Study on the prices and quality of rail passenger services

Final Report
April 2016

European Commission
Directorate General for Mobility and Transport

Our ref: 22870601
Client ref: MOVE/B2/2015-126

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1 Introduction

Study background

1.1 Under Article 15 of Directive 2012/34/EU establishing a single European railway area (the Recast Directive), the European Commission (the Commission) is required to monitor developments in rail transport across the European Union and to report on these to the European Parliament and the Council. Accordingly, the Commission collects a wide range of information on the rail sector of each Member State through the annual Rail Market Monitoring Survey (RMMS). All European Union Member States except Cyprus and Malta (which do not have railways), together with Norway, submit RMMS questionnaire responses.

1.2 In preparing reports on the rail sector, the Commission must include information on fares and service quality. These are key determinants of the competitiveness of rail services relative to other transport modes, and it is important for policy makers to understand how they are influenced by policy at the Union, national and regional level. However, given the wide range of fares and services offered, a reflection partly of the different fare setting and subsidy policies prevailing in different Member States (and in different regions within individual Member States), it is difficult to obtain comparable information through the RMMS.

1.3 Against this background, the Commission has initiated this study on the prices and quality of rail passenger services. Steer Davies Gleave was awarded the contract to undertake the study in October 2015 and this Final Report sets out the findings and conclusions.

Study objectives and methodology

Study objectives

1.4 The study is intended to investigate the rail service offer, defined in terms of fare levels and service quality, to passengers across the European Union and to assess how this has been influenced by policy in different Member States. The Commission is particularly interested in how the prices and service offer have evolved and vary in different States. It is also concerned with the impact of market liberalisation and competition, and policy in relation to services operated as Public Service Obligations (PSO services) under contract between a transport authority and a railway undertaking.

1.5 A key objective is therefore to determine how far policy in each of these areas has influenced the attractiveness of rail services in different markets, more specifically suburban, regional and long-distance services operating on routes on the main European rail network. The findings are expected to inform the Commission's Fifth Report on Rail Market Monitoring, to be published during the first half of 2016.

1.6 The study covers all 26 Member States of the European Union which have operating railways, plus Norway and Switzerland. For simplicity, in this report the term Member State is taken to

apply to all of these countries, notwithstanding that Norway and Switzerland are not members of the Union[1].

Overview of methodology

1.7 In view of the multiplicity of fares and services available, it has not been possible to undertake a comprehensive study of the rail service offer across the European Union. However, we sought to ensure that the results of our analysis are representative of the passenger experience in different Member States and of the influence of policy on the fares and service quality offered to them. Accordingly, our methodology included the following elements:

- Review of trends in yield and fare data: where data are available, we reviewed historical trends in fares and yields to determine how these developed over the last decade.
- Review of national and rail sector characteristics: we investigated the impact of factors such as rail network length, degree of urbanisation and income levels on yields, providing context for the more detailed investigation of fares policy and fare levels in different countries that provided the main focus for the study.
- Desk research by Member State: we carried out desk research into the rail service offer in each Member State, and prepared case studies of 12 of them. This work included a review of various websites, covering railway undertakings, infrastructure managers and other rail sector organisations. It allowed us to identify developments in fares policy and sales and distribution channels, including applications of new technology to help buy tickets, and to assess the extent of innovation in rail markets more generally.
- Assessment of station facilities: based on a review of website information, we investigated the services and facilities available at a major station located in the capital of each Member State, assessing aspects of service quality such as provision of ticket facilities, train information and assistance for persons with reduced mobility (PRMs).
- Review of data from RMMS and the ERADIS database: to inform the case studies and our broader understanding of service quality, we also reviewed and analysed data from RMMS and from reports on service quality submitted by rail operators and included in the European Railway Agency Database of Interoperability and Safety (ERADIS). This enabled us to assess the service offer in each Member State by reference to measures such as punctuality and customer satisfaction.
- Sampling of rail fares: we sampled fares systematically for a selection of services, covering all Member States and suburban, regional, long-distance domestic and international markets. This enabled a comparison of fares within and between countries, taking account of the influence of factors such as type of fare and booking horizon (the period between booking and travel).
- Sampling of fares offered by competitive modes: building on the analysis of rail fares, we identified the cost of car travel, and coach and airline fares for equivalent origin-destination pairs, to determine how effectively rail competes with these modes on a range of shorter and longer distance routes across the European Union.
- Stakeholder engagement: we carried out extensive stakeholder engagement through interviews with, or written responses from a total thirty-three stakeholders including railway undertakings, transport ministries, regulatory bodies, passenger representative

[1] Norway is a member of the European Economic Area and Switzerland is a member of the European Free Trade Area. Both comply with aspects of European railway law.

bodies and a number of pan-European organisations[2]. These responses informed our understanding of rail policy, notably in relation to the provision of services operated as Public Service Obligations (PSOs) and the introduction of on-rail competition.

- Review of the impact of on-rail competition: we investigated a number of examples of on-rail competition in the Czech Republic, Italy and the UK, identifying impacts on the behaviour of new entrant and incumbent operators and comparative fare and service quality levels.
- Review of the impact of national rail policies: drawing on the stakeholder responses and published information, we compared the ways in which fare levels and service quality are determined in different Member States and different markets, contrasting the importance of administered fares, PSO specifications and the availability of public subsidy in some markets with the effect of commercial incentives and competition in others.

1.8 To supplement the core research team, we also engaged a broader team of staff with country-specific transport sector experience across all Member States. In addition to providing their own knowledge and experience, our country experts assisted with data collection and stakeholder contacts, and reviewed the outputs of the desk research and stakeholder engagement exercises.

1.9 Based on our findings, we sought to draw conclusions about the overall competitiveness of rail relative to other modes in different markets, and about the impact of different rail policies on the attractiveness of rail services from the perspective of passengers.

Organisation of this report

1.10 The remainder of this report is organised as follows:

- Chapter 2 provides an overview of the passenger rail market in Europe, the institutional arrangements that govern rail policy and the characteristics of the national networks.
- Chapter 3 provides our analysis of suburban fares and tickets.
- Chapter 4 provides our analysis of other fares and tickets.
- Chapter 5 discusses competition between rail and car, coach and air transport.
- Chapter 6 discusses competition between rail operators, whether for or in the market.
- Chapter 7 examines quality and customer satisfaction.
- Chapter 8 synthesises and draws conclusions on the preceding analysis.

1.11 The following additional information is provided in appendices:

- Appendix A, our country case studies
- Appendix B, a statistical analysis of national railway characteristics
- Appendix C, a case study on fares between Exeter and Fareham
- Appendix D, background on factors influencing travel demand
- Appendix E, a summary of the extent of coach market liberalisation
- Appendix F, a glossary of terms

[2] This represents a response rate of 22% of the 150 organisations contacted.

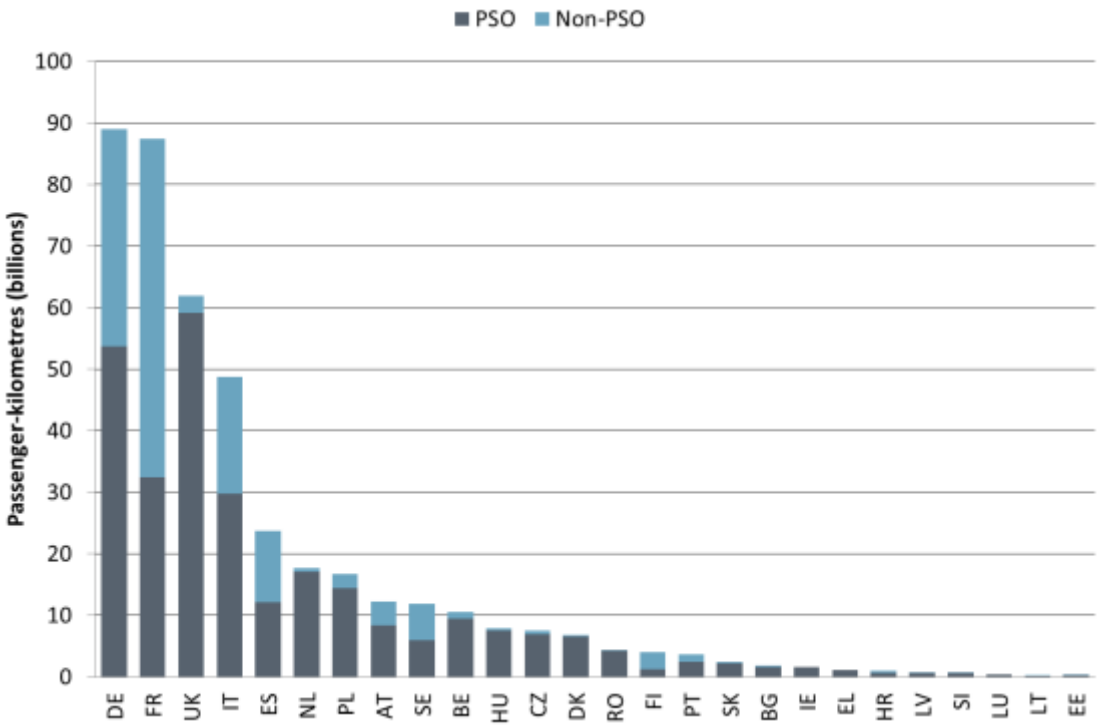
2 The passenger rail market in Europe

European rail travel demand

2.1 Over the ten years to 2013, and as reported to Eurostat, passenger rail demand in the European Union (EU28) increased by 61.8 billion passenger-kilometres to 424 billion passenger-kilometres. This represents an average growth rate of 1.6% per annum and suggests that in 2013 rail had a 7.4% share of all surface transport including private car, bus and coach, rail, tram and metro.

2.2 Figure 2.1 shows how the largest markets for rail travel are in large and high-income Western European Member States.

Figure 2.1: Rail passenger-kilometres by Member State (2013)

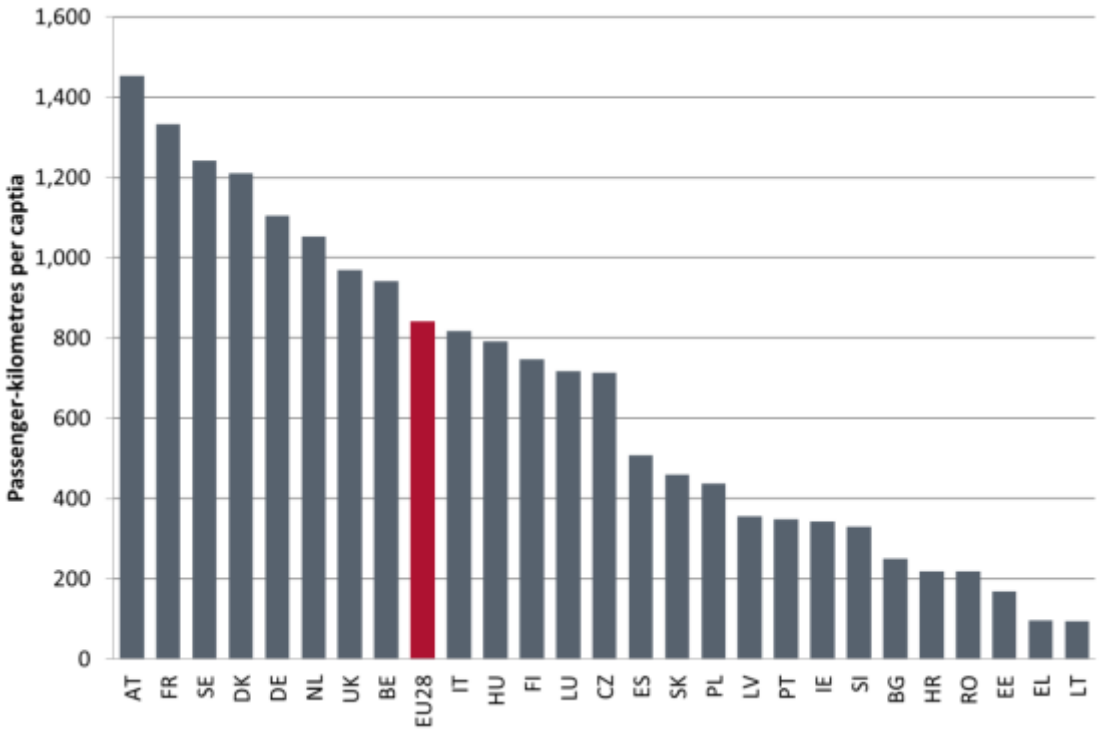


Source: Steer Davies Gleave analysis of Eurostat data

2.3 Many rail services in these large high-income Member States are not part of a Public Service Obligation (PSO) agreement[3], except in the UK where the PSO operator (franchisee) may have offered to pay a premium to operate the service. Across the European Union, however, two thirds (or 280 billion passenger-kilometres) of the estimated travel by rail in 2013 was made on PSO services.

2.4 Figure 2.2 shows how estimated rail travel per inhabitant varies by a factor of ten between the Member States which have railways. In 2013, estimated rail travel per head of population was typically over 1,000 kilometres per year in Western and Northern Member States and less than 100 kilometres in Lithuania and Greece.

Figure 2.2: Propensity to travel by rail by Member State (2003-2013)

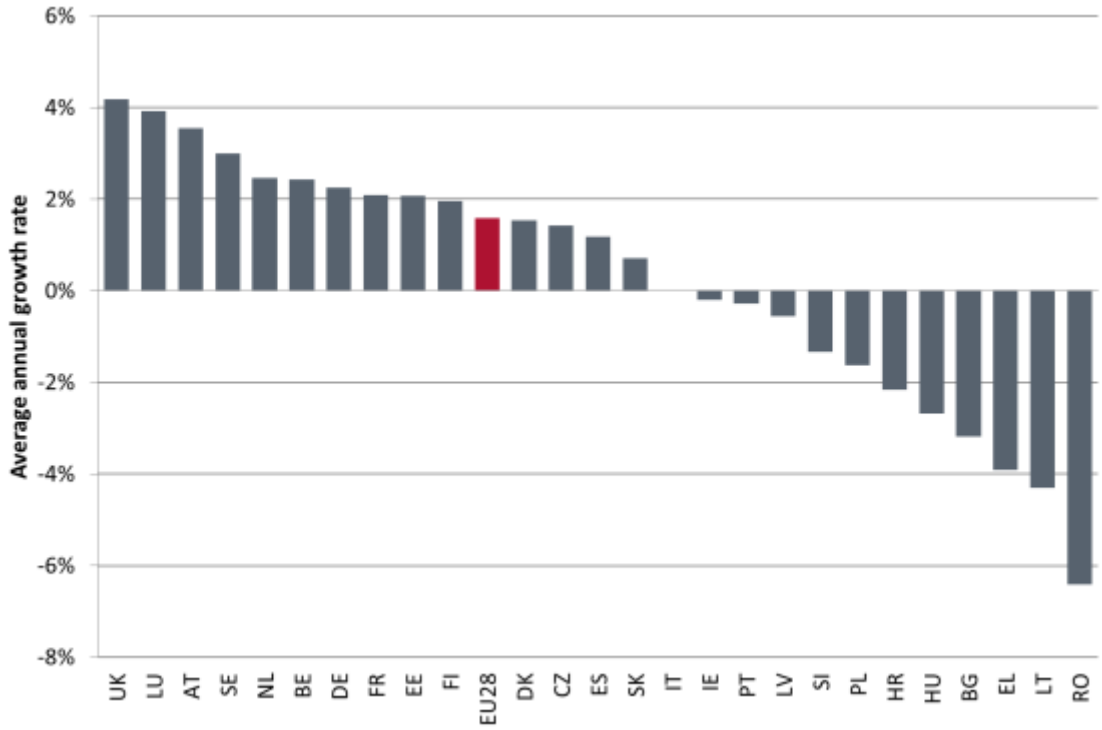


Source: Steer Davies Gleave analysis of Eurostat data

2.5 Growth in rail use over the ten years to 2013 also varied significantly by Member State, as shown in Figure 2.3.

[3] Public Service Obligations are defined in Regulation (EC) 1370/2009 to mean requirements defined or determined by a competent authority in order to ensure public passenger transport services in the general interest that an operator, if it were considering its own commercial interests, would not assume or would not assume to the same extent or under the same conditions without reward.

Figure 2.3: Average annual growth in rail passenger-kilometres (2003-2013)



Source: Steer Davies Gleave analysis of Eurostat data

2.6 The largest increases in rail passenger-kilometres, with average annual growth of at least 2%, were in EU15 Member States: the UK, Luxembourg, Austria, Sweden, the Netherlands, Belgium, Germany, France and Estonia.

2.7 A decline in rail patronage over the ten years to 2013 was reported in eleven Member States, with average rates of decline of over 6% in Romania, 4% in Lithuania and Greece and 3% in Bulgaria. In Bulgaria, the decline may result from the consolidation activity required by its Railway Reform Programme. In Greece, it may be due to the contraction of state funding required as part of the wider fiscal austerity packages implemented from 2010.

2.8 The divergence in growth rates with EU13 Member States also reflects a broad range of exogenous and endogenous factors. For example, increased access to car ownership and higher car use in new Member States will suppress rail demand. Conversely, the opening of new infrastructure or services, such as the West Coast Main Line upgrade works in the UK (2008) and the HSL-Zuid line in the Netherlands (2009) will support rail demand and encourage modal shift.

European rail fares

2.9 Each year millions of fares are calculated and marketed by a wide range of national, regional, local and urban authorities and operators. However, databases of historic fares may not be saved or made available to third-parties. Nevertheless, we identified a number of sources of data providing some indication of historical trends, although each source is subject to some caveats. More specifically, the data sources identified to investigate changes in fares through time include the following:

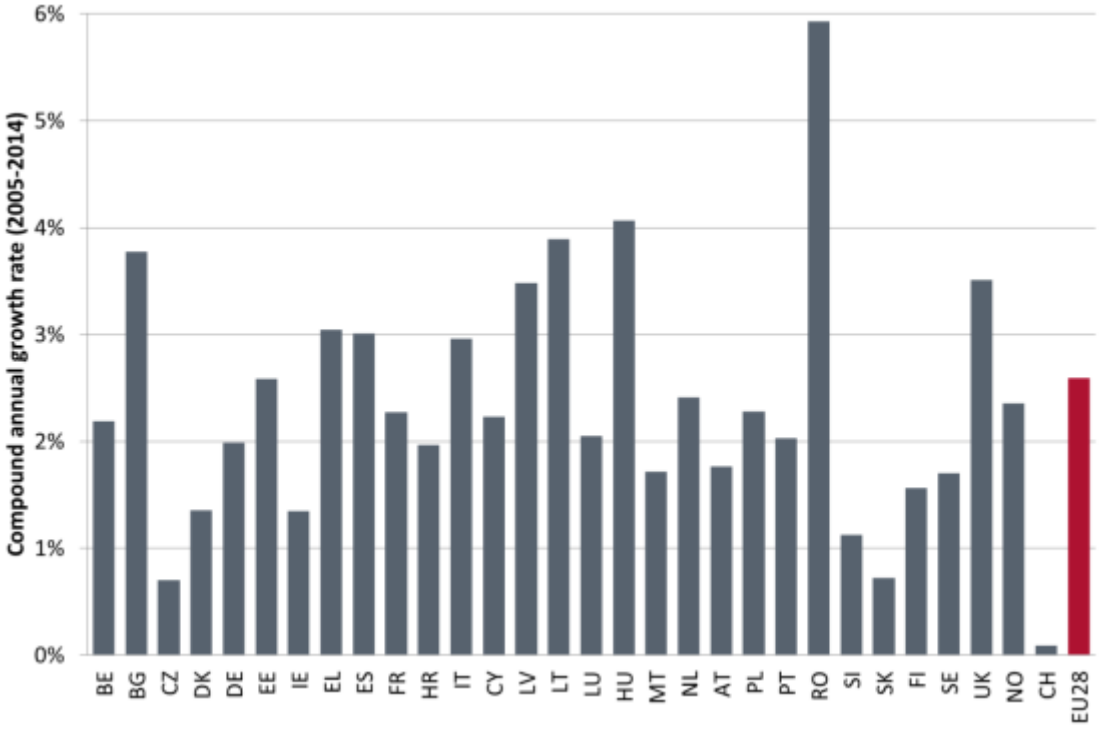
- Harmonised Index of Consumer Prices (HICP) can be disaggregated to allow some analysis of how rail fares in individual Member States have changed relative to average prices across all transport modes.
- Historical fares data at the national level are published by the UK Office of Rail and Road.
- National average yield data can be calculated from time-series data on passenger revenue and passenger kilometres reported in Eurostat.
- Fares data collected for the 2009 *Comparisons between fares and ticketing in Britain and continental Europe* study by Steer Davies Gleave for Passenger Focus (now Transport Focus, the representative body for rail passengers in Great Britain) includes information on 2009 fare levels that can be compared with 2015.
- Information that has been obtained from stakeholder engagement.

2.10 We discuss each of these sources below.

Harmonised Index of Consumer Prices (HICP)

2.11 Figure 2.4 uses data from the HICP to illustrate inflation across all transport modes from 2005 to 2014.

Figure 2.4: Harmonised Index of Consumer Prices: all transport (2005-2014)



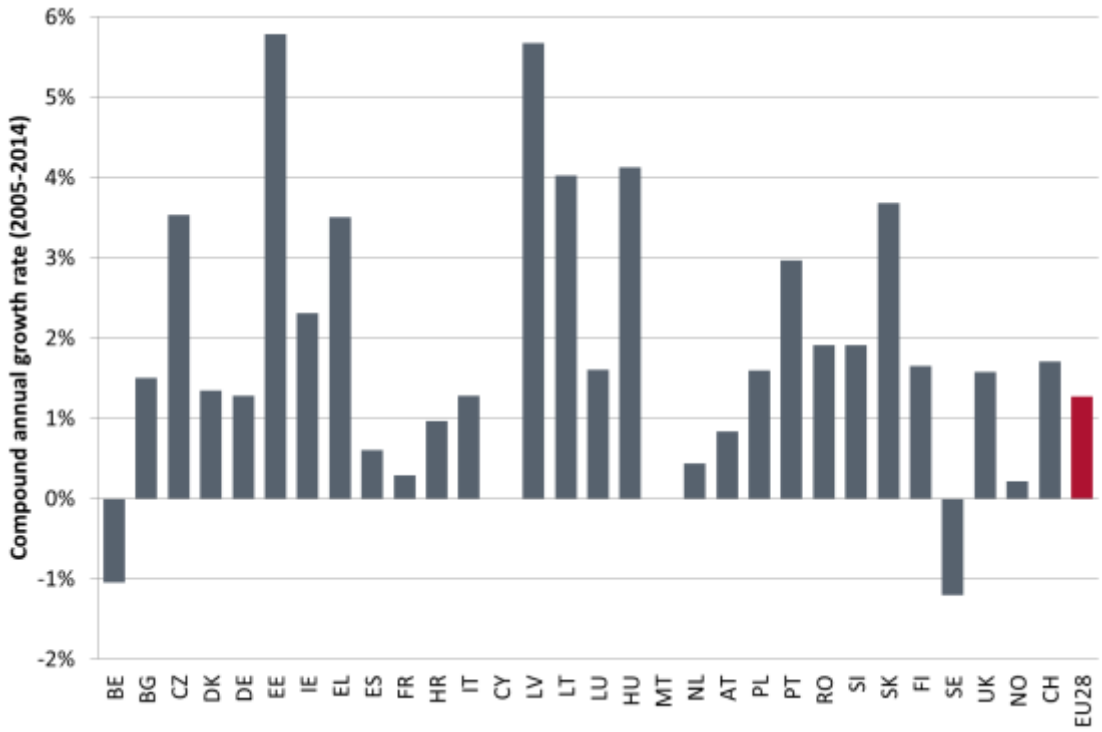
Source: Steer Davies Gleave analysis of Eurostat HICP data

2.12 The dominance of private car travel in the index means that these figures are heavily affected by volatility in the price of crude oil and improvements in fleet efficiency. They are also influenced, in some part, by the strength of the economy in each Member State, including the perceived quality of macroeconomic policy.

2.13 Figure 2.5 uses disaggregate HICP data to consider the relationship between the price of rail and the "all modes" average shown in Figure 2.4. In this chart, a value greater than zero suggests that rail travel is becoming more expensive than a basket of transport services

(private and public) across all modes. A value less than zero suggests that rail travel is becoming cheaper.

Figure 2.5: Harmonised Index of Consumer Prices: rail transport/all transport (2005-2014)



Source: Steer Davies Gleave analysis of Eurostat HICP data

2.14 In all but two Member States (Belgium and Sweden), rail travel appears to be becoming more expensive relative to other modes. While across the European Union (together with Norway and Switzerland) the divergence is modest (approximately 1% per year), there are some notable outliers (Estonia and Latvia) where rail travel appears to be becoming considerably more expensive than other modes. In Estonia this may be due to the reduction in Russian freight transit traffic which previously cross-subsidised passenger journeys.

2.15 At this level of disaggregation, the reliability of conclusions based on HICP data is limited. The HICP aims to be representative of the developments in the prices of all goods and services available for purchase within the euro area for the purposes of directly satisfying consumer needs. It measures the average change over time in the prices paid by households for a specific, regularly updated basket of consumer goods and services. As part of a large bundle of goods that is weighted to produce whole-economy inflation estimates, HICP therefore relies upon a small sample of rail products which may not be representative of the rail market in general, and many individuals or households will experience different fares depending upon the corridor and type of ticket bought[4].

[4] On average, the prices of around 700 products are collected every month in different outlets and in approximately 1,600 different towns and cities across the euro area.

National fares data

2.16 The UK Office of Rail and Road publishes time series data on rail fares. We investigated the availability of similar data for other Member States and identified Sweden as the only country which provided a similar time series on advertised fares at the point of sale, rather than average yields which reflect changes in the mix of fares that are bought.

2.17 It is important to distinguish between fare and average yield, in particular, if the calculation of average yields includes multiple ticket types. Average yield may not always provide a reliable proxy for changes in fares since passengers may change their travelling habits in response to fare changes. Table 2.1 provides a stylised example of the distinction between fare and average yield.

Table 2.1: Fare and average yield: an example

Class of travel	Indicator	Scenario 1	Scenario 2
First Class	Fare (1)	€50	€75
	Journeys (2)	100	50
	Revenue (3) = (1)x(2)	€5,000	€3,750
Second Class	Fare (4)	€20	€20
	Journeys (5)	500	525
	Revenue (6) = (4)x(5)	€10,000	€10,500
	Average yield (7) = ((3)+(6))/((2)+(5))	€25	€24.78

2.18 In Scenario 1, a train has fares of €50 in First Class and €20 in Second Class. With 100 passengers travelling in First and 500 in Second, this generates an average yield of €25.

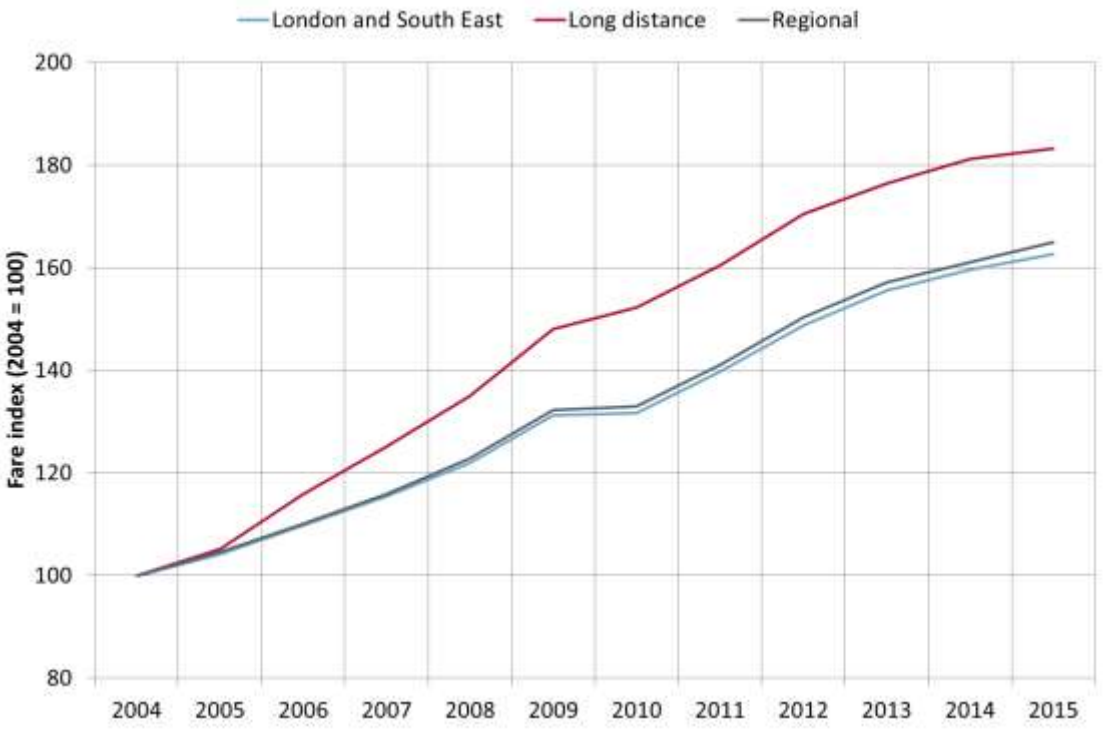
2.19 In Scenario 2, the First Class fare increases to €75. This reduces the demand for First Class to 50 passengers, 25 of whom choose to travel in Second Class instead, and the remaining 25 no longer travel by rail, but may use alternative modes, make a different trip, or choose not to travel at all.

