THE IMPACT OF SEPARATION BETWEEN INFRASTRUCTURE MANAGEMENT AND TRANSPORT OPERATIONS ON THE EU RAILWAY SECTOR

NOTE
Abstract

This note reviews the experience of vertical separation in the European railway sector. It discusses the advantages and disadvantages of vertical separation as well as its economic, operational, safety and user impacts. Different approaches to vertical separation have produced different results, some having a substantial positive impact in terms of the competitive development of the railways, but others less so. This note sets out the results of a comparative analysis, drawing on a range of source material.
The impact of separation between infrastructure management and transport operations on the EU railway sector

CONTENTS

LIST OF ABBREVIATIONS 5

LIST OF TABLES 9

LIST OF FIGURES 11

EXECUTIVE SUMMARY 13

1. INTRODUCTION 15
   1.1. Preface 15
   1.2. Study requirements 15
   1.3. Why vertical separation? 16
   1.4. Advantages and disadvantages of vertical separation 17
   1.5. Legislative background 19
   1.6. Organisation of briefing note 21

2. MARKET ANALYSIS 23
   2.1. The position of rail transport compared to other modes 23
   2.2. Trends in rail transport volumes and performance 24
   2.3. International shares of rail freight transport 27
   2.4. Rail market opening 28

3. EUROPEAN EXPERIENCE OF VERTICAL SEPARATION 29
   3.1. Types of vertical separation 29
   3.2. Analysis of the degree of independence 32

4. THE IMPACT OF SEPARATION 37
   4.1. Case study: Great Britain 37
   4.2. Case study: Sweden 42
   4.3. Case study: Netherlands 44
   4.4. Case study: Italy 48
   4.5. Case study: France 50
   4.6. Separation and liberalisation 53
   4.7. Separation and market shares 56
   4.8. Separation and growth 58
   4.9. Summary 59

5. CONCLUSIONS OF THE ANALYSIS 61

REFERENCES 63
LIST OF ABBREVIATIONS

AT Austria
BE Belgium
BG Bulgaria
CRF Comité de Regulacion Ferroviara (Spanish RB)
CY Cyprus
CZ Czech Republic
DB Deutsche Bahn (German national railway company)
DBO Design, Build and Operate contracts
DE Germany
DK Denmark
EC European Community
ECJ European Court of Justice
EE Estonia
EEA European Economic Area
EEC European Economic Community
EL Greece
EP European Parliament
ES Spain
EU European Union
EWS English, Welsh and Scottish Railway
FI Finland
FR France
FS Ferrovie dello Stato (Italian Railways Holding Company)
GB Great Britain
GID Gestionnaire de l’Infrastructure Délégué
HSL High speed line
HU  Hungary
IE  Ireland
IM  Infrastructure Manager
IT  Italy
Km  Kilometre
LT  Lithuania
LU  Luxembourg
LV  Latvia
MS  Member State
MT  Malta
NL  Netherlands
NS  Nederlandse Spoorwegen (Dutch incumbent RU)
NTV  Nuovo Trasporto Viaggiatori
OBB  Österreichischen Bundesbahnen
PL  Poland
PPP  Public-Private Partnership
PSO  Public service obligation (contract)
RB  Regulatory Body
RFF  Réseau Ferré de France
RFI  Rete Ferroviaria Italiana (Italian IM)
RMMS  Rail Market Monitoring Scheme
RO  Romania
ROSCO  Rolling stock companies
RRA  Rail Regulatory Authority (perspective Greek RB)
RU  Railway undertaking
SE  Sweden
SI  Slovenia
The impact of separation between infrastructure management and transport operations on the EU railway sector

SJ  Statens Järnvägar
SK  Slovakia
SNCF  Société Nationale des Chemins de fer Français (French national railway company)
SPAD  Signal Passed At Danger
TEN-T  Trans-European Network - Transport
TRAN  Committee on Transport and Tourism
URSF  Ufficio per la Regolazione dei Servizi Ferroviari (Italian RB)
LIST OF TABLES

**Table 1**
Degree of separation 30

**Table 2**
Indicators of independent capacity allocation 32

**Table 3**
Independence: results from Railimplement analysis 33

**Table 4**
Change in costs in Great Britain 38

**Table 5**
Main causes of the change in cost post privatisation – Great Britain 40

**Table 6**
Changes in costs post privatisation - Sweden 43

**Table 7**
Revenues and costs of ProRail and NS - Netherlands 45

**Table 8**
Real values of revenues and costs of ProRail and NS - Netherlands 46

**Table 9**
Profit and loss of RFF and SNCF - France 51

**Table 10**
RFF transfers to SNCF for IM activities - France 52
LIST OF FIGURES

Figure 1
Market share of passenger transport modes (in passenger_km, EU-27, 2000-2008) 23

Figure 2
Market share of freight transport modes (in tonne_km, Eu-27, 2000-2008) 24

Figure 3

Figure 4

Figure 5

Figure 6
Cumulative growth in rail freight transport (2000-2009) 27

Figure 7
Percentage of international rail freight - 2008 27

Figure 8
Share of non-incumbent operators in Member States 28

Figure 9
Share of non-incumbent operators in Member States and degree of separation 34

Figure 10
Kilometres of track by year of installation – Great Britain 39

Figure 11
Total rail industry cash costs per train km 40

Figure 12
Variation in employee levels - Sweden 43

Figure 13
Operating costs of Prorail and NS (indexed to year 2003) 46

Figure 14
NS customer satisfaction and punctuality 2000-2009 47

Figure 15
Operating costs of FS (indexed to 2003) 49

Figure 16
Rail market opening score freight – 2009 54

Figure 17
Rail market opening score passenger – 2009 54

Figure 18
IBM liberalisation index 2007 55
Figure 19
IBM liberalisation index 2004

Figure 20
Separation and market shares

Figure 21
Separation and growth
EXECUTIVE SUMMARY

The objective of this note is to provide a summary of experience across EU Member States concerning the separation (unbundling) of railway operations from railway infrastructure management, looking at the advantages and disadvantages of vertical separation. It also reports on five case studies: Great Britain, Sweden, the Netherlands, Italy and France (in each case, exploring the impact of separation on economic costs, operations, competition and safety, as well as taking into account the perspective of rail users), with these case studies being chosen as representative of the various separation models across Europe. Finally, the note draws conclusions from the European experience of vertical separation with a view to informing future policy discussions.

In several network industries, vertical separation has fostered the development of competition and the realisation of largest and more efficient markets, stimulating additional employment and increased investment. The railway sector differs from other network utilities mainly in terms of systems that require coordinated investment and the substantial technological barriers that remain between Member States.

The experience of other industries suggests that there are significant gains to be made from restructuring and liberalisation, notwithstanding the existence of technical barriers between national networks. The Recast consolidates the requirements in previous Directives and defines them in more detail, but does not go as far as requiring the full vertical separation of the infrastructure manager and railway undertakings.

The findings of this note indicate that the recent EU rail legislation, while having a significant impact on the organisation of rail industries within the various Member States, has done little to increase rail’s share of the passenger and freight markets. The impact of vertical separation may only be evident after a long period and the rail industry is operating within a reasonably stable legislative, regulatory and economic environment. The selected case studies suggest that the observed trends in costs, fares and service quality can be explained by a wide range of factors and cannot be attributed to vertical separation itself.

Nevertheless, it is clear that the development of competition has become more established in countries which have been subject to full separation, such as the UK, than in other Member States where the extent of restructuring has been more limited. This supports the view that separation coupled with a strong regulatory framework can be more effective than regulation alone in ensuring non-discriminatory access to rail networks.

KEY FINDINGS ON VERTICAL SEPARATION

- In the railway industry, the greatest benefits arise from the separation of freight operations - rather than passenger operations - from infrastructure management, as passenger operations are usually highly dependent on public funding and the opportunities for purely commercial operations tend to be more limited.

- In the UK, the introduction of competitive franchise bidding has helped to stimulate market growth and encouraged service innovations as well as constraining elements of the cost base, although costs have increased substantially since 2000. Whilst this is partly a reflection of enhanced investment in response to the effects of previous policies on renewals activity, it has been argued that industry costs are excessive
and this may be partly the result of complexities and inefficiencies introduced by the contractual matrix put in place at the time of privatisation.

- In Sweden, which has a long history of vertical separation, coordination issues have not arisen following vertical separation. On the contrary, there has been an improvement in performance and a reduction in delays since separation.

- In the Netherlands the evidence suggests that vertical separation of the rail sector has supported improvements in punctuality, reliability, capacity and safety. Furthermore, there is no clear evidence that vertical separation has led to a significant increase in the costs of either the infrastructure manager or the main incumbent train operator.

- In Italy, there has been substantial entry into the freight market following market opening, notwithstanding the fact that there is still partial integration and new entrant operators continue to identify barriers hindering access to the network.

- The experience of the French rail industry provides little if any evidence of the impact of separation. The partial nature of the separation has meant that the scope for introducing competition and increasing transparency has not been realised and that there has been little if any change in efficiency and the passenger experience.

- The authors of this note suggest that future policy options for ensuring non-discriminatory access and encouraging new entry could usefully focus on independence of operational decision making as distinct from legal separation, not least because regulation alone is unlikely to prevent non-discrimination. Other issues, such as the ability of a dominant railway undertaking to unduly influence capacity allocation and other decisions through co-location with the IM should also be addressed.

- **Mechanisms for ensuring full vertical separation need to be informed by a thorough understanding of the potential costs arising from the adoption of a particular structural model.** These may be significant where the model requires the introduction of a complex contractual framework providing for, inter alia, the coordination of the timetable, payment of liquidated damages for delays and extensive consultation across train operators when planning infrastructure enhancements.

- It would also be helpful to have a **better understanding of the impact of vertical separation on the management of the wheel-rail interface** than is currently possible on the basis of previous studies. However, in investigating these issues further, it will be important to avoid drawing overly-simple conclusions on the basis of the experience of individual Member States. As the evidence reported here demonstrates, observed trends in costs, fares and service quality can be explained by a wide range of factors and in most cases cannot be attributed to vertical separation itself.
1. INTRODUCTION

1.1. Preface

This briefing note on “The impact of the separation between infrastructure management and transport operations on the railway sector in the European Union” has been prepared in accordance with the terms of reference set out in section 1.2 below. The note sets out the manner in which EU Member States have implemented the requirements of Directives 2001/12/EC and 2001/14/EC in relation to the independence of essential functions and in particular in relation to the degree of vertical separation of infrastructure management and train service provision. The note also describes what impact this has had on the markets in different Member States and discusses the advantages and disadvantages of the solutions adopted.

Given the prohibitive cost of building a parallel railway network, vertical separation is generally the only viable means of introducing competition into rail service provision. Nevertheless, vertical separation is not synonymous with liberalisation or competition, although it is generally regarded as an important pre-condition for market opening in industries with both natural monopoly and potentially competitive aspects of service provision. For the purposes of this note:

- Liberalisation means allowing more than one railway undertaking (RU), to make use of the railway infrastructure, whether as required by EU legislation or as additionally permitted by a Member State. Hence, liberalisation means that at least one RU that is independent of the infrastructure manager (IM) is permitted to provide rail services.
- Non-discrimination means equal treatment of all RUs by the IM in terms of access to rail network capacity.
- Unbundling, or vertical separation, means separating the functions of the IM from any RU as a means of ensuring non-discrimination. Unbundling therefore means that all RUs are independent of the IM, with the aim that this structural independence will lead to behavioural independence. For the purpose of this note we use the terms unbundling and vertical separation interchangeably.

