



Study on passenger and freight rail transport services' prices for final customers

Final Report

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August – 2024



EUROPEAN COMMISSION

Directorate-General for Transport and Mobility

Directorate C – Land Transport

Unit C.3 Rail Transport – Single European Rail Area

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Luxembourg: Publications Office of the European Union, 2024

ISBN: 978-92-68-11326-4

doi: 10.2832/403804

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Table of Contents

1.	Introduction	1
2.	Methodological approach.....	5
2.1.	Literature Review	6
2.2.	Stakeholder survey	7
2.3.	Case Studies	9
2.4.	Targeted interviews	10
2.5.	Caveats of the methodology and limitations of the study	11
3.	Open Access Passenger Transport	13
3.1.	Impact of competition on ticket prices	14
3.2.	Impact of competition on quality of services	21
3.3.	Impact of competition on demand	23
3.4.	Market characteristics and developments	25
3.5.	Conclusion	28
4.	Passenger Transport under Public Service Obligations.....	29
4.1.	Impact of competition on final prices	29
4.2.	Impact of competition on quality of services	31
4.3.	Impact of competition on demand	33
4.4.	Market characteristics and development.....	34
4.5.	Conclusion	37
5.	Freight Transport	38
5.1.	Impact of competition on final prices	39
5.2.	Impact of competition on quality of services	43
5.3.	Impact of competition on demand	45
5.4.	Market characteristics and developments	47
5.5.	Conclusion	50
6.	Conclusion	51

List of Figures

Figure 1: Survey respondents' country of origin/operation	8
Figure 2: Survey respondent per stakeholder groups.....	9
Figure 3: Avg. HICP for passenger transport by railway for selected groups of EU MS (index 100=2003)	14
Figure 4: Average ticket prices before and after the start of competition on selected cases	15
Figure 5: Cheapest tickets offered, with and without competition	16
Figure 6: Actual ticket prices (operated as an index) from start of competition and 5 years forward	17
Figure 7: Market developments on Prague-Ostrava (2011-2015)	18
Figure 8: Average standard ticket price, Vienna-Salzburg (2011-2023)	19
Figure 9: Development in frequency in Austria and Sweden	23
Figure 10: Evolution in customer prices in Germany (source: Bundesnetzagentur)	30
Figure 11: Development of fare increase ceiling since 2008 (DK)	30
Figure 12: Arriva – bonus/malus payments.....	32
Figure 13: Demand for regional passenger transport in Germany	33
Figure 14: Demand for passenger transport by rail in Denmark	34
Figure 15: Developments in rail freight prices since start of liberalisation.....	39
Figure 16: Developments in freight prices since 2013 (case study data)	40
Figure 17: Survey results on prices of freight RUs and shippers	41
Figure 18: Net revenue per employee for RUs in Sweden (in SEK and 2014 prices)	42
Figure 19: Survey results on service quality of freight RUs and shippers	43
Figure 20: Punctuality at different degrees of delays on RFC1 for November 2022	45
Figure 21: Developments in mode shares for the French freight transport market.....	46
Figure 22: Freight rail transport performance for Germany	46
Figure 23: Historical tonne- and train km for the Italian rail freight market	47
Figure 24: Differences between incumbent and non-incumbent operators in the rail freight market.....	49

List of Tables

Table 1: Key legislative developments at EU level	3
Table 2: Key indicators and data collection method for each concept.....	6
Table 3: Overview of case studies.....	10
Table 4: Overview of findings: OA case studies.....	13
Table 5: Effects on demand of competition from the case studies.....	24
Table 6: Overview of findings: Freight case studies	38

1. INTRODUCTION

In response to the pressing need to reduce CO2 emissions and address the challenges of climate change, the European Union (EU) has implemented a series of ambitious policies and targets. One key focus area is the decarbonisation of the transport sector, with railways having been identified as a crucial lever in achieving these goals due to their relative low CO2 intensity. Yet, despite the high efficiency of railways, more can be done to harness its full potential. To utilise railway capacity to its full potential and respond to climate objectives, the EU has undertaken a process of opening the railway markets to foster greater competition.

Competition in the rail market can take two forms: open-access (OA) competition (competition-in-the-market)¹ and Public Service Obligation (PSO) contracts through competitive tendering (competition-for-the-market)². Freight rail is almost exclusively organised through open-access competition, while competition in the passenger railway market is organised through both types³.

As highlighted in this report, competition in railways seems to trigger an increase ridership and brings about significant benefits to society⁴. The benefits of competition in railways depend on the form of competition (PSO or OA):

- Passenger services (OA):

In OA services, where competition is more mature, the following effects could be noticed:

- Lower fares as operators compete to attract more passengers⁵.
- Potential cost reductions, allowing operators to maintain profit margins in the face of decreased revenue.
- Increased frequencies and thereby more flexibility for the passengers.
- Improved service quality to attract customers, such as offering amenities like free Wi-Fi, catering facilities, modern rolling stock, lounge spaces in the stations etc.

- Passenger services (PSO):

Market opening in this market segment is still recent, and its effects will be felt fully only upon the expiry of the last contracts awarded before December 2023, i.e. during the transitional period foreseen by the Fourth Railway Package. Therefore, the study has significant limitations, however:

- There is evidence that the benefits to society arising from competition 'for the market' materialise essentially in the form of reduced costs for the competent

¹ OA denotes the form of competition where operators can operate entirely at their own commercial risk. Operators are not bound by fixed term contracts or must not adhere to specific public service requirements. However, the operators depend on ticket sales to continue operating. However, different models can be adopted, such as the Spanish HS case where there was a tendering procedure to award track capacity via framework agreements on the different HS corridors.

² When PSO are awarded by public tender, operators compete to win a contract giving them the right to operate on a specific geographical area if they meet a set of public service obligations. The operator receives compensation from the state. The contracts usually run for 10-15 years. The PSO contract doesn't prevent possible competition on the same lines with OA services. However, the competent authority or the PSO operator can ask an economic equilibrium test to the Regulatory Body if they fear that a new OA service will lead to a deterioration of the economic equilibrium of the PSO contract. The obligation to award PSO contracts through competitive tender has been in force only since end of December 2023, although some Member States have been tendering PSOs for several years.

³ Since the 25th of December 2023, the unconditional direct award of PSO contracts is no longer possible. Competitive award is the norm (subject to limited exceptions).

⁴ For a full overview of the effects of competition as indicated by the academic literature, please see the annex to this study.

⁵ Mainly for OA competition, since fares under PSO contracts are often regulated by the competent authorities.

authorities that tender PSO services. It is for the authorities to decide whether and how to pass on the savings of public money to end-users.

- The study shows that some competent authorities have chosen to pass on the benefits of competition in the form of higher frequencies and/or improved quality of service, while other have prioritised cost reductions. Competition for the market appears to have no direct effect on prices, which are typically regulated.
- Freight services:
 - Lower prices for the final customers.
 - Increased transport services, as there is more supply (more operators) and more niche services (operators targeting specific markets).
 - Higher service quality as operators invests in new or special rolling stock to attract customers.

Despite the benefits of competition, there are some challenges involved in its introduction. As for the benefits, the challenges are different in the freight and passenger segments. A common challenge is the state and capacity of the infrastructure to absorb the increased traffic on the network. Without solving this issue, competition will have difficulties to increase the ridership. Moreover, despite the efforts of regulators to create a fair and open market, new entrants are faced with barriers to entry. Most notably in the passenger segment, the dominance of incumbent operators on ticket platforms limits the visibility of the non-incumbents to the customers. Bidders for PSO contracts do not always have access to data (e.g. passenger data or rolling stock maintenance data) that are necessary to prepare their bids. Furthermore, for both passenger and freight segments, access to rolling stock and access to services facilities, such as maintenance centres and track sidings, remains a major obstacle for new entrants given the high costs associated with the investment.

Legislative developments

Historically, the railway sector in Europe was dominated by national monopolistic incumbents that acted as both infrastructure managers and operators. However, as from the adoption of Directive 91/440/EEC in 1991, the EU took steps to introduce competition by allowing independent railway undertakings to apply for track access. Since then, a series of legislative packages have been implemented to further liberalise the railway markets, leading to open-access competition and competitive tendering for passenger services, as well as open-access competition for freight services. The key railway packages adopted at EU level are listed below.

Legislative package	Year adopted	Description	Key provisions and entry into force
1st railway package	2001	Contained provisions on organisational separation, capacity allocation, and licensing.	Opened the market for international freight rail services on the TEN-T Network in 2003.
2nd railway package	2004	Aimed at removing entry barriers to national markets for operators with EU licences and increase competition in the rail freight market.	Opened the market for international freight rail services on the entire network in 2006 and for domestic freight rail services in 2007.
3rd railway package	2007	Included regulations on public service obligations, passengers' rights, and opened up the	Opened the market for international passenger rail services in 2010.

Legislative package	Year adopted	Description	Key provisions and entry into force
		international passenger train market for access and cabotage.	
Recast of the 1st railway package (Dir. 2012/34/EU)	2012	The Recast focused on enhancing competition transparency in rail market access, empowering national regulators for cross-border collaboration, and fortifying the financial structure to encourage investment. Directive 2012/34/EU established a unified European railway area.	
4th railway package	2016	Aimed at completing the single European railway area, ensuring independence of IM from RUs, and introducing open competition in domestic passenger markets (OA for long-distance and mandatory competitive tendering for PSO).	Opened the market for domestic passenger rail open access services in 2020 and mandated competitive tendering for domestic PSO services, with a transition period ending on December 25, 2023.

Table 1: Key legislative developments at EU level

In addition to the steps taken at EU-level in introducing competition, certain countries can be considered as trailblazers for liberalising the railway markets. While freight railway markets were liberalised at EU level in the 90s and hence have reached a certain level of maturity across countries, the liberalisation of passenger railway markets has happened at multiple speed and stages. As a result, some markets have been liberalised since the 90s (Germany and Sweden) while some are just beginning to liberalise their markets with the entry into force of the key provisions of the 4th railway package⁶. The differences between the start of competition in the European countries provides excellent case studies on the effects of competition and hence the impact of the 4th railway package on markets and society.

This study examines the effects of competition in freight and passenger rail services on the prices and service quality offered to the final customers. It does so by investigating 21 specific cases⁷ of competition in the EU railway markets. In addition, the opinions of key stakeholders on the impact of competition were surveyed and included in the study.

Report structure

The study consists of a final report summarising and analysing all the findings made and an annex containing the specific findings. This final report and its annex are structured as follows:

- Section 2 describes the methodological approach of the study and contains a discussion on the limitations and caveats of the chosen approach.
- The following 3 sections present and analyse the findings of the study on the three market segments included in the study:
 - Section 3 on OA passenger competition.

⁶ For a detailed breakdown of the liberalisation of the railway markets and the entry of the first competitor, please see the 6th RMMS report. [6th_rmms_report.pdf \(europa.eu\)](#)

⁷ (8 OA, 4 PSO and 9 freight)

- Section 4 on PSO passenger services.
- Section 5 on freight rail.
- Section 6 concludes the study.
- The Annex to this study includes the following parts:
 - The case studies.
 - A table of the main effects of competition as identified by the academic literature.
 - The results of the survey.
 - An overview of the sources used for data collection.

2. METHODOLOGICAL APPROACH

This study was conducted by applying a sequential data gathering approach, consisting of four elements: a literature review, a survey, case studies, and targeted interviews. The methodology was developed in close cooperation with the European Commission at all steps. The analysis of the gathered information covers different timeframes depending on each case study and reaching, at the latest, the first months of 2024.

The data collection methods employed in this study are designed to ensure the collection of a comprehensive set of key indicators, as shown in Table 2.

Category	Concept	Metric	Unit	Scope of desk research	Scope of surveys	Scope of targeted interviews	Scope of case studies	
General	Size of network	Length of lines, by nature of transport	km	✓			(adding granularity)	
	Average rail utilisation rate (passenger)	Evolution of utilisation of rail infrastructure	pkm per line-km	✓			(adding granularity)	
	Average rail utilisation (freight)	Evolution of utilisation of rail infrastructure	tkm per line-km	✓			(adding granularity)	
	Passenger volume	Passenger-km (pkm)	pkm	✓	✓ (trends)	✓	(adding granularity)	
	Freight volume	Tonne-km (tkm)	tkm	✓	✓ (trends)	✓	(adding granularity)	
	Open/closed rail market	Status of rail market/non-incumbent share	N/A	✓			✓	
	Commercial/PSO service	Share of domestic PSO services	%	✓	✓ (trends)	✓	(adding granularity)	
	Competition		Herfindahl-Hirschman Index	N/A	✓			
			Market share of non-incumbents	%	✓			
Number of new entrants			#	✓				
Price	Pricing of rail services compared to other modes	Harmonised index of consumer prices (HICP)	N/A	✓		✓		
	Pricing of passenger rail	Price of an average fare	EUR/pkm		✓ (trends)	✓	(adding granularity)	

Category	Concept	Metric	Unit	Scope of desk research	Scope of surveys	Scope of targeted interviews	Scope of case studies
	Pricing of freight rail	Price of an average freight shipping service	EUR/tkm		✓ (trends)		✓ (adding granularity)
Feasibility and quality of transport	Punctuality (passenger)	Percentage of services classified as punctual	%	✓	✓ (trends)	✓	(adding granularity)
	Punctuality (freight)	Percentage of domestic freight services arriving on time	%	✓	✓ (trends)	✓	(adding granularity)
	New rolling stock	Share of passenger railway vehicles newer than 10 years old	%	✓		✓	✓ (adding granularity)
	New services	Inclusion of Wi-Fi, luggage services, dining onboard and/or fast check-in	Y/N	✓			✓

Table 2: Key indicators and data collection method for each concept

2.1. Literature Review

A thorough review of the main literature covering rail transport in Europe was conducted as the first step. The literature review involved gathering data from various sources such as statistical databases, industry reports, and academic research. The collected data provides a comprehensive overview of the European rail market, including information on market structure, regulatory frameworks, and key players. A list of the consulted reports and academic articles can be found in the annex to this report. The review focused primarily on the collection of data on the prices (ticket fares and price per tonne) and on the quality of services and their development over time. Both qualitative and quantitative data was collected.

The quantitative data collection can be divided into the following steps:

1. Source selection: Relevant sources, such as Eurostat, the 7th RMMS report, and case studies, were identified to obtain data on metrics related to rail services, pricing, feasibility, and quality.
2. Data compilation: Data from these sources were collected, organised, and compiled into a databank, which can be found in the annex to this report. The data included information on network size, rail utilisation, passenger and freight volumes, market status, pricing, and quality metrics. The variables for which data was collected are summarised in Table 2 above and in the Annex to this report.
3. Data differentiation: Data collection was divided into passenger and freight markets. Within the passenger rail market, further differentiation was made between services provided in the context of PSOs and those in open access markets.
4. Country selection: Data was collected for the EU27, excluding Malta and Cyprus, and including Norway and Switzerland⁸.

⁸ Malta and Cyprus have no railway network. Norway and Switzerland have been included due to their relevance to the TEN-T network

2.2. Stakeholder survey

The second step consisted of a survey of the stakeholders involved in European railways (both freight and passengers). The survey aimed to identify the opinions of railway stakeholders on competition and their impact on the sector and the services offered to the final customers. Moreover, the analyses of the responses provided an understanding of the trends, patterns, and key insights from the sector. The survey was carefully designed in cooperation with the European Commission.

The questionnaire shared with each of the respondent groups is shown in the Annex to this report.

Survey Development

The survey was developed based on the main findings of the literature review aimed to test these findings.

The survey was developed according to the following steps:

1. **Defining the target respondents.** The following stakeholder groups were targeted:
 - a. Infrastructure managers.
 - b. Railway undertakings (freight and passenger).
 - c. Passenger associations.
 - d. Shippers/freight forwarders/ports and terminals.
 - e. National transport/rail authority.

Stakeholders which are not part of the target respondent groups were approached for a targeted interview. These stakeholders included ticket vendors and academics.

2. **Designing the questionnaire.** The questionnaire was designed per respondent group with specific questions for each group of stakeholders. However, key questions (on price and quality) were included in all questionnaires to facilitate analyses across stakeholder groups on key common topics. The questions were split into three sections:
 - a. A series of preliminary questions enabling the identification of the main business activities of the respondent. These included questions on factors such as the main country of operation or, for passenger RUs, their involvement in PSO or OA markets.
 - b. A series of mandatory questions on price, quality and other related key topics.
 - c. Lastly, a series of optional questions on the wider effects of competition.

No space for textual answers or comments were included in the questionnaires. Instead, respondents were asked if they would accept to be approached for a follow-up interview. In some cases, respondents provided additional information and documents by mail. The full questionnaires can be found in the annex to this report.

3. **Dissemination.** The study used the Qualtrics⁹ survey tool for which EY has a licence. The tool could be accessed via PC and phone/tablet. The survey was sent to a list of respondents selected by EY in cooperation with the European Commission. The list of respondents was selected to cover all stakeholders and countries within the scope of the study. It was sent as an invitation by mail with a link to the survey. The link could be shared an unlimited number of times, allowing stakeholders to share the survey with the relevant parties in the organisation. In the first dispatch of the survey, 110 potential respondents were invited¹⁰. A total of 4 reminders were sent out. Additionally, the survey was shared with interviewees from the targeted consultations and interviews carried out as part of the case studies. The survey was open for responses for 4 months.

Survey Responses

Number of responses:

The survey received a total of 52 responses from participants. Out of these, all responses were considered valid for analysis, as all provided consent to the privacy policy. The 50% response rate indicates a significant level of interest and engagement from the participants, which is encouraging for the validity and reliability of the survey results.

Geographical distribution of respondents:

The survey achieved a satisfactory geographical spread, with participants from 16 countries. However, some countries, such as Austria, were overrepresented, and others, such as France, were underrepresented. This will be discussed in more detail further below. The distribution of respondents across different countries is as follows:

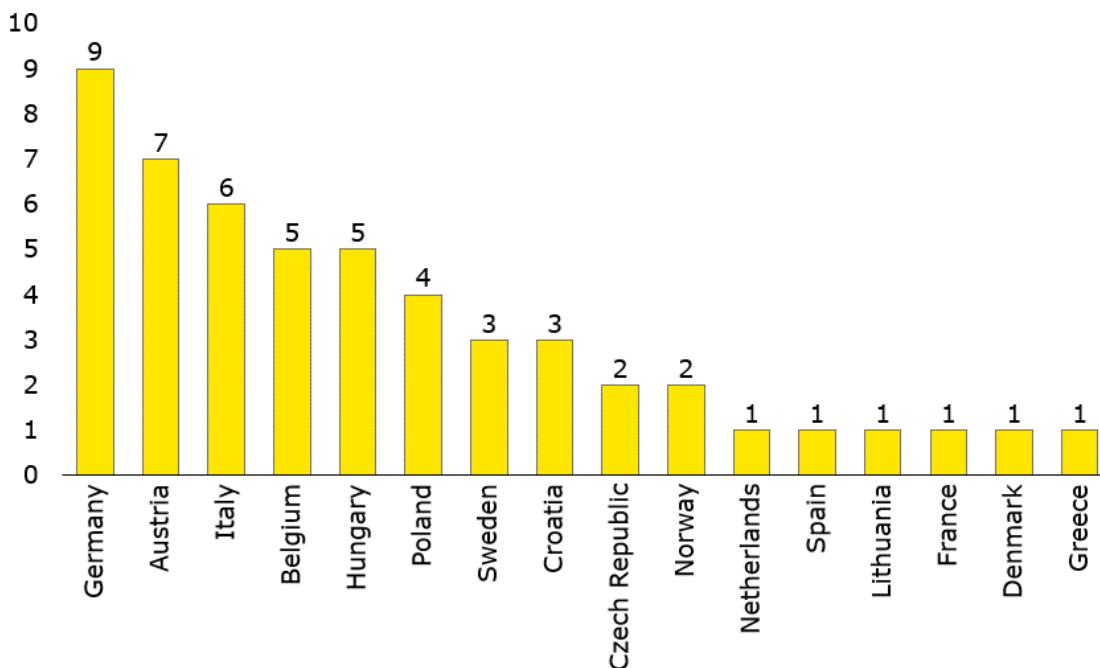


Figure 1: Survey respondents' country of origin/operation

This diverse representation across countries enhances the generalisability of the survey findings and provides a broader perspective on the topic at hand. It also suggests that the

⁹ [Qualtrics XM // The Leading Experience Management Software](#)

¹⁰ The number of respondents who forwarded the survey can't be traced.

survey managed to reach stakeholders from various regions, allowing for a more comprehensive understanding of the subject matter.

