



# The economic regulation of railway networks: A worldwide survey



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## ABSTRACT

The rapid expansion of car use in the second half of the 20th century together with growing inefficiencies in the publicly run railways, led to traffic decline and financial difficulties for many railway companies. In order to face this situation, various structural reforms have been introduced which have increased the level of private sector involvement, strengthening the need of sound economic regulation. Starting from a desk survey, the paper reviews the resulting railways models for 20 countries. The main characteristics of each regulatory system have been collected and analyzed in order to provide an ex-ante overview of the current practices, both in quantitative and qualitative terms. Results show how public subjects still play a dominant role as infrastructure managers and frequently also as service providers in vertically integrated structures. Limited cases of privatization occurred. Our survey evidence how each country has developed its own framework according to its transport system, political context, economic situation, business and regulatory environment. Further researches are needed to study the ex-post performance of the industry providing empirical evidences of the impacts of the reforms.

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## 1. Introduction and aims

In the field of transport, the presence of vertical integration between infrastructure and services, the complexity of the networks, the relationship between state intervention and privatization tendencies together with the historical and political context make regulation a very difficult task. The inherent monopolistic nature of rail infrastructure is characterized by indivisibilities and economies of scale and scope; hence, regulation is needed to prevent monopoly exploitation, to reduce asymmetry of information, to guarantee non-discriminatory access to any essential facilities and to monitor performance of service provider (OECD, 2005; ECMT, 2005).

This paper aims at presenting different approaches to the problem posed by the natural monopoly of railways infrastructure through the in depth analysis of a sample of 20 countries. The paper follows a previous one focused on the highway sector (Beria et al., 2015), based on the same concept and structure. The paper is structured as follows. Section 2 briefly recalls the previous comparative studies on this topic. Section 3 introduces the three parts of the desk survey carried out and the countries analyzed. Section 4 compares the various network management models, Section 5 discusses the main regulatory aspects, and Section 6 focuses on the regulatory institutions. Finally conclusions are drawn.

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## 2. Existing comparative studies

Extensive researches have been done in the field of railways regulation. In terms of comparative studies, there are many researches which analyze the pros and cons of railways reforms, ranging from a single-country case study to international benchmarking. Here we will recall some of them, in particular referring to cross-country comparisons of regulatory models.

Nash (2008) provides an analysis of the EU railway policy evidencing its limits and merits together with the development of three organisational models among EU countries. In a further work, Nash et al. (2013), examining the subsidy levels and trends in passenger and freight traffic in Germany, Britain and Sweden, point out the absence of elements to support the view that “the reform process has worked better in the other two countries than in Germany”. Pittman (2013) discusses the reform of the former Soviet Railways evidencing the strong role of both the governments and the incumbent. Gómez-Ibáñez and de Rus (2006) review several scholars’ contribution concerning the experiences with railway reforms in Europe, North America and Latin America. Two approaches to introduce competition in the sector are in particular analyzed, namely the debates on unbundling and on privatization. The issue of vertical separation is also discussed in OECD (2013), together with the frameworks resulting from railway reforms in a sample of countries, and in Roland Berger (2012) which also looks at the optimal setup of a rail system and the main lessons learned considering a sample of countries outside Europe. Beria et al. (2012) describe and assess the regulatory frameworks in four European countries focusing in particular on the actual level of liberalization and its implications. Finger and Rosa (2012) presenting the railway systems in six European countries focus on their institutional approaches and the main regulatory issues. Thompson and Kohon (2012) discuss the history and analyze the approaches and the outcomes observed in Latin America and North America, while Campos (2001) focuses on the rail restructuring processes in Brazil and Mexico. In a series of World Bank studies, comparisons among countries with an increasing private participation in railways are provided in order to review the outcomes of those processes. In particular, Sharp (2005) focuses on the performance of railway concessions in Latin America, Williams et al. (2005) discuss the outcomes in Australia and New Zealand while Bullock (2005) shows the results in Africa. In general, these three studies evidence the positive results in particular for freight railways, underlining also the problems posed by concession schemes. CER (2011) presents experts’ contributions on reforms within their country, recalling the steps of the reforms, how they have been implemented, their successes together with their limits.

Among the single-country cases, Link (2012), provides an analysis of the outcomes of the German model with a focus on unbundling, public infrastructure financing and access charge regulation together with the problems that have slowed the process. Alexandersson and Rigas (2013) recall the Swedish deregulation process together with other European railway reforms showing the impact of market opening and other structural changes in the sector. In the following paragraphs, we will contribute to the debate by means of a systematic comparison of 20 countries.

## 3. The framework of the survey and the sample

We built a database on railway regulation including 20 countries<sup>1</sup> from all continents. The database is structured in three parts, focused on:

1. general and quantitative aspects of railway infrastructure;
2. specific regulatory aspects, namely the current regulatory framework;
3. regulatory bodies, namely *who* regulates the sector.

The desk activity focused mainly on academic documents and institutional data (e.g. governmental websites, national agencies reports, etc.). Moreover, for most of the countries, at the end of the process the information collected have been reviewed by a national expert. The countries have been selected considering the role and importance of the railway network, their economic relevance and peculiar regulatory features, their geographical location and, in some cases, the availability of information. We gathered data for the following countries (Fig. 1): Australia, Austria, Brazil, Canada, Chile, China, France, Germany, Great Britain, Hungary, Italy, India, Japan, Mexico, Russia, Spain, South Africa, Sweden, Turkey and United States. Therefore, the sample includes the largest countries in terms of economic power, population (55% of the world population) and extension of the railway networks. Urban and suburban railway networks have not been taken into account.

Australia, Russia, United States, Canada and China have been chosen due to their extensive networks, the role of the freight sector and their weight in the world’s economy. India, has been included for the same reasons and because of the current status of its railways which, until now, have not undergone any major reform thus it will face relevant challenges in the next future. South Africa represents the most dynamic economy in its continent and its rail network is essential to connect ports to urban and industrial hinterlands. Brazil, Chile and Turkey show an increasing role as global players and railways can contribute to this successful path. Finally, Japan and the European countries have been selected due to their peculiar and different railway history that shows a wide diversity of options used by governments to reform their rail sector.

<sup>1</sup> It must be noticed that some countries could have ongoing processes thus the reform process may need more time to show its effects.

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