2.20 The result of changing from Scenario 1 to Scenario 2 is that, while the First Class fare has risen and the Second Class fare has not changed, the average yield has fallen from €25.00 to €24.78.

2.21 Due to the way in which it incorporates elements of behavioural change, care must be taken when interpreting average yield data that covers multiple ticket types or fare levels.

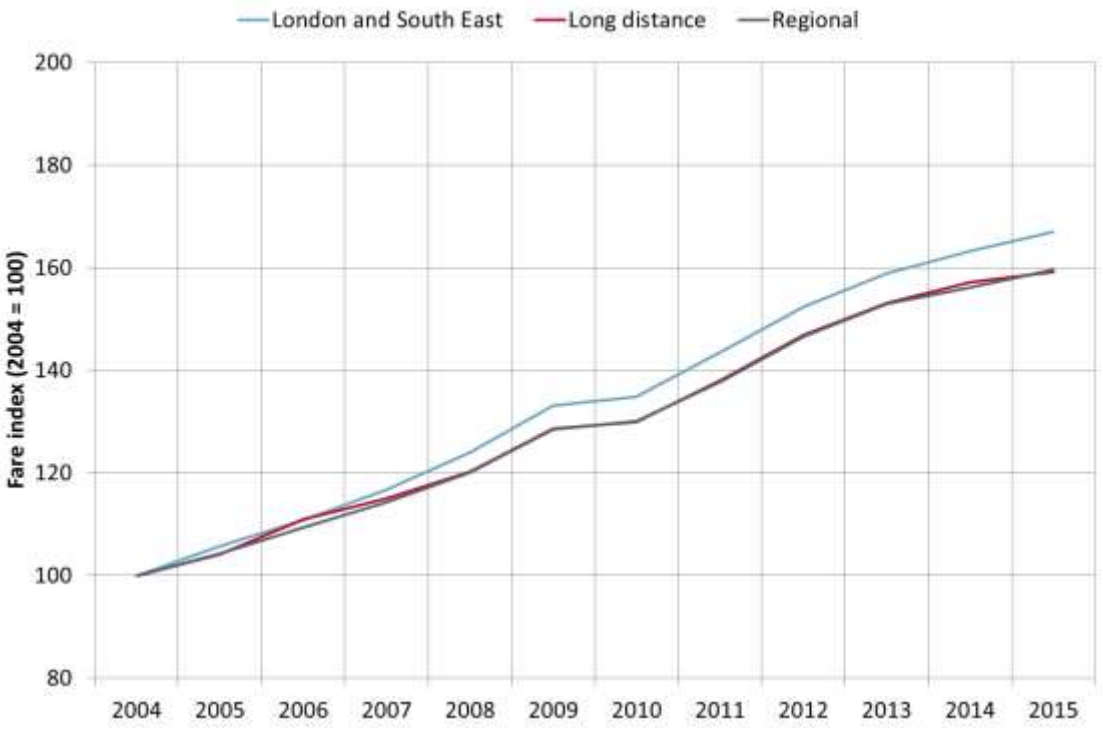
2.22 The Office of Rail and Road time series data on rail fares take the form of indices for different fare types for each the main categories of PSC (franchise) in the UK. These are calculated each year in January, the month in which fares increases permitted under the regulatory mechanism in the franchise agreements are applied. Separate indices are calculated for Anytime, Off-peak, Super-off peak, Advance and season fares. Figure 2.6 to Figure 2.8 inclusive show trends in anytime, off-peak and advance fares for each franchise category from 2004 to 2015. Note that the data covers services operating in the privatised rail industry in Great Britain and hence does not include fares in Northern Ireland.

Figure 2.6: Trends in Anytime fares in Great Britain (nominal)



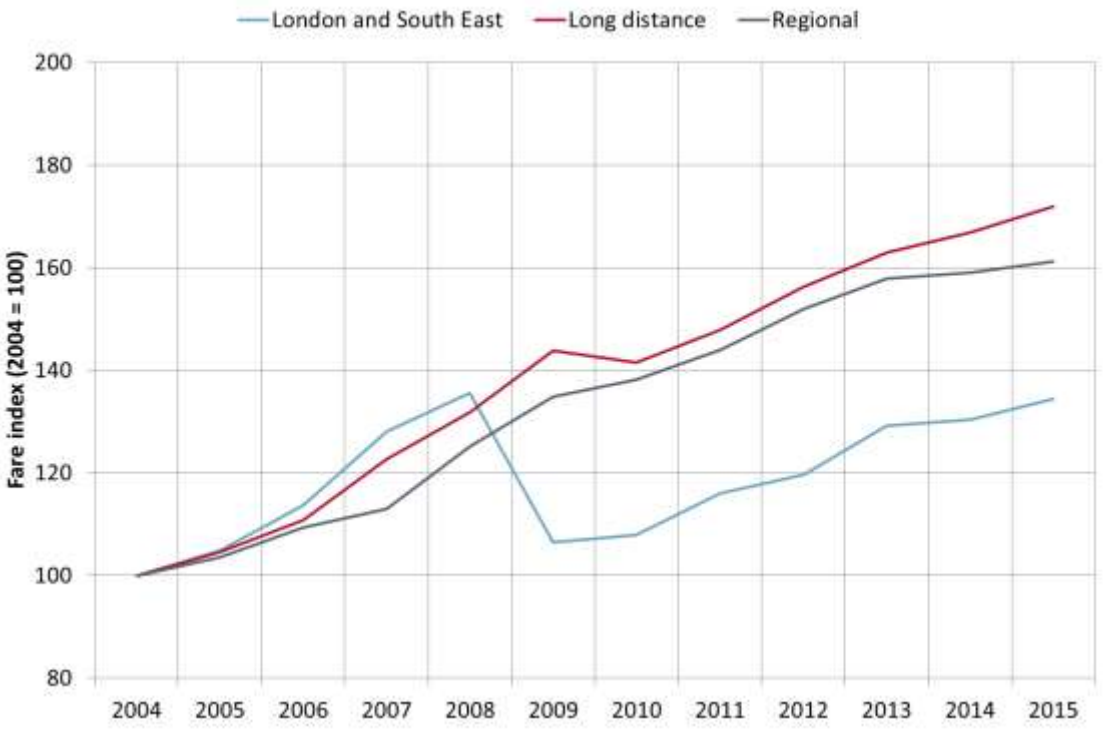
Source: UK Office of Rail and Road

Figure 2.7: Trends in Off-peak fares in Great Britain (nominal)



Source: UK Office of Rail and Road

Figure 2.8: Trends in Advance fares in Great Britain (nominal)



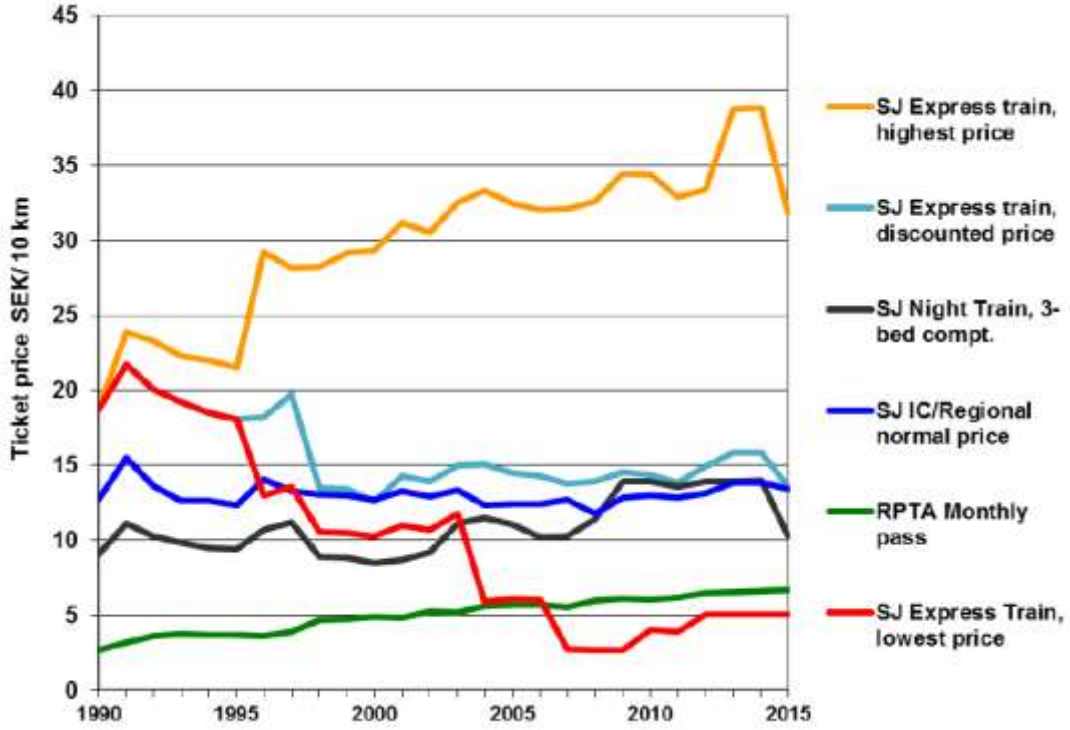
Source: UK Office of Rail and Road

2.23 The figures indicate a steady annual increase in the real value of most fares over the period as a whole, in the range of between 1% and 2% per annum for Anytime and Off-peak fares. The apparent substantial reduction in Advance fares on London and Southeast services in 2009 may reflect the major reclassification of fares that occurred in that year. If so, Figure 2.8 may illustrate a more general issue concerning discontinuities in data sets even where these appear to allow analysis of long term trends.

2.24 In Sweden, the Royal Institute of Technology (KTH) has produced a report which describes the changes in rail fares and patronage in Sweden between 1990 and 2015. Some key findings are summarised below[5].

[5] KTH Sweden (2015) *Development of supply and prices on Swedish railway lines 1990-2015*

Figure 2.9: Rail fare trends in Sweden (2015 prices)



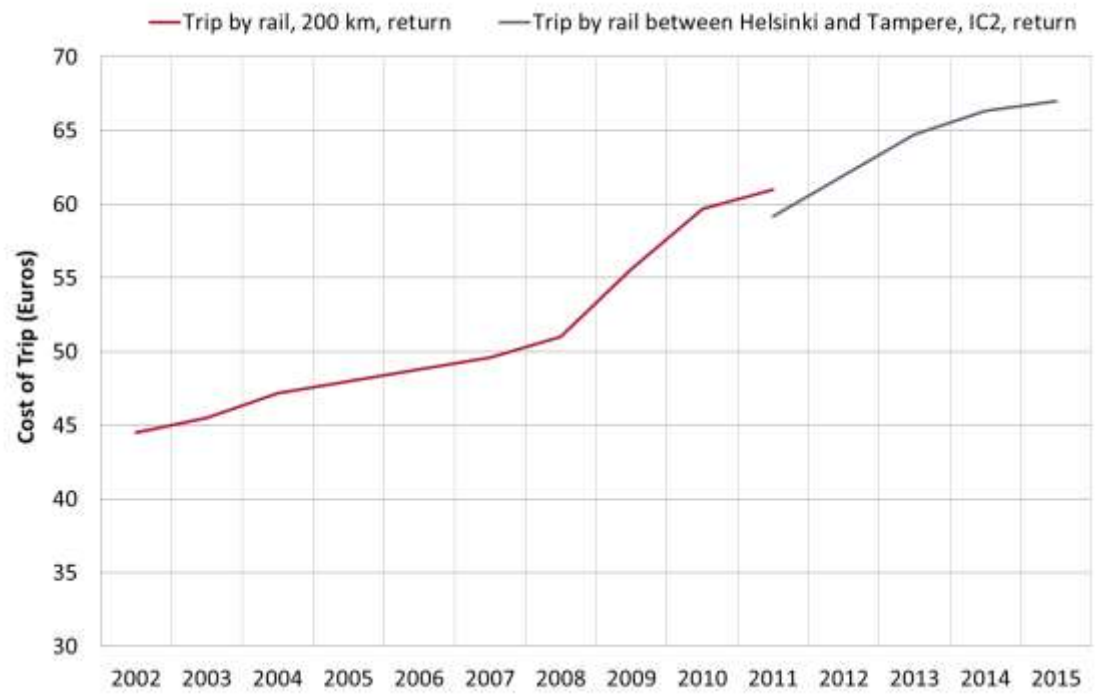
Source: The Royal Institute of Technology (KTH Sweden)

2.25 Figure 2.9 illustrates considerable variation in Swedish rail fares (per 10 km) over the past 25 years. The price of SJ Express' highest fare has grown steadily year on year, whilst the lowest priced SJ Express fare decreased dramatically between 1990 and 2008 and has almost levelled off since. This is indicative of SJ's pricing policy, which has been strongly influenced by the introduction of yield management (a policy that tends to increase the range of fares paid). The prices of other, specific rail products have remained broadly fixed in real terms, with the exception of the RPTA Monthly pass which has grown steadily and has almost doubled since 1990. The downward trend observed on SJ services from 2014 can be partly explained by the complete market liberalisation of Swedish railways in 2010[6]. This has introduced some competition on the network and has pushed SJ to lower its fares.

2.26 The Finnish Transport Agency also provided an extract of time-series fares data which is reported in Figure 2.10 below.

[6] Deregulation started on October 1st 2010, however, train paths needed to be submitted by April 2010 for the timetable that came into place in 2011, which corresponded with train operation year 2012.

Figure 2.10: Rail fare trends in Finland



Source: Statistics Finland

2.27 Figure 2.10 shows a steady increase in in the cost of a 200km trip between 2002 and 2012. Between 2012 and 2015 the sample trip was changed to Helsinki to Tampere by IC2, however, the trend observed is similar. Since the data only represent a trip type, it is not possible to infer whether fares on average followed the same pattern.

National average yield data

2.28 A further potential source of national time-series data on rail fares is passenger revenue and passenger-kilometre data reported at national level. Again, where available, this data is not subject to many of the shortcomings of HICP data, providing a more comprehensive picture of rail travel across all routes and ticket-types. However, we examined the source information on which these data are based and are aware that they may be inaccurate for a number of reasons:

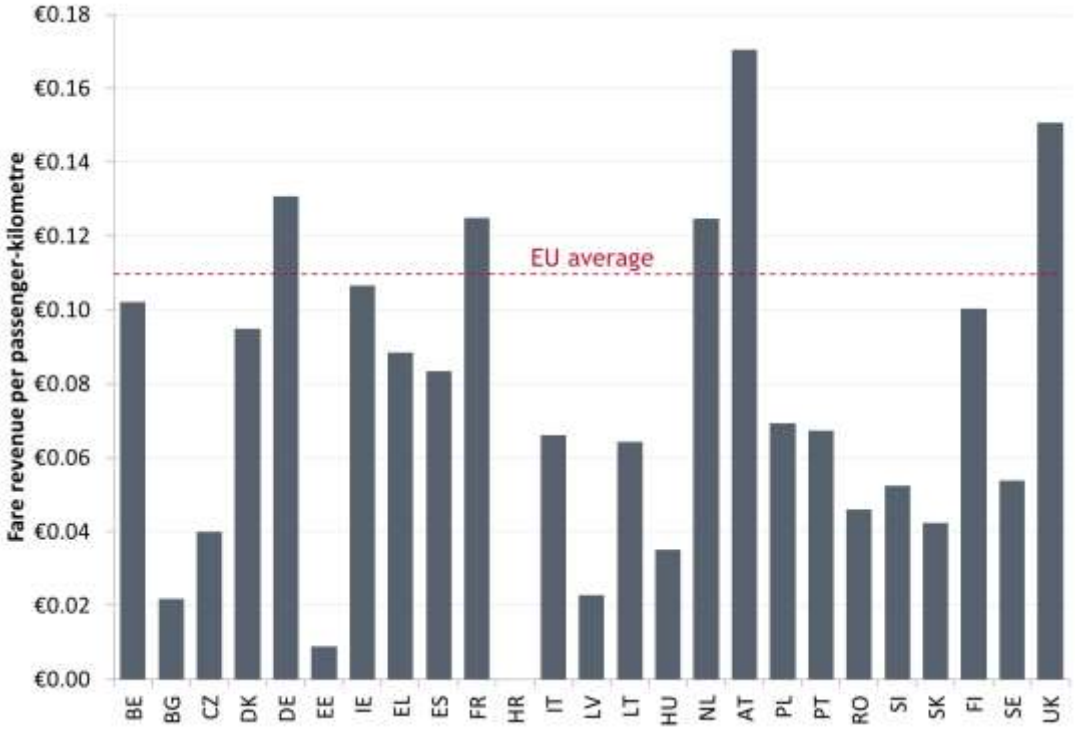
- Reported passenger revenue data may exclude revenue associated with gross cost Public Service Contracts (PSCs), or not allocated to rail by a competent authority, particularly in urban areas[7].
- Reported passenger revenue reflects the number of passengers who pay each fare, but this will change not only with underlying demand but also when fares are changed relative to the passengers' willingness to pay (as illustrated in Table 2.1). Changes in the average fare paid by passengers will not be the same as changes in the average fare set by competent authorities or operators.

[7] In recent but unpublished work for the Commission on the implementation of Regulation 1370/2007, we found the revenue for multimodal urban and suburban travel was rarely identified or allocated to a mode.

- Reported passenger-kilometres are estimated, and in other studies we found that these estimates are sometimes based on assumptions, such as that there is a fixed average trip length.

2.29 Despite the shortcomings described above, Figure 2.11 highlights the disparity in average yields (fare revenue per passenger-kilometre) between States.

Figure 2.11: Fare revenue per passenger-kilometre (2012, excluding Luxembourg)



Source: *Study on the Cost and Contribution of the Rail Sector* (Steer Davies Gleave, 2015).
Note: fare revenue data is not available for Croatia.
Note: for ease of presentation the reported €0.58 per passenger-kilometre in Luxembourg has been excluded. However, this high average yield is difficult to reconcile with our findings of low individual fares (see Chapter 4).

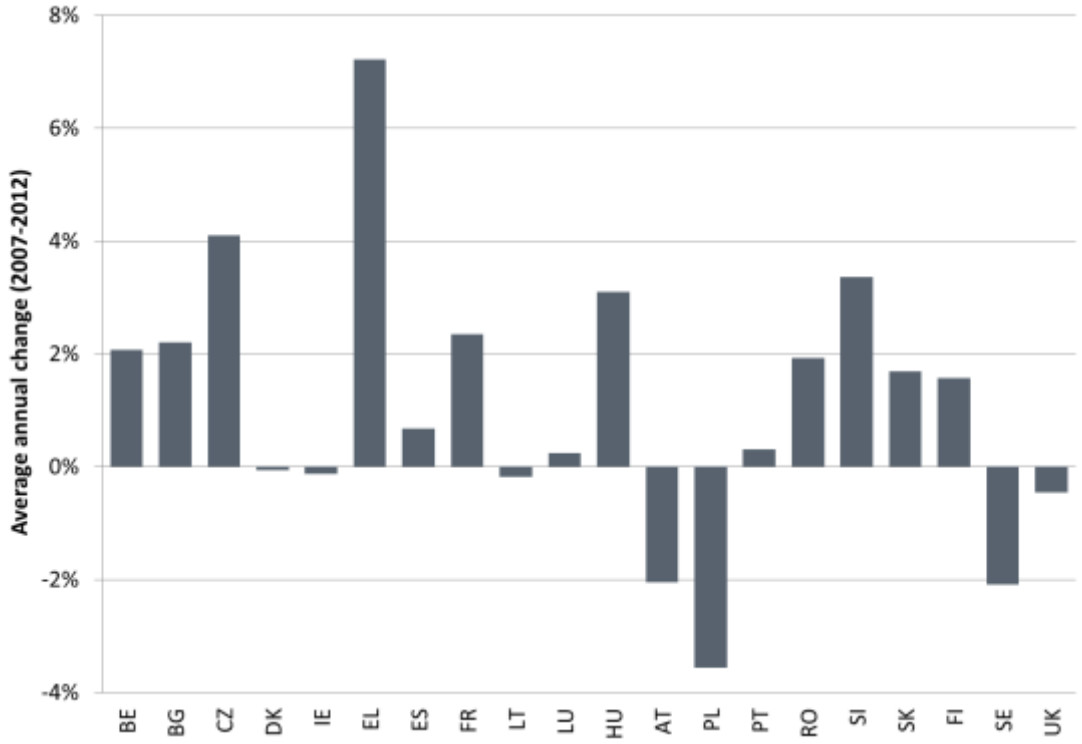
2.30 As might be expected, the highest average yields are found in high-income EU15 Member States with well-developed, high-quality passenger networks. Fares in Sweden are a notable exception to this general observation, where average fares are broadly half those charged in neighbouring Denmark and Finland.

2.31 The observed difference in average yield may reflect the proportion of industry costs covered, through necessity or design, by subsidies. As we discuss later (see Figure 2.16), the operating cost recovery from fare revenue in Western European Member States is typically higher than elsewhere in the EU. However, in some markets fares may be low, even if railway undertakings seek to maximise revenues, because of either low incomes or competition from other modes[8].

2.32 Figure 2.12 shows the average annual change in average yield (measured as fare revenue per passenger-kilometre) between 2007 and 2012 for a sample of Member States.

[8] In some Member States, particularly where services are poor, there is evidence of rail being considered an 'inferior good'. In economics terminology, an inferior good is one for which demand falls when consumer income rises.

Figure 2.12: Average annual change in revenue per passenger-kilometre (2007-2012)



Source: *Study on the Cost and Contribution of the Rail Sector* (Steer Davies Gleave, 2015).
Note: average annual change calculated as a compound annual growth rate (CAGR).

2.33 In the majority of cases, average yields have risen, although the average rate of increase varied considerably. The very high increases in average yield in Greece may be a result of large reductions in the number of passenger services on offer and consequent reductions in rail use. Only the most profitable services, typically those with higher average yields, have been retained at the expense of less profitable routes and services.

2.34 As noted previously, these outcomes are likely to reflect a number of factors, not least the potential for passengers to trade down to a cheaper product when faced with a fare increase (as illustrated in Table 2.1) and external factors such as the economic slowdown which began in 2007. For example, despite well-documented increases in UK rail fares, average yields fell between 2007 and 2012. This is probably due to passengers shifting from First Class and unrestricted ("open") tickets to Standard Class and yield-managed advance purchase ("Advance") tickets[9]. The transfer of some high-yield London suburban services from a national net cost to a municipal gross cost PSC may also have affected reported average yield.

Comparison with fares data obtained from previous work

2.35 In our previous work for Passenger Focus (see paragraph 2.9), we identified a range of fares available in 2009 on specific routes within a limited number of States[10], as shown in Table 2.2 below. In each case we sought to compare 2009 and 2016 fares of each type.

[9] Due to the way in which the data presented in Figure 2.12 has been constructed, some of the change in average yield may also be due to a fall in the value of the pound relative to the euro over the same period, leading to an apparent fall in revenues when converted to euros.

[10] *Comparisons between fares and ticketing in Britain and continental Europe* (SDG, 2009)

Table 2.2: Member States and routes in 2009 fares study for Passenger Focus

State	Origin	Destination
Germany	Hamburg	Berlin
Spain	Valencia	Madrid
France	Paris	Marseille
Italy	Milan	Rome
The Netherlands	Leeuwarden	Rotterdam
Poland	Krakow	Warsaw
Sweden	Malmö	Gothenburg

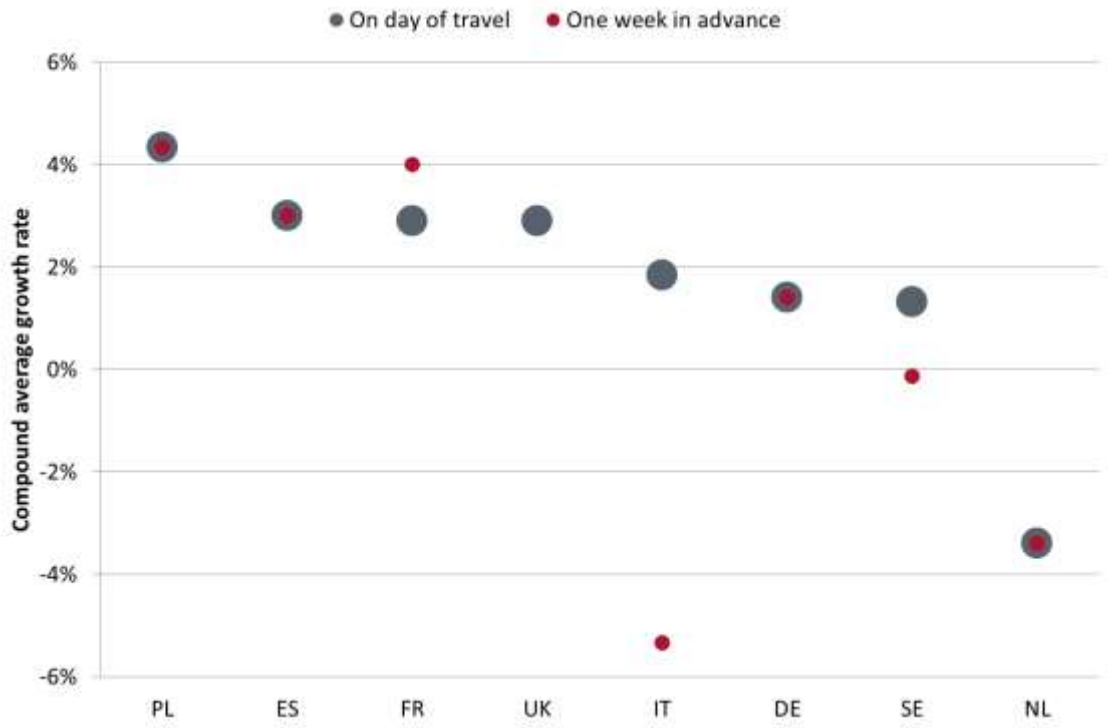
Source: *Comparisons between fares and ticketing in Britain and continental Europe* (Steer Davies Gleave, 2009)

2.36 Figure 2.13 and Figure 2.14 overleaf show compound average growth rates for two ticket types booked on the day of travel and a week ahead. In each case, the growth rate represents an average annual change in the real ticket price.

