation has been decided in response to the railway operators' demands which have, in general, been satisfied since the railway system's capacity was sufficient and there was no real conflicts of interest.

Infrastructure Charges

MoT approves the maximum charges for infrastructure use and further submits them to the Government. The limits of the tariff for infrastructure use are fixed through the Performance Contract concluded between the railway infrastructure manager and the MoT. The pricing system takes into account particularly the costs of repairs and maintenance of track and the cost of operating the service. The infrastructure manager can negotiate the charges with the railway operators on the basis of number of paths, period requested and circulation section.

The infrastructure charging system is currently based on a set rate for each kilometre travelled multiplied by the distance travelled. In future, it is envisaged that infrastructure charges will comprise two components:

- A fixed part which would be paid every year and would be based on the length and profile of the lines used, the volume and type of traffic, the speed required, the type of traction, signalling axle weights, bridges, gauge and other traffic data;
- A variable part which would be paid every month and which is differentiated according to the section of track (main or secondary line) and the number of train km run.

The level of infrastructure charges is negotiable between CFR and the railway operator, taking into account the number of paths required, the sections of line and the period of demand (time of day, day of week)

The costs of capital repairs are financed by the state, in accordance with the performance contract concluded between CFR and the Ministry of Transport.

Other Charges

If paths are contracted for but not used, CFR may impose a charge on the operator, given that CFR has already prepared the infrastructure and allocated paths but that the terms of the contract have not been executed. In this case, the expenses of planning paths and the possible loss of income caused by the rejection of the demands of other operators for those paths should be recovered by CFR.

In the case of utilisation of lines and equipment belonging to CFR, on the basis of an access option, there are provisions for the operator to pay a usage charge. An access option gives the operator the right to buy paths at any time.

Infrastructure Access Contract

CFR must place its infrastructure at the disposal of operators in a non-discriminatory manner, using an access contract. Foreign operators and international groupings should be granted access to public railway infrastructure according to the conditions stipulated in the law and by conventions and international agreements to which Romania is a party.

The infrastructure access contract is concluded between CFR and each railway operator and defines:

- The services provided to the operator
  - the package of rights (access, utilisation, traction, power rating, conditions of operation of trains)

  - emergency services (in the case of accidents)
  - access options (to the telecommunications network and other services)
- Responsibilities for safety;
- Quality of service parameters;
- Charges for the use of infrastructure;
- Maximum levels of charges for other contracted services;
- The responsibility for damage and civic interests;
- The length of the contract and the method for resolving disputes.

Conclusions

Of all the CEE countries, Romania has moved fastest in restructuring its railways. Although open access operation is not as well developed as in Poland or the Czech Republic, the government has, after initial delays, acted more quickly in carrying out bold and rapid reforms of the incumbent railway. In formulating its approach, it has gone beyond the requirements of EU directives and has learnt important lessons from other countries about:

- the need to embark on reforms boldly and change course if they do not go according to plan
- the importance of removing debt form operating companies.

If successfully implemented, these reforms will establish Romanian railways on a sound commercial basis, with transparent interfaces between independent players based on contracts and operators subject to competition. Romanian railways will then be further forward on the path of reform, not just than other CEECs, but also than most countries in the EU.

SWITZERLAND

Railway Restructuring

Initial situation

Switzerland's current public transport structures developed over several decades. They no longer entirely satisfy the demands of a modern transport system. A number of structural inadequacies mean that the Swiss federal railways (CFF) and franchised service providers (FSP) are unable to provide efficient services. Railway restructuring is putting Swiss railways on a new footing and improving framework conditions for service providers.

Objectives of railway restructuring

The principal aim of railway restructuring is to make public transport more efficient and improve cost-benefit ratios. Rail companies must abide by the rules of the market and better exploit the potential it offers. The restructuring of the railways injects competition into the rail system. Only the provision of good services, priced as low as possible, will ensure that rail is competitive. A further aim of restructuring is to ensure that financing is more transparent and to improve cost control. Separating policy functions from corporate functions will ensure a clearer division of responsibilities and will clarify the respective roles of the railway undertakings and the government.

Measures taken

The restructuring measures can be divided into two categories: those applicable to all Swiss railway undertakings and those that concern only CFF.

Four measures are applicable to all railway companies

Measure No. 1 applicable to all railways: separation of infrastructure and operations

Separating the accounts and organisation of the two sectors will make the production process more transparent.

Organisational separation will allocate the main business of the companies to either the infrastructure or operations, in line with EU practice, in order to create the right conditions for granting reciprocal open access to the network.

The infrastructure sector comprises all the components necessary for trains to run (for example, personnel and installations). It primarily consists of the track and equipment permitting access to the railway system (for example, platforms, underpasses), capacity management and traffic control.

The operations sector covers transport operations and all related services (traction and train crews), marketing and distribution, rolling stock and maintenance, including the necessary depots.

Accounting separation ensures the necessary cost transparency. Cross-subsidies within the undertaking must be eliminated as they hinder service provision. This measure enables the introduction of open access to the network and a train path charging system. The infrastructure and operations sectors are, as far as possible, to be managed as profit centres.

Measure No. 2 *applicable to all railways*: *open access*

This measure allows other undertakings access railway infrastructure subject to payment of an access charge. The objective is to increase competition between the various operators.

Access to the Swiss railways is open to undertakings of other countries offering reciprocal arrangements to Swiss operators.

Access licence

Undertakings must meet certain technical and general requirements before they can obtain authorisation to use the network from the network access regulatory authority (*i.e.* a network access licence).

The six requirements for the network access licence:

- The undertaking's organisation must be such as to ensure safe and reliable operation.
- It must have qualified personnel.
- It must have safe rolling stock.
- It must be financially solvent with adequate insurance cover.
- Its staff must be employed under the terms and conditions normally pertaining in the sector, to prevent social dumping.
- It must comply with the safety requirements specific to the given line.

Train path allocation:

The infrastructure manager is responsible for allocating train paths. By train path is meant the right, limited in time and space, to use the track (analogous to air traffic "slots"). In the rail context, it is limited by legal restrictions as stipulated in the statutory instrument on priority traffic. In Switzerland, regional and long-distance passenger services are the backbone of the country's public transport system. These "time-dependent" services have priority in the use of the network. Consequently, freight traffic cannot disrupt the timetabling of inter-city and regional trains. This said, the Federal Council does have powers to grant waivers in the interests of the national economy and regional development. It can therefore give freight traffic priority over certain sections of track.

Order of priorities for train path allocation:

- Timetabled passenger trains take priority. Trains running every hour take priority over trains that run only once per day.
- Connecting trains must not be cancelled.
- In the event of trains with equal priority, market forces will be the deciding factor and paths will be allocated to the highest bidder.

Charges for paths

The train operator pays a charge for the use of the path to the infrastructure manager.

The *path charge* is made up of a basic charge plus a charge for additional services. Under the terms of Section 9b of the Swiss Railways Act (LCF), the *basic charge* comprises a minimum charge plus a contribution to costs. The minimum charge for all categories of transport is calculated from the standard marginal costs. These are set and published by the Federal Transport Office (OFT) in accordance with the principles set out in the statutory instrument on network access. In accordance with the Railways Act, *the contribution to costs for franchised passenger services* is determined by the franchise authority. For other trains, the infrastructure manager is responsible for setting contributions and charges for additional services in a non-discriminatory manner and for publishing them in accordance with the principles outlined in the statutory instrument.

Network access agreement

The infrastructure manager enters into an agreement with the train operator on the allocation of paths and user fees. All operators must be treated equally and offered the same technical and economic terms and conditions for comparable time requirements (advance purchase periods).

Arbitration committee

An arbitration committee will be appointed to ensure non-discriminatory access to the network. It will settle disputes regarding the allocation of paths and path charges.

Measure No. 3 *applicable to all railways: introduction of advance purchasing principle for all categories of traffic*

In 1996, an amendment to the Railways Act introduced the principle of advance purchasing of regional passenger services. Since then, any costs not covered are no longer paid ex post, but the federal government and the cantons purchase services from transport undertakings at a price agreed in advance on a tender basis.

This principle will henceforth be extended to all rail services. In future, the railways will provide only those services which cover their costs or which are purchased in advance by the public authorities. Under this system, only costs not covered that have been calculated and agreed in advance will be paid. The objective is therefore to provide only those services for which there is a market demand or services that are expressly requested, purchased and paid for by the authorities.

Measure No. 4 *applicable to all railways: liberalisation of freight traffic*

The objectives of railway restructuring also apply to freight traffic. From this point on, freight traffic will be left to market forces. The same regime will hence be applicable to both passenger and freight modes.

In principle, the railways must, be able to survive on the market without subsidies at the current level of supply of freight services, which they must constantly strive to improve.

Only in the event of changes to the framework conditions will the public authorities be empowered to guarantee a basic level of service by purchasing freight services. They may then decide what type of freight traffic rail must carry and the charges they are willing to pay.

Three measures applicable to CFF

Measure No. 1 *applicable to* CFF: *new rules governing relations between the government and* CFF

The new division of responsibilities between the federal government and CFF is clear. While the former sets financial and policy goals, with the help of the new service agreement, a spending ceiling and financial targets for CFF, the latter is responsible for operations management.

Service agreement

The Federal Council and CFF jointly set the targets for the undertaking for a period of four years, renewable. Formerly, the federal government assigned mandates unilaterally. The first service agreement, for the period 1999-2002, gives full operational and managerial freedom to CFF on the responsibility of its new board of directors.

The four strong points of the service agreement:

- Strategic guidelines
- Provision of transport services
- Infrastructure maintenance and development
- Financial benefits for the federal government

Separate medium-term targets are agreed with CFF for operations and infrastructure. Even if the management of the undertaking is systematically market-oriented, it is essential that the provision of basic national public transport services be guaranteed.

I*n the operations sector*, CFF must make a profit. When the provision of basic services does not cover its costs, the federal government and the cantons purchase and finance the necessary services. As before, this applies to both regional and combined services.

I*n the infrastructure sector*, costs must be covered and the rate of use of the rail network, and therefore productivity, must be improved. The management of investment for basic requirements and payments to the infrastructure sector were agreed jointly and are included in an investment programme.

Spending ceiling

The spending ceiling is a four-year infrastructure financing arrangement. If CFF fails to achieve the targets set, its deficits will no longer be covered automatically and will be charged to the undertaking's accounts.

Train services, chiefly purchases for regional passenger and combined services, are not included in the spending ceiling. Payment for them is covered by a compensation agreement under the purchasing procedure governed by the Railways Act and the statutory instrument on compensation. Finance for major projects is also excluded from the spending ceiling.

Parliament approves the service agreement and spending ceilings. It could, when it passes the Swiss budget, determine the basic values applicable to CFF. From now on, the budget and management report will be approved by the Federal Council only.

The Federal Council's strategic objectives for CFF SA

In order to safeguard the interests of the federal government as the owner of the undertaking, the Federal Council will give details in the strategic objectives of the targets set in the service agreement for operations and infrastructure and of the reporting and control system for the board of directors. It will also indicate the federal government's expectations as regards targets in terms of finances and personnel and CFF's co-operative ventures and shareholdings.

Measure No. 2 *applicable to* CFF: *new legal status*

CFF, a state-owned unincorporated body, was not capable, in its old form, to respond to the constantly changing transport market.

Its legal status was therefore changed in order to separate policy functions from management functions and to strengthen the undertaking's independence.

CFF has become a public limited company.

Its new status as a public limited company makes it more aware of its responsibility for management and its accountability for results. Moreover, it now has the same status as franchised service operators and foreign rail undertakings.

Measure No. 3 *for* CFF: *refinancing*

CFF will benefit from full debt relief. The deficits shown in its accounts for the past few years will be written off by cancelling its debts to the federal government (cancellation of cash loans). CFF will therefore be able to start the financial year on 1 January 1999 with no deficit on its balance sheets.

The federal government will also take over repayments and interest on pension and emergency fund loans totalling CHF 5.56 billion.

Of federal loans totalling CHF 14 billion, CHF 8 billion will be converted into equity capital and 4 billion into conditionally repayable loans at variable interest rates. A total of CHF 2 billion will remain as a cash loan at normal interest rates.

Current State of Restructuring

Acts and statutory instruments

Acts. Swiss legislation on the restructuring of the railways, passed by Parliament on 20 March 1998, came into force on 1 January 1999, namely: the new Federal Act on CFF; amendments to the Railways Act, the Passenger and Road Transport Operators Act, the Public Transport Act; and amendments to the Decree on the refinancing of CFF. These changes were in line with EU regulations (Directives 91/440, 95/18 and 95/19) and with the bilateral agreement on land transport.

Statutory instruments. The implementing legislation, 10 statutory instruments in all, also came into force on 1 January 1999. It comprises: four new statutory instruments (on access to the rail network; the award of rail infrastructure franchises; the award of passenger transport franchises; infrastructure not subject to the Railway Restructuring Act) and five amended statutory instruments (on the promotion of combined transport and the transport of accompanied motor vehicles; the railways; public transport; timetables; and OFT emoluments. A further, general, statutory instrument lists minor amendments to a whole series of other statutory instruments.

Future measures/second phase of restructuring

The restructuring of the railways should be thought of as a process of gradually adapting public transport structures to current requirements and conditions. As it is an on-going process, the first package of measures outlined here will be followed by others that will gradually enable better results to be achieved (greater efficiency, better cost-benefit ratio for public transport). Experience with the first stage will tell us whether and when other changes will be needed. A dynamic, practical procedure such as this allows restructuring to be constantly fine-tuned to new frameworks and to play an important role in a transport policy which must take account of multiple interconnections. This said, restructuring will continue to be co-ordinated with developments in other transport policy areas and with developments in Europe.

In the long term, depending on developments and experience with the current measures, other aspects could be integrated into the restructuring process. Harmonisation of financial flows will be one major objective. This would enable us to treat CFF and private railways on the same footing as regards infrastructure and investment financing (loans, contributions from the cantons). Another possibility would be the legal separation of infrastructure and operations at a later date.

Public transport is a very heavily regulated area. Therefore, the restructuring of the railways had to be incorporated into a highly complex legal context. During the second stage of restructuring, the regulatory framework (laws and statutory instruments) will be clarified and simplified.

UNITED KINGDOM

This section deals with the railways of Great Britain (England, Scotland and Wales). The railways in Northern Ireland have always been managed separately and remain in the public sector.

Historical Perspective

The railways of Great Britain were constructed entirely by the private sector in the 19th century. They were then heavily regulated which was unusual in other industries at that time. Rates, terms of service and industry structure were all regulated. During the First World War, the railways were run as a national system, demonstrating the inefficiencies of the disaggregated regional structure. The war also had a devastating effect on railway finances.

In order to address the major inefficiencies arising from duplication and excess capacity, the Railways Act 1921 amalgamated the railways into 4 private regional companies. The Act also provided for regulation of rates. The main impact of the regulation of rates was not on the overall level of rates but rather their lack of flexibility since the law prevented "undue preference' (*i.e.* discrimination in modern.

Nationalisation of the railways did not occur until 1948, later than elsewhere in Europe. The four regional companies were at that time restructured into six regional groups within a single national railway. Regulation of maximum rates continued but the railways were no longer required to avoid undue preference and to treat all shippers equally. Further deregulation occurred with the 1962 Transport Act, which relieved British Rail (BR) of any obligation to take unprofitable traffic.

Increasing financial difficulties led to major cuts following the publication of the Beeching Report[36] in 1963. The main cuts affecting freight were:

- Route mileage was reduced by 30%.
- The numbers of freight depots and stations was reduced by 70%.
- The number of marshalling yards was reduced by 50%.
- BR was to withdraw from wagonload freight, which was considered to be unprofitable.

In 1982, BR decided that it needed to change from a production driven railway to one driven by the market. It introduced five business sectors, including ones for Parcels and Freight (later split into Trainload Freight and Railfreight Distribution). BR began a process of reducing the power of the regions, which BR had inherited from before nationalisation. These regions had been focused on production and were poorly organised for providing a seamless service to inter-regional customers. This process culminated in 1992 with the abolition of the regions and the transfer of all assets, including infrastructure, to market based profit centres. The final structure of British Rail immediately prior to privatisation therefore consisted of vertically integrated operators with each piece of infrastructure allocated to its "prime user", which was rarely freight.

In 1982, BR also began to divest itself of non-rail interests beginning with hotels and ferry services. In 1989, it sold off British Rail Engineering Ltd (BREL), its rolling stock manufacturer. It is also notable that, by 1992, about half of the rail freight wagons in Britain were owned by shippers.

Despite the radical cuts during the 1960s and the internal re-organisation and partial privatisation of the 1980s, BR continued to lose traffic and deficits continued to rise rapidly. The decline in traffic was

particularly marked for freight, which had begun to decline in the early 1950s, some 20 years before the decline began in France and Germany. Between 1952 and the financial year 1993/4,[37] rail freight tonnage in Britain halved and rail's share of the freight market declined from 42% to only 6.5%,[38] well below the average for the EU (15%).

In 1993/4, the freight business represented only 20% of BR's revenue. BR was receiving only limited subsidy from the Government for freight through Freight Facilities Grants, which fund capital expenditure where there are environmental and other benefits. However, freight was only paying marginal cost for track under BR accounting conventions. Despite cuts in services, including withdrawal from wagonload freight, BR was losing money on its container, international, parcels and letters services.

The reasons for the decline of freight and its deteriorating financial position were mainly exogenous. They include:

- The decline in the importance of coal and other traditional heavy industries
- The railway's difficulty in serving the logistical requirements of modern industry
- The relocation of factories to areas which do not have rail facilities
- The development of an extensive road network and an increasingly competitive road haulage industry following its deregulation in 1968.

Some of these explanations apply to other countries, but the general economic changes occurred earlier in Britain than elsewhere in Europe. Also rail freight's difficulties in Britain were exacerbated by geography. There are relatively few long distance movements in Britain and the average length of haul for rail freight was only 113km in 1993. Since rail cannot exploit its distance advantage, this largely restricts the profitable rail markets to those where it has cost advantages from high volumes. This accounts for the dominance of the trainload business, which by 1992 represented 80% of BR's freight revenue.

