

# Imperfect competition in a network industry: The case of the European rail freight market



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## ARTICLE INFO

### Classification:

L130  
R400

### Keywords:

Barriers  
Competition  
Persistence of profits  
Rail freight  
Single market

## ABSTRACT

**Purpose:** This paper opts for a time varying approach to measure the competition on the European rail freight sector according to two questions: what is the current level of competition and how is this expected to evolve in the long run?

**Approach:** A firm-level dynamic panel estimates the persistence of profit in the European rail freight sector.

**Main findings:** The persistence of profits shows a high degree of competition in the short run but imperfect in the long run due to the existence of barriers on the market. Secondly, the ratio between capital and labour cost is calculated. It indicates moderate economies of scale.

**Originality:** Knowledge about this new market and the dynamics are limited in the academic literature. The research is relevant for the policy makers to monitor the rail freight market and to harmonise the practices between network managers to improve the European single market.

## 1. Introduction

The European Commission has supported free competition on the European rail market since 1991 (1991/440/EEC). The goals are twofold: to increase efficiency and to develop a single market in accordance with the common transport policy defined by the Treaty of Rome (1958). More than 20 years later, however, it is only the rail freight market that is open to free competition: in 2007 (2004/51/EC), rail freight shifted from national-level markets with monopolies and cooperation to a European-level market with free players and competition. In this paper, the main objective is to assess the coherence between the European goal of the single market and the rail freight market by answering two questions:

- What is the current level of competition?
- How is competition expected to evolve in the long term?

Knowledge about this topic is limited at the European level. This applies to the academic literature, where most analyses are based on comparisons of incumbents' efficiency (De Borger, 1992; Cantos and Maudos, 2001; Friebel et al., 2010), on national approaches (Vierth,

2011; Laisi et al., 2012; Woodburn, 2014) or on aggregate approaches for the European market (Crozet et al., 2014; Gevaers et al., 2015). It also applies to the European Commission, whose market monitoring addresses only the industry level and uses aggregate data. In general, the analysis of competition and its dynamics on the European rail freight market is incomplete because of a lack of data and the belief that railway transportation is characterised by high barriers between national markets and high sunk costs, leading to reduced chances of successful competition (Nash and Preston, 1992; Brewer, 1996; Vierth, 2011; Crozet et al., 2014; Woodburn, 2014). Analyses are often limited to the identification of barriers and the comparison of market share between incumbents and newcomers. No deep analyses have been made of firm behaviour or market structure, though other sectors do this routinely using industrial economics (Mueller, 1977; Tirole, 1988; Lipczynski et al., 2013).

This study proposes a new approach to competition analysis through firm behaviour on the rail freight market. We analyse competition at firm level using an indicator developed by industrial economics: persistence of profit (POP). Data was collected on a selection of firms across Europe, covering the time period between 2007 and 2014. POP was able to provide us with a dynamic picture of

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each firm's behaviour by measuring its average profit and the persistence of profit from one year to the next.

The organisation of this paper is as follows. Section 2 begins by painting a general picture of the freight market in Europe and demonstrating the current lack of knowledge about competition on this market. Section 3 then presents the methodology we used to assess the degree of competition in the short and long term based on the POP principle. In Section 4, the database is described. Section 5 provides an overview of the results. Finally, Section 6 discusses the results and suggests that the only objective reasons for a low degree of competition on the European market are the imperfections of the single market (barriers to entry/exit) and a lack of market regulation, which leads to a high degree of concentration. Section 7 concludes by emphasising the need for European regulation to manage competition and ensure an efficient market.

## 2. Context: liberalisation in 2007 and impacts on the European rail freight market in 2014

European rail freight liberalisation changed the paradigms of the market from national markets and monopolies into a single European market with competition. The goal was to find a solution to the decline of the railway freight market in Europe and to its lack of competitiveness compared to road freight (91/440/EEC). In this section, we provide a short overview of the rail freight market and the related literature in order to clarify doubts about the effect of liberalisation since 2007 and the need to perform deeper analyses.

### 2.1. A long path to change in the rail freight market

The European policy for the liberalisation of the rail freight market came a long way between 1991 (91/440/EEC) and 2007 (2004/51/EC). The initial disentanglement of infrastructure (network manager) from transport services (operator) was intended as the first step towards a more efficient market through competition. Besides certain pioneers, such as the UK (1994), Germany (1994) and Sweden (1996), the majority of European countries opened their national markets between 2004 and 2007, following the European deadline. The main reasons for this delay were strong national preferences on the part of the Member States themselves and strong opposition from trade unions to competition and open access markets.<sup>5</sup>

As of 2016, the European rail freight market can be defined *a priori* as an integrated market with open access to tracks and non-discrimination between newcomers and incumbents. Fig. 1 shows that the market share of newcomers has increased since 2006 from 9% to 26% (Eurostat, 2016).