Distribution among stakeholder groups:

The survey respondents belonged to different stakeholder groups within the railway industry. The distribution of respondents among these groups is as follows:

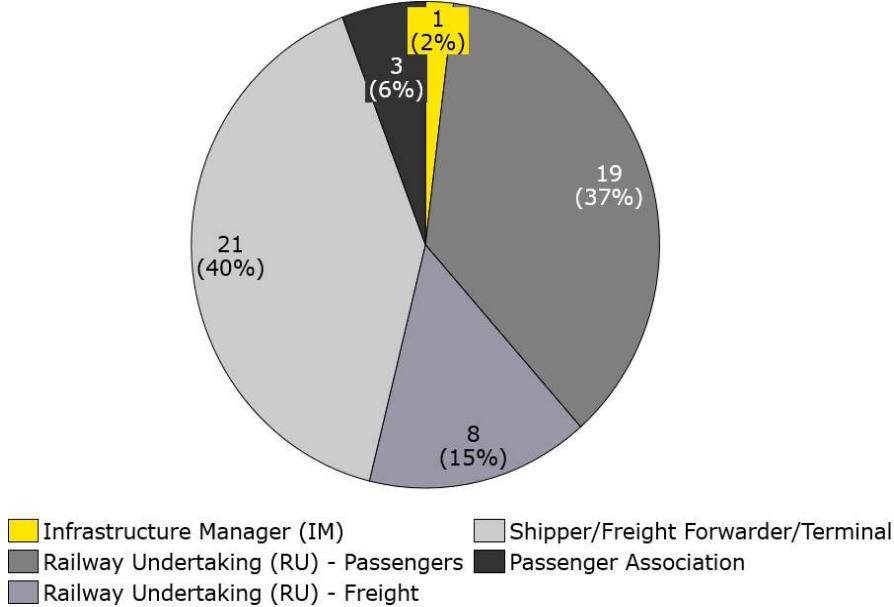


Figure 2: Survey respondent per stakeholder groups

These stakeholder groups represent different perspectives and interests within the industry. Specifically, the customers of freight RUs (shippers/freight forwarders/terminals) and passenger RUs were particularly interested in participating in the survey. Passenger association and freight RUs have made fewer responses. For passenger associations, this study also carried out targeted interviews. Moreover, there is a definite number of passenger associations. The study thus covered a considerable share of the total population. For freight RUs, only a marginal share of the total pool (792 in 2020¹¹) was covered. Out of the passenger RUs, 74% were operating as OA RUs, while the rest were either PSO operators or national incumbents with no competition in the market.

2.3. Case Studies

The third part of the methodology consisted of 21 case studies on key markets or specific lines with active competition. The purpose of the case studies was to zoom in on the effects of competition at a micro level both currently and over time. The selection of case studies considered both passenger and freight rail market segments, thereby including various forms of competition. The case studies were selected in cooperation with the European Commission.

The case studies were carried out using both desk research and interviews with the stakeholders involved. To ensure that the data (qualitative and quantitative) collected from these case studies could be effectively compared and analysed, a standardised framework was developed. This framework sought to maintain consistency in data collection across different cases and countries. It was chosen to allow for comparisons between the case studies.

¹¹ See databank attached as an annex to this study.

Case study selection

The selection of the case studies was strategically planned to ensure a comprehensive analysis of the railway markets. The focus was on geographical diversity and covering the relevant rail segments in terms of type of rail (freight and passenger) and type of competition (OA or PSO through competitive tendering). Moreover, case studies were selected based on the maturity of the competition as this would allow for an analysis over time and for markets with less competition to act as a control group. The selection spans specific lines (the case of OA competition), regions (PSO) and entire markets (freight). Table 3 presents an overview of the selected markets in scope.

Market		Region
Passenger	Open access	Austria Czechia Italy Spain Sweden International HSR Germany France
	PSO	Poland (also covers OA) France Germany Denmark
Freight		Croatia France Germany Sweden Poland Italy RFC1, RFC 2 and RFC 6

Table 3: Overview of case studies

2.4. Targeted interviews

The targeted interviews aimed to fill any remaining knowledge gaps and to crosscheck findings from the other activities. The interviewed stakeholders represent a diverse range of backgrounds and regions. Stakeholders included customer associations, locomotive leasing companies, stakeholder associations, infrastructure project consortiums, and rail freight associations. Moreover, the targeted interviews covered stakeholder groups who were not included in the survey. The interviews allowed to gather valuable perspectives from different stakeholders, thereby enriching the overall understanding of the European rail market. A specific interview guide was produced for each interview. The interviewees have been anonymised¹².

¹² The European Commission are aware of the interviewed stakeholders.

2.5. Caveats of the methodology and limitations of the study

The following section will discuss the limitations of the study and its methodology.

Secondary data collection

The use of secondary data has some limitations. Firstly, there are inconsistencies in the timeseries and the granularity of the data between countries and case studies. In some cases, this hinders the comparability between case studies and countries. This has been partly countered by collecting additional data through interviews, by operationalising the data through indexation and by using a common reference period such as years from start of competition. There is also the risk of bias, especially if data sources have vested interests. Moreover, such data might not capture the full context, like hidden costs or the reasons behind pricing decisions. The main risk with secondary data is that this study cannot control how that data has been collected or operationalised and, as a result, there may be differences between countries or rail market segments¹³. The study has reduced these risks by using primarily trusted data sources such as Eurostat, IRG rail or peer-reviewed academic studies.

Survey

The survey received a reasonable coverage across segments and countries. However, there were some over- and underrepresentation among stakeholders and countries. Notably, there was strong participation from German stakeholders, whereas countries such as France, Spain, and those in the south-eastern region of Europe were underrepresented. This may have affected the findings of the survey to be skewed towards the opinions and experiences from these countries. On the other hand, this overrepresentation may be due to the longer existence of competition in the countries with more respondents, resulting in a greater interest in participating than in countries with no or little history of competition.

The distribution among stakeholder groups has a strong representation from shippers/freight forwarders/terminals/ports and an underrepresentation of freight RUs as compared to the total population of freight RUs. This could entail that the customers of the RUs are more interested in shedding light on the state of competition in freight rail. Passenger RUs were well represented compared to passenger associations. These differences in distribution and their potential effects on the findings have been corrected by the fact that the study conducted five targeted interviews with passenger associations and a series of interviews with the freight case studies.

Even though both non-incumbent and incumbent passenger RUs were invited to participate, there is a strong representation of non-incumbent operators. 74% of the responding passenger RUs are non-incumbents.

Case studies

As mentioned above, the selection of the case studies was based on their coverage of different market segments (PSO, OA and freight) and their characteristics (maturity of competition, number of competitors etc.). However, there were other case studies which could have been included, such as freight operations on the Iberian Peninsula or passenger services in the Netherlands.

Obtaining the appropriate data for the case studies proved to be more challenging than anticipated. The categorisation into OA, PSO, and freight sometimes posed difficulties in

¹³ The availability and reliability of data for railway studies have been studied in great detail by ERA. For more information, please see: [ESG-TF-Data-Quality-Final-report_en.pdf \(europa.eu\)](https://www.era.europa.eu/era-media/11944)

terms of data accessibility, as various countries, RUs, and statistical databases employed differing methods for classification (such as not distinguishing PSO and OA for passengers). Moreover, securing harmonised and consistent data for the same reference periods, particularly concerning pricing information, presented significant hurdles. In certain instances, such as in the case of France, there were gaps in information for some years, which often impeded the comparability between countries and sectors. Overall, it was particularly difficult to find relevant and quantitative data for case studies about the freight sector, especially for pricing. When examining punctuality, it was challenging to obtain sufficient quantifiable data in consistent units, and the root causes of delays were frequently unclear. Rail delays can predominantly be attributed to either IMs or RUs, but without precise knowledge of the responsible party, it becomes challenging to assess the impact of competition on punctuality. Finally, the analysis of the PSO segment could only be based on limited information since the obligation for competitive tendering has entered into force only recently and competition for the market was only present in few cases. Accordingly, the findings for the PSO services should be considered with caution at this stage.

Targeted interviews

Throughout the interviews, participants displayed a highly collaborative attitude and were consistently open to sharing their information and experiences. Nevertheless, understandably, a noticeable inclination on their part to advocate for and safeguard their individual interests, which were closely tied to their respective sectors, was observed. Consequently, the study frequently encountered challenges in maintaining complete transparency and objectivity when considering their responses to assess the impacts of competition in an impartial manner. This aspect also applies to the survey and the interviews conducted as part of the case studies.

3. OPEN ACCESS PASSENGER TRANSPORT

Open Access (OA) competition or competition-in-the-market denotes the form of competition for the transport of passenger by rail, where operators are operating in direct competition on specific lines. With market opening increasing in the last decade, there has been a growing trend of OA competition across Europe on mainly long-distance services. The impact of OA competition on prices and quality varies across regions, and the following narrative provides a cohesive understanding of these dynamics. In summary, the findings related to OA competition have been obtained by several complementary sources and methods, including desk research, a stakeholder survey, interviews, and the following case studies:

- Spain (HSR)
- France (HSR)
- Czechia
- Sweden
- Italy (HSR)
- International HSR
- Austria
- Germany

Table 4 below summarises the findings of the OA case studies on the main parameters examined in this study¹⁴.

Case study	Competition	Price Δ ¹⁵	Quality Δ	Frequency Δ	Demand Δ	Market share of non-incumbent Δ	RU cost efficiency Δ	Mode share of rail Δ
Passenger								
Czechia	OA	↓	↑	↑	↑	↑	ND	↑
Austria	OA	↓ ¹⁶	↑	↑	↑	↑	ND	ND
Italy	OA	↓	↑	↑	↑	↑	ND	↑
Spain	OA	↓	↑	↑	↑	↑	ND	↑
France	OA	↓	↔	↑	ND	↑	ND	ND
Germany	OA	↔	↔	ND	↔	↑	ND	ND
Sweden	OA	↓	↑	↑	↑	↑	↑	↑
Int. HSR	OA	ND	↔	ND	ND	ND	ND	↑

Table 4: Overview of findings: OA case studies

¹⁴ ND: No Data

¹⁵ Δ denotes a change.

¹⁶ Initially, the prices decreased with competition, however, the non-incumbent WESTbahn could not sustain the lower prices through covid. Hence, ticket prices were increasing over time.

3.1. Impact of competition on ticket prices

Overall, the findings from the case studies suggest that ticket prices decreased with competition. For most case studies the study observes a reduction in ticket prices from the start of competition as compared to the ticket prices before competition. This can indicate that operators have been competing to attract passengers by offering lower prices. Beyond the immediate effects of competition, there has been a greater variance across case studies regarding the development of the ticket price. Overall, the ticket prices have been stabilising in the long-term.

Figure 3 below shows the Harmonised Index of Consumer Prices (HICP)¹⁷ for rail passengers, for specific groups of MSs and over a period of 26 years (1996-2022). The HICP trend over this period allows to observe possible effects due to the entry into force of the four legislative packages. As illustrated, MSs where OA competition started early (yellow line)¹⁸ have witnessed a weaker increase in HICP than for the rest of the EU MS (black line) and the EU 25 average (dotted grey line). In economic terms, this is explained by the fact that only in the presence of actual competition would any undertaking consider sharing any generated economic surplus with their customers, by making their prices more competitive (or by increasing service quality).

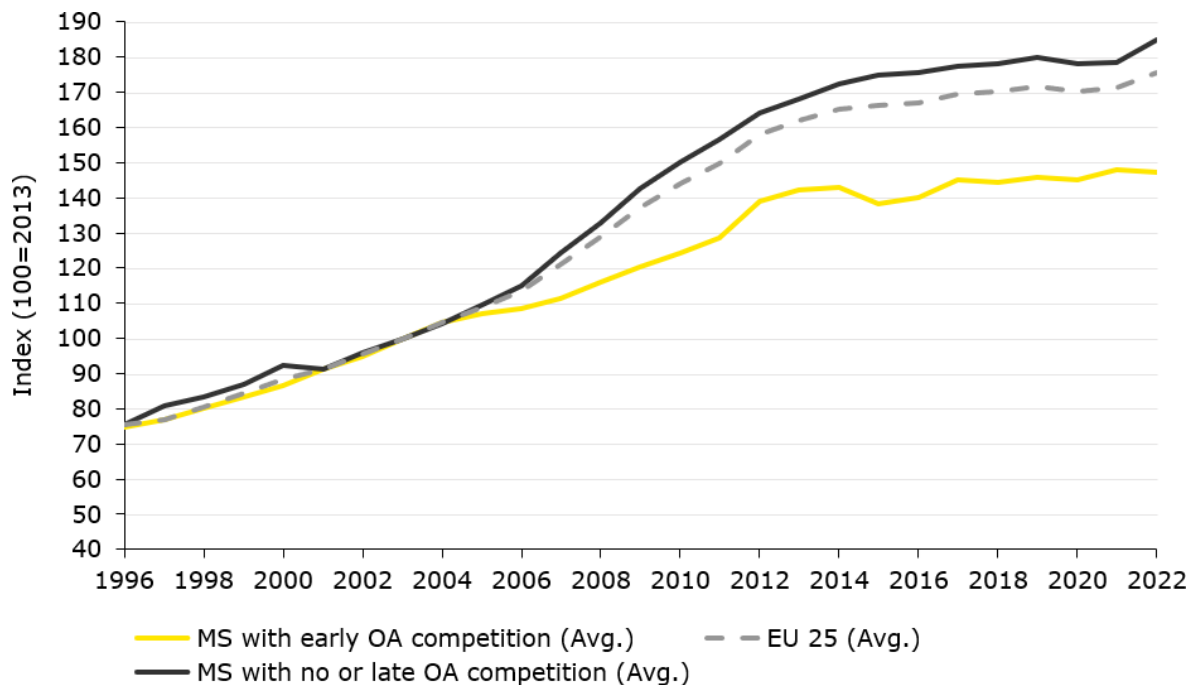


Figure 3: Avg. HICP for passenger transport by railway for selected groups of EU MS (index 100=2003)

¹⁷The data is sourced from Eurostat and has been rebased to 2003 (as opposed to 2015) where the first railway package entered into force. A few caveats should be mentioned in relation to the graph. Firstly, that the HICP for passenger transport by railways (ECOICOP 07.3.1) includes price data on train, tram and underground as well as transport by private vehicles (auto trains). Secondly, that the HICP is set relative to other transport modes and thus is affected by their potential price fluctuations. As a result, the figure above does not display an index of the ticket prices on lines with OA competition and the lower index for markets with early OA competition can't be contributed solely to the presence of OA competition. Nevertheless, certain network effects can be assumed and as such competition on one line could influence lowering ticket prices on other parts of the network.

¹⁸Austria (2011), Czechia (2011), Germany (2001), Italy (2010), Slovakia (2014) and Sweden (2009).

Immediate effects of competition:

Across all case studies, where historical data on prices have been obtained, the average ticket price across operators from before the start of competition to after the start of competition has decreased. Figure 4 below displays the average ticket prices across operators for selected cases with and without competition. On average ticket prices have decreased by 28% on the selected case studies due to a non-incumbent operator entering the market¹⁹. Most notable is the case of the Madrid-Barcelona line, where ticket prices decreased by 43% upon the entry of Ouigo, Renfe Avlo and in late 2022 also Iryo.

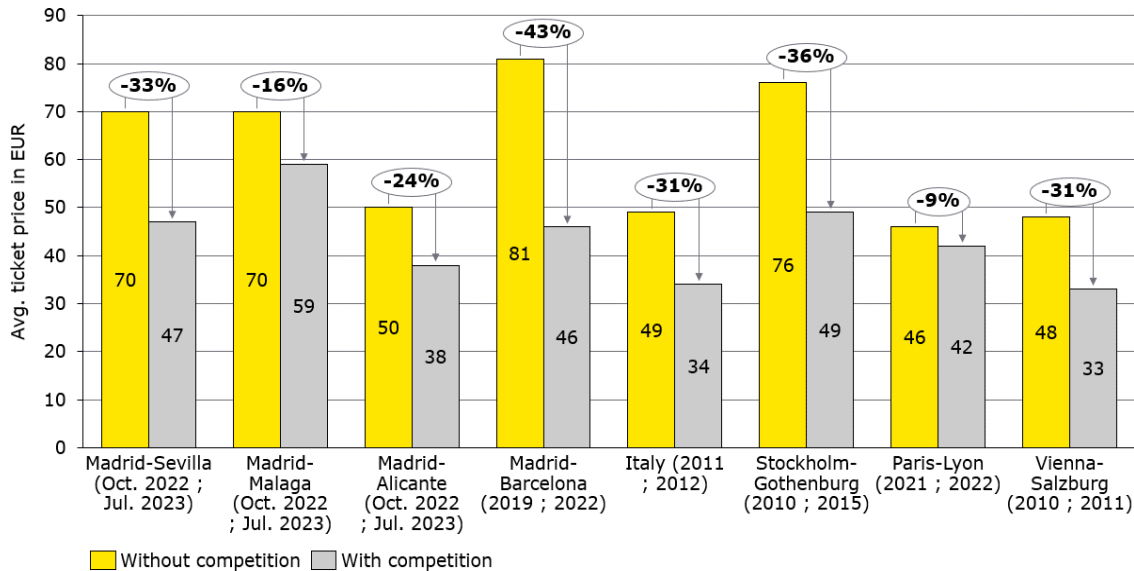


Figure 4: Average ticket prices before and after the start of competition on selected cases²⁰

The decrease in ticket prices highlights the go-to market strategy of the non-incumbent, which enters the market by establishing itself as the cheaper alternative to the incumbent. This effect can, moreover, be seen on the Swedish line between Stockholm and Gothenburg, where the ticket price decreased by 36% between 2010-2015²¹. The price development for Sweden is illustrated in the figure above, where the difference between the reference year of 2010 where SJ was the sole operator and 2015 where MTRX started operating.

One interesting exception is the Paris-Lyon line where ticket prices have only decreased by 9%. This is because Trenitalia's aim in entering the market, rather than competing on price, was actually, to capture additional demand on the line by increasing supply.²². Moreover, interviews with stakeholders suggest that the relatively low decrease would be due to SNCF already charging lower monopoly rents on the Paris-Lyon. In fact, SNCF was already operating a low-cost offer (Ouigo) to compete with other modes²³ on the same

¹⁹ The figure displays the average ticket prices, hence the cheapest ticket in the market with competition is lower than indicated here. For example, in Austria, where WestBahn offered a €17 euro ticket in 2011.

²⁰ The ticket prices are collected at the last point available before the start of competition and the first year after the start of competition. The dates in the brackets indicate when the ticket prices was collected and should be read accordingly (date pre-competition ; date with competition). The following sources were used: [Madrid-\(Sevilla, Malaga, Alicante\)](#), [Madrid-Barcelona](#), [Italy](#), [Stockholm-Gothenburg](#), [Paris-Lyon](#) and Vienna-Salzburg is based on own elaboration. The ticket prices for Madrid-Barcelona and Stockholm-Gothenburg are not from the last year before competition started. On Madrid-Barcelona, competition started in 2021 and on Stockholm-Gothenburg the last year without competition was 2014.

²¹And 53% between 2010 and 2021. See section "1.7 Case study – Open Access, Sweden" of the Annex to this study.

²² See section 1.3 of the Annex to this study.

²³ Patricia Perennes. Intermodal competition: studying the pricing strategy of the French rail monopoly. Transport Research Arena 2014, Apr 2014, Paris, France. fhal-01272287

line²⁴. Lastly, the covid-19 pandemic seems to have decreased ticket prices just before Trenitalia's entry²⁵ and this further constrained price changes in the period (2021-2022).

Looking at the cheapest ticket on offer in the market as illustrated in Figure 5 below, the decrease in ticket prices is even more significant. The cheapest ticket price decreased on average 45% with competition as compared to a situation without competition.