Restructuring and Privatisation: The Railways Act 1993

In November 1993, Parliament passed the Railways Act 1993, which provided the basis for the privatisation of British Rail. The aims of the Act were to improve the quality and efficiency of rail services and encourage their use by:

- Introducing competition.
- Providing additional investment by the private sector.
- Introducing private sector management.[39]

In preparation for privatisation, the railways were restructured radically. The vertically integrated structure introduced by BR in 1992 was abandoned before it had had time to settle in. In 1994, the rail industry was split into about 100 companies, all of which are now privately owned. 25 operating companies provide passenger services under franchises, some of which are supported by national (and sometimes local) government. BR was vertically separated with the formation of Railtrack, which owns, manages and allocates capacity for almost all rail infrastructure (track, signalling, bridges and tunnels). Railtrack is also the freeholder of certain freight terminals, sidings, yards, depots and other premises and grants long term leases on these facilities to freight operators.

At the time of the Act, BR had three rail freight businesses:

- Trainload Freight, which represented 65% of rail freight revenue (80% once the trainload part of Railfreight Distribution known as "Contract Services" was transferred to Trainload Freight)
- Railfreight Distribution, which comprised Channel Tunnel services and Freightliner, which served the domestic and deep sea container markets (90% is deep sea)
- Rail Express Systems, which carried parcels and letters.

Table 6. **Trainload Freight: Proportion of Rail Tonnage and Modal Share (1991/2)**[1]

Market sector	Proportion of rail trainload tonnage	Modal share of rail
Coal	42%	Industrial coal: 30% Power station coal: 75%
Metals	20%	85-90%
Construction	21%	5%[2]
Oil and petroleum	17%	15%

1. Rail freight privatisation, the Government's proposals, Department of Transport 1994.
2. 54% for movements over 160 km.

Of these, only Trainload Freight was profitable.[40] Trainload Freight principally provided private siding to private siding trainload services for individual customers in four market sectors: coal, metals, construction and oil and petroleum. Table 6 shows the proportion of rail tonnage and modal share in each of these markets (before Trainload Freight absorbed the Contracts business):

Table 6 shows that for power station coal and metals, Trainload Freight enjoyed a modal share of well over 50%. There was therefore an issue about how to ensure competition in these and other trainload freight markets. Shippers made representations against the formation of a privatised monopoly. The Government intended to structure Trainload Freight for privatisation in such a way as to balance two objectives:

- To instil competition in order increase efficiency.
- To avoid fragmentation which would threaten the existing economies of scale in the industry.

It therefore decided to break Trainload Freight into three companies with patterns of services focused on different regions. The companies would however overlap with one another and would be allowed to compete nationwide. They would also have to compete with open access operators. Soon after the formation of these three companies as BR subsidiaries in 1994, one of them introduced a new wagonload service (Enterprise), based on a hub system, which has since proved to be a source of growth.

In contrast to the considerable interest shown by the private sector in passenger franchises, very little interest was shown in freight. In the end, the Government sold all three Trainload Freight companies in 1996 to a consortium led by Wisconsin Central, a US short line operator). The company adopted the name English Welsh and Scottish Railways (EW&S). The same consortium later purchased the loss making Rail Express Systems and the Channel Tunnel part of Railfreight Distribution (*i.e.* excluding the Freightliner business). This gave EW&S 90% of the total rail freight business in Britain. A recent article by the former Chairman of the British Rail summed up the episode: "The efforts to create on-rail competition in defiance of business economics were to a large extent wasted".[41]

Freightliner was sold in 1996 to a management buyout. A Track Access Grant of £75 million over 5 years was provided as part of the privatisation package. Freightliner is essentially a wholesaler providing inland intermodal transport of containers or tanks to shipping lines, logistics companies and road hauliers. This is a highly competitive market as all traffic could easily go by road.

In contrast, intermodal competition from road haulage to EW&S's core trainload business is more limited. Rail competition can come from open access operators, providing they meet safety and licensing requirements. There have only been two open access operators, both carrying some of their own freight using their own locomotives and drivers.[42] They are:

- National Power (the largest pre-privatisation open access operator), the largest UK electricity generator, but this operation was bought out by EW&S in late 1998;
- Direct Rail Services (a subsidiary of British Nuclear Fuels) which began operations in 1998 – DRS has also begun trials for third parties (food distributors).

These are highly specialised operations and may not be replicated on a large scale. As the former Managing Director of EW&S stated in an interview, "other operators will only enter the industry if we fail to provide an adequate service".[43] Potential open access operators of rail freight services face significant barriers to entry:[44]

- Preparing a safety case is time consuming and expensive.
- Annual insurance premiums can be very high in relation to the scale of operations of a small open access operator.
- There are economies of scale and scope which put small open access operators at a disadvantage *vis-à-vis* EW&S in some markets, *e.g.* a critical mass is required before effective utilisation of rolling stock and maintenance facilities can be achieved.
- The second hand rolling stock market is not well developed.
- Gaining access to the network is complex – charges may also be high in comparison with the charges paid EW&S.

However, major customers may enter the industry for a variety of reasons, *e.g.* to understand the true cost of rail haulage and obtain a better deal for the operator.

There is particular public policy concern over Railtrack, the monopoly provider of infrastructure services. There has been considerable comment from operators and shippers that Railtrack is not interested in freight, as it represents less than 10% of its income (the low proportion is partly because freight is charged as a marginal user and makes no contribution to fixed and joint costs). In response to this criticism, in April 1997 Railtrack issued a 10 point plan for the development of rail freight.[45] The plan included lower costs, better routes, improved services, development of terminals and formulation of a Code of Practice. There was also a target to reduce barriers to entry by open access operators so as to increase their share of the market to 10% in five years.

Current Regulatory Framework

Regulatory oversight of rail freight under the Railways Act 1993 is the responsibility of the Rail Regulator. The Rail Regulator is appointed by the Secretary of State for Transport. The Regulator manages a non-ministerial government department, which is funded from licence fees. His duties (objectives) under the Act can be summarised as follows:

- protecting the interest of rail users and promoting use of the railway network;
- promoting competition and preventing abuse of market power;
- imposing on operators the minimum of restrictions and enabling providers of services to plan for the future.

The Railways Act 1993 gave the Rail Regulator powers in the areas of rail competition and consumer protection issues.

The Rail Regulator has two main functions (powers) which are relevant to rail freight:

- licensing railway infrastructure and passenger and freight operators;
- approving contractual relations between Railtrack and train operators.

The Regulator's licensing function can be used to discipline Railtrack and operators if they abuse their market power to exploit their customers. This function has been used extensively on Railtrack, which is now required to produce detailed annual plans and to maintain a variety of performance statistics as part of the licensing process. In 1997, adequate investment was made a condition of Railtrack's licence.

In 1997, the Regulator employed consultants to undertake a review of the freight market[46] in order to:

- Develop a strategy to promote the development of rail freight within the context of the regulator's duties.
- Identify the main factors that will determine rail freight demand over the next 15 years and the way in which they might be affected by the actions of key industry players.

The main purpose of the study was to determine actions required to assist the development of rail freight. The study concluded that, after years of decline, there was potential for growth though not on the scale envisaged by the rail freight industry which was forecasting a doubling or tripling of traffic. It further came to the conclusion that growth is contingent on a number of actions being taken by Railtrack and the freight operators, with greater regulatory control from the Rail Regulator.

Following the above freight study, the Regulator set out the following regulatory strategy for rail freight:[47]

- regulatory action will be focused on protection against potential misuse of market power by anti-competitive or exclusionary behaviour by dominant companies in respect of competitors, including the unfair use of that power over the supply industry;
- railtrack will be required to supply freight with enough capacity;
- regulatory action will not be intrusive and the administrative burden of regulation on the industry will be minimised;
- the prices quoted by EW&S to dependent customers will be compared with those charged to customers in general and there will be publication of price information.[48]

For train operators, the Regulator stated that his strategy was to use general competition law and, if necessary modifications to licences, to take enforcement action in the case of misuse of market dominance. For Railtrack, the Regulator stated that he expected that Railtrack's 10 Point Plan would be developed into a comprehensive freight strategy which Railtrack would share with freight operators. This strategy is now under continuous evolution. It is published annually as part of Railtrack's Network Management Statement in which Railtrack sets out (as part of the licensing process) its plans for developing the network.

The other main function of the Regulator, that of approving contractual relations between Railtrack and train operators, includes review of: Railtrack's charges for access to the network to ensure they are not excessive or discriminatory; of the quality of train paths and the performance regime; and review of the implications of agreements for the capacity available for other operators.

Railtrack's charges for freight are negotiated with individual operators but they must be approved by the Regulator. In 1995, the Regulator published his criteria for approval of access charges.[49] The criteria are that:

- The structure of charges should reflect the value of access to users and should enable Railtrack to recover its total freight specific costs (avoidable costs) plus any expected contribution to shared common costs.
- Charges must lie below standalone costs.
- Charges should be neither higher nor lower than for other operators taking into account specific factors related to the services provided.

In the same document, the Regulator noted that in 1995/6, Railtrack did not expect to cover its total freight specific costs from freight. However, he considered it should be able to do so within a few years through a combination of cost savings and negotiations with operators. In setting the charges for passengers services, he took the view that freight revenues were unlikely to make a material contribution to shared costs over the period to March 2001 (the period for which he was then reviewing access charges).[50] Track access charges were initially established for this 6 year period and change annually based on the retail price index. Price regulation is the normal approach to economic regulation of monopolies adopted in the UK and has the advantage over the rate of return regulation in that it encourages efficiency. However, it creates a difficult challenge for the Regulator in getting the price right and may lead to game play by the regulated monopoly at the time of the periodic review of access charges.

Access charges were structured with low variable charges in order to encourage operators to increase services. In the event, traffic has grown far more than expected but the low variable access charges mean that there is no incentive for Railtrack to facilitate the rise in traffic through investment or any other means. The Regulator is currently considering whether the structure of access charges should change for the period 2001–6 in order to improve the incentives on Railtrack.

Regulatory invention on track access agreements has aimed at creating an appropriate balance between the rights and aspirations of different operators. This has worked both in favour of freight and against it. In approving track access agreements for passenger train operating companies, the needs of freight have frequently been taken into account. On the other hand, the track access agreement between Railtrack and EW&S was modified by the Regulator to provide more flexibility for Railtrack to meet the needs of passenger operators.

On the related issue of timetabling, the Regulator issued a Policy Statement in 1998.[51] This statement recognised that freight had been at a disadvantage in the timetabling process because of the uncertainty concerning future freight demand. Recognising the importance of providing a rapid response to the needs of freight customers, the Statement proposed that Railtrack take a more positive stance in allocating capacity for freight services, where there is a reasonable likelihood that this capacity would be utilised.

Impact and Issues

Following the privatisation of the trainload freight business in February 1996, rail freight underwent a minor revival:

- Between 1995/96 and 1997/98, tonne km carried by rail increased from 13.3 to 16.9 billion tonnes, an increase of 27%, with modal share increasing from 5.9% to 7.2%.[52]
- Intermodal and international traffic has increased more quickly than trainload traffic,[53] confirming that new markets are expanding.
- New commodities such as supermarket goods and milk are switching to rail.
- EW&S has spent over £500 million on new locomotives, wagons and a new customer delivery centre.
- Several new rail freight terminals have been opened

In 1998/99, there was a small increase in traffic to 17.4 billion tonne km but the tonnage lifted actually fell in that year. Also there has been no increase in the tonnage of profitable coal traffic since 1995/6. In common with the passenger businesses, freight has benefited from economic growth. Economic growth has led to increases in demand and increasing congestion on a railway that had been starved of investment during the privatisation process. Congestion in turn has led to deterioration in the performance of the railways, in terms of punctuality and reliability.

Little, if any, of the increase in traffic can be attributed to deregulation alone. Rail freight is still dominated by one provider, albeit a private one, although tough road competition remains and the market is contestable by open access operators. To the extent that traffic growth has been caused by the reforms, rather than by economic growth, it is probably mainly from the transfer of ownership to the private sector and the resulting freedom from Treasury controls on spending. The higher level of investment, which is necessary to ensure future growth, has therefore been permitted by privatisation, and this meets one of the previous Government's original objectives. Investment may have been encouraged by the fact that the dominant freight operator is prepared to make major investments because, without strong competition, it is exposed to less risk of losing its market.

There are nevertheless a number of issues concerning the regulation of rail freight:

- Freight services are still run on what is essentially a passenger railway – there are still major issues about freight's ability to expand in an environment in which any spare capacity is taken by passenger services, which have more predictable demand and are therefore able to make "bankable' commitments.[54]
- The planning of investment is made more difficult by the separation of infrastructure from operations and the track access regimes for passenger train operators contains low variable charges and so provide little incentive to Railtrack to invest in enhancement of the network.
- There is a major issue about the timing and standard of renewal of the network, particularly for the benefit of freight. One pressure group, the Piggyback Consortium, recently claimed that less than 1% of Railtrack investment last year was exclusively for freight.

These issues may need regulatory intervention if they are to be resolved.

Current Government Policy

In July 1998, the new Labour Government published a White Paper on Transport.[55] The main proposals affecting rail freight were that:

- A Strategic Rail Authority (SRA) should be formed to provide a focus for the strategic planning of both the passenger[56] and freight railways. It would:
  - set targets for rail traffic growth, monitor network capacity and assess investment needs;
  - ensure that due weight is given to freight in day to day decisions;
  - take on responsibility for the Freight Facilities Grant, which would be made more accessible and increased in budget
- An Infrastructure Investment Fund should be established to address capacity constraints caused by pinch-points, including those affecting freight.
- The periodic review of track assess charges being undertaken by the Rail Regulator should consider whether Railtrack should receive direct payments from the Government under contract in order to increase control of the investment programme.
- The Regulator should be required to follow statutory guidance from the Secretary of State – as an interim measure, a concordat had been reached with the Regulator emphasising the importance of promoting freight.

Some of these changes will require new legislation and are included in the Transport Bill which is currently being considered by parliament. In the meantime, a shadow SRA was established in April 1999 and many of the changes envisaged in the White Paper are being implemented under existing legislation. In particular, the shadow SRA is tasked with filling the strategic planning void left by privatisation and with the issue of finance.

A further major change in the regulation of the rail industry arises from the Competition Act 1998. This Act has two implications:

- The Regulator will have concurrent powers with the Director General of the Office of Fair Trading, in relation to actions likely to restrict, distort or prevent competition – the Railways Act 1993 had given powers in this area to the Regulator alone.
- The Competition Act 1998 will also widen the possible areas of regulatory intervention and provide more flexibility to the Regulator and the Director General in carrying out their functions and duties.

Concluding Remarks

Rail privatisation in Britain was a bold experiment in a number of respects. Though the changes are consistent with the direction set by EU Directives, Britain is the only place in the world where:

- A vertically separated track company has been privatised.
- A private company has taken over more than 90% of the rail freight market but without direct control of track.

Despite the previous Government's original intentions at privatisation, the eventual structure chosen for rail freight was such that competition is limited. The two common carriers, EW&S and Freightliner, operate in separate markets, and the third operator, BNFL, only carries nuclear fuel and waste. Competition in practice will be dependent on:

- The market entry of more open access operators.
- Competition from road haulage, which is limited in some bulk (trainload) markets.

However, even the trainload rail freight market is contestable as revealed by the recent entry and exit of operators in the trainload freight market. Railtrack, on the other hand, is a classic monopoly.

The overall impact of reform on rail freight appears to be positive so far but, as noted above, most of the improved performance can probably be attributed to transfer of ownership to the private sector rather than

to changes in the regulatory environment as such. It is therefore difficult to conclude whether or not the current regulatory environment has assisted in the resurgence of rail freight that followed privatisation.

There may be a case for reducing the level of regulatory intervention over rail freight operators, given the contestability of the markets. However, regulation of Railtrack remains a priority and the greatest challenge for the Government, the SRA and the Rail Regulator is how to ensure that Railtrack is effectively incentivised and regulated. It remains to be seen how successful the various on-going initiatives are in addressing these issues.

Annex

SAFETY REGULATION

The Secretary of State and the Rail Regulator have a duty under the Railways Act of 1993 to take account of the need to protect persons from dangers arising out of the operations of the railways. In doing so, they must take account of advice provided by the Health and Safety Executive (HSE), which has regulatory responsibility for safety under separate, earlier legislation.

The HSE is an independent statutory authority that promotes safety across a wide range of commercial and industrial activities, including railways. Her Majesty's Railway Inspectorate is the part of HSE dealing with railway safety. It is responsible for overseeing safety on railways and for investigating accidents. Safety concerns are thoroughly explored as part of granting train operating and other licenses. The track authority, Railtrack, performs the initial vetting and approval of operators. Its decisions are subject to confirmation of the HSE. One issue that is currently being examined is whether railway safety regulation should be independent of Railtrack.

The fear that privatisation would reduce safety has not be borne out in practice. Comparing the years 1996/7 and 1997/8 with the four previous years:[57]

- Accidental fatalities per train mile were unchanged
- Accidental injuries per train mile fell slightly
- Train collisions and derailments fell by nearly a half.

On the other hand, there are comments from operators that safety regulation is too much of a burden. The former Chairman of EW&S pleaded with regulatory authorities not to strangle the railways with unnecessary safety legislation.[58]

REGULATORY REFORM IN SELECTED COUNTRIES

NORTH AMERICA

NORTH AMERICA

North American Context

The markets for rail freight in North America have changed in recent years, partly as a result of the North American Free Trade Agreement (NAFTA), which has encouraged increases in traffic between the United States, Canada and Mexico. International traffic between NAFTA members is increasing at 12-14% annually. This has led to an increase in international operations, and to trans-national ownership and to strategic alliances. These trends have meant that deregulation in one country, particularly the United States, has influenced the development of regulatory structures in others.

Growth in trans-national ownership has taken several forms:

- US railway companies have bought some of the smaller railways in Canada, and more recently, BNSF (US) has proposed acquiring Canadian National.
- Canadian railway companies have bought both Class I and smaller railways in the United States.
- US railway companies have taken stakes in Mexican railways.

