

**STUDY OF THE FINANCING OF  
AND PUBLIC BUDGET  
CONTRIBUTIONS TO  
RAILWAYS**

**A Final Report for  
European Commission,  
DG TREN**

**Prepared by NERA**

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## EXECUTIVE SUMMARY

### Introduction to this Report

1. This is the final report of a study to “assess the public budget contributions of the financing of railway undertakings and rail infrastructure managers, as well as to review their financial position.” The study follows from the commitment in the 1996 White Paper on a *Strategy for Revitalising the Community's Railways* to “report at regular intervals on the progress made by Member States in reducing debt and improving finances”.
2. The study builds on the work of earlier studies, in particular the two reports by Mercer Management Consulting in 1996 and 1997/8. Mercer’s work on the finances and indebtedness of EU railways was used to inform the 1996 White Paper and the Commission’s Communication COM (98) 202, which reported on the implementation and impact of Directive 91/440/EEC.
3. We have examined the main state-owned railway undertaking and infrastructure manager for each EU Member State, and for Norway and Switzerland. We have also examined private sector railway companies in the UK, where the rail sector was fully privatised. In addition, we have presented information for the ten candidate countries that have rail systems.

### Our Approach

4. This study is based on a number of data sources, in particular: International Railway Statistics published every year by the UIC; information in annual reports published by the different railway companies; data supplied directly by staff in the railway undertakings or infrastructure managers in response to our enquiries; railway state aid data submitted annually by Member State governments to the Commission; information from railway and ministry websites in the different countries; and additional information from specific national publications.
5. We have also undertaken interviews, either face to face or by telephone, with railway representatives in most Member States, Norway and Switzerland. These discussions focused on the forms of public budget contributions received by railways and the financial situation of the railways, but also discussed associated issues, including institutional reform and operating performance.

### Institutional Structure

6. Throughout the 1990s European railways have undertaken significant institutional restructuring which has resulted in a partial unbundling of the integrated railway systems that were typical before 1990. The changes up to 1995 have continued between 1995 and 2001. This has resulted in greater commercial independence, more

of a focus on the core railway business, and the introduction of some competition. The change has been prompted by Directive 91/440 and subsequent Commission policy, but also by a general move by governments to operate public services more commercially and the trend by both private and public companies to focus on their core business in an increasingly competitive environment.

7. Directive 91/440 required that management of railway infrastructure be independent from train operations. The Directive was the catalyst for a major restructuring of European railways throughout the 1990s. The form of separation varies between Member States:
  - complete separation in **private companies** (Great Britain);
  - separate companies within the same state-owned **holding company** (Germany and Italy);
  - infrastructure managers and railway undertakings set up as **separate state-owned bodies** with independent executives (Denmark, Finland, the Netherlands, Sweden, Portugal and Norway);
  - **hybrids**, where railway infrastructure financing is separated, but infrastructure and operating capabilities are retained within the same company (Austria and France); and
  - separate divisions within an **integrated company** for infrastructure and operations (Belgium, Greece, Ireland and Luxembourg).
8. Since the early 1990s railways have been unbundling ancillary activities such as road transport, ferry operations, catering, IT, engineering and management consulting, and equipment leasing. This has occurred in a number of ways, including legal separation of peripheral businesses, sale of such businesses, outsourcing of office and engineering support services, outsourcing or sale of operational support activities, leasing of equipment, creation of special purpose companies for construction and/or operation of new lines such as airport lines or high speed lines, and outsourcing of rolling stock design and manufacture to the private sector.
9. There has also been increased managerial independence as rail organisations have moved into the private sector or into a greater “arms-length” relationship with the state. In many countries, though, the infrastructure authority continues to have a close reliance on the state, both in terms of managerial discretion and dependence on state funding. Even in countries where passenger operations are private companies, they may still be dependant on public support for funding.
10. Competition is evolving at different speeds in the three main areas of railway activity, namely passenger services, freight services and support services. Competition is furthest advanced in support services. In the passenger sector

competition is being introduced mainly through competitive tendering of regional or local services. Only Great Britain has tendered long-distance services. Tendering is now well-established in Great Britain, the Netherlands and Sweden and underway in Denmark, Germany and Portugal. In Germany, new operators have won half the tenders. In freight there are some significant open access operators of international services who mainly act as consolidators with train operations in the hands of the national rail operators, though some are now starting to arrange haulage through independent train operators. There are open access domestic rail freight operators in Denmark, Great Britain, Germany, the Netherlands and Sweden.

11. A further important trend is the devolution of powers to specify and fund services to regional and local governments. This has recently occurred in Germany, Sweden, France and Italy, and to a more limited extent in some other countries.

### **Operating Performance**

12. Previous studies for the Commission, by Deloitte & Touche/Braxton Associates, and by Booz, Allen and Hamilton, have constructed performance indicators for the years 1990 to 1997. The second of these studies provides information on 18 indicators for railways in all 15 Member States.
13. For the present study NERA has selected seven headline indicators. These are: traffic units; total commercial traffic revenue per traffic unit; total railway staff; staff costs as a proportion of operating costs; costs per employee; unit operating costs; and the viability ratio (commercial revenue divided by operating costs). The report charts consolidated results for EU railways over the period from 1995 to 2001.
14. Our findings, consolidated for the EU railways, are summarised in Table 1. The railways experienced significant traffic growth over the period. At the same time, the number of railway staff fell substantially, in part reflecting a trend towards outsourcing activities. Overall, railways have become more commercially viable, a consequence of falling unit costs and broadly stable yields. However, whilst yields for passenger services have increased, those for freight services have fallen markedly.

**Table 1**  
**Indicators of Operating Performance, Consolidated for EU15 Railways**

<i>All currency in 2001 prices</i>	1990	1995	2001	Change 90-95	Change 95-01
<u>Traffic units (millions)</u>					
Passenger km	253,085	266,603	301,253	5.3%	13.0%
Freight tonne km	214,617	221,510	245,377	3.2%	10.8%
Total traffic units	467,702	488,113	546,630	4.4%	12.0%
<u>Commercial traffic revenue (millions €)</u>					
Passenger traffic receipts	18,235	20,352	25,803	11.6%	26.8%
Freight traffic receipts	15,245	11,587	10,226	-24.0%	-11.7%
Total traffic receipts	33,480	31,939	36,029	-4.6%	12.8%
<u>Yield - Commercial traffic revenue per traffic unit (€)</u>					
Passenger (receipts per passenger km)	0.07	0.08	0.09	5.9%	12.5%
Freight (receipts per tonne km)	0.07	0.05	0.04	-26.4%	-20.0%
Overall yield (passenger and freight combined)	0.07	0.07	0.07	-8.6%	0.7%
Total railway staff	1,082,153	982,054	784,452	-9.2%	-20.1%
Cost per employee (€)	39,774	40,245	40,523	1.2%	0.7%
Total operating costs (millions €)	69,263	73,550	73,086	6.2%	-0.6%
Unit operating cost (cost per traffic unit) (€)	0.15	0.15	0.13	1.7%	-13.3%
Viability ratio (revenue / operating costs)	60%	61%	71%	1.1%	16.4%

## Railway Finances

15. Article 9 of Directive 91/440/EEC required that "Member States shall set up appropriate mechanisms to help reduce the indebtedness (of railway undertakings) to a level which does not impede sound financial management and to improve their financial situation". Aid accorded by Member States to cancel debt and improve railway finances must be in accordance with EEC rules on State Aid.
16. The 1996 White Paper *A Strategy for Revitalising the Community's Railways* (COM (96) 421) re-iterated the importance of sound financial management for revitalising the railways. It stated that "the railways must have a financial structure that allows effective, independent management" and also that "for successful restructuring, the burden of past debt must be lifted". The Commission report of March 1998 (COM (98) 202), concluded that "the railways' debt situation has improved substantially since 1990, but this does not mean that the situation is yet satisfactory".
17. The concern expressed in Directive 91/440 and the White Paper was caused by railways' increasing debt levels. Debt grew by 30 per cent between 1980 and 1990 (from ECU 97 to 130 billion), and charges for servicing debt increased from 7 per cent

- of operating costs in 1980 to 11 per cent in 1990. Debt service was a particular burden in Portugal, Italy, Spain and France.
18. During the mid-1990s, virtually all Member States restructured their railways' institutional framework and finances. As a result, debt fell back to ECU 101 billion by 1995. The debt: equity ratio fell from 1.5:1 in 1993 to 1.04:1 in 1995, and charges for servicing debt fell from 13 per cent of operating costs in 1993 to 9.5 per cent in 1995.
  19. Actions to reduce indebtedness were of three broad types:
    - **using separation of infrastructure from train operations** to put new entities on a sound financial basis (Denmark, Finland, France, Netherlands, Norway, Portugal, Sweden, and – accompanied by privatisation – Great Britain);
    - **creating separate entities for financing infrastructure** (Austria, Belgium, Italy and Spain); and
    - **restructuring to relieve the railway of historic debt** (France, Germany, Italy, Luxembourg and Switzerland).
  20. The restructuring was successful in reducing debt levels and interest charges in the short-term. However, such one-off action has not by itself always created a sustainable financial position. In some cases, governments have funded the railways to maintain the new financial position. In others, however, continued funding has not been adequate and debt levels have increased again. Austria, Belgium, France, Germany and Great Britain fall into this category.
  21. Since 1995, railways have continued to invest heavily in asset replacement and new assets, at a faster rate than the growth in operating costs. As a result, **railways' asset intensity** (the amount of capital required per unit of operating cost) has continued to increase. It had increased from 1.9 in 1980 to 3.3 in 1995 for EU Member States. It further increased to 3.6 in 2001. Moreover, these figures probably understate the increase, since they exclude some of the assets funded through special purpose companies or concessions to the private sector, particularly for high speed lines.

22. The increase in asset intensity is important for the financial position of railways. In a steady state situation, if the railways break even on their income statement after government operating support, the depreciation charge (at replacement cost) should be sufficient to cover investment in asset replacement. However, if the asset base is growing, either the railway needs to generate a good surplus on their income statement or the investment has to be covered by additions to the balance sheet, through a substantial government contribution to investment expenses or through increased debt. Therefore, the increase in asset intensity puts continuing pressure on government financing of the railways, and explains the concern among many European governments about the increasing cost of their railways.
23. Overall **railway debt levels** have been stable between 1995 and 2001. The debt: equity ratio for the EU15 fell from 1.1 in 1995 to 0.8 in 1996, due to restructuring by some railways, particularly in Italy. It increased to 0.9 in 1997, and has remained in the range of 0.9 to 1.0 since then. However, this hides significant differences between railways, with several railways having increasing debt levels, counter balanced by falls in debt due to restructuring. Railways can be divided into low, medium and high debt groups:
- **low debt railways**, with a debt: equity ratio less than 0.5 are Denmark, Finland, Italy, Luxembourg, the Netherlands and Sweden;
  - **medium debt railways**, with a debt: equity ratio between 0.5 and one are Austria, Belgium, Germany, Norway and Switzerland, though for both Belgium and Austria, debt has been increasing substantially; and
  - **high debt railways**, with a debt: equity ratio greater than one are Great Britain, Greece, Ireland, France, Portugal and Spain.
24. Debt restructuring and general reduction in debt levels resulted in a reduction in **financial charges**, ie the charges for servicing debt, as a percentage of operating costs in the first half of the 1990s. Since 1995 financial charges have remained stable at about 5 per cent of operating costs. In many countries financial charges are low, at between 1 and 3 per cent of operating costs. In Great Britain and Sweden they are about 5 per cent of operating costs, but stable and sustainable. However, in some other countries financial charges are high or very high, and must be a cause for concern. Financial charges are 22 per cent of operating costs in Portugal, 24 per cent in Greece, and 17 per cent in Spain, though railway finances in Spain are being restructured. In Austria and France financial charges are also high, though the burden falls mainly on the rail infrastructure financing company.
25. One concern is that of **whether current European railway debt levels are sustainable**. Based on benchmarks of commercial companies, it appears that debt levels should be in the range of 30 to 60 per cent of liabilities (with railway undertakings sustaining lower levels than infrastructure managers). On this basis,

the high-debt railways for the countries listed above have debt levels that are not sustainable, and a move towards greater commercialisation would necessitate financial restructuring (in the case of Great Britain, additional funding has already been forthcoming). Also of cause for concern are the increasing debt levels in Belgium (where SNCB has proposed a restructuring programme), and in Austria for the infrastructure financing body SCHIG. SJ, the railway undertaking in Sweden, is also experiencing financial difficulties.

### Public Budget Contributions

26. Public budget contributions to railway undertakings and infrastructure managers are permitted by EU legislation in a variety of forms. These include: Public Service Obligations; financing of transport infrastructure; support under rules for normalisation of accounts; support to reduce indebtedness; and support for restructuring to remove excess capacity.
27. All Member States make payments for the provision of rail services, usually passenger services but in some cases freight services. In several cases these come from a variety of sources, in particular national, regional and local authorities. Table 1 shows the position in 2001. There are some significant differences between these figures and those declared by some Member States, though our report provides explanations of these differences.
28. Almost all Member States make payments for the provision of rail passenger services under contract to central or regional/local government. PSO payments will depend, amongst other things, on the levels of infrastructure charges, including whether they are intended to cover all infrastructure costs or are only estimated on a marginal cost basis.
29. State contributions are made to several railways to cover costs that are additional to those payable to employees by private sector undertakings. This particularly affects those countries where the majority of railway workers have the status of civil servants, including Belgium, France and Germany. The payments may not be shown in annual accounts of the railways.
30. Public budget contributions continue to be made for alleviation of historic debt for several of the railways. In some cases, the vehicle carrying the historic debt may have other important functions (such as SCHIG in Austria and RFF in France which are responsible for infrastructure financing), or may be a separate account (SNCF has a Special Debt Account). In some cases, for example Germany, the state has taken over the historic debt directly and so public budget contributions have ceased.

**Table 2**  
**Estimated Public Budget Contributions 2001, €millions**

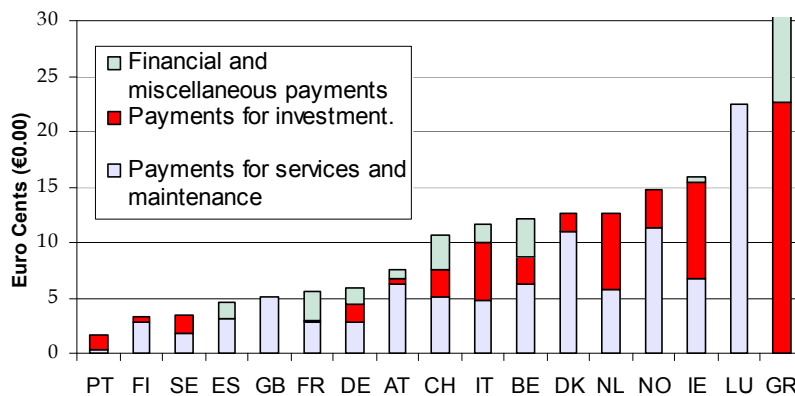
<b>Form of Payment</b>	<b>AT</b>	<b>BE</b>	<b>CH</b>	<b>DE</b>	<b>DK</b>	<b>ES</b>	<b>FI</b>	<b>FR</b>	<b>GB</b>	<b>GR</b>	<b>IE</b>	<b>IT</b>	<b>LU</b>	<b>NL</b>	<b>NO</b>	<b>PT</b>
PSO - Passenger services	491	361	346	4,300	512	265	35	1,731	1,727		129	1,799	76	91	152	9
Freight / combined transport	140		63					76	57		2					
Infrastructure maintenance and operations	950	640	787		235	719	335	1,608	1,201		6	1,430	142	953	408	7
Payments for capital investment	122	419	599	2,649	114		61	263		507	176	3,615		1,224	174	87
Staff and pension obligations		520				30		2,131			4			5		
Debt service	213	17	770			209		1,067		106	5					
Restructuring												1,036				
Other				2,091		178				466		48				
<b>TOTAL</b>	<b>1,917</b>	<b>1,957</b>	<b>2,565</b>	<b>9,040</b>	<b>861</b>	<b>1,401</b>	<b>431</b>	<b>6,876</b>	<b>2,985</b>	<b>1,079</b>	<b>322</b>	<b>7,928</b>	<b>218</b>	<b>2,273</b>	<b>734</b>	<b>103</b>
<b>Total, Declared State Compensation</b>	<b>649</b>	<b>2,207</b>	<b>N/A</b>	<b>9,530</b>	<b>898</b>	<b>1,349</b>	<b>403</b>	<b>6,481</b>	<b>3,005</b>	<b>624</b>	<b>372</b>	<b>6,840</b>	<b>208</b>	<b>2,600</b>	<b>N/A</b>	<b>22</b>

Source: company accounts; company data; State Aid submissions; NERA estimates.

Note: shaded cells are 2000 figures.

31. Figure 1 shows public budget contributions per traffic unit, distinguishing between operating payments, payments for investment, and miscellaneous payments.

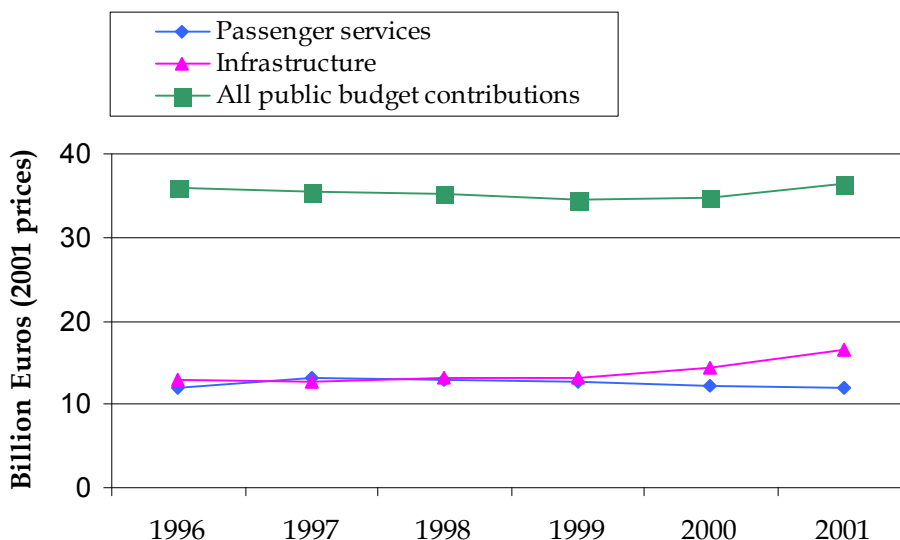
**Figure 1**  
**Payments per Traffic Unit (2001)**



Source: NERA database and analysis

32. Figure 2 shows **trends in overall public budget contributions** across railways in EU Member States between 1996 and 2001. Total payments for passenger services were similar in real terms in 2001 as they had been in 1996, though they were slightly higher in intervening years. In contrast, payments for infrastructure maintenance and investment combined increased by 28 per cent over the period. When allowance is made for the decline in some financial and restructuring payments, total state payments to EU railways in 2001 were similar to those for 1996.

**Figure 2**  
**Trends in Public Funding for EU Railways (Consolidated Figures)**



*Source: European Commission, State Aid Submissions*

33. State-owned railways receive additional (hidden) support when their borrowings are effectively underwritten by the government. This is because they receive higher credit ratings than would a private company, so that they can borrow at a more favourable interest rate. Such railways can borrow at an interest rate of about 0.25 per cent lower than a state-owned railway whose debt is not effectively underwritten and 1.1 per cent lower than a well-rated private rail operator.
34. Another form of hidden government support is provided by the **lack of an equity return required by government** on its investment in the railway. Such a return would be demanded by private investors. On the basis of estimates that have been made of the rate of return which would be required to invest in European railways, NERA estimates that, if they had been acting as commercial entities, European railways would have had to have been making average annual profits of around €11 billion to attract the capital employed, equating to up to 30 per cent of declared public budget contributions. The lack of a need to make a return on capital employed would also translate into a 5 to 10 per cent cost advantage for a publicly-owned train operator competing with a private sector one.

#### **Accounting Separation and Directive 2001/12**

35. Directive 2001/12 requires that railways keep separate accounts for passenger and freight services, as well as for infrastructure. The Directive requires that funds paid for activities related to the provision of passenger services as public services must be shown separately in the accounts and may not be transferred to activities related to the provision of other transport services or any other business.
36. Member States have been moving towards implementation of Directive 2001/12, though the speed of progress has varied. In some countries there are separate passenger and freight companies with their own accounts. In others there are separate divisions with audited accounts, while some countries have separate accounts for passenger and freight divisions but they are not independently audited. Some countries do not yet appear to have produced separate accounts.
37. Financial results for passenger and freight businesses will depend on the way that common costs are allocated between these businesses. In order to avoid cross-subsidy from one business to another, economic theory requires that at least the incremental costs that the activity imposes on total costs be charged to the business as a cost since, if the business does not pay the incremental costs it imposes, it will be receiving a cross-subsidy. In addition, the costs charged to the business should not exceed the standalone costs of providing it. These principles have already been articulated in regard to the determination of charges for the most important component of common facilities used by rail freight and passenger services, namely

infrastructure costs, and it seems appropriate that they also be applied to other elements of common facilities used by rail freight and passenger services.

38. We recommend that the European Commission facilitate the production of a handbook on best practice in the allocation of rail costs. It would be sensible that this handbook incorporates the advice that already exists on best practice in estimating incremental rail infrastructure costs.
39. In interpreting the split of public support to railways in different countries between passenger operations, freight operations and infrastructure, it will be important to take into account the way that infrastructure charges are levied in that country and the extent to which total access charge revenue covers total infrastructure costs.

### **Candidate Countries**

40. There are ten candidate countries that operate railways: Bulgaria; the Czech Republic; Estonia; Hungary; Latvia; Lithuania; Poland; Romania; the Slovak Republic; and Slovenia. All but Estonia have retained state-owned integrated monopoly suppliers of both train operations and infrastructure management but, whilst the traditional operator may still exist as a single legal entity (or a holding company), in many cases it is divided into a number of business units to provide accounting separability between the various business functions.
41. Poland is by far the largest market; in 2001 it accounted for a third of all train kilometres in the ten countries. In total, Poland, the Czech Republic, Romania and Hungary are responsible for nearly 80 per cent of all train kilometres.
42. In contrast to the EU15, railway activity in the candidate countries, in terms of both passenger and freight train-kms operated, fell (by 12 per cent) from 1995 to 2001. The big drivers of this fall in traffic are Bulgaria, Poland and Romania, for whom total train kilometres have fallen by 16 per cent over the period.
43. Employment has been following a strong downward trend in the candidate countries, similar to that in the 15 EU countries. However staff productivity, as measured by employment per thousand train kilometres, is much lower than in the EU15, by a factor of two or three times.
44. The debt: equity ratios and the debt as a proportion of total liabilities indicators both show that gearing is considerably higher in the candidate country railways than in the EU railways, with Hungary, Romania, the Slovak Republic and Slovenia all being particularly highly geared.
45. This position is one that has changed dramatically over the mid to late 90s, with the debt: equity ratio rising from 0.1 in 1996 to 1.1 in 2001. For the EU15 countries, the debt: equity ratio only rose from 1.1 to 1.2 over the same period. Large operating

losses have been a major contributor to increasing debt, so that in many cases debt levels are not sustainable.

46. Despite the high levels of gearing amongst these candidate country railways, interest payments constitute only 3 per cent of total operating costs which is 2 percentage points less than for the EU15.
47. The general trend for public budget contributions in the candidate countries has been upwards. According to UIC statistics, over the 1995 to 2001 period government operating support rose by 13 per cent in total in real terms. This was driven by a 43 per cent increase in operations contributions as infrastructure contributions fell by 39 per cent.

### Country Profiles

48. Appendix A to the report provides detailed profiles of the situation in each of the 17 countries studied in this report. Each profile: describes the national industry structure and any restructuring that has taken place since 1995; discusses trends in operating and financial performance since 1995, and the public budget contributions made to each of the organisations; and outlines the data used and any adjustments made.
49. Appendix B provides details of rail system in each of the ten candidate countries that have railways, under the two headings of “institutions and reforms” and “operating and financial performance”.

### Database

50. A major output of this project is the database we have prepared of financial data, and a limited number of activity data, for each of the railway organisations we have studied. The database for is provided in Appendix C (EU, Norway and Switzerland) and Appendix D (Candidate Countries).

## 1. INTRODUCTION

### 1.1. Study Context and Objectives

The aim of this study is to assess the public budget contributions to the financing of railway undertakings and rail infrastructure managers, as well as to review their financial position. The study follows from the European Commission's commitment in the 1996 White Paper on a *Strategy for Revitalising the Community's Railways* to "report at regular intervals on the progress made by Member States in reducing debt and improving finances". It builds on the work of earlier studies, in particular Mercer Management Consulting (1996, with an update in 1997/98).<sup>1</sup> Mercer Management Consulting's work on the finances and indebtedness of EU railways was used to inform the White Paper, and European Commission Communication 202 (1998), which reported on the implementation and impact of the Directive 91/440/EEC.

The three primary objectives of the study are based around the following activities.

- We have prepared a database of financial statistics, accompanied by certain activity data, for each of the principal state railways in EU Member States, for Norway and Switzerland, and for the candidate countries. We collated the data in a consistent format with those prepared in Mercer Management Consulting's earlier studies, to allow comparison to be made between the two. It is the intention that the database will be an input into the Rail Market Monitoring Scheme (RMMS). The RMMS was established by the Commission as a means by which to monitor technical and economic conditions and market developments in EU railways.
- We have used the database and accompanying information to report on each railway, and on the picture for all EU railways combined. Although we have considered the institutional structure and operating performance of railways, our principal focus has been to assess the financial situation of the railways, including their indebtedness, and their public budget contributions. We have considered the financial position of the railways with particular reference to certain financial indicators, consistent with the 1996 and 1997 Mercer studies. We have considered all forms of funding by state and other government bodies to the railways, including payments under contract for public service obligations. This information is intended to assist the Commission in communicating the financial position of railways, according to the commitment in its 1996 White Paper.
- We have assessed how far EU policy concerning railways, their finances and public budget contributions, is being reflected in the actual financial and institutional position within Member States. A particular focus has been to understand the extent to which the financial provisions in Directive 2001/12 are implemented. This

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<sup>1</sup> Mercer Management Consultancy is NERA's sister company.

directive prohibits cross subsidy between railway infrastructure and transport, and between passenger and freight services, and specifies that the accounts of these activities should be kept in a way that reflects the prohibition.

## 1.2. Organisations Examined in this Study

For this report, we have examined the main state-owned railway undertaking and infrastructure manager for each EU Member State, and for Norway and Switzerland. We have also examined private sector railway companies in the UK, where the rail sector is fully privatised. These organisations are summarised in Table 1.1.

We have also collected data on, and analysed the institutional situation in, the EU candidate countries which have national railways. Table 1.2 lists the organisations in each of these countries and their principal functions. If there has been any recent restructuring of the industry, this is also highlighted.

Over the 1990s, specifically the mid-1990s, the European rail industry went through a period of substantial restructuring spurred on by the first EC railway directive (91/440). Traditionally integrated state operators, controlling both the operation of train services and infrastructure management, have dominated the industry. However, between 1994 and 1997 most railway organisations were restructured and underwent governance changes.

The changes in Great Britain represent the most extreme reform process where the previously state-owned British Rail was split into various separate companies which were then privatised. In seven other countries,<sup>2</sup> there are now separate train operators and infrastructure companies, although they remain in the public sector. Elsewhere, there is a holding company with two separate companies beneath it, or a single rail company, but one that is split into an infrastructure manager and a train operator organisation.

In most countries, the railway undertaking is a state-owned company which legally either has the same status as a private sector commercial company (but one in which the government owns all the shares), or has a special status distinct from private sector commercial companies. Whichever status is chosen, the effect of these governance reforms is that the railway undertakings largely act as private companies with most or all of the same independence of its shareholder. The infrastructure manager in many cases is also a state owned independent company, but often has more direct government involvement (particularly where it is largely directly funded by the government), and in some countries is a government agency.

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<sup>2</sup> Denmark (1997), Finland (1995), France (1997), Netherlands (1995), Norway (1996), Portugal (1997) and Sweden (1989). In Italy and Germany, operations and infrastructure are separate companies within the same holding company. In Spain, the state company, RENFE, is currently being restructured so that infrastructure and operations are being separated.

**Table 1.1**  
**Rail Organisations in the EU, Norway and Switzerland**

Country	Organisation	Type of Organisation	Year of Creation	Ownership Status
AT	OBB	Operations & infrastructure	Pre-1996	State-owned company
AT	SCHIG	Financing company	1996	State-owned company
BE	SNCB/NMBS	Operations & infrastructure	Pre-1996	State-owned company
CH	SBB/CFE/FFS	Operations & infrastructure	Pre-1996	State-owned company
DE	DB AG	Operations & infrastructure	Pre-1996	State-owned company
DK	BS	Infrastructure manager	1997	Government agency
DK	DSB	Train operator	1997	State-owned company
ES	RENFE*	Operations & infrastructure	Pre-1996	State-owned company
FI	RHK	Infrastructure manager	Pre-1996	Government agency
FI	VR	Train operator	Pre-1996	State-owned company
FR	RFF	Infrastructure manager	1997	State-owned company
FR	SNCF	Train operator	1997	State-owned company
GB	Railtrack/Network Rail	Infrastructure manager	Mid 1990s	Private company
GB	TOCs	Passenger train operators	Mid 1990s	Private companies
GB	FOCs	Freight train operators	Mid-1990s	Private companies
GB	ROSCOs	Rolling stock owners	Mid-1990s	Private companies
GR	OSE	Operations & infrastructure	Pre-1996	State-owned company
IE	CIE	Operations & infrastructure	Pre-1996	State-owned company
IT	FS	Operations & infrastructure	Pre-1996	State-owned company
LU	CFL	Operations & infrastructure	Pre-1996	State-owned company
NL	RIB/Prorail	Infrastructure manager	Pre-1996	Government agency
NL	NS	Train operator	Pre-1996	State-owned company
NO	JBV	Infrastructure manager	1996	Government agency
NO	NSB	Train operator	1996	State-owned company
PT	REFER	Infrastructure manager	1997	Government agency
PT	CP	Train operator	1997	Government agency
SE	BV	Infrastructure manager	Pre-1996	State-owned company
SE	SJ	Train operator	Pre-1996	State-owned company

\* RENFE is currently being restructured.

**Table 1.2**  
**Rail Organisations in the Candidate Countries**

Country	Organisation
Bulgaria	Bulgarski Darzhavni Zheleznici (BDZ): Vertically integrated government agency up to 2002 now split into a government infrastructure agency and a state-owned operations company.
Czech Republic	České Dráhy (CD): Vertically integrated government agency up to 2003 now split into a government infrastructure agency and a state-owned operations company.
Estonia	Eesti Raudtee (EVR): Since 1999, EVR has been a private train operator and infrastructure manager. Is exposed to competition.
Hungary	Magyar Allamvasutak RT (MAV): Vertically integrated state-owned company.
Latvia	Latvijas Dzelzceļš (LDZ): Vertically integrated state-owned company.
Lithuania	Lietuvos Geležinkeliai (LG): Vertically integrated state-owned company.
Poland	Polskie Koleje Państwowe (PKP): Up to 2000 operated as the vertically integrated government agency. Now operates as a holding company for separate infrastructure company and an operating company.
Romania	CFR: Vertically integrated organisation up to 1998 now split into three independent bodies: an infrastructure agency, a freight operator and a passenger operations company.
Slovak Republic	Železnice Slovenskej Republiky (ZSR): Vertically integrated government agency up to 2002, now split into an infrastructure government agency and a state-owned operating company.
Slovenia	Slovenske Železnice (SZ): Vertically integrated state-owned company.

Of the candidate countries, all but Estonia have retained state-owned integrated monopoly suppliers of both train operations and infrastructure management but, whilst the traditional operator may still exist as a single legal entity (or a holding company), in many cases it is divided into a number of business units to provide accounting separability between the various business functions.

### 1.3. Status of Data Produced in this Study

For each of the EU countries, Norway and Switzerland, we have undertaken a lengthy process to prepare data that are, as far as practicable, consistent and are fit for purpose. We started with UIC data for each country, but the UIC data have major gaps and inconsistencies. Therefore, we supplemented and replaced UIC data with railway annual reports and with direct data requests to the railways. For later years, company annual reports are increasingly available and we have been able to compare UIC and company data for most countries; for early years company information is available only for some countries.

We have prepared the data so that the categories are consistent with the database prepared by Mercer Management Consulting for years to 1995. We have been particularly concerned to try to ensure that the data we use have been prepared on a consistent basis over the study period (1995 to 2001), so that comparisons of the first and last year are not misleading. In many cases we found that data definitions changed over the period, and we have sought to adjust or replace data where the changes are material to our analysis.

We have also identified a number of differences in the definitions between countries. As we are primarily interested in trends, these differences are of less importance. However, we have wished to compare financial performance and public budget contributions between countries, so we have sought to understand the differences in definitions in these cases. In particular, there are major differences in the representation of public budget contributions in financial statements, and where practical we have made some adjustments to facilitate comparison. These issues are discussed further, with supporting data, in the relevant report chapters.