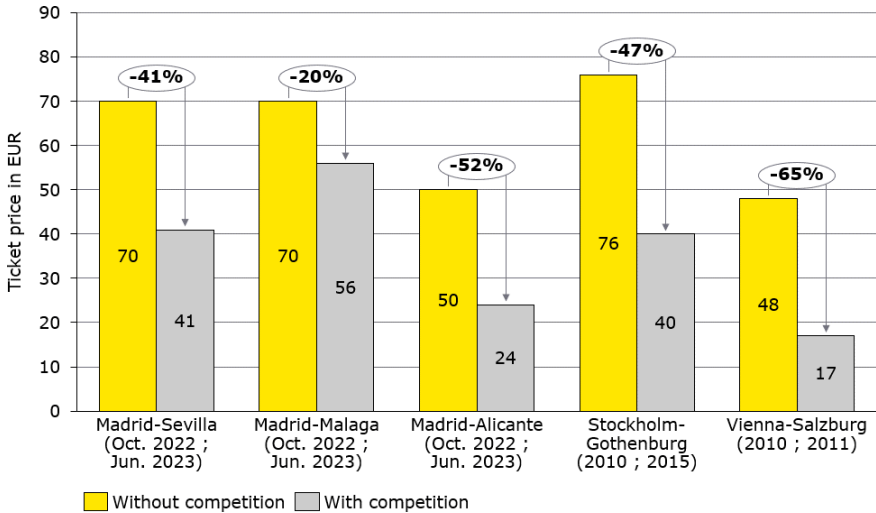


Figure 5: Cheapest tickets offered, with and without competition²⁶

The immediate response of the incumbent operator to the entrance of a competitor varies from case to case. In Austria, the non-incumbent WESTbahn entered the market with an aggressive pricing strategy. However, the incumbent ÖBB did not respond to the challenger when comparing the two's average standard ticket prices. Instead, they began offering special reduced ticket options and introducing dynamic prices where passengers could purchase tickets at a similar level to WESTbahn when purchasing further in advance²⁷. In the Spanish case, the incumbent introduced its own low-cost operators RENFE AVLO as a response to the entry of competitors OuiGo and Iryo. This has the effect on the market of RENFE AVLO being in direct competition with OuiGo and Iryo competing in the same price segment and RENFE AVE focusing on a customer segment with a higher willingness-to-pay and offering additional service. Nevertheless, RENFE AVE has still reduced its prices slightly²⁸. SNCF also introduced its own low-cost operator, IZY, on the Paris-Brussels line in response to competition from the bus and coach market.

²⁴ Laroche, Florent, 2024. "Goodbye monopoly: The effect of open access passenger rail competition on price and frequency in France on the high-speed Paris-Lyon line," *Transport Policy*, Elsevier, vol. 147(C), pages 12-21

²⁵ Idem.

²⁶ Same sources as for Figure 8. The cheapest ticket in the market refer to without competition: the ticket price of the incumbent and with competition, the cheapest ticket offered. The brackets indicate when data is collected. For Sweden and Austria, the prices are based on a yearly average. For the Spanish lines, the prices are based on the CNMC's [report](#).

²⁷ WESTbahn has not introduced dynamic pricing to the same extent as ÖBB.

²⁸ See section 1.1 of the Annex for more information.

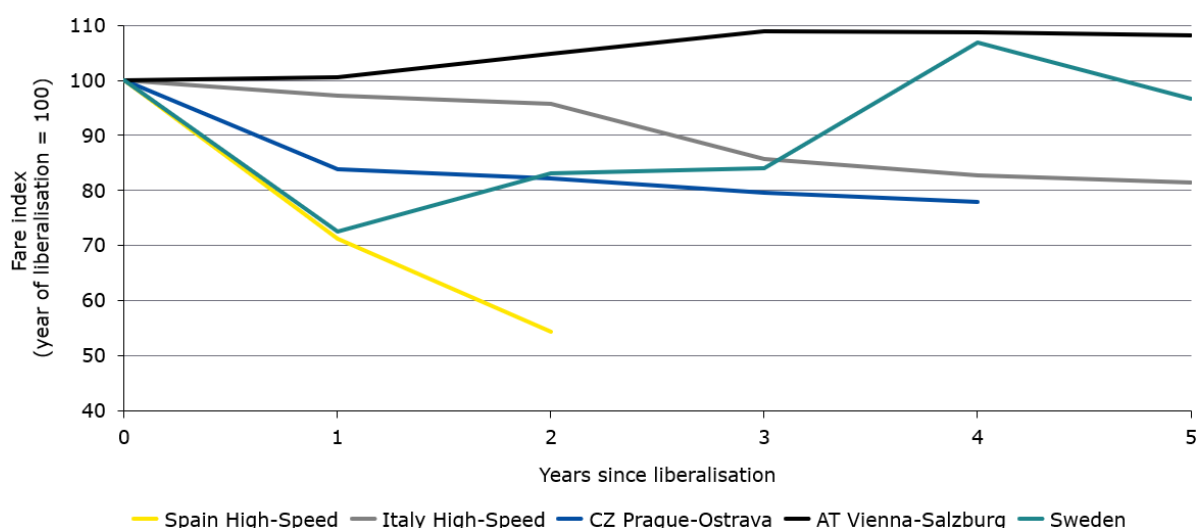


Figure 6: Actual ticket prices (operated as an index) from start of competition and 5 years forward²⁹

Within the first three years, the immediate effect seems to last, as illustrated in Figure 6 above, where the prices for most case studies have decreased in the immediate years after the start of competition. Figure 6 displays the development of the ticket prices on the case studies where actual ticket prices have been collected for this study. This is the result of competition on the ticket prices, which in some cases can be described as an aggressive price strategy between the operators³⁰. Significant ticket price reductions can be observed in Spain, Italy and Czech Republic (Prague-Ostrava). Most notable are the price developments in Spain, where prices have decreased considerably in the first years since market opening. This could be due to the many operators (four) in competition in Spain in comparison with other cases where there are two operators in the market. In addition, the presence of more operators allows for competition among different types of operators (incumbents, non-incumbents and low-cost operators). As a result, there might be less convergence between the operators' pricing strategies. Interestingly, it has not been the strategy of all non- incumbent operators to compete on pricing. Trenitalia France has entered the market on the line Paris-Lyon with the aim of increasing the current supply of seats but with no stated desire to challenge SNCF on pricing³¹.

The survey results shed light on the immediate impact of market opening in the rail sector. One hundred percent of the surveyed stakeholders agree that market opening leads to an increase in the number of market players, akin to non-incumbent operators entering the market. Moreover, 85% of respondents concur that market opening leads to decreased prices/fares in the respective region, aligning with the findings in various case studies, such as in Spain, Italy, and Czech Republic, where prices decreased considerably over the initial years of competition.

Medium to long-term effects:

In the medium to long term, the predominant trend across most case studies shows that the initial decrease in ticket prices tends to stabilise or even increase over time, as observed on the Vienna-Salzburg route in Figure 7 below³². The stabilisation of prices over

²⁹ The figure is operationalised as an index with index 100 at the start of competition to allow for comparison between cases. It has to be noted that the graph starts when there are 2 or more competitors in the market. Hence, it does not include a treatment of pre- and post-competition prices, which is why some cases increase from the start of competition.

³⁰ Case in Czechia for the Prague-Ostrava line (Annex section 1.4).

³¹ See section 1.3 of the Annex for more information. The current operations and pricing strategy on smaller lines and international lines by SNCF could be a potential market for Trenitalia, hence it is not guaranteed that Trenitalia will commit to this strategy on all lines.

³² Some case studies cover markets where competition have started in the last few years. They are the following: France HSR and Spain HSR.

time can be witnessed in the case of Italy, where after initial heavy price decreases, the prices appear to stabilise. There is a tendency for this to occur in OA market situations, where typically only two operators are involved, since operators may not be inclined to compete on prices, as it could be detrimental to their long-term profitability³³. It will thus be interesting to monitor the developments in the Spanish market where multiple operators are present. The presence of a third or fourth, potentially low-cost, operator may hinder reaching the equilibrium and hence could result in prices decreasing even further than in duopolistic market situations³⁴. Nevertheless, the findings of the Prague-Ostrava line indicate that prices decrease to some extent with increased market share of the non-incumbent, as indicated in the figure below.

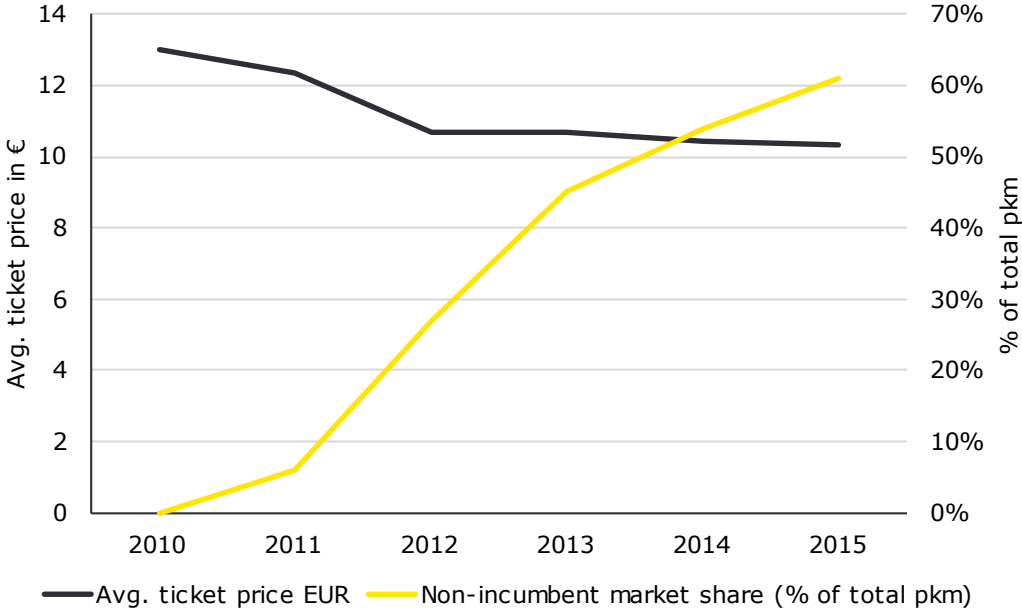


Figure 7: Market developments on Prague-Ostrava (2011-2015)

³³ Montero J.J., Ramos R., Giuricin A. (2016). Open with Care: The Duopoly Model for the Transition to Competition in Long-Distance Passenger Railway Transportation. *Competition and Regulation in Network Industries*, 17(3-4), 241-259

³⁴ Montero, J. J., & Ramos Melero, R. (2022). Competitive tendering for rail track capacity: The liberalization of railway services in Spain. *Competition and Regulation in Network Industries*, 23(1), 43-59. <https://doi.org/10.1177/17835917221082510>

In other cases, there has been a convergence in the prices between the operators. Most notably on the Vienna-Salzburg line where the average daily standard prices of WESTbahn have been increasing since entering the market. Yet, they remained below ÖBB until the 2022 inflation, where it appears that WESTbahn ticket prices have increased to a similar level to ÖBB³⁵.

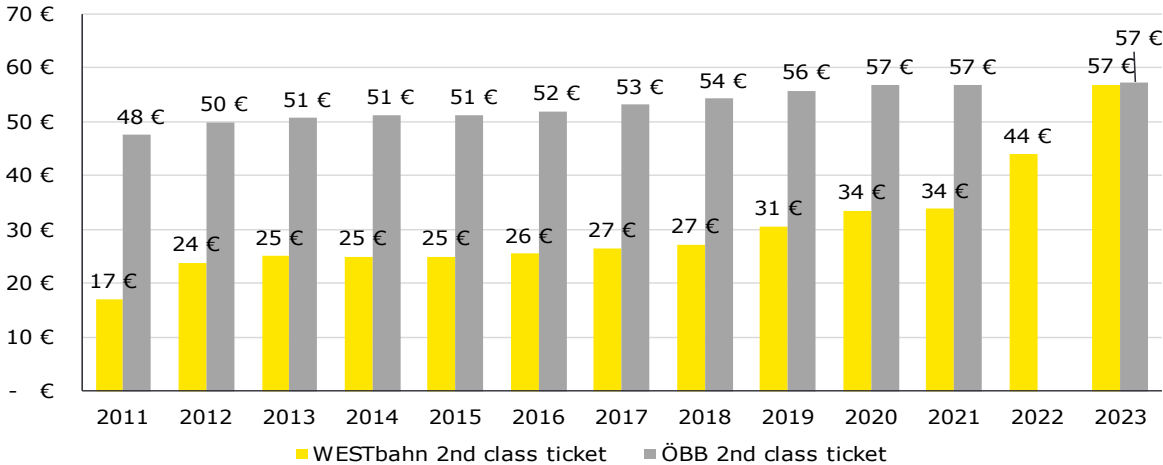


Figure 8: Average standard ticket price, Vienna-Salzburg (2011-2023)

Beyond the two case studies, other factors can be cited as reasons for the stabilisation of the ticket prices. Notably, it is often the case that the non-incumbent will increase their departure frequency, resulting in an increase in their operating costs. The non-incumbent often starts its operations from stations in the suburbs and moves to the main stations after a few years. While it attracts more passengers, the move to serving the central stations comes with higher charges. The case of the effects of COVID-19 and the subsequent energy crisis could indicate that the non-incumbents face more difficulties in keeping low prices when operating costs increase³⁶.

Lastly, the convergence may be due to the ticket prices finding their “natural level”. In a market without competition, the incumbent may impose monopoly rent on lucrative segments, utilising the generated monopoly income to support other segments that might merely break even or operate at a loss. Open access competition primarily concentrates on the lucrative segments, a practice commonly referred to as cherry-picking. Consequently, this competition tends to diminish the monopoly rent set by the incumbent, bringing it closer to the operational costs associated with that specific segment. Hence, with time operators will keep setting prices where they will ensure sustainable margins. However, the benefits to the line with competition could, in the case of high monopoly rents on that line, lead to a potential decrease in services on the other lines on the network as resources would be focused on the profitable line³⁷. This is due to the incumbent losing revenue used on the entire network. In Spain, the IM, ADIF AV, has attempted to counter the issue of cherry-picking by introducing a hybrid competition approach with competitive tendering granting the right to use track capacity and incentivising operators to offer the most possible services on the three Spanish HSR corridors. Operators have higher chances of being granted capacity on Madrid-Barcelona if they also operate on the other lines³⁸.

The survey results also highlight the medium to long-term consequences of market opening. It is noteworthy that 92% of stakeholders agree that business models are affected

³⁵ See section 1.5 of the Annex to this study for more information.
³⁶ This will be discussed in further detail below in the section “Key barriers to entry”.
³⁷ To what extent competition on one line can be detrimental to the network or the size of the monopoly rent was not estimated in detail in this study. However, it was mentioned in interviews.
³⁸ See Montero, J. J., & Ramos Melero, R. (2022). Competitive tendering for rail track capacity: The liberalization of railway services in Spain. *Competition and Regulation in Network Industries*, 23(1), 43-59. <https://doi.org/10.1177/17835917221082510> for a detailed explanation of the Spanish approach.

because of focusing on specific market segments, mirroring the observed trend in various OA market situations where operators adapt to competition by diversifying their ticket options. Lastly, the survey indicates that open access competition is the preferred form of competition; 79% of the surveyed passenger RUs and 100% of the passenger associations state that open access competition is the best to facilitate low prices to passengers.

Effects on pricing strategy:

OA competition has also ushered in some interesting changes and decision in terms of pricing strategies adopted by the operators.

Largely, all analysed operators have adopted dynamic pricing and yield management for their pricing strategies. Notable exceptions include WESTbahn in Austria whose ticket prices have little variation in relation to the time of purchase. Yet, they have progressively introduced dynamic pricing over time. Another exception is Eurostar (formerly Thalys) who on Paris-Brussels appears not to have adopted dynamic pricing to the same extent as on Brussels-Aachen. This could be because on Brussels-Paris, Eurostar has a monopoly while on Brussels-Aachen there is competition to some extent from Flixbus and DB³⁹.

Another aspect on which OA competition is found to have an effect is on the variety of ticket options offered to passengers. As alluded to above, the incumbents have in some case studies introduced new specific low-fare ticket options with little or no flexibility in terms of refunding or modifications to the ticket to compete with the non-incumbents' tickets. In general, the examined non-incumbent operators offer at least two different ticket options while most incumbents offer at least three options (2nd class non-modifiable, 2nd class modifiable, and 1st class). There is a trend towards the non-incumbents offering more options as they settle in the market. The operators can be split up between HSR and non-HSR and within these two main categories based on their ticket options and go-to market strategy: pure low-cost and regular strategy with multiple ticket options catering to all types of passengers.

Pure low-cost operators:

- Mainly one class (2nd class).
- Non-modifiable and modifiable tickets.
- Luggage not included in standard tickets.
- No lounge included.
- Subsidiaries of SNCF operate with double-decker train to increase seat capacity.
- Operators in this group include:
 - HSR: RENFE AVLO, SNCF OuiGo, SNCF Izy
 - Non-HSR: Flixtrain

Regular operators:

- 2 classes (2nd and 1st).
- Within each class the tickets can be bought with different level of modifiability with an effect on the price. Thus, most operators within this group offer 4 ticket options.
- Luggage included on some ticket options, while others resemble the ticket options from the pure low-cost operators.

³⁹ Flixbus is operating busses with longer travel times and hence they are not operating in the exact same segment as HSR. Eurostar and DB both are members of Railteam. See Annex, section 1.8 for more information. On Paris-Brussels, the travel time with bus (where Flixbus operates) is even longer (4h10 by bus v. 1h20 with HSR) than on Brussels-Aachen. Thus, bus can be considered to operate in a different market segment than HSR.

- Subscription possibilities and reduced tickets for seniors, students etc. are offered.
- Lounge included for 1st class passengers on HSR services.
- Operators in this group:
 - HSR: RENFE AVE, SNCF TGV, DB, IRYO, Trenitalia, ITALO, Eurostar
 - Non-HS : ČD, Leo Express, Regiojet, WESTbahn, BB, SJ, MTX

The survey results mirror the observations in the transport industry case studies. Consensus exists among stakeholders that operators can benchmark their fares to competitors, emphasising the influence of competition on pricing strategies. Additionally, like the operators in the transport sector, a significant majority (85%) of respondents concur that market liberalisation leads to an increased offer of different ticket options, reflecting the trend where non-incumbents offer at least two different ticket options and incumbents offer at least three, with some being modifiable, catering to various passenger preferences.

3.2. Impact of competition on quality of services

The quality of services in the railway sector is a pivotal determinant of passenger satisfaction. OA lines, by introducing competition, have the potential to significantly influence the quality of services offered. This section delves into the impact of competition on the quality of services on OA lines, drawing insights from the case studies and targeted interviews.

Service Enhancements

Competition has ushered in a new era of upgraded amenities and offers both onboard trains and at stations. Some general trends can be observed across the case studies, which are that non-incumbents have entered the market with free wi-fi equipped on-board trains, which in some cases have prompted the incumbent to follow suit where it did not have wi-fi already. In Czechia, the entrance of first Regiojet and then Leo Express, who entered with modern rolling stock, prompted ČD to invest in upgrading its rolling stock. As a result, all operators in Czechia operate with trains equipped with free wi-fi, power sockets, transport of over-sized luggage and in-seat refreshments⁴⁰.

In Spain and Italy, all operators offer free wi-fi onboard, however some differences between the two market exists. In Spain, there are two market segments with the first consisting of Iryo and RENFE AVE offering the classic HSR service quality directed towards businesspeople with lounges and similar. The second is the pure low-cost offer consisting of RENFE AVLO and OuiGo, where only necessities are offered. As such the Spanish market can be split in competition based on quality (Iryo and Renfe AVE) and competition based on price (OuiGo and RENFE AVLO). In the Italian market, no low-cost operators have entered the market and Italo and Trenitalia compete in a segment similar to that in which Iryo and RENFE AVE operate⁴¹.

Operators are also focusing on the entire travel experience with operators offering public transport tickets to reach the final destination (Renfe) or bus to go beyond the railway stations (Italo and Trenitalia). The improvements in service quality have to some extent been borne by investments in rolling stock made by the non-incumbents. Different approaches to the investments in rolling stock have been taken. Notably, Italo stands out as they invested in new high-speed rolling stock when launching their services in 2012. However, due to the large costs associated with investing in new rolling stock⁴², most new independent entrants, such as Leo Express, either lease or purchase second-hand rolling

⁴⁰ See section 1.4 of the Annex to this report.

⁴¹ The four operators competing in this segment can also be considered to compete on frequency. See the part on frequency for more info and [Beria et al. \(2023\)](#).