In Mexico, US carriers have stakes in all four recently privatised systems. However, in the US and Canada, each national market is dominated by national carriers:

- In Canada, the two major Canadian transcontinental carriers have a 90% market share of tonne km within Canada.
- In the United States, US carriers represent 95% of revenue, the rest being carried by the two major Canadian transcontinental carriers.

In 1997, there were five major US operators with annual revenues ranging from US$3.6 to 9.8 billion and two slightly smaller Canadian ones with annual revenues of US$2.7 and 3.1 billion. No other carrier in the continent had revenue over US$1 billion. Regulators are faced with the crucial questions of:

- What measures can be introduced to maintain real contestability in various markets if mergers continue?
- Has the number of major railways been reduced to a point where further mergers between them would result in significant unavoidable losses in competition?

UNITED STATES OF AMERICA

Background and Early Development

Because of the size, geography and structure of the economy of the United States:

- A high proportion of freight transport consists of bulk commodities – for example, railways carry 60% of all coal and coal represents 38% of total carloads (excluding intermodal).
- Average lengths of haul are often long (the average for Class I railways[59] is 1,360km[60]).
- 30% of freight is internationally traded through ports or, increasingly, within NAFTA.

As a result, rail enjoys a competitive advantage in freight. Because of the long distances, low air fares, high car ownership and low petrol prices, passenger operations are not competitive. Freight therefore dominates the railways.

The Interstate Commerce Commission (ICC) was formed to regulate the industry in 1887, when railways dominated the transport sector and there were concerns about the abuse of monopoly power. Regulation was later further strengthened, despite the dominance of railways being reduced somewhat in the first half of this century. In 1945, railroads were still responsible for nearly 70% of intercity freight. This share had fallen to 37% by 1980.[61]

The National Passenger Railroad Corporation, Amtrak, was formed in 1970, to take over inter-city passenger traffic from the private railways, which then became freight only. This was in response to increasing losses being incurred on these services, the consequent lack of investment and deteriorating service and the additional problems this was causing for freight operators. Amtrak is a federally owned corporation subsidised by Congress. Amtrak owns the track infrastructure it uses in the Northeast, and has the right to operate over all other track under negotiated access agreements (subject to adjudication in the event of a dispute with the infrastructure owner).

The freight railways, in contrast, remained largely in private ownership. They were heavily regulated, with controlled rates. Confidential contracts with shippers were not allowed and only common carrier rates permitted. Before deregulation, they therefore exhibited many of the features of public sector organisations. These features included weak marketing, excessive bureaucracy, overmanning and inefficient labour practices.

During the 1970s, returns on investment fell to low or negative levels and about 20% of the railway industry went into bankruptcy. By the mid 1970s delays in maintenance and capital improvements were estimated at US$4 billion, 25% of annual revenue in the industry.[62] The Consolidated Rail Corporation (Conrail) was formed in 1976 from the consolidation of the bankrupt companies in the Northeast and Midwest and US$7.4 billion of government funds were invested in its rehabilitation.[63] The intention was to make Conrail viable and then to sell it. If it were not possible to make it viable, it would be liquidated, an option that greatly assisted in negotiations with the trade unions. From 1976 until its sale in 1987 (for US$1.9 billion, at a considerable loss), Conrail was owned by the federal government.

The freight railways are therefore again almost entirely in private ownership. Class I railways are all privately owned and receive no subsidy. There are still some short lines and one regional railway in public ownership and some of these receive small federal subsidies for rehabilitation work when justified.

Deregulation

In 1980, in response to the continuing financial crisis in the industry and because other modes had previously been successfully deregulated, Congress passed the Staggers Act. The objective of the Act was to achieve a balance between financial viability of the railway industry and the interests of shippers.

This Act partially deregulated the rail freight industry by severely limiting the powers of the ICC, particularly in the areas of rate setting and trackage (access) rights for one railway to use the track of another railway . Greater reliance was placed on competition.

In 1995, the ICC was replaced by the Surface Transportation Board (STB) and some of ICC's regulatory functions were eliminated and some transferred to other bodies. STB is an independent body attached to the Department of Transport. STB has broad economic regulatory oversight of the railways. STB is responsible for promoting commercial negotiations and for facilitating transport in order to protect the public interest, which includes the financial impact on the carrier.

STB jurisdiction covers all railways operating within the United States, although its primary focus is the Class I carriers. It has the duties to:

- Ensure carriers have trackage rights to operate on another carrier's infrastructure in certain circumstances, mainly where mergers have occurred – these rights are required by law to be non-discriminatory (however, trackage rights are normally freely negotiated on a reciprocal basis without regulatory intervention);
- Reduce rates in limited circumstances, where a complaint is filed and market dominance and power can be shown, or the complaint is *bona fide*;
- Address quality, where a complaint is filed and market dominance and power can be shown to exist;
- In limited circumstances, control exit from the rail business through abandonment or sale;
- Exempt certain transactions or services from regulation, where competition makes regulation unnecessary;
- Issue directed service orders allowing one carrier to operate over another's lines during a service emergency.

The most regulated aspect of the regime is STB's right to approve or decline mergers in the rail industry, or to impose conditions (*e.g.*, trackage rights or divestment of line sections) on the merger to promote competition, where this is in the public interest. Approval by STB confers immunity from anti-trust proceedings.

STB does not therefore routinely review contracts between operators and shippers. These are considered to be commercial matters. The STB's right to intervene is limited to situations where shippers claim they have been discriminated against. The onus is on shippers to demonstrate market dominance before maximum rate regulation can be applied. Even where shippers are captive, STB encourages parties to come to an agreement without its intervention. About 70% of traffic are therefore moved under freely negotiated contracts[64] and regulatory intervention occurs only for commodities or routes where competition is inadequate and where competition will be weakened by a change in the *status quo*, such as a merger.

Mergers between competing rail companies are assessed to determine whether the potential gains in terms of cost savings outweigh the loss in competitive stimulus to efficiency. There can be better ways to preserve competition than completely preventing a merger, *e.g.* by requiring lines serving markets where the merging companies competed to be sold to a third party or that trackage (access) rights be provided to third parties, and STB normally prefers this route.

STB has no powers to require carriers to spend capital although its decisions may lead indirectly to capital being spent.

Parties to a hearing before STB have the right to appeal STB's decision to the Courts if they consider that STB has:

- acted contrary to the opinion or desire of Congress when it passed legislation; or
- been arbitrary or capricious.

The regulatory system seems to have worked well in preserving competition overall, although cases of dispute have revealed the many more or less subtle ways in which the owner of the tracks can create barriers to entry when access exists in theory.

Impact of Deregulation on Industry Structure

Deregulation has resulted in the following contrasting changes in industry structure, combining both fragmentation and concentration:

- fragmentation through an increase in the total number of railways through the growth of short lines and regional railways;
- greater concentration of the industry as a whole, through mergers of Class I railways.

About 365 short lines and regional railways have been formed since 1980 and they now number over 500.[65] Their share of track km has increased from less than 5% to about 29%, although they carry only about 9% of tonne km.

Table 7. **Evolution of Industry Structure (1980-1997)**

Classification	Numbers of carriers		Track kilometres			
	1980	1997	1980		1997	
	Number	Number	Km	%	Km	%
Class I	40	9		95	195 000	71
Regional/ small	Not known	541		5	79 000	29
Total	Not known	550	432 000	100	274 000	100

The short lines and regional railroads have significant advantages over Class I carriers:

- being small and local, they are closer to customers and are therefore able to provide a better service;[66]
- they normally have lower costs than Class I railways[67] as a result of being subject to lower labour rates, fewer restrictive labour practices and different safety standards that imply lower labour and capital costs.

Deregulation has resulted in the consolidation of Class I freight railways[68] from around 40 in 1980 to nine at the end of 1998. These are listed below with their region of operations and their 1997 revenues. The Class I railways represent 91% of all freight revenues:

Of the nine Class I railways, five are major carriers. These carriers are far bigger than the other Class I railways and, between them, they represent 94% of Class I railway revenue. The division and take over of Conrail (which held a monopoly over routes to New York) by Norfolk Southern and CSX was approved by the STB in July 1998 and reduces the number of major railways to four, two in the West of the country and two in the East. This suggests that the consolidation of the industry has now reached a point where mergers and acquisitions raise important issues of market concentration and economic dependence.

Mergers have enhanced the market power of rail firms by reducing the number of competitors in markets where rail has a significant technical advantage. This might be expected to have resulted in excess profits in some markets but, given the low rates of return experienced by the industry (despite the rapid increase in productivity), this does not seem to be significant for the rail freight market overall.

Particular concerns arose when Union Pacific (UP) merged with Southern Pacific in 1996 to create the largest railway in the country. Following this merger, rail operations across much of the south of the

Table 8. **Class I Railways and their Revenues**

Railway	Region	Operating revenue in 1997 (US$ million)[1]	Share of Class I railway revenue
Union Pacific[2]	West and South	9 800	30%
Burlington Northern and Santa Fe (BNSF)[3]	West	8 408	25%
CSX Transportation	East	4 989	15%
Norfolk Southern	East	4 222	13%
Conrail	East	3 646	11%
Illinois Central[4]	East	622	2%
Soo Line (Part of Canadian Pacific)	West	559	2%
Kansas City Southern	West	516	1%
Grand Trunk Western (Part of Canadian National)	East	352	1%
Total operating revenue (Class I railways)	–	33 114	100%
Of which: freight revenue (Class I railways)	–	32 322	–
Freight revenue, regional and small railways	–	3 027	–

1. Includes revenue from non railways activity.
2. Formed in 1995 from the merger of Union Pacific with Southern Pacific.
3. Formed in 1995 from the merger between Atchinson,Topeka and Santa Fe with Burlington Northern.
4. CN's takeover of Illinois Central was approved by STB and implemented in 1999.

USA collapsed, as a result of a badly managed rationalisation. The collapse caused major problems for shippers and for port operators. Many explanations have been given for the collapse, including:

- Crew shortages.
- Failed computer systems.
- Inherited infrastructure problems.
- Increasing traffic levels.
- Culture differences.

The disruption caused the merged company to experience major costs, which may deter railway companies from over-stretching themselves in the future. The issue is whether commercial disincentives are sufficient to prevent a recurrence of this major disruption, or whether regulatory intervention is required.

The length and seriousness of the crisis led STB to carry out an investigation to try to find a solution to the problem. On STB's instigation, temporary access rights were granted to other operators over the track of the merged operator. In 1999, STB declared that the service crisis was over.

Further mergers between major railways may not occur in the short term due to the time required to consolidate recent mergers and the possible resistance of shippers and STB. Resistance is likely to be greatest where the merged railways would dominate a part of the country. Some observers foresee further mergers resulting in the creation of two trans-continental railways. This is supported by some shippers, as they foresee advantages in having carriers providing trans-continental services, for example, to avoid the need for some shipments to be transferred between terminals where systems meet, such as Chicago.

Mergers to create a trans-national railway are therefore less likely to meet objections than a merger creating a monopoly in one region of the country.[69] This is because, for mergers between companies in different regions of the country, the benefits to shippers of one company providing through services are more likely to outweigh the potential loss of efficiency through reduced competition. A merger between BNSF and UP (both with operations concentrated in the West), for example, is therefore unlikely whilst one between UP and Norfolk Southern is possible. The recent proposal to merge BNSF and CN raises more complex issues because of CN's interests in US railroads (see Table 5).

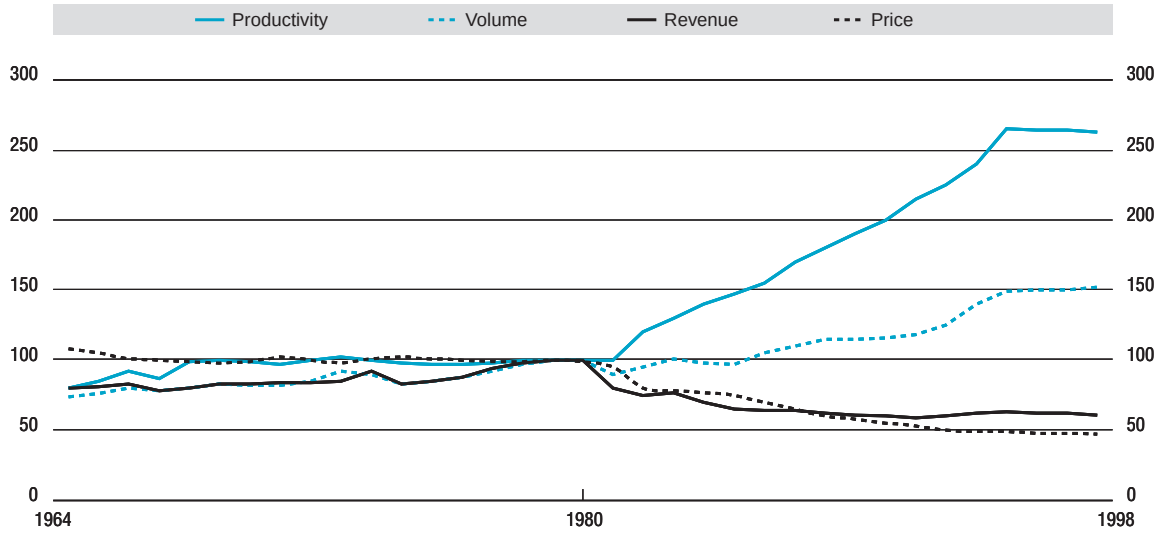
Impact of Deregulation on Performance

The success of deregulation has far exceeded expectations. Before 1980, the rail freight industry had experienced stagnation of volumes and a decline in profitability. However, since 1980, there has been a turnaround in the industry. The contrast is demonstrated by Figure 8.

Figure 8 shows that, between 1980 and 1997:

- Labour productivity has increased by an extraordinary 262% to 11.3 million tonne km/employee,[70] an increase that exceeded that of virtually any other industry in the United States
- After years of increases prior to 1980, average rates per tonne km have declined for all commodities and by an average of 16% in nominal terms and 55% in real terms.[71] The main reason for the decline is the massive reduction in costs brought about by deregulation.
- Traffic has increased by 40% (GDP increased 47% to 1996[72]) and modal share has increased slightly from 37 to 39%
- Rail's share of the growing automotive market grew from 40 to 70%, over a period when the industry was moving to just in time delivery
- Inter-modal traffic, for which rail faces the greatest competition, has grown by 184%,[73] although it is becoming increasingly difficult to expand, as capacity constraints affect the economics of serving this market
- Return on capital has increased from 4% to 8%,[74] a major improvement though still not enough to allow full replacement of assets
- Train accidents and employee casualty rates, rather than increasing as feared before deregulation, have declined by 70%.[75]

Figure 8. **Performance of major railroads in the United States, 1964-1998**



Note: Index 1981 = 100. Staggers Act passed October 1980.
Productivity = Indexed revenue tonne miles per constant dollar, operating expense with special charges removed.
Volume = Indexed revenue tonne miles.
Revenue = Indexed constant dollar operating revenue.
Price = Indexed constant dollar freight revenue per revenue tonne mile.
Source: Association of American Railroads (AAR).

The reasons for this success are the stability of the regulatory environment, the ability of railways to shed unprofitable lines and to discriminate in pricing (Ramsey pricing) and possibly their ability to merge in order to achieve economies of scale. These have in turn encouraged investment: during the period 1980 to 1996, the railway industry invested 15% of revenue, compared to the typical US industry figures of 2-7%.[76] A common form of investment, that has allowed economies of density to be achieved, is that of double tracking lines that were previously single track

One study[77] suggests that none of the efficiency improvements in US freight railways has been due to mergers. It used data envelopment analysis[78] to examine efficiency in two stages: provision of the track network; and shipment of goods using track as an input. It found that mergers do increase technical efficiency in the maintenance of track (using labour and capital more effectively) but that there are losses in scale efficiency. This implies that there is an optimal size for track networks that has been exceeded in many recent mergers. The authors assert that the primary reason mergers have continued beyond the optimal network size is to provide market power. Track is a sunk cost and its ownership provides the incumbent with a barrier to entry into the market allowing monopoly profits through price discrimination. This is certainly an important issue for regulatory authorities, whatever the accuracy of this particular study.

Despite the improvements in performance, deregulation has not been a complete success from an industry perspective:

- Revenues have failed to increase in real terms since 1980, despite the growth in traffic, because rates have declined by so much. This is one reason that growth has been sought through mergers
- Despite productivity gains, US freight railways still do not cover their cost of capital (debt and equity). Between 1992 and 1996, industry average return on investment averaged only 8%, compared to a cost of capital of 12%.[79]

In addition, other stakeholders have lost from deregulation:

- A corollary of the productivity gains is that employment in the railway industry fell by 53% between 1992 and 1997 although this has not been a major issue because of the low unemployment rate in the United States.[80]
- Customer choice has been reduced because the network has been reduced in size by 38% from 264 000 km to 163 000 km.[81]

About 60% of traffic now originates at points served by only one carrier. As result, some shippers, particularly in the coal, agricultural and chemicals industries are not satisfied with the services provided or, to a lesser extent, the rates charged (despite the fall in rates). They are also concerned about the impact on these of further mergers.

A major factor driving mergers has been the requirement of shippers for a seamless service. This has also led the railways to undertake a collaborative program to improve interchange of freight from one railway to another. Such interchanges affect about 30% of traffic.

Current Debate

In response to pressure from shippers, Congress is currently considering a number of pieces of legislation which would partially reregulate railways through:

- Withdrawing immunity from anti-trust proceedings where STB has conferred immunity;
- The introduction of administered third party access rights;
- Tighter rate regulation.

The common objective of the proposals is to increase competition. However, the Association of American Railroads (AAR), which represents all Class I railways, argues that:

- There is sufficient competition already for most traffic, from a combination of rail-to-rail, intermodal competition (from road and water), product competition (ability to use alternative materials) or geographic competition (ability to use other sources);

- Where there is insufficient competition, shippers already have a right to request that STB impose maximum rates.

One contentious issue is what would happen to the return on capital (currently 8%) in the absence of regulatory change. AAR argues, on behalf of the industry, that returns will go down because the easy opportunities to improve financial performance have already been taken and considerable investment is needed to achieve further improvements. However, recent trends have been positive and the recent round of mergers may allow financial performance to improve.