2.37 They illustrate the variation between Member States, markets (defined by ticket types), and booking horizons. While it is not possible to generalise on the basis of the evidence shown, we note that:

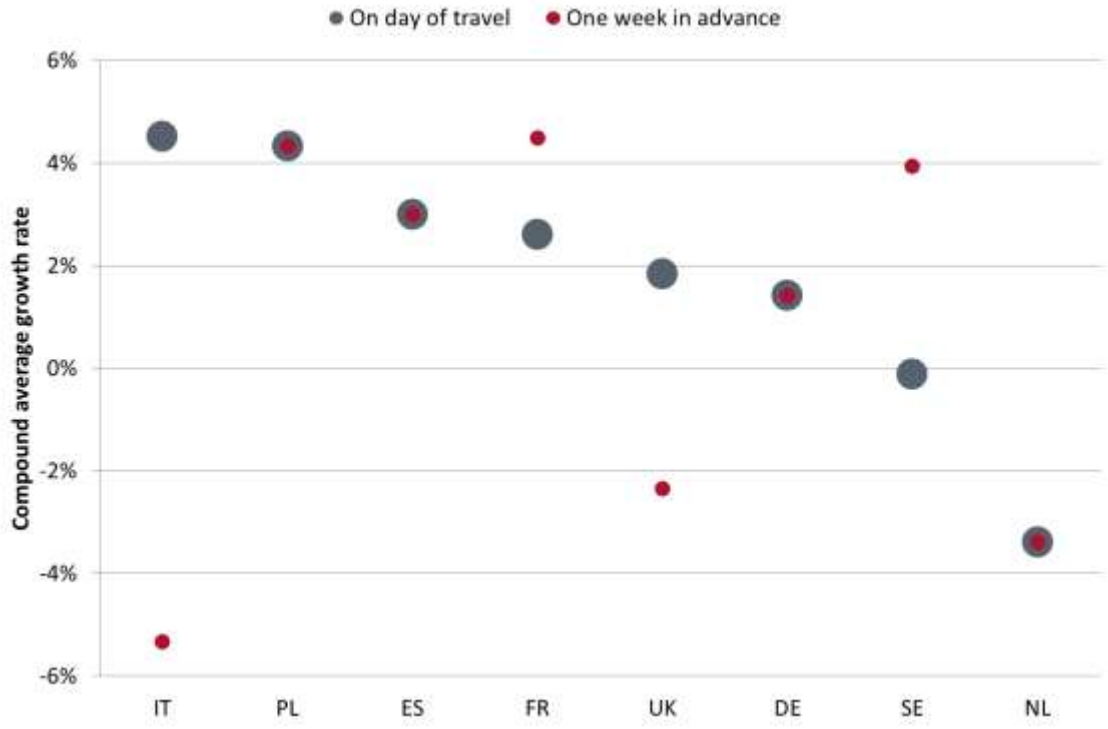
- France, Poland and Spain appear to have applied significant fare increases in both peak and off-peak markets;
- the benefits of buying tickets a week in advance rather than on the day have increased significantly in Italy, possibly reflecting a sharper commercial focus following the introduction of on-rail competition (Milan-Rome is one of only a few corridors with on-rail competition, and may not be typical);
- the benefits of buying tickets a week in advance have fallen in France as the price differential with tickets bought on the day of travel has narrowed;
- in the Netherlands, there has been a substantial fall in real fares across a range of routes which may, in part, be due to the introduction of the OV Chipkaart card and the associated restructuring of fares; and
- in Poland, Spain, Germany and the Netherlands, fare changes were similar for each ticket type and booking horizons.

Figure 2.13: Average annual growth rate: peak return fare



Source: Steer Davies Gleave analysis (based partly on data from 2009 study for Passenger Focus).
Note: analysis is based on the corridors described in Table 2.2. It was not possible to identify a directly comparable advance fare for the UK, because of ticket reclassification in 2009 and subsequent changes to ticket restrictions.

Figure 2.14: Average annual growth rate: off-peak single



Source: Steer Davies Gleave analysis (based partly on data from 2009 study for Passenger Focus).
Note: analysis is based on the corridors described in Table 2.2

Information from stakeholders

2.38 While none of the stakeholder responses included quantitative information on trends in fares, several provided information on some of the underlying causes of changes in fare levels.

2.39 Table 2.3 below summarises responses to specific questions for each of the Member States where information has been provided. Note that it has been compiled on the basis of information provided by a mix of stakeholders, including transport ministries, regulatory bodies and train service operators. Where different responses were received from stakeholders within the same Member State, the study team reached a judgement based on the advice of country experts. The question relating to PSO and non-PSO services was not sent to Member States for which the column is shaded grey.

Table 2.3: Changes in the structure and level of fares (2005-2015)

Member State		Significant changes in the last ten years?	Do fares depend on whether the service is PSO or non-PSO?	Were changes driven by intramodal competition?	Were changes driven by intermodal competition?
BE	Belgium	×		×	n/a
BG	Bulgaria	✓	✓	×	✓
CZ	Czech Republic	×	✓	✓	✓
DK	Denmark	✓		×	×
DE	Germany	✓	✓	×	×
IE	Ireland	✓		×	×
IT	Italy	✓	✓	✓	✓
EL	Greece	✓		×	×
ES	Spain	n/a	×	×	n/a
HR	Croatia	×		×	×
HU	Hungary	✓		×	×
NO	Norway	✓		×	×
AT	Austria	✓		×	×
PL	Poland	✓	✓	✓	✓
PT	Portugal	✓		×	✓
RO	Romania	✓		✓	✓
SK	Slovakia	✓		✓	✓
FI	Finland	✓		×	✓
SE	Sweden	✓	✓	✓	✓
SI	Slovenia	×		×	×
UK	United Kingdom	✓	✓	✓	✓

Source: Steer Davies Gleave analysis of stakeholder responses

2.40 As the table shows, the majority of Member States have changed either the structure or level of fares (or both) over the last 10 years. In many cases, significant changes have been driven by competition with other modes, at least in part, and intramodal competition has an effect on fare setting in some. Almost all Member States to which the question was submitted confirmed that the level and/or structure of fares depended on whether the service in

question was operated under a PSO contract. The approach to provision of PSO services in different countries is discussed further below.

2.41 Further examination of the responses highlighted a number of reasons for introducing changes, some commercial and others policy-driven. In particular, we note the following:

- In Bulgaria, off-peak fare reductions have been introduced on regional services to promote off-peak travel.
- In Austria, Italy, Finland and Romania, fares on some routes have been changed in response to competition. For example, yield management systems have been introduced in Italy to support fare-setting on routes on which there is competition from low-cost airlines, although we could not confirm that they are used where there is on-rail competition. In Austria, yield management has been introduced on the Vienna-Salzburg route, on which there is competition between rail operators. Elsewhere, for example in the Czech Republic, Portugal, Sweden and the UK, yield management has been introduced purely to increase revenues on commercial interurban services.
- In Hungary, fare increases have been introduced explicitly to cover the costs of new long-distance rolling stock.
- Smartcards have been introduced in a number of Member States. For example, in Ireland smartcards have been introduced in Dublin to attract passengers and to monitor travel behaviour, with a view to offering passengers tailored information about services. National public transport smartcards have been introduced in Denmark (Rejsekort) and the Netherlands (OV Chipkaart).
- In Finland, Greece and Romania, discounts have been introduced to promote rail travel and encourage patronage.

National institutional arrangements

Use of PSO contracts

2.42 To provide context for the fares analysis, we examined the extent to which Member States rely on PSO contracts for the provision of rail services, and on the different approaches to their procurement. We identified Member States making direct awards of contracts and others awarding them through competitive procurement procedures, as well as a number using both approaches.

2.43 Table 2.4 overleaf summarises our findings.

Table 2.4: Stakeholder responses on PSO contracts in provision of rail services

Member State		PSO award		PSO contract type		Types of service covered by PSO					
		Direct	Tender	Gross cost	Net cost	Urban	Interurban	Suburban	Regional	Interregional	High speed
BE	Belgium	●			●						
BG	Bulgaria		●		●			●	●	●	
CZ	Czech Republic	●	●	●	●		●	●	●		
DK	Denmark	●	●		●	●	●	●	●		
DE	Germany	●	●	●	●	●	●	●	●	●	
IE	Ireland	●			●						
IT	Italy	●	●		●	●	●	●	●		
EL	Greece	●			●						
ES	Spain	●	●		●	●		●	●		●
HR	Croatia	●			●						
HU	Hungary	●		●	●						
NO	Norway	●			●						
AT	Austria	●		●	●						
PL	Poland	●	●	●		●	●	●	●		
PT	Portugal	●	●		●						
RO	Romania	●			●						
SK	Slovakia	●		●	●						
FI	Finland	●		●	●						
SE	Sweden		●	●	●	●	●	●	●		
SI	Slovenia	●			●						
UK	United Kingdom		●	●	●	●	●	●	●	●	●

Source: Steer Davies Gleave analysis of stakeholder responses

2.44 We did not seek information from all Member States on the types of service covered by PSO contracts, and in some cases received different answers from the transport ministry and the corresponding regulatory authority.

2.45 For example, in one Member State the ministry reported that some PSO contracts on the state-owned network are directly awarded, while the regulatory authority indicated that all services were competitively tendered[11]. This inconsistency may, in part, reflect recent market developments. For example, central contracts for the state-owned rail operator which provides the majority of the long-distance and regional services, were extended by a further 10 years in 2009. However, a number of tendering opportunities are emerging and a number of private sector bidders are preparing accordingly.

[11] As before, where divergent responses were received from stakeholders within the same Member State, the study team reached a judgement based on the advice of country experts.

2.46 Our more detailed review of the responses highlighted the following:

- only Poland makes exclusive use of gross cost contracts[12];
- PSO contracts with national operators tend to be net cost, as in the Czech Republic and Hungary, but there is variation in the allocation of revenue risk at the regional level;
- even where contracts are gross cost, with operators taking little or no revenue risk, operators may nevertheless face significant financial risk as a result of contractual incentive mechanisms in the form of reward or penalty schemes (as in Sweden); and
- national legislation providing for competitive tendering of PSO contracts does not guarantee the application of competitive procurement procedures, as in Spain where Renfe, the incumbent national operator, continues to benefit from a direct award.

Fares on PSO services

2.47 As already noted, a number of stakeholders have confirmed that the structure and/or level of fares can depend on whether services are commercial or operated under PSO contracts. However, we could not categorise either services or fares as "PSO" or "non-PSO":

- There is rarely any indication of whether a train is operated under a PSO, unless it is a suburban service specified by the local competent authority or there is a national PSO[13].
- PSO fares may be administered (as in many suburban areas), regulated (as in some Member States), or left to the market (as with many fares in Sweden and Great Britain).
- National operators may operate both "PSO" and "non-PSO" services but choose, or be required, to have a common fare structure.
- A competent authority or "PSO" operator may set or regulate fares that all operators must accept. This means that fares which operators are in principle free to set may be "quasi-regulated" by the regulated or administered fare which they must accept.
- An individual train service may include both "PSO" and "non-PSO" station calls.
- A station pair may be served by both "PSO" and "non-PSO" services.

2.48 Where possible, however, in later chapters of this report we have identified whether fares appear to be administered, regulated or constrained only by reference to the market, as summarised in Table 2.5.

Table 2.5: Approaches to setting fares

Approach	Body setting fare	Operator may vary fare	
		Lower	Higher
Administered	Fares are set by a national, regional, local or municipal authority, and there is no deviation from the specified fares.	×	×
Regulated	Fares are set subject to constraints, typically an upper limit on individual fares or in a "basket" of fares.	✓	No, or only in basket
Market	Fares are set by the rail operator and not subject to regulation, but may be constrained or "quasi-regulated" by other rail fares.	✓	✓

Source: Steer Davies Gleave analysis

[12] Gross cost contracts require the contracting authority to take revenue risk, with bidders paid a fixed fee per unit or period, and therefore incentivised to minimise costs subject to meeting contract obligations.

[13] National PSO arrangements only appear to be in place in Estonia, Ireland, Greece and Luxembourg, where all domestic passenger rail journeys are made on PSO services.

2.49 In practice, while we also found that the various websites we used to research the fares may offer one or more fares, they do not always name them, list all the fares available and any differences in their validity, or say how they are calculated. For example, it was rarely possible to infer:

- what authority or operator had set the fare;
- the reasons for any variation in fares between trains;
- whether different fares had different validities or conditions of use; or
- the highest or lowest fares that might be charged.

2.50 Variation in prices between individual trains might be due, inter alia, to:

- different service quality or stopping patterns;
- market pricing in response to competition;
- differential pricing by time of day;
- discounts on certain trains available only a certain period in advance;
- special offers; or
- active yield management in response to forecast and emerging bookings on each train.

2.51 The study timescale constrained us to carry out research late in 2015, and we found that some "month ahead" fares quoted for travel in 2016 were higher than those quoted for travel in 2015. Where this was the case, we assumed that this was due to general annual fares rises, rather than any of the factors listed above.

The impact of subsidies on revenues

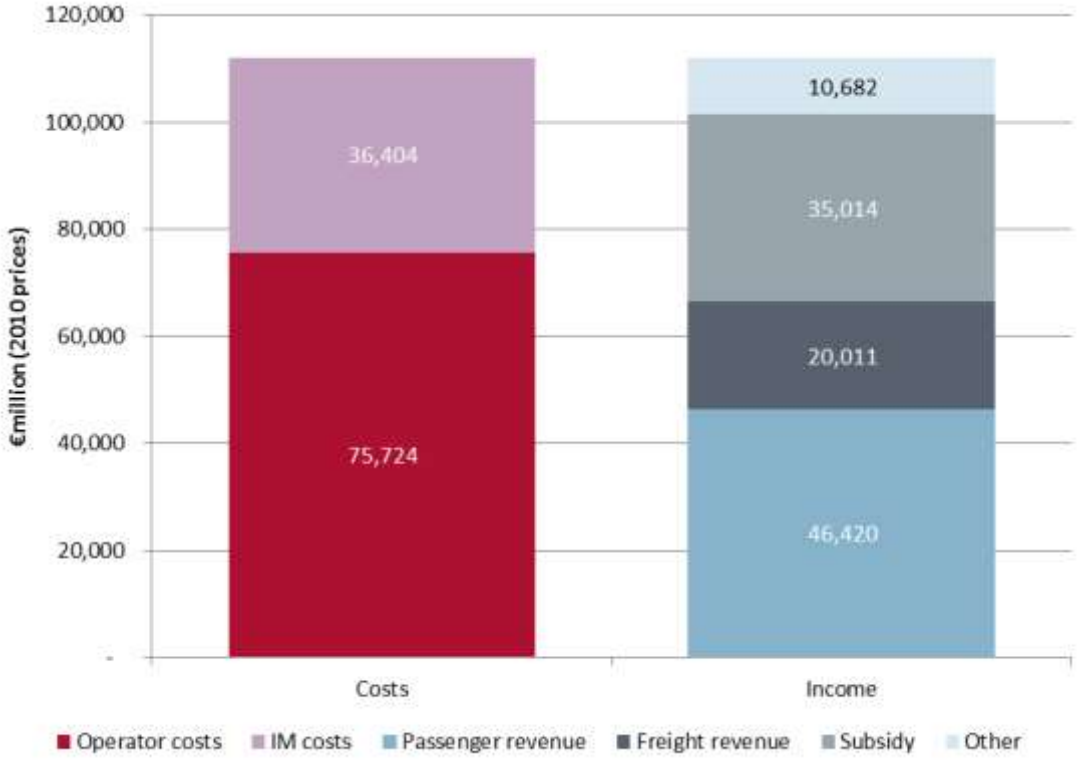
2.52 While PSO services are not necessarily subsidised, many rely on financial support from national, regional or local transport authorities, whether they are operated under net or gross cost contracts. As noted above, it is not possible to categorise either individual services or individual fares as PSO or non-PSO, and any estimate of the extent to which PSO services rely on fare revenue rather than public subsidy is therefore problematic. It is nevertheless possible to estimate the contribution of fare revenue to the overall costs of the rail industry in a given Member State. This provides an understanding of the policy and political framework in which fares are set. We note, for example, that in the UK, where fare revenue as a proportion of costs has been steadily increasing in recent years, there is now strong political pressure to restrain annual fare increases, notwithstanding ongoing public sector funding constraints.

2.53 The overall operating cost of railways in the European Union reported in 2012 was around €110 billion, as shown in Figure 2.15 below[14]. This figure covers all European Union Member States with a railway except Croatia, for which full data was not available. On average, the mix of infrastructure and operator costs is approximately 30:70. This ratio reflects both the underlying cost structure of the EU rail industry, and the way in which it is financed. In those Member States which make significant subsidy payments to infrastructure managers, track access charges are typically lower and hence the operating costs of freight and passenger operators are lower. Alternatively, if subsidies are channelled through operators delivering

[14] Operating costs include the provision of both passenger and freight services and the operation and maintenance of fixed infrastructure. As far as possible capital expenditure on rolling stock replacement, infrastructure renewal and enhancements is excluded. The figures are likely to mask significant differences in input and output trends, and in costs, revenues and subsidies, between different Member States. Moreover, aggregate analysis of this kind cannot identify hidden costs such as maintenance backlogs in some Member States.

public service obligations, track access charges are typically higher and hence operator costs make up a larger proportion of the total. In countries with more rail freight, the proportion of total costs accounted for by the infrastructure manager is greater.

Figure 2.15: EU total rail operating costs, revenue and subsidy (2012)



Source: Study on the Cost and Contribution of the Rail Sector, Steer Davies Gleave, 2015.

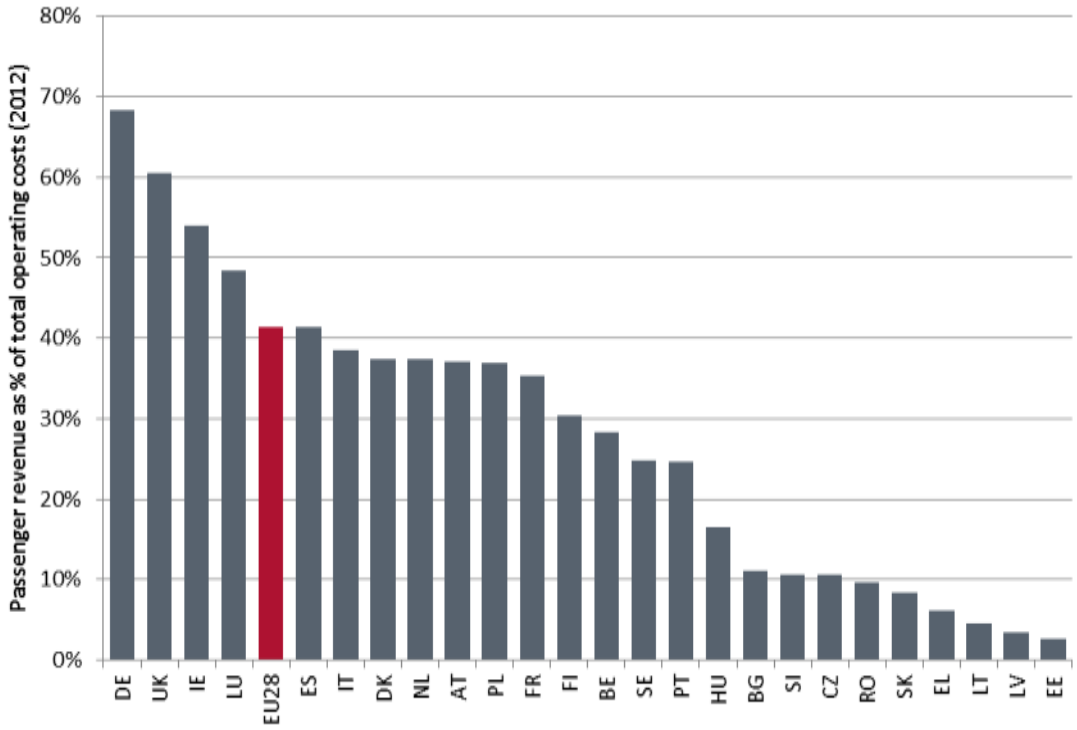
2.54 Roughly 60% of costs are covered by fare box and freight revenue (40% passenger and 20% freight) and a further 30% by subsidy. The remaining 10% (around €11 billion) is a residual balancing item that is likely to include freight income not captured at the Member State level (data was not available for all Member States) and other sources of income such as property rents and retail revenue.

2.55 This analysis, originally undertaken for the *Study on the Cost and Contribution of the Rail Sector*, has been further developed as Figure 2.16. The figure illustrates the extent to which passenger revenue from fares covers total rail sector operating costs (incurred by freight and passenger railway undertakings, and infrastructure managers) by Member State. As this analysis relies upon a range of "top-down" assumptions applied to aggregate rail industry data, the results should be considered as indicative of broad trends and not representative at the Member State level.

2.56 The distribution of cost coverage is highly skewed, with only the large passenger rail networks in Germany and the UK recovering more than 60% of operating and maintenance costs through passenger fare revenue. This may, in part, be due to exogenous factors such as population distribution and density, and factors such as policy initiatives to reduce the taxpayer burden of rail sector funding and track access charging regimes. The remaining Western European Member States typically recover 25-40% of operating costs through fares.

2.57 Cost coverage from fares is lowest among Eastern European Member States, where approximately 5-15% of total operating costs are met by fare revenues. This similarly reflects a range of factors which vary by country, but which may include the cost burdens imposed by legacy networks with high fixed costs, lower service frequencies and uncompetitive journey times, lower network densities and lower fares. It also reflects the relative importance of, and the share of costs incurred by, rail freight traffic as in the Baltic States, which are predominantly freight rail networks. Poland is a notable outlier, where 37% of operating costs are met by income from fares.

Figure 2.16: Passenger rail revenue as a proportion of total rail operating costs (2012)



Source: Steer Davies Gleave analysis of data collected for the Study on the Cost and Contribution of the Rail Sector.

2.58 On the basis of the evidence presented in Figure 2.16 it is not possible to assess the proportion of passenger rail costs covered by the passengers themselves since it is not possible to allocate all network costs to either passenger or freight traffic. In Sweden, for example, infrastructure charges are very low and do not cover the full marginal cost of running services over the network. Central government subsidy paid directly to the infrastructure manager means that many infrastructure costs are common and cannot be allocated to passenger or freight.

The development of competition

2.59 A previous study by Steer Davies Gleave on the Fourth Railway Package in 2012 included a review of the extent of competition in the market (on-rail) and competition for the market (in the form of competitive tendering for rail concessions) at the time. It noted:

- the well-established structural and regulatory frameworks in Sweden and the UK, which provide for competition for the market while allowing some on-rail competition on specific routes;
- the emergence of new entrants offering commercial services competing with those provided by incumbent national operators in a number of Member States; and

- growing use of competitive tendering in some Member States, notably Germany.

2.60 At the same time, the study highlighted various barriers to entry, including access to stations and key facilities such as maintenance depots, that appeared to be hindering the further development of competition. The analysis indicated that measures proposed for the Fourth Railway Package legislation, in particular those covered by the governance pillar, would help to address these and deliver substantial customer benefits.

2.61 While the Fourth Railway Package has not yet been adopted, the level of competition in rail passenger markets across the European Union has developed since 2012. Table 2.6, which is limited to information from stakeholders who responded to our call for evidence, summarises the current situation regarding competition in the market for rail services[15].

2.62 Table 2.6 ignores competition for the rail market through competitive tendering and the introduction of differentiated rail products by existing operators, which are often lower cost and serve new and emerging markets. Recent examples include Ouigo (SNCF) services in France in 2013 and Izy (Thalys) services between Paris and Brussels in 2016[16].

2.63 As already highlighted in Table 2.3, a significant number of Member States have indicated that both intermodal and intramodal competition have affected rail fares on one or more routes within their national networks over the last ten years.

[15] Member States are omitted from Table 2.6 if no stakeholder response was provided: this does not imply that intermodal competition or on-rail competition have had no influence on the rail market.

[16] Izy services will operate on conventional rather than high speed lines in France to reduce infrastructure costs, will have no buffet, and will offer digital-only ticket sales. Ten tickets for each service will be available for €10, but will not guarantee the passenger a seat.

Table 2.6: Stakeholder comments on developments in rail competition

Member State		Intermodal competition	On-rail competition
BE	Belgium	×	×
BG	Bulgaria	Fares on routes subject to road competition can be 30% lower	×
CZ	Czech Republic	Road competition on the Prague-Brno route	Competition on a few routes
DK	Denmark	Formal cooperation between rail operators and regional traffic agencies regarding rail and bus fares Private coach competition	Multiple operators, but coordinated fares
DE	Germany	Coach competition permitted from 2013	Competition on price between long-distance and regional services, and some open access long-distance operators
IE	Ireland	×	×
IT	Italy	Competition on routes served by low-cost airlines	Competition on HS services. 55% of tickets are discounted, compared to 20% in 2012.
EL	Greece	×	×
ES	Spain	Coach competition limited to national concessions	×
FI	Finland	VR announced fare reductions of 25% in February 2016, partly in response to the entry of low-cost coach operators	×
HR	Croatia	Generally no, but there are discounts on certain lines, for some periods of time	×
HU	Hungary	No explicit differentiation when there is intermodal competition	×
NO	Norway	×	Two operators in the corridor to Oslo Gardermoen Airport, but they are both state ownership
AT	Austria	No significant competition with other modes, standard fares are based on mileage	Competition on the Vienna-Salzburg route, between the incumbent ÖBB and WESTbahn Management GmbH
PL	Poland	PKP (train operator) offers a discounted ticket when train services compete with highways	Some competition Warsaw – Lodz corridor
PT	Portugal	Fares are influenced by intermodal competition	×
RO	Romania	CFR Calatori (incumbent) sets discounts on some interregional and regional trains	CFR Calatori (incumbent) applies fares and discounts similar to those offered by competitors when operating on the same route
SK	Slovakia	Fares are influenced by intermodal competition	Some competition
FI	Finland	Bus competition influences fares on long-distance services	×
SE	Sweden	Fares are influenced by intermodal competition	Competition on a few routes
SI	Slovenia	×	×
UK	United Kingdom	Fares can be influenced by intermodal competition, depending on the route	Competition on a few routes

Source: Steer Davies Gleave review of stakeholder responses.

National railway characteristics

2.64 We also considered how rail industry and other characteristics of Member States, for example network size, the degree of urbanisation and propensity to travel by rail, might influence rail fares. This is a complex question given the range of factors that influence fares. For example:

- As already noted, rail operators typically offer a wide range of fares, which might be administered or regulated, set according to factors such as government policy, regulatory constraints, commercial objectives and market conditions.
- Travel patterns differ substantially between Member States, even where their respective rail networks are otherwise comparable. For example, the proportions of urban or suburban travel and longer distance travel may vary, with implications for average fares and yields.

2.65 Nevertheless, the characteristics of national rail networks and the geographical and demographic profile of Member States are part of the background against which fares policy is determined, and might conceivably contribute to average fare levels, whether administered, regulated or set only by reference to the market. We therefore examined the relationship between average yields in individual Member States and a range of characteristics, set out in Table 2.7 below with a comment on their potential influence.

2.66 Table 2.7 is followed by a number of figures based on national 2012 data collated for our recent study on the cost and contribution of the rail sector. These show the relationship between each of the factors in the previous table and average rail revenue per passenger-kilometre. As expected, they suggest a complex set of relationships, although a number are broadly consistent with the influences described above.

2.67 First, Figure 2.17 appears to show a positive relationship between network length and average yield, at least in the case of Member States with larger networks. At first sight, this is at odds with the relationship expected, since the longer journeys made possible on larger networks tend to have lower average yields. Those with networks of around 5,000 kilometre or less have a wide variation in average yield, reflecting variations in fares policy and/or commercial objectives. There is no clear relationship between network density and average yield.

2.68 Second, Figure 2.19 shows that an apparent broadly positive relationship between the share of urban population and average yield, although there is substantial distribution of Member States across both axes and a number of apparent outliers (such as Austria, Estonia and Latvia). The overall relationship is consistent with the view that a high degree of urbanisation tends to generate a relatively high level of shorter rail journeys resulting in higher average yields. The relationship between population density and average yield may reflect a similar effect, to the extent that the more densely populated Member States are likely to exhibit higher levels of urbanisation.

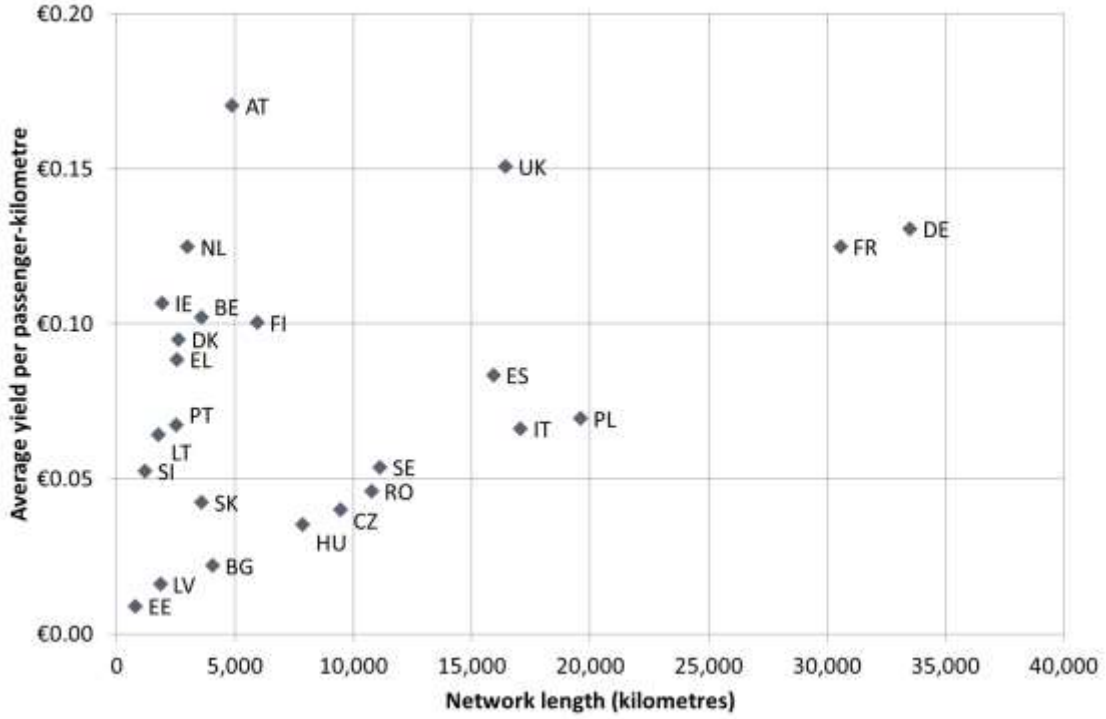
2.69 Third, there appears to be a broadly positive relationship both between propensity to travel by rail and average yield (Figure 2.21) and between car ownership and average yield Figure 2.22). Both figures probably reflect the strong positive correlation between GDP per capita and average yield shown in the final Figure 2.23, with higher income leading to both more rail travel at a given fare level and higher levels of car ownership.