⁴² This is cited by many stakeholders as a key barrier to entry for operators. See more in section 4.3 for discussion of this and its impact.

stock. The third case is that some non-incumbent operators who are funded by or are subsidiaries of incumbents in other countries such as OuiGo. In this case, the operators make use of their mother companies' rolling stock. The approaches have, to a varying extent, affected the incumbent by making it invest in upgrades to its rolling stock. Most notably in cases such as in Czechia and Austria, where the incumbent either upgraded its rolling stock (Austria) or purchased new rolling stock (Czechia). However, it must be noted that there are considerable differences between competing in HSR as opposed to non-HSR. For HSR, the second-hand rolling stock market is virtually non-existent and given that the pre-dominant market segment is business travellers it would be difficult to compete on second-hand rolling stock not equipped with all amenities. For non-HSR, there is a second-hand market and leasing market, and operators would have a greater ability to compete with second-hand rolling stock by setting lower prices. Interestingly, in this category a switch to investing in new rolling stock and quality occurred as the market share of non-incumbents grew.

The survey reveals a consensus among stakeholders regarding the positive effects of market liberalisation. Moreover, 92% agrees that liberalisation has led to an increased supply of services, reflecting a broad expansion in options for passengers. Furthermore, 85% concur that liberalisation has contributed to the availability of low-cost rail services, making rail travel more accessible.

Punctuality and frequency

Punctuality, reliability, and frequency have also become a focal point in some regions. Sweden's MTRX, for instance, introduced better amenities and improved punctuality on its Stockholm-Gothenburg line. Punctuality, however, is a difficult metric to measure quality since data on delays often include delays caused by the IM or the infrastructure in general. In fact, lines with OA competition may become the victim of their own success. In the Italian case, the increased frequency on the network has saturated the network with the result of increased delays. In 2022, 67,1% of the trains were punctual (less than 5 min. delay)⁴³.

Frequency is a key performance indicator given that increased supply, in terms of more departures per day, increases the availability of rail and flexibility for the passengers in deciding when to travel. Increased supply will in turn lead to increased demand, given that the elasticity of the demand to the offer is very strong (the more there are available trains, the more passengers would see the train as a reliable and available choice and demand will increase). This also makes more passengers switch to rail from other modes. Figure 9 below displays the development in departures per day for Vienna-Salzburg and Stockholm-Gothenburg. On both lines frequency has increased with competition. On Stockholm-Gothenburg, where 2010 marks when SJ had a monopoly, the departures per day increased by 33% between 2010 and 2019⁴⁴. In Austria, frequency has increased by 40% from 2012 to 2023 after WESTbahn entered the market in 2011⁴⁵. In Italy, frequency increased by 56,4% between 2010 and 2013 on the Rome-Milan line⁴⁶.

⁴³ Microsoft PowerPoint - Puntualità valori consuntivo 2022 - obiettivi 2023 (rfi.it)

⁴⁴ [Utveckling av utbud och priser på järnvägslinjer i Sverige 1990-2021 \(transportstyrelsen.se\)](https://transportstyrelsen.se/utveckling-av-utbud-och-priser-pa-jarnvagslinjer-i-sverige-1990-2021)

⁴⁵ Data: EY elaboration.

⁴⁶ Bergantino A.S. (2015). "Incumbents and new entrants," in Finger M., Messulam P. eds , rail economics, policy and regulation in Europe, Edward Elgar Publishing, 171-209.

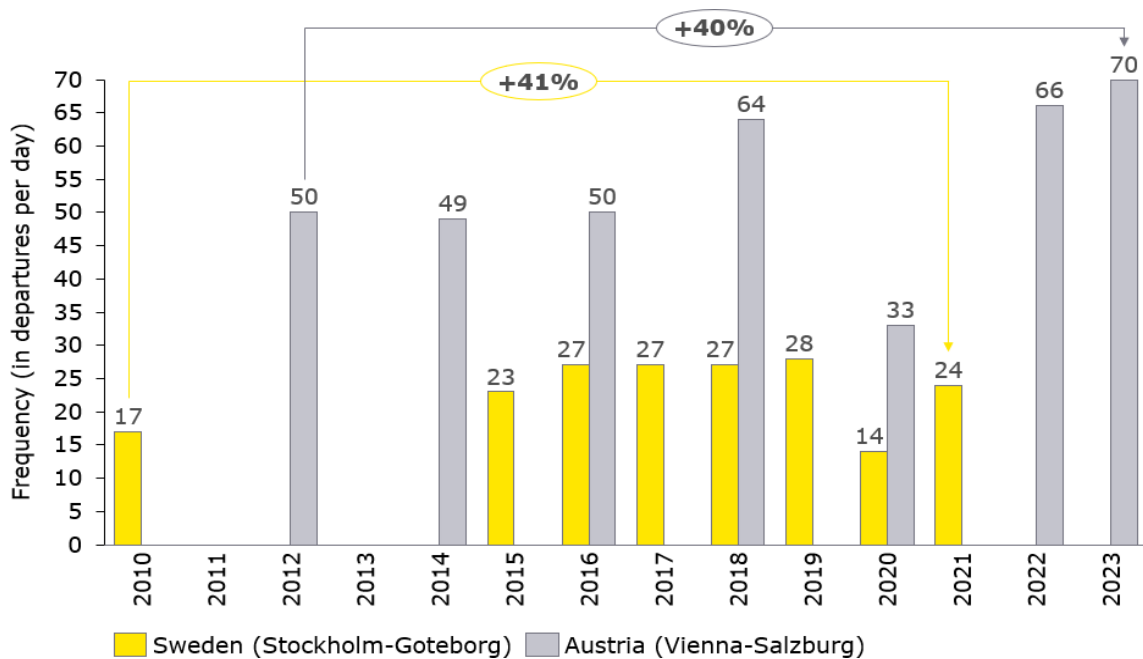


Figure 9: Development in frequency in Austria and Sweden

Frequency has also increased considerably in Spain as a result of competition. However, the Spanish model of OA competition is different from other models. Operators bid on operating on the lines for a 10-year period, thereby obligating themselves to run a certain number of departures per day. Thus, the Spanish model is a hybrid between competition in the market and for the market.

According to the survey, 46% agree that market opening has increased the punctuality of services in their respective regions. This indicates that challenges in maintaining punctuality persist, possibly due to factors not specifically relating to competition. Meanwhile, the substantial increase in service frequency, akin to the Vienna-Salzburg and Stockholm-Gothenburg lines, echoes the link between market opening and improved service options.

3.3. Impact of competition on demand

A derived effect from the decrease in price and improvement in service quality is the increase in demand for rail. The two main effects of OA competition mentioned above makes rail a more attractive form of transport for passengers both in terms of induced demand and of passengers switching to rail from other modes.

As illustrated by Table 5 below, the introduction of competition has led to considerable increases in demand for rail. Not only has the demand for rail increased, the mode share of rail has also increased significantly for the two cases where data is available. In both

Spain and Italy, aviation has been completely outcompeted by rail on domestic connections with the rail mode share in both cases being above 70%. Other case studies indicate that demand has increased after the start of competition. However, no data is available for the specific lines and hence the effect has been inferred from the entire network. As a result, these findings have not been included in the table below. These findings are key to understanding the wider implication of competition on society, since a mode shift to rail will reduce the external costs of transport considerably and hence provide large societal benefits⁴⁷.

⁴⁷ [Smart and affordable rail services in the EU: a socio-economic and environmental study for High-Speed in 2030 and 2050 - Europe's Rail \(europa.eu\)](#)

Case study	Demand increase since comp. Start	Increase in rail mode share
Spain HSR	167% ⁴⁸ (avg. across lines)	25 percentage point increase in first two years of comp. on Madrid-Barcelona ⁴⁹
Italy HSR	64% ⁵⁰ (2012-2017)	18 percentage point increase from 2012 to 2017 ⁵¹ .
Czechia (Prague-Ostrava)	154% (2011-2019) ⁵²	No data.
Austria (Vienna-Salzburg)	25% (2013-2016) ⁵³	No data.

Table 5: Effects on demand of competition from the case studies⁵⁴

Certain caveats surrounding the findings above must be noted. Firstly, the factors influencing the demand for transport, although being very important, goes beyond price and quality. The general wealth of a society and its citizens has a great impact on the propensity to travel with rail. Moreover, the infrastructure has a significant effect. In the Italian case, competition was introduced at the same time as the infrastructure was finalised and hence it's difficult to isolate the effects of competition. Secondly, in some cases, especially for HSR, railway will outcompete other modes simply by being a better mode of transport for that connection without competition. Examples of such cases are Paris-Lyon⁵⁵ and Paris-Brussels.

⁴⁸ EY elaboration based on [4889759.pdf \(cnmc.es\)](https://www.cnmc.es/4889759.pdf). The high growth is carried by the Madrid-Barcelona line, where competition started immediately after reopening of society post-Covid. The average growth for all lines from Q2 2022 to Q2 2023 was 42%.

⁴⁹ [Evidence Shows There Could Be 50% Modal Shift To Rail If Competition Were Introduced Onto More Long-Distance Routes in Europe | ALLRAIL - The Future of Passenger Railways](#)

⁵⁰ Antoniazzi, F., Giuricin, A. & Tosatti, R. (2019). Introducing competition in Italian high-speed rail. *L' space géographique*, 48, 329-349. <https://doi.org/10.3917/eg.484.0329>

⁵¹ Idem.

⁵² Case study on Czechia.

⁵³ Finger M., Kupfer D., Montero J.J. (2016). Competition in the Railway Passenger Market. Florence School of Regulation Research Project Report, Florence School of Regulation, European University Institute in cooperation with UNED, S. Domenico di Fiesole.

⁵⁴ Only data from the specific lines where OA competition is present has been included.

⁵⁵ There is competition on Paris-Lyon currently, however, the TGV has been successful in attracting passengers prior to competition as well.

3.4. Market characteristics and developments

Inherent to its term and definition, OA competition is the form of competition where operators can freely access the infrastructure upon paying track access charges and meeting certain requirements. However, new entrants face a series of barriers to enter the market, and upon entry, to compete on a fair level with the incumbent. This section presents and discusses the main findings from the study.

Barriers to entry and to operate on fair conditions

Access to rolling stock:

Access to rolling stock for prospective operators is cited as a major obstacle by the interviewed stakeholders. It is mainly related to the large investment needed to acquire the rolling stock prior to even starting operations. As alluded to above, there are differences in how large the barrier is between HSR and non-HSR operations.

Non-incumbent HSR operators⁵⁶ would need a multi-million euro starting capital to enter the HSR market. This is due to the non-existent second-hand market and leasing market for HSR rolling stock, which would eventually help reduce the initial investment. Purchasing new HSR rolling stock presents a major investment⁵⁷. For example, the cost of Italo's 25-unit Alstom fleet when they started operations in Italy accounted for €618m out of a €769m start-up budget⁵⁸. As a result, most HSR competition is between national incumbents who are already operating HSR services, save for the case of Italo and to some extent Iryo⁵⁹. For non-HSR, there is a rather developed second-hand market in addition to a leasing market. Hence, independent operators face less of a barrier to entry than for HSR. Lastly, there are also issues surrounding the homologation of rolling stock and the rail infrastructure interoperability when entering new markets. Vehicle owners must demonstrate compliance with national operational rules and the authorisation process can be costly and cumbersome⁶⁰. With regards to traffic management system, ERTMS deployment is definitely a key enabler of competition, as can be observed in Spain where ERTMS deployment facilitated the entry of international operators⁶¹.

The cost difference between HSR and non-HSR rolling stock could have the effect of determining the market players for OA competition. The markets would be split in two: 1) HSR market consisting mainly of national incumbents competing in the respective national networks. However, this comes with the risk of operators making "gentlemen agreements" as they would not be interested in starting a price war, which could hurt them in their own market. Thus, passengers would benefit from increased frequency to the extent the infrastructure can absorb it. 2) non-HSR market with many smaller independent operators competing with incumbents on key routes. To some extent, this segmentation is happening already.

Regulatory barriers:

In one case, Poland, the study found claims of regulatory barriers to entry for new entrants in domestic OA services. New services must be notified to the regulator and the regulator may have to perform an Economic Equilibrium Test (EET) of all concerned operators and

⁵⁶ Here reference is made to operators who are not tied to a national incumbent. They can hence be considered as independent. An example is Italo.

⁵⁷ [IR: añadir algo del Funding gap y de la Guía Europea \(uni-muenchen.de\)](#)

⁵⁸ [NTV unveils Italo trains - International Railway Journal \(railjournal.com\)](#)

⁵⁹ Trenitalia holds a 45% stake in Iryo. [Globalvia takes stake in Iryo ahead of November launch | News | Railway Gazette International](#)

⁶⁰ [L'A T publie une étude sur les systèmes de sécurité dont doivent être équipés les trains pour circuler sur les lignes à grande vitesse et formule des recommandations pour lever un frein majeur à l'entrée sur le marché français - ART \(autorite-transport.fr\)](#)

⁶¹ See presentation of ADIF at the ERTMS 2024 Conference: [1.5. Dominguez-ERTMS as facilitator for railway liberalization.pdf \(europa.eu\)](#)

their operations demonstrate that there is no negative impact on the active PSO contracts⁶². UTK, the Polish regulator, will then make a ruling on the access to the infrastructure. Nevertheless, there has been both public and academic debate on the previous decisions of UTK to grant or not to grant access to the Polish network⁶³. Currently, only 2% of passengers are carried by services other than PSO and most of them are carried out by publicly owned entities⁶⁴.

Ticketing:

Stakeholders have emphasised ticket vending as one of the key market entry barriers and barrier to fair competition. The acute issue lies in the dominance of the incumbent operator over the ticket vending system. The incumbent owns the physical ticket vending machines in the stations and is moreover synonymous with railways⁶⁵. There are independent ticket vendors in rail, such as OMIO and Trainline, like in aviation. However, they hold miniscule market shares and are mostly used for cross-border journeys. As a result, passengers mainly search for tickets with the incumbent and may not be aware of a competitor. This fact is crucially hindering competition since it is difficult for non-incumbents to increase their market share if passengers do not know they exist.

Both non-incumbent operators and ticket vendors face barriers in ticketing. While non-incumbents have their own websites and are present on independent ticket vending sites, they have difficulty in selling their tickets in the train stations. This is due to the high costs associated with installing the vending machines and the limited space in the stations for vending machines⁶⁶. Moreover, ticket vendors face barriers in accessing real-time traffic data from the incumbent operators. In Germany, the Bundeskartellamt found that DB had been in violation of competition law by abusing its dominant position on ticket vending platforms. DB had restricted access to real-time traffic data for third-party providers and by having imposed advertising bans on third-party providers, hereby strengthening the position of its own platform DB Navigator⁶⁷.

Access to infrastructure and to service facilities:

Access to infrastructure and to service facilities, such as maintenance depots, sidings and certain stations (both in terms of train paths and services in the stations) have also set barriers for the non-incumbent. In Italy, Austria and Czechia, the non-incumbents faced issues in accessing infrastructure necessary for their operations or had extra imposed charges to access the infrastructure. Notably, in Austria, WESTbahn lodged complaints before the European Commission, the Court of Justice and local courts for violations of different legislation by ÖBB. The complaints varied from illegal subsidies benefiting ÖBB to station access fees imposed upon WESTbahn⁶⁸.

Interviewed stakeholders have indicated the high track access charges (TAC) can be a barrier to entry. This varies from country to country and if the type of railway service is

⁶² An EET is not a regulatory barrier itself, but a legal requirement set at EU-level and not performed only in Poland.

⁶³ For more information and a discussion of this see: section 1.12 of the Annex to this report, Krol, M., Taczanowski, J., Jarecki, S., & Kolos, A. (2019). Publicly-owned operators can also challenge incumbents. New cases of open-access passenger rail competition in Poland. *Journal of Rail Transport Planning & Management* and the [ALLRAIL](#) article on the matter.

⁶⁴ See section 1.12 of the Annex to this report.

⁶⁵ This can vary dependent on the maturity of the market competition. Some authors have identified that in mature markets, non-incumbent may have an advantage by not being associated with an operational legacy. See Tomeš & Fitzová 2019, Does the incumbent have an advantage in open access passenger rail competition? A case study on the Prague–Brno line, *Journal of Rail Transport Planning & Management*, Volume 12.

⁶⁶ See section 1.5 of the Annex for an example from Austria. The issue of physical ticket vending at station will become less critical with digitilisation and increased use of online services to purchase tickets.

⁶⁷ See section 1.6 of the Annex to this report.

⁶⁸ See section 1.5 of the Annex to this report.

freight or passenger. In particular, HSR traffic is characterised by high TACs⁶⁹ and hence both in Italy and France there have been attempts to incentivise new entrants by regulating track access charges⁷⁰. In France, a system of TAC discounts has been set in place for new entrants in the first years of operations. TACs are reduced through a discount of 37% of the “redevance de marché” part of the track access charges aiming at compensating IM’s fixed costs) the first year, 16% the second year and 8% the third year⁷¹. In Italy, purposefully low track access charges over a longer time frame have been mentioned as a key factor in fostering the current competition between Italo and Trenitalia⁷².

The role of regulatory bodies in fostering competition:

In OA markets, as found in the case studies, regulatory bodies often play an important role in fostering optimal competition. Their primary function is to ensure non-discriminatory access to railway infrastructure, preventing market dominance by incumbent operators and allowing new entrants to compete effectively. These bodies are also responsible for monitoring market dynamics, identifying and rectifying any anti-competitive practices. This includes overseeing track access charges and capacity allocations to ensure level market conditions for all operators.

A notable case is the Italian high-speed rail market, which has seen significant developments over the past 12 years. Initially, the private operator Italo faced financial challenges, but these were resolved through a series of strategic and regulatory interventions. These included debt renegotiation, regulatory changes, the reduction of access charges, the cessation of unfair commercial practices by the incumbent, and crucially, gaining access to main stations in Rome and Milan. This last point was particularly significant as Italo was initially only permitted to serve secondary stations in major cities.

Legislative changes in Italy since 2003, preceding the EU legislative package, have enabled open access in the railway sector. In 2014, ART made a pivotal decision to reduce the access charge structure for high-speed lines by approximately 36%, dropping from about 12.8 €/train-km to 8.2 €/train-km. This significant reduction in access charges was a major step in fostering competition, making it more financially viable for new entrants like Italo to compete with incumbent operators.

This case exemplifies the multifaceted role of regulatory bodies in OA markets. By adjusting the regulatory framework and ensuring fair access to essential infrastructure, ART not only levelled the playing field for new entrants but also contributed to the overall health and competitiveness of the Italian high-speed rail market.

The proactive intervention of regulatory authorities in OA markets, as demonstrated by Schienen-Control GmbH against the incumbent operator in Austria, is essential in promoting a competitive environment. Such actions encourage operators to innovate and improve their offerings, leading to better pricing, service quality, and overall customer satisfaction.

⁶⁹ See figure 41 of the 6th RMMS report: https://transport.ec.europa.eu/system/files/2019-02/6th_rmms_report.pdf

⁷⁰ Similar policy has been introduced in Sweden for non-HSR operations. See section 1.7 of the Annex to this study for more information.

⁷¹ See section 1.3 of the Annex to this report for more information.

⁷² Christian Desmaris, Fabio Croccolo. The HSR competition in Italy: How are the regulatory design and practices concerned? Research in Transportation Economics, 2018, 69, pp.290-299. [10.1016/j.retrec.2018.05.004](https://doi.org/10.1016/j.retrec.2018.05.004). [ffhalshs-01825881](https://www.researchgate.net/publication/3255881)

3.5. Conclusion

This study has found that OA competition, across a variety of different cases, both decreased ticket prices and improved the quality of the service as compared to the situation prior to the start of competition. These two main effects have resulted in making railways more attractive to passengers, thereby increasing demand for rail, and shifting passengers to rail from competing modes.

Despite the clear benefits of competition for passengers, there are several challenges which impede reaching the full potential of competition. Firstly, the current state of the infrastructure in some countries and the limited available capacity continue to restrain the potential increase in traffic. This limits the potential improvements of service quality (such as increased frequency and punctuality) but also hinders reaching the milestones set out in the European Commission's Sustainable and Smart Mobility Strategy. Secondly, ensuring easy access to all types of rolling stock is key to lower the market entry barriers for operators as well as easing the homologation of the rolling stock. Thirdly, ensuring equal access to ticket vending platforms for operators is crucial for ensuring the passengers' awareness of competition. Lastly, introducing track access charges rebates for operators in their first years of operations could incentivise more new entrants.