This chapter draws, where appropriate, on a separate note on the structure of the regulatory bodies in the EU rail industry, which illustrates the institutional framework and resources needed to support independent regulation.

1.2. Study requirements

The objective of this note is to provide a review of the existing cases of vertical separation compared to cases where vertical integration remains. It provides a summary of experience across EU Member States concerning the separation of railway operations from railway infrastructure management and an outline of costs and benefits in each case.

As set out in the terms of reference, the note is based on:

- Research and updated information and documentation on experience of vertical separation (organisational, financial and institutional) within the EU;
• A comparative analysis of the different models adopted (vertical integration compared with the different versions of vertical separation) in order to outline their essential features and advantages and disadvantages;

• Observations on the operational, safety and economic implications as well as effects on passengers and freight customers; and

• An examination of the degree of separation between the infrastructure manager and the incumbent railway operator, the market shares of all rail operators (incumbent and new entrants) in the freight and passenger transport sectors in each Member State and developments in these markets in recent years.

The note also draws conclusions on whether further harmonisation of rules on unbundling is necessary in order to allow the development of a European railway area. The note is not an impact assessment. Summary tables and figures of the current market situation in terms of growth and market shares are included in Chapter 2.

1.3. Why vertical separation?

The issue of separating infrastructure management from transport operations is at the core of economic theory focusing on the introduction of competition as a means of encouraging efficient, customer-centred service provision. In other network industries competition has been introduced with notable success, for example in the energy and telecommunications sectors. Moreover, some transport sectors have always been subject to separation. For example, the provision of roads is independent of the provision of transport of passengers or freight by road, and in the aviation sector the providers of air passenger and freight services are different from the providers of airport services. In these cases, vertical separation has encouraged the development of efficient, competitive markets, stimulating the creation of new companies, additional employment and increased investment.

In the railway industry, the greatest benefits arise from the separation of freight rather than passenger operations from infrastructure management. This is because passenger services are generally only operated on a commercial basis where:

• sufficient infrastructure capacity is available;

• commercial operation is possible at the fares permitted by regulation or sustainable in the marketplace; and

• Member States conclude that commercial services do not harm the viability of PSO services.

These conditions are relatively restrictive and purely commercial passenger rail operations are therefore the exception in Europe. However, concessioning or competition "for" rather than "in" the market has generally improved the profitability of higher quality PSO services, and such competition is facilitated by vertical separation. We also note that benefits can arise in integrated models such as those in Baltic States.

In order to ensure that the benefits of non-discrimination are achieved, it is essential to ensure that key functions relating to access to the infrastructure, in particular capacity allocation, are performed independently of, and therefore separated from, train operation. As discussed further below, some Member States have implemented a form of vertical separation without ensuring such independence, for example because the capacity allocation function has been contracted back to the train operator.
The advantages and disadvantages of vertical separation have been debated at length. Key issues are discussed in more detail below.

1.4. Advantages and disadvantages of vertical separation

Past research into the theory of vertical separation (Preston, 2002; European Commission, 2006) has identified a number of theoretical advantages, although these have not necessarily been identified or quantified in practice. The list below identifies the most relevant ones according to the analysis undertaken as part of this study:

- **Transparency**: A greater amount of information can in theory be available to policy makers, enabling a more direct comparison of the cost of rail transport as compared with other modes. This information, as reflected in track access charges, should in theory also allow potential operators to better assess commercial opportunities for market entry (although in practice some concerns about information asymmetry, as discussed below, remain).

- **Cost efficiency**: Separation allows for the specialisation of operators and the exploitation of economies of scale, leading in turn to a fall in unit costs. For example, independent freight operators can expand services beyond national boundaries and secure scale efficiencies from a larger customer base and rolling stock fleet. Where competition between operators develops, these efficiencies will be passed on to final customers in the form of better service quality and lower prices.

- **Neutrality**: Non-discriminatory access is better secured when there is full vertical separation. The charging and/or allocation body of an integrated railway company is incentivised to find a way of favouring the internal operator, whereas an independent IM will generally have a commercial incentive to accommodate the capacity requirements of both new and established operators.

- **Competition**: Separation allows for increased competition leading to cost reduction, innovation and improved quality, as already noted. In principle, the development of competition follows directly from the benefits of neutrality and non-discrimination, at least where there is sufficient capacity to accommodate different services. As discussed above, competition in the market tends to be limited to freight services. Nevertheless, competition for the market can bring important benefits for both passengers and public transport authorities subsidising PSO services; in effect, transport authorities can award PSO contracts on the basis of the lowest required subsidy or the most innovative service offering. Effective competitive procurement of this kind depends on the transparency and non-discriminatory treatment of prospective bidders that vertical separation can help to secure.

- **Privatisation**: Separation facilitates the privatisation of different organisations within the industry and hence the introduction of greater commercial and financial discipline. However, separation does not necessarily lead to privatisation. In practice, of those networks that have vertically separated, only a small number have actually privatised their activities. Furthermore it should be noted that separation is not necessary for privatisation.
Past research (Preston, 2002; European Commission, 2006) has also identified a number of theoretical disadvantages of vertical separation; the main disadvantage is that there is potentially an increase in industry costs, driven by the need for a strong regulatory regime to support the market and prevent monopoly abuse as well as a complex contractual framework. The list below identifies the most relevant ones according to the analysis undertaken as part of this study:

- **Transitional costs**: In moving from a vertically integrated to a vertically separated industry, transitional costs arise as a result of the need for organisational restructuring and the introduction of new contractual arrangements and working practices. While these transitional costs might be expected to be outweighed by the cost savings from increased competition over the long term, they can be substantial, especially where the industry structure and/or regulatory framework are modified several times over a number of years. Transition costs have been identified as a practical issue for the industry in Great Britain, which is discussed further below.

- **Loss of economies of scope**: Economies of scope and, to a certain extent, economies of scale, arising from integrated operations may in theory be lost with the unbundling of key activities. However, the results of academic studies investigating this issue are mixed, with some suggesting that the benefits of vertical separation outweigh any adverse impact in terms of loss of scope economies (see for example Cantos, Pastor and Serrano, 2010).

- **Information asymmetry**: The infrastructure manager may in theory have incentives to withhold information from either the regulator or train operators, especially where the provision of such information would have an impact on its remuneration.

- **Decreased incentive to invest in infrastructure**: It may be difficult for an infrastructure manager to achieve adequate returns on investment where train operators are the main beneficiaries (for example infrastructure investment that leads directly to reductions in train operator costs). In these circumstances investment will tend to be sub-optimal. Whether, in practice, infrastructure managers can recover the costs of such investment, including an adequate return, will depend on the structure of access charges and the associated regulatory framework.

- **Double marginalisation**: Vertical separation may lead to the so-called “double marginalisation” problem, whereby monopolists at different stages of the value chain (in this case, infrastructure management and train operation) each charge a margin over and above the efficient cost of the service they are providing. This problem can, however, be reduced or eliminated in practice by effective regulation of both access charges and, where appropriate, rail fares or freight rates.

- **Coordination problems**: The increased interfaces between the various parties in the industry can create coordination problems, for example in relation to settling disputes or agreeing a timetable in circumstances where several operators use the same infrastructure. Such problems can be solved by implementing appropriate contractual or industry procedures, but in practice these procedures can nevertheless be time-consuming and resource intensive.

- **Lower level of reliability and safety**: It can be argued that in some circumstances, such coordination problems can lead to an increase in delays and cancellations and even a reduction in safety. For example, some commentators have attributed the Hatfield accident and subsequent deterioration in train service
performance in GB to the industry structure implemented at the time of privatisation. However, it can equally be argued that these events were the result of incentives created by the particular commercial and contractual arrangements put in place rather than vertical separation itself.

- **Possible negative impact on competition:** The unbundling of vertically integrated firms can in theory result in the creation of entities that are relatively weak in financial terms and therefore vulnerable to takeover by others. Consolidation of this kind has been observed in practice in the UK, with a number of franchised operators being absorbed by larger companies (GB Railways by FIRST Group, Chiltern by Deutsche Bahn, EWS by Deutsche Bahn, etc). In this case there has been relatively little apparent effect on the level of competition in the market since the extent of open access operation was anyway limited, although the number of companies capable of preparing credible bids for rail franchises has also been reduced to some degree. This theoretical concern is anyway open to challenge if the alternative is a vertically integrated monopoly offering little or no scope for competitive entry.

Other disadvantages include the application of larger contingencies, the development of a more risk averse culture and an increase in the number of entities (often with conflicting objectives). Overall, it is not possible to draw firm conclusions on the case for vertical separation on the basis of a consideration of theoretical advantages and disadvantages alone. As discussed in the following chapters, the impact will depend on the particular economic, commercial, regulatory and institutional environment in place in particular Member States. However, the discussion above does serve to highlight that vertical separation is not an end in itself, and that many of the advantages are only realised if it is a precursor to market opening and the development of competition.

### 1.5. Legislative background

The relevant EU legislation does not require vertical separation between infrastructure managers and railway undertakings. It does, however, require that the “essential functions” relating to access to infrastructure are independent of the provision of transport services. Articles 6 and 9 of Directive 2001/12/EC define the requirements for separation:

**Article 6:**

1. Member States shall take the measures necessary to ensure that separate profit and loss accounts and balance sheets are kept and published, on the one hand, for business relating to the provision of transport services by railway undertakings and, on the other, for business relating to the management of railway infrastructure. Public funds 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 that reflects this prohibition.

2. Member States may also provide that this separation shall require the organisation of distinct divisions within a single undertaking or that the infrastructure shall be managed by a separate entity.
3. Member States shall take the measures necessary to ensure that the functions determining equitable and non-discriminatory access to infrastructure, listed in Annex II, are entrusted to bodies or firms that do not themselves provide any rail transport services. Regardless of the organisational structures, this objective must be shown to have been achieved. Member States may, however, assign to railway undertakings or any other body the collecting of the charges and the responsibility for managing the railway infrastructure, such as investment, maintenance and funding.

4. The application of paragraph 3 shall be subject to a report by the Commission in accordance with Article 10b, to be submitted by 15 March 2006."

Article 9:
...4. In the case of railway undertakings profit and loss accounts and either balance sheets or annual statement 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.

ANNEX II
List of essential functions referred to in Article 6(3):
- preparation and decision making related to the licensing of railway undertakings including granting of individual licenses,
- decision making related to the path allocation including both the definition and the assessment of availability and the allocation of individual train paths,
- decision making related to infrastructure charging,
- monitoring observance of public service obligations required in the provision of certain services."

Articles 4 and 14 of Directive 2001/14/EC also set out the requirements for separation:

"Article 4
...2. Where the infrastructure manager, in its legal form, organisation or decision-making functions, is not independent of any railway undertaking, the functions, described in this chapter, other than collecting the charges shall be performed by a charging body that is independent in its legal form, organisation and decision-making from any railway undertaking....

Article 14:
1. Member States may establish a framework for the allocation of infrastructure capacity while respecting the management independence laid down in Article 4 of Directive 91/440/EEC. Specific capacity allocation rules shall be established. The infrastructure manager shall perform the capacity allocation processes. In particular, the infrastructure manager shall ensure that infrastructure capacity is allocated on a fair and non-discriminatory basis and in accordance with Community law.