Table 2.7: Member State characteristics and their influence on rail fares

Characteristic	Measure	Potential impact on fares and yields
Network length	Track kilometres	Network length will vary with the size of the Member State but also with network density. Larger networks may provide opportunities to take longer journeys, for which fares are likely to be higher. However, the revenue per passenger-kilometre generated by longer journeys tends to be lower than for shorter journeys, since fares typically do not increase in proportion to the length of the journey (even in the case of some kilometric fares).
Network density	Track kilometres per square kilometre	Denser networks may provide more opportunities for making relatively short journeys by rail. These might result in lower average fares (revenue per journey) but higher average yields (revenue per passenger-kilometre), again because fares tend not to increase proportionately with distance.
Share of urban population	Urban population as a proportion of total population	Member States with relatively large urban populations may have a larger proportion of suburban and interurban, rather than regional, travel. The impact on rail fares and yields will depend on the specific characteristics of their rail networks, but urban areas that are well served by local networks will generate relatively high numbers of short journeys. Again, these might result in lower average fares but higher revenue per passenger-kilometre.
Population density	Population per square kilometre	Population may have similar impacts as the share of the urban population, depending on the coverage of the rail network. A higher population density may mean a greater degree of urbanisation.
Propensity to travel by rail	Passenger-kilometres by rail per capita	It is particularly difficult to identify cause and effect in the case of this measure of propensity to travel. If lower yields reflect lower fares (for example, as a result of policy decisions taken by one or more transport authorities), these could be expected to lead to a greater tendency to travel by rail. However, if the population in a Member State is more inclined to use rail services, passengers may be more willing to pay higher fares than would otherwise be the case. The relationship between rail passenger-kilometre per capita and observed fares and yields is therefore difficult to predict.
Car ownership	Number of cars per capita	Similarly, any relationship between car ownership and rail fares and yields may be hard to determine from a simple correlation of relevant measures. A high level of car ownership may reduce the market power of rail services and have the effect of constraining fares and yields, but may also be highly correlated with average income, which we discuss next. However, Member States with higher average incomes are also likely to exhibit higher levels of car ownership leading to road congestion and making rail travel relatively more attractive. This allows rail operators to charge higher fares for rail travel.
Average income	GDP per capita	Higher income Member States tend to have more developed rail networks commanding higher fares and generating higher average yields. We note, however, that countries with broadly similar average incomes may adopt very different rail fare policies with some, for example, relying more on tax rather than fare revenue to fund rail services and investment than others. Hence, we would expect significant variation around a broadly positive relationship between GDP per capita and average yield.

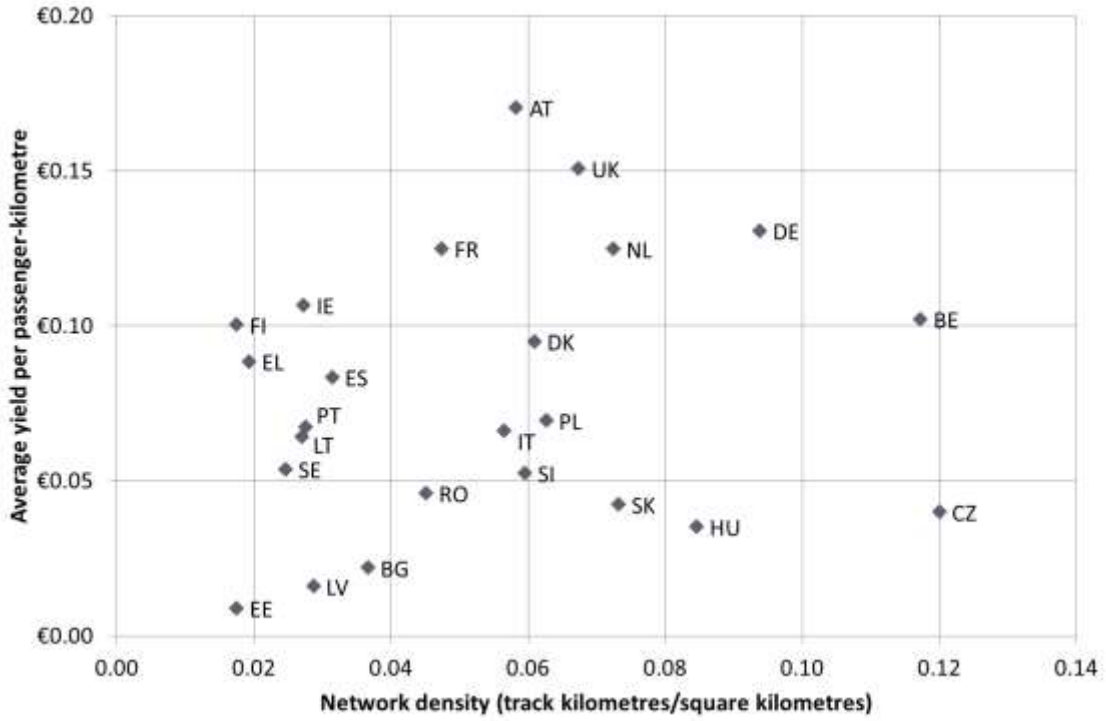
Source: Steer Davies Gleave analysis

Figure 2.17: Average yield and network length



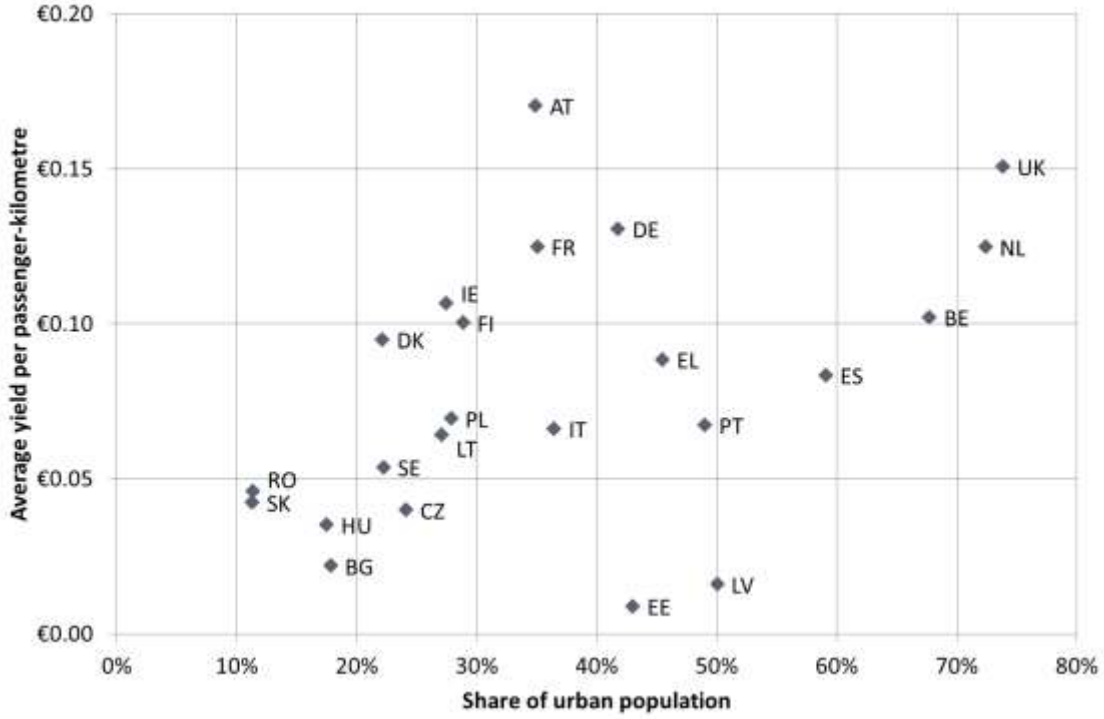
Source: Steer Davies Gleave analysis using data collected for a study on the cost and contribution of the rail sector

Figure 2.18: Average yield and network density



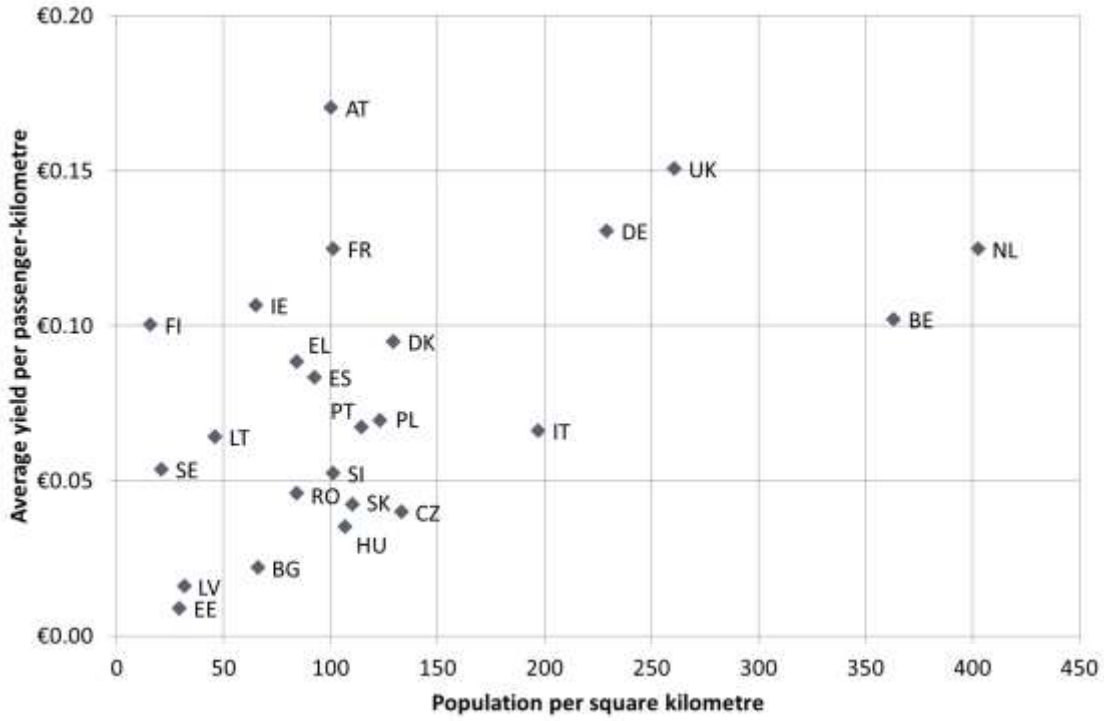
Source: Steer Davies Gleave analysis using data collected for a study on the cost and contribution of the rail sector

Figure 2.19: Average yield and urban population



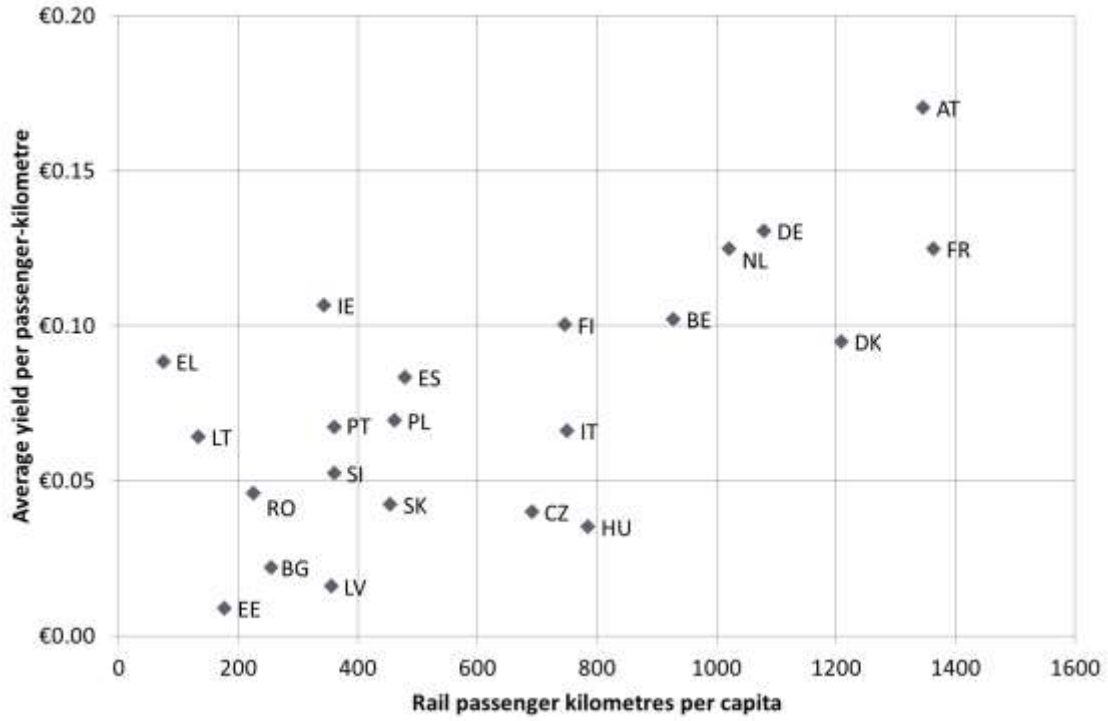
Source: Steer Davies Gleave analysis using data collected for a study on the cost and contribution of the rail sector

Figure 2.20: Average yield and population density



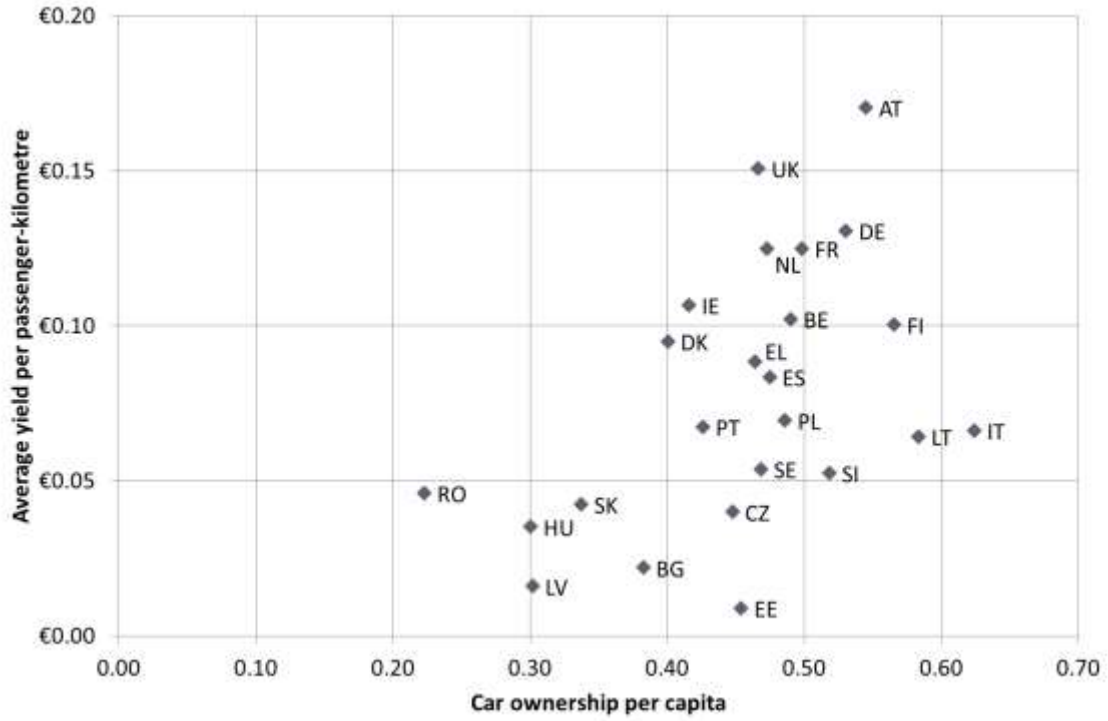
Source: Steer Davies Gleave analysis using data collected for a study on the cost and contribution of the rail sector

Figure 2.21: Average yield and propensity to travel by rail



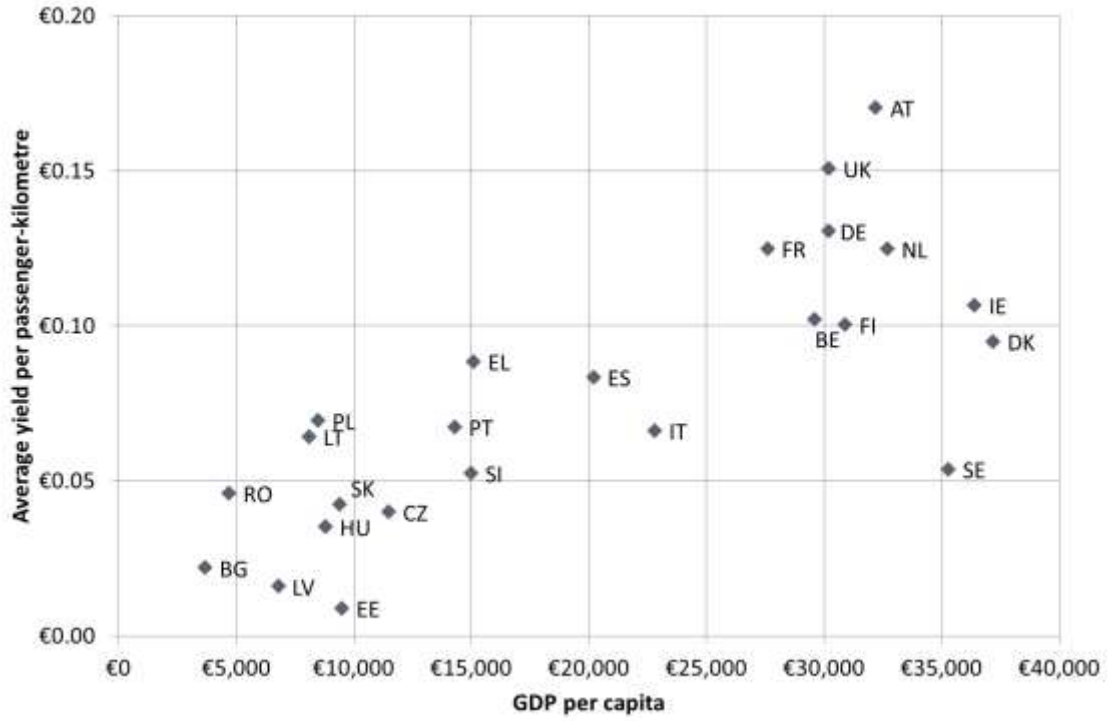
Source: Steer Davies Gleave analysis using data collected for a study on the cost and contribution of the rail sector

Figure 2.22: Average yield and car ownership



Source: Steer Davies Gleave analysis using data collected for a study on the cost and contribution of the rail sector

Figure 2.23: Average yield and GDP per capita



Source: Steer Davies Gleave analysis using data collected for a study on the cost and contribution of the rail sector

2.70 We investigated the significance of these apparent relationships using statistical techniques as reported in Appendix B. The results could be interpreted as in a number of ways.

2.71 First, GDP per capita may influence the levels of administered, regulated and market fares, in that higher fares may be affordable in countries with higher average incomes, but some Member States are outliers from this apparent relationship:

- The UK and Austria appear to have slightly higher yields than might be expected given the size of their respective networks (Figure 2.17) and their GDP per capita (Figure 2.23).
- Sweden, in contrast, has lower yields than suggested by its GDP per capita (Figure 2.23), although these are consistent with its more limited rail network (Figure 2.17) and relatively low level of urbanisation (Figure 2.19)[17].

2.72 Second, average revenue per passenger-kilometre rises with network length among the larger networks. This might suggest either of the following:

- Longer networks provide greater rail connectivity, increasing the number of relatively short journeys undertaken by rail, which tend to generate higher yields per unit of distance.
- Rail travel in these countries is relatively more dominant within certain market segments, with the result that competition from car travel and other modes is less of a constraint on rail fares than would otherwise be the case. This means that rail is a "price-maker"[18].

[17] In addition, Sweden's incumbent operator, SJ, reports passenger kilometres "excluding Regional Public Transport Authority season tickets" but yield "including PTA season tickets". It is not clear how this apparently inconsistent reporting has been reflected in Swedish national statistics, but one possibility is that some or all urban journeys and revenue have been omitted from the data for Sweden.

2.73 Third, in the case of Member States with networks of around 5,000 kilometres or less, other factors influencing fare and yield levels dominate, resulting in a wide range of yields among these countries. Examination of Figure 2.17 indicates that they fall into two broad groups:

- countries joining the EU after 2004, with average yields in the range €0.01-0.07 per passenger-kilometre; and
- higher income countries from among the EU15, with average yields in the range €0.09-0.17 per passenger-kilometre.

2.74 This is consistent with the general relationship seen between average income and average yield shown in Figure 2.23.

[18] In economics terminology, a "price-maker" is an individual or company which is sufficiently influential within the market to be able to affect the price of a product or service.

3 Suburban fares and tickets

Introduction

3.1 In this chapter we examine regional and interurban fares, which are commonly set by administrative means by an urban or municipal competent authority and are often integrated with other modes. We did not limit this analysis to the case studies examined in Appendix A but instead included all the capital cities with material suburban rail networks.

3.2 We collected data during November 2015 for journeys undertaken during either November or December 2015, dependent upon whether fares were sampled one day, one week or one month in advance.

3.3 We expressed all fares in PPP-adjusted euros, converted at the market exchange rates, and adjusted to reflect differences in purchasing power in different Member States[19]. Thus the relative level of reported PPP-adjusted fares reflects their cost relative to a standard basket of goods.

Suburban fares sampled

3.4 Following discussions with the Commission, we assumed that a suburban network should consist of at least one line with regular services at intervals of (illustratively) 30 minutes or less connecting at least five stations within 10 kilometres. Using this criterion we excluded a number of capital cities:

- Luxembourg, Riga, Bucharest and Ljubljana have no frequent suburban commuter services.
- Vilnius in Lithuania has a number of stations in the communities surrounding the city, but the only frequent rail service we were able to identify is to the airport, to which a single rail vehicle operates a three kilometre shuttle service intended only for airport passengers and workers.
- Sofia in Bulgaria has services to Iskarsko Shose, but with intervals of up to two hours between trains. There are more frequent services between Sofia and Sofia-Sever, but these stations are only two kilometres apart.

3.5 We did not attempt to analyse details of the rail timetables in each capital city, but found suburban stations in most of the remaining cities had more frequent, but not necessarily regular, services. Szemeretelep (Budapest) and Holendrecht (Amsterdam) had regular services every 30 minutes. After consideration, we also included services at Ivanka pri dunaji

[19] Exchange rates from **www.xe.com** on 7 December 2015, purchasing power parity data from **http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tec00120** updated 9 November 2015

(Bratislava), with regular services every 60 minutes for most of the day, and Lagedi (Tallinn), where some corridors have several trains per hour at peak times.

3.6 To enable an indicative comparison of fares in each of the capital cities, we identified a suburban station approximately 10 kilometres from the city centre, as defined in Table 3.1. We then identified the range of fares available for travel between the suburban station and the city centre:

- Single tickets might be used by a traveller or visitor making only occasional journeys.
- Multi-trip tickets, where available, might be used by a traveller or visitor making infrequent journeys.
- 30-day or one month period passes might typically be used by a regular commuter, although passes for shorter and longer periods are often available.

Table 3.1: Suburban fares: stations selected for 10-kilometre radial journey in capital cities

Member State		City	Station selected for "10-kilometre" sample journey	
			Name	Kilometres
AT	Austria	Vienna	Brunn-Maria Enzersdorf	11
BE	Belgium	Brussels	Lot	11
CH	Switzerland	Bern	Flamatt	12
CZ	Czech Republic	Prague	Radotin	12
DE	Germany	Berlin	Lichterfelde Ost	11
DK	Denmark	Copenhagen	Glostrup	11
EE	Estonia	Tallinn	Lagedi	12
EL	Greece	Athens	Piraeus	8
ES	Spain	Madrid	Fuencarral	10
FI	Finland	Helsinki	Tapanila	11
FR	France	Paris	Choisy-le-Roi	11
HR	Croatia	Zagreb	Sesvete	10
HU	Hungary	Budapest	Szemeretelep	11
IE	Ireland	Dublin	Dun Laoghaire	10
IT	Italy	Rome	Capannelle	10
NL	Netherlands	Amsterdam	Holendrecht	10
NO	Norway	Oslo	Rosenholm	10
PL	Poland	Warsaw	Piastow	12
PT	Portugal	Lisbon	Queluz/Belas	11
SE	Sweden	Stockholm	Helenelund	10
SK	Slovakia	Bratislava	Ivanka pri dunaji	12
UK	UK	London	Crystal Palace	11

Source: Steer Davies Gleave analysis.

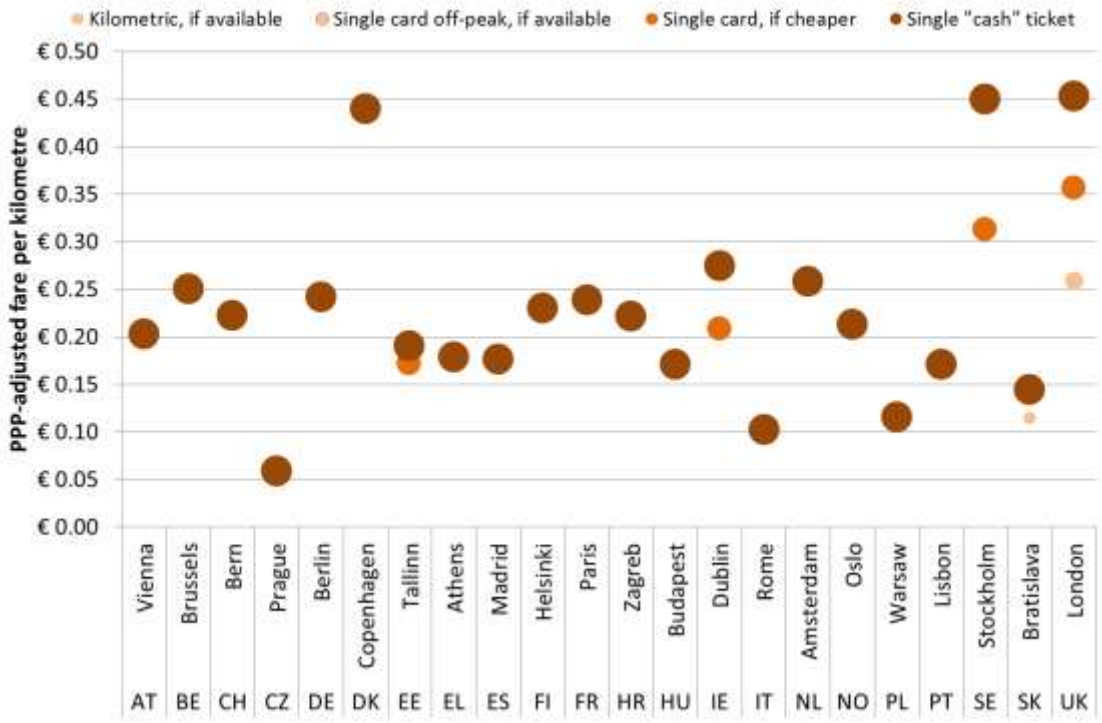
3.7 Our findings are summarised in Table 3.2 below and in Figure 3.1 to Figure 3.3.