Given that we have accessed data from a variety of sources, and have made a (limited) number of adjustments, the financial statistics and other data will in some cases be different from companies' own published statistics. In addition, the public budget contributions will differ from those reported by Member States' governments to the EU for a number of reasons - for example our analysis does not include regional train operators, and the reporting of capital payments may occur in different time periods.

For the Candidate countries, we have relied on UIC data to a greater degree, though we have checked data against company reports and with the companies directly when it has been practical to do so.

#### **1.4. Structure of the Report**

This report is structured as follows.

- In chapter 2 we describe our approach to this work and the sources we have used.
- In chapter 3 we provide some background information concerning the institutional structure of the European industry, considering issues such as vertical separation and competition.
- In chapter 4 we examine different indicators of the operational performance of the railways, present these indicators and comment on operational trends in EU railways.
- In chapter 5 we present trends in railway finances and indebtedness.
- In chapter 6 we examine forms of public budget contributions for the different EU railways.
- In chapter 7 we review implementation of Directive 2001/12, and the appropriate

methods to allocate common costs to different parts of the railway business.

- In chapter 8 we present a detailed overview of the railways' position in the EU candidate countries.
- In chapter 9 we provide our conclusions and recommendations.

There are four appendices to this report.

- Appendix A is a profile of the national railway sector for each of the 17 main countries examined.
- Appendix B provides details of railways in the ten candidate countries which have rail systems.
- Appendix C is a database of railway statistics from 1995 to 2001 for railways in the EU, Norway and Switzerland. This updates Mercer Management Consulting's earlier work on railways statistics to 1995, and is presented in a compatible format.
- Appendix D is the equivalent database for the candidate countries.

## 2. OUR APPROACH

### 2.1. The Process

The main tasks we undertook to complete this study are described below.

#### Stage 1. Database structure and initial data input

The primary source of data for the study is the UIC publication *International Railway Statistics*, which is produced annually on the basis of templates completed by participating railway organisations. This was also an important source for Mercer Management Consulting's studies. We prepared the structure of the database, so that it was consistent with the previous studies, and so that it allowed us to process UIC statistics easily. We then populated the database with UIC statistics for all countries. We examined the data, noting gaps (UIC data are incomplete for many of the companies we considered) and discontinuities.

#### Stage 2. Collection of annual reports:

The annual reports were used in a number of ways. They were used as checks on UIC data and to complete gaps; but they were also used to provide insight into how the organisations are funded, and provide background information to interpret the financial statistics. Whilst some of the companies (primarily infrastructure companies) do not produce detailed accounts, nearly all of the organisations produce some form of annual report. These reports were requested from the companies, though the most recent versions were usually available on the Internet.

#### Stage 3. Interim assessment:

On the basis of the information collected, we assessed the status of financial data and examined more general background material concerning the institutional structure of the railways and the forms of public budget contributions that they received.

We compared the data in annual accounts with those published by UIC, and we were able to identify a number of gaps and potential inconsistencies of definition. The financial data from the annual reports were used, where possible, to replace any inconsistent UIC data or complete gaps. Where UIC data were missing and needed to be input from annual reports, we compared the data in the annual accounts with those in UIC for adjacent years to ensure that we retained definitions that were consistent.

In a number of cases we replaced all UIC data with data from annual reports, because the UIC data were not compiled on a consistent basis over the period of our study or appeared to contain major errors.

The generation and analysis of a number of financial and performance indicators at this stage of development also enabled us to test further the consistency and accuracy of the data held. Using the interim indicators we were also able to get a better understanding of the operating environment for the railways and nature and trends of any government budget contributions.

#### Stage 4. Questionnaires and interviews:

The next stage in the study was to use direct contacts with railways and ministries to clarify outstanding issues concerning the financial data, as well as provide information on the status of the railways with respect to EU policy in these areas. We contacted the relevant organisations in each of the 17 countries directly, through written questionnaires, through structured discussions by telephone, and by face to face interviews.

In some cases it was not possible to complete the dataset on the basis of published information. In such cases, we asked the organisations to both verify and complete the relevant database entry. This has been a useful source of information for several of the organisations.

The written questionnaires typically concentrated on clarifying certain aspects of the data and forms of public budget contributions. They also provided a valuable opportunity to improve our qualitative understanding of the industry structures and processes in each country.

For all the 17 main countries we sought to interview, either by telephone or face-to-face, at least one key agency in the railway industry. The countries where we conducted face-to-face interviews, were France, Germany, Great Britain, Italy, Spain and the Netherlands: the remainder we sought to interview by phone. Whilst these interviews were a further opportunity to confirm certain aspects of the data, their main purpose was for us to improve our understanding of the operation of the national industry. Institutional and organisational changes (both past and future), the railways' financial position, public budget contributions and the role of EC directives in shaping domestic policy were all important topics raised in the interview stage.

#### Stage 5. Candidate country studies:

The railways in the candidate countries were considered in less detail than the other countries. In accordance with the study terms of reference, we have placed greater reliance on published sources of data, and have not subjected the figures to the same degree of scrutiny as those for the EU Member States, Norway and Switzerland. In addition, we have not assessed the situation with respect to the candidate countries in the same level of detail as for the Member States.

We undertook the same process of collecting and collating UIC and annual report data as for the main database. Any gaps in the data or concerns over consistency were raised in

questionnaires which were sent to all countries. The questionnaire also sought to improve our understanding of public budget contributions and other key issues.

The response rate to the questionnaires was low,<sup>3</sup> so that the checking of data that we have undertaken has been restricted. In addition, we were unable to obtain full financial data for two countries.

#### Stage 6. Completion of the database:

This last substantive task of the development process involved establishing a set of consolidated data. Using the data provided by the organisations in the questionnaire and interview stages, a number of further additions and corrections were made to the database. In a few cases, we filled gaps in the data with NERA estimates, which typically followed trends in the data. Filling these gaps minimised inconsistencies in consolidated data and indicators that would arise from incomplete data.

Some significant gaps remain.

- Jernbaneverket, the Norwegian infrastructure manager, does not record balance sheet information so it has not been possible to construct any form of balance sheet for any of the years under consideration. In terms of the aggregate EU wide data, we believe that this omission is not large enough to cause any sizable bias or inaccuracy.
- In addition, the industry restructuring has meant that more activities are being transferred to companies outside the scope of this study. In particular, rail freight services in the Netherlands and Denmark were transferred to another company, Railion, towards the end of our period of study. Railion is majority owned by DB AG, so that Railion statistics are included in the data for Germany.

Due to the way the European industry has evolved over the period, many countries now have two rail organisations (an operator and an infrastructure manager) instead of one integrated company. For the purposes of providing an overview of the sector, and comparing data with 1995, it was necessary to aggregate the data from these individual companies into one integrated sheet for each country. For most entries in the database this simply involved adding the entries for each organisation together. However, where there are payments between the two organisations, and cross funding, these flows have been removed from the combined sheet to prevent any distortion of the figures, in particular through double-counting of access charges both as a cost to train operators and as revenue for infrastructure companies.

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<sup>3</sup> We are grateful to Hungary, Poland and Slovakia for their responses. The response rate was similar to that for Member States, though in the latter case we pursued a greater number of contacts in accordance with the focus of the study.

We adjusted the database so that financial data could be viewed in both real euros (at 2001 prices) and nominal local currencies.

This final task of database development involved a large scale checking and auditing stage. We checked that the numbers contained in the database were entered correctly and aimed to ensure that the resulting database provided as complete and consistent a picture of the EU railways.

#### Stage 7. Reporting:

Using the series of performance and financial indicators built into the database, in conjunction with the background data from interviews and questionnaires, the last task of the project involved the reporting of our findings.

## 2.2. Information Sources

We used the following information sources in this study.

- **UIC financial statistics** The International Union of Railways (UIC) publishes International Railway Statistics which are detailed financial and activity statistics on its member railways every year. The 1995 to 2001 editions of this document were used in the development of the database. Several railway organisations are missing from this dataset, including all railway organisations in Great Britain. For certain other organisations, the data are not complete.
- **Annual report data** The majority of the main railway organisations in Europe now produce annual reports and accounts. These reports typically contain detailed financial data, including explanations of changes to the financial data in the notes to the accounts, and background information on trends during the year. However, several organisations do not produce annual reports, particularly infrastructure managers which are not corporations.
- **Data supplied directly** by staff in the railway undertakings or infrastructure managers in response to our enquiries.
- **Information from interviews** with key agencies in each country. For most countries we held telephone interviews or face-to-face interviews with at least one organisation. This process involved discussions with a range of bodies including Ministries, train operators, infrastructure managers and traditional vertically-integrated organisations.
- **EC railway State Aid dataset** This dataset has been compiled from statistics submitted to the European Commission annually by Member State governments. This spreadsheet was a useful source of additional data on public contributions. It was usually not directly comparable with our other data, for example because it

reported capital contributions which were not separately identified in the balance sheet, or because it included funding for local operators.

- **Organisation and Transport Ministry websites** The websites of both the organisations and the relevant Ministries were also used to provide additional background material on the organisations and institutional structures.
- **Other publications** For a number of countries, additional specific data sources were used to provide supplementary activity or background data. In certain instances we also drew on the Amadeus financial database,<sup>4</sup> which provides standardised financial data on 6 million public and private companies in 36 European countries, and activity data published by DGTREN and ECMT.

Table 2.1 summarises the information sources we have used for each country. For greater detail on the sources used for each country, please see the country profiles in Appendix A. Information sources for the candidate countries are summarised in Chapter 8.

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<sup>4</sup> <http://amadeus.bvdep.com>

**Table 2.1**  
**Information Sources**

<b>Country</b>	<b>Company</b>	<b>Main Sources for Database</b>	<b>Other Main Sources for Study</b>
AT	OBB	UIC, annual accounts	Information provided by the Transport Ministry, Austrian Railway law, SCG brochures
AT	SCHIG	Annual accounts	Annual reports; interview with SNCB
BE	SNCB/ NMBS	UIC	BAV website, various media articles, SBB brochures
CH	SBB/CFF/F FS	Data direct from organisation, UIC, annual accounts, BAV	State aid documentation from the Transport Ministry, the Regionalisation Law", the Federal Plan for railway expansion, assorted other govt. and DB documents
DE	DB AG	Annual accounts	Interview with Transport Ministry, relevant agency websites
DK	BS	UIC, data direct from organisation	Finance Ministry's website
DK	DSB	UIC, annual accounts	E-mail correspondence with RHK, company website
ES	RENFE	Annual accounts	E-mail correspondence with VR, company website
FI	RHK	Annual accounts, data direct from RHK	Annual reports; companies' websites; interview with SNCF
FI	VR	UIC, annual accounts, data direct from VR	UIC, annual accounts, SRA reports
FR	RFF	UIC and annual accounts	Interview with SRA, various ORR and SRA publications
FR	SNCF	Principally UIC	UIC, annual accounts
GB	Network Rail	UIC, annual accounts, SRA reports	Material provided by OSE
GB	TOCs	UIC, annual accounts, SRA reports	Material provided by CIE
GB	FOCs	UIC, annual accounts, SRA reports	UIC; interview with FS
GB	ROSCOs	UIC, annual accounts	Annual reports
GR	OSE	UIC, annual accounts	Face-to-face interviews, company websites
IE	CIE	UIC, annual accounts, data direct from CIE, CSO publications	UIC; interview with FS
IT	FS	Annual accounts	Annual reports
LU	CFL	UIC, annual accounts	Face-to-face interviews, company websites
NL	RIB/Prorail	UIC, annual accounts, direct data from RIB	UIC, annual accounts
NL	NS	UIC, annual accounts	Interview with the Transport Ministry, Standard and Poor's report, Ministry website
NO	JBV	UIC, annual accounts, data direct from JBV	UIC, annual accounts, data direct from NSB
NO	NSB	UIC, annual accounts, data direct from NSB	CP annual reports; email exchanges with INTF and CP
PT	REFER	UIC	Telephone interviews with Industry Ministry, company publications
PT	CP	UIC	
SE	BV	UIC, annual accounts	
SE	SJ	UIC, annual accounts	

### 3. INSTITUTIONAL STRUCTURE

#### 3.1. Separation of Principal Activities

It is European Commission policy that management of railway infrastructure should be independent from train operations. Directives 91/440 and its amendments specify that these two activities should have separate audited accounts, but separate divisions or entities are also encouraged. The Directive was a catalyst for major restructuring of the EU railway sector throughout the 1990s.

- In Belgium, Greece, Ireland, Switzerland and Luxembourg, infrastructure management and train operations have been established as separate divisions **within the same company**.
- In Germany and, more recently, in Italy the two entities are separate companies but within the **same holding company**. The privatisation of DG AG, in Germany, is now being mooted and it is not yet clear whether the holding company structure will remain.
- In France and Austria, **hybrid structures** have been implemented. In France, RFF is the owner of the infrastructure. However, the railway undertaking, SNCF, retains an infrastructure division and has undertaken all infrastructure maintenance, by contract with RFF, and some infrastructure enhancement. In Austria, a separate body, SCHIG, is responsible for infrastructure financing, but OBB is responsible for both services and management of infrastructure.
- In Portugal, Norway, the Netherlands, Sweden, Denmark and Finland, the main railway undertaking and infrastructure manager are **separate companies or agencies**, but are both state owned. In some of these countries, some of the rail services are now undertaken by private companies.
- In Britain, the infrastructure manager is an independently regulated private company; the railway undertakings are private companies, which are independent from the infrastructure manager.

Directive 2001/12 built on Directive 91/440 and went further by stipulating that passenger and freight services should be separated, with separate accounts.

In several countries this requirement is met by the separation of activities into independent companies. In Sweden, passenger (SJ AB) and freight (Green Cargo) were established as completely separate state owned companies in 2000; in the Netherlands and Denmark the freight businesses of the state railway were merged with DB's freight business into the new company Railion; in Germany and Italy, freight and passenger services are separate companies within the overall holding company; in the UK, freight services are undertaken by independent private sector operators. However, in Portugal and Finland freight services

and passenger services remain within the railway undertaking, and in Belgium, Greece and Ireland they remain within the integrated company.

Separation of activities has not been without problems: the transaction costs of communication and negotiation are undoubtedly higher. In the Netherlands, when co-operation between the three separate infrastructure companies was found to be poor, a new unified structure for infrastructure management (Prorail) was devised. In Great Britain and Sweden, there have been various disputes between the infrastructure company and the railway undertakings that have taken considerable management time to resolve.

The situation is summarised in Table 3.1.

**Table 3.1**  
**Organisation of Principal Activities**

	Integrated	Holding Company	Hybrid	Independent Infrastructure and Train Operators	Independent Passenger and Freight
AT			✓		
BE	✓				
CH	✓				
DE		✓			✓(1)
DK				✓	✓(2)
ES	✓(4)				
FI				✓	
FR			✓		
GB				✓	✓
GR	✓				
IE	✓				
IT		✓			✓(1)
LU	✓				
NL				✓	✓(2)
NO				✓	✓(3)
PT				✓	
SE				✓	✓

Notes: (1) the freight company is owned by the holding company; (2) the freight company is part of Railion; (3) as of 1 January 2002; (4) separation is planned.

### 3.2. Unbundling of Ancillary Activities

Until the early to mid-1990s, state-owned railways were vertically integrated railway businesses. Often they also had diversified interests in activities such as local and long-distance buses, road freight transport and logistics, travel agencies, ferry operations, real estate and associated retail development, catering, IT, engineering and management consulting, and equipment leasing.

Since the early 1990s, railways have begun to undertake an unbundling of both their integrated railway businesses and their other diversified interests. While most public attention has been focused on the unbundling of infrastructure from train operations, and of passenger from freight, equally substantial unbundling has taken place in other areas of railway activities.

Great Britain provides the most dramatic example of unbundling. In the mid-1990s, British Rail was unbundled into over 100 different companies that were subsequently privatised. The unbundling created separate companies for: infrastructure management (a single company, Railtrack, now Network Rail); passenger train operations (25 companies); rail freight operations (6 companies, now consolidated into 4); rolling stock leasing companies (ROSCOs - 3 companies); rolling stock maintenance/overhaul (6); infrastructure maintenance (12), telecommunications (1); infrastructure engineering design, IT, materials storage and logistics, and others.

There has also been significant unbundling in other Member States. It can be divided into six different types:

- **Legal separation of peripheral businesses**, which were previously divisions of the railway, into companies unrelated to the railway or within a holding company. In Sweden, SJ was unbundled in 2000 into three legally separate and unrelated companies, two for railway operations (SJ AB for passenger, Green Cargo for freight) and a third for peripheral businesses (Swedcarrier, a holding company comprising companies for real estate, rolling stock maintenance, terminal production and IT). In the Netherlands, NS is a holding company with passenger services, train maintenance, infrastructure maintenance and construction, stations, and real estate as separate businesses. In Italy, FS is now a holding company with separate legal businesses for infrastructure, train operations, road transport, engineering, and stations. Germany has a similar structure with DB AG as the holding company. This legal separation aids transparency of accounts and reduces cross-subsidy. Together with the associated managerial independence, it allows the businesses to operate more commercially, often in competitive markets.
- **Sale of peripheral businesses**. In the Netherlands, NS sold its telecom interests to Worldcom in 2000 for €1.4 billion. In Germany, DB has sold its long-distance bus business and DER, its travel agency business. In Denmark, DSB sold its parcel business in 2000. In Sweden, SJ has steadily sold its smaller peripheral businesses since 1995. In France, SNCF sold its wagon leasing business, Ermewa, in 2002. The pace of sales is slow but steady, and the establishment of peripheral businesses as separate legal companies is likely to accelerate the sale of those businesses that cannot achieve profitability on a stand-alone basis.
- **Outsourcing of office and engineering support services** to specialist suppliers, sometimes by selling off internal departments. Examples of such support services are IT (hardware/network maintenance and operation, software development),

telecommunications, photocopying services, recruitment, building maintenance, security, office supplies, engineering drawing offices, materials storage and logistics, road transport and office catering. Many railways which used to undertake all these activities in-house have seen a steady decline in their in-house activity and employees.

- **Outsourcing and sometimes sale of operational support activities.** Examples include maintenance of signalling equipment and rolling stock (often to manufacturers as part of a supply and maintain contract for new equipment), train cleaning, station maintenance and cleaning, on-train catering, and infrastructure engineering design (often as part of design-build contracts). One of the largest areas of outsourcing now opening up is infrastructure maintenance. In Finland and the Netherlands, all infrastructure maintenance is outsourced by the infrastructure company (RHK and RIB/Prorail respectively). In Denmark and Sweden, the infrastructure companies (Banestyrelsen and Banverket) are beginning to outsource maintenance from 2003/04.
- **Leasing of equipment.** We have mentioned leasing separately because of the potential size and specialised nature of the sector. Traditionally, railways have financed new equipment themselves or through Eurofima. Financial constraints are causing some railways to lease, if only experimentally at present. The leasing market has been given impetus by the creation of the three UK ROSCOs, which provide operating leasing to UK passenger franchisees, and are becoming active in the rest of Europe. DSB in Denmark has recently leased new passenger rolling stock from a ROSCO, and new operators in Denmark, Sweden and Germany are leasing equipment for their concessions from the ROSCOs. DB has leased some freight wagons. Leasing is likely to grow slowly but steadily. In addition, some European railways (eg SJ in Sweden, NS in the Netherlands, OBB in Austria, SNCB in Belgium) have been large users of cross-border tax leases. As public sector companies they pay no tax and therefore cannot take advantage of tax depreciation allowances. A sale and leaseback arrangement with an investor who can take advantage of the allowances (typically in the US) gives them significant benefits. A large proportion of the rolling stock fleet in all four of these countries has been leased in this way, as well as some infrastructure. Originally “off-balance sheet” (i.e. not appearing as debt), the railways are now recognising this leasing as an obligation in their accounts.
- The creation by the government of **special-purpose companies** for the construction and/or operation of new lines and services, often in public-private partnerships. The most common areas are airport lines (eg Arlanda, Heathrow Express, Oslo airport) and high-speed lines (eg the Channel Tunnel Rail Link, Netherlands HSL). The creation of separate operators reduces the scope of the main state-owned railway, and particularly its ability to grow, since most of these arrangements are in growth areas. At the same time, it also reduces the strain on the railway’s finances, since it does not have to fund what are often highly capital intensive projects.

- **Outsourcing/loss of advanced technical knowledge and design to manufacturers.** During the 1950s to 1980s, new equipment (locomotives, passenger multiple units, signalling) was often designed by the state-owned railways with the national manufacturers building to the railways' detailed specification. The railways usually possessed greater technical resources than the manufacturers, and were willing to take the risk on technical innovation. This situation is rapidly changing. The manufacturing industry has consolidated into a few global companies, who are developing standard products or platforms, with economies of scale in development and manufacturing. Railways have not been able to keep up with manufacturers, and, under financial pressure, have cut technical staff. Technical control has moved to the manufacturers, which will continue as further technical standardisation occurs (eg ERTMS), and the rail industry is likely to become similar to the airline or electricity industries, in which the operators are service providers, with few technical resources.

All of these changes have meant major reductions in the scope of railways' activities, both horizontally (i.e. the railways are increasingly focused on the railway business only) and vertically (i.e. the railways no longer perform some of the railway functions themselves).

Such outsourcing is common to many state-owned industries (eg electricity, water, ports/airports) and private sector companies, which realise that they cannot compete with specialist firms in cost, service or innovation in areas that are not part of their "core" skills. If these other industries are a guide, outsourcing in the rail sector is likely to continue further.

There have been some changes in the opposite direction, particularly the move toward acquiring logistics businesses to strengthen the rail freight business. DB's acquisition of Stinnes, and SNCB's acquisition of ABX are examples. It remains to be seen whether these acquisitions are successful.

### 3.3. Managerial Independence

Another important trend in the organisation of railways has been increased managerial independence from government. Again, this has been prompted by Directive 91/440 which requires that railway undertakings have independent status from the State, notably with respect to assets, budgets and accounts.

Many of the railway organisations are now established as companies, subject to the same legislation and regulations as any other commercial company, even though they remain 100 per cent state owned.<sup>5</sup> Such a status gives management considerable independence from

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<sup>5</sup> It is sometimes said that the railway has been "privatised" in this context, but this terminology is confusing because "privatised" is usually taken to mean that it is owned by the private sector, whereas typically these companies remain 100 per cent state owned.

their owners, similar to that of a private sector company listed on a stock exchange, and this limits the government's ability to influence the company. For example, the Netherlands government found, in its recent disagreements with the NS Board and Management, that because of Dutch company law its formal authority was severely limited. It is currently developing a concession contract with NS which will give it greater power.

In other cases, for example in Belgium, France and Portugal, the legal status is specific to the state sector (a state owned enterprise, with certain public service obligations), and the government influences the body through various means including certain appointments to its board.

The extent of independence from the state will depend on the details of the relationship with the owner, both formal and informal. It could also be said that the independence will depend on the regulatory regime and the nature of any contracts the undertaking has with government, though these will not impede the undertaking from acting according to commercial principles, albeit within the regulatory environment that it operates.

Several railway undertakings are privately owned, and hence can be said to have full independence from the state. Freight operators, which generally do not receive public funding are profitable, are completely independent of government except in as far as the government may try to influence them to achieve public policy objectives, as it does with other private sector companies. Passenger operators typically are partially funded by public budget contributions under concession contracts with the government. They have normal performance commitments as part of their contracts but, because of their funding, are more susceptible to government influence. New entrants, either through competitive tender or open access, are in this position, though some are actually subsidiaries of railway undertakings in other member states.

In several cases infrastructure managers have retained a closer relationship with national governments. Only in one case, Great Britain, was the infrastructure manager privatised, but this experience resulted in the entity, Railtrack, being placed in administration because of its severe financial difficulties. The new company, Network Rail, was established in 2002 and does not have shareholders, though for public budgeting purposes it remains in the private sector. As such it is an unusual entity, reliant on debt financing. The exact way it will operate remains to be seen.

In several countries – Norway, Finland, the Netherlands and Denmark – the infrastructure manager is a government agency rather than a commercial company. These organisations do not necessarily prepare accounts according to standard commercial principles, notably balance sheets are not available in all cases. However, this situation may change: in Denmark, for example, greater independence from government is planned, with an independently appointed board and public funding arranged through contract.

### 3.4. Competition

Competition is evolving at different speeds and in different ways in three areas of railway activities – passenger, freight and support services.

In many respects, competition is furthest advanced in support services. Competition is developing in freight, but progress is slow and the established railways have a significant advantage. In the passenger sector, competition is being introduced mainly through competitive tendering of regional/local services by transport authorities, but progress is also slow. In main network passenger services, political and practical issues mean that competition is likely to develop only slowly if at all.

#### 3.4.1. Passenger

The level and development of competition is very different by type of service.

In **regional and local passenger services**, competitive tendering of services by transport authorities is opening up significant competition, with the incumbent operator (usually the state-owned operator) losing some of its previous operations.

Tendering is now well established in Sweden, Great Britain and the Netherlands. Great Britain is now undertaking its first re-concessioning and many local authorities in Sweden their second re-concessioning. The implications of these changes for subsidy requirements in Great Britain is discussed in Box 3.1.

Germany has tendered over 20 per cent of regional services, Portugal has agreed a 30 year concession for a specific route, and Denmark has awarded a tender for a regional service to a private operator. The law requiring competitive tendering was passed in Italy in 1998, but implementation has been delayed until 2004; however Trenitalia is now operating such services under contract to regional authorities, which is a preliminary to tendering. In Switzerland, local authorities have powers to tender services, but in practice have not done so.

Competitive tendering has resulted in the state-owned railway losing significant business to new operators. In Sweden, SJ now accounts for less than 40 per cent of passenger journeys; the loss of the Stockholm contract in 2000 resulted in an 8 per cent fall in its group revenue (staff, costs and assets were transferred to the new operator). In Germany, DB has won only about 50 per cent of the regional services tendered to date.

In **inter-city and long-distance passenger services**, no countries apart from Great Britain have competitively tendered services, and most currently take the view that they should be retained as exclusive to the national railway. The reasons usually given are the customer benefits of having an integrated system, the operational difficulties of separating services in a dense network and the economies of scale of a single operator. This view is common to countries which have successfully tendered regional services, eg Sweden, Netherlands,

Denmark, although Sweden is currently reviewing whether and how competition can be introduced in the long-distance network.

### Box 3.1 Impact of Tendering on Subsidy in Great Britain

There is clear evidence from Great Britain that competitive tendering for passenger services can reduce subsidy costs; what is less clear is whether those reductions can be sustained. As part of the British Rail privatisation process, the existing passenger services were divided into 25 different Train Operating Companies (TOCs), and offered as franchises under a competitive tendering process. These companies would lease their rolling stock from separate rolling stock leasing companies, while they would pay agreed track access charges to Railtrack and be indemnified against any subsequent increases in such charges over their franchise period. In addition, they would be protected against new on-track competition from other train operators. These conditions were intended to reduce the risk that successful bidders would face, and hence the subsidy they would require. In return, the operators would be required to provide minimum service levels and quality standards, and they would be subject to a pre-determined price regulation regime that would prohibit them from raising many (but not all) of their prices above inflation.

As the bidding process proceeded, many industry commentators noted how the franchise bids became increasingly optimistic – the annual subsidy requirements were less than had been expected. Figure 3.1 shows the agreed franchise payments from government over a six year period at constant prices.<sup>6</sup> This shows a marked decline in passenger subsidy payments from government to train operators, in total a 50 per cent fall over five years.

These payments were set out in contracts, and actual payments broadly followed this pattern, but increasingly the train operating companies have got into financial difficulties in meeting their obligations.<sup>7</sup> As a consequence, the Strategic Rail Authority, the government body responsible for the contracts, has felt the need to provide additional funding. The SRA's 2003 Strategic Report, published in January, reports that "over a third of the TOCs are now operated under management contracts under which franchisees are provided with higher levels of support and bear considerably less risk than under the original agreements. The result is that the benefit that the public purse originally received after privatisation is being outweighed by the need to increase support levels." As a consequence "the Government is not as well protected from revenue and cost risk by the original franchising model as was thought at the time it was developed."<sup>8</sup> Of course, the SRA could have taken a tougher line – but the consequence was that franchises would have had to be taken over in the short term and then re-let – though this has subsequently happened in the case of one London-area franchise. However, incentives still are likely to be dulled in future franchise arrangements.

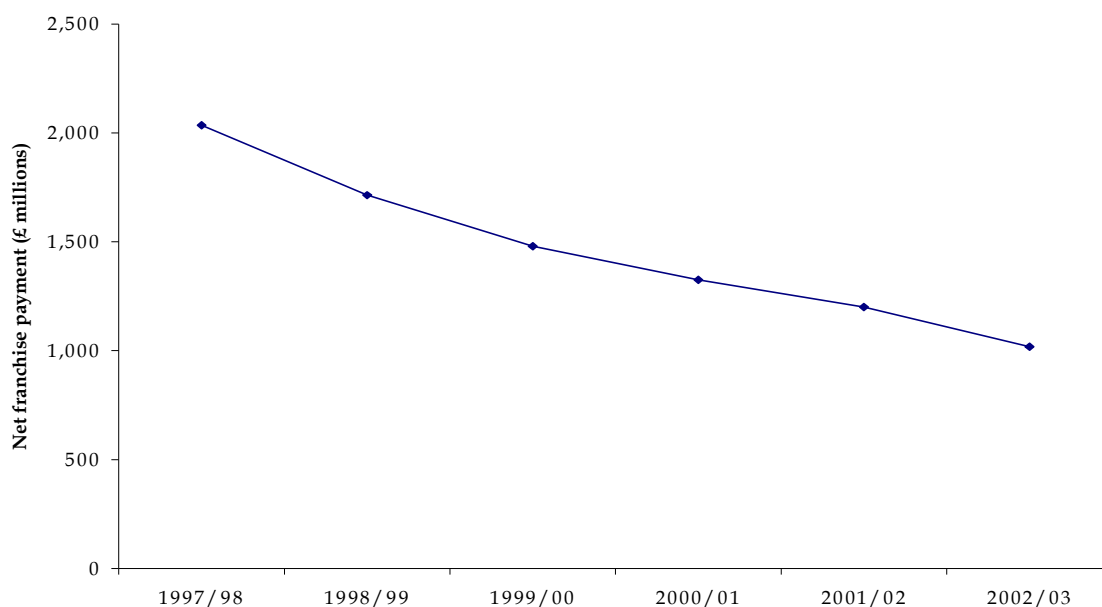
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<sup>6</sup> Many of the franchises were of seven years duration so, since the franchises were not all let in the same financial year, there is a set of total agreed franchise payments for all 25 TOCs combined over six full years.

<sup>7</sup> The main reasons are that while demand for rail travel and hence revenue have risen, it has been more difficult to cut costs than the bidders originally anticipated – this has hit hardest on those franchises where fares revenue has been a low proportion of costs.

<sup>8</sup> Strategic Rail Authority *The Strategic Plan 2003* 2003, p.47.

**Figure 3.1**  
**Traffic Units, 1995 to 2001**



More generally, an academic study has concluded that rail privatisation in Britain did lead to efficiency savings, at least in the early years. Pollitt and Smith considered efficiency savings after British Rail privatisation. They estimated that in the five years before privatisation unit costs went up by one per cent per annum in real terms after adjusting for changes in output and the impact of economies of scale. In the years after privatisation, but before 2000/01, unit costs after adjusting for inflation fell by two per cent a year after adjusting for output/scale effects.<sup>9</sup>

In **international passenger services**, most railways and Ministries envisage that the current pattern of joint ventures between national railways will continue. Some countries already competitively tender their share of the joint venture partnerships (eg Great Britain tendered Eurostar UK, although SNCF and SNCB are part of the consortium, and the Netherlands tendered operation of services over HSL Zuid, although NS is part of the winning consortium).

In **open access passenger services**, there are few new entrants. In Great Britain, open access is effectively constrained to services that are not being offered currently, for fear of “cherry picking” of existing services, which would undermine the franchisees’ profitability and

<sup>9</sup> M G Pollitt and A S J Smith “The restructuring and privatisation of British Rail: was it really that bad?” *Fiscal Studies* December 2002, 23, 463-502.

result in higher subsidies being required. Some open access services have been introduced by different franchise operators either on the same route or serving the same pairs of towns or cities by alternative routes. There is some evidence that this has led to reduced fares and improved service levels on these routes.<sup>10</sup> The only full open access operator is Hull Trains, which re-introduced a direct service from London to Hull discontinued by British Rail.

### 3.4.2. Freight

In **international freight**, some significant open access intermodal services have emerged. New operators operate some north-south intermodal services both from Benelux (eg ERS) and from the south (Italian operators). Up to date, the new operators have acted as consolidators of volume, either from their consortium partners or from third parties. The rail haulage has been provided by state-owned railways. However, some operators are starting to arrange haulage through independent operators, particularly those emerging through the opening up of the German domestic market.

In **domestic freight**, open access is allowed in Denmark, Germany, Great Britain, the Netherlands, Denmark, and Sweden. Significant new operators are emerging, but to date the main railway undertaking has only lost a small share, and still dominates the market (80 to 90 per cent share in Sweden, 80 per cent in Great Britain, 90 per cent in Netherlands, 95 per cent in Germany according to our interviews and other sources). Most countries expect a continuing if slow reduction in this share.