A common theme in the debate is the extent to which the application of the Staggers Act has meant that the balance has now shifted too far away from shippers in favour of the railways and whether partial reregulation would produce a better balance than continuing with the current regime. The issue is whether:

- It is now time to change the law, or the way in which the law is applied by STB, to provide more protection for shippers OR
- To make no change, in order to avoid threatening the viability of the industry and thereby to protect the long term interests of all stakeholders.

Within the confines of its existing powers under current legislation, STB is also examining a variety of other issues:

- Do railways have the opportunity to make adequate profits and therefore could they withstand the impact of more regulation?
- Are rates currently charged to shippers reasonable? – the current overall rate of return on capital of 8% is low but, for particular markets, returns may be unjustifiably high
- What should be done to avoid repetition of the UP merger problems?

In the context of the proposed merger between BNSF and CN, STB will hold a public enquiry, beginning in March 2000, on the subject of the consolidation and structure of the North American railway industry. There is speculation that the BNSF/CN merger would lead to a new round of mergers, ultimately leading to the formation of two trans-continental railways.[82] Whatever mergers do take place, STB may be expected to require, as it has in the past, that:

- the merged operators divest themselves of track, where this would introduce competition
- access rights be granted in favour of other operators.

Given the low returns in the industry during the 1990s, the case for re-regulating the industry now is weak. Only if mergers then lead to excess profits, should tighter rate regulation be considered.

Annex

NON-ECONOMIC REGULATION

Technical standards

There has been technical standardisation in North America for a century and inter-operability is being increased through a number of harmonisation initiatives under the NAFTA Land Transportation Standards Committee. Harmonisation has become important because of increased trade resulting from economic integration under NAFTA. More than 20 railways now run between the United States and Canada.

Within the United States, the Association of American Railroads (AAR) plays an important role in defining technical standards, a form of self-regulation.

Safety Regulation

Safety Regulation is the responsibility of the Federal Railroad Administration (FRA) within the Department of Transportation. It is funded primarily from a federal budget allocation, although it does collect some user fees. The FRA employs some 400 safety policy/program administrators and field safety inspectors in the safety area. The FRA outsources data collection and operation of an equipment testing facility to the AAR. The FRA's enforcement mechanism is through fines.

The FRA has a statutory authority to inspect and monitor operations to ensure safety of all railways in the US. It is responsible for establishing rules and regulations to promote safety within the rail industry. Its regulations cover all aspects of rail operations:

- Track and equipment standards
- Time-of-service for train crews
- Accident monitoring
- Operational safety practices

The industry asserts that this mode of regulation – detailed regulations rather than performance standards – is very costly and stifles innovation.

In the USA, as in Europe, safety concerns have recently focused on the potential risks of:

- Reducing freight train crews to one-man operation;
- The use of remote controlled locomotives for shunting.

Indeed, the State of Wisconsin has mandated two-man operation becoming the only State in the Union to legislate on safety. The FRA has also put temporary restrictions on the use of driver-only crews while it assesses the risks – which are contested by the companies involved. These measures have important implications for the economics of rail *vis-à-vis* road transport.

Environmental protection

Primary responsibility for environmental protection within the rail sector lies with the economic regulator, STB. STB makes its decisions, taking account of its duties under the National Environmental Protection Act 1969. This Act requires the Board to consider the environmental impact of major actions, such as mergers or investment projects.

The FRA also has duties related to environmental protection. It is required to:

- produce environmental impact statements of actions, comparing them to alternative actions;
- consider any mitigating measures;
- consult widely with different levels of government.

CANADA

Background and Early Development

The early development and current role of rail freight in Canada is similar to that in the United States. Indeed, average rail distances are even longer (1,238 km for transcontinental railways and 169 km for other railways[83]) and bulk transport is even more dominant than in the US.

In the early part of this century, a hybrid approach to the ownership and regulation of railways was adopted which combined:

- Public ownership of one of the two main trans-continental systems, Canadian National (CN), which was formed in 1919 from bankrupt private companies and privatised in 1995 through its flotation on the stock exchange
- Regulation of prices and the number of lines kept open for all railways, with subsidies to compensate railways for publicly imposed burdens.

Canadian Pacific, the other main system, has always been privately owned. The principal objective of public ownership and regulation was initially one of national development and consolidation.

One distinctive historic feature of rail in Canada was the subsidisation and regulation of wheat traffic. Subsidies were terminated in 1996 but maximum rate regulation still applies, although only to grain movements for the Canadian Wheat Board.

Recent trends have shown an increase in north–south traffic, relative to east–west traffic. The proportion of rail tonnage that was to or from the US increased from 20 to 29% between 1985 and 1995.

Deregulation

Canada began to deregulate railways before the United States with the National Transportation Act 1967, under which rates for all cargo except grain were allowed to become more market responsive. Possibly as a result, productivity growth surpassed that of US railways in the 1970s and this influenced the decision to deregulate railways in the US.[84] However, there was still an obligation under the National Transportation Act 1967 to publish rates and collective rate-making was permitted. This obligation limited the ability of railways to price differentially in order to cover fixed costs.

Pressure for further reform came with the introduction of the Staggers Act 1980 in the United States. This removed the obligation on US railways to publish rates (rate transparency) and gave them the right to enter into confidential contracts. They were able to do this for traffic to Canada and the Canadian railways began to seek similar rights on cross-border traffic. The National Transportation Act 1987 removed the obligation for Canadian railways to publish rates on all but regulated traffic (i.e grain and traffic affected by subsidies).

The National Transportation Act, 1987, also included branch line abandonment procedures that proved to be a major burden on the railways. Under the Act:

- the National Transportation Agency (NTA) had the powers to decide if the operation of a given branch line was economic or uneconomic;
- if economic, then the application for abandonment was rejected and the line continued in operation;
- if uneconomic, then the railway was ordered to cease operations;

- if VIA Rail operated a passenger service on the line, the abandonment date was set at one year from the date of the order;
- if a line was uneconomic but there was a reasonable probability of it becoming economic in the foreseeable future, abandonment could be delayed (for up to five years);
- if it were proposed that the line be transferred to a new operator, the onus was on the purchaser to satisfy NTA that the sale of a line was in the public interest.

Sale of lines by larger railways was also hampered by successor rights provisions contained in federal and some provincial labour statutes. These provisions restricted the ability of short line railways to make significant cost savings. Successor rights remain in only two provinces. Other provinces allow greater flexibility to prospective new operators for the creation of viable shortline operations over low-density rail lines.

The Canadian Transportation Agency (CTA) was formed in 1996 under the Canada Transportation Act to replace the NTA for the economic regulation of those parts of the transport sector under federal jurisdiction. CTA is the sole agency responsible for administering the Canada Transportation Act. It acts as a quasi-judicial tribunal, which applies but does not make policy. It therefore has no mandate to determine what is in the public interest.

The Canada Transportation Act substantially reduced the amount of regulation of rail freight in Canada. The Act deregulated network rationalisation. Rate deregulation and shipper access protections had already been introduced in the 1987 Act and were carried over to the Canada Transportation Act. Regulation is now largely limited to:

- Providing shippers with interswitching rights (for switching from the railway serving the shipper to another railway) at prescribed nation-wide rates if the shipper is located on only one federal railway but is less than 30km away from a second federal railway;
- Ensuring the sharing of track and other facilities by federal railways (but not provincial short lines) – this can either be through voluntary (commercial) unregulated agreement or, if no voluntary agreement can reached, through running rights approved and imposed by CTA acting in the public interest or by the Governor in Council;[85]
- Determining compensation for running rights where CTA imposes running rights and the parties fail to agree on compensation;
- Setting rates and conditions of service where shippers and carriers fail to agree on published rates in non-competitive markets;
- Ordering carriers to construct connections to ensure the flow of traffic.

Part of CTA's economic regulatory functions is licensing of all carriers that operate under federal jurisdiction. These are railways that cross provincial borders. Currently there are 24 such railways and a further 39 are regulated by the provinces. The only requirement for a federal railway to obtain a licence is the adequacy of insurance cover to ensure that the potential liabilities of railways to shippers and the public can be met.

Although CTA regulates those smaller railways which are under federal jurisdiction, the regulatory requirements are more limited, in some respects, than for the transcontinental carriers, especially as regards financial reporting.

In contrast to the United States, the CTA does not deal with mergers and acquisitions, which are handled by Industry Canada, a Department of the Federal Government. The Canada Transportation Act increased the reliance of regulation in the rail sector on general business laws such as the Competition Act and the Business Corporation Act.

Impact of Deregulation on Industry Structure

Because of the provisions of the National Transportation Act, 1987, short line operators, which had existed for years in Canada, were not able to develop to the same extent as in the US. As a result, there

were only 20 in existence in 1996 (compared to over 500 in the United States). The Canada Transportation Act has changed this:

- In 1997, 2 448 km of track were transferred to Regional and Shortline Railways, which led to a 38% increase in their route km. In contrast, only 2 400 had been transferred in the previous 10 years;[86]
- The number of shortline and regional railways has increased from 20 in 1996 to 41 as of 31/12/98.

Details for 1996 and 1997 are set out in Table 9.

Although the proportion of track owned by CN and CP has declined to less than 80%, their share of revenue gross tonne km is still about 90%.

Table 9. **Canada: Ownership of Railways**

Railway/ type of railway	Owned/leased 1997 (route km)	Owned/leased 1996 (route km)
CN	23 731	26 560
CP	15 749	16 724
Sub total Transcontinental	39 480	43 284
Regional and Shortline[1]	10 376	7 512
Terminal/switching	76	65
US Railways	290	290
Passenger	116	116
Total	50 339	51 154

1. Of these, 5 corporations (Railtex, Iron Road, OmniTRAX, Railink and Genessee Rail-One) controlled 46% of track km at the end of 1997. Four of these were US controlled. The fifth, Railink, is Canadian. Since then Wisconsin has also made an acquisition.

Impact of Deregulation on Performance

Taking the passing of the National Transportation Act, 1987 as the first significant step in deregulation, the impact can be assessed by examining trends between 1988 and 1997. During this period:

- Revenue increased by 11% in nominal terms and revenue tonne km by 18%.
- Average rates per revenue tonne km fell by an average of 6% (26% in real terms).
- Staff numbers have fallen from 75 000 in 1988 to 46 000 in 1997.
- Labour productivity increased by 93% from 3.4 million revenue tonne km per employee to 6.6 million, but this is 40% below the level in the US.[87]
- Operating expenses declined by 1%.

The fall in rates may be partly attributed to the removal of the obligation to publish rates in the National Transportation Act, 1987. The average rate per revenue tonne km in 1999 was now 2.35 Canadian cents[88] or 1.57 US cents. This was slightly below the figure for the United States of 1.75 US cents[89] (partly due to the low exchange rate of the Can$). Average rail freight rates are therefore the lowest of any developed country.

Until recently, rail industry profitability (including passenger services) was in decline, with the return on capital falling from 8-10% in the mid 1980s to about 5% in the early to mid 1990s.[90] Profitability then increased to 8% in 1997 although this is still below the cost of capital.[91]

For CN and CP, there has recently been a marked improvement in operating margins, which increased from 14.5% in 1996 to 20.2% in 1997.[92] The improvement in results in 1997 is partly due to:

- efficiency improvements at Canadian National before and after privatisation (CN reduced staff from 34 000 in 1993 to 17 000 in 1998;[93]
- the strength of the economy.

However, the reforms introduced with CTA may also have affected the results. Deregulation, as provided for in the Act, has already had an impact on the structure of the industry, as described earlier. This change in structure alone is likely to have a sustained impact on performance, as seen in the US. For example, CP has invested almost Can$2 billion in new locomotives and improved intermodal yards since the Act was passed.[94] However, it is unlikely that the industry in Canada will be able to catch up in the near future with the industry in the US in view of:

- The head start in the US resulting from the Staggers Act which has resulted in a far more competitive and efficient industry
- The fact that the industry in Canada is still more regulated than in the US. In Canada, shippers are protected by inter-switching rights, the CTA has powers to regulate levels of service on complaint, grain rates are subject to a maximum rate cap, and running rights and access charges can be imposed by CTA. In the US, regulatory action usually only occurs when there are mergers.

A recent study notes that "despite the productivity gains and cost reductions achieved in Canada, the US roads have been a faster moving target, and the gap remains significant. This has serious competitive implications."[95]

Current Debate

In December 1999, BNSF, the second largest railway company in the US, and CN announced their intention to merge through a "combination" to form a new transborder company. This will be subject to judicial review in Canada to ensure that it is fair to CN shareholders and that it complies with Canadian statutory and regulatory requirements.

There is a view amongst shippers that the provisions of the Canada Transportation Act favour the railway industry since the burden of proof is on the shipper to demonstrate harm before CTA can consider a case. This view is disputed by CTA. CTA decides whether there is substantial commercial harm in determining the merits of an application.

The industry unsurprisingly takes a different view from shippers and refers to its moderate return on assets employed and the larger and more efficient operators in the US as evidence of the merits of deregulation. The industry considers that the Canadian Transportation Act 1996 has been a great success[96] and, if anything, would like less regulation.

The Kruger Report, published in 1999, examined the grain market and concluded that more competition should be introduced. Again the industry disputes this and the debate continues.

The Canadian Transportation Act provides for a comprehensive review of its impact in the year 2000. No date is set for the completion of this review.

Annex

NON-ECONOMIC REGULATION

Safety Regulation

In Canada, safety regulation was separated from economic regulation as a result of the National Transportation Act, 1987. Under the Railway Safety Act, the Minister of Transport is responsible for rail safety. The Railway Safety Act, 1989, which assigns to railway management the responsibility for safety and limits Transport Canada, the Government department, to an oversight role. Safety plans, as well as associated operating rules and regulations, are developed by individual carriers and approved by the Minister of Transport.

A review by Transport Canada concluded that the Railway Safety Act contains no specific requirement for railways to have Safety Management Systems that demonstrate their commitment and capabilities to operate safely. It further concluded that the downsizing of larger carriers and the appearance of smaller, less experienced carriers, means there is a need for a more formal way of assuring safety.

Amendments to the Railway Safety Act, which came into effect ion June 1, 1999, require the railways to:

- Implement Safety Management Systems;
- Produce safety plans which must be subject to safety audits;
- Report safety-critical information for the purpose of railway system safety performance.

The amendment also gives increased authority to rail safety inspectors.

The independent Transportation Safety Board is responsible for the independent investigation of accidents.

Environmental protection

Under the Environmental Protection Act, when a new line is to be constructed, the CTA is required to investigate environmental impacts.

REGULATORY REFORM IN SELECTED COUNTRIES

PACIFIC

AUSTRALIA

Context

Australia is a sparsely populated country of 19 million people, mostly living near the East, South and West coasts. There are significant mineral deposits, which are important to Australia's economy. Coal alone accounts for 70% of tonnes carried on common carrier railways (the focus of this paper). [97]

Being ideally suited to transporting bulk commodities over long distances, the rail system carries a significant proportion of all freight. In 1994/95, 56% of total land based freight transport (*i.e.* in tonne km, excluding sea) was carried by rail. In 1996/97, 68 billion net tonne km or 62% of total rail traffic were carried on Commonwealth (federal) or State owned railways which, at that time, were the only common carriers.[98] As in North America, rail passenger transport is limited outside the major cities because of long distances and the railways are therefore dominated by freight.

There is limited scope for head-to-head intramodal competition between operators as few shippers are served by more than one line. Third party access provisions apply to most of the network with some niche market operators emerging on the East-West interstate corridor. There is evidence of some head-to-head competition in the Hunter Valley of New South Wales where the National Rail Corporation was awarded a contract to haul coal in November 1998 (in competition with the NSW state-owned Freightcorp).

Interstate rail freight is relatively undeveloped, partly because of the historic lack of integration of the network – for example difference in gauges, difference in accreditation regimes. Total inter-capital flows by rail in 1994/95 were 10.8 million tonnes, which represents 42% of total inter-capital freight, a lower proportion than for freight overall.[99] The interstate rail system in Australia is under-utilised in general, but there is some competition for peak time slots. For example, for freight transported from Melbourne to Perth the preferred arrival time is early in the morning. The main flows comprise:

- North-south along the east coast, connecting Victoria, New South Wales and Queensland (8.3 million tonnes which represents 6% of total inter-capital flows along this corridor);
- East-west from the east coast through South Australia to Western Australia (2.4 million tonnes which represents 75% of total inter-capital flows along this corridor).

The east-west market is therefore much smaller but rail accounts for a much larger share of the freight transported on this route.

Since the introduction of rail access provisions in 1995 under the Trade Practices Act, rail-on-rail competition has developed on the East-West corridor. This has led to an increase in the volume of traffic carried. The same has not been true for the North-South corridor.

The Commonwealth Government's priority has been to introduce third party access in the interstate market and encourage the entry of third parties "at cost", with the cost for potential entrants the same as for incumbents.

Early Reforms

Until the early 1900s, most railways were privately owned and operated. Following the failure of these private companies to make adequate investment due to difficulties in raising capital, the States[100] took over. The common carrier rail systems were then mainly developed, owned and operated

by state governments as vertically and horizontally integrated public sector monopolies operating within their own jurisdictions. During the 1970s, the Commonwealth Government decided to try and unify the disparate State systems and offered to buy them. Only two states, Tasmania and South Australia, agreed to sell their railways to the Commonwealth. These formed Australian National Railways Commission (AN) in 1973.

Financial and operating performance continued to decline, despite growth in freight and passenger volumes, and this led to pressure for regulatory reform. The deficit on interstate rail operations alone reached AUS $300 million[101] in 1991. The main reasons for poor performance have been identified as follows.[102]

- Fragmentation of the network (poor co-ordination, three different gauges depending on the state, signalling differences and non-uniform safety requirements) resulting in poor co-ordination and low levels of investment particularly in the interstate system.
- Legislative restriction of competition from road in bulk commodity transport markets (coal and wheat) which reduced the incentive for railways to act commercially and affected the cost competitiveness of rail.
- Unfair competition from road in the non-bulk freight market due to under-recovery of road costs.