Table 3.2: Suburban fares: fares found for 10-kilometre radial journey in capital cities

State		City	Monthly or 30-day				Single				
			30-day off-peak	30-day resident	30-day personal	30-day bearer	Kilometric (see note)	Multi-trip/carnet	Card off-peak	Card peak	Cash
AT	Austria	Vienna			●					●	
BE	Belgium	Brussels			●			●		●	
CH	Switzerland	Bern			●					●	
CZ	Czech Republic	Prague		●		●				●	
DE	Germany	Berlin	●		●					●	
DK	Denmark	Copenhagen			●			●		●	
EE	Estonia	Tallinn		●		●			●		●
EL	Greece	Athens			●					●	
ES	Spain	Madrid			●					●	
FI	Finland	Helsinki		●		●				●	
FR	France	Paris			●			●		●	
HR	Croatia	Zagreb			●					●	
HU	Hungary	Budapest			●			●		●	
IE	Ireland	Dublin			●				●		●
IT	Italy	Rome		●		●				●	
NL	Netherlands	Amsterdam			●		OV			●	
NO	Norway	Oslo			●					●	
PL	Poland	Warsaw		●	●	●				●	
PT	Portugal	Lisbon			●			●		●	
SE	Sweden	Stockholm			●				●		●
SK	Slovakia	Bratislava			●		●	●		●	
UK	UK	London			●				●	●	●

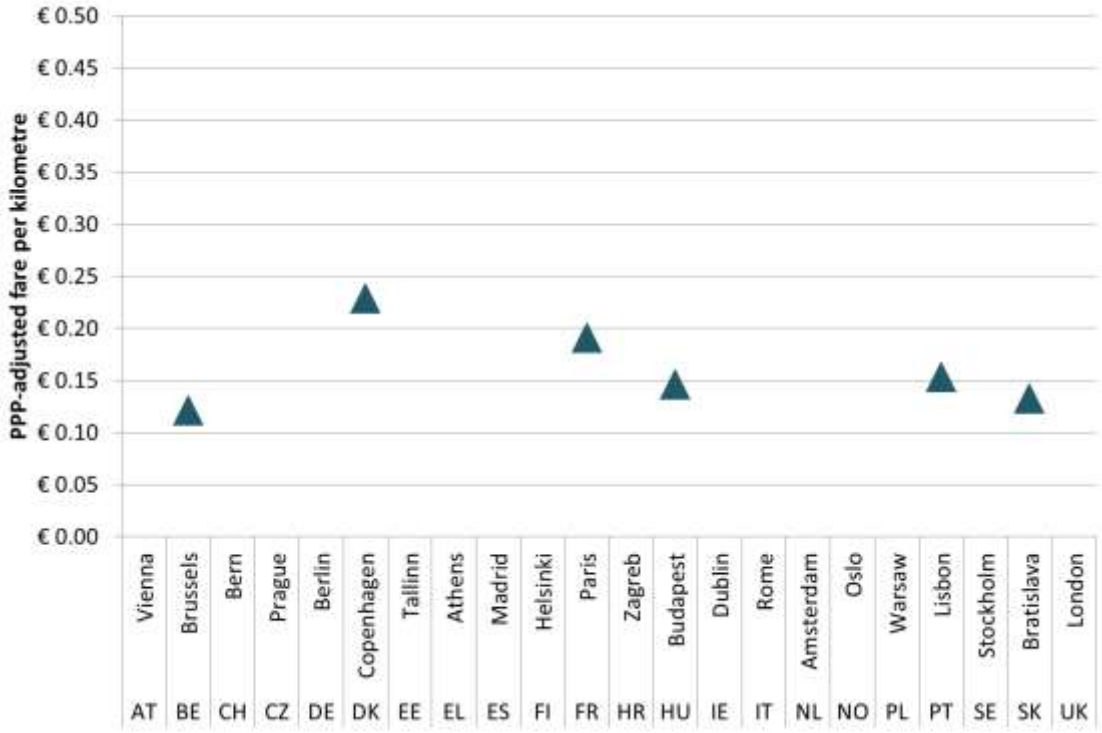
Source: railway and transport authority websites, Steer Davies Gleave analysis, see text for details.
Note: kilometric fare only found for Bratislava, but OV-Chipkaart in the Netherlands is similar to a kilometric fare.

Figure 3.1: Suburban fares: single



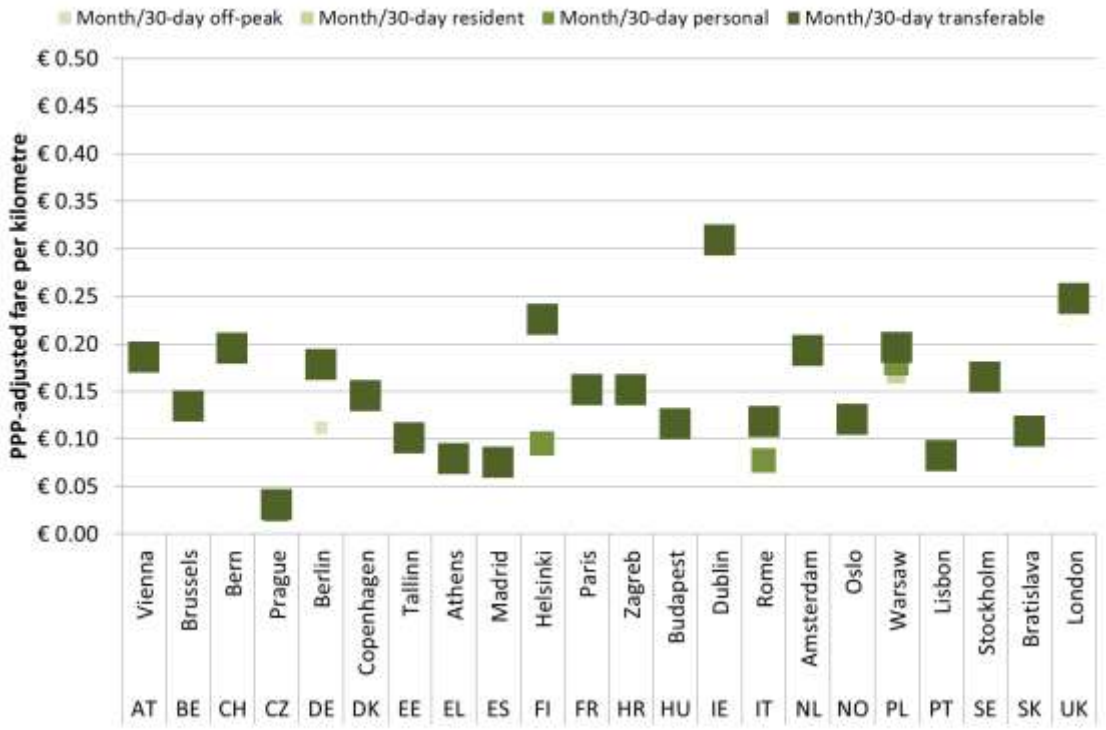
Source: railway and transport authority websites, Steer Davies Gleave analysis, see text for details.

Figure 3.2: Suburban fares: multi-trip



Source: railway and transport authority websites, Steer Davies Gleave analysis, see text for details.
Note: multi-trip fares identified are for ten single trips, except for Bratislava, see text for details.

Figure 3.3: Suburban fares: monthly or 30-day



Source: railway and transport authority websites, Steer Davies Gleave analysis, see text for details.
Note: monthly or 30-day fares have been divided by 40 to estimate the effective single fare for a commuter.
Note: where not specified, and no photocard required, we assume that tickets are transferable, see text for details.

Single tickets

3.8 In many cities a range of single fares are available (see Figure 3.1), including some or all of:

- a full "cash" fare obtainable at a ticket office or ticket machine by cash or by card;
- a discount obtainable using a smart card;
- a further discount for off-peak travel, available in London on the Oyster smart card; and
- a distance-based or "kilometric" fare for the national railway and valid on local services.

3.9 We only found kilometric fare tables for the Czech Republic and Slovakia[20]. In Slovakia the kilometric fare, set in 2011, is €0.50 for the first five kilometres and then an additional €0.05 per kilometre. This means that, for the 14-kilometre journey we examined, the kilometric fare of €0.95 (shown in Figure 3.3 as €0.11 per kilometre after PPP adjustment) undercuts the cash single fare of €1.20 (€0.14 per kilometre after PPP adjustment). We have not established whether passengers are aware of this, or how many take advantage of it, but are aware of similar anomalies in other cities.

3.10 We found other examples of different fares charged by the national railway and by the local or urban authority:

- Fares set by the local or urban authority may either be zonal or rise in discrete steps.
- Both types of fare may be accepted on the same service.

[20] PKP in Poland publishes tariff tables, up to 300 pages long, but they do not appear to be kilometric.

3.11 Tallinn, Dublin, Stockholm, and London give a discount on the cash fare for using a smart card. London is unique in offering a further discount for off-peak fares on Oyster pay as you go (PAYG) and, more recently, in accepting "wave and pay" payment by debit and credit cards.

3.12 We are also aware that:

- In Stockholm, cash fares for single journeys have been raised relative to period fares, with the apparent aim of encouraging residents to buy a period ticket valid throughout Stockholm County.
- In London, cash fares have been raised relative to PAYG fares, with the explicit aim of minimising the use of cash in the system.
- In Tallinn, the discount for using smart cards will be increased from 1 March 2016 to encourage their use and to reduce bus dwell times at bus stops.

Multi-trip tickets

3.13 In many cities multi-trip tickets or carnets are also available (see Figure 3.2). Brussels, Copenhagen, Paris, Budapest and Lisbon offer discounts for 10 tickets bought together, and Bratislava offers €6.60 tickets with 24 "fields": cancelling four of the fields for a three-zone journey results in the €1.10 fare mentioned above.

3.14 The effective discount relative to the full "cash" fare varies, as summarised in Table 3.3 below.

Table 3.3: Suburban fares: multi-trip discount relative to full "cash" fare

City	Brussels	Copenhagen	Paris	Budapest	Lisbon	Bratislava
Effective discount	52%	48%	20%	14%	10%	8%
Ticket type	10-trip carnet					"Fields"

Source: railway and transport authority websites, Steer Davies Gleave analysis.

3.15 We note that, in cities such as Tallinn, the introduction of smart cards has been accompanied by withdrawing multi-trip or carnet tickets. We assume that this is partly because they are close substitutes, but also to encourage occasional users to acquire a smart card.

Monthly or 30-day tickets

3.16 Regular commuters in many cities will typically buy weekly, monthly or annual tickets offering increasing levels of discount relative to single, return or day tickets. The relative prices of these tickets also vary:

- In Switzerland, an annual interregional travelcard, involving travel beyond the area covered by a single suburban pass costs the same as 9, or sometimes 10, monthly tickets.
- In Brussels and some other cities, an annual ticket costs the same as 10 monthly tickets.
- In London, an annual ticket costs the same as 40 weekly tickets.

3.17 In all the capital cities with suburban services it is possible to buy both an annual tickets and either a monthly or a 30-day ticket. We focused on the price of the latter (see Figure 3.3), but note that these might be issued for three different durations:

- a rolling period of 30 days;
- a rolling period of one month, with validity varying from 28 to 31 days; and
- an exact calendar month.

3.18 Prague, Helsinki, Rome and Warsaw issue two distinct types of ticket:

- Transferrable or "bearer" tickets may be used by different people at different times of day. These may be intended for businesses lending them to visitors for local travel, or households with a variety of working hours.
- Non-transferrable or "personal" tickets are cheaper, and may be used only by one person, typically identified by a photocard.

3.19 While in these cities there is a clear distinction between these types of tickets, in many others there is not. In London, for example, we are aware that period tickets or Travelcards were originally non-transferrable and accompanied by a photocard, so that the identity of the user could be checked. With increasing reliance on automatic checks by barriers instead of staff, the requirement for a photocard has now been removed, except for discounted passes such as those for the elderly. Since the introduction of Transport for London's multimodal Oyster smart card, however, we understand that the situation is as shown in Table 3.4.

Table 3.4: Suburban fares: personal and bearer tickets in London

Medium	Modes covered	Type	Transferrable?	Photocard required?
Debit/credit card	Multimodal	PAYG	✓	×
Oyster smart card	Multimodal	PAYG	✓	×
	Multimodal	Day "Travelcard"	×	×
	Multimodal	Period "Travelcard" with no discount	×	×
	Multimodal	Period "Travelcard" discounted for individual (such as a Senior)	×	✓
Paper ticket	Rail-only	Period "season" with no discount	×	✓

Source: Steer Davies Gleave analysis.

3.20 A further complexity in London is that Travelcard and PAYG products can be loaded on the same Oyster card, with the effect that an Oyster card with both products might be either transferrable or not transferrable, depending on the journey being made.

3.21 We note that many of the discounts available in some cities are intended to apply to an individual, and hence are in principle non-transferrable, and in some cases require a photocard or other proof of identity. In practice, however, it may not be cost-effective or even possible to ensure that they are not transferred between passengers, which would also require at least sample checks on the identity of travellers and, in the case of smart cards such as Oyster, the product being used for the journey in question.

3.22 In London, where we work extensively with the local transport authorities, we found no clear statement of which ticket products are transferrable or non-transferrable. In most cities we found no conspicuous reference to whether 30-day tickets are intended to be transferrable. In Figure 3.3 we therefore assumed that 30-day tickets are transferrable unless they require a photocard or are specifically referred to as non-transferrable or "personal".

3.23 We also found an off-peak only monthly ticket in Berlin, the "10-Uhr Karte" valid only after 10am and aimed at those willing to defer travel until after the morning peak. Berlin does not as yet have a smart card system, or gated entry and exit, and this might be the only effective way of deterring or managing morning peak travel.

3.24 Two further arrangements are not shown in Figure 3.3:

- Warsaw offers a small discount available only to those who can demonstrate that they are resident in the city by having filed a local tax return in the preceding year. These tickets require a photocard identifying the user[21].
- Tallinn allows residents of the city free travel within the city area, Zone 1, and all visitors (domestic and international) need to buy tickets within this area. Our analysis is based on fares between Tallinn and Lagedi in Zone 2.

3.25 While monthly or 30-day tickets are normally cheaper than single, return or day tickets, we also noted that[22]:

- In Dublin a monthly zonal ticket is poor value if used only for commuting by train between Dun Laoghaire and Connolly (€0.31 per kilometre after PPP adjustment) and it is cheaper to buy single fares or use the Leap smart card (€0.27 and €0.21 per kilometre after PPP adjustment).
- In Warsaw all three types of 30-day ticket cost more than 40 times a point-to-point cash rail fare from Piastow to Centralna, and the full cash fare would be the cheapest means of commuting between these stations.
- In Rome, a point-to-point cash fare (€0.10 per kilometre after PPP adjustment) costs less than a monthly bearer ticket but more than a monthly personal ticket (€0.12 and €0.08 per kilometre after PPP adjustment).

Variations of fares between cities within a State

3.26 We stress that the analysis described above is based on a single station-to-station journey, and fares per kilometre for other station-to-station pairs might be considerably different, particularly in cities with large fare zones such as Oslo, Helsinki, Stockholm and Berlin.

3.27 Most suburban fares are administered by the competent local or municipal authority, and there is no requirement that fares should be consistent nationally. Switzerland and the Netherlands have national zoning systems, but we understand that the authorities in Bern set the fares in the zones in their area of competence, and the authorities in Amsterdam are free to set local fares which undercut the national OV-Chipkaart fares.

3.28 We therefore examined fares set by local competent authorities in two additional regional cities in Germany, Sweden and the United Kingdom, as summarised in Table 3.5.

3.29 We found the single “cash” ticket price and the monthly of 30-day fare, and also calculated the “break-even” number of single journeys at which the 30-day fare would be cheaper. Figure 3.4 compares these fares, expressed as a PPP-adjusted fare per kilometre.

[21] London also offers a 100% discount on off-peak rail travel to residents over the age of 60.

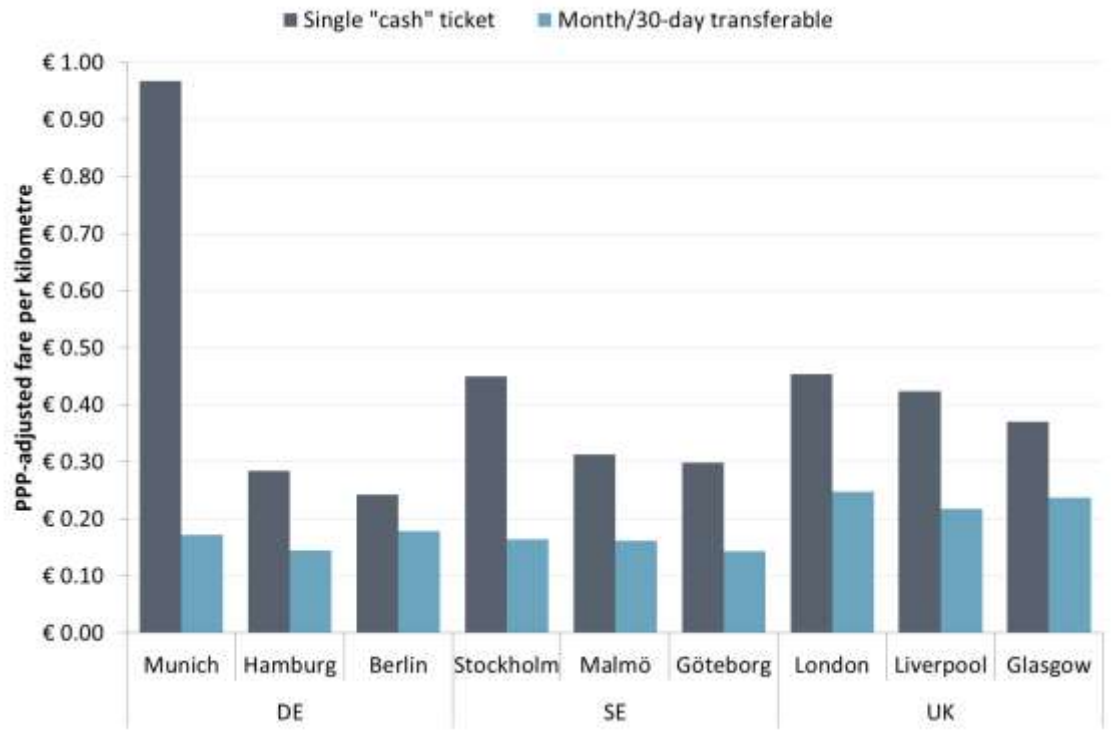
[22] These observations are based upon a small sample of flows and may not be representative of the relative discount available to season ticket holders across the wider suburban networks in these cities.

Table 3.5: Suburban fares: variation between cities within a State

State		Cities	Station selected for "10-kilometre" sample journey		Fare at local prices		
			Name	km	Single "cash" ticket	Monthly or 30-day fare	"Break-even" trips per month
DE	Germany	Berlin	Lichterfelde Ost	11	€2.70	€79.50	30
		Munich	München-Aubing	11	€10.80	€76.60	8
		Hamburg	Hochkamp	11	€3.20	€65.00	21
SE	Sweden	Stockholm	Helenelund	10	SEK 54	SEK 790	15
		Gothenburg	Kållered	12	SEK 41	SEK 790	20
		Malmö	Hjärup	11	SEK 40	SEK 829	21
UK	UK	London	Crystal Palace	11	£4.20	£91.80	22
		Liverpool	Meols	11	£4.00	£82.00	21
		Glasgow	Paisley Gilmour Street	11	£3.40	£87.10	26

Source: railway and transport authority websites, Steer Davies Gleave analysis, see text for details.
Note: fares in München, Hamburg, Gothenburg and Malmö are at 2016 levels, others are at 2015 levels.

Figure 3.4: Suburban fares: variation of single and 30-day fares within Member States



Source: railway and transport authority websites, Steer Davies Gleave analysis, see Table 3.5 for station pairs.

3.30 Figure 3.4 shows wide variation between cities in the same state: the single fare sampled in Stockholm was 50% more than those in the other Swedish cities. A possible explanation is that the competent authority in Stockholm has a deliberate policy of making single fares expensive to encourage residents to buy a period ticket. The most conspicuous outlier, however, is Munich's four-zone single fare of €10.80 for the 11-kilometre journey from the Hauptbahnhof to München-Aubing. A monthly ticket for four zones costs less than eight single tickets.

Suburban fares setting and sharing revenue

Relating fares to costs

3.31 Ideally, fares would send a signal to passengers, suppliers and investors about the need for future investment. This would require fares to reflect "efficient" pricing. Economically efficient pricing is where the price reflects the marginal costs of providing the service. However, estimating marginal costs for the rail industry is not straightforward, as long run marginal costs may differ significantly from their short run values. They will also differ between groups of passengers: estimates of the marginal costs of passengers may vary widely depending on whether they travel with the peak flow, against the peak flow, or at off-peak times.

3.32 A significant problem in calculating marginal costs for the rail industry is the high proportion of fixed, joint and common costs involved in providing a railway service. The marginal cost of carrying extra passengers is very small up to the point where all spare capacity is used up, at which point it can become very large, as more rolling stock, trains or infrastructure is required.

3.33 Decisions regarding the extent to which marginal costs are covered by fares (and hence the relative balance of rail industry funding between fares paid by passengers and subsidy paid by taxpayers) are typically made by competent authorities when determining their fares policy. In most cases, adherence to national fares policy is a requirement enforced through the terms of PSO contracts. Non-PSO services may not be subject to the same fares policy but may, in effect, be constrained or "quasi-regulated", by PSO fares.

3.34 In practice, therefore, while competent authorities may monitor, and set targets for, the overall proportion of costs recovered through fares (see Figure 2.15), no individual fare is set by calculating the cost of the journey to which it relates.

3.35 More typically, fares are set by administrative means to reflect a mix of objectives which may include a cost-recovery target but may also include simplicity, reducing barriers to interchange between trains and between modes, and encouraging use of spare capacity. This commonly results in a combination of a zonal fares system with discounts for buying tickets permitting all travel within a defined area for a defined period.

Zonal fares systems

3.36 Most capital cities have zonal fares systems in which fares are determined by the competent local or municipal authority. Only Switzerland and the Netherlands have national zonal systems, but these still offer flexibility for municipal authorities to set fares, or to undercut national fares, in the zones in their area of responsibility. Suburban fares are therefore often specific to a city or conurbation and may not be typical of those elsewhere in a Member State.

3.37 Most suburban fares are set by these competent authorities using administrative processes. Even where rail operators are constrained only by regulation or by market conditions, the administered fare may act as an effective cap on any fares they set.

3.38 As far as possible we attempted to identify how the fares within the capital city and its surrounding area for each Member State were set, and the extent to which market forces were involved. Our findings for each of the cities are summarised in Table 3.6.

3.39 We noted any references to the year in which some or all fares were last set. In doing so we found two extremes of behaviour:

- In some cities, such as in London, fares are updated annually on a basis linked to inflation.

- In other cases fares may be left unchanged for several years. In Prague and Tallinn, fare levels do not appear to have been changed since 2011. In Tallinn, however, multi-trip tickets have been withdrawn and smartcards introduced in 2013 include a 10% discount. However, an increase in fares from 1 March 2016 has been announced.

3.40 We also identified whether fares in the capital city appear to be administered, regulated or constrained only by reference to the market:

- ● means that at least some fares are set on this basis.
- ? means that we have not identified whether any fares are set on this basis.
- ✗ means that we understand that no fares are set on this basis.

3.41 We also attempted to identify the extent to which revenue associated with suburban rail travel is shared between operators and modes:

- ● means that at least some revenue is shared on this basis
- ? means that we have not identified whether any revenue is shared on this basis.
- ✗ means that we understand that no revenue is shared on this basis.

Table 3.6: Suburban fares: setting fares and sharing revenues

Member State		City	Setting of fare(s) are used within capital area				Sharing revenue		
			Year last set	Administered	Regulated	Market	Dedicated	Among rail	Between modes
AT	Austria	Vienna	2014	●	×	×	?	●	●
BE	Belgium	Brussels	-	●	×	×	?	×	●
CH	Switzerland	Bern	-	●	×	×	?	?	●
CZ	Czech Republic	Prague	2011	●	×	×	?	●	●
DE	Germany	Berlin	2015	●	×	×	?	●	●
DK	Denmark	Copenhagen	2015	●	●	×	?	×	●
EE	Estonia	Tallinn	2011	●	×	×	?	×	×
EL	Greece	Athens	-	●	×	×	?	×	●
ES	Spain	Madrid	-	●	×	×	?	×	●
FI	Finland	Helsinki	2015	●	×	×	?	×	●
FR	France	Paris	2015	●	×	×	?	×	●
HR	Croatia	Zagreb	-	●	×	×	?	×	●
HU	Hungary	Budapest	2014	●	×	×	?	×	●
IE	Ireland	Dublin	-	●	×	×	?	×	●
IT	Italy	Rome	-	●	×	×	?	×	●
NL	Netherlands	Amsterdam	2016	●	×	×	?	×	●
NO	Norway	Oslo	2015	●	×	×	?	×	●
PL	Poland	Warsaw	2013	●	×	×	?	×	●
PT	Portugal	Lisbon	2014	●	×	×	?	×	●
SE	Sweden	Stockholm	-	●	×	×	?	×	●
SK	Slovakia	Bratislava	2015	●	×	×	●	×	●
UK	UK	London	2015	●	●	×	●	●	●

Source: railway and transport authority websites, Steer Davies Gleave analysis, see text for details.
Note: the year fares were set is not always stated on websites, Netherlands showed 2016 fares at time of research.
A dash "-" means that we have not identified the date of the last fare change.
Note: analysis of fare setting and revenue sharing is based on limited information.

3.42 Administered fares include all fares set by local or municipal authorities, in some cases through a formal Regulation or, in the case of the Czech Republic and Slovakia, a kilometric fare table. In contrast, regulated fares are set by the operator, but under constraints set by the relevant competent authority. Fares regulation may be by a range of mechanisms including price caps and links to inflation indices ("RPI-X").

3.43 The only confirmed examples of fares for travel wholly within an urban area being regulated, rather than administered, are in London, where point-to-point rail fares continue to be set by

individual operators, subject to regulation by fares basket, and Copenhagen[23]. We discuss the complexities of fares setting in London further in Table 3.7.

3.44 We did not identify any journeys within a capital city area where rail fares are left wholly to the market. In practice, the near-universal existence of administered rail fares set by a municipal authority sets an effective cap on the fare any rail operator could charge for travel wholly within the urban area, so where market fares exist they are in any case "quasi-regulated" by other fares which must also be accepted.

3.45 Turning to the mechanisms through which revenue is shared, we note that rail fares may be dedicated to one operator in a number of cases, such as where:

- kilometric fares are dedicated to the national rail operator, as in Bratislava;
- the long-distance operator's fares are not valid on local services (although we note that long-distance operators rarely make multiple stops in the same city on a frequent and regular service); or
- operator-specific fares are issued by a franchisee in Great Britain, where there is price competition on corridors such as from central London to East Croydon[24].

3.46 Rail and other modes are ticketed separately in Tallinn, but in every other capital city the existence of multimodal tickets means that some or all revenue is shared with other modes. For multimodal tickets, however, revenue is often not apportioned to individual operators or even to modes, particularly where transport is operated by internal operators or under a gross cost contract in which all revenue from fares is collected by, or passed to, the competent authority.

3.47 A further complexity is where a national incumbent operator may provide services in the same corridor both under gross cost contract to a competent authority and on a commercial basis, and may accept both multimodal and rail-only tickets on all its trains. In these circumstances, revenue may be shared between the competent authority and the operator on some basis.

3.48 Sharing of revenue between rail operators may be relevant where two or more operators provide services within a urban area. We have only been able to confirm that this is the case in London where multimodal, rail-only and operator-specific fares may need to be shared between all the rail operators on whose services the ticket was valid. Rail travel between central London and Crystal Palace, for example, might make use of any of the services listed in Table 3.7.

[23] In Berlin, through long distance services may call at a number of stations within the urban area, local tickets are not valid for travel on these services.

[24] The single fare from London Victoria to East Croydon, set by Southern Trains, is lower than the interavailable fare accepted by all operators by £0.10 (2015) and £0.20 (2016). This small reduction suggests that Southern's aim was not to offer price competition, but to ensure that revenue from sales of its "dedicated" tickets need not be subject to potentially inaccurate apportionment through ORCATS.