### 3.4.3. Support services

Where office and engineering support services are outsourced (see Section 3.2), the outsourcing is through full competitive tendering, since these are services that are generally available in the market place. Examples are telecoms, computer maintenance, and building management.

Where “core” support services are outsourced, the railway often has to create competition from scratch since all/most of the expertise in the area is in the railway. Typically, the railway will break apart the existing in-house activity and sell parts to outside suppliers. Alternatively, it will gradually outsource more and more of its requirement to outside suppliers as it becomes convinced that they are able to perform in a satisfactory manner. In the Netherlands, under the separation implemented in 1995, infrastructure maintenance continued to be undertaken by NS under contract to RIB/Prorail, the new infrastructure company. Gradually new suppliers have been introduced and NS is now also wishing to sell its business (Strukton). In Finland, under the separation also implemented in 1995, VR Track continued to carry out infrastructure maintenance under an exclusive contract with RHK, the infrastructure company. RHK has started to introduce competitive tendering for

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<sup>10</sup> See I S Jones "The evolution of policy towards on-rail competition" *Journal of Transport Economics and Policy* 34, pp371-384, September 2000.

part of its requirements from 2001. In Sweden, Banverket also introduced competitive tendering between its in-house maintenance units and outside suppliers. By the end of 2004, infrastructure maintenance contracts for each region in Denmark will be let by competitive tender. In France enhancement contracts are subject to competitive tender, whereas maintenance contracts are awarded without competition to SNCF.

### 3.5. Role of Regional Authorities

Another important trend has been the devolution of powers to specify and fund services to local governments.

- In Germany, full responsibility for regional services is devolved to regional authorities.
- In Sweden, full responsibility for regional and local services is devolved to local authorities, which have competitively tendered the services, with a large proportion won by new private operators. Inter-regional short distance services are concessioned by a national agency (Rijkstrafiken) working with local authorities.
- In France, legislation for devolution of authority and funding on regional services to regional councils was enacted in 2002, following devolution in pilot areas in 1997 to 2001.
- In 2001 powers in Italy to specify local services were transferred to regional bodies as part of a wider devolution process;
- In Great Britain responsibility for services in Scotland has been devolved to the Scottish Parliament;
- In Switzerland and Austria some PSO funding is provided by the state, and some by regional bodies.
- In Spain and Denmark, the state operator's PSO are undertaken by contract with the state government, but there are separate, long established, local services which are operated through funding by their local authority.
- Although devolution to local authorities is increasing, in several countries, including Belgium, Norway, and England and Wales, regional services continue to be specified and funded by a ministry or agency of the state government. This is a more transparent system than a single national contract, not least because local government would wish to avoid cross-subsidising neighbouring administrations. Thus it allows the trade offs in funding, both between regions and between different forms of public funding within regions, to be more clearly identified.

## 4. OPERATING PERFORMANCE

### 4.1. An Introduction to Performance Indicators

This Chapter reviews railway performance by means of selected performance indicators. Performance indicators can be used to provide a summary of performance, but care needs to be taken in their selection, construction and interpretation. We have constructed seven performance indicators for our 17 countries. Completed results for the years 1995 to 2001 are shown in Appendix C. In Section 4.3 we present consolidated results for the EU Member States for our selected performance indicators. These graphs provide a summary picture of what has been happening to railway traffic, revenue, staff numbers, costs, and the relationship between costs and revenue, over the period from 1995 to 2001. First, though, in Section 4.2, we review the previous studies for the Commission on rail performance indicators.

### 4.2. Previous Studies of Performance Indicators

#### 4.2.1. The studies

The relevant studies and reports we have reviewed are:

- Deloitte & Touche Consulting Group, and Braxton Associates:
  - *European Railways Performance Indicators: Volume 1: Analysis and Comments Final Report, 23 July 1997;*
  - *Study on Performance Indicators for European Railway Undertakings; Volume 2: Appendices, Final Report, 23 July 1997.*
- Booz, Allen and Hamilton, 1999:
  - *European Railways Performance Indicators Draft Final Report, May 29<sup>th</sup> 1999.*

#### 4.2.2. The 1997 Study: Deloitte & Touche Consulting Group

The objective of this study was to “design indicators that would capture the evolution of railway undertakings in terms of financial performance, improvements in productivity and quality of services, and to test the indicators on a sample of railway undertakings for benchmarking”.

This study selected some 50 indices for possible study, but this number was reduced to 19 that were actually calculated. Indices were calculated and plotted for the five years from 1991 to 1995.

Financial values were converted to common values by correcting for national inflation rates to 1995 values and then converting to ECUs using IMF statistics.

The railways covered were:

- SNCF (France);
- FS (Italy);
- RENFE (Spain);
- SJ/BV (Sweden);
- BR/Railtrack (UK).

NERA has categorised the indicators calculated under the following headings,<sup>11</sup> broadly listed in terms of increasing complexity:

- Productivity and yield indicators (D1-D10);
- Cost recovery indicators (D11-D13);
- Financial indicators (D14-D19).

The separate indicators are shown in Table 4.1.

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<sup>11</sup> This numbering scheme has been devised by NERA, and is not from the original studies.

**Table 4.1**  
**Performance Indicators in the Deloitte & Touche/Braxton Study**

No.	Indicator
<b>Productivity and yield indicators</b>	
D1	Passenger load factor - passenger km divided by seat km <sup>12</sup>
D2	Freight load factor - freight tonne km divided by tonne km capacity <sup>13</sup>
D3	Passenger revenue per passenger km (passenger revenue <b>excludes</b> tariff/PSO compensations). This index could be described as "passenger yield"
D4	Passenger revenue per passenger km (passenger revenue <b>includes</b> tariff/PSO compensations)
D5	Freight revenue per freight tonne km transported. This index could be described as "freight yield"
D6	Labour productivity - train kms divided by employees <b>excluding</b> infrastructure employees
D7	Driver productivity - train kms per driver
D8	Train crew productivity - train kms per train crew member
D9	Total operating cost per thousand gross hauled tonne kms
D10	Labour cost per employee (total labour cost divided by number of employees)
<b>Cost recovery indicators</b>	
D11	Cost recovery ratio: commercial revenue, which includes PSO/tariff compensation divided by total operating costs, which include infrastructure costs
D12	Government support (excluding support for infrastructure) as percentage of total revenue excluding interest payments by government
D13	Government support (excluding support for infrastructure) as percentage of total revenue
<b>Financial indicators</b>	
D14	Return on equity, <b>including</b> investment grants
D15	Return on equity, <b>excluding</b> investment grants
D16	Return on net capital: pretax operating result including government support/equity capital plus interest bearing debt plus pension provisions
D17	Return on net capital, <b>excluding</b> government support
D18	Debt/equity ratio, <b>excluding</b> government grants
D19	Debt/equity ratio, <b>including</b> government grants

<sup>12</sup> Note that seats kms are estimates for BR and SNCF. Seat km data are not always available in published statistics.

<sup>13</sup> Note that tonne km capacity data are not always available in published statistics.

### 4.2.3. The 1999 Study: Booz, Allen and Hamilton

This report updates and extends the Deloitte & Touche study in three ways:

- It extends the calculation of indices to the main railways in all 15 Member States;
- The time series is extended from 1995 to 1997; and
- An attempt is made to identify indicators for different types of rail company/activity that might be used in the future.

The Booz Allen and Hamilton report highlights the difficulties of data collection and comparability in an increasingly fragmented railway industry.

The report includes graphs showing performance for years 1991 to 1997 on 18 indicators. In Table 4.2 we categorise them in the same way as the Deloitte & Touche/Braxton indicators and compare them with the list in Table 4.1

**Table 4.2**  
**Booz Allen and Hamilton Performance Indicators**

Booz Allen & Hamilton index number	Deloitte & Touche number	Indicator
<b>Productivity and yield indicators</b>		
15	D1	Passenger load factor - passenger kms divided by seat kms
16	D2	Freight load factor - freight tonne-kms divided by theoretical capacity available
13	D4	Passenger yield, including payments for loss-making services
14	D5	Freight yield, including any PSO payments, though these are relatively rare for freight
17	D6	Labour productivity - train kms divided by employees excluding infrastructure staff
18	D7	Driver productivity - train kms per annum per driver
19	D8	Train crew productivity - train km per train crew member
10	D9	Total operating cost per gross hauled tonne-kms
11	not calculated	Labour cost per gross hauled tonne-kms
12	D10	Labour cost per employee - total labour costs divided by number of employees
<b>Cost recovery indices</b>		
9	D11	Cost recovery ratio - the degree of coverage of total operating costs with total revenue, which includes PSO compensation
7	D13	Government support as a percentage of total revenue
<b>Financial indicators</b>		
1	D14	Return on equity, <b>including</b> investment grants
2	D15	Return on equity, <b>excluding</b> investment grants
3	D16	Return on net capital, <b>including</b> investment grants
4	D17	Return on net capital, <b>excluding</b> investment grants
5	D19	Debt/equity ratio, <b>including</b> investment grant
6	D18	Debt/equity ratio, <b>excluding</b> investment grant

### 4.3. NERA Performance Indicators

The data upon which this section of the report is based is found on page 3 of Appendix C (Consolidated - EU15). Further detail on data definitions is provided in section C1, also found in Appendix C.

In this study we have selected the following seven headline indicators:

- traffic units, disaggregated into passenger km and freight tonne km, which shows the trend in traffic volumes;
- total commercial traffic revenue per traffic unit, disaggregated into revenue per passenger km and revenue per freight tonne km, which show the trend in price/yield achieved by the railways;
- total railway staff;
- staff costs as a proportion of operating costs;
- cost per employee, which indicates whether the railway is able to keep wage rates under control;
- unit operating costs (operating costs divided by traffic units), which is a measure of overall cost trends and can be compared with the trend in price/yield; and
- the viability ratio (commercial revenue / operating costs), which shows whether the railway is becoming more self-financing and therefore reducing its need for government support .

Total railway staff is included because, although not directly an indicator of performance, it is a useful measure of direct employment by the core railway organisations included in this study. Care needs to be taken in interpretation of changes in staff numbers, however, because of the increased use of outsourcing.

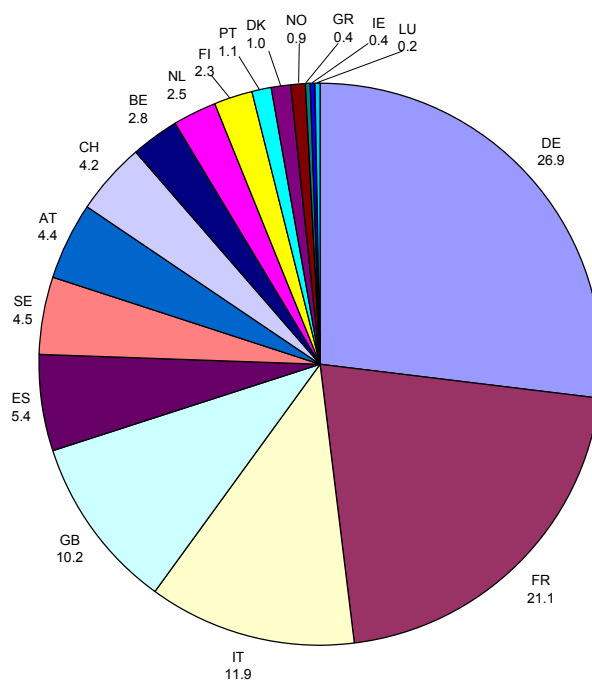
When interpreting changes in the indicators at a Europe-wide level, it is useful to understand the relative importance of each of the countries in contributing to European totals. Figure 4.1 shows the split of traffic units in 2001 between the EU railways as well as Norway and Switzerland. What is clear from this chart is that changes in Germany, France, Italy or Great Britain will have a major impact on the aggregate indicators, as these four countries constitute around 70 per cent of total traffic units.<sup>14</sup>

The Figure shows that Switzerland and Norway combined make up only around 5 per cent of total traffic. In most cases, each indicator for the EU15 has the same value as that for the EU15, Norway and Switzerland. Only where there are differences do we also provide information for the consolidated indicators of all 17 countries' railways.

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<sup>14</sup> The exact influence of the countries will vary depending on the particular indicator being considered but will be largely similar to that indicated in Figure 4.1.

**Figure 4.1**  
**Percentage Split of Traffic Units by Country, 2001**

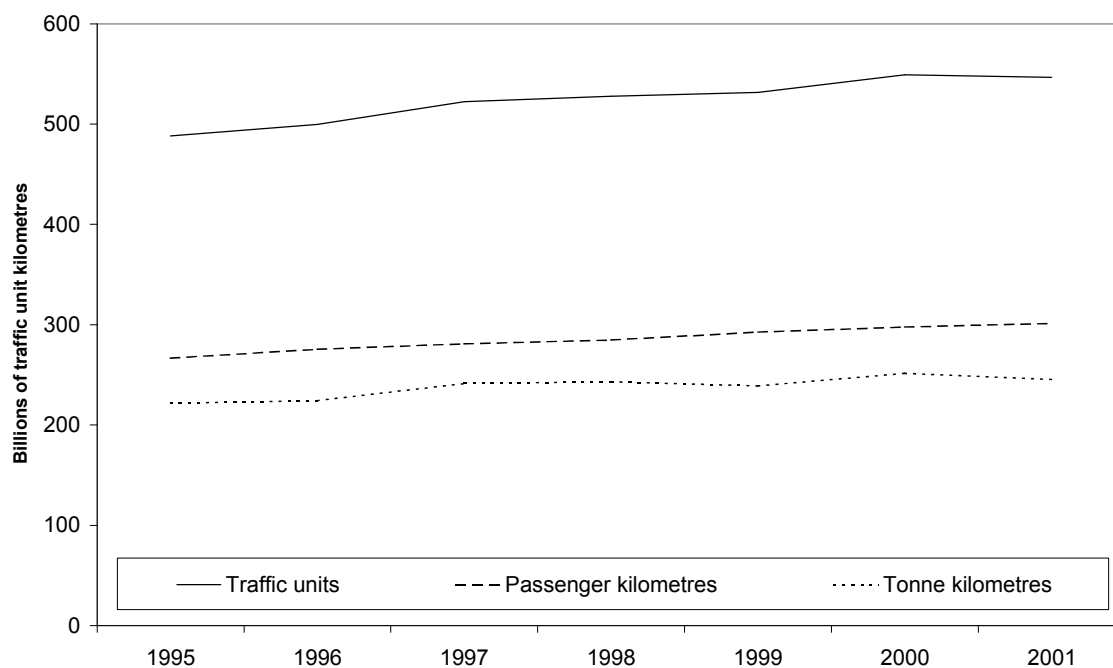


#### 4.3.1. Traffic units

Figure 4.2 shows the trend in passenger km, freight tonne km and traffic units from 1995 to 2001. Traffic units are defined as being the sum of passenger kilometres and freight tonne-kilometres. This is a commonly used measure, though the equal weighting of one passenger kilometre and one freight tonne-kilometre is somewhat arbitrary.

Overall traffic in EU railways increased by around 12 per cent over the period. Freight traffic and passenger traffic both experienced steady growth until 2000, but in 2001 freight traffic levels decreased, so that over the whole period freight and passenger traffic growth were 11 per cent and 13 per cent respectively.

**Figure 4.2**  
**Traffic Units, 1995 to 2001**



The increase in traffic is primarily driven by strong economic growth in most European countries between 1995 (the end of the previous recession) and 2001 (when many countries were still growing prior to September 11). Real GDP growth for the EU was almost 16 per cent over this period, so that rail traffic grew by less than the economy as a whole. Other important factors are that car ownership had reached close to saturation levels in many Member States, so that market share was not being lost to the car to the same extent as in earlier decades, and increased road congestion in some countries made road travel less attractive.

This robust growth contrasts with previous periods: both passenger and freight traffic increased by around 3 per cent from 1990 to 1995 for the EU15, and overall rail traffic (measured by traffic units) was largely static in the 1980s.

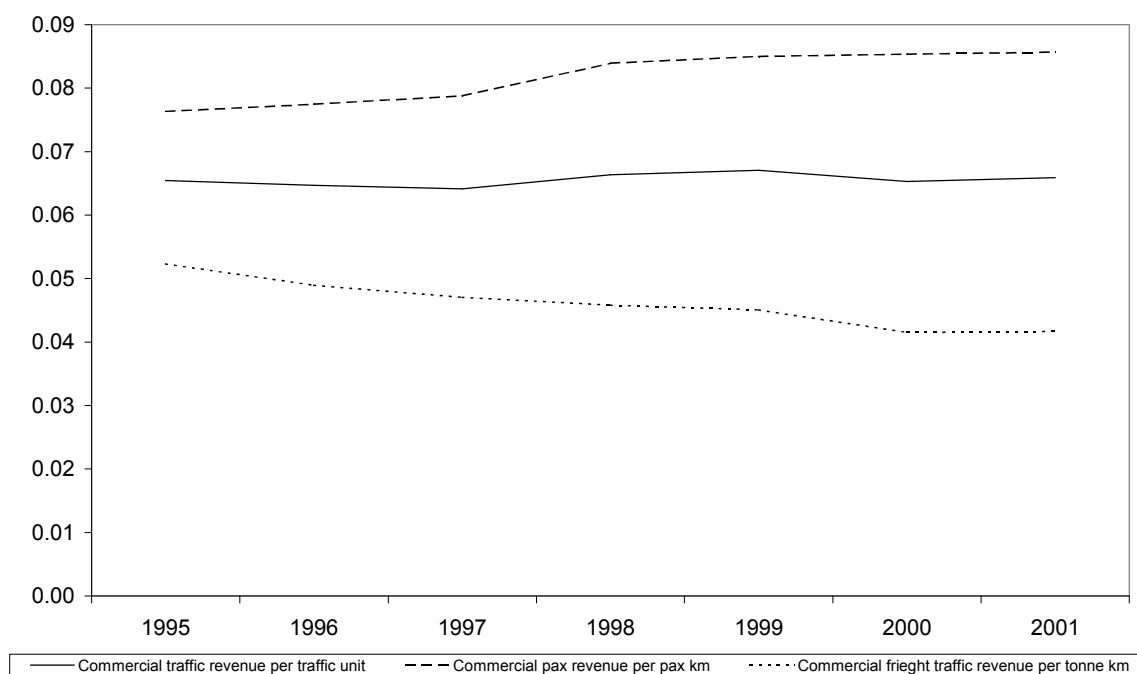
Comparing trends in rail and road traffic in the European Union is also interesting. Road traffic (both passenger and freight) grew by more than 30 per cent from 1980 to 1990, whereas rail traffic did not grow materially over the period. Although rail transport grew by 3 per cent from 1990 to 1995, the growth was substantially less than that for road traffic (10 per cent for passenger traffic and 17 per cent for freight traffic). Only from 1995 to 2000 did passenger traffic by rail increase at a greater rate than by road (11 per cent and 8 per cent respectively), though in the freight sector traffic by rail increased by less than that by road (13 per cent and 18 per cent respectively). Hence the proportion of passengers travelling by rail may be stable or increasing, but the proportion of freight being transported by road has continued to increase.

### 4.3.2. Total commercial traffic revenue per traffic unit (yield)

Figure 4.3 shows the trend in commercial traffic revenue per traffic unit (traffic yield) in 2001 prices, distinguishing between passenger and freight traffic. We define commercial traffic revenue to be combined receipts from passenger and freight customers (excluding public budget contributions).

The traffic yield was broadly static over the period, but this masks differing performance of the two sectors. Yields for passenger traffic increased by 12 per cent in real terms from 1995 to 2001; yields for freight traffic fell steadily over the period so that by 2001 they were 20 per cent below 1995 levels. The decline in freight yields continues a similar decline between 1980 and 1995.

**Figure 4.3**  
**Total Commercial Traffic Revenue per Traffic Unit, 1995 to 2001**



The increases in passenger traffic and yield combine to increase revenue from passenger fares by 27 per cent in real terms (or 25 per cent if we include Norway and Switzerland in the consolidation), approximately 4 per cent a year. In the case of freight the increase in traffic was offset by the decline in yield so that freight revenues fell by 12 per cent overall (or 11 per cent with Norway and Switzerland).

The long-term decline in freight yields has occurred in all but four Member States. The decline has been greatest in some of the largest railways - Germany (-25 per cent), France (-34 per cent), Spain (-20 per cent) and Great Britain (-19 per cent). The four railways that have experienced an increase are Belgium (+18 per cent), Portugal (+8 per cent), Ireland (+5 per cent) and Greece (+2 per cent).

The decline probably has a number of causes. First most EU railways have rationalised their wagonload networks significantly because they were unable profitably to compete for small volume business with road, either on cost or transit time. Germany, France, and Italy have all rationalised their wagonload networks; Great Britain and the Netherlands have effectively discontinued theirs. Wagonload traffic generally has much higher yield than trainload traffic, to cover its higher costs, and reducing wagon load traffic will reduce the overall average freight yield.

Second many railways have reduced their freight unit costs through improved asset and train crew utilisation, terminal rationalisation, locomotive replacement and other actions. Germany, France, Great Britain and Italy have all taken this action. Much of the reduction in costs has probably been passed on to customers in lower prices in order to retain the customer's business against road competition. Third, the decrease in freight yields may reflect increased commercialisation and liberalisation, which have forced the railways to reduce prices and costs to compete with new operators. Two of the four countries with the greatest decline in yields, Germany and Great Britain, also have competition for domestic freight services.

Those railways that have seen an increase in yields have generally not undertaken this kind of operational restructuring, or have only just begun to do so. In addition, the railways may also have increased prices to maintain the financial position of their freight businesses, effectively sacrificing competitiveness for profit. All four of the countries with an increased yield are also among those railways with the worst financial positions.

As one would expect, there appears to be a relationship between prices and volume. The four railways that have seen the largest fall in prices are also among those who have experienced the largest increases in traffic. Great Britain (+55 per cent), Germany (+19 per cent), Spain (+17 per cent) are all above the EU average of +11 per cent increase in freight tonne kms between 1995 and 2001; France experienced +5 per cent growth. In contrast, three of the four countries that saw increases in prices also experienced declines in traffic - Belgium with -6 per cent, Ireland -14 per cent and Portugal -9 per cent.

The increase in passenger yields does not have a clear explanation. Part of the increase may be due to a faster growth in inter-city, particularly high speed premium services, with their generally higher prices per km. Economic upturns, such as that experienced in most of Europe between 1995 and 2001, also encourage more business rail travel. Also governments and railways may have increased prices in real terms to improve railway services, and been able to do so in the less commercial environment associated with many passenger services. It is interesting to note that Great Britain is one of the few countries where yields for passenger services have fallen, which is in part a consequence of private sector operators wishing to fill trains with discounted tickets, though also a function of the government's fares regulation over the period.

### 4.3.3. Total railway staff

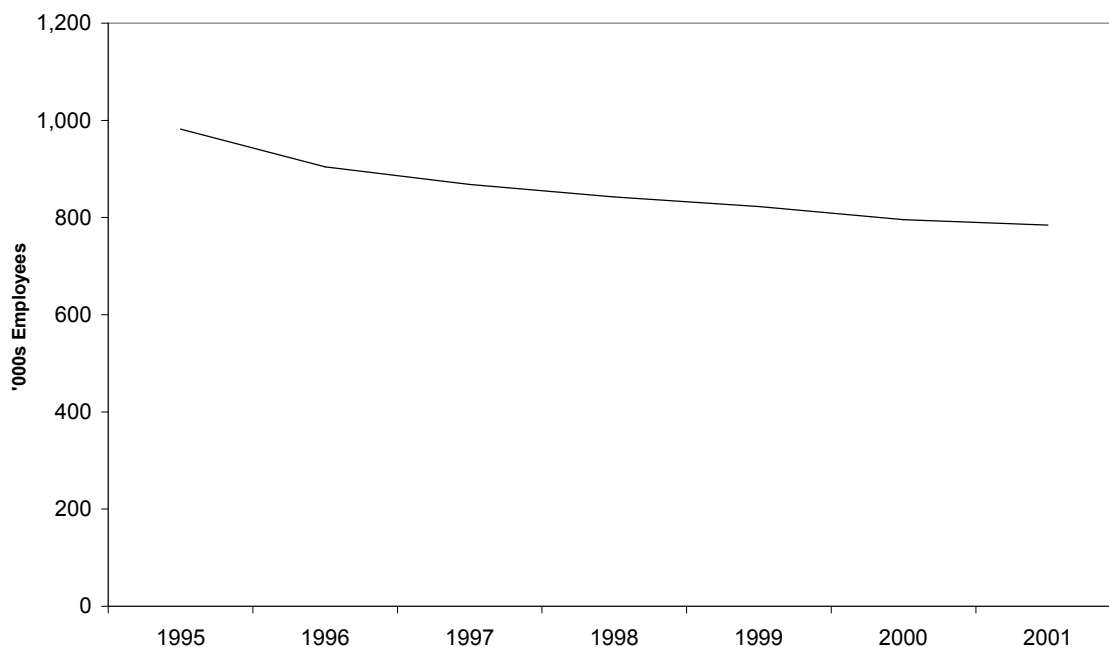
Total railway employment across the EU fell by 20 per cent between 1995 and 2001, and this is shown in Figure 4.4.

In part, this reflects an increased trend in outsourcing and sale of peripheral businesses over this period, which we discussed in section 3.2. An important example of this is the contracting out of infrastructure maintenance in the UK, which accounted for much of the 8 per cent fall in staff numbers between 1995 and 1996, and a quarter or more of the total reduction in staff over the period.

Other countries where staff numbers fell by more than 20 per cent are Germany, Sweden and Norway, reflecting the substantial restructuring and reorganisation that occurred in each case. Staff numbers fell by more than 5 per cent in all countries except Ireland, Belgium, Luxembourg and France, each of which are countries where institutional restructuring has been limited.

The fall in directly employed staff represents the continuation of a longer term trend for the industry. Over the period 1980 to 1995, employment in the EU15 state railways fell by 35 per cent, of which 10 per cent was in the period 1990 to 1995. There has therefore been an acceleration in the reduction in direct employment.

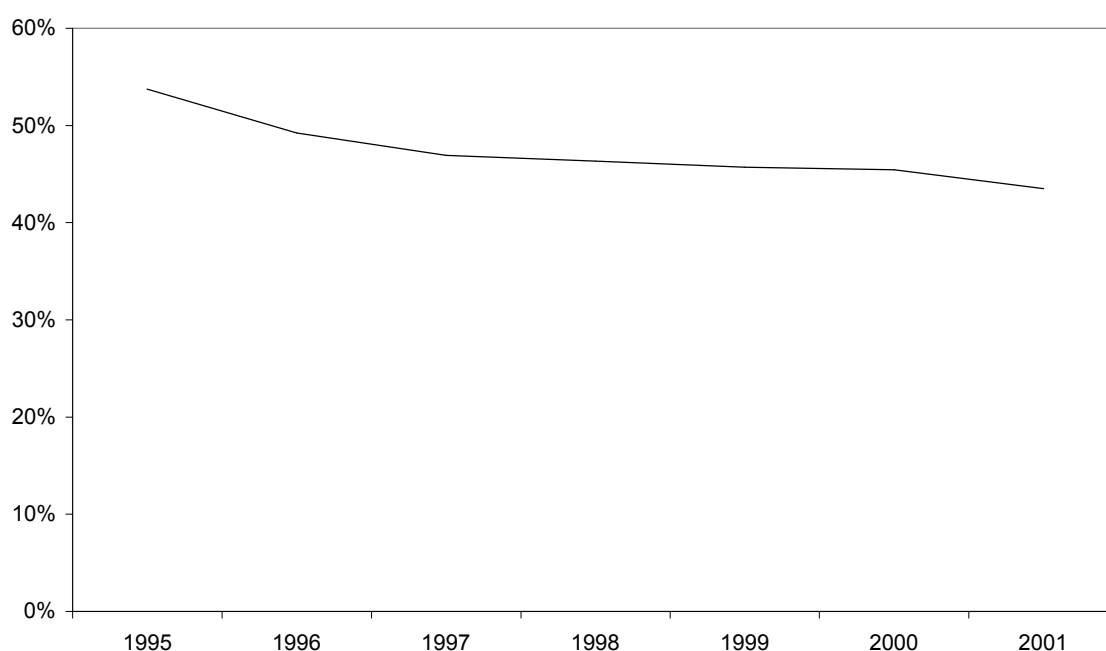
**Figure 4.4**  
**Total Railway Staff, 1995 to 2001**



#### 4.3.4. Staff costs as a proportion of operating costs

Figure 4.5 shows staff costs as a proportion of total operating costs. Overall, the share of total costs accounted for by staff costs has fallen by 11 percentage points, from 54 per cent in 1995 to 43 per cent in 2001 (or to 44 per cent if we include Norway and Switzerland) reflecting the reduction in staff over the period.

**Figure 4.5**  
**Staff Costs as a Proportion of Operating Costs, 1995 to 2001**



#### 4.3.5. Cost per employee

This index is measured by dividing total annual staff costs, corrected for inflation, by the number of employees

As Figure 4.6 shows, real costs per railway employee have not changed greatly over the period. The average cost in 1995 was €40,200 a year. This increased by less than 1 per cent to €40,500 a year in 2001 (both in 2001 prices). Wages in Norway and Switzerland are higher, so that for the 17 countries average wages rose marginally from €41,200 a year in 1995 to €41,500 a year in 2001 (both in 2001 prices). This contrasts with average EU industrial wages, which increased by 7 per cent from 1995 to 2001.<sup>15</sup>

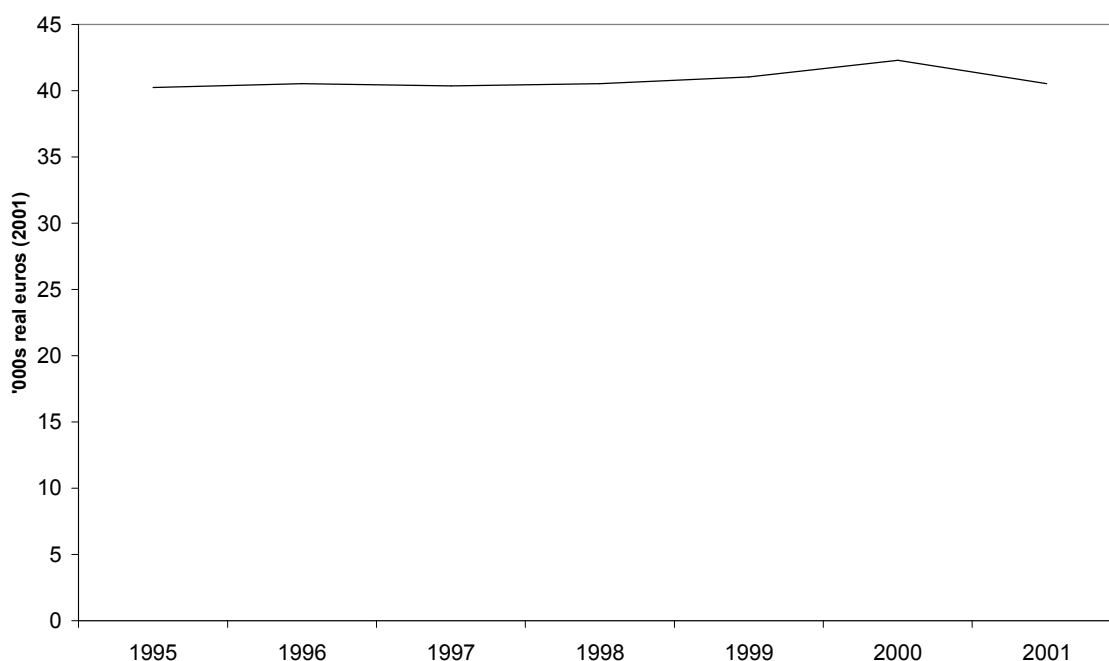
<sup>15</sup> Source: Eurostatistics, Eurostat. Hourly wage, industry (in real terms). Although the Eurostat's data shows an average 7 per cent growth across the 15 countries, there was a high degree of variation across Member States; for example Germany - 5 per cent, Spain - 4 per cent, France - 12 per cent, Italy - 1 per cent and the UK - 25 per cent.

However, there are large differences in the trend between countries, reflecting both a change in wage rates and also a change in the mix of staff. In Austria, Finland, Portugal, Spain and Sweden, staff numbers fell by in excess of 10 per cent, but staff costs per employee increased by substantially more than the equivalent industrial wage rates in those countries. By contrast, the staff cost per employee actually fell in Germany, Italy and Great Britain, with major restructuring occurring in each case.

In countries where staff numbers have not changed a great deal, there are also differences. In Ireland and Luxembourg, average staff costs per employee increased by substantially more than the equivalent industrial wage, whereas increases in Denmark, France and Belgium were modest.

The small increase in average wage per employee contrasts with an increase in real wages of 20 per cent between 1980 and 1993 (about 1.5 per cent a year). Between 1993 and 1995, the average wage reduced by over 15 per cent because of the integration of the low wage DR into DB and German government taking over the civil service premium in DB's wage rates.