2. Where the infrastructure manager, in its legal form, organisation or decision-making functions is not independent of any railway undertaking, the functions referred to in paragraph 1 and described in this chapter shall be performed by an allocation body that is independent in its legal form, organisation and decision-making from any railway undertaking...."
Three levels of separation are therefore required:
- accounting separation between the infrastructure manager and railway undertakings;
- separation of the essential functions listed above from railway operations; and
- separation of PSO funding from all other forms of funding.

The Recast consolidates these requirements and defines them in more detail, but does not go as far as requiring the vertical separation of the infrastructure manager and railway undertakings.

1.6. **Organisation of briefing note**

The remainder of the note is structured as follows:
- Chapter 2 provides commentary on various market trends across the EU;
- Chapter 3 considers the European experience of vertical integration;
- Chapter 4 reviews the impact of separation; and
- Chapter 5 summarises our analysis and sets out our conclusions.
2. MARKET ANALYSIS

This chapter describes the evolution of the EU rail market since 2000 using data from European Commission and Eurostat. Where possible, information has been included for 2009 (2010 information is currently incomplete).

2.1. The position of rail transport compared to other modes

Since 2000, the rail share of the total passenger transport market has remained essentially unchanged at around 6%. Transport by passenger car share dominates the market with a share of about 73% (and is excluded from the figure below in order that trends in the shares of other modes can be more readily seen). Of the remaining modes, bus and air have the highest share, the share of air transport increasing slightly in recent years (driven in part by liberalisation and competition from low cost carriers).

**Figure 1:** Market share of passenger transport modes (in passenger_km, EU-27, 2000-2008)

In freight transport, road and sea transportation have the largest market share. The combined share of rail, inland waterway, oil-pipeline and air has been below 20% throughout the period, with rail accounting for a little over 10%.

*Note:* Excludes passenger car traffic that accounts for about 73% of total market share

*Source:* European Commission (2009)
In view of this stable picture, it seems that recent EU rail legislation, whilst having a significant impact on the organisation of rail industries within Member States, has done little to increase rail’s share of the passenger and freight markets.

2.2. Trends in rail transport volumes and performance

2.2.1. Passenger transport

Between 2000 and 2009, passenger transport, as measured in passenger kilometres, grew in the EU-15 and declined in the EU-12.

---

1 Rail transport performance is expressed in tonne-kilometres for freight and passenger-kilometres for passengers.
In the EU-15 Member States, after a small decline between 2002 and 2003, rail patronage grew substantially (partly driven by the development of the high-speed sector), growing by 16.4% between 2000 and 2008 before falling back slightly in 2009. In the EU-12 Member States, rail demand has continually decreased in recent years, experiencing a fall of 26.8% between 2000 and 2009 (with the largest fall of 8.8% occurring in 2009).

The Member States experiencing the most rapid growth in rail passenger traffic between 2000 and 2009 were Denmark (41.9%), the United Kingdom (36.4%) and Belgium (35.7%). The Member States experiencing the largest fall in patronage over the same period were Latvia (89.5%), Romania (48.7%) and Lithuania (41.6%). The growth rate for each Member State over the period is shown in the figure below.
2.2.2. **Freight transport**

After several years of continuous decline, rail freight traffic returned to positive growth between 2004 and 2007. This growth was, however, essentially cancelled out by the economic recession in 2008 and 2009. From mid-2008, the recession had a major impact on the transport of goods by rail, affecting, inter alia, all sectors traditionally using rail freight services such as the mining, steel, chemical and automobile industries. Between 2007 and 2009, rail freight contracted in EU-15 and EU-12 by 13.0% and 27.6% respectively.

It is important to note that this overall trend relates to a change in tonne kilometres that may hide other trends at the European level and within individual Member States. For example, in the UK much of the increase in rail freight since the mid 1990s reflects increased reliance on imported coal and the associated increase in traffic between ports and power stations. More generally, it is not possible to draw conclusions about the impact of industry restructuring or regulation without an understanding of the particular economic and policy circumstances prevailing in a country during the period in question.

**Figure 5: Trends in rail freight transport (2000-2009)**

![Trends in rail freight transport (2000-2009)](chart)

**Note:** the figure shows percentage change in tonne_km

**Source:** European Commission (2009)

Between 2000 and 2009, the Member States that experienced the largest decline were Hungary (93.6%), Ireland (83.9%) and Luxembourg (71.3%), while the Member States experiencing the highest levels of growth were Latvia (55.3%), Germany (44.1%) and Austria (42.5%). Individual growth rates for all the various Member States are shown in the figure below.
The impact of separation between infrastructure management and transport operations on the EU railway sector

2.3. International shares of rail freight transport

In 2008, the Member States with the highest percentage of international freight transport relative to national freight transport were Latvia, Denmark and Slovakia, with values of 98.3%, 93.1% and 89.5% respectively. The lowest values were recorded in Ireland (nil) the United Kingdom (3.7%) and Portugal (8.2%), all countries geographically on the periphery of Europe with limited cross-border rail links. Percentages for all Member States are set out in the figure below.

Source: European Commission (2009)
**2.4. Rail market opening**

In 2009, the market shares of non-incumbent railway undertakings providing freight services, in terms of tonne-kilometres, were greatest in United Kingdom (100%), Estonia (57%), Romania (45%), the Netherlands (36%) and Poland (32%). On average, the market shares of non-incumbent rail freight undertakings in Europe increased from 10.5% in 2005 to 22.0% in 2009. Shares in a number of Member States in each of the years 2005 to 2009 are set out in the figure below.

**Figure 8: Share of non-incumbent operators in Member States**

The figure above shows that there is no common trend between the different Member States and that experience varies substantially between them, notwithstanding the fact that in each case the rail industry operates under the same broad legislative framework. As discussed in the following chapters, the implementation of this framework has by no means been the same in the various countries, in particular in relation to vertical separation. Against this background, and on the evidence of the figure above, those countries with the greatest non-incumbent share in 2005 appear to have had the greatest success in terms of the subsequent growth of new entrants’ shares.

In Chapter 4 the implications of these trends are discussed in more detail.

**Note:** Greece, Ireland and Luxembourg are not included in the figure as there are no non-incumbent operators in these Member States. Other Member States have been excluded due to a lack of information.

**Source:** European Commission (2009), Steer Davies Gleave (2006), IBM (2008)
3. EUROPEAN EXPERIENCE OF VERTICAL SEPARATION

3.1. Types of vertical separation

Different Member States have implemented the legislation set out in Chapter 1 in different ways. In some cases the Commission has initiated infringement proceedings for a failure to implement specific requirements of the legislation. More generally, it is open to question whether some of the approaches adopted are consistent with the high-level objective of ensuring non-discrimination in order to increase competition in the market and make the EU rail industry as a whole more competitive. This section describes the approaches that have been adopted including the various cases of full vertical separation.

While some options may not be in breach of Directives 2001/12/EC and 2001/14/EC, they cannot be regarded as vertical separation in the strict sense. Here, the note comments on the approaches taken by different Member States with reference to the standard definitions set out in COM (2006) 189:

- Full separation;
- Partial separation;
- Partial integration; and
- Fully integrated.

These definitions could be further refined and there are cases where the approach adopted by a particular Member State has some of the characteristics of more than one of these categories. Moreover, in some cases the initial approach to implementation has changed over time. The analysis in this note is based on our understanding of the position in each Member State at present, reflecting information available in February 2011. It should be noted that further changes may be made, notably in GB where various aspects of the structure of the industry are currently being reviewed.

3.1.1. Full separation

In this approach there is full separation in legal, organisational and institutional terms. The infrastructure manager is independent of the railway undertaking(s), and train service providers secure access to track and stations by means of a contract with the infrastructure provider (for example in the Netherlands).

3.1.2. Partial separation

In this approach there is organisational and legal separation of the infrastructure manager and the provision of railway services, but the main railway undertaking nevertheless remains effectively responsible for key infrastructure management functions. The main example of partial separation is the French rail industry, in which the infrastructure manager RFF and the incumbent train operator SNCF are separately owned but many of the infrastructure management activities are contracted back to SNCF. In particular, SNCF is responsible for the maintenance and operation of the rail network and provides resources for the body responsible for timetabling (Direction de Circulation Ferroviaire).
3.1.3. Partially integrated model

In the partially integrated model, the infrastructure manager and the railway undertaking, while organisationally separate, are subsidiaries of the same holding company. They are therefore likely to be subject to common strategic and commercial objectives, potentially extending to the monopolisation of rail markets. By the same token, the scope for effective co-ordination of infrastructure management and train service provision is correspondingly greater. In some of the partially integrated models there is a high degree of entry in the freight market (for example in Germany and Italy). This is discussed further in Chapter 4.

3.1.4. Fully integrated

In this case there is no separation between the infrastructure manager and the railway undertaking, both sets of activities being performed by a vertically integrated entity. This structure is the least transparent and generally offers the least scope for competitive entry but, conversely, more effective co-ordination of the wheel-rail interface.

We note that of the models mentioned above, only full integration (where there is no separation between the provision of rail services and the determination of equitable and non discriminatory access to infrastructure) is currently prohibited under EU law.

3.1.5. Degree of separation in Member States

The table below sets out which Member States fall within each of the categories identified in COM (2009) 1687 (which reflect the categories in COM (2006) 189) and are related directly to the descriptions set out in the previous paragraph. These have not been modified as they are definitions that are well established in the industry.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>MEMBER STATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full separation</td>
<td>Great Britain, Finland, Denmark, Netherlands, Norway, Spain, Sweden, Portugal, Slovakia, Lithuania, Romania, Czech Republic, Greece</td>
</tr>
<tr>
<td>Partial separation</td>
<td>Estonia, France, Hungary, Slovenia, Luxembourg, Latvia</td>
</tr>
<tr>
<td>Partial integration</td>
<td>Austria, Belgium, Germany, Italy, Poland</td>
</tr>
<tr>
<td>Full integration</td>
<td>Ireland, Northern Ireland</td>
</tr>
</tbody>
</table>

Note: Data provided does not include Bulgaria.

Source: European Commission (2009)

---

2 It should be noted that changes have taken place in some Member States since the publication of the RMMS study (for example Poland has moved to full separation, Lithuania has moved to partial separation. Also Bulgaria is partially integrated). The information that has been used for this part of the briefing note is that published in the RMMS study.
While Member States have argued that partial separation and partial integration are permitted under Directive 2001/14/EC, the Commission has concluded that many of the models actually implemented were not compliant with the requirements of the First Railway Package. It has therefore applied to the ECJ seeking a ruling against several Member States. The Commission Staff Working Document\(^3\) accompanying the Report to the Council and the European Parliament on monitoring development of the rail market (RMMS 2009, Annex 3)\(^4\) provides an overview of infringement procedures related to Directives 91/440/EEC and the First Railway Package in October 2009.