Table 3.7: Suburban rail services between London terminals and Crystal Palace

Operator	Competent authority	Gross cost	Net cost	Fare type	Operator-specific tickets
London Overground	Transport for London	✓		Administered	✓
Thameslink	Department for Transport	✓		Administered	✓
Southern	Department for Transport		✓	Regulated	✓
Southeastern	Department for Transport		✓	Regulated	None identified

Source: Steer Davies Gleave analysis

3.49 In London, revenue-sharing makes use of a number of distinct systems:

- Revenue from rail-only tickets is allocated using the ORCATS (Operational Research Computerised Allocation of Tickets to Services) model developed in the 1970s. Revenue from tickets not dedicated to a single operator is shared between them on the basis of a modelled estimate, using standard assumptions, of what proportion of use of the ticket would be on each operator's service. ORCATS can be challenged where operators produce evidence, such as from ticket inspections, that its allocations are materially incorrect.
- Revenue for day and period Travelcards valid on all modes is allocated on the basis of surveys of passengers including household diaries, in which a sample of households provide a record of all travel on the tickets they hold.
- Revenue from pay as you go (PAYG) Oyster smart cards and" wave and pay" debit and credit cards provide a record of all uses of a particular ticket or card and can also be used to identify and allocate revenue.

3.50 In Berlin, revenue from multimodal tickets is allocated between operators on the basis of surveys of usage. We understand that this approach is also used in other German cities.

Fares structures

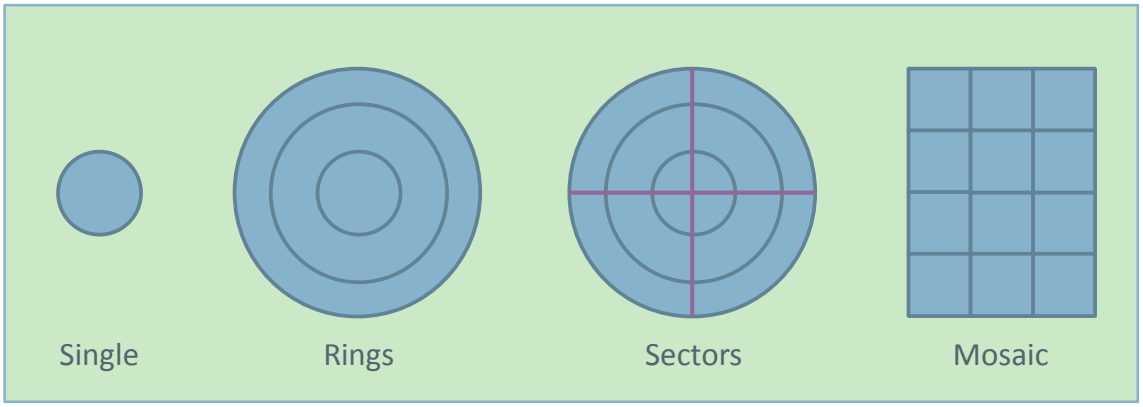
3.51 Many rail fares were originally calculated as a function of distance, a "kilometric fare", and this system has been retained in some national railways including the Czech Republic and Slovakia. Some railways have adopted systems in which fares are broadly distance-related but rise in fixed steps, reducing the total number of prices of tickets which need to be sold.

3.52 In many Member States, the majority of rail travel takes place in urban or suburban areas with a zonal system, in which fares can be identified by counting the number of zones between origin and destination stations. Some zonal systems date back to the 1970s or earlier and some have been changed over time. Bratislava's system, for example, has been redesigned and expanded since 2013 to include commuter rail services.

3.53 We devised the following categorisation of zonal systems, illustrated in Figure 3.5:

- a single zone, in which all fares are fixed, typical of smaller cities such as Brussels or low-fare cities such as Rome;
- rings, with fare calculated from the number of rings, used in Berlin, Tallinn and London;
- rings divided into sectors, so that orbital services, where they exist, pass through a number of different zones, as used in cities such as Copenhagen, Oslo and Bratislava; and
- a mosaic dividing the whole suburban area, region or State into zones, as around Bern.

Figure 3.5: Suburban fares: types of zoning system



Source: Steer Davies Gleave analysis and nomenclature.

3.54 In all these cases the zone boundaries may follow municipal or administrative boundaries or may be modified to reflect local requirements, such as to fine tune the fares to major suburban centres, or to ensure that a community falls into a single zone, or that zonal boundaries coincide with large gaps between stations or stops.

3.55 Table 3.8 summarises our analysis of the 30 capital cities of the EU28 plus Norway and Switzerland. In each city with a zonal system, we identified the maximum number of zones in any direction from the city centre to the outer limit of the zonal system. For the suburban station-to-station fare we examined (as reported in Figure 3.1 to Figure 3.3) we also identified, for the rail corridor including the 10-kilometre journey:

- the number of zones within 10 kilometres of the city centre;
- the distance from the centre to the edge of the system (in the single, ring and sector terminology of Figure 3.5, the radius of the outermost circle); and
- the average incremental radius of each successive zone over this distance.

Table 3.8: Suburban fares: capital cities with suburban rail networks

State		City	Smart card		Sampled commuter rail interval	Zonal system		Characteristics of selected corridor		
			Name	Valid on rail		Type	Zones on radial rail services	Zone at 10 kilometres	Outer edge (kilometres)	Average radius (kilometres)
AT	Austria	Vienna	(Planned)	-	+	Sectors	3-8	2	43	9
BE	Belgium	Brussels	Mobib	✓	+	Single	1	Outside	8	8
BG	Bulgaria	Sofia	Yes	-	No regular suburban rail services					
CH	Switzerland	Bern	×	✓	+	Mosaic	National	4	National	4
CY	Cyprus	Nicosia	×	No railway						
CZ	Czech Republic	Prague	Opencard	✓	+	Rings	4-8	1	35	7
DE	Germany	Berlin	×	-	+	Rings	3	2	26	9
DK	Denmark	Copenhagen	Rejsekort	✓	+	Sectors	3-13	4	45	4
EE	Estonia	Tallinn	Ühiskaart	✓	60	Rings	5	2	73	14
EL	Greece	Athens	×	-	+	No zonal system for rail				
ES	Spain	Madrid	Sube-T	✓	+	Rings	5-6	2	26	5
FI	Finland	Helsinki	Travel Card	✓	+	Municipal	2-3	1	52	26
FR	France	Paris	Navigo	✓	+	Rings	5	3	50	10
HR	Croatia	Zagreb	×	-	+	Rings	3	1	34	12
HU	Hungary	Budapest	(Planned)	-	30	Single	1	1	15	15
IE	Ireland	Dublin	Leap	✓	+	No zonal system for rail (Dublin Bus has zones)				
IT	Italy	Rome	Metrebus	✓	+	Single	1	1	11	11
LT	Lithuania	Vilnius	×	-	✈ airport rail service only					
LU	Luxembourg	Luxembourg	e-go	✓	No regular suburban rail services					
LV	Latvia	Riga	E-talons	×	No regular suburban rail services					
MT	Malta	Valletta	×	No railway						
NL	Netherlands	Amsterdam	OV-Chipkaart	✓	30	National distance-based				
NO	Norway	Oslo	Reisekort	✓	+	Sectors	3-4	1	55	14
PL	Poland	Warsaw	Karta Miejska	✓	+	Rings	2	1	18	9
PT	Portugal	Lisbon	Viva	✓	+	Sectors	4-5	2	23	6
RO	Romania	Bucharest	Cardul activ	-	No regular suburban rail service					
SE	Sweden	Stockholm	SL Access	✓	+	Rings	2-3	1	40	13
SI	Slovenia	Ljubljana	Urbana	-	No regular suburban rail service					
SK	Slovakia	Bratislava	×	-	60	Sectors	6-12	2	31	5
UK	UK	London	Oyster	✓	+	Rings	6-9	3	23	4

Source: railway and transport authority websites, Steer Davies Gleave analysis, see text for details.
Note: "+" = commuter rail more frequent than every 30 minutes in the sample radial corridor.
Note: zone numbers and radii are in a sample radial corridor which may not be typical.

Figure 3.6: Suburban fares: capital cities with zones

Source: railway and transport authority websites, Steer Davies Gleave analysis, see text for details.
Note: zone numbers and radii are in a sample radial corridor which may not be typical.
Note: in some cities the minimum fare includes more than one zone.

3.56 Figure 3.6 summarises our analysis of the 17 cities with zonal systems, sorted by the diameter of the zonal system on the radial corridor we examined, relative to a notional 10 kilometre journey shown by the green line. It also shows the approximate sizes, and numbers or names, of the zones in the radial corridor. It illustrates a number of points about zoning systems.

3.57 First, some cities have a single zone, with flat fares for the whole urban area, although there may be lower "short hop" fares within this zone. The boundary of the zone is typically the area for which the municipal authority is responsible for transport. This structure tends to be used in cities which are small or have relatively low fares, such as Brussels, Rome and Budapest.

3.58 Second, some cities have large fare zones with large average radius. The principal examples, and average zone radii in the selected corridors, are Helsinki (26 kilometres) and Tallinn, Oslo and Stockholm (13-14 kilometres). This can mean relatively large steps between fares for different numbers of zones, although in Stockholm all period tickets cover all of Stockholm County including Zones A, B and C, effectively making period tickets flat fares.

3.59 Third, and at the other extreme, some cities have small fare zones with a small average radius. The average radii of the zones in Copenhagen, Bratislava, London and Bern in the corridors selected is only 4-5 kilometres, with relatively small steps in fares. In London, for example, some tickets group the zones, with common fares for Zones 1 and 2, 3 and 4, and 5 and 6.

3.60 Fourth, the radius covered by a ticket for the central zone varies widely, from 2-3 kilometres in London and Copenhagen, via 4 kilometres in Paris and around 10 kilometres in Warsaw, Stockholm, Vienna and Oslo to over 20 kilometres in Helsinki.

Discounts and reductions

3.61 We investigated the discounts offered and the conditions attached to them. In practice, passengers falling into certain categories may be entitled to either discounted or reduced fares, which we define as follows:

- Discounted fares are lower than the full adult fare by a fixed percentage. We have found discounts at levels of 20%, 25%, 33%, 40%, 50%, 90% and 100% in different cities.
- Reduced fares are lower than the full adult fare, but the percentage reduction varies between different station pairs.

3.62 For example, fares of €5 and €4 may be discounted by 20% to €4 and €3.20 respectively. Reduced fares, on the other hand, may be €4.50 and €3.50, reductions of 10% and 12.5% respectively.

3.63 Discounted fares are simpler to administer and for passengers to understand, but may limit the operator's flexibility to either maximise revenues or manage demand, as they cannot tailor the discount offered to match an individual's willingness to pay. Fares for travel in different quantities (singe, return, season), or at different times (peak, off-peak, weekend) are often therefore reduced by amounts which vary between tickets to meet operator objectives.

3.64 Passengers travelling in suburban areas will normally benefit from any discounts or reduced fares required by national legislation ("general rules" provided for in Article 3 in Regulation 1370/2007) or offered throughout the railway industry. For example, a "general rule" might be that people defined as pensioners in social legislation must travel half price. In this case the railway has not set a pensioner discount and has no control of the age at which it is available, since the pensionable age may be determined in separate legislation.

3.65 Passengers may also benefit from discounts or reduced fares offered by regional or municipal competent authorities. Discounts and reduced fares are common for the young, students, the elderly and persons with reduced mobility (PRM), with varying eligibility rules. However, not all sources (including RMMS) list all discounts and/or reduced fares. Table 3.9 illustrates some of the discounts and reduced fares we identified as being available in various cities.

Table 3.9: Suburban fares: discounts available in different cities

State		City	Examples of discounts or reduced fares
BG	Bulgaria	Sofia	Preferential tariffs, at different rates, for: • University students • Holders of a PhD • Life guards from the mountain rescue service • Persons with reduced mobility (PRM) and their attendants, tiered by severity of disability • Foster parents • Veterans and war victims • "Honourable citizens" of Sofia
CZ	Czech Republic	Prague	100% discounts for babies in strollers (empty strollers require a ticket)
ES	Spain	Madrid	Discounts for large families
IT	Italy	Rome	Discounts for unemployed residents
NO	Norway	Oslo	Group ticket for kindergarten groups and school classes
PL	Poland	Warsaw	Discount of 100% for, inter alia: • Holders of Warsaw Uprising Cross or "For Warsaw 1939-1944" medal, or members of "The association of Poles harmed by the Third Reich" • Honorary citizens of Warsaw • Those born on public transport vehicles in the city • Those who have given more than 18 litres (men) or 15 litres (women) of blood • The disabled, and carriers escorting them or returning from escorting them • Participants in various marathons and half-marathons • Retired transport staff • Widows and widowers of transport staff killed in accidents at work
UK	UK	London	Discounts for residents of London over 60, and separate scheme over 65: • 100% on services funded by Transport for London • 33% on services funded by Department for Transport, off-peak only Discounts for non-residents over 60 years old, on purchase of a photocard: • 33% on services funded by Department for Transport, off-peak only

Source: railway and transport authority websites, RMMS data, Steer Davies Gleave analysis, see text for details.

3.66 In reviewing eligibility for discounts and reduced fares, we found no evidence of the discriminatory practice of using nationality as a criterion. Residence was often cited as a criterion, but this is permitted.

3.67 Nonetheless, discounts for suburban fares are highly variable and need not be consistent between cities in the same State. Even if "general rules" are applied nationally through Regulation 1370/2007, local competent authorities may be free to offer more generous discounts within their area of responsibility, and do so in capitals such as Sofia, Warsaw and London. We also note the potential complexities involved if the same two stations are served by trains supported by different competent authorities applying different discount policies. In at least some corridors in London, entitlement to a discount may depend not only on the passenger's age but also on their place of residence and the operator of the train boarded.

Smart cards

3.68 Table 3.8 shows how many capital cities now have smart card ticketing, which is also planned in Vienna and Budapest. However, some of the smart card systems are limited to non-rail modes and in Riga, for example, the E-talons card is not valid on the limited local rail services.

3.69 Smart cards allow authorities and operators to include a range of customer-focused functionality more easily than with paper tickets. For example:

- Discounts may be offered relative to cash fares, although in many cities the price is the same.
- Discounts specific to individuals may be built into a personal card, often supported by a photocard.
- Discounts may be offered for off-peak travel, as is now the case in London.
- Fares can be made specific to each individual station-to-station journey, as is now the case with the OV-Chipkaart covering the Netherlands.

3.70 Smart cards also offer a number of advantages for the authorities and operators responsible for administering suburban fares:

- They have low costs which can make it commercially viable, once the system has been established, to offer a discount for smart card use.
- They can set fares which vary in small steps with location and time.
- They can offer discounts or even free travel on specific services, or to specific groups if they are non-transferrable or "personal".
- They can provide detailed information on patterns of travel, such as identifying regular journeys and connections.
- They can provide registered users with targeted information based on their travel habits, such as informing them of planned or unplanned changes at stations, or on routes, that they are known to use.

3.71 However, London has already moved to accepting "wave and pay" payment by debit and credit cards, which does not require a separate card, and which allow complex discounts to be calculated in arrears on a "back office" system.

3.72 Replacement of special smart cards with existing debit and credit cards, used as an identifier rather than as a ticketing device, means that discounts can be calculated, and fares collected from passengers, after the journey has taken place. However, any reliance on smart cards relies upon the provision of a comprehensive system of points at which passengers can "check in" and "check out" of the system, whether supported by physical gates or not. Some cities prefer to have an "open" system.

3.73 Other cities, including Helsinki, Stockholm and Zagreb, have introduced M-ticketing, in which tickets can be bought with a mobile phone, in some cases requiring a local SIM card.

4 Other fares and tickets

Introduction

4.1 In this chapter we examine regional, interurban, high speed and international fares, some of which are set by administrative means but many of which are regulated or left to the market.

4.2 We collected data during November 2015 for journeys undertaken during either November or December 2015, dependent upon whether fares were sampled one day, one week or one month in advance.

4.3 We expressed all fares in PPP-adjusted euros, converted at the market exchange rates, and adjusted to reflect differences in purchasing power in different Member States[25]. Thus the relative level of reported PPP-adjusted fares reflects their cost relative to a standard basket of goods.

4.4 All fares per kilometre have been calculated using the straight-line distance between the two cities identified. In some countries this will be closely related to the distance by rail but in others, such as Denmark which has a large number of islands, this is not the case. Straight-line distances allow meaningful comparisons between modes and reflect the impact of direct versus indirect routing by different modes within this comparison.

4.5 We next discuss in turn fares for:

- regional journeys, over distances of 50-100 kilometres not involving the capital city;
- interurban journeys under 300 kilometres;
- interurban journeys over 300 kilometres;
- domestic high-speed journeys; and
- international journeys.

Regional fares

4.6 We agreed with the Commission that we would take the "regional" market segment to mean journeys, typically over distances of 50-100 kilometres, which do not involve a major city, although in practice in some smaller Member States the only material services meeting this definition were to or from the capital. The regional fares we examined are summarised in Table 4.1 overleaf.

[25] Exchange rates from **www.xe.com** on 7 December 2015, purchasing power parity data from **http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tec00120** updated 9 November 2015

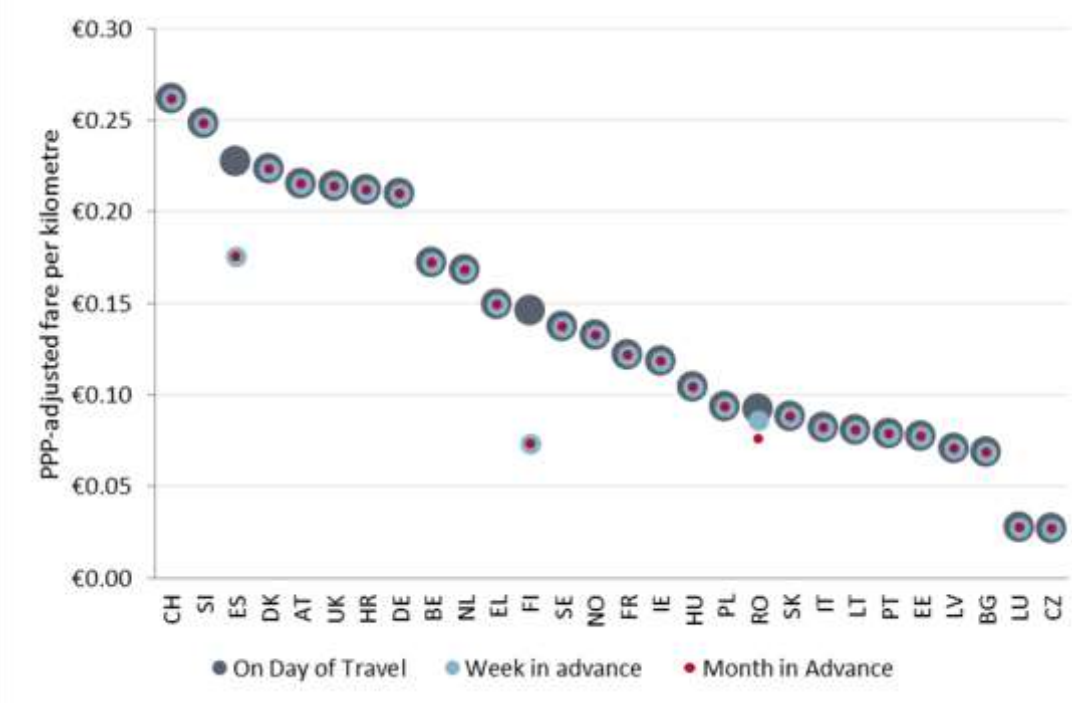
Table 4.1: Regional fares: sample of station pairs

Member State		Regional station pair examined		
		Origin	Destination	Kilometres
AT	Austria	Salzburg	Linz	110
BE	Belgium	Ghent	Antwerp	50
BG	Bulgaria	Burgas	Zimnica	80
CH	Switzerland	Lausanne	Biel	80
CZ	Czech Republic	Ostrava	Prerov	85
DE	Germany	Cologne	Duisburg	80
DK	Denmark	Århus	Viborg	60
EE	Estonia	Tallinn	Rakvere	90
EL	Greece	Thessaloniki	Katerini	70
ES	Spain	Valencia	Castellón	75
FI	Finland	Turku	Salo	60
FR	France	Cannes	Menton	65
HR	Croatia	Zagreb	Varazdin	60
HU	Hungary	Debrecen	Nyíregyháza	50
IE	Ireland	Limerick	Galway	70
IT	Italy	Bologna	Ravenna	85
LT	Lithuania	Vilnius	Kaunas	90
LU	Luxembourg	Luxembourg	Troisvierges	60
LV	Latvia	Krustpils	Daugavpils	80
NL	Netherlands	Utrecht	Zwolle	80
NO	Norway	Bergen	Dale	60
PL	Poland	Poznan	Gniezno	60
PT	Portugal	Porto	Penafiel	40
RO	Romania	Suncuius	Huedin	60
SE	Sweden	Malmö	Helsingborg	65
SI	Slovenia	Ljubljana	Celje	60
SK	Slovakia	Kosice	Prešov	30
UK	UK	Cambridge	Ipswich	70

Source: railway websites, Steer Davies Gleave analysis, see text for details.

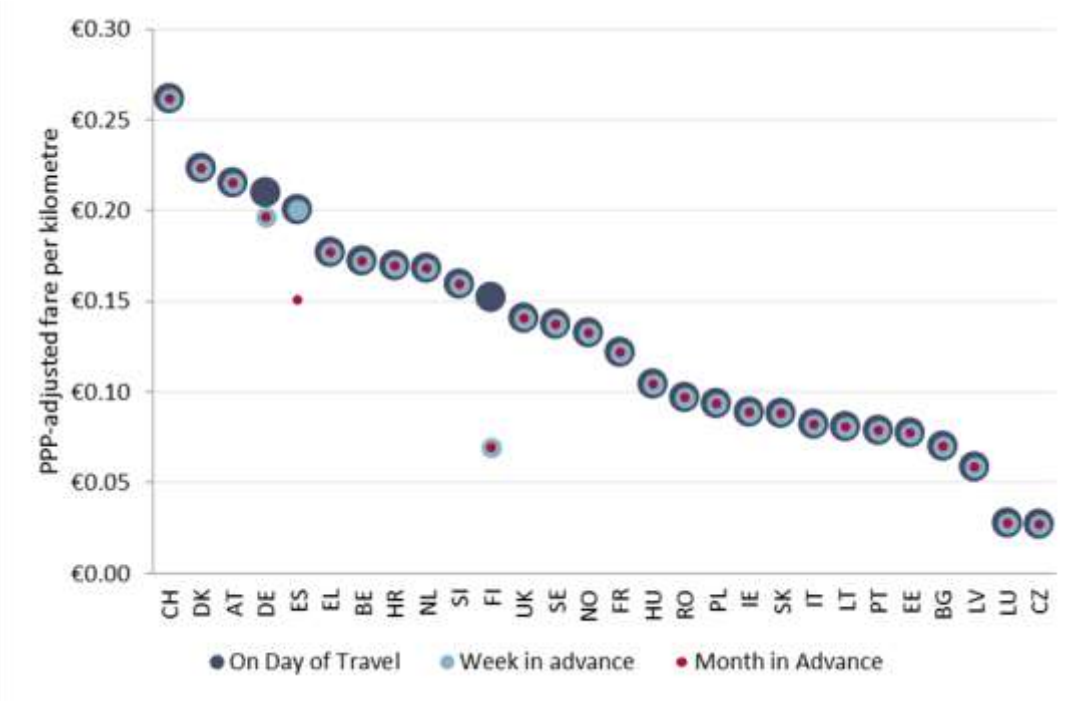
4.7 For each of the station pairs described in Table 4.1 we compared fares by ticket-type and booking horizon. Our findings are summarised in Figure 4.1, Figure 4.2 and Figure 4.3 below.

Figure 4.1: Regional fares: peak single



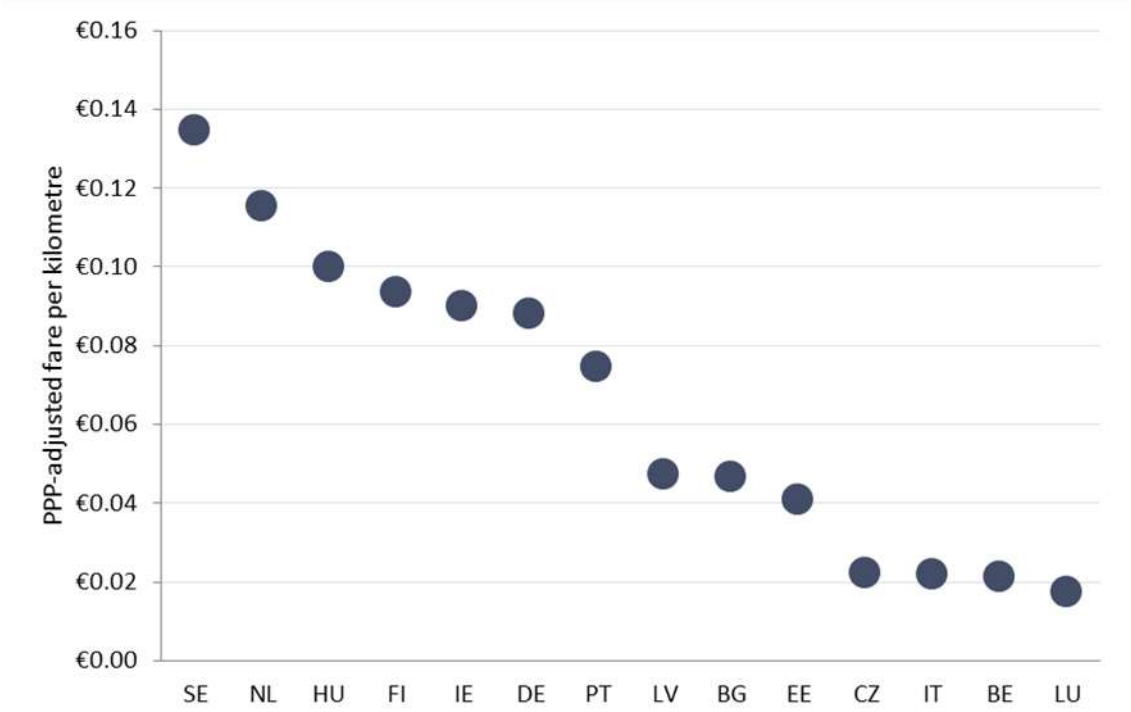
Source: railway websites, Steer Davies Gleave analysis
Note: fares are for a single station-to-station pair (see Table 4.1 for details) and may not be representative.

Figure 4.2: Regional fares: off-peak return



Source: railway websites, Steer Davies Gleave analysis
Note: fares are for a single station-to-station pair (see Table 4.1 for details) and may not be representative.

Figure 4.3: Regional fares: monthly or 30-day



Source: railway websites, Steer Davies Gleave analysis
Note: fares are for a single station-to-station pair (see Table 4.1 for details) and may not be representative.

4.8 We identified regional fares which, when expressed in PPP-adjusted euros, varied from €0.26 per kilometre between Lausanne and Biel in Switzerland (where many citizens buy annual all-lines passes) to €0.017 per kilometre (for a monthly ticket) from the city of Luxembourg to Troisvierges. The most expensive fares were usually found on journeys in Western European Member States, although some of the highest peak single fares were found in Slovenia and Croatia, each with a fare of over €0.20 per kilometre.

4.9 Discounts for booking in advance were only available in a few Member States:

- In Finland a discount of (exactly) 50% could be obtained by booking a week or more in advance[26].
- Spain and Romania had smaller advance booking discounts for peak single fares.
- Spain and Germany had smaller advance booking discounts for off-peak return fares.

4.10 For the majority of regional journeys however, discounts for booking in advance were not available.

4.11 In the majority of Member States, peak single and off peak-return fares per kilometre were the same: return fares were often always the same as two single fares. This implies that there is neither a discount for return fares nor a distinction between peak and off-peak journeys.

4.12 In seven Member States (Croatia, Germany, Ireland, Latvia, Slovenia, Spain, United Kingdom) however, a lower fare per kilometre for off-peak return journeys was available, with discounts

[26] We are also aware the Finland has made experimental fares cuts on at least one route, but cannot confirm whether this affects fares between Turku and Salo.

of over 30% in Slovenia and the UK. A discounted return was also available in Germany, but only if booked in advance. Where yield management is used, the lower cost per kilometre of an off peak-return fare than a peak single fare may be due in part to lower off-peak pricing instead of solely a return booking discount.

4.13 In Greece and Romania, the return fare we found was more than two single fares, which could be a feature of a yield management system but which is more likely an anomaly within the fares structure. Anomalous fares can arise where two different authorities set fares, for example at the boundary between competent authorities or where the regulatory framework allows differential changes to different types of fares or fare regimes.