The gauge problem was resolved in part by the conversion of all interstate track to standard gauge in 1995. This was made possible by substantial Commonwealth Government investment in infrastructure.

One of the difficulties in addressing the remaining problems was that railways were primarily a State's responsibility: the States are still responsible for certifying and licensing operators although the State regulatory regimes must comply with a number of provisions of Commonwealth laws.

Reform required the involvement of Commonwealth and State levels of government. Intergovernmental co-ordination takes place in the Council of Australian Governments (COAG), which is composed of the heads of the Commonwealth and State Governments, together with the President of the Australian Local Government Association. COAG oversees the development of closer co-operation among Australian governments in areas of shared responsibility, notably microeconomic reform and regulation. A ministerial council, the Australian Transport Council, supports the work of COAG on railway reform.

At the beginning of the decade, the Commonwealth and State governments began to reassess the virtues of owning and operating railways and to seek organisational structures better suited to the market. The Industry Commission's Report in 1991 established the basis for reform in the rail sector. At the same time, broader changes were taking place affecting all economic infrastructure (in the power sector, the telecommunications sector, etc).

Trade Practices Act

An Independent Inquiry into National Competition Policy produced the Hilmer Report in 1993, which addressed competition for all network industries. The Report identified access to infrastructure as the key area for legislative reform.

Following the Inquiry, the Trade Practices Act (TPA) was amended (1995), creating the National Competition Council (NCC) and the Australian Competition and Consumer Commission (ACCC) which were given powers to promote competition in rail operations. The amendments to the TPA also established a regime for granting access to nationally significant essential infrastructure. Under the regime there are three ways in which access can be granted.

- ***Declaration*** under the national access regime (the declaration process is only invoked when an access seeker is unable to gain third party access through private negotiations and *certification* or *authorisation* rule out recourse to *declaration*): Where a State has no certified access regime, applications for access can be filed with the NCC which must investigate the application and make recommendations to the responsible Minister on whether the services of the relevant facility should be "declared" or not. The Minister must then decide whether to declare the service or the facility. If declared, the provider of the relevant services must then negotiate with the access seeker over the terms and conditions of access.

- ***Certification*** of State Regime: State Governments can develop their own access regimes, which are subject to certification by NCC. In deciding whether to grant certification the NCC must scrutinise the State access regime to determine whether it conforms with a nationally agreed set of principles.
- ***Authorisation of an Undertaking*** from an Infrastructure Provider: The ACCC can authorise an "access undertaking", which is a set of access principles proposed by an infrastructure manager. If the undertaking is accepted by ACCC, the services of the facility are subject to the conditions of the undertaken and cannot be declared.

The ***declaration*** process for the national access regime works as follows:

a) a business seeking access applies to the NCC for declaration of the infrastructure service;

b) the NCC assesses the application and makes a recommendation to the relevant Commonwealth or State Minister (the Commonwealth Treasurer or the State Premier in the case of State-owned infrastructure). For privately owned infrastructure services the Commonwealth Treasurer makes the declaration decision.;

c) the Minister decides whether or not to declare the infrastructure service;

d) if the service is declared, businesses seeking access and the infrastructure operator negotiate the terms and conditions of access in the first instance (once the service or facility is declared anyone can seek access);

e) if a business and the infrastructure operator cannot reach agreement, they may appoint a private arbitrator and subsequently enter into a contract in accordance with the arbitrator's decision;

f) the parties submit their contract for registration by the ACCC;

g) if the parties cannot agree on the appointment of a private arbitrator, the ACCC can arbitrate the terms and conditions;

h) any appeals regarding Ministerial declarations or ACCC determinations are considered by the Australian Competition Tribunal which has wide powers of review. Appeals on ACCC determinations can only be made on the basis of points of law. (All declaration decisions made to date were appealed to the ACT); and

i) where necessary, access determinations are enforced via Commonwealth Courts.

One of the criteria for the NCC in assessing applications for declaration is whether an effective access regime for the service or facility in question is already in place. This might be a State regime or an undertaking from the infrastructure provider approved by the ACCC. However, no effective undertakings or access regimes are yet in place in Australia (two State access regimes are currently the subject of review by the NCC – WA and NSW – and the Government of Queensland intends to consult NCC with a view to resubmitting a request for certification).

Most of the applications for declarations received to date by the NCC concern rail services: four Certification applications for rail access regimes and five applications for Declaration. Details are provided in an annex. Four of the decisions on Declaration were appealed to the Australian Competition Tribunal and the fifth appealed to the relevant State Court. This underlines the ultimate importance of the ACT and the courts in the development of access regimes in Australia.

A State government might seek ***Certification*** of the state access regime in order to provide certainty about which regime will govern access to certain infrastructure services. Certification means that shippers and carriers know in advance that those services cannot be "declared" under the National access regime.

The ***Undertaking*** process is another alternative to declaration. An infrastructure owner or operator may give a written undertaking to the ACCC setting out the terms and conditions on which businesses will be provided with access. Once an undertaking is accepted by the ACCC, the infrastructure service in question cannot be declared. Conversely, an undertaking cannot be accepted if the service has already been declared or is already covered by another access regime.

By making an Undertaking, an infrastructure owner/operator reduces uncertainty about what access conditions will apply to its service. In particular, it allows anyone considering establishing new infrastructure or purchasing rolling stock to agree access terms before they invest.

Progress in Railway Reform

The 1990s have witnessed large-scale structural reform and some privatisation in the rail sector. Regulatory reform has been mainly aimed at harmonisation of regulatory regimes (including open access) and at standardisation of key infrastructure links to provide gains in efficiency and profitability. Railway reform has, however, taken very different directions in different states. Some states have retained vertically integrated railways, and some have been slow to develop open access regimes.

The position on ownership and access in each State, and for interstate traffic, is summarised in Table 10 below, with details in the following paragraphs.

Table 10. **Summary of the Structure of Rail Freight by State**

State	Track owner	Main freight operator	Open access provision
Western Australia	Westrail, being privatised		Yes (in the process of certification)
Queensland	QR, state Corporation		Yes
South Australia	Intrastate privatised, AS ARTC for interstate		Yes
Victoria	Interstate track State-owned but leased to ARTC under 5 year contract Victrack ownership of other track to be taken over by VLF on privatisation	V/Line Freight (VLF), being privatised	Yes
New South Wales	State owned Rail Access Corporation	State-owned FreightCorp	Yes
Interstate	Commonwealth-owned ARTC, plus States of NSW, Queensland, Victoria & WA	NRC	Yes

It should be noted that VLF and FreightCorp have not traditionally operated interstate. From 1998, FreightCorp began to operate interstate. For example it won a freight haulage contract in South Australia to haul coal between Leigh Creek and Port Augusta. This is not inter-city interstate transport but one intrastate operator entering the intrastate market in another State. The only operators which have entered the inter-city interstate freight transport markets aside from the incumbent NRC are small private niche operators. For example, SCT, Toll and Patrick.

In Western Australia and Queensland, the states own the vertically integrated systems. These each have separate business units for access and separate accounts for infrastructure. There are also differences between these states:

- In Western Australia, Westrail set fees for access to infrastructure, but only for interstate operators. Sale of Westrail's freight business, as an integrated company including operations, rolling stock and track, was approved in September 1998. Western Australia's state access regime has recently been amended to provide access arrangements for the new private owner (and other operators for intrastate traffic) and the new access regime was submitted to NCC for certification in February 1999. The Council has given a preliminary favourable opinion subject to further consultation.
- In Queensland, there are no plans to privatise the vertically integrated Queensland Rail (QR), although it has been corporatised. QR sets access fees for the use of its track by other accredited[103] operators (not limited to interstate operators, as used to be the case with Westrail).

In South Australia and Tasmania, vertically integrated systems have been privatised:

- In South Australia, all track (other than part of the interstate network) was sold in 1997 to Australia Southern Railroad (ASR), a wholly owned subsidiary of Genesee and Wyoming Inc. (United States). ASR sets fees for use of its track by other operators.
- Tasmanian Railways (Tasrail) was sold in 1997 as a vertically integrated operator to a consortium led by Wisconsin Central (United States)

The states of Victoria and New South Wales have separated track from operations, and freight from passenger transport:

- State-owned Victoria Rail Track (VicTrack) manages track and access, and sets fees for the use of infrastructure by State-owned V/Line Freight Corporation (VLF) and other rail operators. VLF is in the process of being sold (with a long term lease from VicTrack over non metropolitan intrastate track, signalling and train control). Under current Victorian Government plans VicTrack will cease to exist and third party access will be administered by the newly privatised VLF.
- In New South Wales (NSW), the State Rail Authority was split into vertically separated corporations in 1996. The State-owned Rail Access Corporation owns the infrastructure and sets access charges for the State-owned Freight Rail Corporation (FreightCorp) and other accredited operators.

NSW, Queensland and WA have applied to the NCC to have their access regimes certified. The NCC has given favourable preliminary recommendations on the NSW and WA regime. Queensland has since withdrawn its request but discussions continue. See Annex for details.

An inter-government agreement in November 1996 established the intention to sell most rail assets owned by the Commonwealth (essentially above rail assets) and set up an organisation to manage access to the interstate network. This led to the break up in 1997 of the Australian National Railways Commission (AN) under an inter-government decree dated November 14, 1997. The Commonwealth Government sold off its operating businesses (including passenger services which were sold to Great Southern Railway) and now only owns:

- The Australian Rail Track Corporation (ARTC) which in 1998 took ownership of interstate track in South Australia which formerly belonged to AN. ARTC is 100% owned by the Commonwealth Government but acts independently of it.
- The National Rail Corporation (NRC), which commenced operations in 1993 and operates the majority of interstate services, mostly intermodal. The NRC is owned by the Commonwealth and the States of NSW and Victoria. The Commonwealth Government has announced its intention to sell its share of the NRC.

ARTC is required to enter into access agreements with other infrastructure owners in order to provide a "one-stop shop" for rail users wanting to access the interstate standard gauge network, instead of users having to negotiate with each State track authority. ARTC owns, manages and controls access to the track linking New South Wales and Victoria with Western Australia and Alice Springs in the Northern Territory. ARTC also manages additional interstate links in Victoria under a lease contract (5 years). ARTC is attempting to form agreements with track owners in Queensland, New South Wales and Western Australia for extension of the interstate network, in accordance with the Intergovernmental Agreement of 14 November 1997.

ARTC has the exclusive right to sell access to the interstate network providing a single point of negotiation for operators. Contracts between ARTC and the other track owners on the network will include obligations and financial incentives for both sides. Regulation of this interstate network poses similar challenges to the development of a coherent regulatory framework for international rail freight transport in Europe.

States will continue to regulate local traffic and with the tendency for freight business to be privatised freight companies are increasingly responsible for administering access to the intrastate track that they own. All States have to provide for non-discriminatory access to interstate infrastructure[104] through the State access regime (or application of the national regulatory regime in the absence of a State regime),

or on the basis of authorised undertakings. The approach to setting access charges varies from State to State, including pure negotiation, administered two part tariffs and a negotiation between regulated limits. The right to allocate slots is determined by the type of traffic:

- ARTC allocates slots for interstate traffic
- Intrastate track owners/managers (both public and private) allocate slots for intrastate traffic.

A regulatory code covers access to the interstate network and is being developed to set tariffs for infrastructure use. Development plans include the introduction of auctions for slots. In peripheral areas, access is negotiated. Access regimes in these areas, however, have to meet certain minimum requirements set at the Commonwealth level which are enforced through the provisions of the Trade Practices Act as discussed earlier.

The terms and conditions for access are determined in an access agreement and are implemented by the operations controller (track manager). The potential conflict of interest between interstate and local trains is therefore dealt with by one body (subject to the requirements of the access agreement). This ensures the operational integrity of the system. However, where there is a vertically integrated operator, other operators might consider that they will not obtain fair treatment and some submissions to the Australian Productivity Commission's 1998/99 Review of Progress in Rail Reform expressed such concerns.

Government policy at Commonwealth and State levels is to increase the role of the private sector through privatisation, open access or, in most cases, both. Following the privatisation of the railways in Tasmania and South Australia, the states of West Australia and Victoria are in the process of privatising their rail freight operations. The Commonwealth Government also plans to sell its share in NRC once issues are resolved about the transfer of assets.[105]

By the end of 1999, only Queensland Rail and the FreightCorp (NSW) will remain in public ownership. These large freight companies account for 60% of net tonne km by rail common carriage in Australia. They mainly carry bulk commodities and over 80% of tonnage is coal. Public ownership has allowed monopoly profits to be used to cross-subsidise other rail operations or to be retained by the States as a form of tax.[106]

The Productivity Commission[107] reports that because of the high prices for black coal in the 1970s and early 1980s, the NSW and Queensland Governments used the rail freight system to obtain revenue from coal producers additional to that raised from explicit royalties. These monopoly rents or *de facto* royalties significantly distorted rail freight pricing and distracted governments from the focus of providing efficient rail freight services. The revenue from these high charges was appropriated by governments into general revenue or was used to allow rail authorities to partially fund loss making services. The inefficiencies have been recognised by the Governments of the two States.

- The NSW Government agreed to phase out what it identified as the monopoly fraction of infrastructure charges over four years to July 2000. However, the mining industry contests that the figure of 14% rate of return for rail infrastructure investment, used by the Government as a benchmark for calculating what constitutes a monopoly rent, is excessive.
- The Queensland government changed the basis for calculating rail freight rates for coal in 1992. The royalty element was removed from concessions negotiated after that date and most contracts had come up for renewal by the end of 1998.

Impact of Change

It is difficult to assess the impact of the change in the ownership, structure and regulatory regime for rail in Australia, as the process is still not complete. However, some trends are emerging.[108]

- Between 1990/91 and 1996/97:
  - freight traffic increased from 53 to 68 billion net tonne km, an increase of 28%;
  - average revenue per tonne km fell by 9% to 4.25 cents (3 US cents), nearly double the averages in the US (1.75 US cents) and Canada (1.57 US cents);
  - freight revenue increased by 18% in nominal terms.

- Between 1987/98 and 1995/96, labour productivity increased from 0.89 to 2.42 million tonne km per employee. This is less than 25% of the level in the US but the Australian rail system has not benefited from the same levels of :
  - competition (of the kinds described in the section on the United States);
  - deregulation (such as the freedom to shed unprofitable lines and services);
  - or full private ownership.

As a consequence, investment is much lower than in the US.

- The rail freight industry is now profitable or close to profitable[109] (although it is difficult to discern trends due to accounting changes).
- Government support only occurs where there is justified community benefit and the service would not otherwise be operated.
- The deficit on interstate freight services has been cut, from AUS $ 300 M in 1991, to AUS$ 80 million in 1996/97 (although this improvement largely arose from debt restructuring).

It is clear that both the operational and financial performance of Australian railways have improved although performance is well below the levels of North America. However, it is difficult to demonstrate causality because many changes were occurring at the same time.

- One off accounting changes have affected financial results.
- Investment in standardising the line gauge has reduced costs and improved service.
- Restructuring, corporatisation and privatisation have improved market focus and may have reduced costs through improvements in labour productivity and capital productivity and utilisation.
- The introduction of open access to some parts of the network (mainly east-west interstate) has increased competition and choice, reduced rates and may with time lead to further cost reductions.

There are currently four open access operators using interstate track for freight services:

- Specialised Container Transport, SCT, a ship container forwarder operating general freight and container services between Sydney, Melbourne and Perth.
- Toll (formerly TNT) a freight forwarding company operating general freight and container services between Melbourne and Perth.
- Patrick The Australian Stevedore, a freight forwarding and port operating company operating export container services from Melbourne and Adelaide.
- Austrac, a freight operator, which runs general freight services in partnership with V/Line Freight between NSW and Victoria.

On the east-west interstate route, competition has reportedly led to rates falling by about 20-25%.[110] However, it is not clear to what extent rates have fallen as a result of open access.

- The new operators are mainly niche players and have not taken much business from NRC – only one of the new entrants, ASR, is a common carrier but its operations are so far restricted to intrastate services in South Australia.
- Most of NRC's lost business has gone to sea and road.
- The National Rail Corporation still retains more than 80% of the interstate freight market.

A corollary of the benefits to shippers of reduced rates is that incumbent operators experience declining profitability. There is some evidence of this for NRC, whose losses increased from AUS$ 60 million in 1995/96 to AUS$ 80 million in 1996/97. NRC's ability and incentive to invest may be reduced by the existence of competition since, even if little traffic is actually lost, NRC may be forced to reduce rates (because the markets are contestable).

The limited impact of open access may be partly due to the fact that the vision of seamless access to the interstate network has not yet been fully achieved. The success of open access is contingent upon the market share of open access operators increasing. This may not happen and the private sector may not make the significant investments required until state owned operators are privatised since private

investors fear subsidised competition or competition backed by implicit state financial guarantees. It is difficult to make judgements in this area, however, as competition takes time to emerge. ARTC believes that there is a significant opportunity for product differentiation on the east-west corridor.[111]

There is also a need to reduce barriers to open access entry through simplified and more uniform access and safety regimes[112] (see Annex). Costs are currently incurred by on users as:

- disjointed approaches mean that users have to negotiate with several entities;
- users have to comply with the different and overlapping standards, practices and processes of these entities;
- there is a direct financial cost to duplicate accreditation.

Current Debate

Despite the limited impact of open access so far, there is acceptance within Commonwealth Government of its desirability, and the Trade Practices Act appears to preclude any other solution. As elsewhere in the world, some incumbent carriers advocate vertical integration without open access and some State Governments appear less convinced of the benefits of open access than the Commonwealth Government.

The main issue from the side of the Commonwealth Government is how to get open access working quickly and effectively. There are several problems.

- States have been slow to develop acceptable access regimes.
- Regimes and accreditation processes vary between States.
- There is a lack of transparency and independence in the administration of third party access where there are vertically integrated operators.
- The playing field is not level between incumbent and open access operators with:
  - incumbents having the disadvantage of public service obligations in rural or remote areas;[113]
  - open access operators.having the disadvantage of lack of facilities (terminals are a particular problem) not subject to third party access.
- The private sector is therefore unwilling to make the investments required.

