

Separation of Railway Infrastructure and Operations

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Introduction

The globalization of economic activity and gradual liberalization of the transport market in the 1990s led to major changes in the organizational structure and monopolistic nature of some railways. Separation of railway infrastructure and operations laid the foundations for introduction of competition to railways as well as for their economic rationalization. This article analyses the basic principles of the European transport policy and the objectives of European legislation on the modernization and competitiveness of railways within the transport system. It also examines how railway infrastructure and operations were separated in various European railway networks as well as the structural consequences of the separation. Finally, the railway infrastructure pricing principles as well as the impact of the separation of infrastructure and operations on railway finances and transport demand are discussed.

European Railway Legislation Modernization and Competition

The old European railways urgently needed reforms to offer customers efficient, high-quality, market-oriented services at lower cost. They could not ignore the globalization of economic activity and liberalization of transport markets without remaining hamstrung by out-of-date organizational structure and monopolistic business tendencies. The finances of traditional railway businesses are inherently non-transparent because they run train operations on their own infrastructure with very high sunk costs. In addition, ownership of infrastructure eliminates any incentive to promote free competition because monopolistic tendencies do not favour

entry of other railway operators on the same infrastructure. Unlike other transport modes, railway infrastructure costs in Europe currently account for some 30% of the total operational costs. This was a major factor in the EU drive to separate the accounting of infrastructure and operations because it enables fair comparison with the infrastructure costs of other transport modes, such as roads and airports, which are largely borne by the state.

Against this background and to reverse the declining fortunes of European railways

(Figs. 1 and 2), the EU formulated a Transport Policy with five basic aims:

- Reduction of various (mainly transnational) barriers to create single European transport infrastructure
- Free market entry and unrestricted operations by transport businesses in markets of Member States
- Reduction of environmental impact of transport
- Phased abolition of all state intervention in and subsidy to railways and promotion of competition

Figure 1 Share of Passenger Transport Market for Each Transport Mode for ECMT* Countries

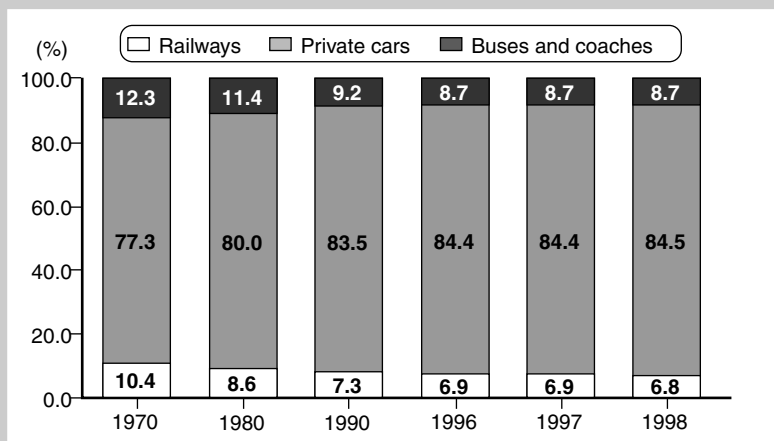
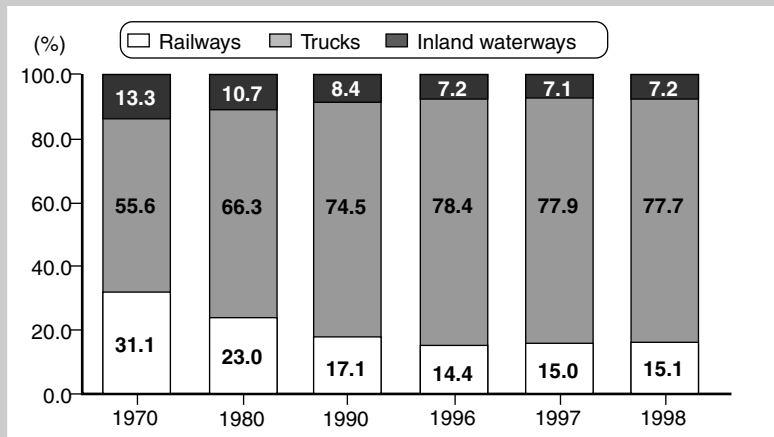