**Figure 4.6**  
**Costs per Employee, 1995 to 2001**

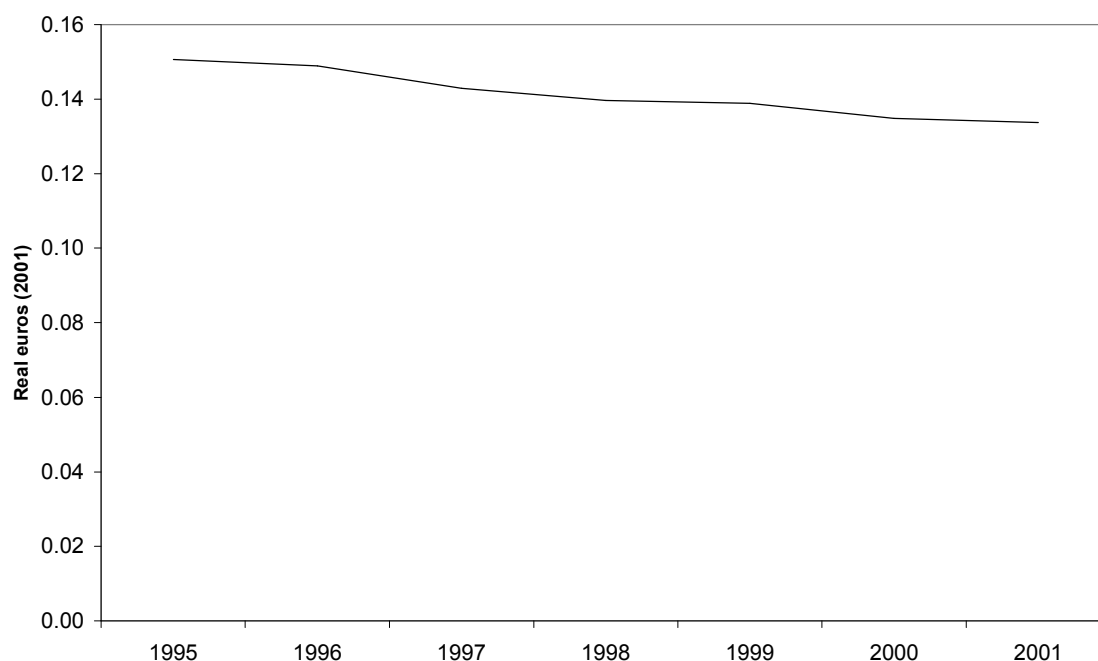


#### 4.3.6. Unit operating costs

Unit operating costs are defined as being total operating costs divided by traffic units and, corrected for inflation, they show how the cost of carrying a unit of rail traffic has been changing over time. Trends in unit operating costs are shown in Figure 4.7.

Unit operating costs decreased by around 11 per cent in real terms, or around €0.02, between 1995 and 2001. This compares with a fall of 2 per cent between 1990 and 1995.

**Figure 4.7**  
**Unit Operating Costs, 1995 to 2001**



Increased traffic volumes have contributed to this result: total operating costs have remained largely static over the period, whilst traffic has increased by 12 per cent. Within operating costs, staff costs have fallen by 20 per cent, but both material purchases / external charges and depreciation charges have increased, offsetting these gains. Part of the reduction in staff costs and increase in external charges is due to increased outsourcing, but the available data does not allow us to estimate how much is due to this.

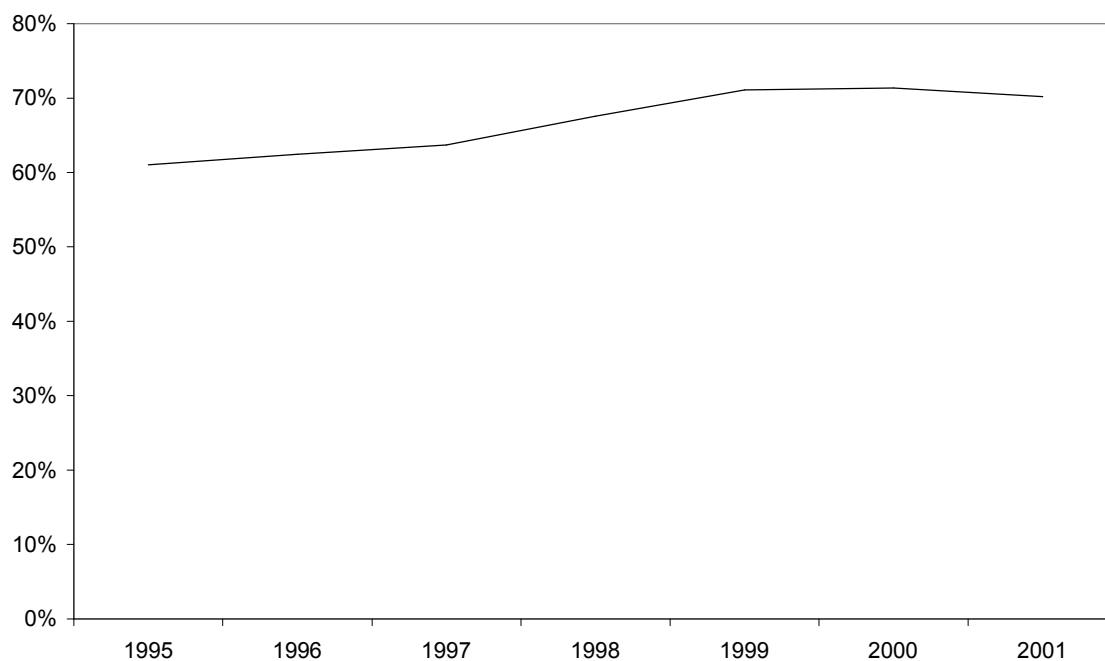
Higher depreciation charges are likely to be a consequence of higher investment, particularly in infrastructure, including high speed rail services, which have been implemented over the last decade.

#### **4.3.7. Viability ratio**

We define the viability ratio as being total commercial revenue divided by total operating costs. It is an important indicator of the trends in railway financial viability.

The financial viability of EU railways is improving. In 1980, the consolidated viability ratio for the EU15 was 58 per cent and it remained less than 60 per cent from 1990 to 1994. In 1995, the ratio had risen to 61 per cent, and reached 71 to 72 per cent in the years 1999 to 2001.

**Figure 4.8**  
**Viability Ratio, 1995 to 2001**



It is difficult to determine a desirable viability ratio for any particular rail system, or for the European rail network as a whole, since this will depend on the case for PSO subsidy, in particular for passenger services, in each particular country. However, the increase in the viability ratio indicates an improving financial position among the railways.

## 5. RAILWAY FINANCES

### 5.1. Legislative Context

Article 9 of the Directive 91/440/EEC required that “Member States shall set up appropriate mechanisms to help reduce the indebtedness (of railway undertakings) to a level which does not impede sound financial management and to improve their financial situation”. Aid accorded by Member States to cancel the debts must be in accordance with EEC rules on State Aid.

The 1996 White Paper *A Strategy for Revitalising the Community’s Railways* (COM (96) 421) reiterated the importance of sound financial management for revitalising the railways. It stated that “the railways must have a financial structure that allows effective, independent management” and also that “for successful restructuring, the burden of past debt must be lifted” (paragraph 26). The White Paper also stated “beginning in 1997, the Commission intends to report at regular intervals on the progress made by Member States in reducing debt and in improving railway finances” (paragraph 53).

The first report by the Commission, published in March 1998 (COM (98) 202), concluded that “the railways’ debt situation has improved substantially since 1990, but this does not mean that the situation is yet satisfactory”.

### 5.2. Past Trends in Railway Finances, 1980 to 1995

The trends in railway finances between 1980 and 1995 were analysed in the two reports by Mercer Management Consulting in 1996 and 1997/8. These were used to inform the Commission’s 1996 White Paper and the subsequent first report on progress in 1998 (COM (98) 202). We summarise below the major trends in railway finances that were described in the Mercer reports and the Commission’s publications, as the basis for assessing how railway finances have developed since 1995.

Between 1980 and the early 1990s, railway finances came under increasing pressure, for four reasons:

- Operating revenue fell considerably (by almost 20 per cent in real terms) between 1980 and 1993, largely due to a 40 per cent decline in freight revenue, as both freight volume and yields came under increasing competition from road transport. Passenger revenue increased by 10 per cent. One consequence was that freight declined from 55 per cent of revenue in 1980 to 37 percent in 1993, so that over this period European railways changed from predominately freight railways to predominately passenger railways.
- Although railways responded by cutting their costs, the cost reduction was less than the decline in revenue (operating costs reduced only by 15 per cent in real terms,

compared to a 20 per cent decline in revenue), and the reduction happened later than the fall in revenue. In particular, although employee numbers were reduced by 35 per cent, an increase of 20 per cent in cost per employee offset a large part of the benefit of the reduction in numbers.

- Because of the greater fall in revenue than in costs, the railways' deficit before government support increased from 47 per cent of operating costs in 1980 to 58 per cent in 1993. Government support covered an average of only 80 per cent of the deficit throughout the period, leaving the railways with substantial losses - equivalent to over 10 per cent of operating costs on average - which they had to carry through to their balance sheets.
- Particularly in the late 1980s/early 1990s, railways increased their investment in infrastructure (eg for high-speed lines) and automation (new signalling and rolling stock). Assets increased by 50 per cent between 1980 and 1993 in real terms even though revenue and operating costs declined by 20 per cent. As a result, asset intensity (the ratio of assets to operating costs)<sup>16</sup> increased from 1.9 to 3.0 between 1980 and 1993. The combination of the operating losses and the increase in assets required additions of €70 billion to the railways' balance sheet over the period .
- Governments funded a substantial amount of the required additions to the balance sheet, but were reluctant to fund it all. Although equity (funded by governments) increased, so that the debt: equity ratio for the 15 railways fell from 2.1:1 in 1980 to 1.5:1 in 1993, debt levels (funded by loans) also increased by a third in real terms, and interest charges rose from 7 per cent of operating costs in 1980 to 13 per cent in 1993.

The situation was particularly serious in some railways, where government funding of the required additions was low. Increased levels of debt and interest charges were a large burden on the finances of the railways in Portugal, Italy, Spain and France.

From the early to mid-1990s onwards, Member States began to restructure their railways' institutional framework and finances. As a result, debt, which had grown from ECU 97 billion in 1980 to ECU 130 billion in 1993 (an increase of 33 per cent), fell back to ECU 101 billion by 1995. The debt: equity ratio fell from 1.5:1 in 1993 to 1.04:1 in 1995, and interest charges from 13 per cent of operating costs in 1993 to 9.5 per cent in 1995.

The financial situation varied considerably from one Member State to another. Germany, Italy and the Netherlands substantially restructured their railways' finances, reducing their debt and interest charges to low/manageable levels.

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<sup>16</sup> It should be noted that 'asset intensity' is equivalent to 'capital intensity'. We have used the term 'asset intensity' to remain consistent with the original Mercer report in which it was used to try to emphasise that this related to physical investment and therefore is not impacted on by mere financial restructuring.

The railways of other Member States still had high debt levels, so much so that COM (98) 202 called the financial situation of five railways (Greece, Portugal, Spain, Sweden and France) in 1995 “serious”. In the case of France and Spain, the governments had restructured debt, but unfunded deficits and high levels of new investments had quickly increased debt again.

### 5.3. Action to Reduce Indebtedness after 1995

The restructuring of railways’ institutional framework and finances continued at a rapid rate after 1995. By 1997, virtually all Member States had undertaken financial restructuring of their railways to reduce debt and improve financial sustainability. Since then some have taken further action (for example Germany in 1999, UK in 2001, and Spain currently). Norway and Switzerland took similar action in 1996 and 1999 respectively. Only Greece and Ireland have undertaken no substantial restructuring (see Table 5.1 for details).

The actions to reduce indebtedness were of three broad types:

**Using the separation of infrastructure** from train operations (and in the UK full privatisation) to put the new entities on a sustainable financial basis. This approach was taken in eight countries.

- Five countries (Denmark, Finland, Netherlands, Sweden and also Norway) established the infrastructure company as a largely government funded body (some small revenue comes from infrastructure and other charges), with low debt levels (5-30 per cent of liabilities). In contrast, the train operating company was established as a commercial company with commercial debt levels (usually 25-50 per cent of total liabilities although SJ in Sweden has 70 per cent debt which is proving difficult to manage).
- In France, the infrastructure company (RFF) was set up in part to relieve the historic debt of the railway undertaking (SNCF). Both companies have high debt levels (95 and 70 per cent respectively). SNCF is currently adequately funded by the government, but RFF’s new debt is rising sharply.
- In Portugal, the infrastructure company (REFER) was established with 30 per cent debt, and the train operator (CP) with 85 per cent debt, far above commercial levels. The government has not adequately funded either company, and debt levels have increased to 45 per cent for REFER and 120 per cent for CP.

**Table 5.1: Summary of Actions Taken To Reduce Indebtedness**

Country	Year of action to reduce indebtedness	Action to reduce indebtedness	Financial impact of action	Subsequent financial performance to 2001
AT	1996	Creation of SCHIG to fund infrastructure investment and of HL (high-speed) and BEG (Brenner) for major projects	All new debt assumed by SCHIG; also 40% of new infrastructure constructed by HL/BEG.	OBB debt level stabilised at 40%
BE	1997	Creation of Financière TGV, to fund high-speed, injected €2 bill. into SNCB	SNCB debt reduced from 50% to 35% of liabilities.	SNCB debt risen to 50% by 2001.
CH	1999	SBB recapitalisation of €12 bill – government take over debt, pension fund deficits and convert loans to interest free.	Debt reduced from 85% to 55% of liabilities; interest payments from 10% to 1% of costs.	SBB debt fallen to 50%. Interest payments stable
DE	1994 and 1999	1994 – creation of BEV to take over €68 billion debt + civil service pay. 1999 – BEV abolished, debt becomes public debt	1994 – reduction in debt from 84% to 28%, and interest payments from 11% to 1% 1999 – no impact on DB.	DB debt increased to 50% by 2001; interest payments remained at 1%.
DK	1997	Creation of infrastructure company, Banestyrelsen.	No impact – pre-1999 debt was short-term, with investment totally funded by State	DSB debt risen to 39% as DSB made commercial.
ES	1996 and current	Creation of GIF to finance high-speed lines Plans being discussed for infrastructure company (ADIF) and relieve RENFE debt	Reduces RENFE future investment + required borrowing	RENFE financial position remained stable, with debt at 70% of liabilities.
FI	1996	Split of VR & RHK, combined with a substantial revaluation of assets. Debt: equity mix was restructured.	No change – railway already low debt. RHK set up with nearly 100 % equity. VR given a 50-50 debt-equity mix.	RHK + VR debt stable
FR	1997	RFF established, responsible for infrastructure and debt financing. 2/3 of SNCF debt transferred to RFF.	SNCF debt reduced from 90% to 70% and interest payments from 15% to 2% RFF debt set at 95% of liabilities, interest payments are 40% of operating costs	SNCF debt remained at 70%, RFF new debt increasing, though total debt stabilised
GB	1994-7 and 2001	Privatisation designed to put railway sector on sound commercial financial basis, with debt set by market . 2001 – Railtrack in administration, replaced by Network Rail	Average debt = 50% of liabilities (Railtrack 39%), TOCs = 76%, ROSCOS = 56%)  Network Rail debt = 56%	Railtrack/Network Rail debt increased to 63% in 2000 due to higher investment; other debt stable
GR	-	None	Debt (70% of liabilities in 1996) and debt service (15%) both high	Despite high losses, equity injections kept debt at 65-70%, but interest risen to 25%
IE	-	None	Debt high (79% of liabilities in 1995)	Debt increased to 82% in 2001
IT	1996/1997	Part of FS debt transferred to the State Fund created for restructuring operations	Debt reduced from 45% to 20% of liabilities	Debt remained at 20% of liabilities to 2001, and interest payments at 0-1%
LU	1997	State took over CFL debt .	Debt reduced from 43% to 26%; interest payments reduced from 7% to 0%.	Debt levels and interest payments remained stable since 1997.
NL	1995	Creation of RIB (infrastructure), fully funded from State budget NS becomes full commercial entity	RIB created with 40% debt, NS with 30% debt	Debt and interest payments of both organisations been stable
NO	1996	Separation of Jernbaneverket (infrastructure company) from NSB.	NSB created with 55% debt, no figures for JVB.	NSB liabilities doubled but investment contributions maintained debt at 45-55%
PT	1997	Separation of REFER (infrastructure company) from CP	REFER created with 30% debt; CP debt reduced from 93% to 76% of liabilities	REFER debt increased to 45%; CP debt increased to 120% in 2001
SE	1995	Banverket assets revalued substantially	Combined debt of BV and SJ reduced from 75% to 35% of liabilities (BV 20%, SJ 70%)	Debt levels been stable, since State fully funded infrastructure investment

- In Great Britain, all the entities privatised from British Rail were established with commercial debt levels. The government undertook to provide what it thought was adequate funding for the industry as a whole for the first seven years through committed multi-year subsidies to the passenger train operators. In practice, a large increase in infrastructure expenditure (due to a backlog of maintenance, more onerous safety requirements and infrastructure enhancements) has not been financeable by the private sector infrastructure company, Railtrack, and it has been replaced by a not-for-dividend company, Network Rail with additional government funding.

**Creating separate entities for financing infrastructure**, particularly high-speed lines and other major projects. Essentially, these are measures to relieve the main railway company of the heavy future financial burden of large new infrastructure projects, and therefore keep them financially sustainable. Several countries have taken this approach, for example:

- Austria created SCHIG to fund rail infrastructure enhancements or new lines. In addition, it created two companies separate from OBB to construct two new infrastructure projects – HL for high-speed lines and BEG for the Brenner line.
- Belgium created Financière TGV to fund the high-speed line network. It injected €2 billion into SNCB for constructing the network.
- Spain created GIF to fund and construct the high-speed lines. It is now planned to merge GIF into the new infrastructure company, ADIF.
- Italy created TAV in 1991 to finance, and manage the design and construction, of high-speed lines. TAV had debt levels of 98 per cent. Its management of the high-speed lines has since been absorbed into FS.

**Financial restructuring to relieve the railway of historic debt.** This is an approach intended to allow the railway to “start again” with a sustainable financial structure. Four countries have taken this approach:

- Germany, where a new government-guaranteed entity, BEV, created in 1994, took over €68 billion of DB’s historic debt. It also undertook to cover the higher salaries of the civil service employees of DB. In 1999, BEV was wound down, and the DB debt became general public debt.
- Italy, where the government took over part of FS’ debt in 1996, and created a fund for operational restructuring of FS, used from 1998 onwards.
- Luxembourg, where the government took over CFL’s debt in 1997. It also created Fonds du Rail to fund infrastructure enhancements.
- Switzerland, where the government in 1996 recapitalised €12 billion of SBB debt and pension fund deficits, and converted the remaining debt to interest free loans.

- France, where the government created an off-balance sheet Special Debt Account containing SNCF historic debt, to which the government makes contributions.

All three types of action have helped to improve the finances of the railways in the short-term. In all the railways, debt reduced as a proportion of total liabilities and interest payments reduced as a proportion of operating costs in the year after the action was taken.

However, such one-off action to reduce indebtedness has not by itself created financial sustainability in the long-term. A number of countries have been forced to take further action, as described above, and others have had to increase funding to the rail sector on a continuing basis.

The problem is that, currently, the railways are not self-financing, i.e. they cannot fund their investment requirements through cash flow generated from current and future operations (including government payments for operating support). The increase in asset intensity experienced by many of the railways, which we discuss in section 5.4.2, means that they need injections of new capital each year. Unless the government makes the required investment contribution, the railways will have to turn to debt.

In some countries, the governments have been willing to provide such equity injections through investment contributions. Governments in Finland, Italy, Luxembourg, Netherlands, Norway, Spain, Sweden and Switzerland have all done so, and railway debt levels have remained stable or have decreased. In many of the countries, the high investment contributions required from government has caused significant tensions between the government and the infrastructure company.

In other countries, however, governments have not provided sufficient capital funding, and the debt levels have increased since the restructuring. Austria, Belgium, France, and Germany fall into this category. Great Britain increased funding only in 2001, with the restructuring of Network Rail into a government funded entity.

## **5.4. Summary of Financial Situation Since 1995**

### **5.4.1. Profit and loss**

Railways have seen an improved profit and loss performance since 1995, both in absolute terms and compared to the previous 15 years. For example, for the EU15:

- Operating revenue increased by 15 per cent between 1995 and 2001 (compared to a decline of a similar percentage in the previous 15 years). Although freight revenue continued to decline (by 12 per cent), passenger revenue grew by 27 per cent, and other revenue by 34 per cent. Freight is now only 28 per cent of combined passenger and freight traffic receipts and 20 per cent of total railway operating revenue.

- Operating costs fell by 1 per cent, resulting in a fall in the deficit before public budget contributions for PSOs and infrastructure maintenance from 58 per cent of operating costs in 1993, and 46 per cent in 1995, to an average of 34 per cent in the three years 1999-2001. Governments also funded a larger proportion of the deficit (approximately 85 per cent on average over the six years from 1995 to 2001, compared to 80 per cent on average in the previous 15 years). As a result, railway losses fell to 5 per cent of operating costs on average over the six years, compared to 10 per cent on average in the previous 15 years.

The level of unfunded losses varied considerably from country to country. In some countries, government support was sufficient to create a sizeable profit (eg Denmark, Italy, GB until 2001). In others, the railways made a small profit (Austria, Netherlands excluding 2000/01, Belgium, Finland, Ireland). However, in a few countries, the losses were large (Greece - 100 per cent of operating costs, Portugal - 65 per cent, France - 10-15 per cent, Sweden - 7 per cent).

#### 5.4.2. Asset intensity

Since 1995, railways have continued to invest heavily in replacement and upgrading of assets, and in new assets such as high-speed lines, at a faster rate than the growth in revenue or operating costs. As a result, asset intensity (the amount of capital required per unit of operating costs) has continued to increase. Having risen from 1.9 in 1980 to 3.3 in 1995, it increased further to 3.6 in 2001 - a slightly slower rate than in the previous 15 years, but still significant. These figures probably understate the increase, since they exclude some of the assets funded through special purpose companies or concessions to the private sector (eg GIF in Spain, CTRL in Great Britain, HSL Zuid in the Netherlands).

The increase in asset intensity appears to have been due to a variety of factors. The factors most often mentioned are: catching up on past under-investment, providing capacity to meet growth in passenger traffic, new high-speed lines, and increased safety and environmental requirements for infrastructure (signalling, train protection, noise barriers and tunnels). In addition, some railways revalued their assets (mostly in the 1994-1996 period) as part of a restructuring programme, eg Banverket in Sweden, VR and RHK in Finland, and Great Britain as a result of BR privatisation.

One example of the increased investment requirements is in the Netherlands, where Prorail (the infrastructure company) has recently agreed with the government to make a provision in its balance sheet for future investment of €6.5 billion (a 25 per cent increase on its present assets), of which €1.8 billion is to catch up on a past backlog of investment, €2.3 billion is for environmental improvements (80 per cent of which is noise related), and €2.4 billion is for asset revaluation.

Growth in asset intensity varies by country. There are large increases in Austria (2.9 in 1995 to 5.8 in 2001), Belgium (2.5 to 4.0), Germany (1.2 to 2.2), France (3.0 to 4.1), Greece (6.8 to

9.7), and the Netherlands (3.2 to 4.8), all of which are investing in new and upgraded lines. Other countries have had relatively stable asset intensity, probably because they have not had under-investment in the past (or, as with Great Britain, insufficient investment took place throughout the period) or they have not invested in high-speed lines (eg Denmark, Finland, Luxembourg and Sweden).

Financial restructuring has changed the asset intensity significantly. In Portugal, assets were revalued in 1997 resulting in a large increase in asset intensity; since then the figure has remained stable. In Italy, under performing assets were written off in 1996 as part of the restructuring, reducing asset intensity; since then it has continued to rise.

Table 5.2 shows a breakdown by country and organisation of how asset intensity has evolved over the 1990s.

The increase in asset intensity is important for the financial position of railways. In a steady state situation, if the railways break even on their income statement after government operating support, the depreciation charge should be sufficient to cover investment in asset replacement (assuming depreciation is based on replacement cost).

However, if the asset base is growing, either the railway needs to generate a sizeable profit on their income statement after government operating support which can then fund the growth in assets, or the growth in assets has to be funded by additions to the balance sheet, through a government contribution to investment or increased debt.

Historically, railways have generated a loss rather than a profit, as we discuss above. With debt reaching unsustainable levels by 1993, most of the funding for the increased asset intensity has had to come from government, which has generated considerable concern in governments about the value for money from the investment.

**Table 5.2**  
**Asset Intensity<sup>17</sup>**

Country	Company	1990	1995	2001	Trend 95 - 01
AT	Consolidated	4.1	2.9	5.8	Increase
AT	OBB	4.1	3.3	4.5	Increase
AT	SCHIG	-	-	1898.6	-
BE	SNCB/ NMBS	2.2	2.5	4.0	Increase
CH	SBB/CFF/FFS	-	3.5	4.9	Increase
DE	DB AG	2.5	1.2	2.0	Increase
DK	Consolidated	2.4	3.2	3.3	Increase
DK	BS	-	-	7.9	-
DK	DSB†	2.4	3.2	2.1	Decrease
ES	RENFE	3.7	5.1	4.3	Decrease
FI	Consolidated	1.8	3.0	3.0	Stable
FI	RHK	-	-	5.5	-
FI	VR†	1.8	0.9	1.1	Increase
FR	Consolidated	2.4	3	4.1	Increase
FR	RFF	-	-	8.5	-
FR	SNCF†	2.4	2.9	1.7	Decrease
GB	Consolidated	1	2.6	1.3	Decrease
GB	Network Rail	-	-	1.3	-
GB	Train Operations	-	-	0.4	-
GB	ROSCOs	-	-	9.1	-
GR	OSE	3.9	6.8	9.7	Increase
IE	CIE	1.0	1.7	2.1	Increase
IT	FS	4.9	8.9	6.5	Decrease
LU	CFL	0.9	1.4	1.4	Stable
NL	Consolidated	3.1	3.2	4.8	Increase
NL	RIB etc	-	8	14.8	Increase
NL	NS	3.1	1.9	2.2	Increase
NO	Consolidated	-	1.1	1.7	Increase
NO	JBV	-	-	0	-
NO	NSB	-	-	2.8	-
PT	Consolidated	2.5	5	10.3	Increase
PT	REFER	-	-	19.5	-
PT	CP†	2.5	5	4.0	Decrease
SE	Consolidated	1.5	4.5	4.8	Increase
SE	BV	-	12.7	9.6	-
SE	SJ	-	1.6	1.7	-
<b>EU15</b>		<b>2.9</b>	<b>3.3</b>	<b>3.5</b>	<b>Increase</b>
<b>EU15 +CH + NO</b>			<b>3.3</b>	<b>3.5</b>	<b>Increase</b>

Source: 1990 figures from Mercer Management Consulting (1997). 1995 & 2001 figures are from the NERA database

† Decrease due to the establishment of a separate infrastructure manager.

<sup>17</sup> Measured as total liabilities divided by total operating costs

### 5.4.3. Debt levels

Railways' high debt levels were a major concern during the 1980s and early 1990s. As described above, debt restructuring in the early 1990s reduced debt levels considerably. The debt: equity ratio of the 15 Member States from 1.48:1 in 1993 to 1.04:1 in 1995.

Since 1995, railways debt levels have been broadly stable. The debt: equity ratio fell from 1.1 in 1995 to 0.8 in 1996, due to restructuring by some railways, particularly Italy. It increased to 0.9 in 1997, and has remained in the range of 0.9 to 1.0 since then. This hides significant differences between countries.

There are broadly three categories of railways:

- Low debt railways (debt: equity ratio of less than 0.5:1). This includes Denmark (0.3 in 2001), Finland (0.1), Italy (0.3), Luxemburg (0.4), Netherlands (0.5) and Sweden (0.4). Of these countries, one group (comprising Denmark, Finland, Sweden and Netherlands) has had low debt levels throughout the period. A second group (comprising Italy and Luxembourg) achieved low debt through restructuring and have broadly maintained it since then.
- Medium debt railways (debt: equity ratio of 0.5 – 1.0:1). This category comprises Austria (1.1 in 2001), Belgium (1.0), and Germany (1.0). It also includes Norway (0.8) and Switzerland (1.0). All of the first three countries restructured their debt during the 1990s, but debt levels have increased again since then. Austria and Germany increased from 0.5:1, and Belgium from 0.6:1 immediately after restructuring.
- High debt railways (debt: equity ratio of over 1.0:1). This category comprises Greece (1.8 in 2001), Spain (2.4), Ireland (4.5), France (4.8), Portugal (1.8), and Great Britain (1.4). In some of these countries, debt has shown a steady increase but no restructuring has taken place (Greece increased from 0.9 in 1995 to 1.8 in 2001, Ireland from 3.7 to 4.5). In others restructuring has taken place, but new debt has increased since then (France, Great Britain, Portugal). Only in Spain has debt been kept stable, perhaps partly because new high-speed lines have been funded through a special purpose company, GIF.

The debt levels shown above include some special purpose entities to finance infrastructure, such as SCHIG in Austria, but exclude others (Eurotunnel, GIF in Spain, CTRL, HSL Zuid). Therefore, total debt levels for the European railway sector are higher than shown here.

In most countries where the train operations and infrastructure businesses have been fully separated, the train operations company operates as a commercial business, and its debt levels are those of a commercial business, with the market determining the acceptable level. The infrastructure company is a government agency, and government funds it through government appropriations (counted as equity) and sets the annual appropriations to keep debt low.

In these cases, the debt: equity ratio of train operators is generally between 0.5 and 1.0, for example in Denmark (DSB - 0.6 in 2001), Finland (VR - 0.8), Netherlands (NS - 0.3). and Norway (NSB - 0.8). The exception is Sweden (SJ - 3.6). Here the debt level is high partly because of the large real estate development interests in Swedcarrier, the holding company for peripheral businesses. However, there is concern about the sustainability of debt levels at SJ AB, the passenger operator.

The debt: equity of the corresponding infrastructure companies in these countries is very low, for example in Denmark (BS - 0.1), Finland (RHK - 0.0), Sweden (BV - 0.2). The debt: equity ratio for RIB/Prorail in the Netherlands is 0.6, but all of the debt is with the government debt agency.

There are two exceptions to this picture. In France, debt levels of both SNCF and RFF are high, with SNCF debt levels stable, but RFF new debt increasing.<sup>18</sup> In Portugal, debt levels for both CP and REFER are high and increasing, but the government has not yet taken action to resolve the problem.

There must be concerns about the increasing debt levels in medium-debt countries, and the unsustainably high debt levels in the high-debt countries. Many of the countries recognise the problem. Further debt restructuring is proposed or being discussed in Austria and Belgium. In Great Britain, the restructuring of Railtrack and creation of Network Rail to replace it resulted in substantial debt restructuring, but there is continuing discussion about how the rapidly rising costs of the rail sector can be financed in the future.

Table 5.3 and Table 5.4 show how the proportion of debt has evolved over the 1990s by country and organisation.

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<sup>18</sup> Historic debt is being reduced through government contributions, so that overall RFF debt levels have been stable.