In 2010 the European Commission took further legal action against some Member States including:

- France\(^5\): for failing to fulfil its obligations under Article 6(3) of and Annex II to Directive 91/440/EEC (as amended), Article 6(2) to (5), Article 11 and Article 14(2) of Directive 2001/14/EC;
- Greece\(^6\): for failing to fulfil its obligations under Articles 6(2) to (5), Article 11 Article 30(1), (4) and (5) of Directive 2001/14/EC;
- Slovenia\(^7\): for failing to fulfil its obligations under Article 6(3) of, and Annex II to, Directive 91/440/EEC, as amended, Article 14(2) of Directive 2001/14/EC, and Articles 6(2) to (5), 7(3), 8(1), 11 and 30(1) of Directive 2001/14/EC;
- Czech Republic\(^8\): for failing to fulfil its obligations under Articles 4(1), 6(2), 7(3), 11 and 30(5) of Directive 2001/14/EC;
- Germany\(^9\): for failing to fulfil its obligations under Article 6(3) of and Annex II to Directive 91/440/EEC and Article 4(2), Article 6(2), Article 7(3), Article 8(1), Article 14(2) and Article 30(4) of Directive 2001/14/EC in conjunction with Article 10(7) of Directive 91/440/EEC;
- Poland\(^11\) for failing to fulfil its obligations under Article 6(3) and Annex II of Directive 91/440/EEC, Article 4(2), Article 6(1), (2) and (3), Article 7(3), Article 8(1) and 14(2) of Directive 2001/14/EC;
- Austria\(^12\) for failing to fulfil its obligations under Article 6(3) of, and Annex II to, Directive 91/440/EEC in its amended version, Article 4(2) and Article 14(2) of Directive 2001/14/EC;
- Hungary\(^13\) for failing to fulfil its obligations under Article 6(3) of, and Annex II to, Directive 91/440/EEC, as amended, Article 6(1), 6(2), 7(3), 11 and Article 14(2) of Directive 2001/14/EC; and

\(^3\) SEC(2009)1687.
\(^4\) COM(2009)676.
\(^5\) Case C-625/10. Action brought on 29 December 2010 — European Commission v French Republic.
\(^6\) Case C-528/10. Action brought on 15 November 2010 — European Commission v Hellenic Republic.
\(^7\) Case C-627/10. Action brought on 29 December 2010 — European Commission v Slovenian Republic.
\(^8\) Case C-545/10. Action brought on 23 November 2010 — European Commission v Czech Republic.
\(^9\) Case C-556/10. Action brought on 26 November 2010 — European Commission v Federal Republic of Germany.
\(^10\) Case C-557/10. Action brought on 29 November 2010 — European Commission v Portuguese Republic.
\(^11\) Case C-512/10. Action brought on 29 November 2010 — European Commission v Republic of Poland.
\(^12\) Case C-555/10. Action brought on 26 November 2010 — European Commission v Republic of Austria.
\(^13\) Case C-473/10. Action brought on 29 September 2010 - European Commission v Republic of Hungary.
Spain\textsuperscript{14} for failing to fulfil its obligations under Articles 4(1), 11(2), 14(1) and 30(1) of Directive 2001/14/EC and under Article 10(7) of Council Directive 91/440/EEC.

3.2. Analysis of the degree of independence

In the past, the Commission has expressed concerns about all but the full separation model described above. In particular, it has initiated a number of infringement proceedings against some Member States in relation to the implementation of the First Railway Package, including proceedings against 11 Member States relating to the separation of the infrastructure management from train operations and the independence of essential functions.

The aim of vertical separation is to create the independence needed to ensure non-discriminatory access to national railway infrastructure. The concern expressed by the Commission and others is that many of the structural models adopted do not adequately ensure non-discrimination. For example, the partially integrated model results in strong, ongoing strategic and commercial links between the infrastructure manager and incumbent train operator, both of whom are accountable to a common owner. It can be difficult to overcome such links by means of independent regulation alone, however strong the regulator’s powers, not least because of problems of information asymmetry and effective monitoring of third party access. In these circumstances, competition will generally be slow to develop and may not develop at all.

The Railimplement study for the European Commission\textsuperscript{15} highlighted a number of tests of the independence of essential functions. These are set out in the table below, from the Railimplement report.

**Table 2: Indicators of independent capacity allocation**

<table>
<thead>
<tr>
<th>MEASURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do the incumbent railway undertaking and capacity allocator, or their holding companies, have common board members? That is, are there board members that sit on either the holding company and the railway undertaking or the infrastructure manager boards; or board members that sit on both the railway undertaking and the infrastructure manager boards?</td>
</tr>
<tr>
<td>Are the incumbent railway undertaking and capacity allocator located in the same building?</td>
</tr>
<tr>
<td>Does the incumbent operator undertake some of the tasks of the infrastructure manager on the main network?</td>
</tr>
<tr>
<td>Does the incumbent railway undertaking control access to the capacity of the infrastructure manager’s assets such as depots and terminals?</td>
</tr>
</tbody>
</table>


\textsuperscript{14} Case C-483/10. Action brought on 6 October 2010 - European Commission v Kingdom of Spain.

The table below sets out the results of an exercise applying these tests, undertaken for the purposes of Railimplement. This note has updated the table below where possible to reflect current circumstances. Steer Davies Gleave believes that these criteria are relevant in seeking to understand independence and non-discrimination and considers that they continue to explain why the First Package has not had the impact expected in terms of securing non-discriminatory access and encouraging competition in the provision of rail services.

Table 3: Independence: results from Railimplement analysis

<table>
<thead>
<tr>
<th></th>
<th>Common board members</th>
<th>Offices in same building</th>
<th>Incumbent undertakes some infrastructure management</th>
<th>Incumbent controls access to some assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Belgium</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Denmark</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Estonia</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Finland</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>France</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Germany</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Great Britain</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Greece</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Hungary</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Ireland</td>
<td>Yes</td>
<td>Yes</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Italy</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Lithuania</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Netherlands</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Norway</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>Yes</td>
<td>Yes</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Poland</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Portugal</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Slovakia</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Spain</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Sweden</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes: Bulgaria and Romania have not been included as they were not part of the original study. Data not available for Latvia.

Source: Steer Davies Gleave (2006)\(^{16}\)

\(^{16}\) Data updated to February 2011 through desk research and telephone interviews.
On the basis of these results, the Railimplement study concluded the following:

- The incidence of common board members and the extent to which incumbent railway undertakings perform infrastructure management duties cause particular concern as they tend to undermine the independence of the infrastructure manager and the incumbent railway undertaking. This is also true in the event that the Holding company (in the partially integrated model) can appoint the CEOs of the IM and RU, as is the case in Italy for example.

- Where the capacity allocation tasks of the infrastructure manager are undertaken by a railway undertaking there is clear potential for distorting the allocation in favour of that undertaking. While the authors are not able to comment on the legality of this practice, they consider that it is difficult to reconcile with the provisions of EU legislation.

- The remaining problems in relation to the sharing of offices and management of other infrastructure assets also need to be addressed as they will tend to undermine confidence in the independence of the infrastructure manager.

- Where the incumbent operator and the capacity allocator have offices in the same building there is a risk of inappropriate interaction between them (although employees of the two bodies working in the same building is not necessarily evidence of such interaction).

Figure 9 presents the market share of non incumbent RUs in relation to the number of instances in Table 3 where the Member State meets the relevant test of independence (indicated by the word “No” in the relevant column). Apart from fully liberalised countries such as Denmark, Great Britain and the Netherlands, there is no clear correlation between the market share of non incumbent RUs and the degree of separation of the former national railway companies. It could be expected that in the future the trend will be in the direction of increasing fragmentation of the rail market as new entrants gain access. At the present, however, the extent of entry across MSs is varied.

**Figure 9: Share of non-incumbent operators in Member States and degree of separation**

![Figure 9: Share of non-incumbent operators in Member States and degree of separation](image)

Source: European Commission (2009); Steer Davies Gleave (2006)\(^{17}\)

\(^{17}\) See footnote 15.
Hence, independence and non-discrimination remain a concern in the sector. More recently, some of these criteria have been **addressed directly by Member States in an attempt to ensure that they are consistent with the Commission’s requirements**. For example, the authors are aware that some have sought to “protect” their capacity allocation activities by erecting a dividing wall within the same building between the access division and the rest of the IM activities, with access allowed only through a coded door. However, such arrangements do not prevent staff from interacting informally in common areas of the building.

In addition, there are cases where staff working for a public body are still paid by another body (or even the IM), again raising questions about the independence of the IM and RU concerned.

The issue of independence is discussed further in the following chapter in the context of a more detailed consideration of the relationship between liberalisation and separation.
4. THE IMPACT OF SEPARATION

The impact of the implementation of the First Package in different Member States has varied considerably, not least because of the different models of separation adopted. This chapter discusses some examples of the impact of separation in a subset of Member States. In particular, the following countries have been reviewed:

- Great Britain (GB)\(^{18}\);
- Sweden;
- The Netherlands;
- Italy; and
- France.

We have chosen at least one MS from each model identified in Chapter 3 except for the fully integrated model (which does not comply with the requirements of the Directives when there is no independence of capacity allocation) as these are representative of the various models. In considering the models adopted in each case, the economic aspects (the costs and benefits associated with the type of separation), operational issues arising from different approaches to separation, and any implications for safety and the impact on ultimate users have been taken into account.

4.1. Case study: Great Britain

4.1.1. Background on separation

Vertical separation in Great Britain followed the Railways Act of 1993 and hence, initially at least, was not driven by the specific requirements of the First Package. The industry was restructured to further a policy of competition for the market (through franchising of PSO services) as well as in the market (through “open access”). The restructuring involved:

- Transferring ownership of passenger rolling stock to rolling stock companies (ROSCOs) independent of the RUs, enabling RUs to compete for, and take over, existing franchises without acquiring or providing their own rolling stock;
- A regulatory policy of Moderation of Competition limiting the ability of passenger operators to compete directly with franchised services; and
- Subject to this policy, incentivisation of franchise operators to provide, on a commercial basis, services over and above those specified in the PSO.
- In the absence of extensive competition in the marketplace, fares and service levels were regulated through the franchise contract.

Following separation of infrastructure management from train operations and the creation of a large number of passenger and freight operating companies, passenger operators were privatised through the award of geographically based franchises on a competitive basis. Since this process began, a number of new entrants have begun operating niche open access services.

\(^{18}\) As regards the UK, we have focused on the main national railway in Great Britain as this is the network that has implemented the requirements of the First Railway Package fully and have not considered the much smaller rail network in Northern Ireland which remains integrated.
Freight operations were privatised following the restructuring. The freight market is now dominated by one large operator, although a small number of new entrants have taken some market share. The passenger market has also seen substantial consolidation in recent years, which has also been accompanied by the entry of Deutsche Bahn through acquisitions in both freight and passenger markets.

Railtrack was created from infrastructure management business of British Rail in 1994 and subsequently privatised. Due to financial difficulties and safety concerns (the Hatfield rail accident in 2000), the company went into Administration in 2001 and the business was taken over by Network Rail, a company limited by guarantee, in the following year. Network Rail, while a private sector entity, has no shareholders and is governed by Members representing the interests of the rail industry, broadly defined.

### 4.1.2. Economic costs of separation

Various studies have identified a significant increase in industry costs over the period since restructuring, and it is clear that overall costs are significantly higher than before the privatisation of the GB rail sector in the mid 1990s. However, the studies also indicate that the reasons for the increase are several and complex and that it is not the result of vertical separation alone. Smith (2004) identifies the main cost increases over the period covering pre-privatisation through to 2001/02, as set out in the table below.