Figure 2 Share of Freight Transport Market for Each Transport Mode for ECMT Countries



*ECMT = European Conference of Ministers of Transport

- Standardization of European transport rules, removal of differences in levies and taxes, and elimination of technical barriers

Separation of Infrastructure and Operations

EU Directives 91/440/EEC, 95/18/EC, 95/19/EC specify the necessity for separate accounting of infrastructure and operations as the minimum reform; the directives do not actually specify splitting infrastructure and operations into two or more separate business entities. Consequently, Member States have adopted two basic methods to achieve the required minimum: Institutional separation in the UK (Railtrack/Train Operating Companies (TOCs)), and France (French National Railways (SNCF)/Réseau Ferré de France (RFF)), and organizational separation as in Germany (Deutsche Bahn AG (DB AG)/DB Netz).

Institutional separation

This method separates the infrastructure owner and railway operators into autonomous entities with separate capitalization, balance sheets and staff. The infrastructure owner can be publicly owned as in Portugal (Portuguese Rail Infrastructure Authority (REFER)) and Sweden (Banverket (BV)) or privately owned as in the UK (Railtrack). Even when the infrastructure owner is publicly owned, it must still operate according to the normal rules and laws regulating private businesses. A government-appointed regulator mediates disputes between the infrastructure owner and railway operators.

Railtrack in the UK is the only example of a genuinely privatized infrastructure owner. However, a series of fatal accidents and serious infrastructure problems in the UK coupled with a 1996 DB AG study (*Die Deutsche Bahn AG öffnet den Fahrweg für Dritte*) suggest that

private ownership of railway infrastructure is not necessarily a good idea.

France falls into this category in the sense that the infrastructure manager (RFF) and operator (SNCF) are completely separate legal entities with separate staff, but the relationship is closer than in the UK because SNCF actually operates and maintains the infrastructure based on contracts awarded from RFF.

In Finland, the infrastructure manager is the Finnish Rail Administration (RHK), a department of the Ministry of Transport and Communications.

So far, it seems that the French and Finnish models have avoided the problems of the UK model.

Organizational separation

This method creates separate business

Figure 3 New Organization Structure of Railways and Interactions between Various Subsystems