**Table 5.3**  
**Debt as a Proportion of Total Liabilities (Percentage)**

Country	Company	1990	1995	2001	Trend 95 - 01	Level 2001
AT	Consolidated	12	34	53	Increase	Medium
AT	OBB	12	34	41	Increase	Medium
AT	SCHIG	-	-	94	-	High
BE	SNCB/ NMBS	40	50	51	Increase	Medium
CH	SBB/CFF/FFS	-	83	50	Decrease	Medium
DE	DB AG	67	35	46	Increase	Medium
DK	Consolidated	13	6	24	Increase	Low
DK	BS	-	-	7	-	Low
DK	DSB	13	6	39	Increase	Medium
ES	RENFE	69	71	71	Stable	High
FI	Consolidated	13	11	11	Decrease	Low
FI	RHK	-	-	2	-	Low
FI	VR†	13	49	44	Decrease	Medium
FR	Consolidated	83	84	83	Decrease	High
FR	RFF	-	-	94	-	High
FR	SNCF	83	84	70	Decrease	High
GB	Consolidated	48	54	58	-	Medium
GB	Network Rail	-	-	56	-	Medium
GB	Train Operations	-	-	75	-	High
GB	ROSCOs	-	-	64	-	High
GR	OSE	37	48	64	Increase	High
IE	CIE	68	79	82	Increase	High
IT	FS	53	45	23	Decrease	Low
LU	CFL	48	43	30	Decrease	Low
NL	Consolidated	36	34	32	Decrease	Medium
NL	RIB etc	-	39	36	-	Medium
NL	NS	36	29	25	Decrease	Low
NO	Consolidated	-	55	44	-	Medium
NO	JBV	-	-	-	-	-
NO	NSB	-	-	44	-	Medium
PT	Consolidated	70	93	64	Decrease	High
PT	REFER	-	-	45	-	Medium
PT	CP	70	93	120	Increase	High
SE	Consolidated	61	35	30	Decrease	Low
SE	BV	-	20	15	-	Low
SE	SJ	-	70	78	-	High
<b>EU15</b>		<b>57</b>	<b>51</b>	<b>48</b>	<b>Decrease</b>	<b>Medium</b>
<b>EU15 +CH + NO</b>			<b>53</b>	<b>48</b>	<b>Decrease</b>	<b>Medium</b>

Source: 1990 figures from Mercer Management Consulting (1997). 1995 & 2001 figures are from the NERA database

**Table 5.4**  
**Debt: Equity Ratios**

Country	Company	1990	1995	2001	Trend 95 - 01	Level 2001
AT	Consolidated	0.1	0.5	1.1	Increase	Medium
AT	OBB	0.1	0.5	0.7	Increase	Medium
AT	SCHIG	-	-	17.1	-	High
BE	SNCB/ NMBS	0.7	1.0	1.0	Stable	Medium
CH	SBB/CFF/FFS	-	5.0	1.0	Decrease	Medium
DE	DB AG	1.9	0.5	0.80	Increase	Medium
DK	Consolidated	0.2	0.1	0.3	Increase	Low
DK	BS	-	-	0.1	-	Low
DK	DSB	0.2	0.1	0.6	Increase	Low
ES	RENFE	2.3	2.5	2.4	Decrease	High
FI	Consolidated	0.2	0.3	0.1	Decrease	Low
FI	RHK	-	-	0.0	-	Low
FI	VR	0.2	0.3	0.8	Increase	Medium
FR	Consolidated	4.8	5.3	4.8	Decrease	High
FR	RFF	-	-	15.0	-	High
FR	SNCF	4.8	5.3	2.4	Decrease	High
GB	Consolidated	0.9	1.2	1.4	Increase	Medium
GB	Network Rail	-	-	1.3	-	Medium
GB	Train Operations	-	-	3.1	-	High
GB	ROSCOs	-	-	1.8	-	Medium
GR	OSE	0.6	0.9	1.8	Increase	Medium
IE	CIE	2.1	3.7	4.5	Increase	High
IT	FS	1.1	0.8	0.3	Decrease	Low
LU	CFL	0.9	0.8	0.4	Decrease	Low
NL	Consolidated	-	0.5	0.5	Stable	Low
NL	RIB etc	-	0.6	0.6	Stable	Low
NL	NS	0.6	0.4	0.3	Decrease	Low
NO	Consolidated	-	1.2	0.8	Decrease	Medium
NO	JBV	-	-	-	-	-
NO	NSB	-	-	0.8	-	Medium
PT	Consolidated	2.3	12.9	1.8	Decrease	Medium
PT	REFER	-	-	0.8	-	Medium
PT	CP	2.3	12.9	-6.0	Decrease	Low
SE	Consolidated	1.6	0.5	0.4	Decrease	Low
SE	BV	-	0.3	0.2	Decrease	Low
SE	SJ	-	2.4	3.6	Increase	High
<b>EU15</b>		<b>1.3</b>	<b>1.1</b>	<b>0.9</b>	<b>Decrease</b>	<b>Medium</b>
<b>EU15 +CH + NO</b>			<b>1.1</b>	<b>0.9</b>	<b>Decrease</b>	<b>Medium</b>

Source: 1990 figures from Mercer Management Consulting (1997). 1995 & 2001 figures are from the NERA database

#### 5.4.4. Financial charges

Table 5.5 shows financial charges for each country, expressed as a percentage of operating costs. The figures for 1990 are taken from the Mercer report, and are based on gross financial charges, i.e. interest paid on debt and other debt service costs. The figures for 1995 to 2001 are based on net financial charges, i.e. interest paid on debt and other debt service costs less interest received on bank deposits. For 1995, the common year, gross financial charges are 10 per cent of operating costs, and net financial charges are 5 per cent.

The change in the basis of calculation has been done to give a more accurate picture of the absolute level of interest burden on the railways. The trends in the two sets of figures are similar.

As we have described, financial charges increased substantially between 1980 and 1993 as debt levels rose. Debt restructuring reduced financial charges by about a third between 1993 and 1995. Since then financial charges have remained stable at around 5 per cent of operating costs.

In many countries, financial charges are now at low levels, i.e. between 1 and 3 per cent of operating costs. Examples are Belgium, Denmark, Finland, Germany, Ireland, Italy, Luxembourg, Netherlands and Switzerland and Norway. Italy has reduced its financial charges to virtually zero through debt restructuring.

In other countries, financial charges are around 5 per cent of operating costs, but stable and sustainable. Great Britain and Sweden fall into this category.

However, in some countries, financial charges are high or very high and must be a cause for concern. The countries are: Portugal (22 per cent), Greece (24 per cent) and Spain (17 per cent), though the latter is being restructured. The financial charges are high for Austria and France also, but the burden primarily falls on the infrastructure financing company, that was established with a dual role of financing debt; the railway operator has either medium (OBB 6 per cent) or low (SNCF less than 1 per cent) financial charges as a proportion of operating costs.

**Table 5.5**  
**Debt Service (Ratio of Interest Payments to Operating Costs)**

Country	Company	1990	1995	2001	Trend 95 - 01	Level 2001
AT	Consolidated	2	3	12	Increase	Medium
AT	OBB	2	4	6	Increase	Medium
AT	SCHIG	-	-	8313	-	High
BE	SNCB/ NMBS	8	-1	2	Increase	Low
CH	SBB/CFF/FFS	-	11	2	Decrease	Low
DE	DB AG	10	0	1	Increase	Low
DK	Consolidated	2	-1	2	Increase	Low
DK	BS	-	-	0	-	Low
DK	DSB	2	-1	2	Increase	Low
ES	RENFE	19	32	17	Decrease	High
FI	Consolidated	0	-2	2	Increase	Low
FI	RHK	-	-	0	-	Low
FI	VR	0	-3	3	Increase	Low
FR	Consolidated	13	13	12	Decrease	High
FR	RFF	-	-	41	-	High
FR	SNCF	13	13	1	Decrease	Low
GB	Consolidated	3	5	4	Decrease	Low
GB	Network Rail	-	-	6	-	Medium
GB	Train Operations	-	-	0	-	Low
GB	ROSCOs	-	-	26	-	High
GR	OSE	9	11	24	Increase	High
IE	CIE	7	6	3	Decrease	Low
IT	FS	21	-2	1	Increase	Low
LU	CFL	4	7	0	Decrease	Low
NL	Consolidated	8	5	1	Stable	Low
NL	RIB etc	-	18	16	-	High
NL	NS	8	1	-3	Decrease	Low
NO	Consolidated	-	4	-1	-	Low
NO	JBV	-	-	0	-	Low
NO	NSB	-	-	-1	-	Low
PT	Consolidated	16	29	22	Decrease	High
PT	REFER	-	-	19	-	High
PT	CP	16	30	22	Decrease	High
SE	Consolidated	3	4	6	Increase	Medium
SE	BV	-	15	7	Decrease	Medium
SE	SJ	-	0	5	Increase	Medium
<b>EU15</b>		<b>11</b>	<b>5</b>	<b>5</b>	<b>Stable</b>	<b>Medium</b>
<b>EU15 +CH + NO</b>			<b>5</b>	<b>5</b>	<b>Stable</b>	<b>Medium</b>

Source: 1990 figures from Mercer Management Consulting (1997). 1995 & 2001 figures are from the NERA database

## 5.5. Sustainable Debt Levels

Directive 91/440 requires that the level of debt of European railways be such that “does not impede sound financial management”. Sound financial management is not defined, but the Directive also says “railway undertakings shall be managed according to the principles which apply to commercial companies”. On this basis, “sound financial management”, including the sustainable level of debt, for a European railway is that which would be appropriate if it were a commercial company.

Following Directive 91/440, a railway managed according to commercial principles is one which is a stand-alone state entity, with government support provided only as a contract payment for published service obligations and payments for specific infrastructure activities.

For a commercial company, the sustainable level of debt is ultimately determined by the willingness of the market to continue to lend to it. The market’s assessment is in turn determined by its view of the risk involved in the company, particularly the company’s ability to service the debt (i.e. make the required payments of interest and principal), even in difficult circumstances and without having to cut back on its operations or investment.

We talk of a commercial company without distinguishing between a company that is state-owned and one that is in the private sector.

When assessing whether a railway undertaking, or infrastructure manager, has sustainable debt levels it is important to consider not only its current position, but also the trend in debt levels. Many railways had low debt levels after financial restructuring in the mid 1990s, but their debt had steadily increased subsequently; even if their debt levels are comparable with those of commercial companies in 2001, they may be steadily increasing, and therefore they should not be considered sustainable.

### 5.5.1. Impact of Government Support on Sustainable Debt

One issue in taking commercial companies as benchmarks for European railways is the extent of government support for the railway. The support can be in two forms. First, since most railways are unprofitable, government budget contributions to support operations and investment determine the railway’s cash flow, and therefore its ability to service the debt. As long as the government continues with this support (or the market expects it to), lenders will continue to lend to the railway.

Second, as we show in section 6.5.1, a state-owned railway’s credit rating and therefore its ability to borrow at a reasonable rate (or at all) is strongly influenced by the perception of the market as to whether the government will intervene should the railway have difficulties making interest payments or debt repayments. At the extreme, if the government guarantees the railway’s debt, i.e. it is essentially sovereign debt, the lenders will tolerate very high debt levels.

The impact on the sustainable level of debt of a government's explicit or implicit guarantee can be seen in those companies that are considered by the market to be guaranteed or supported strongly by their governments. Standard & Poors, the debt rating agency, considers RFF in France as having a status which "entitles it to ultimate recourse from the state, and its finances are fully dependent on the state budget". Because of this market expectation, it can sustain a debt level of 94 per cent of total liabilities (a debt: equity ratio of 15:1).

SNCF is also considered to have a high degree of government involvement and ultimate recourse to the state, and is therefore rated as AAA (see section 6.5.1. It has a debt level of 70 per cent of total liabilities and a debt: equity ratio of 2.4:1. SCHIG in Austria, the infrastructure financing company is also viewed as being essentially state-backed. It has debt of 94 per cent of liabilities and a debt: equity ratio of 17:1.

Clearly, these debt levels are only sustainable as long as the government maintains its support. If the support weakens, for example operating support is not fully funded, then the market will quickly be concerned about the government's intentions, in particular that it will not intervene if the railway has difficulties. The market will refuse to lend more, or only at high interest rates.

The fact that debt levels are already high will make the market more nervous because the small equity cushion means that much of the cost of a restructuring will fall on the lenders. In this case, the railway can find very quickly that no one will lend to it even to roll over existing debt. Government support is two-edged – as long as the market expects it to be maintained, it will finance high debt levels, but if the market believes that the support is in doubt, it may only finance debt levels below that of a normal commercial company, to reflect the perceived risk.

### **5.5.2. Sustainable Debt for a Commercial Railway Company**

We have defined a railway that "is managed according to commercial principles", as in Directive 91/440, as one which is a stand-alone state-owned entity, with government support provided only as contract payments for unprofitable services and payments for specific infrastructure activities. In this case, market benchmarks of debt levels for similar commercial companies are a useful indicator of sustainable debt.

The comparison with market levels of debt for similar commercial companies needs to be done with caution for two reasons. First, although government support is for specific activities and to a large extent committed because of national transport policy, the market will still be concerned about the political uncertainty surrounding future support. Second, since railways generally operate in less competitive markets than other commercial companies, with less variability in operating and financial performance, the market will perceive them as less risky. The two considerations operate in opposite directions – the first will reduce sustainable debt levels for European railways compared to commercial

companies, the second will tend to increase it. Adjusting the market benchmarks for these considerations is difficult and imprecise.

Two benchmarks are available: first US railroads, and second European utilities that operate with no or well defined government support. The following table shows the relevant comparisons:

**Table 5.6**  
**Benchmark of Financial Position in Comparable Companies**

	Debt as % of total liabilities	Debt: equity ratio
EU Railways	49%	0.96:1
North American railroads	31%	0.45:1
European private utilities	68%	2.12:2

*Note: North American railroads data is for CN, CSX, NS, BNSF, KCS, SOO and UP combined for 2000 (source: Association of American Railroads); European utilities is for 20 privatised and state-owned electricity, gas and water utilities (source: Standard & Poor's and Amadeus).*

North American railroads are similar to integrated European railways (i.e. combined infrastructure and train operations). However, they are freight-only railroads, whereas European railways are primarily passenger railways. Freight is more variable to economic cycles, and in North America rail freight is open to greater competition (particularly on prices), than is passenger. The greater variability of freight railroads in operating and financial performances makes them more risky, and therefore North American railroads are unlikely to be able to sustain as high debt levels as European railways.

European utilities are more similar to integrated passenger-only railways for two reasons. First, their demand is relatively robust to economic cycles, and second the level of competition they face is relatively low. The difference is that the European utilities are largely profitable entities, and not reliant on government support. For this reason, the market is likely to perceive passenger railways as more risky than the utilities.

Adjusting the two benchmarks for the factors mentioned would give a debt level for the freight part of a European railway (on an integrated basis with related infrastructure) of perhaps 30 – 40 per cent (rather than 31 per cent), and for the passenger part of a European railway of perhaps 50 – 65 per cent (rather than 68 per cent).

Taking an average of these two benchmarks, weighted for the mix of freight and passenger, gives the following result:

**Table 5.7**  
**Range of Sustainable Debt**

	<b>Range of Sustainable Debt (% of total liabilities)</b>	<b>Proportion of railway revenue</b>
Freight	30 -40 %	30 %
Passenger	50 - 65%	70 %
Weighted average	45 - 57 %	

*Note: the proportion of railway revenue is the percentage of combined passenger and freight traffic receipts for EU15 railways accounted for by each of the traffics.*

The mid-point of the weighted average range is around 50 per cent.

This estimate of sustainable debt can be checked against the debt levels of railway companies that are already commercial entities, or have been set up by their governments to behave commercially. The following table gives examples:

**Table 5.8**  
**Examples of Debt Levels for Commercial European Railways**

	<b>Debt Level - 2001 (% of total liabilities)</b>
Railtrack	50%
Network Rail	56%
NS	30 %
DSB	39 %
NSB	44 %
VR	44 %

*Notes: For Railtrack, the debt level is that assumed by the Rail Regulator in 1995 and 2000 when calculating the allowable access charges. NS debt levels are an average of 1995-2001, since the 2001 figure is distorted by extraordinary items.*

The first two companies are infrastructure, the other four are train operations companies. Taking an average of these two sets of companies, weighted for the mix of infrastructure and train operations, gives the following result:

**Table 5.9**  
**Average Debt Levels of Commercial European Railways**

	<b>Range of Sustainable Debt (% of total liabilities)</b>	<b>Proportion of railway assets</b>
Infrastructure	50 – 60 %	75 %
Train operations	30 - 45%	25 %
Weighted average	46 – 57 %	

*Note: the proportion of railway assets is a NERA estimate of the percentage of combined infrastructure and train operations assets of the EU15 railways accounted for by each business; the total excludes assets associated with real estate and peripheral businesses.*

The mid-point of the weighted average is also around 50 per cent.

The two calculations give broadly the same result, of a sustainable debt level for a European railway of 45 – 55 per cent. This is equivalent to a debt: equity ratio of 0.8:1 to 1.25:1.

## **5.6. Comparison of European Railways with Benchmarks**

Overall, the consolidated financial situation for EU railways is within the range of sustainable commercial debt levels: debt amounts to 49 per cent of liabilities. However, there is a wide variation.

### **5.6.1. Debt below commercial levels**

The infrastructure managers in Norway, Finland, Sweden, Netherlands and Denmark are not treated as commercial companies, and borrowing is restricted to varying degrees. Debts consist of less than 25 per cent in each case, and without institutional reform are likely to remain low.

In 2001 the integrated railway companies in Austria, Luxembourg and Italy had debt levels below our commercial benchmarks.

### **5.6.2. Debt at commercial levels**

As we have already noted, the commercial railway undertakings NS, DSB, VR and NSB had debt levels comparable with our international benchmarks (and were in the range 30 to 45 per cent), as did the commercial infrastructure manager Railtrack (56 per cent). SBB in Switzerland also has debt levels within the commercial range (50 per cent)

SNCB's debt (51 per cent), whilst at commercial levels, had been steadily increasing, so that its recent trends in funding and expenditure do not appear to be sustainable, and this is confirmed by SNCB's recent restructuring proposals.

### 5.6.3. Debt above commercial levels

The train operators and rolling stock leasing companies in Great Britain have high levels of debt, and from 2001 onwards experienced financial difficulties, resulting in additional government contributions being paid. High debt levels of the rail undertaking in Sweden, SJ (around 60 per cent of liabilities, if considered net of financial assets), are a major cause for concern.

Several railways have debts above commercial levels, so that alleviation of debt would be a prerequisite to launching the company on a fully commercial basis. These include the integrated railways in Spain, Ireland and Greece, none of which have yet been alleviated of historic debt in accordance with Directive 91/440, though restructuring in Spain is now under way.

Debt levels of the both the railway undertaking and the infrastructure manager in Portugal are high and increasing, and clearly ultimately require government assistance. As noted above, the infrastructure manager in France, RFF, is accruing new debt at a rate that is not sustainable within its current funding framework. The railway undertaking in France, SNCF, has high but stable debt levels, though it faces funding uncertainty to the extent that it is affected by the financial difficulties of RFF.

The railway financial company in Austria, SCHIG, has high and increasing debt levels, which will ultimately require alleviation by the state. This is likely to be true for some railway financing vehicles in other Member States, which are beyond the scope of this study, for example Financière TGV in Belgium.



## **6. PUBLIC BUDGET CONTRIBUTIONS**

### **6.1. Introduction**

In this chapter we start by discussing forms of public budget contributions to railway undertakings and infrastructure managers, within the framework of EU legislation.

We then present our findings on the forms of public budget contributions to the main state railway in each Member State, Norway and Switzerland for 2001, according to the categories we have identified. We examine these payments with respect to industry output.

We then examine trends in public budget contributions to railways in the EU from 1996 to 2001.

We next examine payments within the context of railways' income statements, and present indicators of commercial viability and yield, contrasting these with levels of payment.

Finally we consider indirect forms of support, in particular improved credit ratings and the absence of a need to provide a return on equity.

### **6.2. Forms of Public Budget Contribution**

Public budget contributions to railway undertakings and infrastructure managers are permitted by EU legislation in a variety of forms. The main forms are described below.

#### **6.2.1. Public Service Obligations**

A Public Service Obligation (PSO) is a government requirement for an operator to undertake services, often with tariff controls, which would not be operated under the same conditions if the operator were acting in its own commercial interests.

The framework of Public Service Obligations for transport services was established in Council Regulation EEC/1191/69. The framework requires operators to be adequately compensated for the obligation, thereby defining a category of public budget contribution permitted under EU law.

The regulation was revised by 1893/91 so that the PSO must be arranged by contract, and that there must be accounting separation between PSO services and commercial services.

#### **6.2.2. Infrastructure**

State aid for the purpose of contributing to the financing of transport infrastructure is permitted under EU law. This is specified in Council Regulation 1107/70, on the granting of aids for transport by rail, road and inland waterway.

Different forms of state aid for infrastructure may occur. They may be directed at operating costs- for the management and maintenance of infrastructure - or take the form of capital grants for investing in infrastructure.

### **6.2.3. Specific operating costs**

Important categories of public budget contribution are specifically identified in Council Regulation 1192/69 on common rules for the normalisation of the accounts of railway undertakings.

The principle behind this regulation is that if the railway organisation is required to bear greater operating costs than it would if it were operating on a commercial basis because of conditions imposed on it by the government, then public budget contributions should be paid to the railway to compensate it for these additional costs.

Items specified in this regulation include payments for retirement (Class III), and payments for backdated government increases in wages and salaries (Class VI).

### **6.2.4. Historic debt**

Article 9 of Council Directive 91/440 specifies forms of public budget contributions which are permitted to reduce the indebtedness of the railway undertaking. The objective of this provision is to reduce indebtedness of the undertaking to such a level that it does not impede sound financial management and to improve the financial situation of the undertaking.

### **6.2.5. Restructuring**

State Aid that is exceptional and is given in order to permit restructuring to remove excess capacity is permitted by EU law. This is specified in Council Regulation 1107/70, on the granting of aids for transport by rail, road and inland waterway. Such aid may include, for example, payments for redundancies.

## **6.3. Incidence of Public Budget Contribution**

Table 6.1 shows our estimates of public budget contributions made in 2001. These figures have been derived from information in railways' annual accounts, UIC data, other publications, data received directly from the organisations concerned and our interviews. They consist of payments made by the national government, or local or regional authorities to the main state railway undertaking and infrastructure manager. In Great Britain, the payments are to the main private sector companies responsible for the railways.

**Table 6.1**  
**Estimated Public Budget Contributions 2001, €millions**

Form of Payment	AT	BE	CH	DE	DK	ES	FI	FR	GB	GR	IE	IT	LU	NL	NO	PT	SE	EU15
PSO - Passenger services	491	361	346	4,300	512	265	35	1,731	1,727		129	1,799	76	91	152	9	15	11,541
Freight / combined transport	140		63					76	57		2							275
Infrastructure maintenance and operations	950	640	787		235	719	335	1,608	1,201		6	1,430	142	953	408	7	463	8,689
Payments for capital investment	122	419	599	2,649	114		61	263		507	176	3,615		1,224	174	87	419	9,657
Staff and pension obligations		520				30		2,131			4			5				2,690
Debt service	213	17	770			209		1,067		106	5							1,617
Restructuring												1,036						1,036
Other				2,091		178				466		48						2,783
<b>TOTAL</b>	<b>1,917</b>	<b>1,957</b>	<b>2,565</b>	<b>9,040</b>	<b>861</b>	<b>1,401</b>	<b>431</b>	<b>6,876</b>	<b>2,985</b>	<b>1,079</b>	<b>322</b>	<b>7,928</b>	<b>218</b>	<b>2,273</b>	<b>734</b>	<b>103</b>	<b>897</b>	<b>38,288</b>
<b>Total, Declared State Compensation</b>	<b>649</b>	<b>2,207</b>	<b>N/A</b>	<b>9,530</b>	<b>898</b>	<b>1,349</b>	<b>403</b>	<b>6,481</b>	<b>3,005</b>	<b>624</b>	<b>372</b>	<b>6,840</b>	<b>208</b>	<b>2,600</b>	<b>N/A</b>	<b>22</b>	<b>967</b>	<b>36,155</b>

Source: company accounts; company data; State Aid submissions; NERA estimates.

Note: shaded cells are 2000 figures.

Some of these values are estimates, because the actual data are not published, and may not appear in company accounts (for example some costs are expressed net of certain payments). In other cases, particularly for capital payments, our definition of the timing of a payment may be different to that of the undertaking or state.

The final row of Table 6.1 shows government statements of total state compensation to railways, which have been submitted to the European Commission. These submissions will include payments to private sector operators and local railways.

The amounts declared by Member States in some cases differ greatly from our own figures (for example, in Austria we calculate there to be €1.9 billion of state payments to OBB and SCHIG in 2001, whereas the state submission is for €649 million). We understand the main reasons for these differences to be as follows:

- For Austria, the State appears to under-report the support payments for rail infrastructure, perhaps because of the complex institutional structure there.
- For Greece, a component of equity is increased annually through “debts arranged by the Greek state” and deposits from “partners”. We have classified these payments as a public budget contribution, because they are payments from government entities and are not recorded as railways’ debt; but as they do not necessarily come from the Greek government, they may not have been declared as state aid.
- In Italy, we have included restructuring funds in the payments, but these were declared to the European Commission several years previously.
- For the Netherlands and for Sweden, we have only included payment to the incumbent public sector railways; there are substantial additional payments made to private operators (for passenger concessions and, for the Netherlands, for freight infrastructure);
- For Portugal, we have included EU grants, which are not classified as state aid.

### **6.3.1. Payments for passenger services**

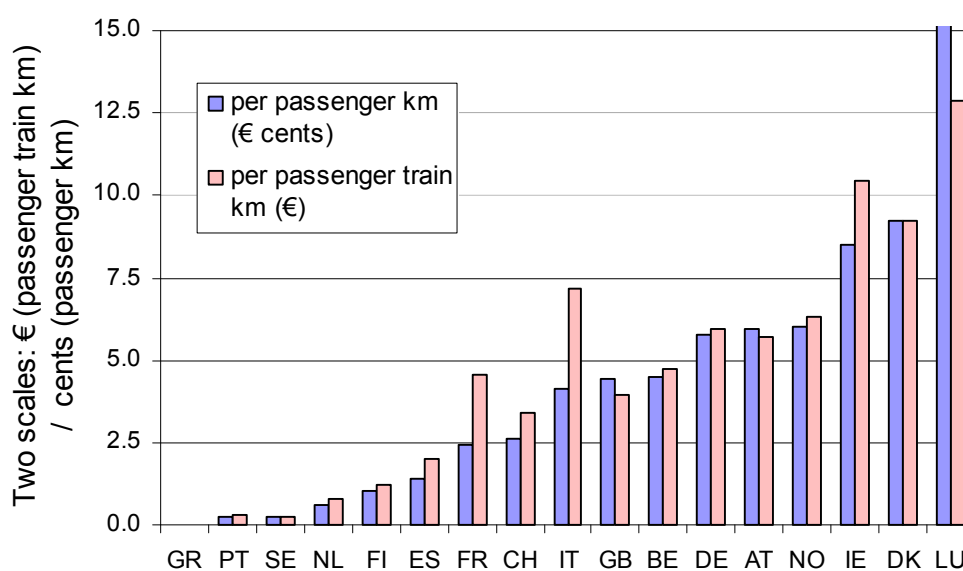
Almost all Member States make payments for the provision of rail passenger services under contract to central or regional / local government. Railway undertakings often classify contract payments as traffic revenue, even if they are payments from government, but we have reclassified these payments as public budget contributions.

The costs of railway undertakings, and hence public budget payments for PSOs, of railway undertakings will depend, amongst other things, on infrastructure charges. In some countries, for example Sweden and Finland, infrastructure charges are set to reflect the infrastructure’s marginal cost, so that railway undertakings’ operating costs and required payments for the PSO will be relatively low; in other countries, for example Germany and Great Britain, the charges are set to cover some or all of the fixed costs of infrastructure

provision, so that railway undertakings' operating costs and required PSO payments are relatively high.

Figure 6.1 shows payments for passenger services per unit of output. Two measures of output are used: passenger km and passenger train km (and they have different units: € cents and € respectively). The Figure shows that payments in Greece and Portugal are very low; in both cases the railway undertaking makes large losses so that the contract payment appears to be insufficient to meet associated Public Service Obligations. In the Netherlands, Sweden and Finland, PSO unit payments are also low, but we know that infrastructure charges in these countries are low also. In two of these countries, the Netherlands and Sweden, competitive tenders for passenger services have been widely used. The payments per unit of output are larger in France, Britain and Germany, where infrastructure charges are set so that they contribute to infrastructure fixed costs. The largest payments for passenger services per unit of output are in Ireland and Luxembourg – both countries with small, integrated, rail systems – and Denmark, where DSB has agreed to refund some PSO payments because they were found to be in excess of requirements.

**Figure 6.1**  
**PSO Payments per Unit Output (2001)**



Source: Table 6.1 and NERA database

### 6.3.2. Payments for freight services

There are few payments for freight services, and some of these are being phased out. The following kinds of public budget contributions are associated with the rail freight sector:

- payments for combined transport;

- payments for freight facilities and infrastructure; and
- payments to customers of rail freight.

As the third type of payment is not received by operators, it is beyond the scope of our analysis.

Historically, support for freight services have often not been clearly identified, and may have occurred indirectly through cross subsidy. Directive 2001/12, which prohibits cross subsidy, had not been implemented in 2001, so it is possible that the freight services in several of the countries were effectively being subsidised by public budget contributions intended for other purposes, or by accumulated debt. As accounting separation is implemented, anecdotal evidence strongly suggests that support payments for freight are decreasing, and state freight services are being forced to operate on a commercial basis.

### **6.3.3. Payments for management of infrastructure**

Several infrastructure managers receive specific funds designated for the management and operations of infrastructure. These funds are treated in different ways. For example, in Belgium the infrastructure payments take the form of a PSO; in Finland and Norway, where the infrastructure manager is a government agency, the financial accounts may not distinguish fully between payments for operating and capital costs. In Great Britain, no direct public budget contributions of this form were intended to occur, because infrastructure charges were set with the objective of satisfying the infrastructure company's revenue requirement. (In practice, some direct Government support for infrastructure has been paid, particularly since the replacement of Railtrack by Network Rail, because the existing funding could not cover the large increase in maintenance required.) In Italy, contributions paid to the infrastructure manager are set to decrease over time in order to provide the appropriate incentives for the manager to operate the network efficiently.

For most infrastructure managers, however, these payments are separately identified and are classified as operating income.

### **6.3.4. Payments for capital investment**

Capital grants are primarily awarded to finance infrastructure investment, though they may also contribute to financing of other types of investment including crossing facilities.

For railways where infrastructure access charges are set at or below marginal cost, capital grants need to be sufficient to finance the investments in full, if the financing is to be sustainable. This is the case in, for example, the Netherlands and Norway where access charges are low or zero, and capital grants are relatively high.

In other countries, for example Great Britain and France, the capital grants are much smaller, and so infrastructure charges need to be greater if the financing of infrastructure is to be sustainable.

In Italy, the capital payments are very high. We have taken these data from government state aid submission to the European Commission, and so they will include state funding for the high speed rail subsidiary of FS. In other countries, for example Belgium and Britain, some state funding for high speed rail service will be paid to separate companies (Financière TGV and CTRL respectively), and so will not be reflected in Table 6.1 except in the final row (“total declared state compensation”).

In Germany, investment payments are high and have increased in recent years. However, at the same time other support for infrastructure investment – in the form of large interest free loans and support to increase the infrastructure standard of the former East German railway – has declined so that the overall support for investment has fluctuated rather than increased.

### **6.3.5. Staff and pension obligations**

State contributions are made to several railways to cover costs which are additional to those payable to employees by private sector undertakings. The payments may not be shown on annual accounts of the railways.

In France, private sector companies contribute to a general state pension fund, but SNCF is unusual in that it has its own fund. The retirement supplement paid by the French State is specified to compensate SNCF exactly for the extra cost of a separate fund. These additional costs have arisen because SNCF has more pensioners relative to its employees than in the wider French economy. Particular features of SNCF’s scheme, such as early retirement options, are fully funded by SNCF. The government payments are to SNCF’s pension fund and do not appear on SNCF’s income statements. The payments in Belgium are also retirement supplements, though they appear in SNCB’s income statement.

In Germany, DB AG’s income statement does not reveal its full staff costs. Instead another state body, BEV, compensates DB AG for the extra costs of employing public servants rather than contracting staff at competitive labour market rates. BEV receives state funding to support this amounting to around €3.8 billion in 2001 (as we do not include BEV in this study, these payments are not reflected in Table 6.1).

The relatively small payments in Spain compensate RENFE for the costs of early retirements and incentive payments for voluntary contract termination, so are a form of payment for restructuring.

### **6.3.6. Alleviation of historic debt**

Public budget contributions continue to be made for alleviation of historic debt for several of the railways.

In both Austria and France, the vehicle carrying the historic debt has other important functions. SCHIG in Austria receives payments both for infrastructure financing and for

servicing historic debt (which it took over from a separate organisation, not from OBB). In France, RFF has two separate debt accounts: historic debt which it inherited at its formation from SNCF, and new debt; it receives ongoing payments from the French government to reduce the historic debt.

In some cases the debt is transferred to a separate account, where it is serviced by an entity other than the railway. In France, some of SNCF's historic debt was transferred to a Special Debt Account, which is the recipient of government funds. In Germany, historic debt was transferred to BEV, but from 2000 was taken over by the government. We have not included these ongoing payments in Table 6.1 because they do not affect the railway companies.

Alleviation of historic debt is often represented in companies' financial statements as a single payment in one particular year. In 2001, this has occurred in the case of Switzerland, where CFF was relieved of the burden of historic debt with respect to its energy division, following earlier restructuring.

In Spain, payments for RENFE's historic debt are specified in a contract and paid on an ongoing basis, recorded as income.

### **6.3.7. Other payments**

The other major payments we have identified are as follows:

- DB AG has received funds associated with merging the former East and West German railways; it has also received funds to pay for a back log of investment and maintenance in previous years;
- the Greek railway receives payments, recorded as equity in its balance sheet, which are debts arranged by the Greek State and deposits of shareholders or partners;
- in Spain, there is a specific payment that is recorded as being compensation for losses.