#### Table 4: Change in costs in Great Britain

<table>
<thead>
<tr>
<th>Cost data</th>
<th>Units</th>
<th>Period annual averages</th>
<th>Pre-privatisation</th>
<th>Post-privatisation</th>
<th>Post-privatisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cash cost</td>
<td>£m real</td>
<td>1963 to 1992/93</td>
<td>1993/94 to 1999/00</td>
<td>2000/01 to 2001/02</td>
<td></td>
</tr>
<tr>
<td>Labour</td>
<td>£ real</td>
<td>6,095</td>
<td>5,633</td>
<td>8,419</td>
<td></td>
</tr>
<tr>
<td>Fuel</td>
<td>£ real</td>
<td>16,318</td>
<td>25,200</td>
<td>28,740</td>
<td></td>
</tr>
<tr>
<td>Materials and Capex</td>
<td>Index (1963=100)</td>
<td>257.7</td>
<td>139.1</td>
<td>139.6</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Final outputs/network size</th>
<th>Units</th>
<th>Period annual averages</th>
<th>Pre-privatisation</th>
<th>Post-privatisation</th>
<th>Post-privatisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total train km</td>
<td>thousands</td>
<td>405,048</td>
<td>410,560</td>
<td>467,872</td>
<td></td>
</tr>
<tr>
<td>Passenger km</td>
<td>thousands</td>
<td>335,514</td>
<td>381,463</td>
<td>431,550</td>
<td></td>
</tr>
<tr>
<td>Freight tonne km</td>
<td>million</td>
<td>19,757</td>
<td>15,366</td>
<td>18,750</td>
<td></td>
</tr>
<tr>
<td>Track kilometres km</td>
<td>KM</td>
<td>37,193</td>
<td>32,704</td>
<td>32,757</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intermediate outputs</th>
<th>Units</th>
<th>Period annual averages</th>
<th>Pre-privatisation</th>
<th>Post-privatisation</th>
<th>Post-privatisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail km renewedd</td>
<td>number</td>
<td>694</td>
<td>359</td>
<td>990</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality measures</th>
<th>Units</th>
<th>Period annual averages</th>
<th>Pre-privatisation</th>
<th>Post-privatisation</th>
<th>Post-privatisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broken rails</td>
<td>number</td>
<td>745</td>
<td>772</td>
<td>621</td>
<td></td>
</tr>
<tr>
<td>Train performance</td>
<td>% on time</td>
<td>88.1</td>
<td>90.0</td>
<td>81.5</td>
<td></td>
</tr>
<tr>
<td>Passenger fatalities</td>
<td>number</td>
<td>42</td>
<td>22</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** (a) 1992/93 is the last year before the impact of privatisation was felt. (b) financial values in 2001/02 prices, based on the RPI. (c) Labour price per head; fuel price per tonne oil equivalent. (d) See Figure 2 in Smith (2004). (e) Data series starts in 1969. (f) Data series starts in 1974. Train performance is a composite measure of the punctuality and reliability data published by British Rail. (g) Data starts in 1964.

**Source:** Smith (2004)
This table confirms the substantial cost increase since restructuring and privatisation but highlights the fact that this was concentrated in the period 2000/01 to 2001/02. This is consistent with the view that costs were artificially constrained, both before and after privatisation, by systematic under-investment in the railway network over many years. The increase in costs from 2000 reflected the need to address the resulting major backlog of investment, prompted in large part by the Hatfield accident of October 2000 and the resulting need to undertake major renewals work across the network. The pattern of renewals since 1963 is shown in the figure below. Note that the significant decline in renewals activity had already begun prior to vertical separation and the privatisation of Railtrack.

**Figure 10: Kilometres of track by year of installation – Great Britain**

![Graph showing kilometers of track by year of installation](image)

**Note:** Data used as a proxy for annual renewal volumes. However, since some of the track laid in the early years of the sample, for example the 1960s, may now have been replaced, this data series may underestimate the true level of renewal volumes during that period. This graph is sourced from Network Rail’s 2003 Business Plan, but has been supplemented with data on actual track renewal volumes from Railtrack’s Annual Returns for some of the post-separation years.

**Source:** Smith (2004)

This view is also supported by data on industry costs per train km. This was consistently above £15 per train km between the mid-1970s and the mid-1980s, falling thereafter until the year of the Hatfield accident after which it rose above £19 per train km (Smith, 2004). This is shown in Figure 11.
More recently, the UK Department for Transport has initiated a review of value for money in the rail industry, led by Sir Roy McNulty and jointly sponsored by the Department and the Office of Rail Regulation. At the time of writing, Sir Roy had not published his final report, but his interim findings highlighted a number of high level causes of the escalation in industry costs since privatisation. These are summarised in the table below.

**Table 5: Main causes of the change in cost post privatisation – Great Britain**

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Train operating costs</td>
<td>£1.4bn</td>
<td>£0.7bn is related to train-km growth, with some of the remainder likely to be due to an output increase such as improved performance. Competition between franchise bidders has helped to constrain costs, although some elements of operating costs, notably drivers’ salaries, have increased substantially.</td>
</tr>
<tr>
<td>ROSCO</td>
<td>£0.3bn</td>
<td>All of this can be related to train-km growth.</td>
</tr>
<tr>
<td>Infrastructure operating and maintenance</td>
<td>£0.2bn</td>
<td>A small part of this is likely to be due to volume growth (&lt;£0.1bn).</td>
</tr>
<tr>
<td>Infrastructure renewals</td>
<td>£2.0bn</td>
<td>£1.3bn due to increase in renewals volume (little of which is traffic related but some of which is related to backlog).</td>
</tr>
<tr>
<td>Infrastructure enhancements</td>
<td>£1.1bn</td>
<td>This will result in an increase in outputs.</td>
</tr>
</tbody>
</table>

**Source:** McNulty Rail Value for Money team, presentation to Transport Economists’ Group, 24 November 2010.
The impact of separation between infrastructure management and transport operations on the EU railway sector

This analysis shows that there has clearly been a cost increase in the industry following vertical separation, but that this can be explained by a number of factors. In particular, there has been substantial investment in the railway, particularly since the Hatfield accident, resulting in increased capacity (helping to accommodate major increases in patronage) and improved performance. Against this, it is worth noting that following its last review of Network Rail’s access charges, the Office of Rail Regulation concluded that the infrastructure manager is some 40% less efficient than the best of its European peers, suggesting significant scope for improvements in efficiency over time. However, while the authors are not in a position to anticipate the outcome of the McNulty review, the emerging industry view is that this inefficiency is a reflection of weaknesses in Network Rail’s management and organisation rather than the result of vertical separation.

4.1.3. Impact of separation on safety

There has been an increased focus on safety in recent years following a number of high profile accidents. In practice, safety had been improving before vertical separation and privatisation and continued to do so thereafter, but the political response to accidents such as Hatfield has probably strengthened the culture of safety throughout the industry. According to ORR, the number of injuries per billion passenger km has more than halved over the last 15 years, from a figure of around 19 in 1997 to 8 in 2008. Furthermore, fatalities have fallen from 37 in 1990, to 20 in 2000, and to 0 in 2008. While it is not possible to conclude from these data that vertical separation has led to an improvement in safety, it is consistent with high and improving safety levels over time.

4.1.4. Impact on operations

Vertical separation has had a strong impact on day-to-day operations in the railways as it has resulted in a number of new operational relationships. In particular, restructuring and privatisation resulted in a substantial expansion of contractual relationships between different parties, such as track access agreements, station access agreements, depot contracts and rolling stock leasing agreements. In the view of some commentators, this contractual matrix has complicated both day-to-day operations and medium and long term planning by introducing delays into the decision making process. At the same time, it has also created more certainty for the industry in some areas, for example in terms of compensation for delays and engineering possessions, both of which are subject to liquidated damages calculations and can be projected with reasonable confidence.

Outside the purely contractual obligations, Network Rail and train operators have found effective ways of collaborating to improve the service offered to passengers and freight customers. This is particularly true in relation to reliability and punctuality, which have improved substantially since the dislocation caused by the Hatfield accident. Immediately following vertical separation, the Public Performance Measure (the percentage of trains arriving within 10 minutes (InterCity) and 5 minutes (other services) of their scheduled time) was between 87% and 90%. This fell to below 80% following Hatfield but has since recovered strongly, the result of joint performance improvement plans and the creation of a strong culture of performance improvement. The value of the Public Performance Measure in 2009-10 was 91.5% and some operators regularly achieve 95% and above.

4.1.5. Competitive situation

The vertical separation of the railways in GB has had a substantially positive effect on competition and market development, with train operators introducing various service
innovations and offering competitive advance purchase and off-peak fares in order to grow patronage. The relationship between industry restructuring, the growth in rail demand and broader economic growth is complex and it would not be correct to ascribe the substantial growth in UK rail traffic reported in Chapter 2 to vertical separation. However, the strong incentives on franchised passenger and freight operators to grow customer volumes undoubtedly helped to reinforce the observed trends over the period since privatisation. This, in turn, has helped to support economic growth across the country.

4.1.6. Impact on users

Rail passenger numbers have grown substantially since vertical separation, even in the wake of the recent economic recession. Rail freight customers have a wider choice of suppliers, although apparent growth in rail freight measured in tonne kilometres is at least partially the result of coal being transported over longer distances, as mentioned in Chapter 2.

At the same time, passengers have seen a substantial increase in average fares in recent years, equivalent to a 19% real increase between 1995 and 2010. However, this average masks substantial variations, with unregulated standard class long-distance fares increasing by over 47% over the same period and regulated standard class long-distance fares increasing by 0.2%. The highly competitive advanced purchase fares referred to above have been facilitated by the introduction of more sophisticated yield management techniques on InterCity services. In addition, service innovations such as wifi and real time train information, while clearly driven by technological development, have been introduced by various operators in response to market demand.

4.1.7. Conclusions on the GB case study

It can be concluded that the GB case provides evidence for some of the benefits of vertical separation described earlier. In particular, the introduction of competitive franchise bidding has helped to stimulate market growth and encouraged service innovations as well as constraining elements of the cost base. Further, while costs have increased substantially since 2000, this is partly a reflection of enhanced investment in response to the effects of previous policies on renewals activity. Nevertheless, the McNulty review has concluded that industry costs are excessive and that this may be partly the result of complexities and inefficiencies introduced by the contractual matrix put in place at the time of privatisation. It is possible that the review will conclude that further industry restructuring is required to address this problem, although there has been no suggestion that vertical separation is a fundamental cause of the escalation of costs in recent years.

4.2. Case study: Sweden

4.2.1. Background on separation

Sweden pioneered vertical separation in 1988, with the separation of infrastructure management (Banverket) from operations (SJ). Both remained in public hands and initially SJ remained the monopoly supplier of train services. SJ still retains a monopoly on any services crossing county boundaries that it chooses to operate commercially. The separation was subsequently followed by the deregulation of the sector, with new entrants taking market share in the passenger market through competitive tenders for services

19 National Rail Trends 2009-2010 published by the Office of Rail Regulation.
within the counties and in the freight sector by taking over niche flows. Government subsidy is provided to Banverket under a contract to run the network. The subsidy covers the costs that are not recovered through access charges, which are set at marginal social cost.