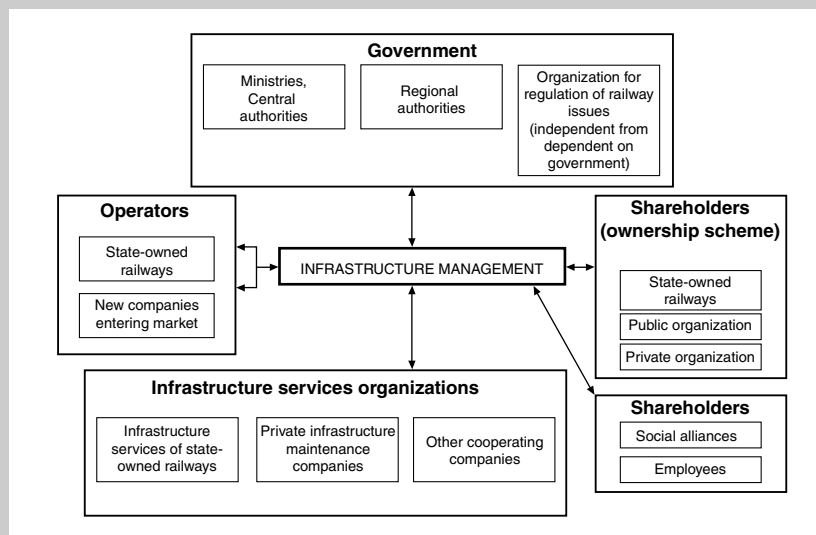
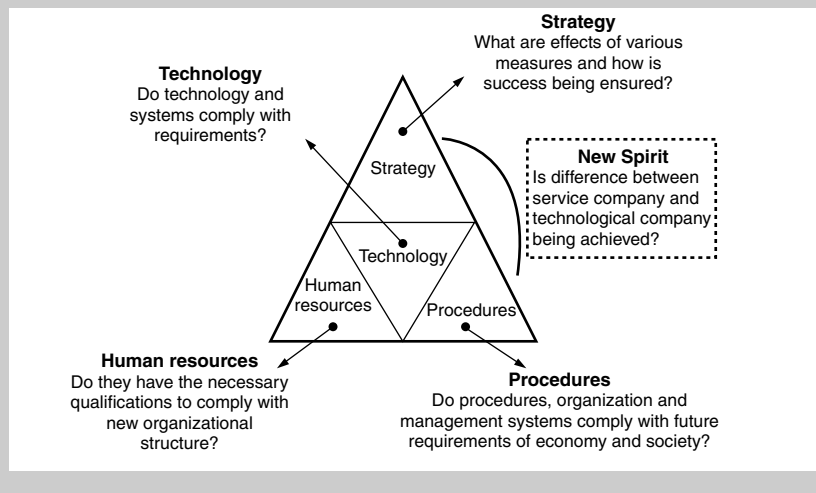


Figure 4 New Roles and Challenges of New Organizational Structure of Railways



units with a large degree of operational freedom. There are two basic patterns:

- Business units operating as part of railway operator

This method is used by Belgian National Railways (SNCB/NMBS) and Italian Railways (FS). The units have an independent management and a separate balance sheet but no legal autonomy.

- Autonomous business units organized within framework of holding firm
This method is used in Germany. The business units developed into

autonomous companies (DB Reise & Touristik, DB Regio, DB Cargo, DB Netz, DB Station & Service) under the holding company DB AG.

Structural consequences of separation

Figure 3 shows the interactions between the subsystems of the reorganized railways and Figure 4 shows the new roles and challenges. Tables 1 and 2 summarize the many questions concerning the new organizational and the factors affecting them.

Basic Principles of Infrastructure Pricing

Like other transport operators, railway operators must observe the normal rules of business competition, which preclude state subsidy except where the railway operator is obliged to offer unprofitable services, known as public service obligations (PSOs), for social reasons. Excluding PSOs, when infrastructure and operations are completely separated, the railway operators pay fees for using the infrastructure to the owner based on the pricing principles outlined below.

- The same pricing principles should apply to all major transport modes throughout the EU. However, structures and pricing levels may vary with transport type and locality due to economic and social differences.
- Infrastructure pricing should be based on the principle that the user pays.
- Pricing should reflect the infrastructure usage level and method based on full-cost accounting bearing in mind environmental and social impacts, such as the costs of accidents, pollution, traffic congestion, etc.
- To prevent competitive distortion, pricing differences should only be allowed when there are actual differences in the cost level and service quality.

Table 1 Questions on New Strategic Organization of Railways

Basic strategy questions
<ul style="list-style-type: none"> • What are new role and responsibilities of infrastructure? • Will users of infrastructure be clients or associates? • Will there be liability in regard to profits/losses and to whom/where will it be assigned? • What will be the income and investment sources? • What services will be rendered to consumers? • What contracts must be made with railway operators? • Will there be many and competing operators? • What consequences will this have? • What will be the consequences of different infrastructure management methods?
<ul style="list-style-type: none"> • How will future planning be achieved? • What changes are necessary?
<ul style="list-style-type: none"> • Will the reactions allow the new organizational structure of railways to increase effectiveness and prepare for further changes, or will they cause backward steps?