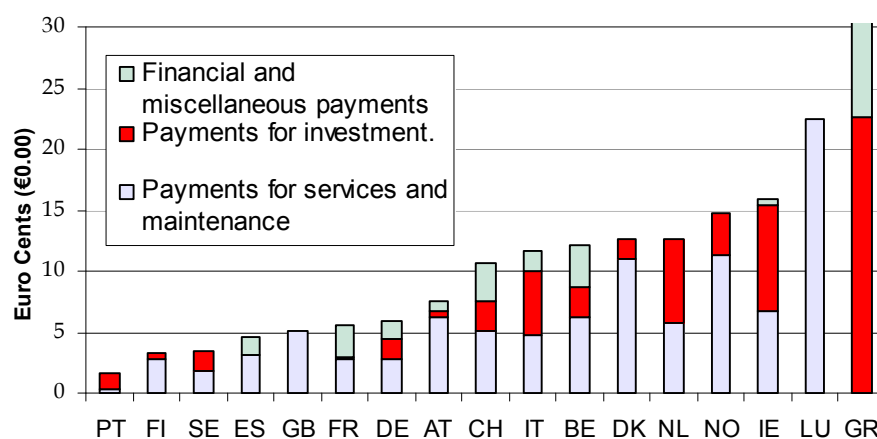
### **6.3.8. Public budget contributions per traffic unit**

Figure 6.2 shows three measures of public budget contribution per traffic unit:<sup>19</sup>

- total payments for passenger services, freight and infrastructure maintenance and operations;
- payments for capital investment, which does not distinguish between renewals and enhancements; and

- all other public budget contributions.

**Figure 6.2**  
**Payments per Traffic Unit (2001)**



*Source: Table 6.1 and NERA database*

As with Figure 6.1, payments to the state railways in Portugal, Sweden, Finland and Spain are low relative to their unit outputs. Whereas Germany and Austria's passenger service funding was relatively high, their funding for passengers and infrastructure combined per unit output is moderate or low.<sup>20</sup> Payments in Ireland, Denmark, Norway and Luxembourg, all with relatively small railways, are high per traffic unit. Although there are no explicit payments for passenger services and infrastructure maintenance in Greece, the payment per traffic unit is high.

#### 6.4. Trends in Public Budget Contributions

Changes in the levels of public budget contributions over time may be a consequence of a number of factors.

- A decrease in funding may reflect increases in traffic or yields, efficiency improvements, or the rationalisation of loss making services;
- it may also reflect organisational change, so that public operators or special purpose vehicles are the immediate recipients of some state funding;

<sup>19</sup> We have defined the traffic units to be the sum of passenger km and freight tonne km. For Denmark and the Netherlands we have estimated the tonne km carried on the national rail networks (by the international operator Railion).

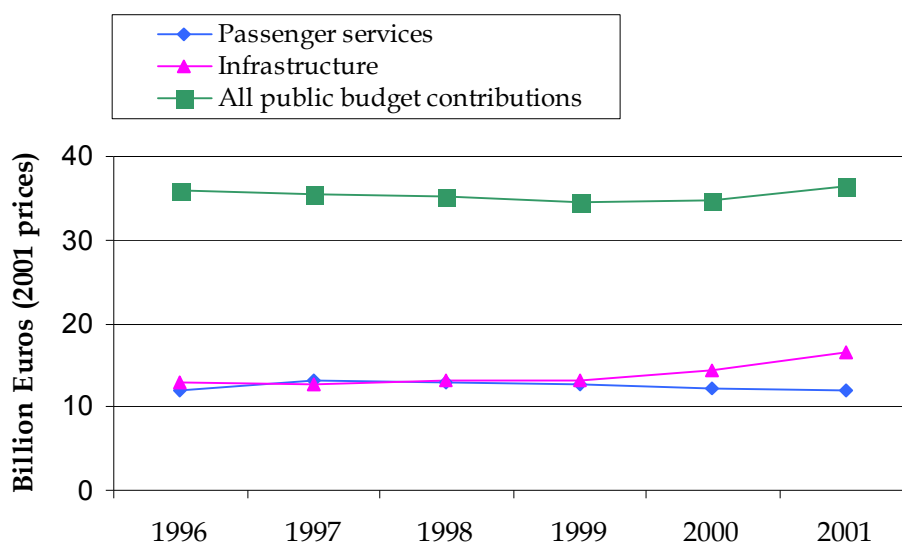
<sup>20</sup> But, as we have seen, in Portugal, Austria and France, new debt appears to be increasing unsustainably.

- higher levels of funding may be given to compensate for historically inadequate funding, which may be reflected in a backlog of infrastructure maintenance or in high levels of indebtedness;
- an increase in funding may reflect a move towards achieving a sustainable financial position for the undertaking and adequate compensation for its public service obligations; or
- an increase in funding may occur as a result of a major infrastructure investment programme, such as high speed rail services.

A mixture of these effects are occurring in EU railways. Figure 6.3 shows trends in public budget contributions across all railways in EU Member States.

- Overall, **payments for passenger services** are similar in real terms in 2001 to those in 1996, though they were slightly higher in intervening years. The consolidated figures mask differences between Member States. In certain countries where competitive tendering has been widely applied - Britain, Sweden, the Netherlands - payments have decreased markedly, and they have also decreased in Spain and Portugal. In Italy, Denmark and Luxembourg, there have been large increases in total payments.
- In contrast, **payments for infrastructure** maintenance and investment combined have increased by 28 per cent in real terms over the period. Of these, payments for operating maintenance appear to have increased marginally, whilst payments for capital maintenance or enhancements have increased by more than 50 per cent. The increase in investment payments supports comments made in the study's interview programme that cost of infrastructure investments have increased as a result of higher safety and environmental requirements. Operating and capital payments increased in the Netherlands and Denmark; capital payments also increased in Ireland and Italy; payments for operating maintenance fell in France and Spain.
- However, when other payments including financial payments are accounted for, **total state payments** to EU railways in 2001 are similar to those for 1996, though they fell marginally in intervening years. Some financial payments have decreased over this period, and investment costs to improve the former East German railway have also decreased, counteracting the increasing support for EU rail infrastructure.

**Figure 6.3**  
**Trends in Public Funding for EU Railways (Consolidated Figures)**



Source: European Commission, State Aid Submissions

## 6.5. Financial Performance and Public Budget Contributions

Table 6.2 provides comparisons of income and expenditure of the national railway sectors in the EU Member States, Norway and Switzerland. We show the combined accounts of the railway undertaking and the infrastructure manager, so that infrastructure charges and other payments between the two entities are netted out.

The Table distinguishes between operating income that are public budget contributions for passenger PSOs or infrastructure management, and operating income from business activities, including passenger fares, payment for the transport of freight, and income from other activities.

The “other revenue” category and associated operating costs are greatly influenced by differences in accounting conventions, making comparisons difficult:

- In most of the countries, other income includes accounting revenue which is used to off set operating costs incurred during the construction of assets (“assets own construction”); in others, the assets are capitalised as they are constructed and the costs do not appear in the income statement;
- capital grants which are amortised, to offset depreciation charges for associated assets, have been classified as other income;
- in some countries revenue from peripheral activities are included in the company’s financial figures (for example in Belgium there is commercial revenue from road

logistics, in Ireland there is some revenue from bus operations), and in others they are not.

Alternatively, some operating costs may be greater than those published; for example in Germany DB staff costs in excess of those of a commercial company are not recorded in the accounts, but appear as costs to BEV instead (this treatment should improve comparability between countries, by normalising accounts); similarly depreciation charges for some state funded investments are not shown in DB's accounts.

The public budget contributions are not directly comparable with those given in Table 6.1 in all cases.<sup>21</sup>

Table 6.2 also shows financial ratios for each country which allow us to assess the adequacy of public budget contributions to fund operating activities.

- The ratio of public budget contributions for operations and infrastructure to operating costs.
- The viability ratio of revenue, excluding public budget contributions, to operating costs.<sup>22</sup>

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<sup>21</sup> For BE, CH, FR, GR, LU, NL, PT and SE, the government support is equal to the first three categories in Table 6.2; for NO, DK and FI, all public support appears in the income statement, irrespective of whether it is for operating costs or capital investment; for GB the income statement does not include freight support, which is given to third parties; for IT and ES other support payments in Table 6.2 appear in the income statement; for AT, DE and IE the categories of support contain a combination of operating and capital payments so are not directly comparable with the income statement.

<sup>22</sup> This indicator does not permit direct comparison of railways' commercial viability between countries, because of the difference in treatment of other revenue, discussed earlier in this section. A better measure would be {traffic revenue} / {operating costs - other revenue.}.

**Table 6.2**  
**Income Statements, 2001**  
**(€millions)**

	AT	BE	CH	DE	DK	ES	FI	FR	GB	GR	IE	IT	LU	NL	NO	PT	SE	EU15
Staff costs	2,010	2,392	1,833	8,003	490	1,083	378	7,508	2,569	280	189	4,590	189	1,018	462	291	800	31,790
Non-staff costs	1,213	1,205	1,882	12,871	670	1,435	717	6,306	7,656	121	178	4,425	210	2,246	570	254	1,493	41,000
<b>TOTAL OPERATING COSTS</b>	<b>3,223</b>	<b>3,597</b>	<b>3,715</b>	<b>20,874</b>	<b>1,161</b>	<b>2,517</b>	<b>1,095</b>	<b>13,814</b>	<b>10,225</b>	<b>401</b>	<b>367</b>	<b>9,015</b>	<b>398</b>	<b>3,264</b>	<b>1,032</b>	<b>545</b>	<b>2,294</b>	<b>72,789</b>
Passenger & baggage traffic receipts	543	557	1,100	6,550	485	943	248	6,195	5,821	52	123	2,186	29	1,352	256	135	585	25,803
Freight traffic receipts	828	438	674	3,896	0	326	338	1,834	1,101	25	22	774	92	0	139	61	493	10,226
Other revenues	493	1,639	902	4,981	201	372	103	2,218	392	10	53	2,924	62	1,229	98	107	708	15,492
<b>Revenues without Public Operating Contributions</b>	<b>1,864</b>	<b>2,633</b>	<b>2,676</b>	<b>15,427</b>	<b>686</b>	<b>1,641</b>	<b>689</b>	<b>10,247</b>	<b>7,315</b>	<b>87</b>	<b>197</b>	<b>5,884</b>	<b>183</b>	<b>2,581</b>	<b>494</b>	<b>303</b>	<b>1,785</b>	<b>51,522</b>
Public operating contributions (public budget contributions for PSO and infrastructure)	1,975	1,001	1,196	5,352	862	1,372	431	3,415	2,928	0	169	3,342	218	1,044	734	16	478	22,602
<b>TOTAL OPERATING INCOME</b>	<b>3,838</b>	<b>3,635</b>	<b>3,872</b>	<b>20,779</b>	<b>1,548</b>	<b>3,013</b>	<b>1,119</b>	<b>13,662</b>	<b>10,243</b>	<b>87</b>	<b>366</b>	<b>9,226</b>	<b>401</b>	<b>3,625</b>	<b>1,228</b>	<b>318</b>	<b>2,263</b>	<b>74,124</b>
Financial and Exceptional Costs (Net)	-389	-216	45	-311	-19	-451	-20	-1,524	-2,316	-60	-6	-182	3	-273	-49	-198	-326	-6,287
<b>NET RESULT</b>	<b>227</b>	<b>-178</b>	<b>202</b>	<b>-406</b>	<b>368</b>	<b>45</b>	<b>4</b>	<b>-1,676</b>	<b>-2,297</b>	<b>-374</b>	<b>-7</b>	<b>29</b>	<b>6</b>	<b>88</b>	<b>148</b>	<b>-425</b>	<b>-356</b>	<b>-4,952</b>
Public operating contributions / operating costs	61%	28%	32%	26%	74%	54%	39%	25%	29%	0%	46%	37%	55%	32%	71%	3%	21%	31%
Revenues without public operating contributions / operating costs (Viability ratio)	58%	73%	72%	74%	59%	65%	63%	74%	72%	22%	54%	65%	46%	79%	48%	56%	78%	71%
Total	119%	101%	104%	100%	133%	120%	102%	99%	100%	22%	100%	102%	101%	111%	119%	58%	99%	102%
Commercial passenger revenue per passenger km (€ cents)	6.6	6.9	8.2	8.8	8.7	4.9	7.5	8.7	14.9	2.7	8.1	5.0	8.4	9.4	10.1	3.3	9.2	8.6
Commercial freight traffic revenue per tonne-km (€ cents)	4.8	5.4	6.4	4.8	N/A	2.8	3.4	3.6	5.7	7.1	4.2	3.1	14.6	N/A	5.7	2.8	2.5	4.2

Source: NERA database (presented and defined in Appendix C). The categories used in this table are either categories in the database or aggregations of categories.

- If these two indicators sum to substantially more than 100 per cent, as for example for Austria and Denmark, then the railway (financial and exceptional results withstanding) may make a large profit, sufficient to cover financial costs; conversely, if these indicators sum to much less than 100 per cent, as is the case for Portugal and Greece, then the railway would ordinarily make operating losses.

Table 6.2 also shows information on passenger revenue per passenger-km (passenger yield) and freight revenue per freight tonne-km (freight yield) for each country. We would expect, a correlation between passenger yields and the ratio of traffic revenues to cost (viability); for example Great Britain and Sweden have fairly high yields and high viability. The relationship between freight charges and commercial viability is weaker.

It is more difficult to assess the adequacy of public budget contributions for financing both operating and capital expenditure, and therefore the sustainability of railways' debt. This is because capital expenditure is not reported in the principal financial statements, and we do not know the financial returns that the expenditure would generate. However, Figure 6.4, which plots the viability ratio against public budget contributions per traffic unit, highlights some capital funding issues.<sup>23</sup>

For example:

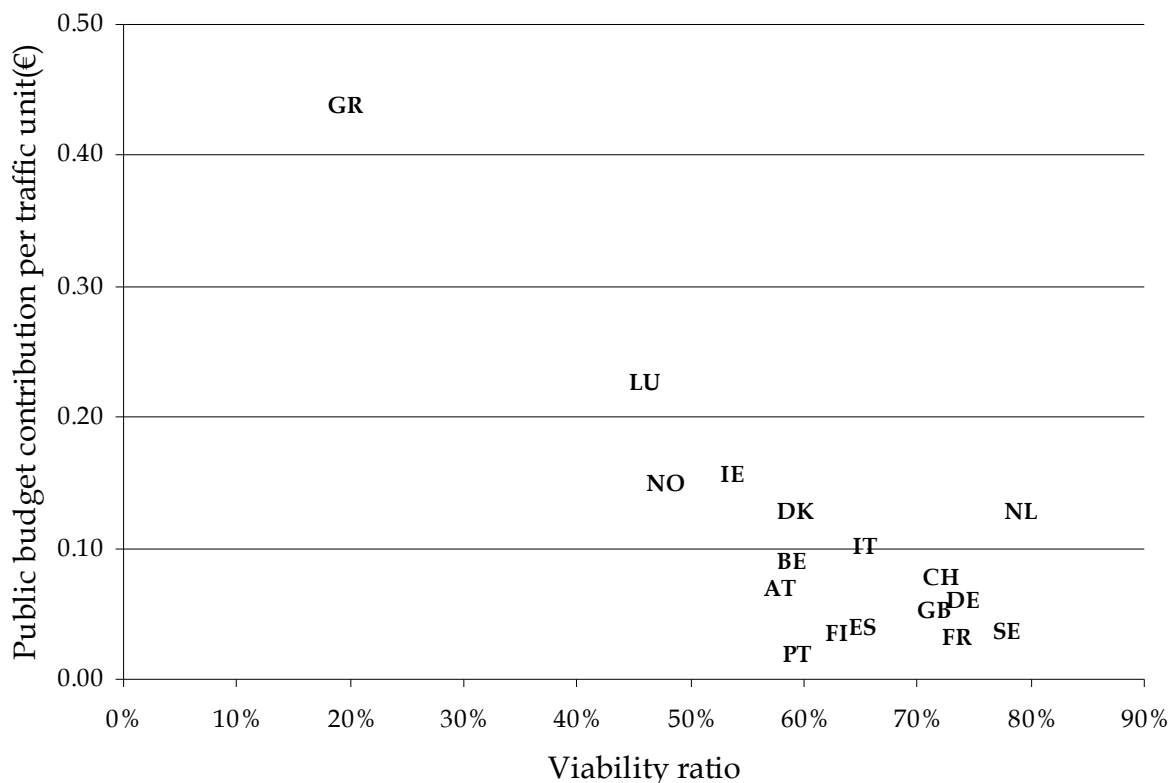
- although Greece receives little funding recorded in its income statement, it receives substantial funds to increase equity, which has limited increases in its debt; the Netherlands is currently receiving large capital payments, allowing it to increase asset intensity;
- the diagram suggests that funding in Belgium, Portugal, Austria, France and Great Britain is low relative to the commercial viability, and we know that new debt increased in each case or, in the case of Great Britain, restructuring has occurred;
- the funding in Spain also appears low but, in contrast to the examples above, debts have been stable; possible explanations are that RENFE does receive support for debt, which are not included in these figures, and capital expenditure may be lower than historic levels (asset intensity has decreased over the period, though we know that investment has occurred outside RENFE).

The low combination of viability and support in Norway and Finland relate to their different accounting conventions, and do not reflect under funding.

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<sup>23</sup> We have defined public budget contributions here to exclude one-off payments associated with restructuring or alleviation of historic debt. The comparison of viability and public budget contributions has an element of double counting, because capital grants can be amortised as "other revenue".

**Figure 6.4**  
**Contributions for Services and Infrastructure per Unit Output and Viability Ratio (2001)**  
**- Principal National Railways in the EU, Norway and Switzerland**



Source: Table 6.1 and NERA database

## 6.6. Indirect Government Support

State railways usually receive indirect support from government relative to commercial companies by:

- Superior credit ratings, awarded on the basis of implicit government support, allowing railways to borrow more cheaply than commercial railways;
- Government shareholders who do not demand commercial returns on equity.

We discuss each in turn.

### 6.6.1. Credit ratings and borrowing rates

Where a railway undertaking or infrastructure manager borrows commercially (rather than from the government or a government agency), its credit rating has a significant effect on the rate at which it borrows.



Standard & Poor's give a credit rating to various state-owned railways in Europe, as well as the parent companies of some private operators. It also rates other private and semi-private railways around the world.

To arrive at a credit rating for both state and private rail companies, S&P assesses the company's business and financial performance on a stand-alone basis, including its economic, policy and competitive environment.

For state-owned railways, S&P also assesses whether to give a rating enhancement above the stand-alone rating for government support provided to the railway. In most cases, its final ratings show that "existing government-owned or supported rail companies are often rated higher than their financial performance implies", because of government support (Report of September 11, 2002).

The risk of privatisation is a key credit issue, since privatisation loses or weakens the government support for the company, and may also coincide with deregulation or liberalisation of the market, greater competition, and therefore a more variable underlying business.

S&P distinguishes between three broad categories of state railways, and the degree of government support to be factored into the rating:

**First integrated companies.** These companies are "highly integrated within the mechanisms of government, are important to transport policy, and are unlikely to be privatised on economic or political grounds". They are likely to have the same rating, or a similar rating, to their government.

Among European rail entities, RFF in France is considered to be an integrated company, and is rated as AAA, the same as its owner government. In S&P's view, its status "entitles it to ultimate recourse from the state and its finances are fully dependent on the state budget". In addition, "privatisation is excluded even in the long run, because of the political and social environments in France". A similar rating would probably be applied to other infrastructure companies (eg Netherlands, Sweden, Finland, Denmark) that are funded directly from the government budget.

**Second, high-linkage companies.** These companies are linked to their governments in various ways. It includes rail entities that, "although autonomous in their operations, are largely policy-based institutions". Such companies can be rated up to two categories lower than the government (eg A versus AAA) reflecting the possibility of a long-term change to the relationship, but in most of Western Europe for state-owned rail operators the differential is likely to be limited to one to three notches (eg AA+ to AA- versus AAA) "reflecting the key social and economic role played by European railways and the slow progress toward privatisation". The actual rating given is based on a case-by-case assessment of government policy toward subsidies, tariff setting and regulation, as well as privatisation.

SNCF (AAA) and SNCB (AA+) fall into the category of high-linkage companies. In both cases, S&P take the view that the likelihood of their being privatised is remote. In addition, they have a high degree of government involvement, including dependence on national budgets, the social and environmental importance of rail, strict state oversight, and ultimate legal recourse to the state. For these reasons, they are rated the same as their governments.

Norges Statsbaner (NSB) is rated AA. Although it is “in a very weak financial position” and deregulation is planned in the next few years, capital injections and increases in operating subsidy from the government give comfort that the government will step in again if necessary. Its rating “is largely dependent on its relationship with, and support from, central government.” DB is rated AA, two notches below its government, because privatisation cannot be excluded according to S&P; the rating also starts to bring it into line with its future credit rating after privatisation.

Third, **stand-alone companies**. These are companies “for which the government does not accept, explicitly or implicitly, the moral or legal responsibility for the debts of the enterprise”. The form and timing of possible support is uncertain and there may be a short-term risk of privatisation. The possible government support gives a potential rating increase of up to one category from the company’s stand-alone rating.

A railway in this category is NS Groep (AA, compared to AAA for its government), which although 100 per cent state-owned operates on a commercial stand alone basis, without any significant financial support from the government. However, it does benefit from government support in terms of “a favourable rail policy and a slow pace of introducing competition”.

The ratings of private sector rail operators, both in Europe and elsewhere, are significantly lower than the ratings of state-owned rail entities. For example:

- Connex is funded by its parent Vivendi, which has interests in media and telecommunications. Vivendi is in the process of being restructured and at one point its debt was rated only BB.
- First Group of the UK, a major passenger rail concessionaire, is rated BBB; its profitability is driven by its UK rail concessions and its UK and US bus interests, all of which are in competitive markets
- Stagecoach is rated BBB, with its rating affected by the problems in its bus businesses in the competitive US market (now being sold piecemeal) and Hong Kong (also now sold)
- Angel, the UK-based rolling stock leasing company, which has a growing fleet of equipment on lease in continental Europe is rated A+. Market conditions are favourable but it still operates in a competitive market and the UK government is renewing franchises and putting pressure on lessors.

Similarly, the major US and Canadian railroads are rated BBB+ or BBB (BN, CN, CP, CSX, NS and SP). Smaller railroads such as KCR and RailAmerica are rated BB or BB-, as is MRS Logistica, the largest private freight rail operator in Brazil. Truck competition and its effect on prices, the economic outlook, and the need for productivity improvements to maintain margins combine to give a rating below the first category. Amtrak is rated BBB- and a credit watch because of the uncertainty regarding its financial and operating plans and the future level of government support.

The benefits in terms of credit rating that state-owned railways receive from government support can be viewed in two ways:

- The benefit compared with the credit rating they would have received without government support, but with the same market dominance and key role in national transport policy. The best examples here are NS Groep and DB, both of which are rated three notches below their governments (AA rather than AAA) because of the low level of government support and/or the threat of privatisation. Three notches is equivalent to approximately 90 bps, or a higher interest rate of 0.9 per cent.
- The benefit compared to the competing private operators, which have no government support, and no such market dominance or key policy role. First Group, Stagecoach and the US freight railroads are all rated as BBB, i.e. 9 notches below government rates. This is equivalent to approximately 170 bps, or a higher interest rate of 1.7 per cent.

For a company such as SNCF which is rated AAA, the same as its government, these figures imply an implicit public budget contribution of €160 million compared to DB or NS (0.9 per cent difference in interest rate multiplied by €17.9 billion of debt) and €300 million compared to private sector operators.

### 6.6.2. Return on equity

Shareholders in commercial companies expect a return on their equity investment in the company. The return they expect depends on the risk inherent in the company – they will expect a higher return from, say, a start-up e-commerce venture where the market, revenue and costs are very uncertain, than they will from an electricity distribution utility which has a relatively stable market, revenue and costs.

If actual returns fall below expectations for long, the share price will fall, the shareholders will seek to replace management and/or the company will be taken over.

Currently European railways make a negative return on the equity invested in them, as Table 6.3 shows:

**Table 6.3**  
**Average Annual Return on Equity, 1995 to 2001 (2001 prices)**

	EU Railways
Published net result	-€3.7 billion
Equity value	€127.63 billion
Return on Equity	- 2.9 %

The return on equity varies considerably between countries. There are three groups:

- Countries that have a large negative return on equity (France -31 per cent average over the seven years, Portugal -55 per cent although the rate in the last three years has been only -16 per cent, Greece -46 per cent).
- Countries that have a return within the range of -5 per cent to +2 per cent, i.e. broadly break-even (Ireland -5 per cent in the last five years, Italy -3 per cent, Germany and Sweden -2 per cent, Netherlands -1.3 per cent, Belgium and Spain - 0.8 per cent, and Austria and Finland 0 per cent).
- The private sector rail system in Great Britain, which has made a full commercial return on equity (+10 per cent between 1996 and 1999, but only 5 per cent over the full seven years because of the losses suffered by Railtrack in 2000/01).

Great Britain has adopted the policy of establishing their rail systems on a full commercial basis. Sweden and the Netherlands have also tried to do so on their train operations side, but have experienced operating and financial problems that have meant the companies have made substantial losses in some years.

It is difficult to gauge what is the return on equity that railways should be achieving. It will differ between the infrastructure company (which is close to a utility) and the train operations company (which is more affected by fluctuations in traffic demand).

For the infrastructure company, the best benchmark is the calculations done for Railtrack by the UK Rail Regulator in determining the appropriate level of access charges for the period 2001-06. He estimated Railtrack's cost of equity (i.e. what shareholders would expect) as between 7.4 per cent and 8.2 per cent in real terms. Railtrack achieved an average 8.5 per cent return on equity in 1996-99, after which its return became negative because of its operational and financial problems.

For the train operations company, the Netherlands government in 1995 set a target for NS of a 10 per cent return on equity (a target NS has not achieved). In the UK, the TOCs achieved an average 26 per cent return on equity between 1996 and 1999, but this was on a very low equity. The ROSCOs, which own all the UK rolling stock and therefore 85 per cent of the train operations assets, had an average return of 10.5 per cent. Combining the two, which

gives a close approximation to a normal train operations company such as NS, gives average return of 12.5 per cent.

The findings for different types of railways are summarised in Table 6.4

**Table 6.4**  
**Return on Equity for Different Type of Railway Company**

Type of Company	Commercial Return on Equity
Infrastructure company	7.4 to 8.2 per cent
Train operating company	10.0 to 12.5 per cent
Integrated railway (weighting of 80/20)	Approximately 8.5 per cent

On this basis, if they were operating as commercial entities European railways should have been making average annual profits of around €11 billion between 1995 and 2001, rather than losses of €3.7 billion.

Part or all of this is effectively a public budget contribution to the railways. There are three ways of viewing the size of the effective contribution:

- By taking only the government's cost of borrowing the equity. The rate will vary by country depending on its credit rating, but is likely to be 3 to 5 per cent, giving a public budget contribution of €4 to 6 billion.
- By taking a rate which reflects the government's cost of money but also the risk inherent in the business. This is difficult to calculate, but some governments set a rate of 6 to 8 per cent for public investments in commercial businesses, giving a public budget contribution of €7.5 to 10 billion.
- By comparing it with a commercial return, as we have done above, which gives a public budget contribution of €11 billion

The contribution equates to up to a 30 per cent of the declared public budget contributions shown in Table 6.1.<sup>24</sup>

Where the government is not requiring a return on equity for the infrastructure company, one view taken by some governments (eg the Netherlands) is that the government is simply treating rail like other infrastructure such as roads where it also does not require a direct return. There is no distortion of competition, since all train operators receive equally the benefit of lower infrastructure costs. The main impact is an under-recording of state aid.

<sup>24</sup> We have not included the annual losses in this calculation, on the basis that they have in several cases been ultimately paid for by state funding for restructuring and other forms of capital injection.

However, where a train operator is concerned, the lack of a required return on equity gives the state-owned operator a competitive advantage against private operators. State-owned train operations companies currently achieve a return on equity well below commercial levels (eg NS +4.1 per cent, SJ -2.0 per cent, VR 4.0 per cent, DSB 3.9 per cent on average between 1995 and 2001). The private train operator will be expected by its shareholders to achieve the return of 12.5 per cent that we discuss above. The difference, of 8.5 per cent for three of the companies, is between 5 and 10 per cent of operating costs – a significant advantage when bidding for competitive tenders.

## 7. ACCOUNTING SEPARATION AND DIRECTIVE 2001/12

### 7.1. Introduction

This chapter of the report is concerned with the allocation of government support to different railway activities, primarily between infrastructure and operations on the one hand, and between passenger and freight services on the other. We place particular emphasis on:

- progress towards implementation of Directive 2001/12 in regard to separation of the accounts of passenger and freight operations; and
- rules to ensure that there is no illegal cross-subsidy between the different activities. This requires a discussion of how common costs may be identified and allocated to different parts of the rail sector.

In Chapter 6 we provided a detailed split of total public support between “transport of passengers”, “freight”, “infrastructure maintenance and operations” and other items, namely “payments for capital investment”, “staff and pension obligations”, “debt service contributions”, “restructuring” and “other public budget contributions”. We also described trends in the public funding of these activities. These show that total state payments to EU railways in 2001 were similar to those in 1996, though the payments fell marginally in the intervening years. Payments for freight or combined transport in 2001 only appear in Austria, France, Great Britain, Ireland and Switzerland.

Article 6 of Council Directive 91/440/EEC of July 29<sup>th</sup> 1991 on development of the Community’s railways had required separation of railway accounts between provision of transport services and provision of infrastructure: “Member States shall take the measures necessary to ensure that the accounts for business relating to the provision of transport services and those for business relating to the measurement of railway infrastructure are kept separate. Aid paid to one of these two areas of activity may not be transferred to the other. The accounts for the two areas of activity shall be kept in a way which reflects this provision”.

Directive 2001/12/EC amending Directive 91/440/EC indicated that so as “to promote the efficient operation of passenger and freight transport services and to ensure transparency in their finances, including all financial compensation or aid paid by the State, it is necessary to separate the accounts of passenger and of freight transport services”. To this end Article 7 of 91/440/EC was amended to include: “In the case of railway undertakings profit and loss accounts and either balance sheets or annual statements of assets and liabilities shall be kept and published for business relating to the provision of rail freight-transport services. Funds paid for activities relating to the provision of passenger-transport services as public-service remits must be shown separately in the relevant accounts and may not be transferred to activities relating to the provision of other transport services or any other business”.

The allocation of support to different activities is very closely bound up with the issue of the system of access charges which is in place for the use of infrastructure. In most Member States total access charge revenue does not cover total infrastructure costs, so not all the infrastructure costs will be allocated to either the passenger or freight business.

Section 7.2 provides a summary of the situation with regard to vertical and horizontal separation as it currently varies between these 17 countries.

The following section, Section 7.3, considers the situation with regard to access costs and horizontal separation between passenger and freight services, and implementation of Directive 2001/12, in each of the 15 Member States (and also in Norway and Switzerland).

Section 7.4 considers cost allocation rules to avoid cross-subsidy as prohibited by Directive 2001/12.

Section 7.5 contains our conclusions in regard to the successful implementation of Directive 2001/12.

## **7.2. Summary of the Position in Different Countries**

Table 7.1 shows a summary of the position in different countries in regard to four key questions, namely:

- Is there accounting separation between infrastructure and operations?
- Are access charges levied?
- Does access charge revenue cover total infrastructure costs?
- Are there separate published accounts for passenger and freight train operations?

Most EU Member States now have accounting separation between operations and infrastructure, and most levy access charges for the use of infrastructure. However, the extent to which access charges cover total infrastructure costs vary between states with a number of countries, including Denmark, Finland and Sweden, levying them on a marginal cost basis.

The extent to which Directive 2001/12 has been implemented varies between Member States: some have full accounting separation between passenger and freight sectors; some have produced separate accounts but they are not independently audited or published; while some have yet to produce separate accounts for the two types of business.

In the next section of this chapter, Section 7.3, we consider the situation in each country in detail.

**Table 7.1**  
**Summary of Practice in Regard to Vertical and Horizontal Separation**

	Is there accounting separation between infrastructure and operations?	Are access charges levied?	Does access charge revenue cover total infrastructure costs?	Are there separate published accounts for passenger and freight train operations?
AT	Yes	Yes	No	No, though accounts exist
BE	Yes	Yes	No	Yes
CH	Yes	Yes	No	Yes
DE	Yes	Yes	Some fixed charges are covered	Yes
DK	Yes, but published info for Banestyrelsen limited	Yes, on mc basis	No	Yes
ES	Yes	No	-	Yes, but not audited
FI	Yes	Yes, on mc basis	No	Yes
FR	Yes	Yes	Some fixed charges are covered	Yes, though not independently audited. Balance sheet for freight being prepared
GB	Yes	Yes	Originally, but no longer	Yes
GR	No	No	-	No
IE	Yes	No	-	No
IT	Yes	Yes	No	No
LU	No	Yes	No	No
NL	Yes	Yes, though at low level	No	Yes
NO	Yes, but limited accounts	Yes, but limited	No	Yes
PT	Yes	Yes	No	No
SE	Yes	Yes, on mc basis	No	Yes

Source: NERA

Note: the symbol - means that there are no access charges.

### 7.3. The Position in Individual Countries

#### 7.3.1. Austria

##### 7.3.1.1. Access charges

ÖBB collects access charges from operators – mainly themselves – but then forwards a proportion of them on to SCHIG mbH, the Rail Infrastructure Financing Company. Access charges are levied for four basic infrastructure services: track access; station access; train shunting; and “parking”. There are rules to determine priority for use of the infrastructure.