4.2.2. Economic costs of separation

The economic impact of vertical separation of the railways in Sweden was examined by Nilsson (2002) with a view to understanding the change in transfers between the State and the railway sector. The results of this analysis, set out below, show that post separation there was an increase in the cost of the railways but, as in the UK case, this has been primarily driven by investment. Indeed, the table suggests that the costs associated with the day-to-day operation of a vertically separated railway are minimal and that there are long term benefits from introducing this kind of industry structure.

Table 6: Changes in costs post privatisation - Sweden

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating subsidy for network</td>
<td>1409</td>
<td>1395</td>
<td>1474</td>
<td>1245</td>
<td>1404</td>
<td>1015</td>
<td>842</td>
<td>707</td>
</tr>
<tr>
<td>Investment costs</td>
<td>578</td>
<td>882</td>
<td>879</td>
<td>3195</td>
<td>3858</td>
<td>4513</td>
<td>5791</td>
<td>7213</td>
</tr>
<tr>
<td>Transfer from sector to State</td>
<td>-125</td>
<td>0</td>
<td>0</td>
<td>-751</td>
<td>-729</td>
<td>-675</td>
<td>-681</td>
<td>-659</td>
</tr>
<tr>
<td>Total net change</td>
<td>1862</td>
<td>2277</td>
<td>2353</td>
<td>3689</td>
<td>4533</td>
<td>4853</td>
<td>5952</td>
<td>7261</td>
</tr>
<tr>
<td>Net change (no investments)</td>
<td>1284</td>
<td>1395</td>
<td>1474</td>
<td>494</td>
<td>675</td>
<td>340</td>
<td>161</td>
<td>48</td>
</tr>
</tbody>
</table>


4.2.3. Impact of separation on safety

Separation has had no detectable impact on safety in Sweden. Sweden’s railways already experienced a high level of safety before separation and restructuring has not had any observable effect on the level of fatalities.

4.2.4. Impact on operations

Since privatisation there has been a substantial reduction in the total number of staff working in the rail sector, as shown in the figure below. This has also been accompanied by a fall in the number of services offered by SJ as well as a reduction in the rolling stock at its disposal.

Figure 12: Variation in employee levels - Sweden

Vertical separation is not seen as a bar to effective coordination. Train performance has actually improved since separation thanks primarily to management change at both SJ and at Banverket which focused on ensuring that the relationship with customers was the most important aspect of the business.

4.2.5. Competitive situation

Although initially not open to competition, the Swedish market has now benefited from the entry of new freight and passenger operators, introducing new services and improved service quality. There has been some market consolidation in recent years but there is no evidence that this has led to a significant reduction in competition.

4.2.6. Impact on users

One of the main indicators of the impact on users is the performance of the railway. It should be noted that the performance of passenger services has improved since vertical separation, with the number of passenger trains running on time increasing to over 90%. However, the performance of freight trains has worsened slightly.

4.2.7. Conclusions on the Swedish case study

Sweden has a long history of vertical separation, having pioneered major restructuring within the rail sector. The gradual deregulation of freight and passenger operations has led to market entry and the development of a more competitive industry. In particular, the quality of passenger services has improved and there is more choice for freight customers, although SJ and Green Cargo remain the dominant operators in the market. Coordination problems have not arisen; on the contrary there has been an improvement in performance and a reduction in delays since separation.

4.3. Case study: Netherlands

4.3.1. Background on separation

The vertical separation of the railway sector in the Netherlands began in the late 1990s. Following the adoption of the First Package, the once fully-integrated railway company was separated into several entities. A full institutional separation between infrastructure management and the main train operator was implemented in 2002, when NS gave up traffic control, infrastructure management and planning, all of which passed to a new organisation, ProRail.

The success or otherwise of the separation has been the subject of much debate. Mulder et al. (2005) maintain that competition on the tracks in the passenger market has failed. Passenger competition has been limited to regional passenger services, which are subject to competitive tendering, while national services are operated under a single concession awarded to the state-owned company Nederlandse Spoorwegen (NS) until 2015. Conversely, competition has been successful in the freight market, with a number of operators providing services on the network.

4.3.2. Economic costs of separation

In the early 1990s, according to the indications of the Commissie Wijffels (1992), the Dutch Government progressively reduced transfers to the rail sector. The rationale for such a
move was that passenger transport should become an unsubsidised commercial activity, while the development and management of the infrastructure should remain a responsibility of the government (van de Velde et al., 2009).

In the first phase of the reform (1995-2000), NS’s management sought to achieve efficiency improvements in response to the first point of a six year program for 1994-2000 set by the Dutch government (OECD, 1998). However, Mulder et al. (2005) claim that NS management’s initial understanding of the investment and maintenance needs of the railway was inadequate and that this had adverse impacts on the network in the short to medium term. For example, the level of train punctuality fell dramatically to a level that did not meet Government requirements (van de Velde, 2009). According to Mulder et al. (2005), this was connected on one hand to delays in network maintenance and on the other to inadequate investments in rolling stock, both problems stemming from uncertainties around political decisions in the initial years immediately after the reform.

Mulder et al. (2005) also indicate that there was insufficient emphasis on improving the technical efficiency of the industry, and the financial shortfall resulting from reduced Government transfers was therefore covered by fare increases rather than efficiency improvement.

Further, the relationship between the infrastructure manager and the main operator was sometimes strained as a result of the absence of adequate contractual and financial incentives between the parties, leading to additional adverse effects such as disruption of rail services and the development of a “blame” culture (Mulder et al. 2005). In recent years, the situation has improved significantly, with performance returning to the satisfactory levels experienced before separation.

The annual reports of both the infrastructure manager (ProRail) and the incumbent rail undertaking (NS) highlight a consistent trend in revenues and costs across the rail sector. The table shows that the costs of the infrastructure manager have gradually increased in recent years, from slightly over €1 billion in 2003 to nearly €1.5 billion in 2009. NS’s costs have followed a similar trend, at least from 2006 when the relevant data first became available. Both companies experienced generally falling profits between 2006 and 2009, although both remained profitable over this period.

Table 7: Revenues and costs of ProRail and NS - Netherlands

<table>
<thead>
<tr>
<th>€ mil.</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prorail Revenues</td>
<td>1029</td>
<td>1129</td>
<td>1197</td>
<td>1260</td>
<td>1330</td>
<td>1464</td>
<td>1476</td>
</tr>
<tr>
<td>Prorail Operating costs</td>
<td>1023</td>
<td>1106</td>
<td>1190</td>
<td>1229</td>
<td>1300</td>
<td>1463</td>
<td>1459</td>
</tr>
<tr>
<td>NS Revenues</td>
<td>1029</td>
<td>1129</td>
<td>1197</td>
<td>1260</td>
<td>1330</td>
<td>1464</td>
<td>1476</td>
</tr>
<tr>
<td>NS Operating costs</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3846</td>
<td>4040</td>
<td>4253</td>
<td>4596</td>
</tr>
<tr>
<td>Prorail profits</td>
<td>6</td>
<td>23</td>
<td>7</td>
<td>31</td>
<td>30</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>NS profits</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>310</td>
<td>355</td>
<td>328</td>
<td>161</td>
</tr>
</tbody>
</table>

Source: ProRail and NS, Annual Reports.

These trends remain consistent even if inflation is taken into account (see Table 8 below)20.

---

20 Between 1997 and 2010, the average inflation rate in Netherlands was 2.08% (source: http://www.inflation.eu/inflation-rates/the-netherlands/historic-inflation/cpi-inflation-the-netherlands.aspx).
### Table 8: Real values of revenues and costs of ProRail and NS - Netherlands

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prorail Revenues</td>
<td>1029</td>
<td>1106</td>
<td>1149</td>
<td>1185</td>
<td>1225</td>
<td>1321</td>
<td>1304</td>
</tr>
<tr>
<td>Prorail Operating costs</td>
<td>1023</td>
<td>1083</td>
<td>1142</td>
<td>1155</td>
<td>1197</td>
<td>1320</td>
<td>1289</td>
</tr>
<tr>
<td>NS Revenues</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3616</td>
<td>3721</td>
<td>3837</td>
<td>4062</td>
</tr>
<tr>
<td>NS Operating costs</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3324</td>
<td>3394</td>
<td>3541</td>
<td>3920</td>
</tr>
<tr>
<td>Prorail profits</td>
<td>6</td>
<td>23</td>
<td>7</td>
<td>29</td>
<td>28</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>NS profits</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>291</td>
<td>327</td>
<td>296</td>
<td>142</td>
</tr>
</tbody>
</table>

**Source:** ProRail and NS, Annual Reports.

The values highlighted above are set out in Figure 13 below, they exclude investments and only relate to operating costs.

### Figure 13: Operating costs of Prorail and NS (indexed to year 2003)

![Graph showing operating costs of Prorail and NS](source: ProRail and NS, Annual Reports.

In conclusion, costs and revenues of both the IM and the incumbent RU have been steadily rising over time. It is not possible to say whether or not this is attributable to vertical separation.

#### 4.3.3. Impact of separation on safety

According to Steenhuisen and de Bruijne (2009), the reforms of the railway sector had a significant impact on safety since separation (1996-2007), with the number of Signals Past at Danger (SPADs) by trains increasing by approximately 70% over the period. However, the number of SPADs subsequently fell by 20% by 2008. According to the authors, the unbundling of the rail sector affected cooperation between controllers. They nevertheless maintain that although institutional fragmentation reduces the manageability of large-scale infrastructures such as the rail network, overall performance is not necessarily affected.

The overall safety of the Dutch network has in any case been high for many years. The only accidents involving fatalities in the past 20 years occurred in 1990 (two passengers killed) and 2009 (one driver killed).
4.3.4. Impact on operations

Steenhuisen and de Bruijne (2009) also investigated the effects of reforms on the operational performance of Dutch railways. They indicate that in the first period of unbundling, NS’s punctuality fell from above 86% in 1999 to below 80% in 2001. In addition, Mulder et al. (2005) indicate that the reliability of rolling stock and infrastructure deteriorated due to excessive rationalisation, resulting in poor levels of punctuality. Punctuality did, however, recover after 2007, possibly contributing to the 4% growth in passengers in 2008.

4.3.5. Competitive situation

As mentioned above, the development of competition has been limited, especially in the passenger market, although freight competition has been stronger and a number of different operators now pass through the port of Rotterdam.

4.3.6. Impact on users

The main effect of the structural reforms implemented in the Netherlands was the rise in fares associated with the financial independence of the railways.

After an initial deterioration in performance due to cost savings and other restructuring measures put in place, punctuality and reliability recovered and capacity and safety also improved. However, in the period after restructuring, passengers faced significant fare increases in order to compensate for reductions in subsidies and cover investment in rolling stock. As highlighted by van de Velde et al. (2009), customer satisfaction declined sharply from 70% to 40% between 2000 and 2001, but then rose again to nearly 80% in 2009. The steady growth of passenger satisfaction after the first years of the 2000s coincides with improving punctuality, which has been between 80% and 90%, and to the increased offer of passenger seats.

Figure 14: NS customer satisfaction and punctuality 2000-2009

![Graph showing NS customer satisfaction and punctuality 2000-2009](Source: van de Velde et al. (2009))
4.3.7. Conclusions on the Dutch case study

This evidence suggests that vertical separation of the rail sector in the Netherlands, after a first period of worsening performance, has subsequently supported improvements in punctuality, reliability, capacity and safety. It has also encouraged competition, particularly in the freight sector but also to some extent in the provision of regional passenger services. While competition in long distance passenger services has clearly been prevented through the award of a single concession, there may be opportunities for opening up the market from 2015. Further, there is no clear evidence that vertical separation has led to a significant increase in the costs of either the infrastructure manager or the main incumbent train operator.