4.14 One reaction to such an anomaly might be that this is evidence of choice, and passengers are free to choose the better priced product. Another interpretation is that operators, or intermediaries such as travel agents, should not offer fares which are worse value than other fares, although we note that if they were not to do so it might prove harder for passengers to establish that they had found all the fares available.

4.15 Finally, only in about half of all Member States was it readily possible to find a season ticket fare, although it is possible that fares may be available on request at a ticket office. For Member States where data was available, monthly tickets were consistently cheaper on a fare per kilometre basis than the equivalent peak single fares. The saving per kilometre ranged from 2% in Sweden to 88% in Belgium.

Interurban fares at distances under 300 kilometres

4.16 We took the interurban market segment to involve a domestic journey from the capital city to another major urban area over a distance under 300 kilometres[27]. On this basis we concluded that there were no effective domestic interurban services in either Luxembourg or Slovenia, which are largely monocentric, as shown in Table 4.2.

Table 4.2: Interurban trips under 300 kilometres: sample of station pairs

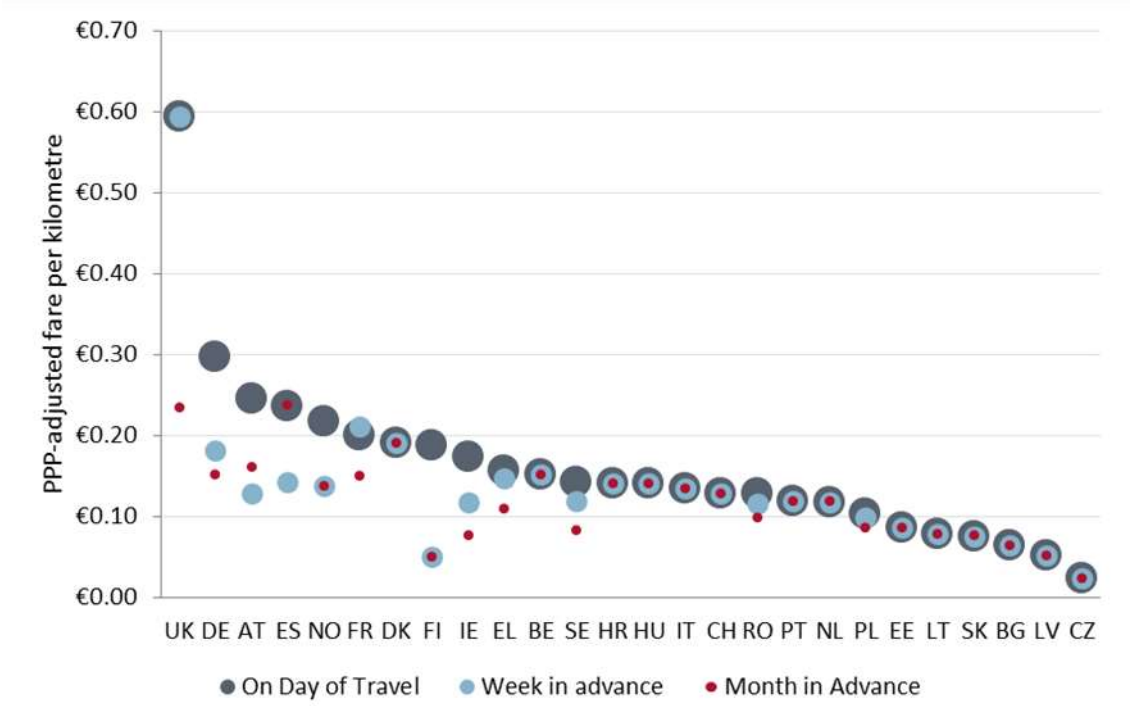
Member State		Interurban under 300 kilometres: station pair examined		
		Origin	Destination	Kilometres
AT	Austria	Vienna	Graz	140
BE	Belgium	Brussels	Liege	90
BG	Bulgaria	Sofia	Plovdiv	130
CH	Switzerland	Lausanne	Zürich	170
CZ	Czech Republic	Prague	Brno	180
DE	Germany	Munich	Stuttgart	190
DK	Denmark	Copenhagen	Aalborg	220
EE	Estonia	Tallinn	Tartu	160
EL	Greece	Athens	Patras	180
ES	Spain	Madrid	Cuenca	140
FI	Finland	Helsinki	Turku	150
FR	France	Paris	Reims	130
HR	Croatia	Zagreb	Osijek	210
HU	Hungary	Budapest	Szeged	160
IE	Ireland	Dublin	Cork	220
IT	Italy	Rome	Naples	190
LT	Lithuania	Vilnius	Klaipėda	290
LV	Latvia	Riga	Daugavpils	190
NL	Netherlands	Rotterdam	Groningen	200
NO	Norway	Oslo	Lillehammer	130
PL	Poland	Warsaw	Lublin	150
PT	Portugal	Lisbon Oriente	Faro	220
RO	Romania	Bucharest	Constanța	200
SE	Sweden	Stockholm	Örebro	160
SK	Slovakia	Bratislava	Žilina	170
UK	UK	London Paddington	Cardiff	210

Source: railway websites, Steer Davies Gleave analysis, see text for details.

4.17 For each of the station pairs described in Table 4.2 we compared fares by ticket-type and booking horizon. Our findings are summarised in Figure 4.4, Figure 4.5 and Figure 4.6 below.

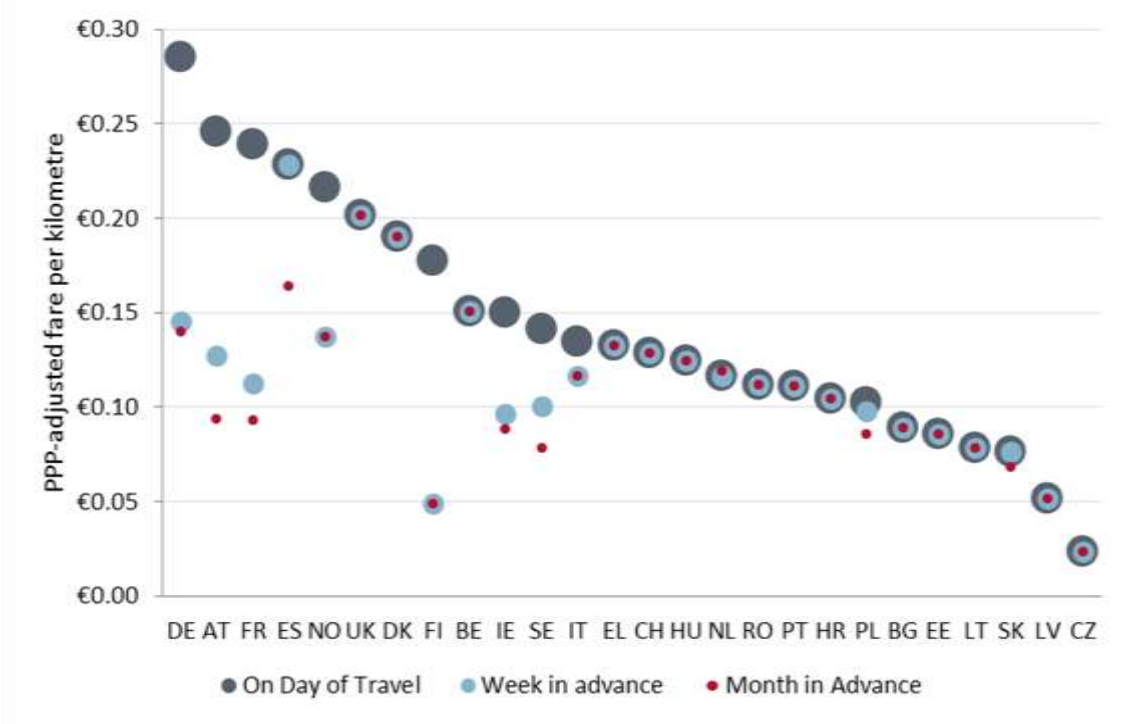
[27] In practice we sampled city pairs approximately 100 to 200 kilometres apart

Figure 4.4: Interurban fares under 300 kilometres: peak single



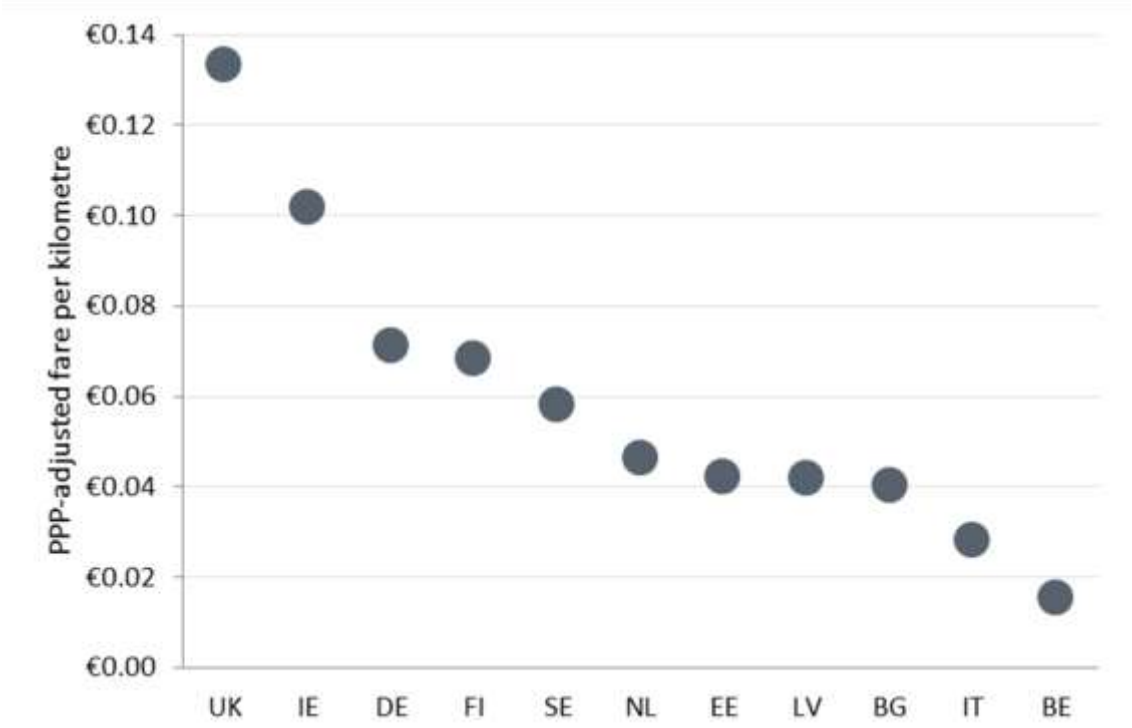
Source: railway websites, Steer Davies Gleave analysis
Note: fares are for a single station-to-station pair (see Table 4.2 for details) and may not be representative.

Figure 4.5: Interurban fares under 300 kilometres: off-peak return



Source: railway websites, Steer Davies Gleave analysis
Note: fares are for a single station-to-station pair (see Table 4.2 for details) and may not be representative.

Figure 4.6: Interurban fares under 300 kilometres: monthly or 30-day



Source: railway websites, Steer Davies Gleave analysis
Note: fares are for a single station-to-station pair (see Table 4.2 for details) and may not be representative.

4.18 The single highest peak single fare we found was an unregulated single fare of £109 from London Paddington to Cardiff, equivalent after PPP adjustment to nearly €0.60 per kilometre and twice the cost of the next highest fare in Germany. However, other, advance purchase fares for this corridor with the same operator were as low as €0.20 per kilometre.

4.19 Unlike regional journeys, on many interurban routes under 300 kilometres discounts were available, for both peak single and off-peak return fares, when booking in advance. In most cases the discounts offered a month in advance were greater than those offered a week in advance. In a number of Member States including Germany, Austria, France, Finland and Ireland, the fare when booking in advance or purchasing a monthly season ticket was around half the fare when booked on the day.

4.20 In The Netherlands, Slovakia and Spain we found some fares which, when booked a month in advance, were slightly higher than the fare booked on the day. This may be an effect of the research methodology in which the fare data was collected during November and early December 2015. Some rail operators implement their annual fare increases in January, so the "month in advance" fare may have included the fare increase for the following year.

4.21 On just under half the interurban routes under 300 kilometres, return fares were less than twice the single fare. The largest saving was in the UK, where the off-peak return fare was more than 60% less than the equivalent peak single. This illustrates the significant premium applied on many routes into central London during the peak period and is reflective of the heavy constraints on the network during the peak. Lithuanian railways provide a discount of 15% (if bought in the station) or 20% (if bought on internet) for round-trip tickets, compared to the equivalent single ticket.

4.22 In Bulgaria and France the quoted return fare was more than twice the single fare. For example, between Paris and Reims there is an advance booking discount of 25% when booking a month in advance, but the fare booked a week in advance is 5% more expensive than when bought on the day. While the fare may be considered superficially anomalous, it may also reflect a particularly busy period one week ahead of when the fares data was collected and the subsequent yield management response by the operator. We collected data in December 2015, when fares may have been affected by the proximity to the Christmas period.

4.23 For those Member States where it was possible to find monthly fares, these were significantly cheaper than 20 peak return tickets: the effective discount ranged from 19% in Latvia to 90% in Belgium.

Interurban fares at distances over 300 kilometres

4.24 We took the interurban market segment to involve a journey from the capital city to another major urban area over a distance over 300 kilometres. On this basis we concluded that long-distance interurban services over 300 kilometres exist in only 16 of the 28 Member States with rail networks, as shown in Table 4.3. We did not investigate season tickets for daily travel over 300 kilometres.

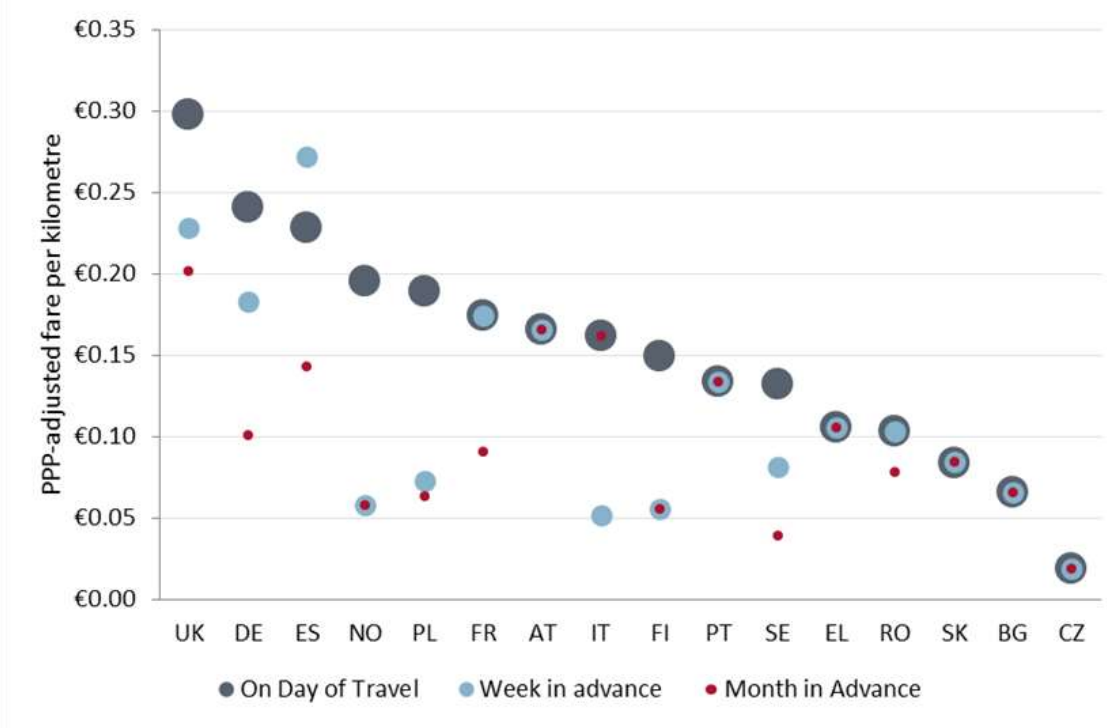
Table 4.3: Interurban trips over 300 kilometres: sample of station pairs

Member State		Interurban over 300 kilometres: station pair examined		
		Origin	Destination	Kilometres
AT	Austria	Vienna	Innsbruck	390
BG	Bulgaria	Sofia	Varna	380
CZ	Czech Republic	Prague	Ostrava	280
DE	Germany	Berlin	Cologne	480
EL	Greece	Athens	Thessaloniki	500
ES	Spain	Madrid	Barcelona	500
FI	Finland	Helsinki	Vaasa	370
FR	France	Paris	Lyon	390
IT	Italy	Rome	Milan	480
NO	Norway	Oslo	Bergen	310
PL	Poland	Warsaw	Wroclaw	300
PT	Portugal	Lisbon	Porto	280
RO	Romania	Bucharest	Timisoara	420
SE	Sweden	Stockholm	Malmö	510
SK	Slovakia	Bratislava	Kosice	310
UK	UK	London	Edinburgh	540

Source: railway websites, Steer Davies Gleave analysis, see text for details.

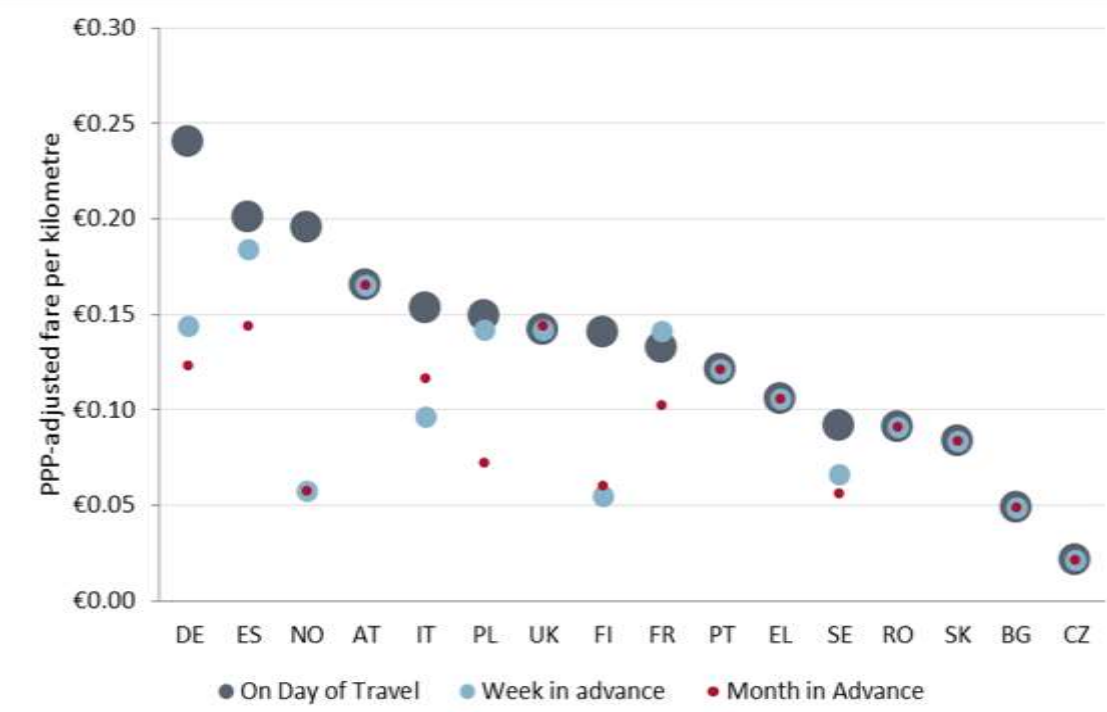
4.25 For each of the station pairs described in Table 4.3 we compared fares by ticket-type and booking horizon. Our findings are summarised in Figure 4.7 and Figure 4.8 below.

Figure 4.7: Interurban fares over 300 kilometres: peak single



Source: railway websites, Steer Davies Gleave analysis
Note: fares are for a single station-to-station pair (see Table 4.3 for details) and may not be representative.

Figure 4.8: Interurban fares over 300 kilometres: off-peak return



Source: railway websites, Steer Davies Gleave analysis
Note: fares are for a single station-to-station pair (see Table 4.3 for details) and may not be representative.

4.26 In France, Germany, Italy and Spain, some or all of the journey may be undertaken on high-speed rail infrastructure using high-speed rolling stock. As a consequence, the fares found in these Member States may be higher than for other interurban journeys over 300 kilometres which do not involve high-speed infrastructure or trains. Fares and track access charges for high speed services are typically greater than those for conventional rail. While, to some extent, this may affect comparisons drawn between Member States, journeys on these corridors may be considered both typical and representative.

4.27 The highest fare we found was an unregulated single fare of £140.50 from London Kings Cross to Edinburgh, equivalent after PPP adjustment to nearly €0.30 per kilometre, half the London to Cardiff fare shown in Figure 4.4. Previous studies in Great Britain have shown that rail fares between London and Edinburgh are heavily constrained by competition from domestic air services which link Edinburgh to five London airports.

4.28 Advance booking discounts were available on the majority of interurban routes over 300 kilometres, particularly on the more expensive Western European networks. On journeys where discounts were available, there were often savings of over 50%; the largest of which was in Norway, where there was a reduction of more than 70% for booking a week or month in advance. Advance booking discounts were not available on most of the interurban corridors over 300 kilometres in Eastern European Member States (Poland is a notable outlier) although the walk-up fare on these routes was usually much lower than in Western Europe.

4.29 As with the shorter interurban corridors described above, in ten Member States the fare per kilometre was lower when purchasing a return ticket when compared to an equivalent one-way ticket. The largest observed reduction for purchasing a return ticket was almost 50% in the UK. Again, this may have reflected the distinction between peak and off-peak fares, rather than being directly attributable to a return versus a single fare.

Domestic high speed fares

4.30 We agreed with the Commission that high speed services should mean those that operate mainly or wholly on high speed lines, rather than those that use trains able to travel at 200 km/h, which in some states would include a large proportion of “conventional” long-distance services, including some on regional routes at low speed.

4.31 On this basis we concluded that high speed domestic rail travel exists in only seven Member States, and in only four of them is it possible to travel more than 100 kilometres on dedicated high speed line, as shown in Table 4.4 below.

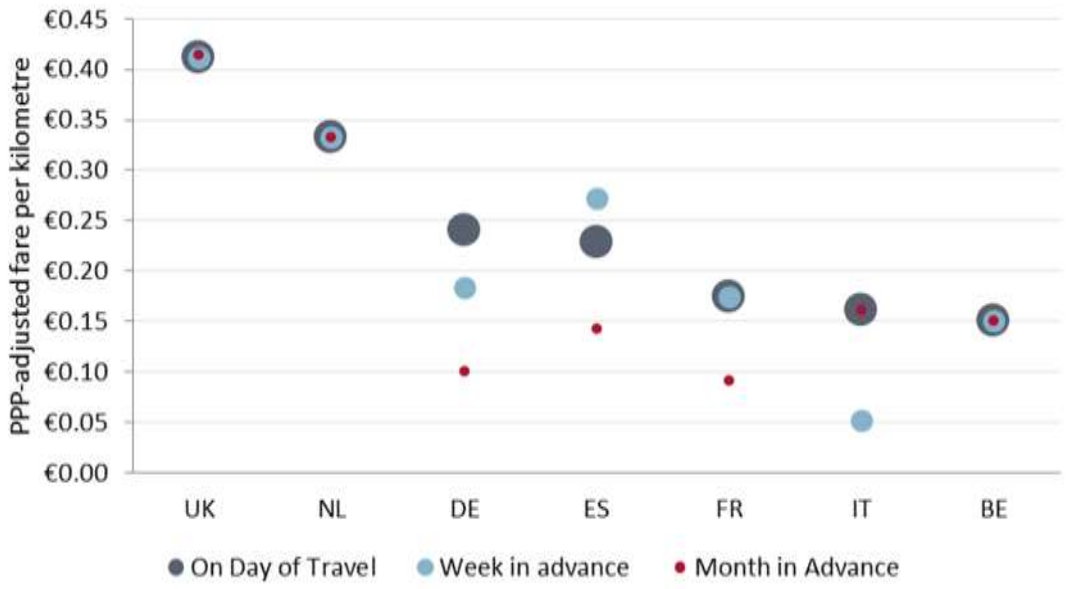
Table 4.4: Domestic high-speed trips: sample of station pairs

Member State		Domestic high-speed station pair examined		
		Origin	Destination	Kilometres
BE	Belgium	Brussels	Liege	90
DE	Germany	Berlin	Cologne	480
ES	Spain	Madrid	Barcelona	500
FR	France	Paris	Lyon	390
IT	Italy	Rome	Milan	480
NL	Netherlands	Amsterdam	Rotterdam	57
UK	UK	London	Ashford	82

Source: railway websites, Steer Davies Gleave analysis, see text for details.

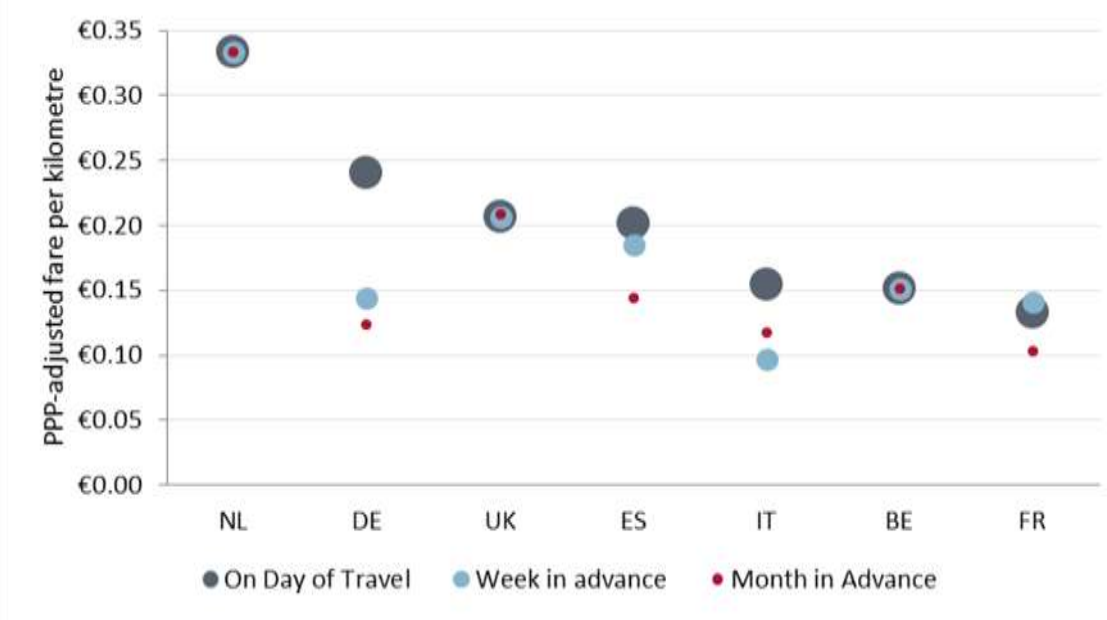
4.32 For each of the station pairs described in Table 4.4 we compared fares by ticket-type and booking horizon. Our findings are summarised in Figure 4.9 and Figure 4.10 below.

Figure 4.9: High speed fare: peak single



Source: railway websites, Steer Davies Gleave analysis
Note: fares are for a single station-to-station pair (see Table 4.4 for details) and may not be representative.

Figure 4.10: High speed fares: off-peak return



Source: railway websites, Steer Davies Gleave analysis
Note: fares are for a single station-to-station pair (see Table 4.4 for details) and may not be representative.

4.33 We did not systematically investigate monthly or 30-day season ticket fares for high speed services, but note that:

- In France, we found no clear information online, and sought information through SNCF's call centre. We were told that there are no season tickets for high speed rail services, and that a commuter would need to buy a ticket for each journey, but could buy a card giving 25% or 50% discount on each individual ticket.
- In Germany, season tickets are in principle available for any journey up to 400 kilometres, which does not include Berlin to Cologne, but in practice at distances over around 200 kilometres it may be cheaper to buy an annual "all-lines" German Rail Pass, costing €4,090 for Second Class and €6,890 for First Class travel. At distances at which season tickets are available, there may be a lower priced season ticket restricted to the regional trains which use (?) the high speed line.
- In Italy, two high speed operators provide services between Rome and Milan. Italo offers monthly season tickets between some city pairs, but not between Rome and Milan, but regular travellers between the cities can buy a 10-trip carnet for €575, advertised as a discount of approximately 50%.Trenitalia offers a total of seven monthly season ticket fares, including First and Second Class and whether including high speed services. A monthly season valid on high speed services between any stations in each city costs €905 for Second Class and €1,292 for First Class.
- In Great Britain, season tickets are available for high speed services. A total of twelve monthly season ticket fares are available between Ashford and London, including First Class and Standard, different routing options, whether including high speed services, and whether including travel within London on arrival.