The different rates of development and implementation of access regimes and the different industry structures between states have created an unbalanced competitive structure. The companies that do not own track suffer disadvantages, or perceive such disadvantages, when they operate in other states with vertically integrated systems.

Developments in the east-west corridor of the interstate market have been encouraging with an access regime that is functioning reasonably well. This is not the case in the north-south corridor. New South Wales is situated at the end of the east-west corridor and in the middle of the north-south corridor. It has an access regime that has been the subject of requests for Declarations under the Trade Practices Act on a number of occasions, suggesting the state regime is ineffective in providing third parties with access. Most of the aspiring new entrants have sought access to intrastate markets. One, SCT, won a claim to have track Declared for interstate operations but the NSW Premier failed to implement the recommendation. SCT appealed to the Australian Competition Tribunal but the case was settled out of court before a ruling, with SCT gaining access to track between Sydney and Broken Hill. There have been particular problems with the conditions attached to access on the north-south corridor, for example in aligning slots and train lengths between the Melbourne-Sydney and Sydney-Brisbane sections of the route. One of the specific goals of ARTC is to increase competition on the north-south corridor.

Prescriptive tariffs are under development for interstate freight transport in order to simplify the process of obtaining timetable slots and reduce differences in the tariff rates applied in different jurisdictions. This should make open access operation easier. Decisions are needed on the kind of price structures most likely to lead to efficient outcomes. The main issue is whether and how to discriminate between users:

- Should a non-discriminatory but differentiated two-part infrastructure tariff (fixed and variable) be used for all interstate transport? The Commonwealth Department of Transport proposed this in 1998, although this is still to be agreed); or
- Should tariffs, in principle, discriminate between different classes of user, *e.g.* applying higher tariffs to higher value products and to captive markets?
- How, in practice can discrimination be exercised, since infrastructure tariffs are normally charged to operators (who may be freight forwarders) and it may be difficult to determine the cost sensitivity of the final customer?

These issues are key to the future profitability of the industry. The NCC is addressing these issues as part of the Certification and Declaration processes.

In August 1998, the Commonwealth Government charged its Productivity Commission to inquire into the progress and impact of rail reform. The Commission is tasked with covering the full range of reform issues: structure, competition, corporatisation and privatisation, inter-government co-ordination, the role of government, regulation and access, and investment. It produced a draft report in March 1999 and a final report has been submitted to the Commonwealth Government. This will be made public shortly.

There are two main areas of concern driving the current re-examination of the effectiveness of the regulatory framework :

- The first is removing barriers to access to the north-south corridor of the interstate network to enable competition to develop there in the way that it already has on the east-west corridor (entrance of niche operators accompanied by a significant fall in tariffs). Linked to this are barriers to out-of-state railways benefiting from the open access regime operated in New South Wales. Possible reforms under consideration try to address both issues at once and concentrate on new models for open access across the country. At the same time the National Competition Council and the courts are being used by third parties seeking access to impose access agreements on the NSW Government as provided for in the Trade Practices Act. This approach takes time is showing some success as out of court settlements have been reached modifying the access regime of NSW.
- The second issue is rent seeking by the Queensland and New South Wales State Governments, as owners of the railways, in transporting coal to ports for export. The Governments have raised large revenues this way in place of general taxation. There are already agreements in place with the mining industry to phase out the practice and introduce tariffs based on economic criteria. However, the rates of return on assets on which the new tariffs are based (14%) are considered too high by the mining industry. Pressure from the industry to allow more competition in this rail market as a route to cutting costs/tariffs will continue.

The rights for third parties seeking access to infrastructure provided in the Australian Trade Practices Act appear to have created an effective basis for competition to develop in appropriate markets, albeit more slowly than many parties desire. The combination of a) enabling State Governments to develop State-wide regulatory regimes that meet a minimum set of requirements on access (ultimately judged by the courts), b) enabling third parties to request the National Competition Council to intervene to improve access (with recourse to the courts) and c) allowing owners of track recourse to the courts where they believe there are not sufficient economic grounds to justify third party access, is gradually achieving the goal of introducing competition, in a way that puts pressure on incumbents to cut costs without significant erosion of economies of scale. The strength of the system is in the focus of the regulatory reform effort on specific markets.

Ensuring adequate investment and returns on investment in the industry nation-wide will depend to a major extent on developing efficient charges for the use of road infrastructure in parallel to regulatory reforms in the railways themselves. This is the subject of recommendations from a separate Productivity Commission inquiry completed in 1999.

Annex I

NON-ECONOMIC REGULATION

Technical standards

The different operating systems, track gauges, and operating standards and procedures existing in each State represent major constraints to the success of reform of economic regulation. In the 1990s, the entry of private operators, the completion of the national standard gauge network and the creation of National Rail (the main interstate operator) focused attention on inconsistent rail regulations as an impediment to efficient and safe interstate rail operations. There is concern that the proliferation of rail safety regulations among jurisdictions is affecting the performance of the industry.

Safety

Safety is the responsibility of the State and Territory Governments. They each have a safety accreditation body which accredits operators seeking to operate on track in their State. Each State has its own body of rail safety legislation

During the 1990s the Commonwealth, State Governments and industry have undertaken several joint initiatives to improve rail safety and operating standards and procedures. One example is the Inter-Governmental Agreement on Rail Safety that came into effect on 1 July 1996 committing governments to a consistent approach to rail safety, including mutual recognition of accreditation and nationally consistent standards by a system of accreditation of owners and operators.

Implementation of measures to achieve these aims is still at the planning stage. Meanwhile more than 20 sets of State based "safeworking rules" still exist.

This issue is being addressed by the current Productivity Commission inquiry into rail reform in Australia.

Annex II

APPLICATIONS TO THE NATIONAL COMPETITION COUNCIL FOR CERTIFICATIONS AND DECLARATIONS OF REGIMES FOR ACCESS TO RAIL SERVICES AND FACILITIES

Source: ncc web site *www.ncc.gov.au*

As of early November 1999 the NCC had received the following applications for certifications and declarations of access regimes.

Certification

- ***The Northern Territory/South Australia Access Regime for Rail Services***

On 18 March 1999, the National Competition Council received an application from the Northern Territory and South Australian Governments to certify as "effective" a Regime for access to rail services provided by existing track between Tarcoola and Alice Springs and new track between Alice Springs and Darwin. Submissions have now closed. The Regime consists of a Code, embodied in a Schedule to the AustralAsia Railway (Third Party Access) Bill (NT) 1999 and in the AustralAsia Railway (Third Party Access) Bill (SA) 1999. These Bills were introduced into the NT Legislative Assembly in February 1999 and into the Parliament of South Australia in March 1999. It is envisaged that this legislation will be passed in both jurisdictions during 1999. The Regime also includes two safety Acts (the Northern Territory Rail Safety Act 1998 (NT) and the Rail Safety Act 1996 (SA)). The Code will not apply to the rail line until proclaimed. The date of proclamation is yet to be decided. It is envisaged that the Code will apply to the existing railway from 1 July 2003 and to the New Railway progressively as it is constructed and becomes operational.

- ***Application for a Recommendation on the Effectiveness of the Western Australian Third Party Access Regime for Rail Services on Government Railways***

On 24 February 1999, the NCC received an application from the Western Australian Government to certify the "effectiveness" of the State's access regime for rail services. The Council's draft recommendation on this matter was released on 15 September 1999. The Council adopted a public consultation process in assessing the Western Australian Government's application and considered that there were a number of threshold certification issues. The Western Australian Government has now agreed to a number of modifications to address these issues. The Council is of the preliminary view that once these modifications are in place, the WA Regime will be an effective access regime under section 44M of the TPA. The NCC is seeking written comments from interested parties on its draft recommendation by 27 October 1999.

- ***Application for a Recommendation on the Effectiveness of an Access Regime in Queensland***

Queensland third party access regime for rail services provided by Queensland Rail. On 19 June 1998, the Council received an application from the Queensland Government to certify as effective a regime for third party access to certain rail services in Queensland. The regime establishes the conditions of access for access seekers to certain rail lines and associated infrastructure managed and operated by Queensland Rail. The Council prepared an Issues Paper and received submissions from interested parties on the application. On 11 February 1999, the Queensland Government withdrew its application for certification. The Queensland Government has advised the Council that it is committed to the certification process and will continue to work with the Council to facilitate a satisfactory outcome. The Council has discontinued the assessment of Queensland's access regime for rail services.

- ***New South Wales Rail Access Regime***

On 12 June 1997 the Council received an application from the New South Wales Government to certify, as effective, its regime for third party access to NSW rail services. If certified, the regime would establish the conditions to apply to rail operators wanting access to the NSW rail network and associated infrastructure owned by, or vested in, the Rail Access Corporation. On 9 April the Council published its draft recommendation. Subsequent to lodging the Regime, the NSW proposed a number of changes. The Council considers that if these changes are made, together

with changes in accordance with its draft recommendation, it could recommend certification. The NSW Government then provided the Council with specific proposals for an amended Regime and letters of commitment which, together, meet the requirements outlined in the Council's draft recommendation.

Declaration

- ***Robe River***

On 24 September 1998, the NCC accepted an application from Robe River Mining Co Pty Ltd, acting on behalf of Robe River Iron Associates (RRIA), in relation to a privately run and owned rail line service provided in the Pilbara region of Western Australia. The application requests the Council to recommend declaration of a bulk iron ore track transportation service (Rail Service). The provider of that service is Hamersley Iron Pty Limited (Hamersley). Hamersley also is the owner of the facility that provides the service. Hamersley is 100% owned by Rio Tinto Limited.

On October 30 1998 Hamersely applied to the Federal Court in Melbourne for, among other things, an Order that the rail line service that is the subject of the application "is not a service within the meaning of section 44B of the Trade Practices Act". Hamersely sought a declaration that the Council does not have the jurisdiction or power to, among other things, either accept or review the application or make a recommendation in relation to the service to the Commonwealth Treasurer.

The Federal Court heard the matter in late April and early May and on 28 June 1999 it handed its decision. According to the Federal Court the use of Hamersley's rail line is the use of a production process and therefore the Part IIIA access regime does not apply. This means the Council has ceased its assessment of the application and will not be forwarding a recommendation to the designated Minister.

- ***Specialized Container Transport – Western Australia***

On 25 July 1997 the Council received five applications from Specialized Container Transport for declaration of rail and freight support services in Western Australia. The first application covered the use of the rail line between Kalgoorlie and Perth. The other applications cover rail freight support services such as arriving/departing service, marshalling/shunting service and access, and fuelling service. The Council recommended that the rail line be declared by not its freight support services. On 20 January 1998, the Premier published in the Government Gazette the decision not to declare any of the services. SCT appealed this decision to the Australian Competition Tribunal. SCT subsequently withdrew their appeal and, as such, the Premier's decision still stands.

- ***Specialized Container Transport – New South Wales***

Specialised Container Transport (SCT) applied to the National Competition Council on 4 February 1997 for the declaration of rail lines between Sydney and Broken Hill. The Council's recommendation to declare the service was forwarded to the NSW Premier on 16 June. SCT appealed this decision on 27 August 1997 to the Australian Competition Tribunal. They withdrew their appeal in November 1997 after successfully negotiating an access arrangement with the NSW Rail Access Corporation.

- ***New South Wales Minerals Council***

The Council received an application from the NSW Minerals Council on 3 April to recommend the declaration of the Hunter Railway Line Service. This service is provided by the Rail Access Corporation of NSW: a state owned corporation responsible for managing the State's rail infrastructure. The Council made a recommendation to declare to the NSW Premier.

The NSW Premier was deemed to have decided not to declare the service as no decision was published by the Premier within 60 days of receiving recommendation from the Council. Section 44H(9) of the Trade Practices Act specifies that if no decision is published, the service is deemed not to be declared. The NSW Minerals Council appealed this decision to the Australian Competition Tribunal. A decision has yet to be made.

- ***Carpentaria Transport***

On 24 December 1996, Carpentaria Transport applied to the Council for the declaration of rail freight services on the line between Brisbane and Cairns provided by Queensland Rail. The Council recommended that the service not be declared. The Premier's decision was not to declare the service. Some of the reasons the Council gave for not declaring the service differ from those of the Queensland Premier. An appeal was lodged by Carpentaria to the Australian Competition Tribunal on 21 August 1997. A decision has yet to be made.

JAPAN[114]

Japan has 164 railway companies. 31 of these companies are freight railway operators, with one dominant player, JR Freight. The focus of railway transport is on passenger transport rather than freight.

The greater part of Japan is mountainous, with some flat land along the Pacific coast where many densely populated cities are concentrated. This corridor is suitable for railway transport as demonstrated by the highly profitable Tokaido Shinkansen high speed railway. The densely-populated Tokyo, Nagoya and Osaka districts provide big markets for railways. Thus the Japanese transport market favours railways, at least for passenger transport.

Japanese National Railways (JNR) produced a surplus from 1957 until it went into the red at the settlement of accounts in fiscal 1964. From then on losses accumulated rapidly. The Government launched four financial restructuring plans during this period, rescheduling long-term debt. Nevertheless JNR failed to revitalise.

JNR's long-term debt reached ¥ 25 100 billion at the end of fiscal 1986. An ad-hoc Commission on Administrative Reform recommended division and privatisation of JNR in a 1982 report and set out policies for resolving long term debts, recognising that the company was effectively bankrupt. A Supervisory Committee for JNR Restructuring was established in 1983 and submitted advice which formed the blueprint for the Prime Minister's privatisation program announced in July 1985. Six regional passenger companies were established, splitting the country into six mainly geographically determined districts.

JNR's nation-wide freight transport business was taken over by one new freight transport company, Japan Freight Railway Co. (JR Freight). This pays the six JR passenger transport companies and the Japan Railway Construction Public Corporation fees for using their tracks and other facilities, and itself owns a small amount of track dedicated to freight use (mainly short connections to freight terminals). Following negotiations between the companies in 1987, JR Freight pays fees for the use of infrastructure on the basis of avoidable costs.

The railways subsequent business results have been much better than expected. The volume of freight carried by JR Freight also increased. Freight transport had fallen from 30 billion tonne-km to 20 billion tonne-km during the 5 years from 1982 to 1986, but increased by an average of 6.1% annually after reorganisation to reach 26.7 billion tonne-km by 1991. A business boom did contribute to the good performance but no-one expected such a recovery in freight transport.

Table 11. **Management Resources of Japan Freight Railway (1997)**

Employees	10 513
Operational-km	10 036
Number of stations dealing with freight	344 (12 additional depots)
Transport volume	48 Mt
Assets	¥280 billion
Debt taken over from JNR	0 (transferred in 1996)
Capital	¥ 38 800 million

Source: Ministry of Transport.

Table 12. **Trends in Business Results of Seven JR Companies (¥100 million)**

	Operating revenues	Operating profits	Pre-tax profits	Net income after tax
1987	35 529	3 448	1 558	500
1988	38 132	4 177	2 207	889
1989	39 391	4 042	2 895	1 601
1990	42 257	4 705	3 035	1 480
1991	43 882	6 871	3 068	1 565
1992	44 047	9 024	2 360	1 264
1993	43 950	8 543	2 243	1 115
1994	42 723	7 390	1 423	734
1995	43 708	8 131	2 195	1 067
1996	44 505	8 102	2 360	1 276
1997	44 121	7 288	1 982	1 027

Source: Ministry of Transport, Japan.

The increase in transport volume helped improve the JRs' profits and earnings. Combined profits and earnings for the six JR passenger transport operators and JR Freight together are shown in the accompanying table.

Railway decline

JNR played a central role in reconstruction after World War II but in the end was unable to respond sufficiently flexibly to later industrial restructuring, to changes in the location of industry, to concentration of population in large cities and migration of population (with an expansion of sparsely-populated areas) and to changes in the transport market through improvement of roads and the shift to the automobile. The volume of freight traffic on the railways showed a steady upward trend in the latter half of the 1950s as the economy grew but began to decline after a peak in 1970. The modal share for rail in total freight transport (including short sea shipping and domestic air freight) fell continuously from nearly 50% in 1955 to just 4.6% in 1986 priori to privatisation. Rail lost out to shipping and truck transport. Despite this overall trend JNR's cargo division maintained its share in the transport of oil, cement and containers.

Management performance declined rapidly against a background of a rigid system as a public corporation and slow rationalisation. JNR management was not allowed to abandon unprofitable lines for political reasons. In addition, the Government completed construction of railways that were clearly unprofitable and required JNR to operate them. Increases in passenger fares were not allowed for fear of political fallout. While political intervention restricted JNR's decision making management was unable to respond to the more competitive market by working out new management strategies despite the competence of JNR staff.

In 1971, the Council for Transport Policy agreed a co-ordinated transport programme aimed at restoring the competitiveness of the JNR freight transport business, the main cause of the deficit. The major pillars of the scheme were introduction of an axle weight tax for trucks and massive investment in modernisation of freight transport. However, these measures had little or no positive effect, and payment of interest on the loans taken out for investment fell into arrears.

Rationalisation of the workforce was delayed. JNR employment was maintained at the 400 000 mark from the companies inauguration in 1949 until 1980. Consequently labour productivity was low and only half to a third that of the private railways in Japan. In November 1975, the National Railway Workers' Union went on strike for 8 days over the right to strike – the longest strike in its history. Contrary to initial expectations, the 8-day freight transport strike did not disrupt industrial activity or everyday life. This seriously undermined the position of JNR in freight market. There were further recurrent strikes.

Despite the worsening balance of revenue and expenditure, JNR spend a huge amount of money on capital investment, over one trillion yen between 1978 and 1981. In the absence of restructuring to meet market demands much of this money was effectively misspent.

Why did reform succeed?

As noted, the fundamental conditions of the Japanese transport market are far from disadvantageous to railways. Traditionally, Japanese customer confidence in rail transport services is high. The volume of passenger transport on Japanese railways dramatically outstrips that of European railways, and Japanese railways have not lost customers in the same way as Europe.