There has been a significant increase in fares following restructuring. However, this has been the result of a shift in the balance of funding, away from public subsidy and towards the passenger. This change reflects a policy decision to reduce the rail industry’s call on taxpayers and to increase the degree of independence from Government. It is therefore not a direct result of vertical separation.

4.4. Case study: Italy

4.4.1. Background on separation

The Italian rail market underwent a period of liberalisation in 2000 and 2001, with the opening up of the market to new entrant freight and passenger operators. The only limitation that was applied to this market opening was that there should be reciprocity between the countries from which new entrants were seeking to enter. Liberalisation was accompanied by separation, with RFI, the IM, being separated from Trenitalia, the RU, but both companies remained under the ownership and control of the holding company FS Holding. This is, therefore, an example of a partially integrated model.

In terms of separation, the picture has not changed significantly since initial efforts in 2000, apart from a decision by RFI to pass to Trenitalia the management of a number of rail related services discussed further below.

4.4.2. Economic costs of separation

Although a quantitative estimation of the costs of separation in the Italian railways has not been carried out, some qualitative comments on the economic impact of the unbundling process can be made.

Looking at total system costs for the Italian state railways (that is FS as a whole), it can be seen that following an initial period in which costs rose, the trend has been reversed since 2006 and costs have started falling (although in 2009 they remained above the 2004 level). Figure 15 shows the change in operating costs for FS.
This suggests that the vertical separation alone did not lead to a significant increase in costs. Conversely, after an initial period in which costs increased for a number of reasons (e.g. increased personnel costs for contractual updating, merging and re-organisation of business units, etc.), in recent years cost control has led to a steady improvement in the financial performance of the rail sector in Italy. The entry into the rail market of new operators (such as NTV) can be expected to increase competition and put further downward pressure on costs.

4.4.3. Impact of separation on safety

The Italian railways have historically been seen as one of the safest in Europe and separation has had little effect on perceived levels of safety. There have, however, been some high profile accidents since separation, involving both the incumbent RU and new entrant operators.

4.4.4. Impact on operations

There has not been a direct impact on operations as performance in terms of delays has essentially remained at constant levels since separation. In recent years, passenger concern has focused on hygiene onboard rolling stock (especially on regional and non high speed services). Similarly, service disruption has been the subject of high profile press comment. However, these concerns cannot be attributed to separation process. Rather, they are linked to management and other failures within the industry. Further, increased competition in the future may provide an incentive to improve the operational performance of the incumbent RU, to the benefit of passengers.

4.4.5. Competitive situation

The separation of 2000\(^{21}\) and the implementation of the First Railway Package in 2003 have led to a number of new operators entering the market and taking a substantial share of traffic on some key corridors, especially on the Brenner corridor to Austria and Germany, but also on domestic flows.

\(^{21}\) Ministerial Decree. 31 October 2000, n. 138 T.
The freight market is very open and, at first glance, liberalisation appears to have been successful. However, new entrant operators have made a number of complaints about access to rail related services. In particular, the incumbent operator, Trenitalia, has been given the management of a number of freight terminals by the infrastructure manager, RFI, raising concerns that partial integration continues to undermine the independence and non-discriminatory behaviour that the First Package sought to establish.

By contrast, there was limited entry into the passenger market (SeaTrain) until the end of 2009, when an open access operation run by DB, OBB and Le Nord began an international service between Munich and several Italian cities with a number of intermediate domestic stops. In November 2010 another operator, Arenaways, began operating between Turin and Milan. However, shortly before Arenaways began commercial operations, the Italian rail regulator, URSF\textsuperscript{22,23}, decided that both these new services could not call at any intermediate stations within Italy as this would have a negative effect on the economic position of the public service contracts between Trenitalia and the relevant Italian regions. The decision is currently being appealed but the limitations remain in place for Arenaways. However, the decision against DB, OBB and Le Nord has been suspended\textsuperscript{24} while the case is reviewed, and therefore in the meantime they are able to call at intermediate stops.

It should be noted that the same provisions should not affect NTV, the new open access high speed operator that is due to begin operating services at the end of 2011, as high speed services are not subject to public service contracts.

**4.4.6. Impact on users**

Separation has had no direct effect on users and has not led to an increase in fares. In fact, following separation, the majority of fares remained unchanged in nominal terms until 2006. From then, fares have risen as a result of new (high speed) infrastructure coming online and in order to recover the real fall in fares during the period between 2000 and 2006.

**4.4.7. Conclusions on the Italian case study**

The partially integrated model in Italy has not had a significant effect on industry costs. Meanwhile, the freight market has seen substantial entry. However, entrants have complained about access to key facilities and the scope for competition in passenger markets has yet to be fully realised.

**4.5. Case study: France**

**4.5.1. Background on separation**

In 1997, the infrastructure management functions of SNCF, the national rail service provider, were separated from the operation of train services through the creation of RFF. SNCF retained responsibility for train operating activities. The aim of the separation was primarily to enable SNCF to divest itself of substantial levels of debt while meeting the requirements of Directive 91/440/EC.

\[\text{\textsuperscript{22} Decision no. 589 of the 9\textsuperscript{th} November 2010.}\]
\[\text{\textsuperscript{23} Decision no. 659 of the 6\textsuperscript{th} December 2010.}\]
\[\text{\textsuperscript{24} Decision no. 671 of the 10\textsuperscript{th} December 2010 and Decision no. 134 of the 17\textsuperscript{th} February 2011.}\]
As discussed above, while this institutional separation has provided for independent management of the two companies, RFF has been obliged by law to contract back a number of key infrastructure management activities to SNCF. The latter now acts as “Gestionnaire de l’Infrastructure Délégué” (delegated infrastructure manager and hence undertakes some of the functions of the infrastructure manager) and RFF, although it is the owner of the infrastructure, has a relatively limited role in relation to infrastructure management, largely restricted to strategic planning and setting access charges. In the course of our Railimplement study\textsuperscript{25} for the European Commission, a number of stakeholders expressed concern that this approach did not ensure sufficient independence and non-discriminatory access and that market entry would be restricted as a result.

Some small steps towards greater separation have been made however. Decisions concerning path identification are effectively made by RFF, although timetabling responsibilities are shared by the two companies (SNCF still has a “body” within its structure in charge of traffic management although the Chairman is nominated by the Government and not SNCF). In addition, RFF is now able to commission infrastructure enhancement from PPP contractors rather than from SNCF.

4.5.2. Economic costs of separation

Given that the main objective of the separation in France was to improve SNCF’s debt position, subsequent studies of the impact have tended to focus on the effectiveness of the debt transfer. However, there have been some studies of the overall cost of the industry, the results of which can be used to assess the cost impact of restructuring.

Filleul et al. (2001) identify the total profit of the French railway industry in the year prior to separation and in the years immediately thereafter. The annual profits of SNCF and RFF are set out in the table below. The table indicates an increase in profitability, although, given the range of factors that can affect profits in a given year, it is difficult to identify conclusions concerning the impact of restructuring on costs.

<table>
<thead>
<tr>
<th>Year</th>
<th>RFF</th>
<th>SNCF</th>
<th>RFF + SNCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>0.00</td>
<td>-2.32</td>
<td>-2.32</td>
</tr>
<tr>
<td>1997</td>
<td>-2.15</td>
<td>-0.15</td>
<td>-2.30</td>
</tr>
<tr>
<td>1998</td>
<td>-2.09</td>
<td>-0.11</td>
<td>-2.20</td>
</tr>
<tr>
<td>1999</td>
<td>-1.57</td>
<td>-0.09</td>
<td>-1.66</td>
</tr>
<tr>
<td>2000</td>
<td>-1.69</td>
<td>0.06</td>
<td>-1.63</td>
</tr>
<tr>
<td>2001</td>
<td>-1.65</td>
<td>-0.17</td>
<td>-1.81</td>
</tr>
<tr>
<td>2002</td>
<td>-1.59</td>
<td>0.02</td>
<td>-1.57</td>
</tr>
<tr>
<td>2003</td>
<td>-1.42</td>
<td>0.01</td>
<td>-1.41</td>
</tr>
<tr>
<td>2004</td>
<td>-1.45</td>
<td>0.32</td>
<td>-1.13</td>
</tr>
<tr>
<td>2005</td>
<td>-0.92</td>
<td>0.53</td>
<td>-0.39</td>
</tr>
<tr>
<td>2006</td>
<td>-1.09</td>
<td>0.32</td>
<td>-0.77</td>
</tr>
<tr>
<td>2007</td>
<td>-1.57</td>
<td>0.64</td>
<td>-0.93</td>
</tr>
</tbody>
</table>

\textbf{Note:} Pre 2002 data is converted into Euros using the definitive exchange rate. A grant of €800 mil. was made to RFF in 2004 to reduce its debt burden, in order to compare the values before and after 2004 this value has not been included in the calculations.

\textbf{Source:} Filleul et al. (2001), SNCF and RFF Financial Reports.

RFF accounts also show the nominal amount that it pays to SNCF for infrastructure management activities, as indicated in the table below. Allowing for inflation and a progressive expansion of track renewals since 2007, these data suggest a steady reduction in real costs since 1997.
On one level, this evidence is consistent with the view that vertical separation is consistent with, and may even support, improved efficiency. However, given the particular allocation of responsibilities for infrastructure management, it is open to question whether these data provide any insights into the impact of vertical separation. In particular, since SNCF continues to perform a number of key infrastructure management functions, there is no reason to expect evidence of significant changes in cost levels in the years after 1997 (after controlling for other factors highlighted in the discussion of other case studies, in particular changes in levels of investment). Going forward, recent initiatives may provide a "market" test of infrastructure management costs and the impact of separation on IM efficiency. RFF has agreed DBO contracts for two HSLs (Tours – Bordeaux and Le Mans – Rennes – Nantes), which appear to compare favourably in cost terms with equivalent contracts with SNCF. Furthermore, RFF agreed a three year maintenance contract with a company for a part of the network in the Morvan region at the end of 2010, and intends to conclude similar contracts for other short lines with the aim of decreasing costs further.

### 4.5.3. Impact of separation on safety

Separation has not had any discernable impact on safety as accidents, fatalities and incidents have remained broadly at the pre-separation level. Again, this is likely to reflect the fact that there have been few changes to the way in which key infrastructure management activities are undertaken.

### 4.5.4. Impact on operations

Our understanding from Filleul et al. (2001) and Court of Auditors of France (2001 and 2008) is that there are, however, strong concerns about the relationship between SNCF and RFF. There is still tension between the two institutions as a result of the overlapping roles of the two entities in infrastructure management, particularly where the division of responsibility is not always clear (e.g. at stations and marshalling yards). This is not considered to have a significant direct impact on the operation of train services however.