4. PASSENGER TRANSPORT UNDER PUBLIC SERVICE OBLIGATIONS

Where PSO services are awarded through competitive tendering (*competition for the market*) operators bid against each other to obtain the right to operate a bundle of railway services, subject to public service obligations imposed by competent authorities for a pre-defined period. This section delves into the impact of competitive tendering and direct award for PSO services. The effects of competition are assessed by comparing selected case studies with and without market opening (i.e. competitive tendering) as done for OA services. However, it is premature to draw firm conclusions on the effects of competition in the PSO segment, since competitive tendering is in its infancy in most of the Member States, and even in the countries selected for the case studies, with the exception of Germany, competitively awarded PSOs represent a very small percentage of overall traffic. As was the case in the OA section, this section presents the findings of the desk research, survey and targeted interviews, and the following case studies⁷³:

- France PSO – Région Sud and Région Hauts de France (HDF) (competitive tendering).
- Denmark PSO (one competitive tender, two direct awards).
- Poland PSO (direct award with an analysis of the interactions between OA services and PSO services in the Polish market).
- Germany PSO (competitive tendering).

Since PSO operators are usually constrained in their price setting freedom by the conditions imposed by the competent authorities in their contracts (either directly awarded or competitively tendered), the parameter of price is considered not relevant for the assessment of the effects of competition on PSO services. Also, quality and frequency of the PSOs services offered can depend to a more or less large extent on the competent authorities' requirements. Market opening of PSO services via competitive tendering acts as an enabler for the transfer of benefits to the passengers. Those benefits can be passed on to users in terms of lower prices, better quality, and higher frequencies at the same cost for the competent authorities. However, competent authorities may also decide to reinvest in other sectors the savings made when they receive the same rail service at a lower cost.

4.1. Impact of competition on final prices

Implications of public regulation of fares

Fares for PSO services, just like other criteria such as frequencies, geographical coverage and service quality, are typically set by the competent authority. Operators have limited leeway to alter fares and are generally confined to offering promotions within a predetermined framework. Consulting firms, employing traffic modelling tools, are typically commissioned to set regional /prices, which means that ticket prices are not directly influenced by the introduction of competition for the PSO market⁷⁴. As a result, the main effect of competition for the market takes the form of savings of public money spent by the awarding authorities and, ultimately, by the taxpayer on PSO contracts.

In France, the PSO competitive tenders in Région Sud and Région Hauts de France were designed in such a way as to primarily enhance service frequencies rather than reduce train fares.

⁷³ It has to be noted that the period under study in some case studies fall entirely within a contract and hence changes due to tendering are difficult to estimate. Additional interviews have been made in these cases to fill in the gaps in data.

⁷⁴ See section 1.9 of the Annex to this study.

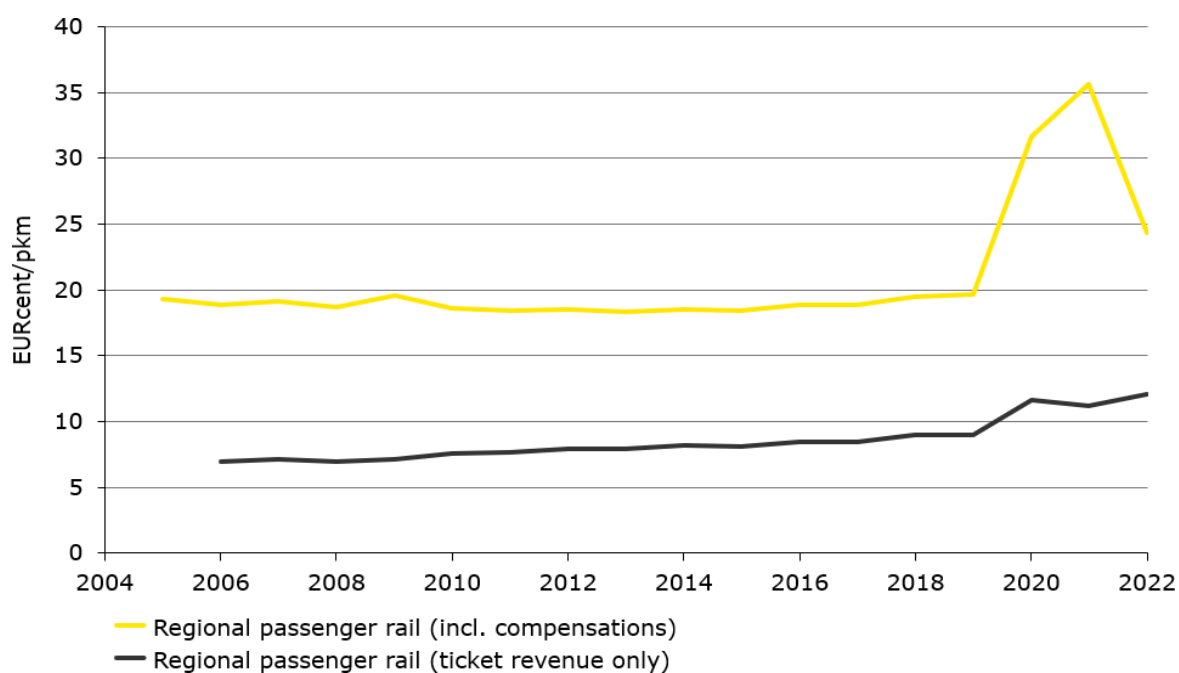


Figure 10: Evolution in customer prices in Germany (source: Bundesnetzagentur)

In the Danish railway system, the rail regulator sets fares using a model that accounts for various macroeconomic factors, including inflation, fuel costs and others. The Danish Authority for Traffic (Trafikstyrelsen) oversees and controls ticket prices by imposing a cap on the annual increases. However, if an operator does not utilise the permitted fare increase in one year, it is allowed to exceed the cap the following year. This cap is applied to the average of all standard tickets, allowing for differential pricing across routes. For instance, in 2024, the ceiling is set at 10.3%, and operators like DSB plan to apply the maximum permitted increase, sparking public discourse on the balance between the cost and quality of rail services. It's estimated that the anticipated price hike outpaces the consumer price index, raising concerns about the affordability of train travel⁷⁵.

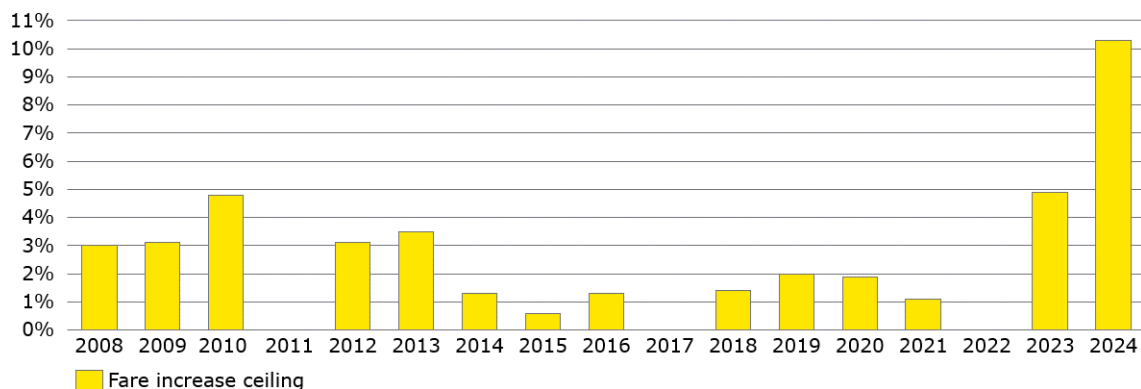


Figure 11: Development of fare increase ceiling since 2008 (DK)

In Germany the competitive tendering of regional PSO contracts produced important savings for competent authorities estimated in around EUR 0.2 billion over the period from 2005 to 2019 (taking into account inflation). The subsidy per passenger-km passed from EUR 0.14 per km in 2005 to EUR 0.11 in 2019. The positive effects extended to revenues of tendered regional operators, being DB subsidiaries or other operators, increasing by 90% between 2005 and 2019⁷⁶. Looking at the regional PSO ticket revenue in EUR cent/pkm the trend is slightly increasing, suggesting that the competent authorities did

⁷⁵ See section 1.10 of the Annex to this study

⁷⁶ Rail Partners (2023) *Track to Growth: Creating a dynamic railway for passengers and the economy*. [Rail Partners - Track to Growth.pdf](#)

not use these savings to reduce PSO fares but likely used for improving the passengers' experience as confirmed by the quality reports of the public transport authorities showing that competitively awarded services are rated significantly better than the others⁷⁷.

Effects on pricing strategy

Although prices are usually regulated by contracting authorities in PSO services, the operators have varying degrees of flexibility in setting their pricing strategies.

In France's Région Sud, while operators do not have the autonomy to adjust ticket prices, they can propose promotional operations within a set framework. Unrelated to the competitive tendering of the services, a new pricing scheme was introduced in 2023 by the region, emphasising frequent users and commuters and hereby breaking with the old system of discount cards.

While, for the reasons explained above, intra-modal competition does not exert pressure on PSO prices, intermodal competition may affect PSO pricing strategies. For example, in Denmark, demand growth in the long-distance bus market led the national incumbent DSB to adopt and expand the coverage of the cheaper *Orange* ticket. The *Orange* ticket is limited in quantity and can only be used for travelling outside rush hour.

The findings from the survey indicate that 69% of stakeholders agree that PSO operators can benchmark their fares to competitors from other modes of transport. Additionally, 46% of stakeholders agree that market opening has increased the offer of different ticket options.

4.2. Impact of competition on quality of services

The introduction of competition in the PSO rail markets has also played a role in reshaping the quality of services offered to passengers. Since ticket prices are defined by the contracting authority, service quality emerges as a key differentiator.

Service Enhancements

In Région Sud, France, competitive tendering will potentially lead to heightened service quality. The increased service quality would come because of a condition in the call for tenders made by the region. The condition states that the winning operator must come with a supplier for new rolling stock. The winning bid for the "Métropoles" lot included the Bombardier OMNEO double-decker trains⁷⁸. This development is further complemented by the region's commitment to funding the rolling stock and associated infrastructure. The focus on service quality extends beyond hardware, with the implementation of comprehensive Key Performance Indicators (KPIs), encompassing punctuality, train composition accuracy, information dissemination to travellers, and effective communication from staff both on-board and in stations⁷⁹. In fact, the drive for awarding contracts competitively in Région HDF was to improve the service quality which had been decreasing with SNCF as the operator.

However, in Denmark, a lack of political support in terms of financing had led to the decline in service quality on trains, with issues such as unstable Wi-Fi and reduced on-board facilities, including catering. Notably, this has been reported both on lines operated by DSB (direct award) and Arriva (competitive tendering). However, in response to these challenges and possibly influenced by competition from long-distance bus services, DSB has re-introduced on-board catering in collaboration with 7-Eleven. Additionally, the political sentiment recognising the need for enhanced service quality led to the procurement of the Alstom Coradia Stream trainsets, a significant investment aimed at upgrading the current

⁷⁷ See: [Bundesnetzagentur - Marktuntersuchungen](#)

⁷⁸ [New Omneo trains for Transdev's Marseille-Nice line | RailTech.com](#)

⁷⁹ See section 1.9 of the Annex to this study

fleet⁸⁰.

According to survey results, it appears that the introduction of competition has indeed led to positive service enhancements. The survey indicates that 69% of respondents agree that market liberalisation has improved the quality of services for end-users.

Punctuality and frequency

In the French Région Sud the new competitively awarded PSO contract will considerably increase the frequency on the lines. Specifically, there will be a +110% traffic increase on the “Métropoles” lot and a 53% increase in traffic on the “Azur” lot. This increase in the supply of services and thus flexibility for the passenger has been enabled by increased cost efficiencies. In the French case, the efficiency gains produced by competitive tendering were used by the Regions to obtain higher frequencies for the passengers at the same price paid in the previous PSO contract awarded without competition for the market.

In Denmark, the frequency is set by the contracting authority, and operators adhere to these specifications. Arriva's contract includes a bonus/malus scheme that focuses on customer satisfaction and punctuality, indicating an emphasis on timely service. Figure 12 below shows the development of the bonus/malus scheme for Arriva and the train-km produced. The figure below shows the development of the bonus/malus scheme for Arriva and the train-km produced. Overall, it can be inferred that with stable pre-COVID train-km bonus for customer satisfaction remained more or less stable, whereas punctuality -even if still allowing a bonus – was performing less well. Cancelled trains at the fault of Arriva appears to be an issue for which malus paid by the company increased over the years. The strong rise in cancelled arrivals in 2021 and 2022 can be explained by the COVID-19 pandemic measures.

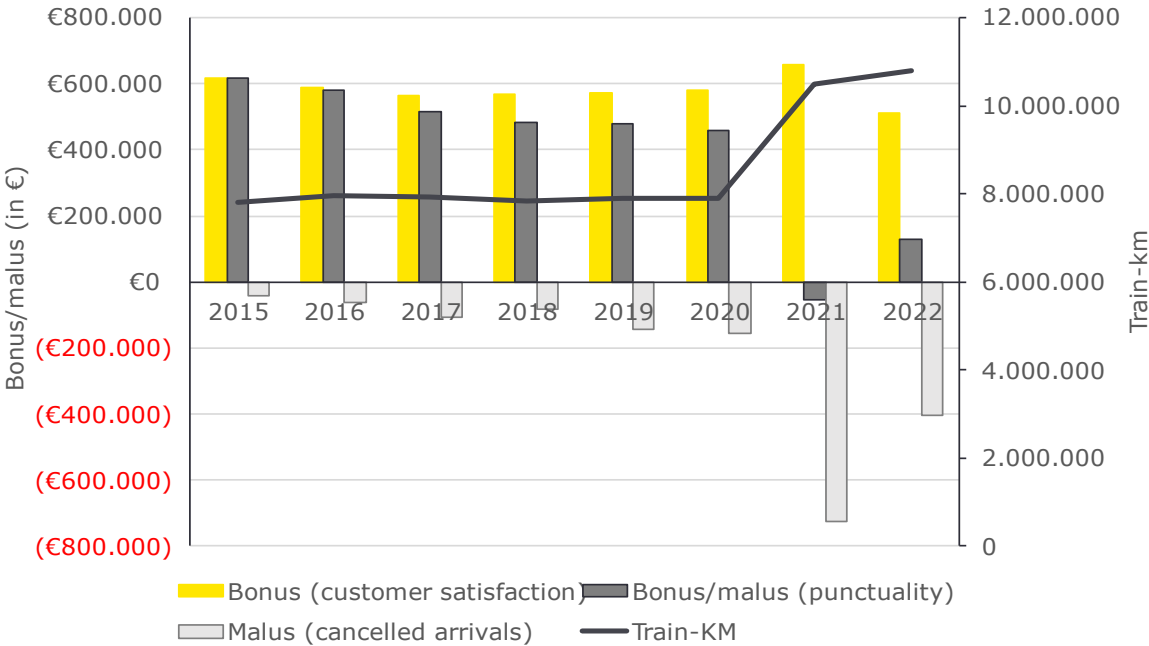


Figure 12: Arriva – bonus/malus payments

However, the findings from Denmark also indicate that the impact of competition on quality of services may be limited due to a political decision of competent authorities of only reducing costs. Comments collected during a stakeholder interview suggests that the government investments are not large enough to support an increase in quality, but just to uphold the operations of trains.

⁸⁰ See section 1.10 of the Annex to this study

Delays remain a significant challenge in Germany, impacting the perceived quality of rail services. However, the delays are often the result of the poor quality of the infrastructure that affect all the market segments and cannot be solved via efficiency gains or quality improvements obtained via competitive tendering. The German government has pledged massive investments in upgrading the infrastructure⁸¹, but as the works are foreseen to take place over several years it seems that the delays will not be improved in the short-term.

4.3. Impact of competition on demand

A report produced by Rail Partners ⁸²shows how between 2002 and 2019 the evolution of rail passenger-km increased by 52.6% in regional routes and by 36.3% in long-distance routes. This is consistent with a positive impact of competitive tendering applied in regional routes. In any event, this development preceded the introduction in May 2023 of the so called "Deutschlandticket" or 49 EUR Ticket, a monthly subscription that gives passengers unlimited travel on all regional public transport throughout the country, which is having a significant impact on the German rail market, notably in terms of demand.

The development of the general traffic performance of regional rail services in Germany is shown in Figure 13 below.

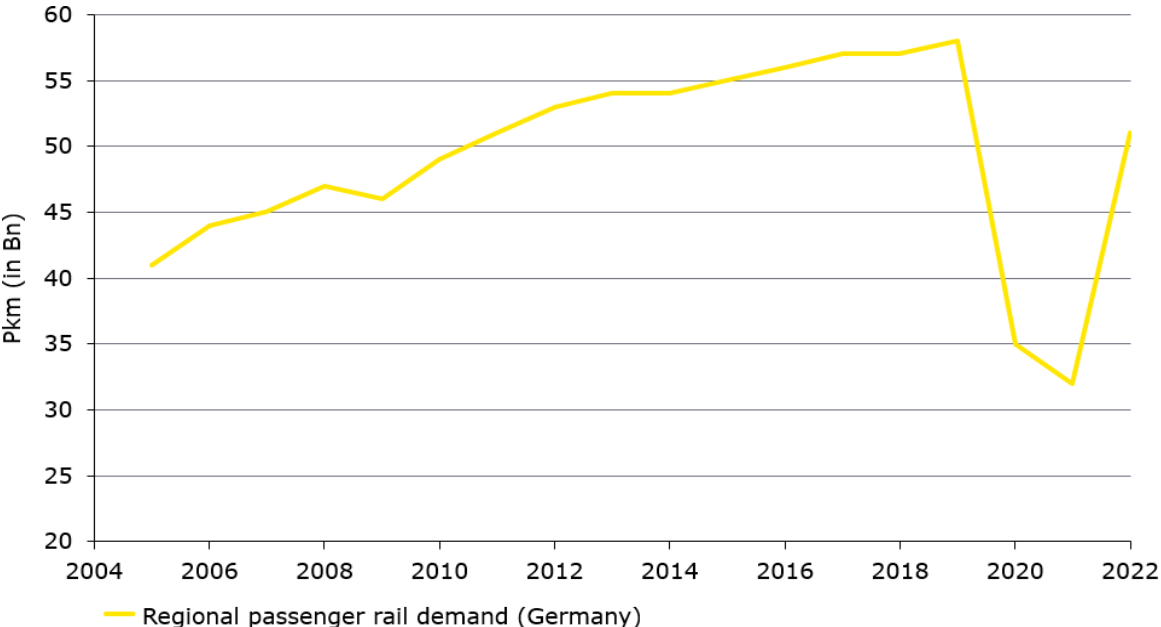


Figure 13: Demand for regional passenger transport in Germany

In Denmark, the demand for rail passenger transport has stagnated over the 2011 - 2023 period, except for the period affected by the Covid-19 pandemic, where it plummeted. This is shown in Figure 14 below.

⁸¹ High performance German network project (<https://www.railtech.com/all/2024/03/22/db-invests-record-7-6-billion-euros-in-german-rail-in-2023/?qdpr=accept>)

⁸² Rail Partners (2023) *Track to Growth: Creating a dynamic railway for passengers and the economy*. [Rail Partners - Track to Growth.pdf](#)

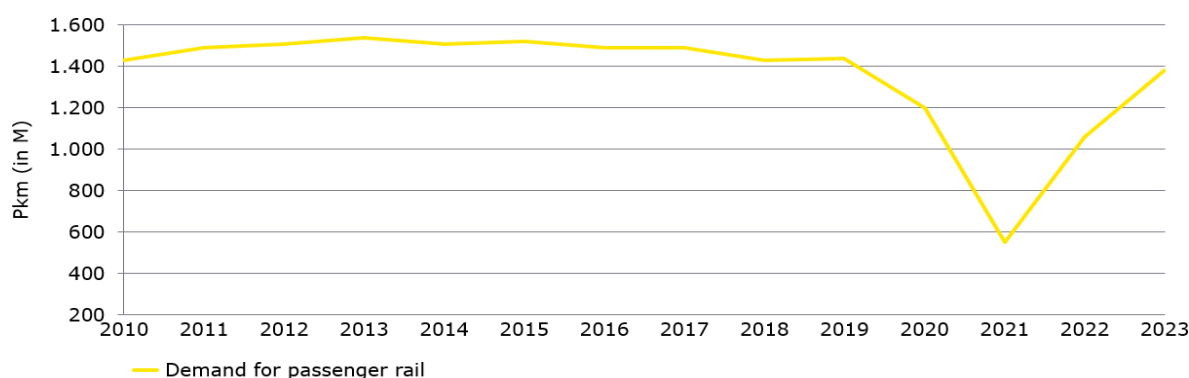


Figure 14: Demand for passenger transport by rail in Denmark

Several factors have been identified as potential causes for this stagnation, including competition from long-distance bus services, ongoing significant track maintenance and infrastructure works, and competition from private car usage. In the Danish case, long distance bus transport demand experienced a stronger relative increase in passenger demand than rail.

