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Rail research projects: Case studies

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ABSTRACT

This paper presents eight research projects developed during an intensive rail programme. The projects are as follows: Comparative Assessment of the Impacts of Rail Deregulation on Rail Transport Performance; Overcoming the intermodal transport barriers; Standing seats for high-capacity trains; Logistics principals for efficient rail systems; Access charge systems in European countries; Efficient energy use for sustainable rail transport; Analysis of Rail Yard and Terminal Performances; and Urban freight movement by rail. For each project a short description is provided covering the project key components, including the aims, objectives, methodology, results and the conclusions.

1. Comparative assessment of the impacts of rail deregulation on rail transport performance

1.1. Aims

The primary aim of this project is to compare the effects of different rail deregulation programmes across Europe. By looking at variables, indicators and case studies, additional aims are the analysis of relative performance, the identification of high and low performances and the understanding of the potential impacts on other EU countries.

1.2. Objectives

The objectives to be achieved in the project are as follows:

- Comprehend the laws and regulations of the three EU Rail deregulation reforms.
- Analyse the current situation.
- Identify possible gaps between the reforms and their implementation.
- Identify the effects of the reforms on system performance in the different EU members.
- Suggest improvements on the application of the railway deregulation reforms.

1.3. Methodology

A literature review is carried out, covering the laws and regulations of the three deregulation reforms, the implementation of the packages (indexes), the impacts of deregulation and freight and passenger train indicators for EU members. Information obtained from official sources such as the European Commission, OECD and Eurostat formed the foundations of the research and has been illustrated in the results graphically. The results are extracted, analysed and discussed. Ultimately, analysis of the results helps towards the conclusions and recommendations about how to improve the European railway system.

1.4. Results

In terms of Licensing, there was an observed doubling of railway license numbers during the period of 2003–2006. Although, in some countries the railway license numbers remained constant.

Between 2000 and 2007, the market share of freight transport by rail grew in most member states and especially in countries where non-incumbent rail undertakings acquired significant market shares. In 2007 EU-27 countries observed a 2.8% rise of freight transport by rail, whilst in EU-12 countries and EU-15 countries there was a noted rise of 1.1% and 3.7% respectively. Notably, 2008 brought a lot of volatility across the EU in terms of freight transport by rail, where some countries experienced a 9.7% increase (Denmark) and some countries experienced a 29.2% decrease (Estonia).

In regard to passenger transport between 2000 and 2007, the majority of member states experienced increased passenger transport by rail. Most notable increases were seen in Ireland (44.6%) and Latvia (36.1%), however some significant drops were also observed particularly in Romania, Lithuania and Bulgaria of 35.7%, 32.3% and 30.8% respectively. In addition, the highest increase in traffic is the high-speed sector where an observed increase from 59 million people in 2000 to 92 million people in

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2007. 2008 brought further increases in rail passenger traffic for the majority of EU members, and although the global economic crisis occurred in 2008, decreases in passenger traffic only became apparent in 2009 and 2010. These decreases varied from member state to member state, depending on a number of factors such as economy, logistics systems, etc.

As an important indicator to measure the quality of service, punctuality was examined (for combined transport trains) and despite improvements in delays over scheduled arrival times from 1999 to 2007, space for improvement is still there.

1.5. Conclusions

- All EU-Members began the legal process of transposing EU Directives into national law and obtained legal separation between Infrastructure Managers and Operators. However, due to differences in interpretation, the proper separation of the two entities has not yet been achieved which produces inequality in the market and in infrastructure access conditions.
- From the punctuality indicators, it is concluded that there has been no visible improvements in recent years.
- There has been a notable increase in rail passenger service quality, which is evident in Germany, France and the UK. Slight increases have been observed in the remaining EU countries.
- Changes in the rail freight sector have been less visible, with the ton-kilometre indicator remaining stable in recent years. The freight sector leader is Germany, which is still growing.

1.6. Suggestions

- In anticipation of possible lay-offs and job shifts from the state-owned rail companies to the private sector rail companies, training programs may be necessary to help railway workers acquire new skills in order to obtain jobs in more technically advanced railway companies.
- Knowledge retention and dissemination schemes could be undertaken in order to reduce the risk of losing knowledge as rail workers across Europe retire. This knowledge is critical to training new rail employees.
- Administrative and financial support could be made available to future rail companies who wish to enter rail freight and passenger markets. This support could be useful to emergent companies in recruitment processes to integrate redundant workers from state-owned companies, who possess technical and practical know-how.
- The ERA could prioritise the spreading of railway-related information and training on a wider range. The performance indicators could then be published regularly by an official source, like the ERA, so that the impacts of policy can be monitored and recorded more effectively.

2. Overcoming the intermodal transport barriers

2.1. Motivation

As the European Union expands, there are growing needs for more efficient integration and harmonised transport systems. This includes intermodal transport systems that help to service the flows of passengers and freight in between borders. Intermodal transport goes some way to ensuring fair play and competition between the different transport modes, and plays to their respective strengths. If used to its maximum potential and without restrictions, it can offer a lot of advantages such as speed, safety, efficiency and flexibility. The barriers to intermodal transport will be traced and researched, before solutions are presented.

2.2. Objectives

- Identify the barriers in intermodal transport
- Research those existing barriers
- Generate possible solutions for those barriers in intermodal transport

2.3. Methodology

A literature review focused around current government policy is carried out in order to identify the existing barriers to intermodal transport and to suggest some improvements.

2.4. Barriers

1. Segmentation, fragmentation and a general lack of cooperation among the intermodal transport operators.
2. Non-integration of Intelligent Transport Systems and absence of multimodal travel information services.
3. Competition between transport modes – inability of some modes to compete with other modes.
4. Conditions for the operational and technical integration of the different national railway systems in the European Union and accession countries (interoperability and safety requirements).
5. Infrastructural barriers.
6. Barriers regarding logistics concepts and practice services.
7. Barriers regarding financial and economic issues.

2.5. Suggestions and solutions

In order to tackle the problem of segmentation and fragmentation of transport operators, further and improved collaboration between the authorities and transport operators is desired. Establishing a new authority to supervise this collaboration and to create unity between transport modes would go some way to doing this.

The non-integration of ITS, which makes traffic management more difficult, must be solved. ITS systems can easily be interconnected and this could expedite the communication between the different transport modes. Considering that the quality of ITS is strongly correlated to the quality of transport, this barrier is an important one to overcome.

Promoting rail transport and eliminating borders and regulation in rail could help with the problem of the lack of competition between other transport modes and road transport, which ultimately can slow intermodal system development.

A united and well-connected Europe, with simple cross border transactions can facilitate a competitive market across the continent. To make this a reality, each member of the EU should focus on solving their own respective interoperability issues related to signalling and dispatching systems and national regulations of different infrastructure systems.

Infrastructural issues, logistics concepts and practice services, financial and economical issues might be fixed through further integration of current system equipment, telematics systems for remote access control and developing standardised infrastructure for intermodal systems. Creating a common language that all transport managers can understand may ease integration and boost intermodal transport.

Creating an environment in which a fair and competitive transport market can grow is very important. Otherwise there is no incentive for dominant transport modes to collaborate with other means of transport, as they can manage freight or passengers on their own.