### 4.5.5. Competitive situation

There has been some significant entry into the French freight market, with Veolia (the activities of which in France have been bought by Europorte 2, a Eurotunnel subsidiary), EWS (now Eurocargorail) and a small number of other operators commencing limited services across the country. However, the significance of this entry must be considered in the context of a French rail freight market that has lost 50% of its market share in recent years. To date, there has been no entry into the passenger market (but Veolia and Trenitalia are expected to enter in December 2011 on the Paris - Milan line). Our understanding is that operators are generally unwilling to try to enter the market given the structure currently in place and the associated concerns about gaining the necessary access to the network.
4.5.6. Impact on users

The impact of separation has not been visible to passengers as services are still managed by SNCF. Insofar as passengers are aware of the issues surrounding vertical separation and liberalisation, this has been the result of rail strikes prompted by the reaction of parts of the industry to the prospect of competition. However, freight customers have benefited from limited competition for cross-border flows, and some small operators have taken niche flows away from SNCF, partly as a result of problems arising in SNCF’s freight (Fret) division in recent years.

Data published by the Court of Auditors of France indicate that 2-3% more trains arrive late since restructuring. This has, however, been balanced by a substantial fall in freight related delays from some 19% in 1997 to some 13% in 2006. However, it is not possible to attribute these changes to vertical separation since several other factors, for example changes in traffic volumes, are likely to have had an impact at the same time.

4.5.7. Conclusions on the French case study

Overall, the experience of the French rail industry provides little if any evidence of the impact of vertical separation. The partial nature of the separation has meant that the scope for introducing competition and increasing transparency has not been realised and that there has been little, if any, change in efficiency and the passenger experience. The current relationship between RFF and SNCF means that independence is not guaranteed and there is no clear indication that this will change under the current legislative framework.

4.6. Separation and liberalisation

A review of the European rail networks indicates that the extent of liberalisation in freight markets has varied significantly. In all but two cases, the liberalisation requirements as set out in the Directives have been implemented through domestic law, but in some of these cases barriers that inhibit entry into the market remain. The RMMS study and the IBM Rail Liberalisation Index discussed below provide evidence of the extent of liberalisation in both freight and passenger markets.

4.6.1. RMMS

The RMMS report used data received from Member State surveys to prepare a Herfindahl-Hirschman Index aimed at providing a score for rail market opening for freight (the lower the score the greater the degree of market opening).

---

The analysis within RMMS shows that there continues to be substantial concentration in the majority of Member States, although the more extensive market opening measures in respect of freight have encouraged the development of competition in some markets.
4.6.2. IBM liberalisation index

The IBM liberalisation index suggests a somewhat different outcome, with the market opening scores being comparatively much higher and, more importantly, the ranking of the various Member States being substantially different. The Liberalisation Index for 2007 (the latest year for which results are available) and 2004 is shown below. A comparison between the two years indicates that scores have increased significantly across Member States, although any conclusions about the level of liberalisation achieved must be qualified by reference to the criteria used in compiling the index (which have been challenged by a number of stakeholders).

**Figure 18:** IBM liberalisation index 2007
4.7. Separation and market shares

The relationship between the market share of new entrant rail freight operators in different Member States and the degree of vertical separation in the various markets is illustrated in the figure below.
The impact of separation between infrastructure management and transport operations on the EU railway sector

Figure 20: Separation and market shares

![Diagram showing separation and market shares](image)

**Note:** Relates only to freight market shares. Data not available for all Member States. "Infringements" relates solely to those infringements relating to the independence of the infrastructure manager and the independence of essential functions.

**Source:** European Commission (2009) and Steer Davies Gleave analysis.

The figure shows that there is no simple correlation between the degree of separation and the market share of new entrant operators. The fully separated model appears consistent with both high and low new entrant shares. In addition, while entry in countries adopting the partially integrated and partially separated models has generally been lower, some markets have seen substantial entry. Note, however, that the relative attractiveness of some markets is affected by other factors, in particular location, the level of transit traffic, rail gauge and population size. Such factors are particularly important in the case of Greece, Finland and Lithuania for example. Against this background, full separation appears to be an important, although not sufficient, pre-condition for a major competitive challenge to an incumbent railway undertaking.

There is also no strong correlation between the type of separation adopted and whether or not a Member State has been referred to the Court of Justice for infringement proceedings. As noted above, our previous work for the Commission has highlighted a number of stakeholder concerns about the structural models adopted in some Member States. Stakeholders expressed particular doubts about whether the partially integrated models in Italy and Germany and the partially separated model in France would provide for the required independence in relation to infrastructure management activities. It should be noted that since the completion of previous studies such as RailImplement\(^{28}\), the institutional arrangements in these Member States have not changed significantly.

---

For example, potential entrants to the French market must effectively obtain some services from SNCF, a potential competitor. Similarly, RFI in Italy and DB Netz in Germany are not incentivised to facilitate access to third parties as any potential additional revenue that they obtain from new entrants is likely to be more than offset by the corresponding loss in revenue incurred by the incumbent railway undertaking.

Some opponents of full separation argue that it leads to coordination problems, while opponents of liberalisation argue that it leads to “cherry-picking” of profitable flows (this concern led to the policy of Moderation of Competition in Great Britain, and is reflected in similar provisions in the Third Railway Package). However, new entrants have also generated new traffic and there is no obligation on a freight transporter to switch to a new supplier (although the authors of the Railimplement study were informed of a supplier being threatened with retaliation if they chose to move some, or all, of their flows away from an incumbent operator).

Notwithstanding the lack of independence, some operators have in any case managed to enter the market at a high cost and have become successful.

### 4.8. Separation and growth

A comparison of the growth rates in freight transport between 2000 and 2009 and the degree of separation in the various Member States is set out in Figure 21.

**Figure 21: Separation and growth**

![Figure 21: Separation and growth](image)

*Source: European Commission (2009) and Steer Davies Gleave analysis.*

---

29 Recital 10 of Directive 2007/58/EC states that “Member States should have the possibility to limit the right of access to the market where this right would compromise the economic equilibrium of these public service contracts [...]” on the basis of an assessment provided by the national regulatory body.
No meaningful conclusions can be drawn from the comparison of growth rates and the level of separation as there is little correlation between these variables. The growth rate of freight markets is affected by many factors, not least the overall rate of economic growth and opportunities for cross-border movements, and it is therefore difficult to identify the particular impact of industry restructuring.

4.9. Summary

The case studies and additional evidence discussed in this section demonstrate the difficulty in identifying the specific impacts of a particular approach to the implementation of the First Package. For example, rapidly escalating costs can reflect the need for urgent investment following a long period of constrained renewals activity, while substantial fare increases may be the result of a deliberate policy of rebalancing railway funding away from the tax payer towards the passenger. Similarly, market entry and market growth will be influenced by the size, location and wider economic growth of a particular Member State. Hence, the impact of vertical separation may only be evident after a long period and the rail industry is operating within a reasonably stable legislative, regulatory and economic environment.

At the same time, it is clear that the development of competition has been more successful in countries such as GB, which have been subject to full separation, than in other Member States where the extent of restructuring has been more limited. It is also evident from previous studies that the predictions of economic theory in terms of the scope for discrimination under these more limited forms of vertical separation are borne out by the concerns on real market entrants and other stakeholders. In these circumstances, notwithstanding the Commission’s infringement proceedings referred to above, it appears that the implementation of the First Package has yet to secure the development of the European railway in the way originally envisaged.
5. CONCLUSIONS OF THE ANALYSIS

All former utilities within the EU have been subject to vertical separation and liberalisation to increase competition in the sector and reduce costs for the final user. In railways, competition can bring benefits in terms of improved services, greater choice and reduced costs to the industry, thus making the use of rail more attractive for freight customers and passengers.

The main feature that separates railways from other network utilities is the substantial technological (interoperability) barriers that remain between Member States. These are being addressed by the European Railway Agency (ERA), but full technical harmonisation is unlikely to be achieved in the foreseeable future, particularly as the Agency has yet to define what the extent of technical harmonisation should be. In the absence of such harmonisation, differing standards have resulted in the railways developing largely within national boundaries, limiting the potential for cross-border flows.

In parallel to pursuing technical harmonisation, European policy has also sought increasing market opening of Europe’s railways. This was promoted initially by opening up freight traffic on the TEN-T network, subsequently on all international routes and finally on domestic routes. The Parliament and Council of Ministers have also begun to liberalise passenger markets, focusing initially on international flows.

Effective liberalisation requires the right industry structure if it is to achieve the expected benefits in terms of increased competition. In particular, the infrastructure manager must be independent of the dominant railway undertaking if non-discriminatory access to the rail network is to be preserved. In the absence of such independence, the infrastructure manager will have an incentive to support the commercial interests of the dominant undertaking by discouraging and limiting new entry. As discussed in Chapter 3, some approaches to vertical separation adopted in response to the First Package have failed to secure such independence, although some have encouraged an increase in market entry with new operators taking a significant share of traffic on key corridors.

Given the evidence reported here, it is important to note that legal and organisational separation of primary responsibilities alone will not guarantee the required independence. This is because commercial, institutional and cultural relationships can continue to hold across legal and organisational boundaries, particularly where they have become well established over time. For example, where key responsibilities are contracted back to the main train operator, the structural model cannot guarantee that key operational decisions, for example relating to the allocation of train paths, are made independently of the commercial interests of the incumbent RU. At the very least, potential entrants may consider that the scope for discrimination is such as to reduce significantly the likelihood of approval. In these circumstances they may be discouraged from pursuing new commercial opportunities, especially where the associated entry costs are substantial and non-recoverable.

The evidence presented here suggests that the structural changes implemented following the First Railway Package have, in many cases, allowed established relationships between the IM and incumbent RU to remain in place. In these circumstances, it is unlikely that regulation alone will be sufficient to prevent discrimination, not least because of the need for checks and balances in the regulatory process, which inevitably delay regulatory
decisions, and the fact that the information available to the regulator will tend to be more limited than that available to the IM. Hence, more rapid market opening is likely to depend on greater separation of the IM and RUs than has been achieved in many Member States to date.

The authors of the current note suggest that future policy options for ensuring non-discriminatory access and encouraging new entry could usefully focus on independence of operational decision making (as seen in full vertical separation) as distinct from legal separation. Other issues, such as the ability of a dominant railway undertaking to unduly influence capacity allocation and other decisions through co-location with the infrastructure manager should also be addressed. More generally, potential new entrants in both freight and passenger markets must be convinced that decisions concerning access to rail networks do not discriminate in favour of incumbent operators if they are to be encouraged to invest in new services. This is only likely to be achieved if established relationships that could be expected to unduly influence such decisions, such as exist between an IM and RU under common ownership or operating under unique contractual arrangements, are avoided.

At the same time, mechanisms for ensuring full vertical separation need to be informed by a thorough understanding of the potential costs arising from the adoption of a particular structural model. As discussed in Chapter 4, these may be significant where the model requires the introduction of a complex contractual framework providing for, inter alia, the co-ordination of the timetable, payment of liquidated damages for delays and extensive consultation across train operators when planning infrastructure enhancements. It would also be helpful to have a better understanding of the impact of vertical separation on the management of the wheel-rail interface than is currently possible on the basis of previous studies. However, in investigating these issues further, it will be important to avoid drawing overly-simple conclusions on the basis of the experience of individual Member States. As the evidence in Chapter 4 demonstrates, observed trends in costs, fares and service quality can be explained by a wide range of factors and in most cases cannot be attributed to vertical separation itself.
REFERENCES


ROLE

The Policy Departments are research units that provide specialised advice to committees, inter-parliamentary delegations and other parliamentary bodies.

POLICY AREAS

- Agriculture and Rural Development
- Culture and Education
- Fisheries
- Regional Development
- Transport and Tourism

DOCUMENTS