Although it is difficult to draw conclusions from the limited cases on PSO competition presented in the study, there is evidence that Member States may, via competitive tendering, achieve improvements in the quality and frequency of services which, in turn, may drive demand for rail services (Germany). Rail demand remains, however, subject to many other factors not related to intra-modal competition such as competition between different modes (bus, private car) and quality of the infrastructure (Denmark).

4.4. Market characteristics and development

Key barriers to entry and to fair competition

Barriers to entry in the rail market can significantly influence the level and nature of competition. Understanding these barriers is crucial to ensure a competitive landscape which benefits both operators and passengers. This section explores the key barriers to entry in PSO rail markets, drawing from various case studies, survey results and interviews.

Access to infrastructure and to services facilities

In many of the studied markets, the incumbent is still profiting of historical advantages, which hinder potential new entrants. These advantages can take various forms.

In the Haut de France region, the modernisation and construction of new maintenance facilities require substantial investments and time, further complicated by the incapacity of SNCF Réseau to connect these new facilities to the national network, ostensibly due to staffing issues⁸³. The Haut De France region has, in addition, limited historical data on the rolling stock and other infrastructure, which makes it difficult to start operations. In fact, the region brought a complaint before the French regulator against SNCF to get access to all data to prepare the call for tender. Moreover, the French competition authority has in a study indicated that the operators are incurring high costs related to preparing bids, which are not compensated fully by the regions⁸⁴.

In Poland, publicly owned operators are the main beneficiaries of EU funds for acquisition of rolling stock (from Infrastructure and Environment Programme). The public operators were entitled to EU financing equalling 50% of new rolling stock costs. The market

⁸³ An interviewee raised doubts whether this is indeed the case. However, this study has not found any proof of this being the case. See section 1.9 of the annex to this report

⁸⁴ See *Avis 23-A-18 du Novembre 2023 relatif au secteur des transports terrestres de personnes*, Autorité de la Concurrence ([Avis 23-A-18 du 29 novembre 2023 \(autoritedelaconcurrence.fr\)](https://www.audelaconcurrence.fr) for more information.

dominance of the incumbent is also a factor at play.

Access to rolling stock for PSO services may be a high barrier to entry for new operators who cannot benefit from a pool of suitable rolling stock and would need to procure new trains.

Access to infrastructure is a critical component in the realm of rail transport, and it can often emerge as a significant barrier to operating on fair and competitive conditions. This is particularly evident in countries like Poland and France, where the challenges associated with infrastructure access and modernisation have profound impacts on the operational landscape for railway companies.

The chronic underinvestment in Polish rail infrastructure and the resulting modernisation efforts, especially on the line E30, have limited network capacity and increased delays. This situation creates a challenging environment for new entrants who cannot rely on consistent service levels⁸⁵.

Lastly, some other legal barriers can exist, such as in the French Regions Haut de France ("Etoile de Lille") and Auvergne-Rhone-Alpes where SNCF operates with asbestos-contaminated rolling stock, which cannot be transferred in its present condition, according to the REACH Regulation⁸⁶. Some of the rolling stock has been refurbished in the last 10 years and will still be in operation for the next 10 to 15 years. Therefore, although the rolling stock can be claimed back by the Regions which financed it, it must be decontaminated before it can be transferred. This risks hampering future competitive tenders.

Historical advantages of the incumbent

The market position of the incumbent is another barrier to entry and incumbents have considerable advantages when bidding for PSO contracts. Given that they usually were the operators historically providing PSO services, they have a full knowledge of the costs and revenues associated to the provision of those services. Their reluctance to share this data (e.g. in France) may make it difficult for new entrants to bid in a competitive tender. PSO tenders can moreover be characterised by high transaction costs⁸⁷ with bidders incurring significant costs for preparing their bids⁸⁸. If too high, these costs can deter potential operators from bidding⁸⁹. As a result of the market position of the incumbent, it may incur lower costs in preparing the bids.

Incumbents are often also already owners of the appropriate rolling stock, whereas new entrants must buy it or lease it. Where the competent authorities do not own/lease the rolling stock for the provision of the PSO services, and the incumbent is not under the obligation to hand over the rolling stock in case of change of PSO operator, access to rolling stock may be a barrier to entry.

Incumbents may possibly use their position in the market to underbid in competitive tenders. The Danish national incumbent DSB submitted bids for two PSO contracts. In both cases, the incumbent underbid competitors. One of the cases covered the two lines on the Øresund coast (Elsinore-Copenhagen and Copenhagen-Malmö). In order to be eligible for the tender, DSB formed a joint venture together with the Scottish company First Group, called DSBFirst with DSB as majority shareholder. DSB First had by far the lowest offer and consequently won the contract. However, after operations started in 2009, it was

⁸⁵ See section 1.12 of the annex to this report

⁸⁶ [REACH Regulation \(europa.eu\)](https://eur-lex.europa.eu/eli/reg/2013/606/oj)

⁸⁷ See Williamson, O. (1979). Transaction-cost economics: The governance of contractual relations. *Journal of Law and Economics*, 22, 233–261. And ECMT (2007), *Competitive Tendering of Rail Services*, OECD Publishing, Paris, <https://doi.org/10.1787/9789282101636-en>.

⁸⁸ See *Avis 23-A-18 du 29 novembre 2023 relatif au secteur des transports terrestres de personnes* (Autorité de la Concurrence) - [Avis 23-A-18 du 29 novembre 2023 \(autoritedelaconcurrence.fr\)](https://www.aud.cnc.fr/fr/avis/avis-23-a-18-du-29-novembre-2023-relatif-au-secteur-des-transport-terrestres-de-personnes)

⁸⁹ See ECMT (2007) for an in-depth discussion on transaction costs related to bidding for PSO contracts and their impact on the bidding and contract itself.

revealed upon the start of operations that DSB First had bid with a price that did not cover their actual costs hereby leading to severe deficits. DSB First ceased its operations as a result in 2011 and DSB subsequently took over the operations of the two lines without any competition⁹⁰.

Differences between direct and competitive award

The effects of the PSO contracts being awarded through competitive tendering or direct award varies from case to case.

In Denmark, where some parts are directly awarded (to the incumbent DSB) and some parts were awarded competitively (first contract to Arriva) it is difficult to find differences in service quality between the two even if the size of the contracts, the duration and the requirements were not the same. It was reported that political decisions yielded influence on the quality of services. This is a direct consequence of how much funding is allocated to rail.

Instead, the political focus has been on cost savings. Competitive tendering in Denmark is reportedly saving the Danish taxpayers millions of euros. In the case of Arriva's first contract, covering the period 2003-2010, estimates were showing significant savings for the Danish state compared to the previous contract operated by DSB. In 2009, almost by the end of the contract, expected savings were reported to be in the range of DKK 0,5 billion (€67 million)⁹¹. The tendering of the coastal lines, which initially was won by DSB First, was estimated in 2007 by the Ministry of Transport to potentially have saved DKK 100 million (€ 13,4 million) per year for the Danish state over the period 2009-2017⁹².

The Danish experience with competitive tendering of PSO contracts appears rather positive, though two-sided. On the one hand, the case of Arriva. Despite some challenges during their initial ramp up phase, they managed to deliver on expectations for the rest of the contract and *Rigsrevisionen* (Danish National Audit Office) concluded in 2012 that the contract with Arriva had eventually saved DKK 303 million (€40 million) as compared to the previous contract with DSB⁹³. In addition, more train-km were driven by Arriva than prior to the tendering. On the other hand, the significant organisational changes in the DSBFirst case, and the actual return of the operation of the contract to the national incumbent DSB do not offer the necessary conditions and consistent evidences of any actual final savings for the state. At the same time, the two cases of competitive tendering of PSO contracts do offer valuable lessons in terms of PSO contract tendering and enforcement.

In France, competitive tendering has led to considerable cost decreases as compared to regions with direct award. In the Haut de France region, competition led to lower costs as compared to the general network. The cost/train-km in the contract with SNCF on the rest of the network without competition is 28,5€/train-km (including track access charges). The cost on the « étoile d'Amiens » is 23€/train-km. The savings were used to increase the number of trains. Savings are coming from optimised production process (for rolling stock and staff), in view of competing in the tender with another operator.

⁹⁰ First as DSB Øresund, a separate subsidiary, until 2015 and afterwards as part of DSB. See [Beretning om Kystbanen | Rigsrevisionen](#) for more information on the decision concerning DSBFirst.

⁹¹ Boston Consulting Group. (2009). *Øget konkurrenceudsættelse af jernbanesektoren*. Copenhagen: Transportministeriet.

⁹² Idem.

⁹³ Rigsrevisionen (2012). *Notat til Statsrevisorerne om beretning om Trafikministeriets håndtering af kontrakten med ARRIVA*. See: [Notat om beretning om Trafikministeriets håndtering af kontrakten med ARRIVA \(rigsrevisionen.dk\)](#)

The role of regulatory bodies in fostering competition in PSO markets

Regulatory bodies do not always have wide powers as regards the definition of the scope and the award of PSO contracts. While EU law requires putting in place mechanisms for legal redress, it does not confer powers to the rail regulatory bodies to oversee PSO tendering procedures. This remains a possible choice of Member States but is not an obligation.

Where they do have such powers, regulatory bodies can play a key role in ensuring a balanced and beneficial competition. These bodies can, for example, oversee tendering processes, ensuring transparency and fairness, which is particularly crucial in countries where rail services have traditionally been dominated by state monopolies. The regulatory bodies have intervened both in Denmark and France to ensure fair competition between bidders.

In France, the Autorité de régulation des transports (ART) has ruled on several cases of disagreements between the non-incumbent bidders and SNCF. The cases span from the transfer of staff between SNCF and the regions to the application of surcharges by SNCF Réseau for the management of interfaces.

In Denmark, the regulator intervened to exclude DSB from the bidding for the lines in West Denmark (later won by Arriva) since they had been bidding with a price that was considered at risk of leading to deficits.

4.5. Conclusion

The examples of competitive tendering in the EU PSO market are still very limited, as the obligation entered in to force only in the last days of 2023. A new analysis of the PSO market should be carried out when the current PSO contracts, in majority directly awarded, expire and are replaced by competitively awarded contracts.

Despite these limitations, the evidence gathered by the study shows that, where competent authorities have used competitive award, they have consistently achieved a decrease in costs enabling improvements in the rail offer, notably as regards service quality. It is not meaningful to try and establish any direct effects of PSO competition on ticket prices, as these are largely regulated by the contracting authority or the government.

In countries where competitive tendering has been used more systematically, like in Germany, the effect on demand appears to be positive. In Denmark, where de facto the majority of PSO services have been directly awarded, demand for rail appears to have been negatively influenced by inter-modal competition, and even where a PSO was tendered, the quality of service failed to improve, as the competent authority only aimed to reduce its costs. It can be expected that further benefits will arise, and barriers will fall, as the market becomes more mature and the market opening provisions of the 4th Railway Package deploy their full effects.

Looking ahead, it will be key to ensure that new entrant PSO operators have equal access to infrastructure and service facilities in the network, as well as better access to suitable rolling stock. Competent authorities can also act to increase demand for rail PSO services by using savings from competitive tenders to achieve better and more frequent PSO services.

5. FREIGHT TRANSPORT

Rail freight transport has been completely liberalised in the EU since 2007, for both national and international services⁹⁴. The start of competition has affected the freight rail markets in multiple ways. This section presents the findings concerning the impact of competition on the freight rail markets. Findings related to the present freight market segment have been obtained using several complementary sources and methods including dedicated survey questions, follow-up stakeholder interviews and the following case studies:

- Sweden
- France
- Croatia
- Germany
- Italy
- Poland
- Rhine Alpine Corridor (RFC1)
- North Sea Mediterranean Corridor (RFC 2)
- Mediterranean Corridor (RFC 6)

Table 6 below summarises the findings of the OA case studies on the main parameters examined in this study.

Case study	Competition	Price Δ ⁹⁵	Quality Δ	Frequency Δ	Demand Δ	Market share of non-incumbent Δ	RU cost efficiency	Mode share of rail
Freight								
Sweden	OA	ND	↑	ND	↑	↓	↑	↔
France	OA	↓	↑	ND	↓	↑	↑	↔
Croatia	OA	↓	ND	ND	↑	↑	ND	↔
Germany	OA	↔	ND	ND	↑	↑	ND	↔
Italy	OA	↓	ND	ND	↑	↑	ND	↑
Poland	OA	↔	↔	ND	↓	↑	ND	↓
RFC1	OA	↓	↑	ND	ND	ND	ND	↔
RFC2	OA	↓	↑	ND	ND	ND	ND	ND
RFC6	OA	ND	ND	ND	↑	ND	ND	ND

Table 6: Overview of findings: Freight case studies

⁹⁴ Some countries did, however, liberalise before the entry into force of the Second railway package (adopted in 2004 with freight provisions entering into force in 2007)

⁹⁵ Δ denotes a change.

5.1. Impact of competition on final prices

The introduction of competition in the freight rail market has had varying impacts across different countries. The dynamics of competition in the rail freight sector have influenced pricing strategies, service offerings, and overall market behaviour. This chapter delves into the impact of competition on pricing in the freight markets, drawing insights from various case studies and data sources.

Effects on price

Overall, competition has had varying impacts on price development. Figure 15: Developments in rail freight prices since start of liberalisation below illustrates the price developments in Croatia and France after the start of competition (first new entrant).

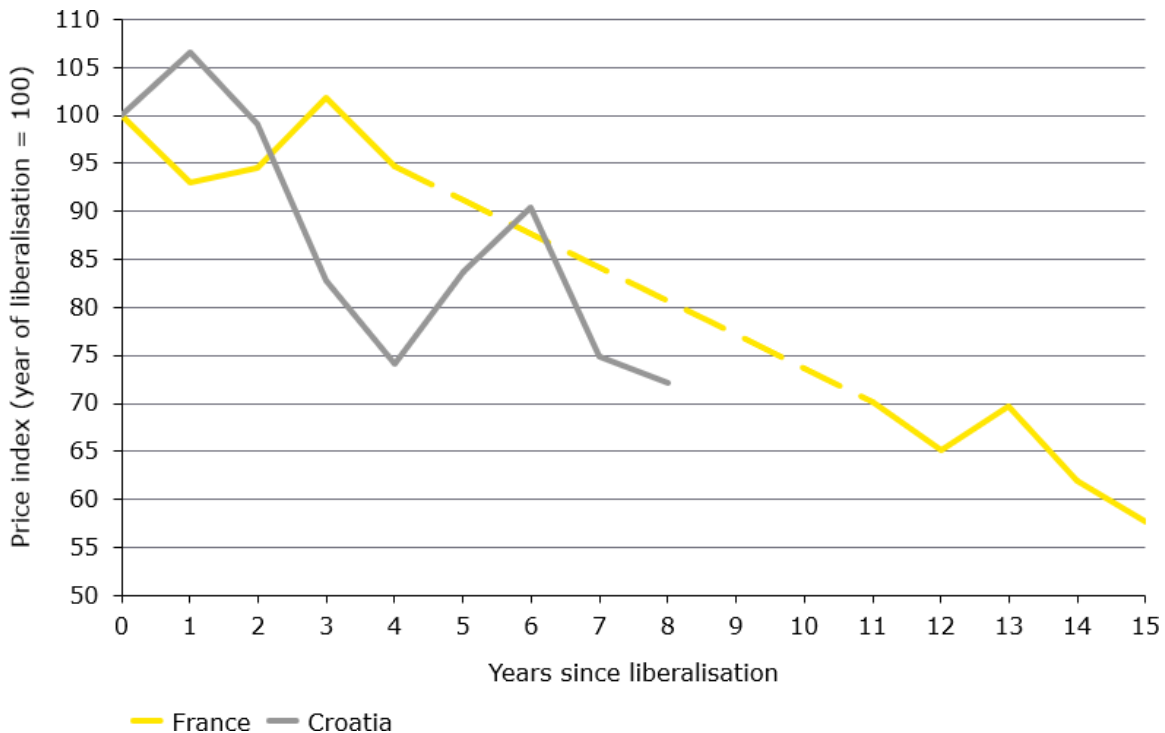


Figure 15: Developments in rail freight prices since start of liberalisation⁹⁶

The figure shows that in France and Croatia prices have decreased since the entry of competitors. This can be due to the entry of a new market player seeking to attract customers by offering more competitive pricing than the incumbent operators. This competitive pressure can lead to a decrease in prices as operators strive to grow their market shares. This price decrease is enabled by an increase in cost efficiencies of the RUs, which has been mentioned as the main effect of competition (more information in the next section). The information on the market shares acquired by non-incumbents and their development is sparse. However, in Croatia, the new entrants started achieving results 2 years after liberalisation (in 2015), and 3 years after liberalisation (in 2016) non-incumbent operators held a 13% market share. 8 years after liberalisation (in 2020) the non-incumbent held 43% of the market⁹⁷. In France, the non-incumbents held 15% of the market within 3 years of the start of competition, while the latest data indicates that SNCF Fret holds only 49% of the market share.

⁹⁶ The figure shows the indexed evolution of €cents/tonne km. Inflation has been accounted for using the general inflation index. Note that the data was not always available for all countries (e.g., France had a gap for 7 years).

⁹⁷ See section 1.13 of the annex to this study.

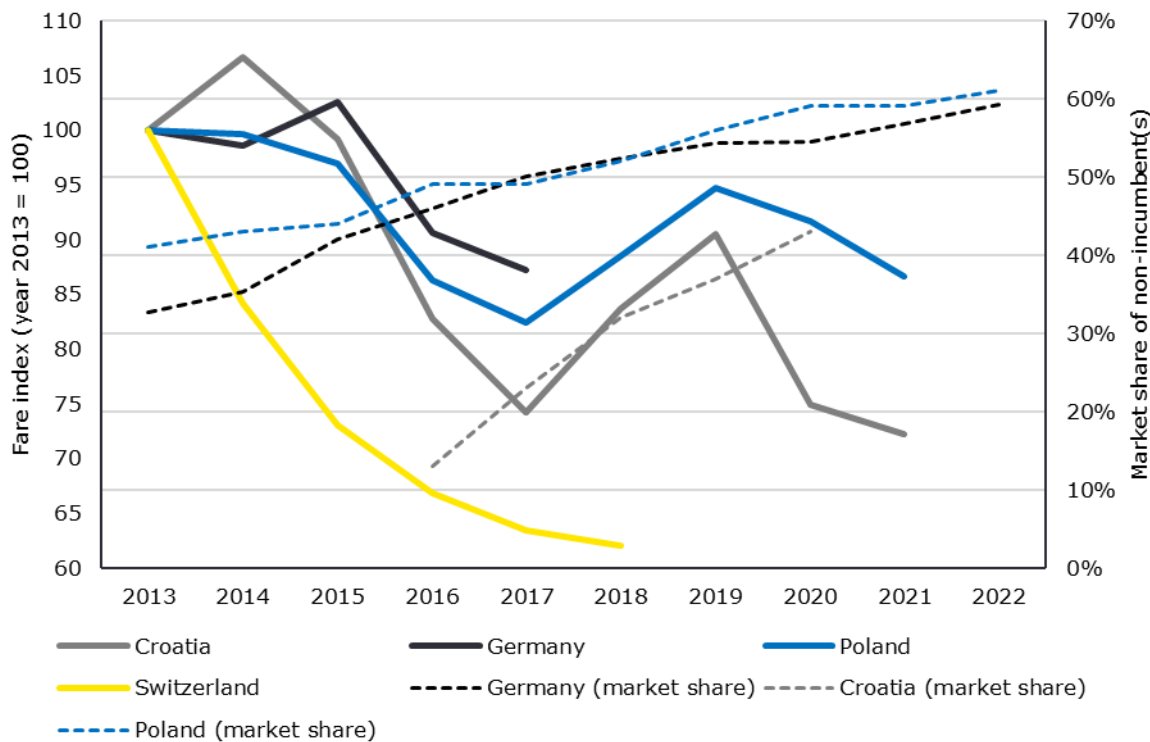


Figure 16: Developments in freight prices since 2013 (case study data)

Figure 16 above illustrates the developments of freight rail prices since 2013⁹⁸. In Croatia, increased competition correlated with decreasing rail freight rates, emphasising the importance of pricing flexibility and understanding demand elasticity⁹⁹. In Poland, competition led to fluctuations in average revenue per tonne-kilometre, with specific cargo types showing price sensitivity¹⁰⁰. On the North Sea Mediterranean Corridor, the price of transporting a container from Antwerp to Basel has fallen by around 15% since 2007. This has made rail freight a more competitive option for businesses and has helped to boost trade along the corridor¹⁰¹. Aside from the case of Croatia, which is explained above, the market share of the non-incumbents grew over the period in which prices decreased. This indicates that increased competition, measured as the market shares of non-incumbents, has a downward effect on prices.