##### 7.3.1.2. Separation of accounts

ÖBB offers non-railway services, the most important of which are public bus transport and electricity generation. The information provided in the financial statements does not allow for the full separation of these activities.

As ÖBB only meets the minimum requirement of accounting separation between the infrastructure division and the operations (“Distribution” division) infrastructure access payments largely appear as internal service charges between the operations and infrastructure divisions. While ÖBB’s consolidated profit and loss accounts show an access charge of ATS 4,106 million in 2001, this figure consists of the payment to SCHIG AG and not the internal payments within ÖBB.

Within the Distribution division separate financial statements are produced for each sub-division such as passenger and freight, but are not published.

#### 7.3.1.3. *Implementation of EU Directive 2001/12*

There is a strict accounting division between infrastructure and operations, and both divisions publish their own income statements and balance sheets, and public funding is clearly earmarked for each division. Horizontal separation is not marked as clearly as is vertical separation: within the Distribution division there are separate divisions such as passenger transport and freight transport which are managed individually and have separate accounts, but there are no statutory restrictions imposing controls on how common costs are allocated between these or on how internal transfer prices are calculated.

### 7.3.2. Belgium

#### 7.3.2.1. *Access charges*

Payments between the different directorates of SNCB include payments for infrastructure access, which are internal payments currently amounting to around €175million a year.

#### 7.3.2.2. *Separation of accounts and implementation of EU Directive 2001/12*

SNCB has nine directorates, each of which has a separately audited income statement and balance sheet. SNCB receives government funding for two public service obligations, namely for domestic passengers and for infrastructure. These entities have separate income statements and incremental changes to balance sheets which are published and audited. This means that costs and revenues between public service obligations and commercial activities must be disaggregated.

### 7.3.3. Denmark

#### 7.3.3.1. *Access charges*

Banestyrelsen, the infrastructure provider, charges access fees to train operators using its infrastructure. These access charges are in the main set to reflect marginal costs.

### 7.3.3.2. *Separation of accounts*

DSB was split between two separate organisations, DSB and the Danish National Railway Agency (Banestyrelsen) in 1997. DSB has published annual reports every year since 1996 but these have only been independently audited since 1999. However, Banestyrelsen did not publish annual reports, though one without an income statement or a balance sheet was published (in Danish) in 2001.

### 7.3.3.3. *Implementation of EU Directive 2001/12*

There is separation of accounts between passenger and freight operations because both of DSB's rail freight divisions were sold to the private sector by the beginning of 2001.

Regulation 2001/12 had very little impact in Denmark because most of the changes required had already been implemented. Separation of infrastructure and operations had been achieved by separating Banestyrelsen and DSB. The government had also achieved horizontal separation by a legal split of passenger and freight operations into separate companies, which meant that they had to publish individual accounts and that public budget contributions could not be used to cross-subsidise from one sector to the other.

## 7.3.4. Finland

### 7.3.4.1. *Access charges*

Infrastructure charges have been in place since 1995 and are based on the marginal costs caused by different types of train. These charges fund about 15 per cent of the infrastructure operator, RHK's, costs, and the rest are funded directly by government.

### 7.3.4.2. *Separation of accounts and implementation of EU Directive 2001/12*

Separate audited accounts have been in place for infrastructure (RHK) and train services (VR) since 1995. But before that, from 1990, there were separate accounts for train operations and infrastructure. VR Cargo and VR Passenger Services are separate legal entities and have separate income statements.

## 7.3.5. France

### 7.3.5.1. *Access charges*

Access charges are paid by SNCF to RFF and are revised annually by decree. They have a fixed component determined by track length, fees for reserving train paths and use of station platforms, and a variable component for actual use of the infrastructure. The fees are not apparently based on a detailed methodology to determine the marginal cost of infrastructure – financial considerations to increase RFF's poor financial performance are a more important consideration.

### 7.3.5.2. *Separation of accounts*

Before 1997 SNCF was an integrated state owned company responsible for both rail operations and infrastructure. The industry was restructured in 1997, and infrastructure assets were transferred to a new state-owned company RFF. However, unlike in most other Member States, SNCF has retained a railway infrastructure division, which undertakes all infrastructure maintenance and renewal activities for RFF, as well as some infrastructure enhancements.

SNCF has separate divisions for its passenger services, freight services and infrastructure activities. Separate accounts are prepared for each of the divisions, though they are not separately audited.

### 7.3.5.3. *Implementation of EU Directive 2001/12*

As a result of the Directive SNCF has been preparing a balance sheet for its freight activities, to be established by the end of 2003.

## 7.3.6. **Germany**

### 7.3.6.1. *Access charges*

Access charges were introduced in 1994 and were originally mainly based on train-kms adjusted for different categories, and with controversial discounts for large operators. In 1998 DB introduced a two-part tariff that was intended to take account of the high fixed costs of the network and also differentiated between different types of traffic, scarcity factors and the train operator's planning flexibility. In 2001 DB returned to a linear access charge tariff.

### 7.3.6.2. *Separation of accounts*

Infrastructure and operations were formally separated in 1999. DB is a holding company that combines three train operators (the long haul passenger operator, the regional passenger operator, and the rail freight operator) with two infrastructure providers (the network, and the stations), so there is separation between passenger and freight.

### 7.3.6.3. *Implementation of EU Directive 2001/12*

A further institutional separation of the DB AG Holding is currently not considered to be necessary and the existing accounting separation and prohibition of cross-subsidies are seen as sufficient to meet EU requirements without further splitting up of the railway company.

### 7.3.7. Great Britain

#### 7.3.7.1. Access charges

Access charges are charged for both passenger and freight trains according to principles that were originally designed to ensure that all infrastructure costs were covered by charges. The principles used to determine track access costs for passenger trains differ from those used to determine track access charges for freight trains, though both sets of charges are consistent with Directive 2001/14 in that they cover marginal costs.

#### 7.3.7.2. Separation of accounts

There is full separation of accounts for railways of Great Britain because of the existence of a separate infrastructure company, originally Railtrack and now Network Rail, and of separate passenger train operating companies and freight train operating companies.

#### 7.3.7.3. Implementation of EU Directive 2001/12

Because freight services are provided by private freight train operators with their own sets of published accounts, while passenger services are provided by private passenger train operators with **their** own sets of published accounts, the original form of privatisation introduced in the mid-1990s meant that there was from this time clear separation of accounts for passenger and freight train operations. It is also possible to separately identify infrastructure costs paid by passenger trains from those paid by freight trains.

### 7.3.8. Greece

#### 7.3.8.1. Access charges

We understand that rail access charges are not levied in Greece.

#### 7.3.8.2. Separation of accounts

Although the infrastructure and train operations divisions are presently within the same organisation, separate accounts are prepared and published.

#### 7.3.8.3. Implementation of EU Directive 2001/12

The Hellenic Railway Organisation operates both infrastructure and train services in Greece. Hellenic Railways have informed us that there is a Presidential Decree in preparation that will provide for the establishment of two separate companies for the operation of infrastructure and train services. We understand from the European Commission that the draft decree may be published in the Official Journal in late 2003 or early 2004.

### **7.3.9. Ireland**

#### *7.3.9.1. Access charges*

There is no system of access charging on the Irish rail system.

#### *7.3.9.2. Separation of accounts*

Iarnrod Eireann is still a vertically-integrated railway, with both infrastructure and train services provided by the same organisation, but with separation of accounts. IE's published accounts have for some years separated out infrastructure and operations as required by EC Directive 91/440.

#### *7.3.9.3. Implementation of EU Directive 2001/12*

IE's published accounts also separate out financial results for the suburban passenger division from those for the mainline division. However, as the mainline division includes both longer-distance passenger services and freight services, there is at present no separation in published accounts of the results for passenger and freight. A Strategic Rail Review of the Irish rail system published in April 2003 recommended that IE's freight business should be constituted as a separate commercially focused entity within IE, and we presume that this would result in separate accounts. However, at present we have no information on current government plans in this regard.

### **7.3.10. Italy**

#### *7.3.10.1. Access charges*

Access charges are levied by RFI on Trenitalia.

#### *7.3.10.2. Separation of accounts*

Historically FS had been an integrated organisation, but in 2001 the infrastructure manager (RFI S.p.A) and the railway undertaking (Trenitalia S.p.A) were established as separate companies within the same holding company. They have separate published and independently audited accounts.

#### *7.3.10.3. Implementation of EU Directive 2001/12*

Passenger and freight train services are undertaken by separate divisions of Trenitalia, but they do not have separate published accounts.

### 7.3.11. Luxembourg

#### 7.3.11.1. *Access charges*

CFL publishes its track access charges, which have three main components: an administrative charge, a charge associated with the cost incurred when the infrastructure is used, and a charge reflecting the scarcity of the capacity being used.

#### 7.3.11.2. *Separation of accounts*

CFL remains an integrated company, responsible for management of the infrastructure, passenger services and freight services. The three activities are organised into separate directorates, though accounts for these directorates are not published.

#### 7.3.11.3. *Implementation of EU Directive 2001/12*

The move towards liberalisation has been slower in Luxembourg than in other Member States. Some liberalisation, on some international lines, is required by the end of March 2004 and Luxembourg is required to establish a regulatory authority by the end of August 2004.

### 7.3.12. The Netherlands

#### 7.3.12.1. *Access charges*

Up to 2001 infrastructure charges were set at zero. The government has now introduced charges and plans to increase them steadily until they cover the marginal costs caused by different traffic types by 2007.

#### 7.3.12.2. *Separation of accounts*

Railways in the Netherlands were restructured in 1995 when the operator (NS) was separated from a group of four rail infrastructure organisations (these four have been merged into a single entity, Prorail, from the beginning of 2003).

#### 7.3.12.3. *Implementation of EU Directive 2001/12*

In 2000 the NS Cargo business was merged into the Railion operation, which is owned 92 per cent by DB, 6 per cent by NS and 2 per cent by DSB.

Consequently, infrastructure, passenger services and freight services are already in fully separate organisations or companies. NS and Railion have separate income statements and balance sheets, which are audited by independent accounting firms. Prorail will have full accounts in the form of income statement and balance sheet from the beginning of 2004.

### **7.3.13. Norway**

#### *7.3.13.1. Access charges*

Track access charges only account for three per cent of the costs of the track authority Jernbaneverket. Charges are only levied for freight trains (and they are related to freight costs by road) and on the line to Oslo airport; there are no charges for other passenger services.

#### *7.3.13.2. Separation of accounts*

Rail infrastructure and operations in Norway have been separated from December 1<sup>st</sup> 1996. However, while Jernbaneverket has published an “annual report” since 1996 this does not contain any form of balance sheet or traditional income statement. Nor does it appear to be independently audited. The reports concentrate on detailing the company’s activity and performance and the only financial details are an augmented cashflow statement which is extracted from the state budget.

#### *7.3.13.3. Implementation of EU Directive 2001/12*

As well as vertically disaggregating the rail industry in line with EU Directive 91/440 Norway has also achieved horizontal separation by splitting passenger and freight services provided by NSB into separate companies, NSB BA and CargoNet AS.

### **7.3.14. Portugal**

#### *7.3.14.1. Access charges*

INTF, the rail governing body, specifies the criteria to be used for setting infrastructure charges. REFER, the infrastructure manager, sets the charges, subject to INTF’s authorisation. Charges have been set for some years but were published in a table for the first time in 2001, and are a function of train km. Levels have been the subject of dispute between CP, the railway undertaking, and REFER.

#### *7.3.14.2. Separation of accounts*

Vertical separation in Portugal was instituted in 1997 with the creation of the infrastructure organisation REFER as a separate entity to CP. Transfer of assets was completed by 1997 and transfer of the workforce by 1999. CP and REFER both produce audited income statements and balance sheet.

#### *7.3.14.3. Implementation of EU Directive 2001/12*

CP has three separate business units for passenger services (Greater Lisbon, Greater Oporto, and Intercity/Regional), a business unit for freight services, and one for rolling stock/traction. The separate business units do not have published audited accounts.

### 7.3.15. Spain

#### 7.3.15.1. *Access charges*

There is not yet a proper system of access charging in Spain, although there are some relatively small internal transfers under this heading within RENFE's accounts. The only access prices published are those for the yet-to-be-opened Madrid to Barcelona high speed line.

#### 7.3.15.2. *Separation of accounts*

Since 1991 RENFE has been divided into a number of internal business units both responsible for train services (Cercanias – commuter services; Regionales – regional passenger services; Grandes Lineas – long distance passenger services; Alta Velocidad – high speed passenger services; Cargas – freight; Transporte Combinado – combined freight transport) and other functions (traction; train maintenance; signalling; infrastructure maintenance; stations; resources and real estate; IT services; and head office and projects). Each of these 13 divisions publishes its own results, so there is some separation of accounts between passenger and freight services. In addition, public funding most not be switched between divisions. However, we note that the divisions are not legal entities and so their results are not based on individually audited income statements or balance sheets. Neither are there clear rules for internal allocation of common costs between divisions.

#### 7.3.15.3. *Implementation of EU Directive 2001/12*

A new draft law has been presented in 2003 to create an independent infrastructure operator in Spain and to provide for non-discriminatory access by third party operators to the network.

### 7.3.16. Sweden

#### 7.3.16.1. *Access charges*

Access charges in Sweden are based on marginal cost principles.

#### 7.3.16.2. *Separation of accounts*

Rail provision in Sweden is split between operations and the infrastructure authority Banverket. Up to 2000, SJ operated through separate business sectors (i.e. operating divisions) for passenger, cargo, engineering (rolling stock maintenance), property, and IT. On 1 January 2001 SJ was divided into 6 separate limited companies, operating independently of each other. The companies are SJ AB (passenger), SJ Green Cargo (freight), and four others operating under a holding company, Swedcarrier – Jernhusen (real estate), EuroMaint (engineering), TraffiCare (terminal production) and Unigrid (IT).

Banverket (BV), the Swedish National Rail Administration, has overall responsibility for the rail network in Sweden. It plans, maintains and operates the rail infrastructure (the assets themselves are owned by the State). In 2001, it started to out-source infrastructure maintenance, through competitive tendering between its in-house production units and external suppliers.

#### 7.3.16.3. *Implementation of EU Directive 2001/12*

All of the accounting/financial requirements in 2001/12 have already been implemented. As of 1 January 2001, infrastructure, passenger services and freight services were already in fully separate organisations/companies. Banverket is funded directly by government, while SJ AB and Green Cargo are commercial entities subject to Swedish accounting regulations.

As a result, all three companies have separate income statements and balance sheets, which are audited by outside accounting firms. The three organisations/companies have fully separate cost structures. There is no cross-subsidy between them. All functions or assets are owned by one company, which then charges the other company on a normal commercial basis (examples are train maintenance and real estate).

### 7.3.17. Switzerland

#### 7.3.17.1. *Access charges*

The access pricing system is based on standardised marginal costs with a demand-related component to cover a part of the fixed element of infrastructure costs. Internal payments for infrastructure access are netted out of the consolidated accounts, and amounted to SFr 616.1 million in 2001.

#### 7.3.17.2. *Separation of accounts*

Accounting separation between operations and infrastructure was introduced in Switzerland in 1997.

#### 7.3.17.3. *Implementation of EU Directive 2001/12*

Although not legally obliged to implement EU Directives, Switzerland has closely aligned its railway reform initiatives with European Union policy. Vertical separation of infrastructure and transport services is specified in the Swiss legislation, which provides for separate accounting and, in the case of SBB, individual auditing. There is no legal obligation for horizontal separation but, since the freight rail activities of SBB are undertaken by independent companies, SBB is obliged to prepare separate accounts for these divisions too. These accounts are also audited individually.

#### 7.4. Prevention of Cross-Subsidy

This section of the chapter considers cost (and revenue) allocation rules to avoid cross-subsidy. As we noted in the introduction to this chapter, Article 7 of 91/440/EC was amended to state that: “In the case of railway undertakings profit and loss accounts and either balance sheets or annual statements of assets and liabilities shall be kept and published for business relating to the provision of rail freight-transport services. *Funds paid for activities relating to the provision of passenger-transport services as public-service remits must be shown separately in the relevant accounts and may not be transferred to activities relating to the provision of other transport services or any other business*” (our italics).

In simple terms such (illegal) cross-subsidy can be said to occur when a particular activity is credited with fewer costs than should be properly allocated to that activity (or with more revenue that should be properly allocated to the activity).

In the railway context, rail freight services would be in receipt of a hidden cross-subsidy if some of the costs that should be allocated to the freight business were actually allocated to the passenger business, and covered by public financial support to the passenger business. Some examples may help to explain the situation:

- suppose a locomotive depot provided locomotives for both freight and passenger services, but that all locomotive and crew costs were allocated to the passenger business and none to the freight business: in those circumstances the freight business would not have to pay its traction costs and would receive an effective subsidy that would not be captured in the accounts.
- suppose that a particular rail line is used only by freight trains, but that none of the costs are charged to the freight business, but instead are used to calculate total system-wide access charges, which are then borne mainly by passenger trains. Again there is a hidden subsidy to the freight business.

Assessing whether cost allocation rules are being used in the appropriate way to avoid cross-subsidy therefore requires:

- an understanding of where in the railway system it will be necessary to allocate costs between different types of activity, specifically, given the existence of Directive 2002/12, between passenger operations, freight operations and infrastructure; and
- an understanding of the rules by which costs can be allocated between different activities, in those circumstances where costs might be said to be “common” between different activities.

In regard to the first of these issues, we note that common costs arise in railways in three main areas:

- there may be some items of railway operations equipment that are used for both passenger and freight services. Multi-purpose locomotives are one that we have already mentioned, though much railway rolling stock – passenger multiple units, or freight wagons, for example – may only be used in one of the sectors.
- there will be some costs such as headquarters staff and safety inspectors which may not be associated with particular activities, be they operations on the one hand and infrastructure on the other, or passenger train operations on the one hand and freight train operations on the other.
- railway infrastructure – track, signalling and the line of route itself, with its bridges, cuttings, embankments and tunnels – is the classic case of a common facility. The complex debate over the determination of access charges has provided good evidence of the difficulties that do arise in allocating costs to determine the use of facilities that truly are joint across different activities.

The issue of how to allocate common costs to different activities has been considered at length in the economic literature on cost allocation.<sup>25</sup> This literature is associated with the two areas of **competition law** and of **utility regulation**. In competition law the issue arises in determining whether firms may be guilty of excessive pricing, discriminatory pricing or predatory pricing: in all three cases the answer will depend on the relationship between prices and costs, and so it will be necessary to identify costs. In utility regulation there is often a need to identify costs in order to determine the appropriate levels of regulated charges – for example, some activities may be regulated, and others not, so the regulator needs to be satisfied that the appropriate costs are being charged to the regulated activity.

A review of the **literature on cost allocation** confirms that there is no single “correct” method of allocating joint or common costs. Economic theory suggests a set of minimum requirements, which set a “floor” and a “ceiling” to costs:

- The floor is that of **incremental costs**. The incremental cost of a good or service is the additional cost that a firm producing a number of different products or services incurs as a result of providing extra units of that good or service in addition to its other outputs. Thus it is the net addition to total costs from producing extra units of a particular output. In the context of railways, the incremental cost of an extra passenger train run on the network would be the additional operating costs of that train plus any additions to the cost of maintaining and providing infrastructure used by the train. The incremental costs of infrastructure would be the additional costs of maintaining and providing the infrastructure. There would be cross-subsidy to the

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<sup>25</sup> NERA’s report *Regulatory Approaches to Cost Allocation* (April 2001) provided a review of cost allocation rules for common costs in the rail context for the UK Office of the Rail Regulator. The report is available at [www.rail-reg.gov.uk/filestore/consultants/nera\\_costalloc.pdf](http://www.rail-reg.gov.uk/filestore/consultants/nera_costalloc.pdf).

train operator if the price paid for use of the infrastructure was less than the incremental costs.

- The ceiling is that of **standalone costs**. The standalone cost of a good or service is the cost of providing that service using facilities that are not also used to produce another good or service – that is the costs of a facility that “stands alone”. So the standalone infrastructure costs of freight trains would be the cost of infrastructure for a freight network that only catered for freight trains, and the standalone infrastructure costs of passenger trains would be the cost of an infrastructure network that only carried passenger trains. If an activity was required to pay more than its standalone costs then it would be better for it to develop its own network, since this could be done at a cheaper cost. In practice, calculation of standalone costs requires calculation of the costs of a hypothetical network, with the need to make careful assumptions as to what those costs would be if the network was developed from scratch.<sup>26</sup>

These rules will provide some guidance on cost allocation, and they will ensure that there is no cross-subsidy, but they will not ensure that all costs are covered. To do this, it would be necessary to use some form of fully-distributed cost allocation mechanism. The way to ensure static economic efficiency in the absence of externalities would be to use Ramsey pricing, with common costs allocated in inverse proportion to demand elasticities (so that, the less responsive the demand for a particular activity to price, the higher the price in relation to costs). In practice, different fully-distributed cost allocation methods might be used, of which the most common are:

- the relative output method – where common costs are allocated on the basis of each service’s share of total output;
- the gross revenue output – where common costs are allocated on the basis of each service’s share of total revenue; and
- the attributable cost method - where common costs are allocated on the basis of each service’s share of total attributable costs.

However, none of these is correct in an economic sense, and different rules will yield different results in terms of the relative sizes of the profits or losses of the activities over which common costs are being allocated.

Of course, these issues have already been considered at some length in regard to cost allocation in the railway sector in regard to the discussion over how to charge for infrastructure access. This discussion culminated in Directive 2001/14/EC of February 26<sup>th</sup> 2001 on the allocation of railway infrastructure capacity and the levying of charges for the

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<sup>26</sup> For a detailed calculation of the standalone costs of a rail **freight** network in Great Britain see NERA and Symonds Group *The Standalone Cost of Freight Access* A Report for the Office of the Rail Regulator August 2000.

use of rail infrastructure. The Directive requires that charges for access should be “set at the cost that is directly incurred as a result of operating the train service”.<sup>27</sup> These charges may be averaged over a reasonable spread of train services and times. These charges are minimum levels: in order to obtain full recovery of costs incurred by the infrastructure manager mark-ups can be levied on the basis of efficient, transparent and non-discriminatory principles.<sup>28</sup> This is exactly the principle we have elaborated above, namely that charges for particular activities should at least cover incremental costs, and that governments and infrastructure authorities should have discretion as to how they should recover the other common elements of infrastructure costs.

This means that there will be an absence of cross-subsidy from passenger services to freight services if:

- the infrastructure charges that are levied on freight trains comply with the principles that are set out in Directive 2001/14/EC, so that access charges **at least** equal the costs directly incurred as a result of operating the freight trains.
- where the freight trains are operated by the same company as the passenger trains, then incremental costs of freight train operation are properly accounted as a cost to freight train operations – and where they are separate companies any services provided to the freight train company are charged to the freight train company at a charge that at least equals the incremental cost of supplying these services.
- where there are general overhead costs such as headquarters management, these are allocated between the freight and passenger businesses on an incremental basis.

In practice, we believe that the difficulties of identifying incremental costs will be greater in regard to infrastructure than in regard to the other components of common costs, where use of facilities such as locomotives and crews, and office staff, can be much more closely related to use incurred, so that the satisfactory separation of accounts will depend on the practical methods used to account for use of non-infrastructure resources by the passenger and freight businesses. We believe that these practicalities will be more straightforward to achieve where the passenger and freight businesses are provided by separate companies. In the meantime, we doubt that there is sufficient guidance on good practice in this regard available to railway companies from the Commission, and we recommend that the Commission take steps to produce a handbook of good practice in regard to the drawing up of railway accounts, and in particular in regard to the allocation of common costs between different activities.

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<sup>27</sup> Directive 2001/14/EC, Article 7.3.

<sup>28</sup> Charges may also reflect both scarcity of capacity, and environmental effects caused by train operations. An EU Task Force on Rail Infrastructure has considered best practice in estimating the marginal costs on which (minimum) charges are to be based – John Thomas *EU Task Force on Rail Infrastructure Charging: Summary Findings on Best Practice in Marginal Cost Pricing* October 2002.

Finally, we note that the rules that have been developed for infrastructure charges mean that it will be very difficult to compare financial results between different parts of the rail business – passenger services, freight services and infrastructure – between different Member States because these results will depend very much on the system of access charging adopted. For example:

- in one country (Great Britain is an example before the financial collapse of Railtrack), infrastructure charges might be designed to cover all infrastructure costs, so that there would be no explicit public support to infrastructure, while freight access charges might be designed to cover only freight incremental costs, so there might also be no direct public support to freight, with all the public support to passenger services.
- in another country (such as Sweden) access charges for both passenger and freight services might be levied on an incremental basis only, so that there was direct public support to the infrastructure authority, and a different balance between support for passenger and other services.
- in a third (at present hypothetical country) there might be an attempt to cover all infrastructure costs by charges but with common infrastructure costs recovered from both passenger and freight services. This would mean that there was no explicit public support for infrastructure, but a re-balancing between passenger and freight support.

## **7.5. Conclusions on Accounting Separation and Directive 2001/12**

In this chapter we have considered progress towards implementation of Directive 2001/12, in particular with regard to accounting separation between passenger and freight services. Our conclusions are as follows:

- a first clear requirement is to determine whether there are separate accounts between passenger train operations and freight train operations. Progress varies between Member States. In some countries (Denmark, Great Britain and the Netherlands) there are separate freight and passenger train companies with their own separate accounts, and in others there are separate and audited accounts. However, some have separate accounts which are not independently audited, and in some other countries full separate accounts for passenger and freight businesses do not yet appear to have been prepared.
- in regard to the rules that are required to ensure absence of cross-subsidy, we have reviewed the relevant economic theory, and conclude that cross-subsidy will be avoided if each business (freight and passenger) is at least charged the incremental costs of its activities. These incremental costs will of course include all the direct costs of the activity, plus the incremental costs associated with common facilities. This is the principle that the Commission has already adopted in regard to the most

important component of common costs on the railway network, namely the provision of rail infrastructure.

- in practice, there is a need for more practical guidance in implementing these principles in regard to those common costs other than infrastructure, and we recommend that DG TREN commission production of a handbook on principles of railway cost accounting and allocation – it would be sensible that this handbook would also incorporate the guidance that does already exist on the implementation of Directive 2002/14 on infrastructure charging.
- we note that it will remain difficult to compare performance in regard to the types of public support (though not the overall level) for different railway systems across EU Member States because of the very different ways that Member States will choose to implement Directive 2001/14 in regard to overall recovery of railway infrastructure costs.

## 8. CANDIDATE COUNTRIES

### 8.1. Introduction

In this chapter we provide data and analysis for the railways in each of the ten EU candidate countries that operate a rail network.<sup>29</sup> Whilst detailed analysis as carried out for the main 17 countries is beyond the scope of this study, we provide an analysis of the institutional, operational and financial situation in each of the countries and for the consolidated sector. Where appropriate, comparisons with the main 17 countries are made. Although the availability of data restricts our analysis, we discuss the nature of, and trends in, public budget contributions. We also consider any reforms that have taken place to bring domestic rail policy in line with EU legislation and directives.

This chapter is structured as follows.

- In section 8.2 we describe our approach to this work and the status of the data we have collated.
- In section 8.3 we explain the institutional structure and reforms of the candidate country rail sector, considering issues such as vertical separation and competition.
- In section 8.4 we examine different indicators of the operational and financial performance of the railways in the ten countries of interest.
- In section 8.5 we provide our conclusions.

We present a short profile for each of the ten countries in Appendix B. The database for these countries is given in Appendix D.

### 8.2. Information Status and Approach

The primary source of data for the candidate country database was the published UIC *International Railway Statistics* for the years 1995 to 2001. A largely similar process was undertaken for the assimilation of these data into a database as was used for the main 17 country database. The key difference was the level of checking and verification that could be carried out. Where annual reports, or other published materials, were available<sup>30</sup> they were used to cross-check the UIC data, although for a number of cases this was not possible. Where appropriate, these additional data sources were used to complete any gaps in the data or to replace any inconsistent data.

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<sup>29</sup> Countries considered are: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia. Cyprus and Malta are not included as they do not have railways. **So, any reference to “the candidate countries” should be taken to exclude these two countries.**

<sup>30</sup> Search for documents concentrated on documents published in languages spoken by the project team.

Once an interim database was constructed and analysed, copies of the entry for each of the countries, with a background questionnaire, were sent to the relevant organisation in each country. The purpose of this questionnaire was to finalise and verify the data held for each country and to augment our understanding of the history and operation of the industry in each of the countries. Any additional data from the questionnaire stage, in conjunction with any necessary data corrections, were then entered into the final database.

Table 8.1 shows the sources and status of data gathered on each of the ten countries. The range of data sources used is wide and has allowed a certain level of corroboration of the UIC data. Although limited, the feedback from the questionnaires seems to support the data used. As Table 8.1 shows, the database for these countries is largely complete; for most countries the only gaps in the data tend to relate to freight activity data. There are only two countries for which we have significant data gaps:

**Table 8.1**  
**Data Sources and Status by Country**

Country	Organisation	Main Information Sources	Completeness of Data
Bulgaria	BDZ	UIC data, Amadeus, BDZ website, Bulgarian Transport Ministry website	Complete
Czech Republic	CZ	UIC data, data direct from CD, Amadeus, CD's website, Czech Transport Ministry website	Complete
Estonia	EVR	UIC data, EVR website, Estonian Railway Administration website, <i>Today's Railways</i> magazine <sup>†</sup>	Complete
Hungary	MAV	UIC data, data direct from MAV, Amadeus, MAV website, Hungarian Transport Ministry website	Complete
Latvia	LDZ	UIC data, Amadeus, LDZ website, LDZ annual reports (2000 & 2001), information from Ministry	Large gaps
Lithuania	LG	UIC data, Amadeus, LG website, information from Ministry	Large gaps
Poland	PKP	UIC data, Amadeus, PKP annual report 2001, PKP website	Complete
Romania	CFR	UIC data, CFR website, CFR Marfa website	Complete
Slovak Republic	ZSR	UIC data, data direct from ZSR, ZSR website, annual reports 2000 & 2001	Complete
Slovenia	SZ	UIC data, annual reports 1998 to 2001, SZ website, Slovenian Transport Ministry website	Complete

Notes: <sup>†</sup> "Estonian railways today", *Today's Railways*, May 2003.

- **Latvia** – although we have good activity data for all years, the financial data we have been given are not in a consistent form to use for consolidated statistics.
- **Lithuania** – the situation is similar to Latvia, except that we have financial data for 2000 and 2001.

The questionnaire replies from the Czech Republic, Hungary and the Slovak Republic have been very useful in furthering our understanding of the institutional and public budget contribution situation in these countries. For the remaining countries, our understanding of the institutional and financial arrangements was informed by annual reports and the websites of the relevant organisations.

### **8.3. Institutional Structure and Reforms**

#### **8.3.1. Economic background**

The experience of railways in the candidate countries has been similar to, but more extreme than, that of the EU railways. Prior to 1990, rail had an artificially large share of transport relative to the economic competitiveness of the mode. Development of road transport was constrained by poor roads, lack of quality trucks, and discrimination in favour of rail as the more “efficient” mode. Moreover, the countries’ economies were dominated by heavy industry and the pattern of trade within the Soviet block involved specialisation between countries, so that there was a greater need for trade flows of inputs and of manufactured goods within the block.

Demand within these markets collapsed in the early 1990s with the fall of the Soviet Union, economic contraction and economic restructuring. The collapse was not matched, at least in the short term, by sufficiently radical restructuring of the railways. Towards the end of the 1990s, as these economies have begun to recover, the railways have been experiencing a further, though smaller, downturn in passenger demand caused by growth in car ownership.

Institutional reform, in line with the EU’s policy agenda, has meant that railways have moved further from government control, and in some cases, introduced private sector participation. But the mismatch between demand and supply has meant that many of these railways became heavily indebted, so that large scale restructuring has become desperately needed.

#### **8.3.2. Railway restructuring**

The Eastern European railways were not only impacted by economic changes that resulted from the collapse of the Soviet Union, but also by the political reforms which resulted in the creation of a number of new independent states. After the break up of Czechoslovakia in 1993, the railway was also split into two organisations, *České Dráhy* (serving the Czech Republic) and *Železnice Slovenskej Republiky* (serving the Slovak Republic). This experience

was mirrored by the Estonian, Latvian and Lithuanian rail industries in 1992 following the creation of the Commonwealth of Independent States. *Eesti Raudtee*, *Latvijas Dzelzceļš* and *Lietuvos Geležinkeliai* all emerged from the old USSR rail network as independent railways.

The late 1990s have been another period of turbulence for the railways as governments have imposed a number of reforms to bring domestic policy and laws into line with EU policy and regulations. Whilst all countries have engaged in some form of reform, the extent to which this has happened varies. All but one country have retained state-owned integrated monopoly suppliers of both train operations and infrastructure management but, whilst the traditional operator may still exist as a single legal entity, in many cases it is divided into a number of business units to provide accounting separability between the various business functions.