Reorganisation gave the new companies an opportunity to exploit management potential, assisted by external pressures. It allowed the companies to do what they had sought to do earlier but could not do within the JNR framework. This revitalisation was the key to improving performance.

Government certainly ensured that the reforms would succeed in the short term through measures taken just before privatisation: abandonment of unprofitable local lines, transfer of JNR's long-term debt to the JNR Settlement Corporation and a reduction in excess labour (out-placement of 80 000 staff in 1985 out of a total of 280 000). However, though these were necessary measures, they were not sufficient measures for the success of the reforms. Corporate revitalisation, backed by the business boom at the time, helped the JRs to boost transport volume annually and ensure that balance sheets remained in the black – and without the fare increase originally scheduled by the government.

Outlook

JR Freight faces problems in generating income because there is severe competition in the freight transport market and because demand for freight rail transport is largely determined by business conditions – after several difficult years Japan entered a recession in 1998. In addition, it is getting harder to operate freight trains due to the lack of track capacity caused by an increase in short-distance inter-city passenger train services provided by the JRs. Solving these problems will be a major challenge.

Past railway debts have proved an intractable problem. In transferring historical debt to a separate, public corporation, the JNR Settlement Corporation (JNRSC), government undertook to isolate the railways from this liability in order to allow them to operate in a commercial environment and to facilitate their privatisation.

Land owned by JNR in urban areas, and surplus to requirements, was to be sold to pay off railway debts. However, the rapid rise in prices for land in the central business districts of Tokyo and most major cities in the 1980s led Government to suspend sales of land for fear of fuelling inflation. JNRSC was unable to divest land as planned, the property bubble burst, and the debts have grown instead of being paid off.

In 1998, the Diet (parliament) passed the Bill for Disposal of Debts and Liabilities of the JNR Settlement Corporation. The law dissolved the corporation and transferred the majority of its ¥ 27.7 trillion ($ 209 billion) debt to the government's general account (¥23.5 trillion – a ¥ 0.82 tax on the sale of each cigarette was installed as part of the package to pay off of the debt retained by the state).

In accordance with the law, the Japan Railway Construction Public Corporation (JRCC) took over most of the ¥ 4.3 trillion pension related liabilities, to be repaid by the sale of real estate, the sale of JRCC stocks and through public subsidies.

The law also required JR companies to share part of JNRSC's liabilities related to JR company employees. These liabilities were left over from the absorption of the former JR Group Mutual Aid Association pension fund into the national Employees Pension System in 1997 (benefits and contributions differed between the two systems). JR companies decided to pay their burden (totalling ¥ 177 billion) by the end of FYR 1998. JR Freight was responsible for ¥ 13.1 billion of this which could have a significant impact on the profitability of JR Freight in the present difficult circumstances. At the same time, however, the law enables JR Freight to obtain an interest free loan to cover this cost from JRCC.

A stock market collapse delayed privatisation of the JR rail companies but over half of the companies' equity was sold by JNRSC and JRCC. JRCC continues to hold 32% of the total stock of JR companies. In the case of JR Freight, 100% of equity is currently held by JRCC. The policy of the Ministry of Transport is, however, to pursue full privatisation of all the JR companies. This is the ultimate goal of the reform begun in 1987. The Ministry of Transport organised a Roundtable Examination of the Problems for Complete Privatisation of JR freight in October 1998 for JR Freight management and external experts under the direction of the Minister, with a remit to clarify steps towards the full fledged privatisation of the company.

Notes

1. European Railway Comparisons, report by the Institute of Transport Studies, University of Leeds, for the British Railways Board, 1994.
2. Proposal for a Directive on the interoperability of the trans-European conventional rail systems, COM(1999)617.
3. Source: Structure of the European Railway Industry, Mercer Management Consulting, December 1996, prepared for DG4, Mercer analysis using UIC data.
4. *Source*: UIC.
5. *Source*: European Railways Performance Indicators, a report for the European Commission DG7, Booz Allen Hamilton, July 1999.
6. "The Commission nevertheless wants to stress that a complete opening of the market for rail transport services for both passenger and freight is important. It will therefore pursue this issue further and continues to see full liberalisation as its final goal." Explanatory Memorandum paragraph 6, Proposal amending Directive 91/440/EEC, Brussels 24.11.1999.
7. DB Cargo press release, 18/12/98.
8. Railways: Structure, Regulation and Competition Policy, OECD Round Table on Competition Policy, 1998.
9. A Strategy for Revitalising the Community's Railways, COM(96)421.
10. Fair Payment for Infrastructure Use, COM(98)466.
11. Proposal for a Council directive on charges COM(98)480.
12. Paragraph 70 of Explanatory Memorandum preceding the proposal contained in COM(1998)480.
13. Now part of what had become known as the Railway Package, COM(99)616.
14. An Examination of Rail Infrastructure Charges, Report for the European Commission DGVII, May 1998.
15. *Source*: Most figures in this section are from the CD Business Plan, 1998.
16. *Source*: Railway Gazette International. July 1999, CD in Search of Commercial Freedom.
17. *Source*: Freight Transport Department, CD.
18. Few railways have such a wide discrepancy between historic and replacement values.
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28. *Fair Pricing for Infrastructure Use*, COM(1998)466.
29. *Rail Reform puts* DB *on Track to recovery*, *Ibid*.
30. *Rail Privatisation, Britain and Germany compared*, C Hass-Blau, *Anglo-German Foundation*, 1998.
31. *Source*: PKP Statistical data.
32. *Source*: PKP Restructuring Programme, discussion document for Council of Ministers, Ministry of Transport, 1999.
33. *Source*: PKP Restructuring Programme, discussion document for Council of Ministers, Ministry of Transport, 1999.

34. *Source*: Railway Gazette International, July 1999, PKP poised to take the privatisation plunge.
35. Rail Business Report, 1999, Railway restructuring moves to Eastern Europe, L. Thompson (World Bank) and V. Olievschi (CFR).
36. *The Reshaping of British Railways*, British Railways Board, 1963.
37. Financial years end 31 March.
38. *Transport Statistics Great Britain*, Department of Transport 1993, measured in tonne km.
39. *Britain's Railways*: A *New Era*, Department of Transport 1994.
40. British Rail Report and Accounts 1993/4 show margins on Trainload Freight (operating profit divided by turnover) of 20%.
41. The Privatisation of Britain's Railways, John Welsby and Alan Nichols, Journal of Transport Economics and Policy, January 1999.
42. Other companies provide their own wagons and one its own locomotives but they are not operators and drivers are supplied by EW&S or Freightliner.
43. *Resurgence of Rail – Prospects for European passenger and freight transport*, M. Taylor, Financial Times Automotive, October 1996.
44. This list draws on *Rail Privatisation*: *Progress, Players and the Future*, W. Bradshaw and M. Aveline, OXERA, 1996.
45. *Promotion of Rail Freight*, Railtrack, April 1997.
46. *The Potential for Rail Freight*, NERA, September 1997.
47. *Regulatory Objectives for Rail Freight*, Office of the Rail Regulator, 1997.
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49. *Framework for the Approval of Railtrack's Track Access Charges for Freight Services*, Office of the Rail Regulator, 1995.
50. Railtrack has recently made the point repeatedly that it does not make money from freight.
51. *The Timetabling of the Railtrack Network, a Policy Statement*, Office of the Rail Regulator, 1998.
52. *Transport Statistics, Great Britain*, Department for the Environment, Transport and the Regions, 1998. Figures refer to financial years ending March 31.
53. *Source*: Railtrack. Data in gross tonne km (not net as in *Transport Statistics, Great Britain*) indicates that between 1995/6 and 1997/8 international traffic grew by 39%, intermodal by 20%, compared to 15% for freight traffic overall.
54. The Rail Freight Group has suggested that freight should have a quota of capacity reserved on lines where there is currently spare capacity. Modern Railways, December 1998, page 793.
55. *A New Deal for Transport*, Department of the Environment, Transport and the Regions, 1998.
56. SRA would subsume the Office of Passenger Rail Franchising (OPRAF) which was set up under the 1993 Act.
57. Source: Railtrack Annual Report and Accounts, 1996/7 and 1997/8.
58. *Slow start to tripling freight*, Modern Railways, page 713, November 1998.
59. Class I railways are defined as those with revenue exceeding $250 m in 1993 prices. Regional railways operate more than 560 km of railway or revenue over $40 m. all other are local railways.
60. Railroad Facts,1998, Association of American Railroads (AAR).
61. Figures in tonne km including pipelines. *Source*: *Ibid*.
62. Draft Paper, "The Sources, Benefits, and Necessity of Aggressive Railroad Capital Investment, AAR, December 1998.
63. *Ibid*.
64. *Ibid*.
65. Railway Gazette International, November 1998, "America's small railroads are not waiting for the millenium".
66. A study by ICC and Federal Railroad Administration showed shipper satisfaction improving significantly after conversion to small railroads, Source: A Survey of Shipper Satisfaction with Service and Rates of Shortline and Regional Railroads", 1989.
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70. In tonne km per employee. Source: AAR, Railroad Facts, 1998.
71. *Ibid*.

72. National Accounts, main aggregates, Volume 1, 1960-1996, OECD, Paris, 1998.
73. *Ibid.*
74. Average returns fell as low as 1% in 1975. Source: Railroad Facts, various years .
75. *Source*: AAR, Railroad Facts, 1998.
76. Mercer Management Consulting Verified Statement to STB, 25/3/98, based on data from Railroad Facts, 1997, and the Statistical Abstract of the United States, 1997.
77. Chapin and Schmidt, *Do mergers improve efficiency*? Journal of Transport Economics and Policy, Vol. 33, 1999.
78. See section on productivity for a description of this technique.
79. *Source*: AAR, Railroad Facts, 1998, based on STB "Revenue Adequacy" assessment.
80. The decline appears to have flattened out (although number employed continues to decline slowly) and the industry has now started to hire new staff. *Source*: Ted Krohn, *The Railway Industry in the* USA, in *Railways: Structure, Regulation and Competition Policy*, Committee on Competition Law and Policy, Round Table 15, OECD, Paris, 1998.
81. Based on road length excluding yard track, sidings and multiple track.
82. STB website, notice of public hearing on major rail consolidation, 24/01/00.
83. *Railway Trends*, 1998, Railway Association of Canada (RAC).
84. *The Total factor Productivity of Canadian Railways*, 1956-91, Tretheway M. et al, Centre for Transport Studies, University of British Columbia (UBC).
85. *Issue Paper on Running Rights*, Canada Transportation Act, 1996.
86. *Ibid.*
87. Similarly, total factor productivity increased by 2.7% per annum between 1981 and 1991 but it remains about 50% below that for US railways. Source: (UBC) report on railway performance, 1994, quoted in "Perspectives on Productivity and the Canadian Railway Industry", RAC, April 1998.
88. Railway Trends, 1998, Railway Association of Canada.
89. Mercer.
90. Rail Sector Economic Performance, Transport Canada website, accessed 4 December 1998.
91. Railway Trends, 1998, Railway Association of Canada.
92. *Transportation in Canada*, Transport Canada's Annual Report, 1997.
93. *Canadian Railways Feature*, article by RAC in Railway Gazette International planned for March 1999.
94. *Ibid.*
95. Study by IBI, 1997, quoted in *Perspectives on Productivity and the Canadian Railway Industry*, RAC, April 1998.
96. *Canadian Railways Feature*, Ibid.
97. *Source*: Australasian Railway Association, Fact Sheet 6, accessed on website on December 15,1998. There are also railways serving private mines (primarily iron ore railways located in North Western Australia), but these may be regarded as integral parts of the mining operations.
98. *Source*: *Performance of Government Trading Enterprises*, 1991/2 *to* 1996/7, Commonwealth Government, 1998.
99. *Rail freight efficiency and competitiveness in Australia*, Transport Reviews, 1998, Volume 18.
100. We use States for both States and Territories.
101. 1 AUS$ = US$0.64 in January 1999.
102. OECD, CLP Round Table 15, Railways: Structure, Regulation and Competition Policy.
103. Accreditation, from the Commonwealth Department of Transport, is a form of licensing which basically is determined by safety requirements.
104. In fact the Trade Practices Act applies to infrastructure of "national significance". There are a series of criteria to determine what constitutes national significance including size of facility, importance to trade, importance to the national economy etc. Rail track that does not cross a State boundary has been deemed nationally significant in NCC recommendations, *e.g.* in the Hunter Valley of NSW where the intrastate track serves coal mines.
105. *Rail Reform*, Department of Transport website, dated 15 October 1998.
106. As noted in *Rail Transport*, Industry Commission, 1994.
107. *The Australian Black Coal Industry*, Productivity Commission Inquiry Report No.1 July 1998.
108. Source: *Performance of Government Trading Enterprises*, Ibid.
109. Pre tax operating results went from a loss of AUS$700 million in 1991/2 to a profit of AUS600 million in 1993/4. The situation deteriorated till 1995/6 (loss AUS$700 million) but turned to profit in 1996/7 (AUS$400 million). *Source*: *Ibid.*

110. *Submissions to Productivity Commission Inquiry into Progress in Rail Reform*, ARTC, 1998; NCC Annual report 1998.
111. Submission to *Productivity Commission Inquiry into Progress in Rail Reform*, ARTC, 1998.
112. *Ibid.*
113. *Inquiry into Progress in Rail Reform, Issues Paper*, Productivity Commission, August 1998.
114. *Sources*: Ministry of Transport; Yukihide Okano, President of the Japan Society of Transportation Economics, in Japan Railway and Transport Review, June 1994; International Railway Journal, November 1998.

Appendix

RAILWAY PERFORMANCE

Railway Performance

Measuring the performance of railways is not easy. Railways produce a multiplicity of outputs (transport of varying quality between a variety of origins and destinations at various times of day/week/year), using a multiplicity of inputs, subject to joint costs and major economies of scale and scope. Moreover their performance is heavily influenced by the geography of the area in which they operate (gradients, distances between markets). There will therefore be difficulties with interpreting any set of indicators of operating, commercial and financial performance.

Multiplicity of outputs is a problem if the different products have significantly different cost characteristics, and traffic on them is growing or declining at different rates. Failure to identify different traffic whose costs are very different will be very distorting. For instance, part of the rapid improvement in productivity of British Rail freight wagons in the 1980s was because of the decline and eventual abolition of movement of single wagonloads in favour of movement of traffic in full trainloads.

Freight traffic is particularly complex because of the lack of a homogenous unit of measurement. A tonne of freight may cost very different amounts to transport according to whether it is a dense product or not. Loaded wagon kilometres may be a better unit of measurement than tonne kilometres, and distinctions may be needed between trainload, wagonload and container or intermodal traffic. If tonne kilometres are used, a distinction by commodity is important; for instance a railway which has declining coal traffic and rapidly growing inter-modal will almost certainly show declining productivity if tonne kilometres are the measure.

Joint costs pose a particular problem. A single track railway may carry both passenger and freight traffic, a passenger train first and second class passengers and a freight train a variety of commodities. In this situation, only some of the costs can be specifically attributed to one of the forms of traffic; the remaining costs are joint. The result is that railways typically are characterised by economies of scope; that is the costs of a single railway handling a variety of types of traffic are less than if each distinct product were to be handled by a different railway. Moreover, most evidence suggests that railways are subject to economies of traffic density. Putting more traffic on the same route generally reduces unit costs, unless the route is already heavily congested.

The result is that apparent rises in productivity may be caused by diversification into new products or by increased traffic density rather than by improvements in the efficiency with which given tasks are performed.

The value of international comparisons of railway performance are also conditioned by the similarities and differences in the networks being compared. For example, Preston[1] found very high returns to increasing density on low density railways such as those of Ireland, Finland, Norway and Sweden, whilst the two most densely used rail systems examined, those of Switzerland and the Netherlands, had negative returns to density. Similarly small railways such as those of Ireland, Denmark and the Netherlands had strongly increasing returns to scale, whereas those of large European railways such as in France, Germany and Great Britain showed negative returns to scale.

Partial Productivity Measures for EU *railways*[2]

The benchmarks most widely used for comparing railway performance, both over time and internationally, are partial productivity measures (PPMs). PPMs relate a firm's output to a single input, for example traffic units per train km (load factors). They are easy to calculate, easily understood and require limited data.

Financial indicators for railways in selected European Union member states are given in Table 14.

Table 14 shows that there is a wide variation in the levels of financial indicators. For example, cost recovery ratios (average 1989-94) for EU railways range:

- From 0.24 for Belgium and 0.26 for Italy
- to 0.54 for Netherlands and 0.70 for Britain.

This indicates that, despite productivity gains, there should be considerable scope for improving the financial performance of railways in many EU countries towards the level of the best performing railways.

Table 13. **Key Benchmarking Indicators**

Indicator Area	Indicators
1. Operations	1.1 Train km/staff (direct staff) 1.2 Vehicle kms/annum (by vehicle type) 1.3 Train kilometres per track km
2. Commercial	2.1 Market share 2.2 Mean train load 2.3 Mean length of haul
3. Financial	3.1 Total Cost per train km 3.2 Receipts per traffic unit 3.3 Revenue/cost

Table 14. **Financial Indicators for Selected EU Railways**

Country	Operating Cost/Train km (£ sterling)			Receipts/Traffic units (pence)			Revenue/Cost ratio (cost recovery)		
	1994	1997	1989-94 Mean	1994	1997	1989-94 Mean	1994	1997	1989-94 Mean
Austria	14.2	14.5	14.8	3.3	3.3	3.4	0.38	0.39	0.40
Belgium	23.7	17.2	20.7	3.1	3.3	3.0	0.21	0.30	0.24
France	15.7	22.0	16.3	3.5	3.4	3.5	0.50	0.35	0.51
Germany	8.6	10.1	n.a.	5.0	4.8	n.a.	0.89[1]	0.74	0.50
Britain	17.5	n.a.	11.2	6.0	n.a.	6.1	n.a.	n.a.	0.70
Italy	19.0	17.6	26.8	3.8	2.3	3.0	0.44	0.29	0.26
Netherlands	9.2	14.4	8.78	3.4	4.0	3.2	0.54	0.41	0.50
Portugal	10.4	7.5	12.0	1.9	2.0	2.1	0.37	0.37	0.37
Spain	11.5	10.2	12.7	2.8	2.5	2.8	0.36	0.44	0.35
Sweden	13.2	10.2	11.2	2.2	2.6	2.3	0.42	0.51	0.54
Switzerland	14.0	n.a.	13.3	3.9	n.a.	3.9	0.46	n.a.	0.48

n.a. Data not available.
1. This figure suggests that the restructuring of the German railway has led to a change in the definition of its costs and revenues. This makes a comparison with other countries very difficult.
Source: Institute for Transport Studies, Leeds University, analysis based on UIC data.