The stakeholder survey indicates that shippers disagree more with the view that prices have decreased with competition than freight RUs. The figure below shows the opinion of both supply and demand side for the question whether prices have decreased due to competition, where 1 indicates strong disagreement and 9 indicates strong agreement.

⁹⁸ The figure has been adjusted for inflation and 2013 has been chosen as reference year since most data collected starts in 2013. Competition started, save for Croatia, well before 2013 in most cases, however, no data is available from before this period for most case studies. Hence, any before and after effect of competition could not be measured by this study. Indexation done to facilitate comparison between countries.

⁹⁹ See section 1.15 of the Annex to this report

¹⁰⁰ See section 1.18 of the Annex to this report

¹⁰¹ See section 1.20 of the Annex to this report

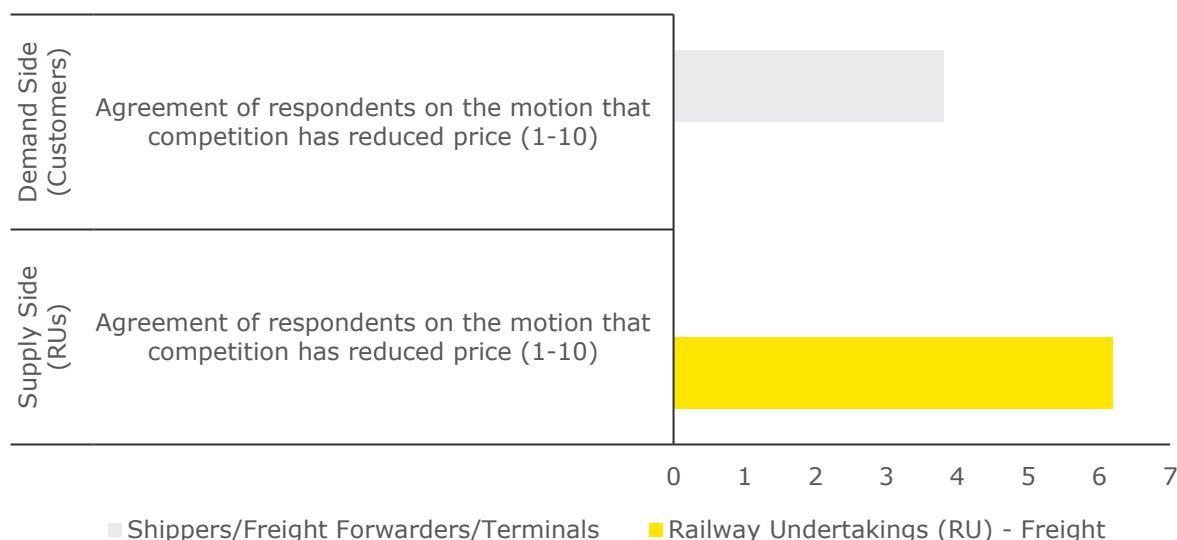


Figure 17: Survey results on prices of freight RUs and shippers

Both intra- and intermodal competition can also influence rail freight pricing. This has been the case in Germany, where intense intra- and intermodal competition has led to noticeable improvements in quality and price reductions on the railways, but without a sustainable increase in rail's share of the market¹⁰². In the Polish rail market, there is specialisation in the haulage of specific types of freight rather than geographic specificity regarding a particular route. This suggests that internal competition has less impact on margins and revenues than external competition (road transport). Many customers, mainly from outside the minerals and raw materials sector, are very price-sensitive and hence better able to switch mode of transport in the event of a rate increase¹⁰³.

It must be noted that price analysis for freight transport based on a general t-km value comes with certain caveats. Firstly, there are external factors affecting the level of the prices. These include rail's competition with other modes such as road transport and to some extent inland waterways. For certain loads, road transport prices can exert downward pressure on rail freight prices. Secondly, the availability and the quality of the path/route affects the prices. Thirdly, the pricing dynamics vary depending on the form of freight rail being block train, single wagon load (SWL) or combined transport.

Interviews suggest that incumbent operators, in some cases, are cheaper than the non-incumbents. It was cited that this may be due to incumbents receiving higher levels of state support. The study cannot confirm if this was the case.

Lastly, transport prices overall and across all modes are expected to increase in the future. This is due to the increase of energy price, shortage of drivers (for trucks and trains), and the fact that rail locomotives are becoming increasingly expensive.

Cost structures and efficiencies

Across the surveyed markets, the main impact of competition has been the increase in cost efficiencies of operators. The entry of new market players has pushed operators to look for measures which can decrease operating costs. This is particularly the case for the employees of the operators, where there are differences between the incumbents and non-incumbents. For example, within SNCF a driver only drives; another staff member is required to manipulate the signalling system (lever for switches on the tracks), and a third one to couple and uncouple the wagons. So, for a train with a locomotive and 2 wagons, three agents are needed. When private companies entered the market, they trained drivers

¹⁰² See section 1.16 of the Annex to this report.

¹⁰³ See section 1.18 of the Annex to this report.

in ancillary tasks: ground safety operations, retrieval of information from customers, etc. This has drastically reduced the need for staff. As staff costs represent a significant part of rail operating costs, the decrease of staff had an impact on prices¹⁰⁴. A similar development can be observed in Sweden (see figure below), where the non-incumbents (all except Green Cargo) have increased their net revenue per employee drastically¹⁰⁵. Railway employment in Sweden did decrease in the period surveyed, but the operators managed to increase their efficiency over time¹⁰⁶. Notably, Green Cargo had the same transport performance in 2004 as it did in 1989, with 40% less staff and a 50% smaller wagon fleet¹⁰⁷.

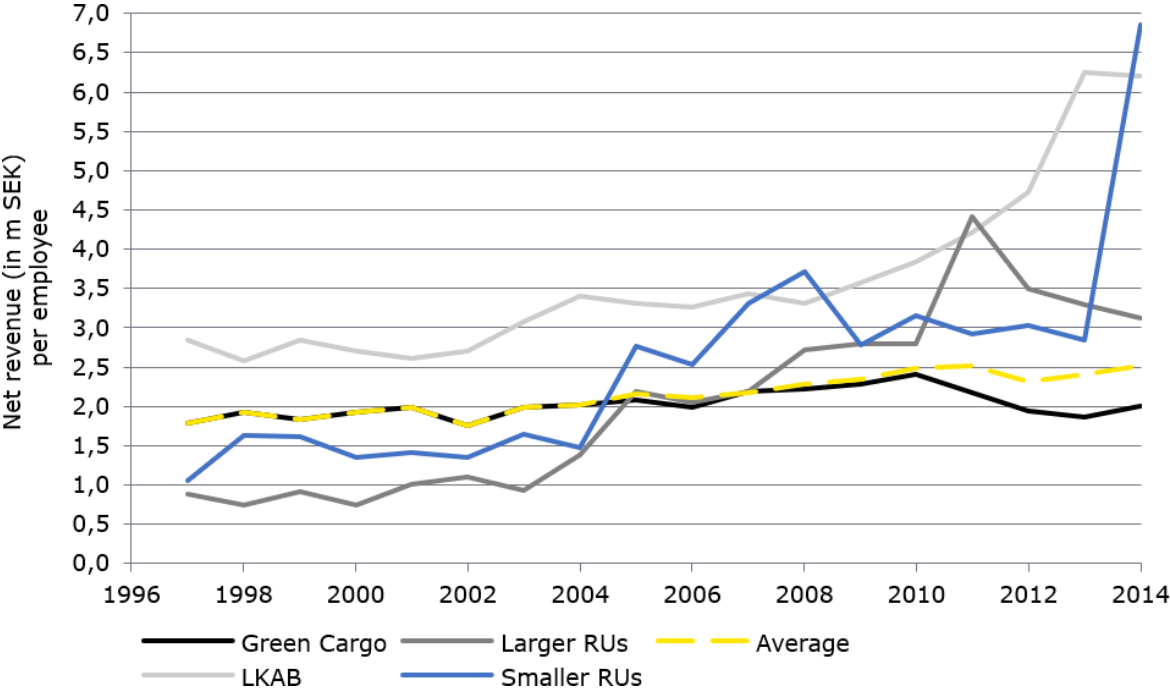


Figure 18: Net revenue per employee for RUs in Sweden (in SEK and 2014 prices)

It has also been reported that the relatively favourable working conditions for employees of national incumbents has spurred those incumbents to set up private subsidiaries, which can hire employees at closer to market standards¹⁰⁸. Interestingly, of the freight RUs that were part of the stakeholder survey, 63% disagrees that competition has decreased operating costs. The recent energy crisis has to be taken into account here, as there may be a bias toward recent experiences.

Effects on pricing strategy

In rail freight, competition and pricing strategies have affected each other. The new entrants are targeting specific markets depending on the potential profitability of the market. This goes for both the type of cargo transported and the type of freight rail transport. Overall, new entrants focus on transporting cargo types for which less rolling stock is needed for the operations. As a result, most new entrants focus on block train operations rather than single wagon load. In fact, it was reported that non-incumbents often only own (or lease) the locomotive and transport the goods and wagons of the client.

¹⁰⁴ See section 1.14 of the Annex to this report.
¹⁰⁵ EY adaptation and translation of figure produced by VTI. Original (in Swedish) can be found here: [VTI rapport 874 \(diva-portal.org\)](http://VTI.rapport.874.diva-portal.org)
¹⁰⁶ It has to be noted that part of the efficiency of the larger RUs is due to them operating blocktrain and on longer framework contracts
¹⁰⁷ I. Vierth (2012). Uppföljning av den avreglerade marknaden för godstransporter på järnväg. VTI Rapport 741. VTI, Linköping Sweden. Uppföljning av avregleringen av godstrafiken på järnväg.pdf (diva-portal.org)
¹⁰⁸ Specially in France the employees of SNCF have enjoyed favourable working conditions such as early retirement etc. The conditions have historical roots and are difficult to alter.

This aspect has been reported by a major shipper to limit the service supply for some specific cargo types. Moreover, the increased focus on the more profitable block train operations have made SWL dependent shippers consider becoming their own RU to ensure future supply of services.

It was reported that operators in the intermodal market have become volatile to price and demand fluctuations. Notably, in an interview for the French case study, an intermodal operator highlighted the volatility of their operations. The ease of the operations with intermodal transports results in a market with strong competition between many operators (rail and road). There is an apparent oversupply, which consequently leads to difficulties in covering costs, while mainly large operators cut prices leading to constant pressure on prices. Consequently, the operators win and lose contracts all the time¹⁰⁹.

5.2. Impact of competition on quality of services

The introduction of competition in the rail freight markets across various European countries and corridors has undeniably influenced the quality of services provided. The effects, both positive and negative, have been observed across different regions, offering a comprehensive understanding of the evolving rail freight landscape.

Service enhancements

Throughout the study it remains unclear to what extent competition has improved the overall service quality and the feasibility of rail freight transport¹¹⁰.

The stakeholder survey provides an overall picture on the opinion of both RUs and shippers on the subject. The survey results indicate that respondents are split on the questions related to the quality of services¹¹¹. 52% of the shippers agree to an improvement in service quality while for freight RUs 38% agrees as can be seen in the figure below¹¹².

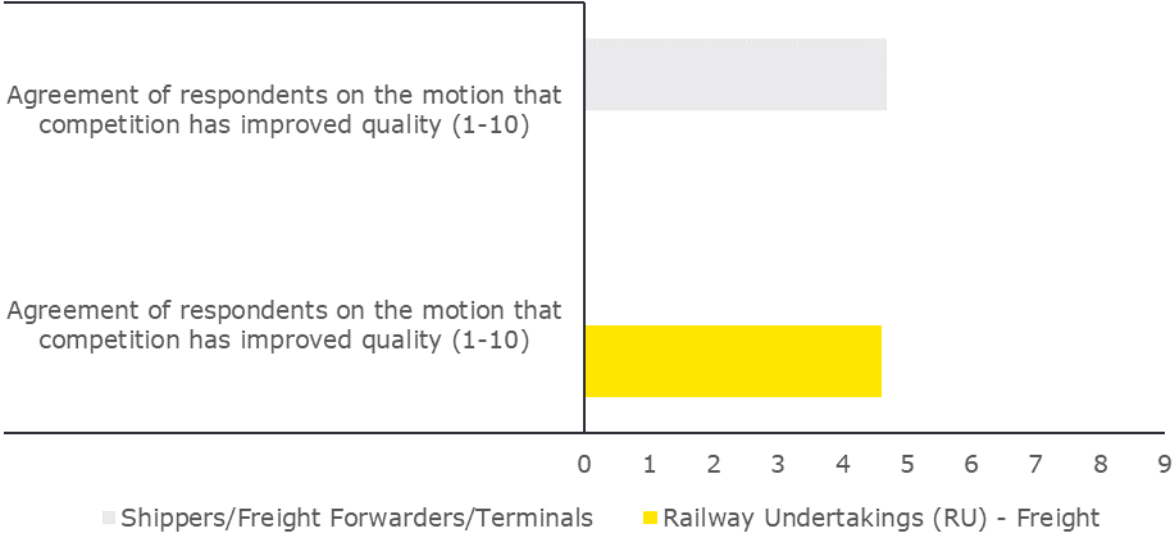


Figure 19: Survey results on service quality of freight RUs and shippers

On the topic of service reliability there is significant difference in responses between RUs (63% disagree) and shippers (48% agree). This difference could be due to the difference in rail transport type requested by shippers and provided by the RUs respondents, however

¹⁰⁹ See section 1.14 of the Annex to this report.
¹¹⁰ Feasibility of transport denotes the ease of moving goods from a to b.
¹¹¹ Please see the Annex to this study for a full overview of the responses.
¹¹² Figure 20 displays the average value of the responses. Hence, why the number in the figure diverges with the numbers in the text. Nevertheless, both show indicate similar results.

this study cannot provide any details on this. For the supply of services, there is agreement to an increase on both sides. 67% of the shippers agree to an increase in service supply, while 75% of RUs agree.

In the case studies, it seems that service quality and reliability is a key topic and determinant of the choice of operator. In the French freight case study, it was reported that one's customer chose the operator based on the reliability of the services rather than the price. This is due to the extra costs associated with unreliable services. Delays result in extra costs for the shipper and the RU who have bonus/malus schemes in their contracts. For example, a new entrant in France made an error in its price calculation by forgetting a second locomotive for a slope, which resulted in higher costs than the price paid for the service.

Rolling stock investments

One major effect of competition in the rail freight market is the creation of both a second-hand market and leasing market for acquiring rolling stock. The market has been spurred on by the demand from non-incumbent RUs for mostly leasing their rolling stock. In fact, it was reported that new entrants rarely own any wagons and, in some cases, not even locomotives. All rolling stock is leased. The leasing market is reported to function quite well with a broad variety of offers, however, the leasing companies themselves reported that operators faced difficulties in affording technological upgrades. In particular, ERTMS upgrades cause uncertainties related to interoperability. Specifically, funding for new investments in rolling stock was reported to currently be too low. The development towards a specific leasing market shall be seen in conjunction with the focus of new entrants on operating freight transport types associated with lower costs, such as block trains and intermodal transport. Single wagon load transport requires many fixed assets and is thus less interesting for new entrants.

In Poland, there is a high investment focus on the intermodal infrastructure and rolling stock. The main reason of high investments is the existence of a significant amount of state aid for intermodal transport, led by the EU Infrastructure and Environment Operational Programme, with one of the measures specifically aimed at intermodal development in 2014-2020. The 2021-2027 EU budget perspective continues its focus on intermodal transport in the European Funds for Infrastructure, Climate and Environment. Thus, the level of intermodal investments is expected to remain high¹¹³.

Punctuality

As for the findings related to passenger transport, it is difficult to assess whether the punctuality of freight RUs is related to their operations or the infrastructure. It has, however, been reported that delays, on international connections specifically, are a major concern. For cross-border rail it is mainly all the various stops for crossing borders which causes delays. This is cited as a major issue for the attractiveness of cross-border rail transport. This is despite some interviewees reporting that competition has led to efficiency increases for cross-border operations. Given that long-distance rail (often cross-border in Europe) is the most competitive distance compared to road transport, this implies that creating a more seamless European rail area would result in demand increases. Moreover, the state of the infrastructure hampers punctuality in some of the case studies. Specifically, in Germany the state of the infrastructure has been leading to decreases in punctuality¹¹⁴. The delays for international rail freight services are illustrated with RFC1 as an example in

Figure 20 below. Only 30% of rail freight services arrive on time. At EU-level, on average across EU MS, 47 % of the international rail freight services arrived on time while it was

¹¹³ See section 1.18 in the annex to this document.

¹¹⁴ See section 1.16 of the annex to this report.

only 64% for domestic rail freight services¹¹⁵.

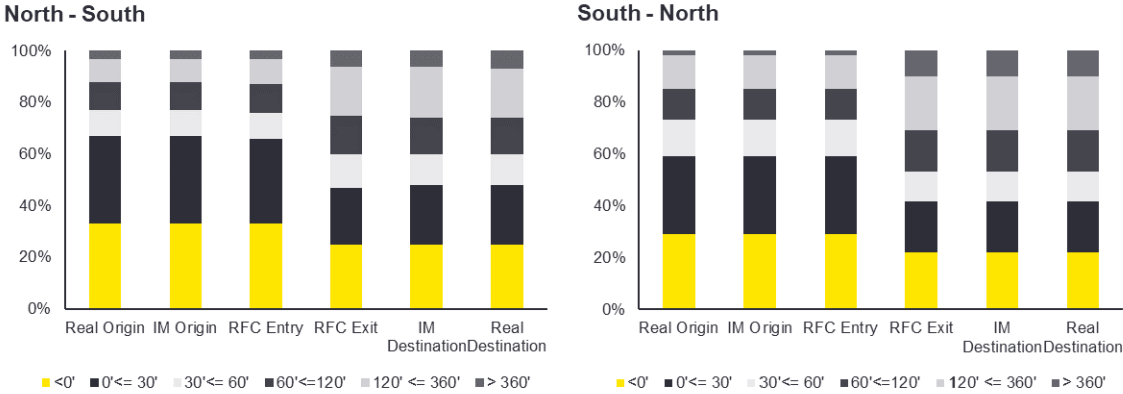


Figure 20: Punctuality at different degrees of delays on RFC1 for November 2022¹¹⁶

The survey responses indicate that competition has not led to increases in punctuality. 60% of the participating shippers disagree with the motion that competition has increased punctuality. Freight RUs remain neutral on the matter (38%).

5.3. Impact of competition on demand

The findings of the study indicate that competition has had mixed effects on the demand for railways. More specifically, the demand for rail seems to be either stagnating or increasing slightly after the start of competition. However, looking at the competitiveness with road transport, this study has mostly found railways to losing market share due to the strong increase in demand for road transport.

The development mentioned above is notably the case in France, where the mode share of freight rail has been decreasing until the introduction of competition in 2006 (vertical dotted line) where after it stabilises. It was reported that the French incumbent SNCF had focused primarily on its TGV services (passenger HSR) and as result the freight activities had been neglected. New freight RUs focusing entirely on freight can have made freight rail more attractive¹¹⁷. A similar stabilisation of the demand for freight rail was found to be occurring in Italy¹¹⁸.