Table 2 Factors Affecting New Organizational Model of Railways

<p>Political objectives</p> <ul style="list-style-type: none"> • Privatization (partial or total) • Encouraging competition • Equal competition between railways and roads • Transparency
<p>Responsibility for organization of critical procedures</p> <ul style="list-style-type: none"> • Time schedule • Assignment of time slots for departure and arrival of trains to various operators • Traffic management
<p>Prospect for more than one operator</p> <ul style="list-style-type: none"> • Many operators on railway infrastructure will require powerful and independent infrastructure management unit

Costs of transport infrastructure

Operation of railway infrastructure involves various costs, some of which should be borne by the users. Economic theory divides these costs into fixed costs and direct costs.

Fixed costs includes construction costs, various maintenance costs (lighting, staff) and some other labour costs when there are legal or contractual obligations. In the case of Railtrack, fixed costs account for some 90% of total costs, and about 75% for SNCF.

Direct costs depend on the degree to which the infrastructure is used; if there are no users, this cost is a debit. Most maintenance costs are direct costs. Marginal costs are the additional costs incurred by operating an additional train, etc.

The transport sector has internal costs (costs to users) and external costs (costs to non-users). The latter are costs due to traffic congestion, pollution, noise, safety, etc. Clearly, users of the road infrastructure pay only internal costs but not the external ones, leading to some advantageous disparities in comparison with railways.

Examples of infrastructure pricing principles

By separating the accounting of infrastructure and operations, the EU legislation aimed to make the costs of railway operations more transparent, providing increased management flexibility and gradual introduction of competition. The method adopted for pricing railway infrastructure (RI) was critical to achieving healthy competition. EU Directive 91/440/EEC stipulates the following obligations:

- Only designated railway operators are obliged to pay RI usage charges.
- The debit method for RI charges is an obligation of the state.
- The charges must not discriminate between RI users.
- Although not obligatory, RI charges should be calculated based on parameters such as journey distance, transport type, speed, load per axle, time, etc. The parameters are at the discretion of each Member State.
- Railway operators operating exclusively urban, suburban and local services do not fall under the RI pricing obligations. The same applies to Eurotunnel because cross-Channel traffic is interurban and not suburban.

Additionally, EU Directive 95/19/EC stipulates the following obligations:

- The RI usage must be balanced within 3 to 5 years after the start of pricing. Consequently, infrastructure expenditure should be balanced in relation to usage revenues after 2002–03. However, this is a difficult goal that only Railtrack and DB AG have achieved, possibly because their access charges are very high.
- RI pricing must be non-discriminatory for RI users and this is an obligation of the state.
- RI charges shall be calculated according to the principles set out in EU Directive 91/440/EEC excluding PSOs. In the case of PSOs, the state may impose a lump sum usage charge on the operator providing the PSO.
- The results of promoting competition, improving services and increasing transport levels shall be evaluated after some period of years for adjustment purposes.

The various tariffication models can be classified into three basic types:

German model with two components:

- Constant component (Nenzcard) related to speed, traffic (passenger, freight, express, etc.) and track demand
- Variable component (per train km) expressing speed, track demand (0.85 to 1.15), and schedule accuracy (1.0 to 1.4)

French model with three components:

- Access component (very disadvantageous to new market entrants)
- Reservation component (per train km) to be paid even when track path not used
- Circulation component based on factors such as distance, departure time, track condition, etc.

British model with two components:

- Fixed charges allocated irrespective of traffic level
- Marginal costs (<10%) allocated in relation to actual traffic

In the British approach, the infrastructure owner (Railtrack) always collects at least 90% of the total costs—a financial utopia, but very sensible for a private company.

Percentages of Railway Infrastructure Expenses in Europe

Percentages near 100%

In theory, Germany and the UK both use pricing models where RI revenues and expenses are balanced.