This evolution of newcomers' market share can be interpreted as a success for European policy. The Western European rail market consists of around 170 active operators and has a turnover of €15 billion (Laroche et al., 2016).

Nevertheless, some authors have shown that the European rail freight market still lags behind other modes, such as road or air, in terms of competitiveness (Laroche and Guihery, 2013; Bonnafous and Crozet, 2014; Gevaers et al., 2015). The same authors also question the impact that liberalisation and competition have had on market efficiency (Friebel et al., 2010).

### 2.2. A non-evident impact of liberalisation on the rail freight market

The impact of the Staggers Act (1980) on the US rail freight market

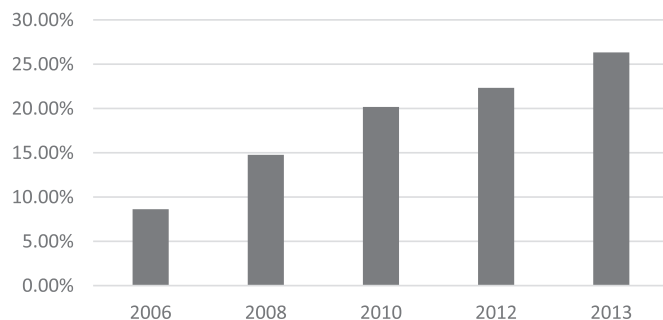


Fig. 1. Market share of newcomers in EU-28 between 2006 and 2013. Source: Eurostat (2016).

is commonly used to illustrate the beneficial effect of a deregulation policy. Faced with a lack of productivity on the US rail freight market, the Federal Government decided in 1980 to deregulate the market by ending price regulation on transport services, which had been fixed by the Interstate Commerce Commission (ICC) since 1887 (Ivaldi and McCullough, 2007). Since then, the market has undergone major changes: productivity tripled and volume doubled, while rates were cut in half (see Fig. 2). Hence, the modal share of rail freight increased from 25% in 1990 to 31% in 2012 (Eurostat, 2015). This success certainly inspired the European Commission to develop a common railway policy. Twenty years after the change of policy in Europe, however, the results – as shown in Fig. 2 – are rather different.

The results for some of the biggest rail freight operators in Europe show no significant changes since 2007 in terms of productivity, volume, revenue or rates. While the period of analysis for Europe is short, because of a lack of long-term data, this finding raises questions about the true impact of the European policy on the rail freight market despite the newcomers' success.

### 2.3. Reviewing the market analysis literature on the rail freight sector

A review of the academic literature reveals a large volume on the rail freight market in general but only a small range of analyses in terms of competition. Firstly, most studies focus mainly on classic efficiency analyses of main operators (De Borger, 1992; Cantos and Maudos, 2001; Hilmola, 2007; Friebel et al., 2010). However, only incumbents (no newcomers) are considered, which provides a narrow, retrospective view of the market.

Secondly, while some studies give a broader overview of the market (Beck et al., 2013; Crozet et al., 2014; Gevaers et al., 2015; ECA, 2016; IGR-Rail, 2016), this is mainly to compare the performance of the rail freight industry to other modes of transport. Nevertheless, the level of analysis remains too aggregated to produce insights into the degree of competition.

Finally, several deeper market analyses have been performed, but the market scope was reduced either to a national market (Vierth, 2011; Deville and Verduyn, 2012; Van de Voorde and Vanelander, 2014; Woodburn, 2014) or to a very limited number of operators (Gasparic et al., 2009).

This overview highlights a mismatch between the new market conditions for rail freight (European market and open access) and the tools and scopes that are typically used to analyse it (descriptive approach, aggregated data or panel of incumbents only). Most often, competition is analysed using growth in ton-kms, rail freight market share compared to other modes or the market share of newcomers. In order to conduct a proper assessment of the degree of competition on the European rail freight market, deeper market analyses are required.

This paper complements existing analyses by taking a dynamic approach to competition based on firm behaviour (incumbents and newcomers) and instruments from industrial economics. This is

<sup>5</sup> Passengers are still in limbo in some of the pioneering countries which opened their markets to competition (UK, Germany, Sweden and Italy for high-speed trains) and other countries which have maintained the monopoly system (France, Spain, Belgium). The Fourth Railway Package, currently being discussed by the EC and the Member States, is to propose 2019 as a deadline for passenger competition.

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