¹¹⁵ 8th RMMS report: https://transport.ec.europa.eu/transport-modes/rail/market/rail-market-monitoring-rmms_en

¹¹⁶ Indicates the shares of flows with a certain degree of delay at origin and destination for the entire flow (real origin/destination), the part of the flow on rail (IM origin/destination) and on the corridor (RFC origin/destination). Source: [2022-11 punctuality overview with different thresholds November 2022.pdf](#)

¹¹⁷ See section 1.14 of the Annex to this report.

¹¹⁸ See section 1.17 of the Annex to this report.

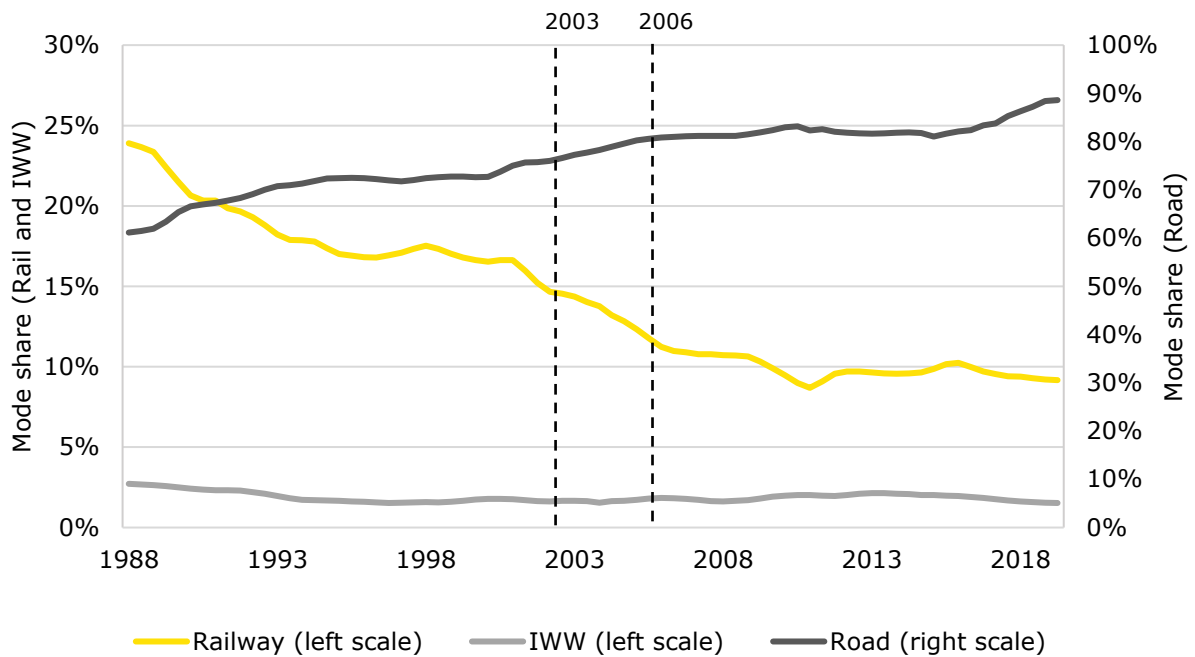


Figure 21: Developments in mode shares for the French freight transport market

Rail freight transport in Germany has been generally increasing in the past 20 years, as illustrated in the figure below. Performance in 2021 rose to a value just above the pre-COVID levels. Rail freight transport performance grew by an above average 8.3% and reached a market share of 18.6% (2020: 17.9%). The market share of road freight transport decreased to 72.3% (2020: 72.7%). In 2022, slight increases in transport performance are expected for rail (+0.5%), and slight losses for truck transport (-0.5%). Demand for rail freight has been increasing in Sweden as well¹¹⁹.

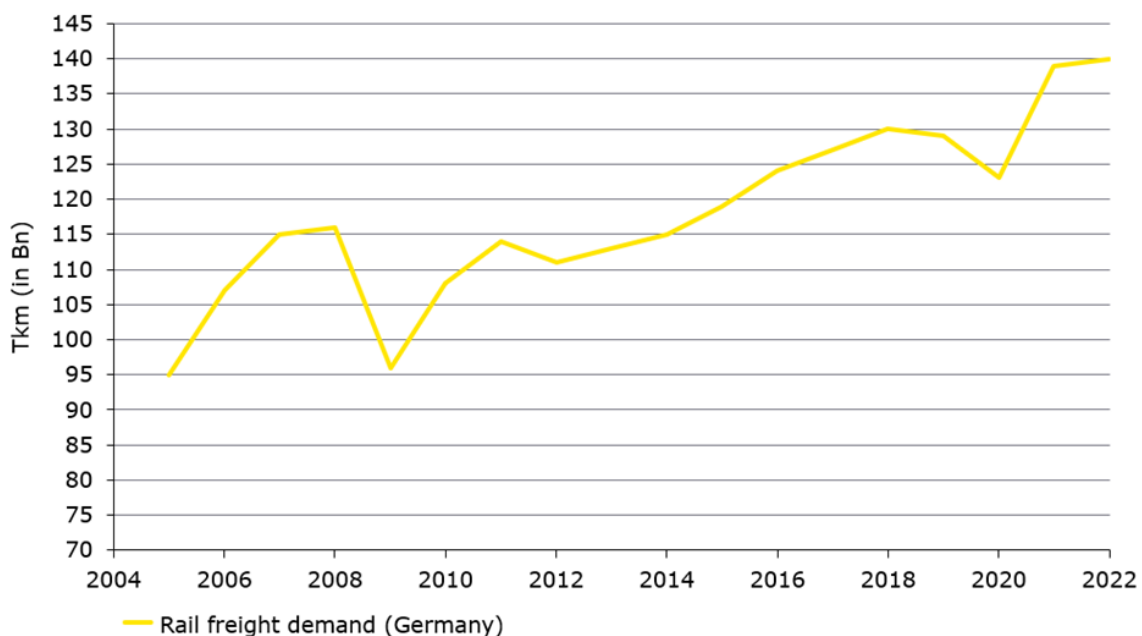


Figure 22: Freight rail transport performance for Germany

While the train-km and tonne-km generally follow similar trends, a significant contrast emerges in the case of Italy, as shown in the figure below. Here tonne-km experienced a

¹¹⁹ See section 1.13 of the Annex to this report.

10% increase from 2004 to 2022. In contrast, train-km registered a substantial 16% decline during the same period. This is due to the increased focus on intermodal traffic in Italy, which decreases the average transported distance while increasing the tonne transported¹²⁰.

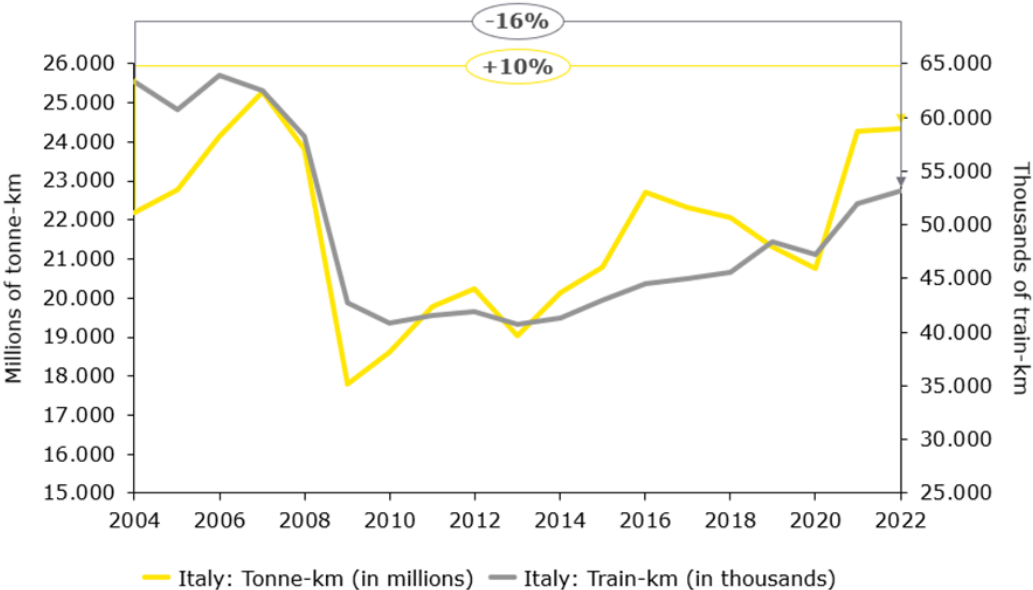


Figure 23: Historical tonne- and train km for the Italian rail freight market

The increased tonnage for intermodal transport is in line with other findings that indicate that new market entrant RUs focus on specific market segments. As mentioned above, there has also been an increase in the number of market players for intermodal transport in France.

5.4. Market characteristics and developments

Barriers to entry

The rail freight market's competitive landscape is shaped by various barriers that influence the entry and operation of new and existing players. These barriers vary across countries and have a profound impact on the market dynamics.

Historical incumbent advantages

Historical incumbent's advantages are also present in freight rail transport. In Poland, there has been some debate regarding the main railway infrastructure manager. Private railway entities have reported cases of railway tracks and station blockings by the incumbent, creating significant barriers to entry. However, there have also been cases of alleged collusion and bid rigging by private entities against the incumbent. However, none of the cases resulted in fines¹²¹.

As alluded to above, the incumbent operators may receive state subsidies which could distort competition. In May 2023, the French government ordered the restructuring of Fret SNCF due to concerns of the European Commission about state aid. The aid, totalling €5.3 billion in debt cancellation and €170 million in recapitalisation, was deemed to distort competition in the French freight rail freight market. Fret SNCF will split into two entities in 2025, one for transport (retaining 80% of activities) and one for maintenance. The decision, made after negotiations with the European Commission, saved Fret SNCF from

¹²⁰ [The European Rail Freight Market - Competitive Analysis and Recommendations-1649762289.pdf \(erfarail.eu\)](#)
¹²¹ See section 1.18 of the Annex to this report.

potential bankruptcy. The restructuring involves losing 30% of traffic, resulting in a 20% revenue drop €730 million, transferring 62 locomotives, and reducing staff by 10%. The French government must find new operators for the ceded lines to avoid losing market share to road transport, barring SNCF subsidiaries from competing for these lines.

Infrastructure challenges

In one case, capacity constraints are mentioned as a barrier to operate on fair conditions. On the Swedish network capacity constraints are particularly challenging for freight operators who compete with passenger trains for rail space. The lengthy and ill-suited application processes for acquiring train slots also make it difficult for new operators whose production may change on short notice to enter the market. While this stability may benefit established businesses, it poses significant challenges for new entrants seeking to break into the market. Freight trains have often the lowest priority in capacity conflict, therefore the idea to safeguard capacity, defined in the new COM Capacity proposal¹²², to provide more and better-quality capacity to freight sector, can really boost the modal shift from road to rail. Finally concerning service facilities, even for freight market it is important a transparent and not discriminatory access to maintenance centres, and, even more, to last mile facilities and rail related services, such as shunting/marshalling yards, siding and freight logistic terminals, as they represent scarce facilities in the EU rail network which are difficult to replicate with the construction of new sites.

Vertical integration

An overarching effect of competition is a trend towards vertical integration among shipping companies, terminal operators, and railway undertakings. This integration is driven by the need for efficiency and control in the supply chain. This can lead to improved coordination between different modes of transport, such as sea and rail, resulting in faster transit times, reduced costs, and enhanced reliability.

Moreover, owning or closely collaborating with terminal operations allows shipping companies to streamline operations. This integration can lead to more efficient cargo handling, optimised storage, and smoother transitions between different transport modes. The control over terminals also allows for better capacity management and scheduling, which is crucial in handling the variability in cargo volumes and maintaining service consistency.

The Swiss shipping conglomerate MSC was a pioneer in embracing vertical integration within the industry. In a strategic move in 2015, MSC acquired the entire freight division of Portuguese railways, subsequently rebranding it as Medway. This new entity primarily focused on operations between Spain and Portugal. To bolster its presence on the Iberian Peninsula, MSC expanded its rail network, investing significantly to enhance connections to its port operations in Valencia. Additionally, MSC established a logistics hub in Lousado, located in northern Portugal, and introduced new rail freight services linking Spain and Portugal. This expansion was aimed at providing comprehensive multimodal services across all its port locations in both countries, underscoring its commitment to integrated logistics solutions. Moreover, in 2023 MSC and Ferrovie dello Stato Italiane signed an MoU for establishing a corporate entity for covering freight logistics in Italy and European ports. Mercitalia (logistics division of FS) will hold 51% ownership while MSC, through their company MEDLOG, will hold 49%¹²³. Another example of this vertical integration is the establishing of Oceanogate, the groups rail traction company by Italian shipper Contship¹²⁴.

Other examples of vertical integration between RU and the customers have become more prevalent with the increase in competition. As noted below, the new market entrants are increasingly focusing on specific market segments such as intermodal and block trains

¹²² https://transport.ec.europa.eu/system/files/2023-07/COM_2023_443_0.pdf

¹²³ [MSC and Ferrovie dello Stato Italiane Sign MoU on Development of Intermodal Hubs across Italy | MSC](#)

¹²⁴ [The European Rail Freight Market - Competitive Analysis and Recommendations-1649762289.pdf \(erfarail.eu\)](#)

leaving single wagon load to the incumbents. As a result, companies dependent on single wagon load are becoming their own RUs. This is the case in Poland, where Lotos Kolej (now merged into Orlen KolTrans), initially established for the purpose of oil shipping from the refinery in the Gdańsk metropolitan area, which has started to offer transport services to external clients, finally reaching over 5% share in the market¹¹⁴.

Focus on particular business segments

As alluded to in this section, competition has resulted in an increased focus on specific market sectors. This change is primarily driven by the new entrants which focus on either intermodal or block train transport. The focus is primarily related to the large operating and capital costs related to SWL. The focus of the non-incumbents is summarised in the figure below. The survey indicates that this may have resulted in an increase in transport feasibility for shippers. 62% of the responding shippers indicate that competition in the freight rail market has eased their business operations. Interestingly, 48% of the respondents disagree that competition has increased the attractiveness of rail as compared to road transport.

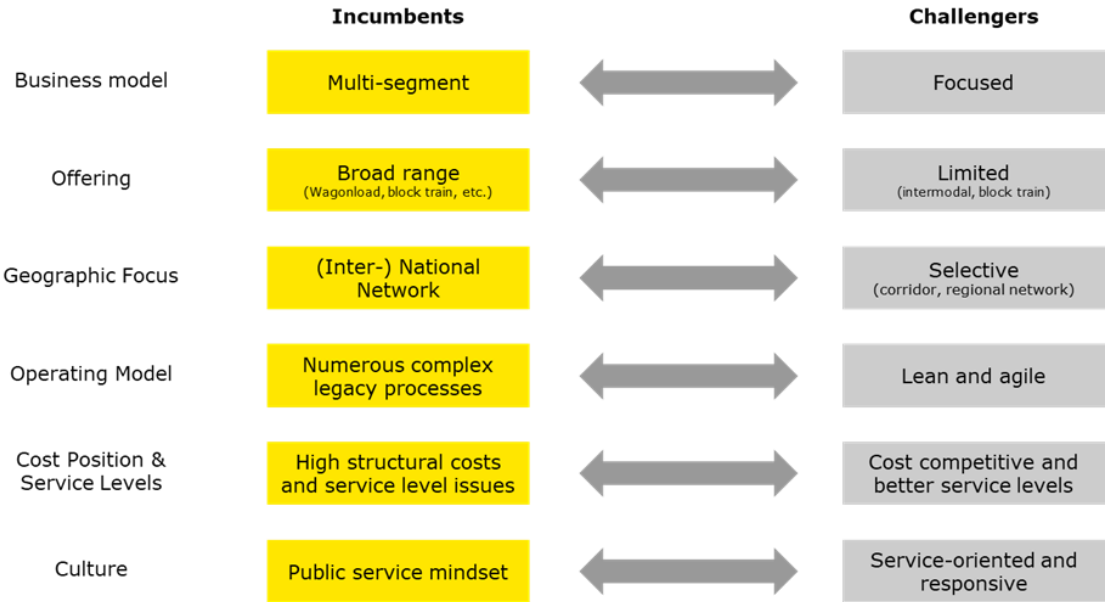


Figure 24: Differences between incumbent and non-incumbent operators in the rail freight market¹²⁵

The focus can be seen in the Italian market where intermodal traffic has resulted in an increase of the total tonnage but a decrease in the average hauled distance. Specifically, there has been a substantial increase in the category termed "other commodities". This category encompasses a diverse range of merchandise goods that are commonly transported in ocean containers, continental cargo boxes, or swap bodies. This increase is particularly striking, with the proportion of "other commodities" within the overall transported goods rising from 56% to 65% over a span of 13 years. This trend suggests a diversification and expansion of the goods transported by rail, reflecting changing market demands and logistics preferences¹²⁶.

¹²⁵ ECM Ventures, E. (2022). The European Rail Freight Market Competitive Analysis and Recommendations - Study on behalf of European Rail Freight Association (ERFA). ECM Ventures.

¹²⁶ Idem.

5.5. Conclusion

In conclusion, this study has found that competition in the freight rail market has led to a decrease in prices, across a variety of different cases, when measured for all types of freight rail transport. Competition also improved quality through service enhancements. However, the greatest effect is on the market segmentation, where new entrants primarily focus on specific types of freight transport. The demand for freight rail appears to have stabilised thanks to competition. However, the strong increase in demand for road transport has resulted in a stagnation or decrease in the market share of rail freight.

Future challenges for freight rail are predominantly related to cross-border traffic and the many current obstacles operators face. Lengthy border stops and specific national operational requirements are hurdles to further increasing demand for freight rail, especially for long-distance freight services where freight rail is the most efficient. In addition, the segmentation of non-incumbents in block train and intermodal transport could be detrimental to freight rail clients depending on single-wagon load transport.

6. CONCLUSION

This study can confirm the expectations that competition in the rail transport market for both freight and passenger services has had a positive impact on prices and service quality for the final customer. With regards to the individual market segments composing the scope of the present study (OA, PSO and freight), the following conclusions can be drawn:

Open access:

- OA passenger markets have witnessed significant price drops due to competitive pressure, with new entrants often introducing innovative pricing strategies to attract customers.
- Service quality has considerably improved due to competition with non-incumbent operators that differentiate themselves in the market through better quality. The increased focus among non-incumbents on quality has prompted incumbent operators to invest in new rolling stock. Moreover, there has been an increase in frequency due to competition.
- The decrease in ticket prices and improvement in service quality have resulted in a strong increase in demand across the examined case studies. In some cases, the increased demand for rail has resulted in railways becoming the dominant mode.
- Nevertheless, certain barriers remain to reach the full potential of competition. These include access to ticketing platforms, quality of infrastructure, and availability of rolling stock.

Public service obligations:

- Market opening in this market segment is still recent, and its effects will be felt fully only upon the expiry of the last contracts awarded before December 2023, i.e. during the transitional period foreseen by the Fourth Railway Package. Therefore, the study has significant limitations, however:
 - There is evidence that the benefits to society arising from competition 'for the market' materialise essentially in the form of reduced costs for the competent authorities that tender PSO services. It is for the authorities to decide whether and how to pass on the savings of public money to end-users.
 - The study shows that some competent authorities have chosen to pass on the benefits of competition in the form of higher frequencies and/or improved quality of service, while other have prioritised cost reductions. Competition for the market appears to have no direct effect on prices, which are typically regulated.

Rail freight:

- In the freight sector, competition has had mixed effects. While some markets experienced price reductions due to increased competition, others experienced stable prices.
- Competition has resulted in an increased focus on service quality and reliability, which in some cases is the determining factor for the choice of operator.
- Competition has resulted in increased market segmentation with non-incumbents focusing on block trains and intermodal transport. Moreover, there is a trend towards vertical integration in the market with shippers and specifically raw material producers setting up their own rail freight operators.
- The effect of competition on demand varies. In some cases, demand has increased (e.g., Germany) as a result of competition while for others (e.g., France) it has remained stable.

In addition, this study identified a series of future challenges for achieving the full potential of competition and for railways in general:

- The need of investments to expand and/or upgrade the railway infrastructure was mentioned across all market segments as a fundamental enabler of demand growth.
- For passenger services, the main ticketing platforms belong to incumbents, which restricts competition's visibility to customers. Increased focus on assuring equal access to ticket platforms for all operators is deemed to be an important aspect with the view to spurring demand for railways.
- Lastly, interoperability improvements among the member states' railway networks, including speeding up cross-border procedures and deploying ERTMS, will be needed to foster international rail traffic.

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