The most free-market reforms have been put in place by Estonia. Competition was introduced to the railway when, in 1996, an additional passenger and freight operator, *Edelaraudtee AS*, was set up by the government. Following this in early 1999, the government then restructured and privatised *Eesti Raudtee*, the existing national railway, resulting in the company being bought by Baltic Rail Services, an international consortium. The move to privatising the railway was completed in 2000 when *Edelaraudtee AS* was sold to *GB Railways*.

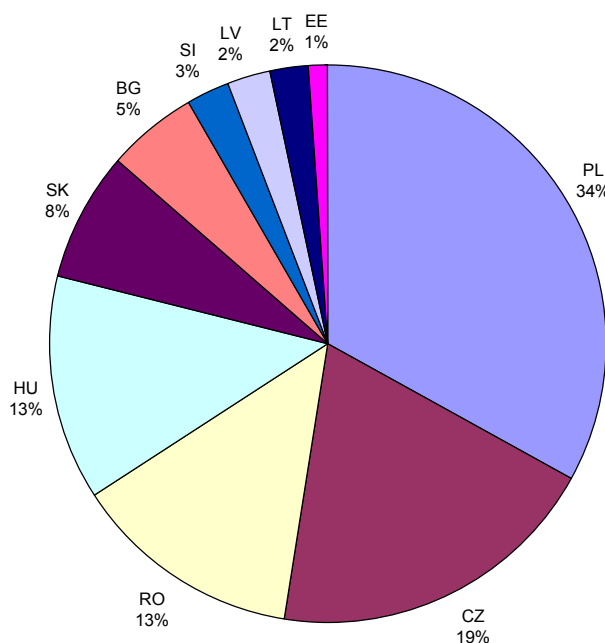
### 8.3.3. Market structure

Figure 8.1 shows the split of total train kilometres between the candidate countries. What is clear from this figure is that Poland is by far the largest market; in 2001 it accounted for a third of all train kilometres in the ten countries. In total, Poland, the Czech Republic, Romania and Hungary are responsible for nearly 80 per cent of all train kilometres. The dominance of these four countries does primarily reflect the size of the countries (the top four also have around 80 per cent of population) but also their importance in the European network in terms of goods exports.<sup>31</sup>

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<sup>31</sup> Primarily coal and steel from Poland.

**Figure 8.1**  
**Percentage Split of Train Kilometres by Country, 2001**



#### 8.3.4. Traffic trends

Between 1995 and 2001, total train kilometres in the candidate countries fell by 12 per cent with reductions in both freight and passenger train kilometres (down 17 per cent and 9 per cent respectively). The big drivers of this fall in traffic are Bulgaria, Poland and Romania, for whom total train kilometres have fallen by 16 per cent over the period. Not all of the ten countries have experienced a contraction in output; Estonia, Hungary and Latvia have all experienced slight growth (up 3 per cent). The decline in train kilometres contrasts with an increase of 9 per cent in the EU15 countries; here freight train kilometres increased by 1 per cent and passenger train kilometres increased by 11 per cent.<sup>32</sup>

These traffic trends in the candidate countries are explained by a number of factors; the decline of key exports for the large central European countries,<sup>33</sup> a growth in Russian exports (principally oil) travelling through the Baltic States and a modal shift towards cars and road transport. This latter explanation is particularly important for understanding the trends in passenger traffic. The significance of the fall in demand is further emphasised by the fact that the economies of these countries were experiencing a period of positive growth.<sup>34</sup>

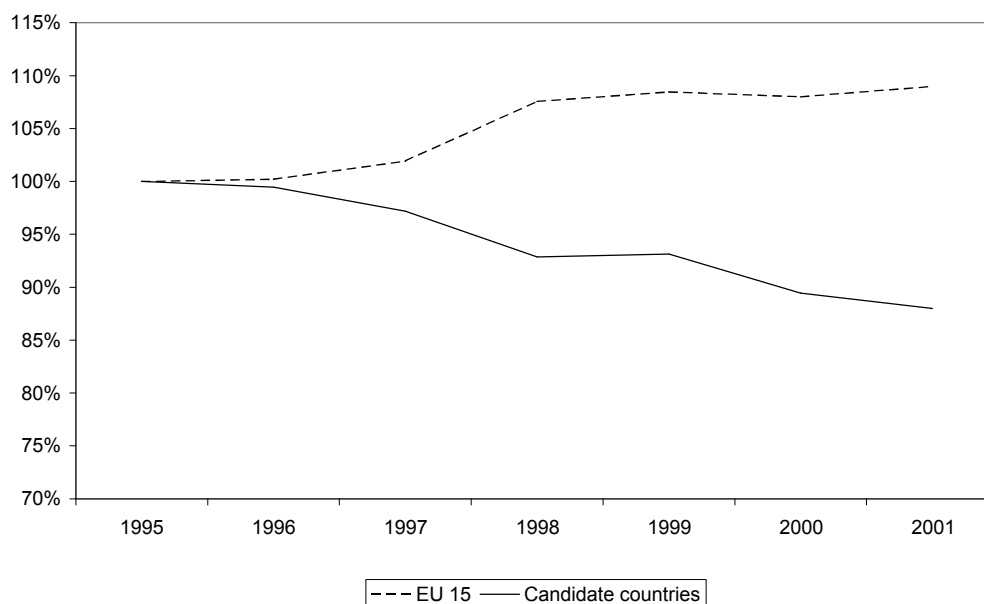
<sup>32</sup> This general trend in passenger train kilometres does appear to be supported by the trend in passenger kilometres. In fact, this alternative measure of the level of activity in the rail passenger business would suggest that passenger growth has been even stronger than growth in passenger capacity.

<sup>33</sup> ie. Bulgaria, Poland and Romania.

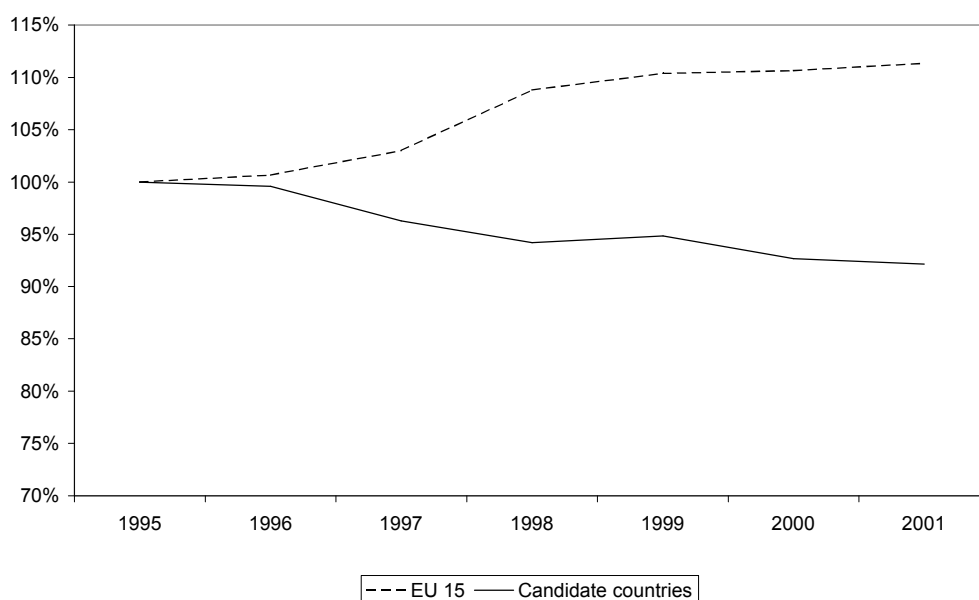
<sup>34</sup> All but three of these candidate countries grew by at least 3.5 per cent a year, on average, over the period. Only Bulgaria and Romania suffered negative average annual growth.

Figures 8.2, 8.3 and 8.4 show the trends in total train kilometres and the passenger and freight components. These charts clearly demonstrate the very different experiences in the candidate and EU countries.

**Figure 8.2**  
**Total Train Kilometres 1995 to 2001**  
**Indexed (1995 = 100)**



**Figure 8.3**  
**Passenger Train Kilometres 1995 to 2001**  
**Indexed (1995 = 100)**



**Figure 8.4**  
**Freight Train Kilometres 1995 to 2001**  
**Indexed (1995 = 100)**

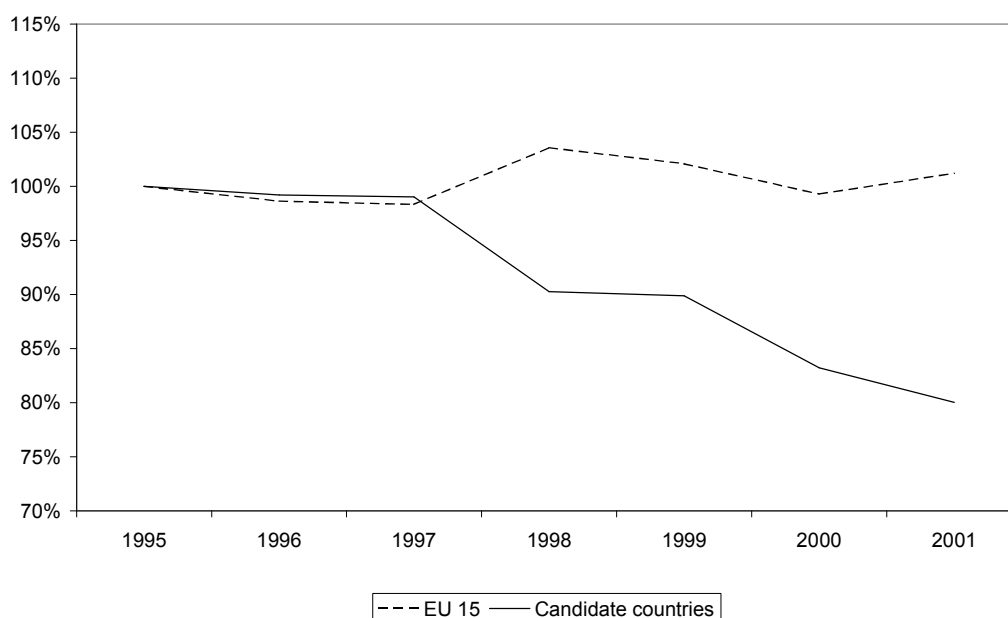


Table 8.2 shows that traffic levels in the candidate countries are around a quarter of that in the EU, which is in proportion to their relative populations.<sup>35</sup>

**Table 8.2**  
**Train Kilometre Trends in the EU and Candidate Countries by Traffic Type, 1995 to 2001**

millions	1995			2001		
	EU15	Candidate countries	Candidates as a % of EU	EU15	Candidate countries	Candidates as a % of EU
Total passenger train km	2,165	542	25.1	2,408	500	20.8
Total freight train km	654	282	43.1	663	225	34.1
Total train km	2,819	824	29.2	3,070	725	23.6

Source: NERA database

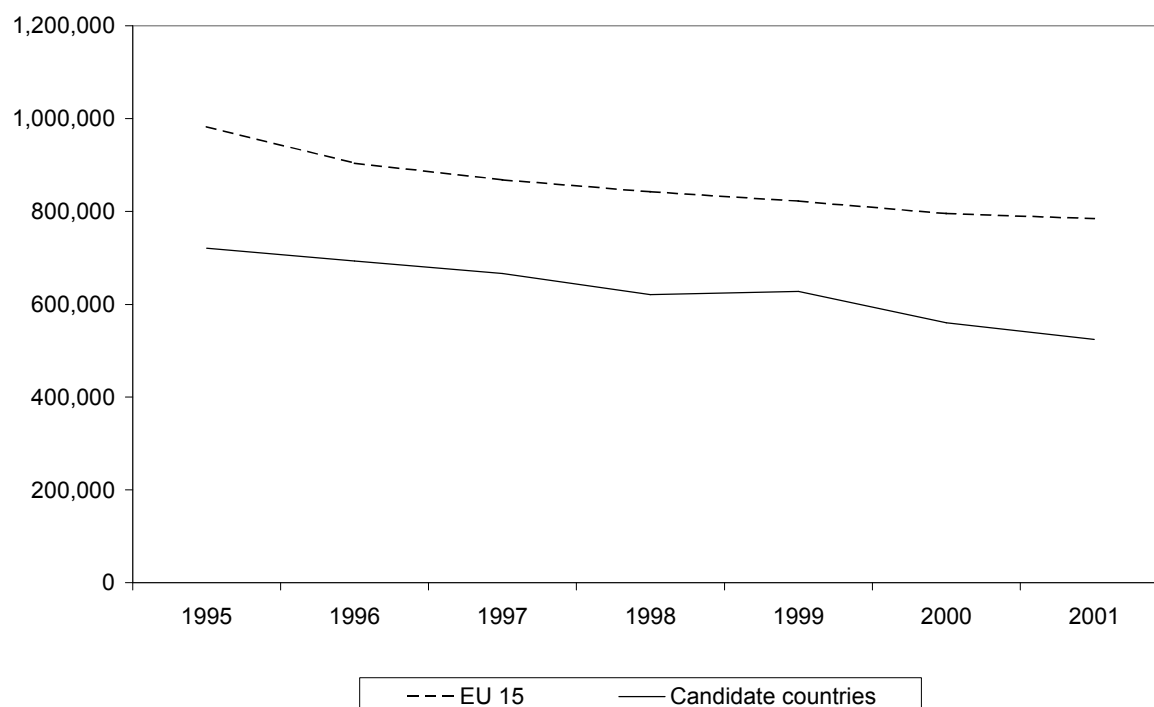
Whilst total traffic levels in the candidate countries and the EU are broadly in proportion to their populations, the mix of traffic is very different. The EU market is dominated by passenger traffic, with 78 per cent of train kilometres passenger related. For the candidate countries this is less of the case, with 69 per cent of the train kilometres being passenger. The importance of freight to the candidate countries is largely driven by coal and steel exports travelling through Poland and the Slovak Republic, whilst exports from Russia travelling to the Baltic ports in Latvia and Estonia are also important.

<sup>35</sup> Population of the candidate countries is 28 per cent of the 15 EU countries in total.

## 8.4. Financial and Operating Performance

### 8.4.1. Operating performance

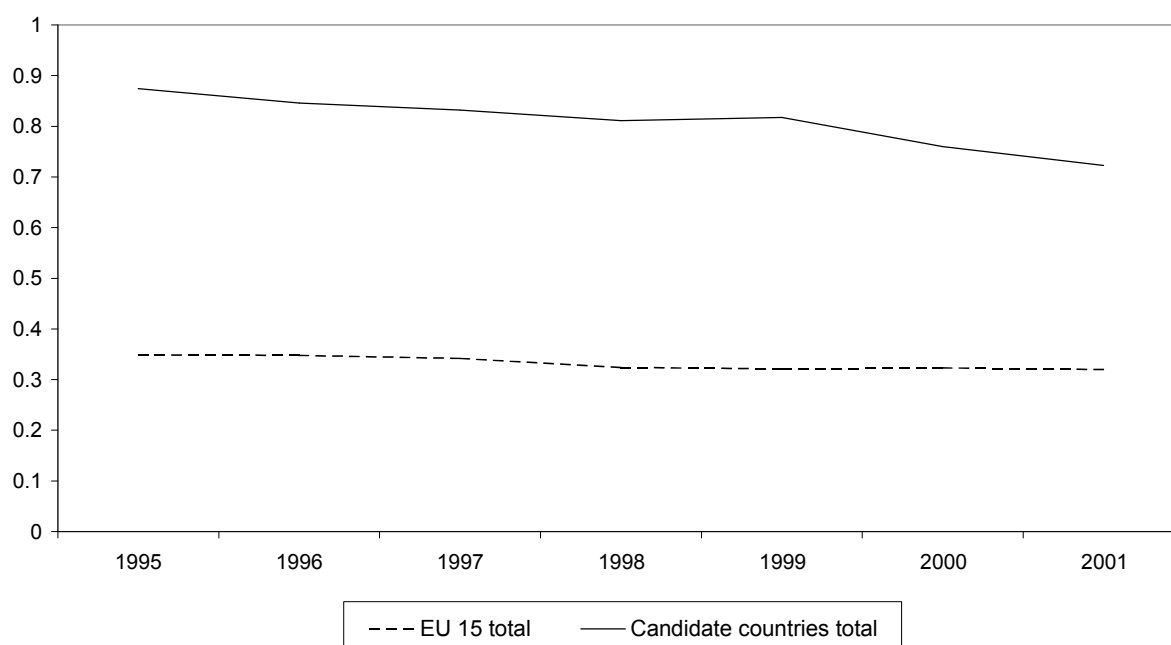
**Figure 8.5**  
Total Railway Staff, 1995 to 2001



As Figure 8.5 shows, employment has been following a strong downward trend in the candidate countries, similar to that in the 15 EU countries. Between 1995 and 2001 the reduction in employment was 27 per cent for candidate countries' railways, compared to 20 per cent for railways in the EU.

Although total staff fell by 27 per cent in the candidate countries, due to the 12 per cent decrease in train kilometres (as shown in section 8.3.4), the gain in productivity appears to be substantially less. Between 1995 and 2001, the candidate country railways have reduced employment per thousand train kilometres from 0.87 to 0.72, a decrease of 17 per cent, whereas for the EU15 railways the ratio has fallen from 0.35 to 0.26. The implication of this is staff productivity in the candidate countries is much lower than in the EU15 (by a factor of 2 to 3 times), and the gap is widening.

**Figure 8.6**  
**Employment per Thousand Train Kilometres, 1995 to 2001**



#### 8.4.2. Financial performance

Average asset intensity, as measured by total liabilities over operating costs, is lower for the railways in the ten candidate countries than for the EU railways; only the Bulgarian railways, Czech railways and Slovenian railways operate at or above EU average asset intensity. This typically reflects the older, heavily depreciated infrastructure and rolling stock used in the candidate countries, even though operating costs in candidate countries are generally lower than for EU railways (which, other things being equal, would result in a higher asset intensity).<sup>36</sup>

Whilst the levels of total assets, and therefore total liabilities, of railways in the candidate countries are relatively low, the proportion of these liabilities that is debt is often high. The debt: equity ratios and the debt as a proportion of total liabilities indicators both show that gearing is considerably higher in the candidate country railways than the EU railways, with Hungary, Romania, the Slovak Republic and Slovenia all being particularly highly geared.

Table 8.3 shows the financial position of the railways in 1995 and 2001, and how the financial position has evolved over time. The most significant result is the extent to which the reliance on debt financing has increased: in 1995 the debt: equity ratio for the EU was 1.1

<sup>36</sup> Operating costs per train kilometre are around 1 to 1.2 euro cents for the candidate countries but around 2.5 euro cents in the EU.

compared to just 0.1 for the candidate countries; but by 2001 the position had reversed and the candidate countries were operating at 1.2 compared to the EU at 0.9.

**Table 8.3**  
**Indebtedness Indicators by Country, 2001 (1995 in brackets)**

	Asset intensity	Debt as % of total liabilities	Debt:Equity Ratio	Debt Service liabilities
Bulgaria	3.5 (1.2)	55 (14)	1.2 (0.2)	5 (2)
Czech Republic	3.3 (1.9)	39 (12)	0.6 (0.1)	2 (0)
Estonia	1.0 (1.0)	52 (29)	1.1 (0.4)	3 (0)
Hungary	2.9 (4.2)	74 (12)	2.8 (0.1)	5 (9)
Latvia	- (-)	- (-)	- (-)	- (-)
Lithuania	2.8 (-)	13 (-)	0.2 (-)	0 (-)
Poland	1.7 (2.9)	46 (8)	0.8 (0.1)	3 (0)
Romania	1.1 (5.6)	70 (9)	2.3 (0.1)	1 (1)
Slovak Republic	2.8 (2.4)	67 (11)	2.1 (0.1)	6 (0)
Slovenia	3.8 (-)	94 (-)	16.1 (-)	2 (-3)
<b>Candidate countries<sup>37</sup></b>	<b>2.2 (3.0)</b>	<b>55 (10)</b>	<b>1.2 (0.1)</b>	<b>3 (1)</b>
<b>EU15</b>	<b>3.5 (3.3)</b>	<b>48 (51)</b>	<b>0.9 (1.1)</b>	<b>5 (5)</b>

Source: NERA database

This trend is a result of both falling equity and rising debt.

- Overall, the railways have been making heavy annual losses, which in turn has reduced equity.
- Debt was generally low in 1996, and debt increases will in part reflect a move towards a more commercial financing structure.
- But lack of government financing has meant that debt levels have continued to increase.

It is clear that government funding is in many cases insufficient to finance the railways, in their current form, in a sustainable manner.

Despite the high levels of gearing amongst these candidate country railways, interest payments constitute only 3 per cent of total operating costs which is 2 percentage points **less** than for the EU15. Also, it should be noted that debt for the candidate country railways is only around €10 billion compared with €100 billion for the EU15 railways based on annual turnovers of €6 billion and €50 billion respectively.

<sup>37</sup> Excluding Latvia and Lithuania.

### 8.4.3. Public budget contributions

The general trend for public budget contributions in the candidate countries has been upwards. According to UIC statistics, over the 1995 to 2001 period government operating support rose by 13 per cent in real terms. This was driven by a 43 per cent increase in operations contributions; infrastructure contributions fell by 39 per cent. However, if the data are similar to those of EU railways, there are likely to be hidden, and possibly escalating, operations contributions in the revenue data for a number of the candidate countries.<sup>38</sup>

This overall trend of increasing contributions, which occurred in all but one of the eight countries for which we have UIC data,<sup>39</sup> contrasts with the trend observed in the EU of falling operating contributions, down 21 per cent. It is likely that, as passenger services over the period have become increasingly loss making, the contributions have increased to provide some compensation, potentially at the expense of infrastructure maintenance. This again contrasts with the experience in the EU where the trend has been improved financial performance of passenger services and an increasingly greater proportion of contributions being focused on infrastructure.

Whilst the overall increase in contributions has been reflected in seven of the eight countries, the extent to which governments have contributed more does vary sharply across the countries. Driven exclusively by increases in operations contributions, the Czech Republic has increased contributions the most sharply with an overall rise of three-quarters over the period. In contrast, Bulgaria increased contributions the least with an increase of only 13 per cent, again driven by operations support. Whether this large variation reflects actual variation or just inconsistent classification of public budget contributions is not clear.

In terms of policy, it appears that there is a high degree of variation between the candidate countries in the way that they administer the payment of public service payments. A number of the countries appear to have retained the traditional state budget allocation approach. However, advances in reforming this system have been made in some countries, notably in:

- The Czech Republic – the funding regime was reformed in 2001 and the new approach involves the Czech Railways receiving funding for PSO services via a contract payments.
- Hungary – the Railway Act of 1995 specifies the financial framework and requirements of parties for the provision of public service operations.

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<sup>38</sup> For several of the EU railways, some public budget contributions were classified as passenger revenue in the UIC data. We have reclassified these payments, so that support is shown separately; but for the candidate countries we have often not had sufficient information to be able to make such adjustments.

<sup>39</sup> Total contributions only fell in Poland.

- Poland –the creation of PKP as a holding company with all the separate business units as subsidiary companies has made the cross subsidisation of railway operations much more difficult.
- The Slovak Republic – PSO services are operated under contract with the government. However there is still an on-going dispute between the government and the railways over the payment of around €350 million in contract payments dating back to 1994.

## 8.5. Conclusions on Candidate Country Finances

The finances of candidate countries' railways have been under particular pressure over the period that we have studied:

- After substantial falls in traffic in the early 1990s, train kilometres declined by 12 per cent from 1995 to 2001, in spite of buoyant economic growth in many of the countries. This declining market position, a result of a number of factors including increased car ownership and reductions in output in some heavy industries, has meant that revenues have fallen by around a quarter over the same period.
- Whilst there has been some improvement in productivity, employee productivity remains substantially lower than that of EU railways, and operating costs have not fallen as quickly as commercial revenue, resulting in an increased financing requirement.

This is a similar experience to the EU railways 10 or 20 years earlier, though recent EU traffic trends have been more positive, and certain restructuring has lessened inefficiencies.

In addition, in common with EU railways today, candidate countries have major aspirations to improve their trans-European railway infrastructure, and are obliged to comply with certain regulations, which have associated financing implications.

UIC data suggest that public budget contributions have generally increased over the 1995 to 2001 period; but it is clear that these contributions have been insufficient to fund the public service undertaken. As a result, many of the railways have experienced large operating losses.

The funding shortfall has resulted in increasing reliance on debt financing and a general increase in total liabilities. The increase in the use of debt, both short term and long term, has been substantial and has resulted in the proportion of all liabilities that is debt for the candidate countries increasing from less than a tenth of that for the EU countries in 1995 (when it was lower than commercial levels for historical reasons), to being 50 per cent **higher** than the EU countries in 2001. It is this trend that is of greatest concern as it appears to be unsustainable.

Whilst the railways are heavily indebted, progress has been made in instigating the reforms prescribed by the European rail directives, in particular with respect to the separation of the infrastructure manager and the railway undertaking. But, although reform in the payments of public service obligations has made some progress, railway finances in the candidate countries are not yet in a sound state.



## 9. CONCLUSIONS AND RECOMMENDATIONS

### 9.1. Introduction

This study has been concerned with the main state railways in each of the EU Member States, in Norway and in Switzerland, concentrating on the period 1995 to 2001. We have also examined the EU candidate countries that have national railways.

At the start of the period, largely in response to Directive 91/440, most of the railways underwent substantial **institutional and financial restructuring** to relieve indebtedness and to separate infrastructure management from operations. For example, railways in Denmark, Belgium, Finland, Germany, Italy, Luxembourg and the Netherlands were restructured with low or lower debt levels. However, restructuring of debt did not occur in Greece, Ireland or Spain.

Since then **railway reforms have continued**, albeit without the large-scale restructuring of the early period, and real progress has been made towards establishing financially sustainable railways operating on a commercial basis.

### 9.2. Public Budget Contributions

Public budget contributions have become more transparent, with payments often made under contracts spanning several years, with only minimal funding for freight, identification of contributions in the accounts of railways, and treatment to normalise accounts with respect to these payments.

In almost all Member States, **passenger services are now funded by contract**, though contracts often relate to a large number of services bundled together, and very few services are operated outside the PSO framework.

In Germany, the Netherlands, Great Britain, Portugal and Denmark certain regional services have been awarded to operators on the basis of **competitive tender or concession**. Such reforms are attractive because they greatly strengthen the companies' incentives to provide services efficiently, thus alleviating funding concerns. In certain other states (for example in Italy, Switzerland and Norway), there is interest in tendering passenger services, but also some hesitance and delay.

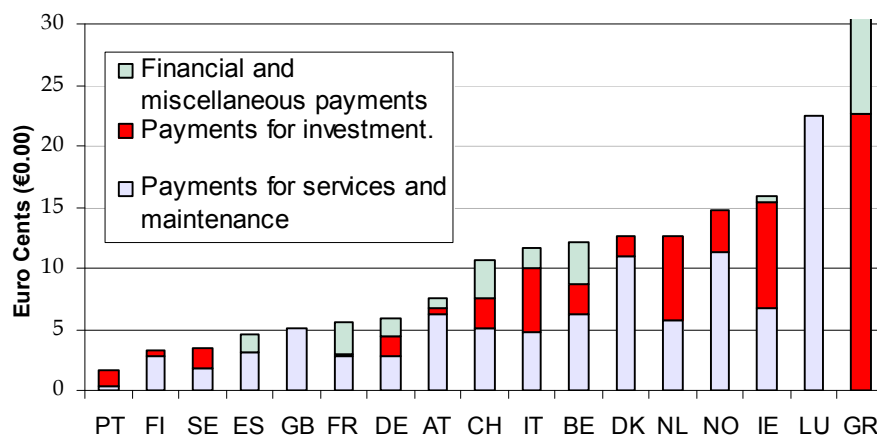
In many of the larger countries (for example Germany, Sweden, France and Italy), responsibility for service funding and specification has been **devolved to local government**. This is a more transparent system than a single national contract, not least because local governments would wish to avoid cross-subsidising neighbouring administrations. Thus it allows the trade offs in funding, both between regions and between different forms of public funding within regions, to be more clearly identified.

The **freight sector** has become more commercialised over the period. Freight subsidies, where they exist, are typically restricted to infrastructure grants, grants for combined transport facilities or incentive payments to rail freight customers. In many countries, freight services are provided by separate established companies, though in some cases work to separate accounts from other railway activities is ongoing. Rail freight competition is still limited, but most advanced in Germany and Great Britain, and the operator Railion has developed to be the main operator in Denmark, Germany and the Netherlands.

Most countries receive payments for **infrastructure** maintenance, often in the form of a contract, and capital grants for investment. Infrastructure managers are also funded, to varying degrees, by track access charges. Debt is an important means for financing infrastructure, and is sometimes off balance sheet, for example through a company subsidiary or special purpose vehicle.

Figure 9.1 compares public budget contributions to the organisations studied between countries. The figure shows that the form of funding, as well as the amount per traffic unit, can still vary widely between countries.

**Figure 9.1**  
**Payments per Traffic Unit (2001)**



Source: NERA analysis

### 9.3. Financial Position

Over the period covered by the study, the **operational performance** of European railways has improved considerably, supported by strong economic growth. Commercial traffic revenue increased by 13 per cent (passenger revenues growing by 27 per cent, freight falling by 12 per cent). Operating costs did not change overall, so that the viability ratio of operating income (excluding public budget contributions) to operating costs improved substantially (from 61 per cent in 1995 to 71 per cent in 2001).

Governments have contributed more to railways' **funding requirements**, both operational (so that losses after public budget contributions were 5 per cent of operating costs over the period compared to 10 per cent over the previous 15 years), and in terms of capital. Total public budget contributions were broadly similar in 1995 and 2001, though there was a shift over the period from support for restructuring to payments for infrastructure, particularly in the form of capital grants for infrastructure investment.

Overall, **Debt** has been broadly stable since 1995, and many EU railways now have sound finances. However, some railways still have high debt levels that would require restructuring for them to move further toward commercialisation. This group comprises of Great Britain (although further government funding is still being provided), Greece and Ireland (neither of which has yet undertaken financial restructuring), France, Portugal and Spain (although it is still planning further restructuring). Also of concern is growing debt in Belgium, Austria and SJ in Sweden.

#### 9.4. Candidate Countries

In candidate countries, some progress has been made in instigating the **reforms** prescribed by the European rail directives, particularly with respect to the separation of the infrastructure manager and railway undertaking, and in improving the transparency of payments for public budget contributions.

However, the railways in the candidate countries are displaying many of the characteristics of EU railways one or two decades ago: they appear to be inadequately funded, their commercial revenue is falling and cost savings have been insufficient to compensate for the losses in revenue. Large operating losses are contributing to increased debt (rising from 10 per cent of liabilities in 1995 to 54 per cent in 2002), so that the **financial position** in most of the countries' railways is not sustainable.

#### 9.5. Issues to Address

Reform has been slow in some countries, and in cases where financial restructuring is not accompanied by organisational reform, financial problems can reappear. In a minority of cases, the mismatch between service provision and funding has persisted, so that such companies continued to incur large annual **operating losses** into the late 1990s and beyond.

An associated concern is that some forms of support remain **inadequately specified**, so that activities may be cross subsidised, or are simply directed at funding operating losses. Such payments weaken railways' incentives to be efficient, as do payments which are revised too frequently, because any efficiencies the railways make may result in reduced funding.

With respect to **cross subsidy**, there is a need for more practical guidance in allocating common costs other than infrastructure, and we recommend that DG TREN commission production of a handbook on principles of railway cost accounting and allocation – it would

be sensible that this handbook would also incorporate the guidance that does already exist on the implementation of Directive 2001/14 on infrastructure charging.

In many Member States, there is increased expenditure on **capital investment**. In part such expenditure is in response to a backlog of under investment, but it also includes work to enhance the network, for example with high speed lines and increased safety regulation. As a result, asset intensity has steadily increased over the period so that in 2001 it was around 20 per cent higher than in 1990. In a number of countries high or rising debt levels indicate that such expenditure is not being adequately financed. Policy makers need to ensure that enhancements are merited, and then be prepared to provide adequate funding so that debt levels are sustainable.

The period of our study, 1995 to 2001, has been one of **strong economic growth**, which has undoubtedly increased railways' traffic revenue. Less favourable economic conditions may undermine the financial stability of some railways.

We have also seen financial difficulties in some of **the reformed railways**, in Great Britain, the Netherlands and Sweden. The sector reform and the specifying contracts are both complex, but problems that arise can often be attributed to specific factors – for example the financial difficulties experienced by many operators in the UK can in part be attributed to unrealistic subsidy profiles. So it is important that Member States develop capabilities to administer such changes, and that experience and best practice are widely disseminated.

As railways move towards liberalisation it is also important to recognise **that large hidden support** for state railways persists. State linked railways benefit from favourable credit ratings relative to fully commercial competitors, and from shareholders that in general do not require returns on equity. We calculate that this latter form of support alone could amount to as much as 30 per cent of declared public budget contributions to state railways.

A full analysis of the financial position and public funding of rail systems in Europe is becoming increasingly difficult because: the industry is fragmenting; there are increasingly complex internal flows within the industry, as a variety of complex special purpose vehicles are set up; and as individual organisations within the industry lose incentives to provide data in comparable form. The Commission will need to consider the extent of **monitoring** it wishes to undertake in this area in future, and the means by which it will be able to carry it out.