The key source of data for international railway comparisons is the International Railway Statistics published annually by the International Railways Union (UIC). Even here however, major problems of data comparability exist, and the fragmentation of the rail industry in some countries is leading to data being less complete.

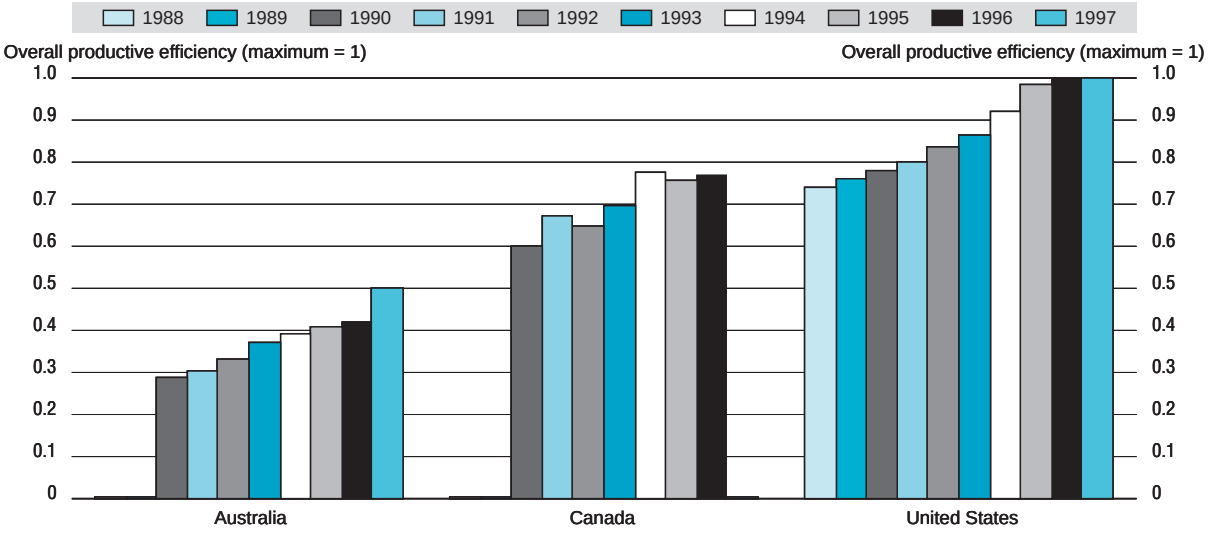
Total Factor Productivity Analysis and International Comparisons of Productivity

Partial productivity measures fail to give a comprehensive measure of economic output. Increases in the productivity of one output often come at the expense of lower productivity from other inputs, making comparisons between different companies complex. Because of these weaknesses, measures of total factor productivity have been developed. Various methods have been devised to add together different inputs and outputs and derive a single measure of outputs per input.

The Australian Productivity Commission (APC)[3] used data envelopment analysis on the basis of a) output net tkm transported and b) inputs of track length, number of locomotives, number of wagons and number of employees. APC's approach was to:

- identify groups of railways with similar profiles in the structure of the input factors used;
- compare railways with similar input structures to the best railways in the group;
- give the best railway in each group an efficiency rating of 1 and each of the others in the group a rating from 0 to 1 depending how much they differ from the best. Thus the closer the indicator is to 1 the more efficient the railway is deemed to be.

Figure 9. **Preliminary estimates of productivity of freight rail systems in the 1990s**



Source: Progress in Rail Reform, Draft Report, Productivity Commission 1999, Ausinfo, Canberra.

The APC analysed the performance of freight railways in Australia, the United States and Canada.[4] These railways were selected as they are considered to show the best performance in the world and adequate data is available. More confidence can be placed in differences revealed by the time series data within a single country than in comparisons between countries due to difficulties in assessing the impact of differences in traffic mix, traffic density, track quality, geographic and topographic features. The results of this analysis[5] are shown in Figure 9.

The analysis unequivocally reveals the improvement in railway performance in each country over the period since 1990 and confirms the widely held perception that US railways are more efficient than other freight railways. It also suggests that much of the difference in efficiency arises from the scale of operations rather than from differences in technical efficiency.

Differences in productivity may be explained in part by differences in the scale of rail systems and the average length of haul and loading gauge:

- US railways carry 35 times as many tonne km of freight annually as Australian railways. The Canadian freight task is 4 times as large as in Australia.
- for coal the typical length of haul in Australia is 135 to 250 km whereas in the US it is 600-1300 km and in Canada 1100 km
- US axle load limits are 32-35 tonnes whereas in Australia the limit is only 22 tonnes.

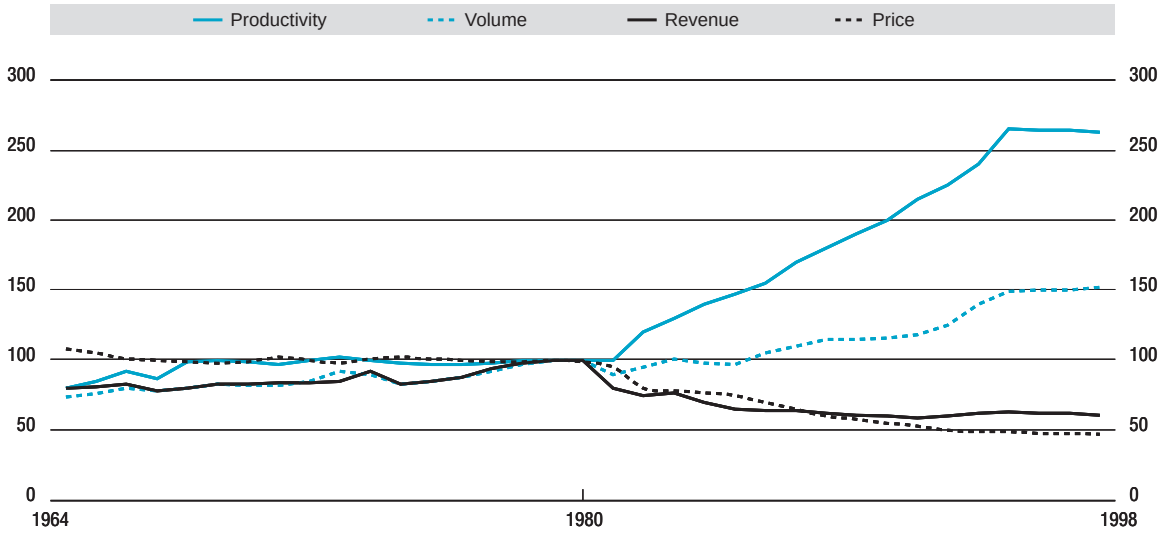
In part the economies of scale derive from market and geographical characteristics but crucially they have also resulted from the freedom of the Class I railways in the US to restructure over the last two decades through mergers and by divestment of short lines.

Trends in the US are shown in more detail in Figure 10. Before 1980, the rail freight industry had experienced stagnation of productivity and a decline in profitability. However, since 1980, there has been a turnaround in the industry, partly as a result of massive investment. Between 1980 and 1997, productivity increased by over 150%.

Gains in productivity can be passed on to three types of stakeholder:

- to customers, in terms of lower rates and/or improved services;
- to share-holders, in terms of improved returns on investment (resulting in improved financial performance for private or government railway owners);
- to labour, in terms of improved remuneration.

Figure 10. **Performance of major railroads in the United States, 1964-1998**



Note: Index 1981 = 100. Staggers Act passed October 1980.
Productivity = Indexed revenue tonne miles per constant dollar, operating expense with special charges removed.
Volume = Indexed revenue tonne miles.
Revenue = Indexed constant dollar operating revenue.
Price = Indexed constant dollar freight revenue per revenue tonne mile.
Source: Association of American Railroads (AAR).

Freight Rates

International comparisons of freight rates in the 1990s, drawn again from the work of the APC, show a slightly different pattern to changes in productivity (see Figure 11). Although the US shows the lowest rates for the decade as a whole, Canada shows the sharpest fall in rates (30%), falling below US levels in 1997, largely because of the decline in the value of the Canadian dollar. Australia also shows substantial improvement but remains well above North American rates.

Differences in the absolute levels of freight rates are explained in part by the scale of rail systems. US railways carry 35 times as many tkm of freight annually as Australian railways. The Canadian freight task is 4 times as large as in Australia. Length of haul also has an important influence. For example for coal the typical length of haul in Australia is 135 to 250 km whereas in the USA it is 600-1300 km and 1100 km in Canada. Infrastructure specifications also have an influence. US axle loads are 32-35 tonnes whereas in Australia the limit is only 22 tonnes.

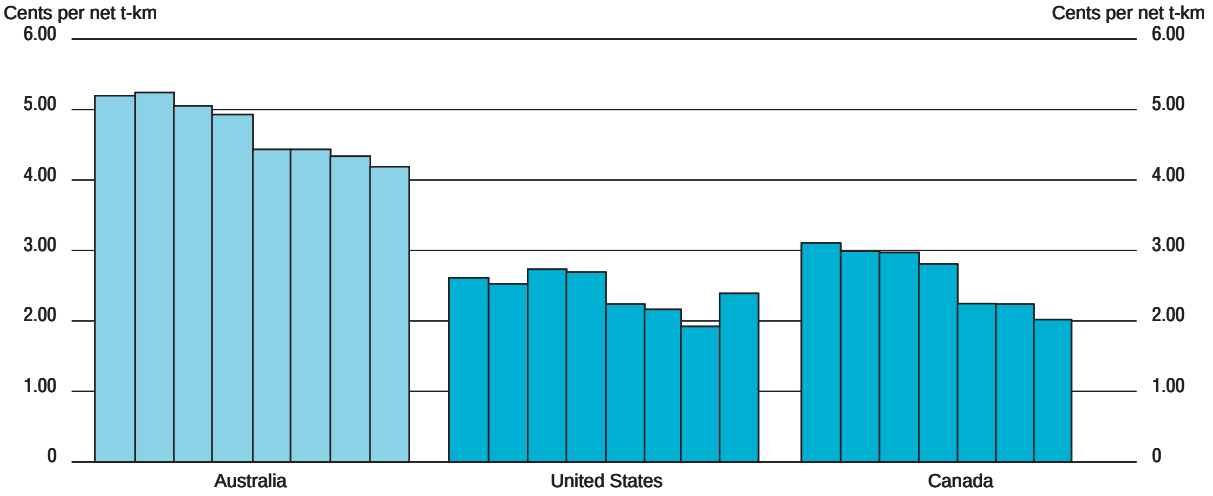
Return on Assets

Data on returns on assets invested, from the APC's analysis, show weak and fluctuating returns in all three countries (see Figure 12). The best results are for the US, where Class I railways show returns of 3 to 5% in all but one year between 1990 and 1997.[6] However, these rates are well below the rates of return that can be achieved in most other sectors of the US economy and they therefore threaten the long term viability of US freight railways.

Canadian and Australian results show even lower rates of return than the US with frequent negative results. In all cases, the negative results can be explained by exceptional circumstances – for example, in 1992, Canadian railways suffered from a generally weak economy together with labour disputes in the mining industry. The most frequent exceptional cost items are the financing of redundancy packages. The Australian figures are not directly comparable to the other railways as they include passenger services, and might be expected to be higher if the passenger results were excluded.

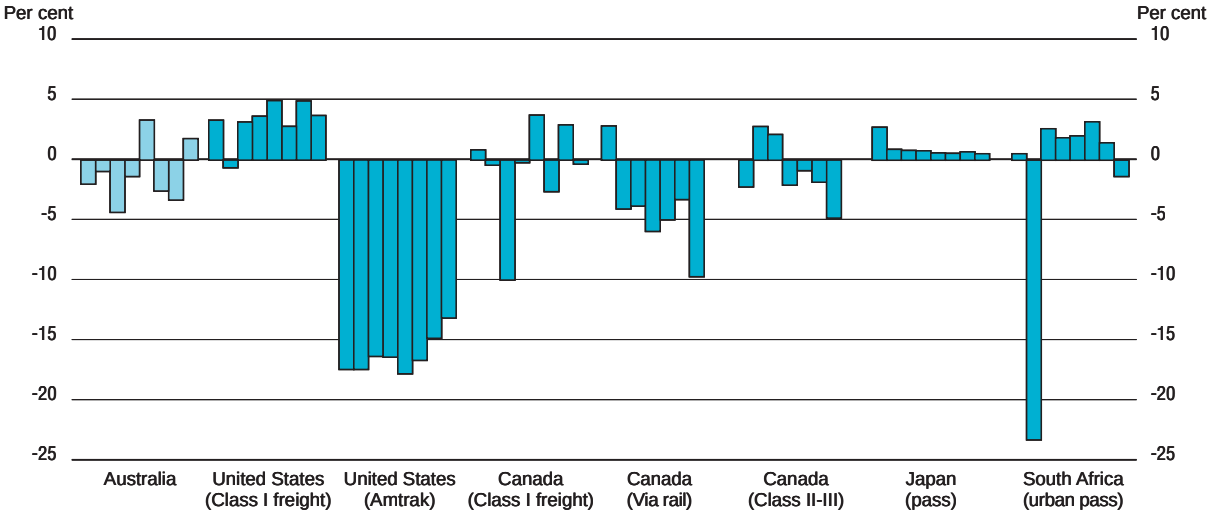
The overall conclusion is that, even in the OECD's best performing rail systems, rates of return are insufficient to guarantee sufficient investment in the industry to provide for growth or even stability in the long term.

Figure 11. **Real Freight Rates 1990-97 (A$)**



Source: Progress in Rail Reform, Draft Report, APC, 1999, Ausinfo, Canberra.

Figure 12. **Return on Assets by Country Disaggregated by Service 1990-97**

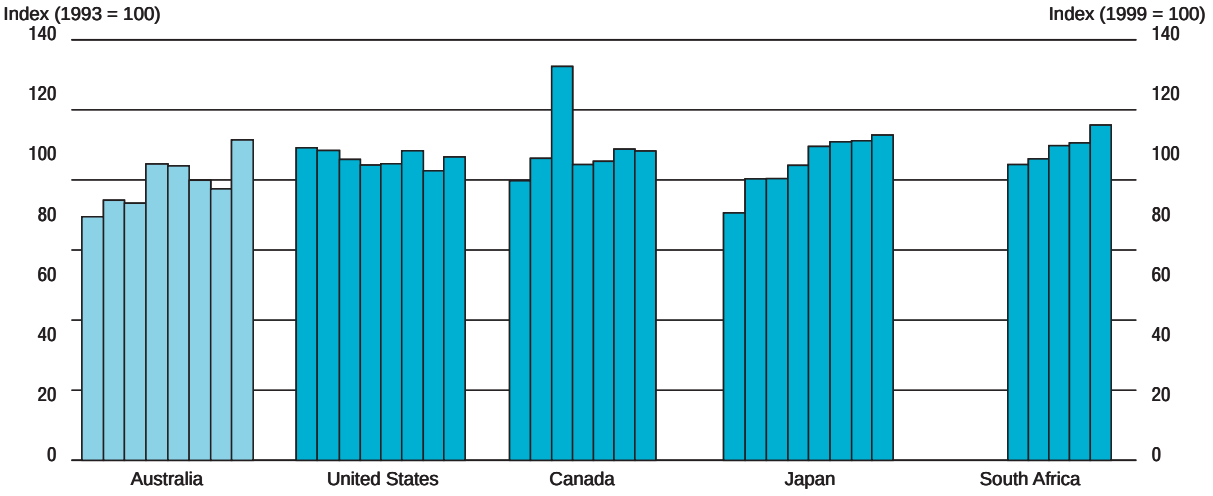


Source: Progress in Rail Reform, Draft Report, APC, 1999, Ausinfo, Canberra.

Labour Remuneration

Comparative data on the full rates of remuneration for rail staff is difficult to compile as items such as pension contributions are subject to widely varying regimes internationally. In some countries the state takes responsibility for all pension contributions whereas in others the railway contributes the employers payments. The APC therefore used unit labour costs (average costs per employee) as a rough indicator of remuneration and presented data on trends over time rather than country to country comparisons. Time series indexes produced by the APC for each country (with no conversion of currencies) are reproduced in Figure 13.

Figure 13. **Index of Real Average Unit Labour Costs by Country 1990-97**



Source: Progress in Rail Reform, Draft Report, APC, 1999, Ausinfo, Canberra.

Figure 13 shows that unit labour costs were remarkably stable in US Class 1 railways in the 1990s. In Canada, unit costs increased by 11% with the large increase in 1992 mainly the result of increased employee benefits linked to labour force restructuring. In Australia, unit labour costs rose by 31% over the period 1990 to 1997. This was caused by a wide range of factors, such as the changing composition of the workforce following the introduction of contracting out.

Notes

1. Preston, J. T*he economics of British rail privatisation*. Transport Reviews 16(1)1-21, 1996.
2. The discussion of Partial Performance Indicators and preceding paragraphs is based on C. Nash, B*enchmarking of European railways – an assessment of current data and recommended indicators*, ECMT/EC Benchmarking Conference, November 1999.
3. *Progress in Rail Reform*, Inquiry Report 6, August 1999, Australian Productivity Commission, published April 2000.
4. Australian railways examined are the interstate system and the railways of each State – *i.e.* excluding the mineral railways operated by mining companies but including the lines that transport coal in New South Wales and Queensland. In North America, US Class 1 railways were examined together with all Canadian freight railways.
5. The APC intends to complete and extend the analysis to cover Japan, New Zealand, South Africa and 16 European countries.
6. These figures are returns on assets rather than the (higher) figures cited in the US chapter which are returns on equity.

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