However, In Germany, the truth is that various forms of state aid and subsidies comprise about 35% of RI expenses with revenues covering about 65%. For example, some staff costs are subsidized by the federal government.

In the UK, revenues should cover 106% (100% expenses + 6% profit) of expenses, but since such a model would quickly wipe out many TOCs, the government provides subsidies, etc., to the TOCs thereby adopting a dual policy of balanced revenues and expenses, and solvency.

Percentages far below 100%

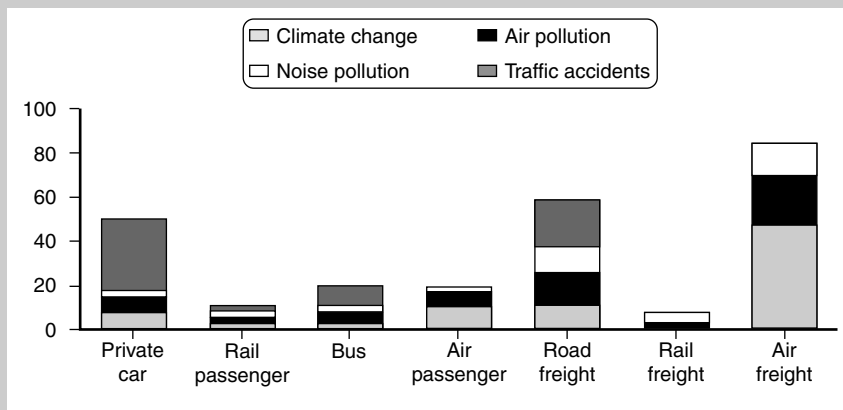
Most EU countries fall into this group as follows:

- Switzerland: 70%
- Italy: 40%
- France: 30%
- Sweden: 15%
- Belgium: 15%

Percentages near 0%

To date, only the Netherlands has applied a zero-pricing policy. However, the General Directorate for Transport of the European Commission with responsibility for competition has enforced a change of this policy.

Figure 5 Comparative External Costs of Various Transport Modes



Sweden is also preparing a modification of its existing pricing in view of the near-zero charges in the freight sector and based on marginal social costs for passenger transport.

Financial Impact of Separation

Except for the Netherlands, the costs of RI usage represent a significant amount of money for railway operators

In the UK, the RI usage charges to TOCs were calculated so that the resulting revenues would cover RI expenses. This significant burden on TOCs is tempered temporarily by state subsidy that will drop to zero at the end of the concession period.

In Germany, RI usage charges are also effected in order to cover most of the total RI expenses, thus creating a serious problem for the operating expenses of the railway operator, as well as for the regions of the country, where some competence of questionable effectiveness for the subsidy of regional character railway lines has been conceded.

By contrast, in France, RI pricing is based on the solvency of the railway operator, creating serious deficits for the infrastructure manager.

External Costs and Consequences for RI Pricing

Increasing environmental awareness and a clearer understanding of the environmental impact of the various transport modes are driving the concept that the polluter pays and are resulting in internalization of external costs.

A relatively recent study of 17 countries (15 EU Member States, Norway and Switzerland) showed that the external cost of transport in 1991 was €272 billion (€1=US\$0.91) or about 4.6% of the GDP of these countries. This breathtaking amount of money is the social cost of accidents, noise, air pollution, climate change, etc., caused by transport.

Figure 5 shows a comparative analysis of the various transport modes—road traffic accounts for 92.2%, air transport for 5.9%, railways for 1.7%, and inland waterways for 0.3%.

Of course, introduction of common rules for calculating external costs is difficult, but the problem of pricing will be even greater. Internalization of external costs

will surely benefit railways while making road transport much more expensive. EU Directive 93/89/EEC aimed to tackle this problem but did not achieve spectacular results. Internalizing the external costs of transport is strongly resisted by special interest groups such as the auto and oil industries and there are no guarantees that it will ever be achieved. ■

Further Reading

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