4.34 The highest fare we found was an unregulated off-peak single fare of £29.50 from Ashford to London, equivalent after PPP adjustment to over €0.40 per kilometre. This may be reflective of the explicit premium placed upon high-speed domestic services to support capital cost

recovery. For example, access charges levied by High Speed 1 Limited (the infrastructure owner) include an investment recovery charge set at the maximum permissible by the Secretary for State as a maximum value per minute of train service. In collecting the fares data we separately identified an unregulated Anytime fare, valid on all trains, costing £35.30 (equivalent to over €0.50 per kilometre). We also found, but do not discuss here, lower regulated and unregulated fares.

4.35 The lowest fare we found was €0.05 per kilometre in Italy, for a week-ahead fare using open access operator Italo. This low fare may be as a consequence of competition with the incumbent operator Trenitalia. Further evidence regarding rail market liberalisation and competition in the market for rail services is provided in Chapter 6.

4.36 Advance booking discounts and yield management systems on high-speed services appears to be offered in France, Germany, Italy and Spain. The higher cost of a fare booked a week in advance than on the day in Spain, and a month in advance than a week in advance in Italy, reflect the particularly dynamic nature of the yield management systems on these routes. Despite this, the highest fare per kilometre for both peak single and off-peak return fare types, the UK and the Netherlands respectively, are on routes that do not appear to be yield managed.

International fares

4.37 The Commission asked us to assess whether there are differences in prices for domestic and international long-distance services. For each domestic long-distance service we identified a comparable international service as shown in Table 4.5.

Table 4.5: Domestic and international long-distance fares

Member State		Domestic long-distance station pair	km	Proposed equivalent international station pair	km
AT(-DE)	Austria	Vienna-Innsbruck	390	Vienna-Nuremberg (Germany)	410
BG(-EL)	Bulgaria	Sofia-Varna	380	Sofia-Thessaloniki (Greece)	235
CZ(-AT)	Czech Republic	Prague-Ostrava	280	Prague-Vienna (Austria)	250
DK(-SE)	Denmark	Copenhagen-Århus	160	Copenhagen- Gothenburg (Sweden)	230
DE(-PL)	Germany	Berlin-Köln	480	Berlin-Warsaw (Poland)	520
IE(-UK)	Ireland	Dublin-Cork	220	Dublin-Belfast (UK)	140
EL	Greece	Athens-Thessaloniki	500	No comparable international service	n/a
ES(-FR)	Spain	Madrid-Barcelona	500	Barcelona-Marseille (France)	340
FR(-DE)	France	Paris-Lyon	390	Paris-Frankfurt (Germany)	480
FR(-UK)	France	Paris-Lyon	390	Paris-London (UK), via Channel Tunnel	340
IT(-CH)	Italy	Rome-Milan	480	Milan-Geneva (Switzerland)	250
NO(-SE)	Norway	Oslo-Bergen	310	Oslo- Gothenburg (Sweden)	250
PL(-DE)	Poland	Warsaw-Wroclaw	300	Poznań-Berlin (Germany)	240
PT(-ES)	Portugal	Lisbon-Porto	280	Lisbon-Madrid (Spain)	510
RO(-HU)	Romania	Bucharest-Timisoara	420	Timisoara-Budapest (Hungary)	260
SK(-CZ)	Slovakia	Bratislava-Kosice	310	Bratislava-Prague (Czech Republic)	290

Member State		Domestic long-distance station pair	km	Proposed equivalent international station pair	km
FI(-RU)	Finland	Helsinki-Vaasa	370	Helsinki-St Petersburg (Russia)	300
SE(-NO)	Sweden	Stockholm-Malmö	510	Stockholm-Oslo (Norway)	420
UK(-DE)	United Kingdom	London-Edinburgh	540	London-Köln (Germany), via Channel Tunnel	500

Source: railway websites, Steer Davies Gleave analysis, see text for details.
Note: fares from Wroclaw to Berlin were not available, so Poznań was chosen as equivalent fare.

4.38 In addition, we gathered information for a number of important international routes which do not have a direct domestic long-distance comparator, as listed in Table 4.6.

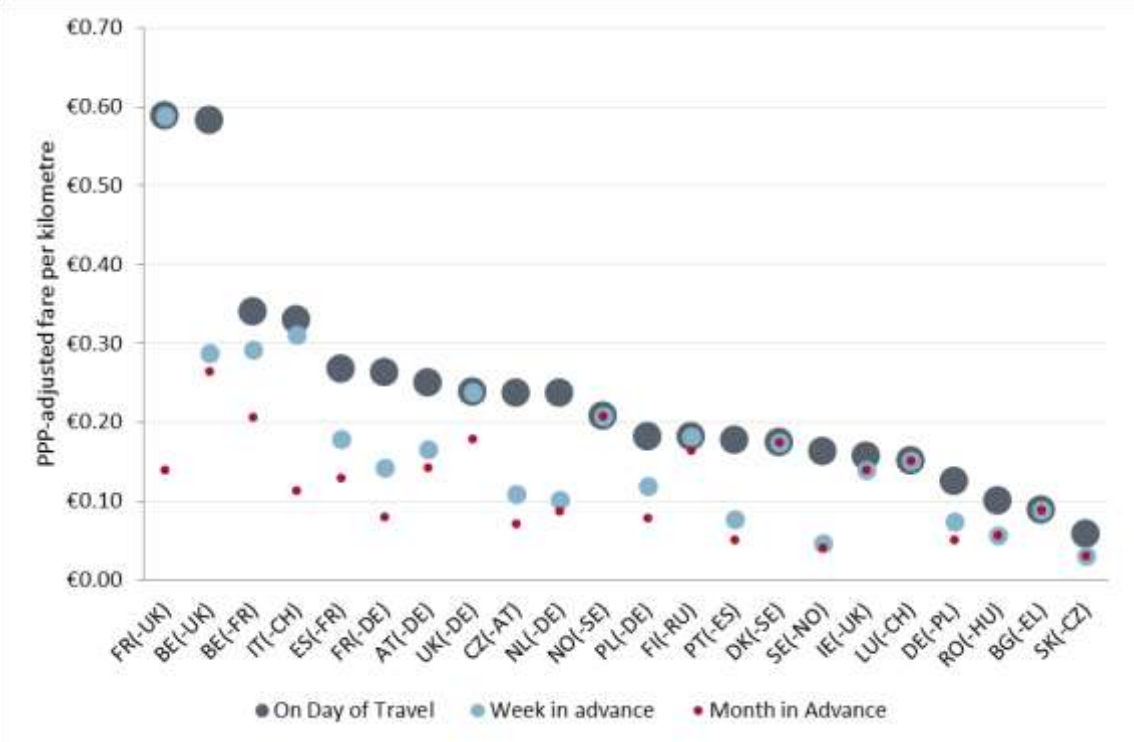
Table 4.6: Other international routes

Member State		Origin	Destination	km
LU(-CH)	Luxembourg	Luxembourg	Basel	250
NL(-DE)	Netherlands	Amsterdam	Hannover	330
BE(-FR)	Belgium	Brussels	Paris	270
BE(-UK)	Belgium	Brussels	London	325

Source: railway websites, Steer Davies Gleave analysis, see text for details.

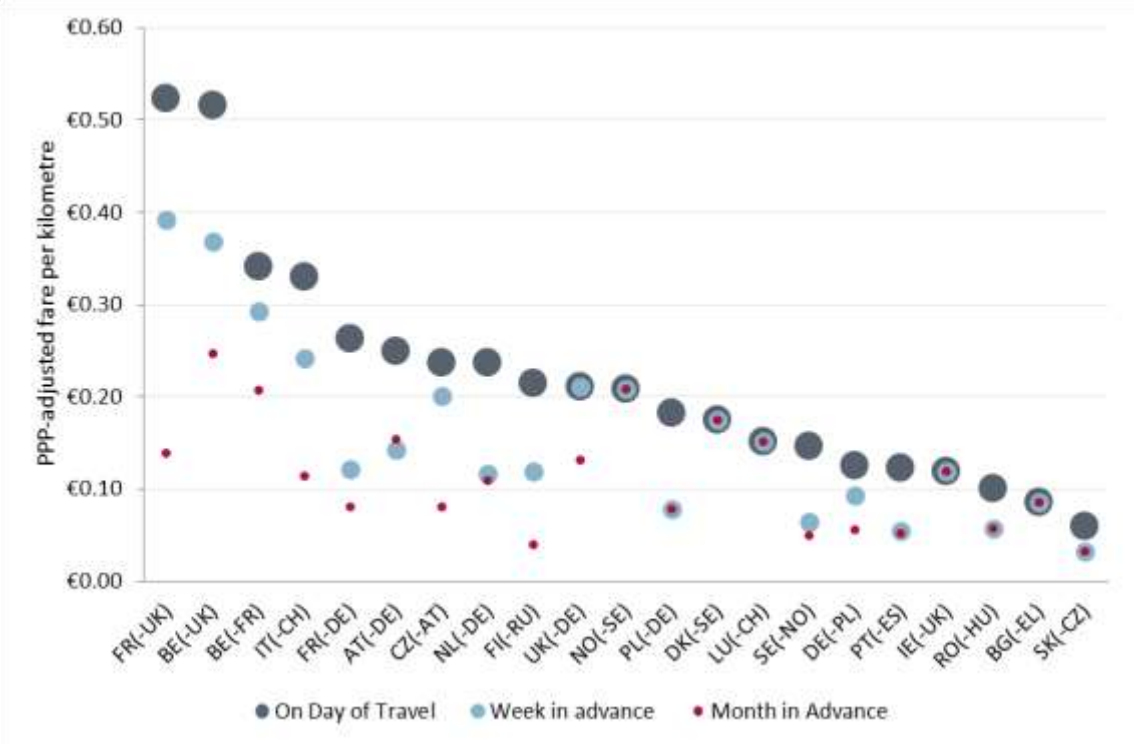
4.39 For each of the station pairs described in Table 4.5 and Table 4.6 we compared fares by ticket-type and booking horizon. Our findings are summarised in Figure 4.11 and Figure 4.12 below.

Figure 4.11: International fares: peak single



Source: railway websites, Steer Davies Gleave analysis
Note: fares are for a single station-to-station pair (see Table 4.5 and Table 4.6 for details) and may not be representative.

Figure 4.12: International fares: off-peak return



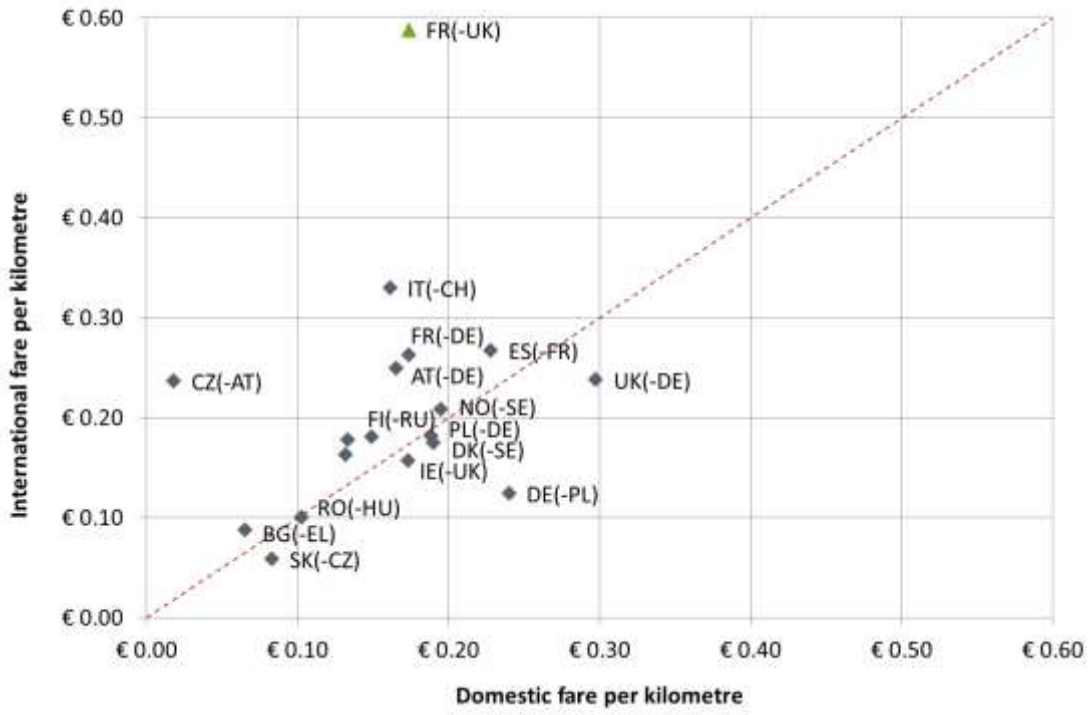
Source: railway websites, Steer Davies Gleave analysis
Note: fares are for a single station-to-station pair (see Table 4.5 and Table 4.6 for details) and may not be representative.

4.40 The highest international fare we found was a single fare of £170 from London St Pancras to Paris Gare du Nord, equivalent after PPP adjustment to nearly €0.58 per kilometre. The two routes served by Eurostar (Paris to London, Brussels to London) are the most expensive journeys within the sample and, in the peak period, are 50% higher than the next highest fare, Brussels to Paris. The lowest peak fare we found was €0.031 per kilometre from Bratislava to Prague.

4.41 In contrast to the equivalent domestic services, there are large advance booking discounts for the majority of international services. This is likely to be because a greater proportion of international services are operated by non-incumbent operators who have the flexibility to yield manage, since international fares are less likely to be set or regulated by competent authorities. The four most expensive international services are operated by international commercial operators Eurostar, Thalys and Eurocity.

4.42 Figure 4.13 compares peak single rail fares on domestic interurban services over 300 kilometres (in Table 4.3) and comparable international rail services (in Table 4.5).

Figure 4.13: International and domestic rail fares over 300 kilometres: peak single



Source: railway websites, Steer Davies Gleave analysis.
Note: fares are for a single station-to-station pair (see Table 4.3 and Table 4.5 for details) and may not be representative. The relevant domestic comparator is labelled first, with the destination of the international comparator in parentheses.

4.43 Most international fares per kilometre are roughly equal to or higher than the domestic equivalent. The Paris to London fare (labelled FR-UK) is three times as much per kilometre as the Paris to Lyon fare, although typically the international rail fare is no more than twice the equivalent domestic fare.

Setting fares

4.44 We set out in Table 2.5, reproduced below as Table 4.7, how fares can be administered, regulated or set by the market.

Table 4.7: Approaches to setting fares

Approach	Body setting fare	Operator may vary fare	
		Lower	Higher
Administered	Fares are set by a national, regional, local or municipal authority, and there is no deviation from the specified fares.	×	×
Regulated	Fares are set subject to constraints, typically an upper limit on individual fares or in a "basket" of fares.	✓	No, or only in basket
Market	Fares are set by the rail operator and not subject to regulation, but may be constrained or "quasi-regulated" by other rail fares.	✓	✓

Source: Steer Davies Gleave analysis

4.45 Outside urban areas, fares are unlikely to be set by urban or municipal authorities. They may be set by a regional or national competent authority as part of a PSO or, where services are

commercially viable, may be regulated by various means, or left to operators to set in the market.

4.46 In practice, public information rarely explains how fares are set for any given journey. Nonetheless, Table 4.8 uses additional information collected alongside data on rail fares by market segment, responses to the stakeholder engagement exercise and evidence gathered in the preparation of the Member State case studies (see Appendix A) to summarise how fares are set. We identified fares as follows:

- ● means that at least some fares are set on this basis.
- ? means that we have not identified whether any fares are set on this basis.
- × means that we understand that no fares are set on this basis.

4.47 We also attempted to identify the extent to which the revenue associated with regional rail journey examined is shared either between rail and other modes or between rail operators or authorities. We identified sharing mechanisms as follows:

- ● means that at least some revenue is shared on this basis.
- ? means that we have not identified whether any revenue is shared on this basis.
- × means that we understand that no revenue is shared on this basis.

4.48 Table 4.7 illustrates a number of arrangements:

- In some States, all fares are administered by a national authority, sometimes through a published tariff table as in Slovakia.
- In Germany, fares may be set by local authorities or by operators, but the latter are subject to regulation.
- In France, the government specifies maximum fares but SNCF may set lower ones.
- In Sweden, fares are set either by local authorities or by the market, and there is no regulated segment. Between Malmö and Helsingborg, SJ is not subject to price regulation, but is required to accept any fares set by Skånetrafiken, the Scania County authority.
- In Great Britain, fares may be set by all three means, and the journey between Cambridge and Ipswich has both regulated off-peak return fares and market-based (non-regulated) single and peak return fares.

Table 4.8: Setting other fares and sharing revenues

Member State		Setting of fare(s) used within the State			Sharing revenue		Comments
		Administered	Regulated	Market	Intermodal	Intramodal	
AT	Austria	●	?	?	?		
BE	Belgium	?			?	×	
BG	Bulgaria	?			?	×	
CH	Switzerland	●	×	×	●	●	
CZ	Czech Republic	?	?	●	?		Not known if operators can or do share revenue
DE	Germany	●	●	●	?		Not known if operators can or do share revenue
DK	Denmark	?			?	×	
EE	Estonia	?			?	×	
EL	Greece	?	?	×	?	×	
ES	Spain	?			?	×	
FI	Finland	?			?	×	
FR	France	●	●	×	?	×	
HR	Croatia	?			?	×	
HU	Hungary	?			?		
IE	Ireland	?			?	×	
IT	Italy	?			?		Not known if operators can or do share revenue
LT	Lithuania	?			?	×	
LU	Luxembourg	●	×	×	?	×	
LV	Latvia	?			?	×	
NL	Netherlands	●	?	?	●	●	
NO	Norway	?			?	×	
PL	Poland	●	×	×	?	×	
PT	Portugal	?			?	×	
RO	Romania	?			?	×	
SE	Sweden	●	×	●	?	●	Not clear if multimodal products are available
SI	Slovenia	?			?	×	
SK	Slovakia	●	×	×	?	×	
UK	UK	×	●	●	?	●	

Source: railway and urban transport authority websites, stakeholder responses, Steer Davies Gleave analysis.
Note: analysis of fare setting and revenue sharing based on limited information.

4.49 Little information is available either on how fares are set or on how revenue is shared. We note, however, that revenue-sharing seems inevitable where services funded by different parties link two stations, or tickets issued by different parties are accepted on a train.

4.50 We are aware of arrangements for revenue-sharing in Sweden and Great Britain, both of which have more than one operator:

- In Sweden, trains between Malmö and Helsingborg are operated by Öresundståg, under a gross cost contract with Skånetrafiken, and by SJ, which must accept Skånetrafiken's fares. We have not established how revenue is shared in practice.
- In Great Britain, all trains between Cambridge and Ipswich are operated by Abellio Greater Anglia. Other rail operators, intermediary websites and travel agents may all sell tickets for this journey but, after deduction of their sales commission, the revenue will all be allocated to Abellio.

Discounts

4.51 As with suburban fares, passengers on regional, long-distance, high speed or international journeys may be offered discounted or reduced fares.

4.52 In suburban markets, as we noted in paragraph 3.63, fares for travel in different quantities (singe, return, season), or at different times (peak, off-peak, weekend) are often reduced by amounts which vary between tickets to meet operator objectives. Outside suburban markets, fares may also be reduced to reflect different booking conditions, such as where advance purchase tickets may be offered, over time, at a range of prices. Nonetheless, some fares may also include a fixed percentage discount on the full fare, such as with railcard products for particular social groups such as the young, the elderly and the disabled.

4.53 In our case studies in Appendix A we attempted to distinguish ticket types and the availability of discounts. In practice, we found that is rarely practicable to separate them in this way, because there are often interactions between the time and type of **travel**, the passenger(s) age or social **status**, and the size of the **group** in which they are travelling. At first sight, it might be possible to deal, in turn, with:

- What is the most cost-effective time to travel?
- What additional discount is available because of my social status or railcard holding?
- What additional discounts are available for a larger group?

4.54 We illustrate some of these issues in Table 4.9 overleaf.

Table 4.9: Discounts: tickets combining travel, social and group characteristics

State	Ticket type	Factors			Details		
		Travel	Social	Group	Travel	Social	Group
BG	25% reduction	●	●		Only certain types of train	Only holders of certain Railcards	
ES	Carné Joven	●	●		Discount varies with train type	Age 14-25, or holder of foreign youth card	
UK	HM Forces Railcard	●	●		Not all fare types, different in July/August	Must be in HM Forces	
CZ	Group of 2-5	●	●	●	Weekends and holidays only	Mix of adults and children	Group of 2-5, but need not be related
FR	Junior & Cie	●	●	●	Only certain types of train	Age 4-11	Discount only valid for a group
CH	Junior and Grandchild Travelcard		●	●		Children 6 to 16	Child needs a card for each parent/grandparent
FR	Familles nombreuses		●	●	Discounts vary by train	Family including children	Minimum family size required

Source: Steer Davies Gleave analysis, see Appendix A for further details.

4.55 In practice this means that, instead of the simple hierarchy of decisions listed in paragraph 4.53, it may be necessary to consider additional factors such as:

- What Railcards should I buy, given my likely pattern of travel over their period of validity?
- Can I pay less if I bring the children, but use a different train?
- Is the extra cost of bringing colleagues so low that they might as well come with me?

4.56 We list in Table 4.10 below a number of ways in which discounts may be set in practice.

Table 4.10: Discounts: examples of how discounts may be set

Type	Approach	Examples	Process
Administered	National legislation	Czech Republic, Poland, Slovakia	Detailed fare table and discount table specified in conditions of carriage
	Regional legislation	Warsaw	Resolution of the City Council
	Fares published, subject to political review	London	Transport for London sets fares and discounts, but politically accountable
Regulated	PSO contract terms	UK	Operator licence requires that certain railcard "schemes" be honoured
Market	State-owned operator is free to set some fares	Germany	Operator sets fares, state as shareholder may specify some elements of policy
	State-owned operator has pricing freedom	Sweden	Operator sets fares, and state explicitly permits it full commercial freedom
	PSO operator has pricing freedom	UK	PSO operators (franchises) set a number of fares and discount conditions
	Open access operator has pricing freedom	Austria, Czech Republic, Italy, Sweden	Open access operator is free to set its own fares and discounts

Source: Steer Davies Gleave analysis.

4.57 In principle, tickets priced lower than the full fare might be specified by administered processes including national, regional and local legislation, regulated through specific agreements within the industry, or set only with respect to market conditions. In practice, while we have not been able to identify what party devised and specified each of the discounts identified in our case studies in Appendix A, we consider it likely that a significant proportion of reduced fares and discounts have been set by operators, in the market, typically with the objectives of meeting targets for one or more of:

- revenue, in the case of wholly commercial operators;
- passenger volumes, in the case of some state-owned operators; or
- social objectives.

4.58 Even on the limited sample of twelve States covered in our case studies, it is difficult to summarise how discounts vary between Member States, for a number of reasons.

Discounts vary between competent authorities

4.59 Discounts may be different in regional and municipal networks, as illustrated in Table 3.9. Many regional and municipal competent authorities offer ticket products and/or discounts which are more generous than those applying on the national network, with the result in cities such as London that there may be four sets of fares between two similar station pairs (see Table 3.7) and both national and local discount schemes.

Discounts have different eligibility criteria

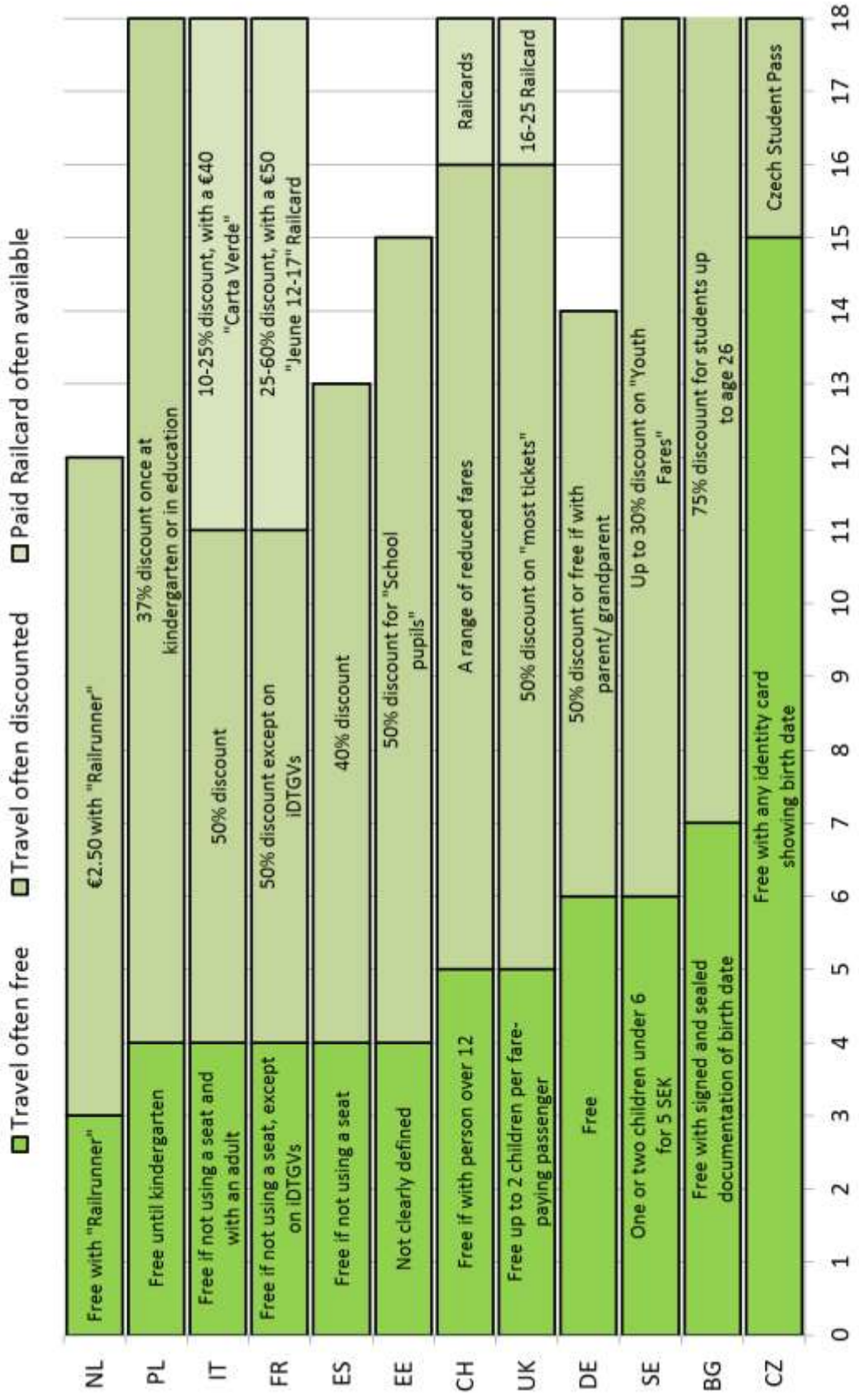
4.60 Basic features such as the age at which passengers are eligible for discounts vary widely. Among the case studies we identified discounts with upper and lower cut-off birthdays of 4, 5, 6, 7, 10, 12, 14, 15, 17, 18, 23, 24, 26, 35, 60, 65, 66 and 70, and other discounts depending on the passenger's status, such as being a current or recent student.

4.61 To illustrate this point, Figure 4.14 illustrates, in simplified form, the range of discounts available for children. There is no consistent definition of the age of a child or the conditions on which they travel. At the extremes:

- The Netherlands allows free travel for children up to 3 after which, with a "Railrunner card", they pay a nominal fare until they are 12, after which they appear to be treated as adults.
- The Czech Republic allows free travel up to the age of 15 with proof of date of birth.

4.62 For groups such as pensioners the variations can be more complex, as entitlement may depend on having reached the retirement age set nationally, or for a particular profession, or following early retirement on health grounds. The railway itself may have no control over either the level of discount or the range of passengers who are entitled to it, which may not be specified by either railway or transport authorities.

Figure 4.14: Examples of discounts for children



Source: Steer Davies Gleave analysis, see case studies in Appendix A.

Discounts may vary by location, direction or time

4.63 Similarly, the times at which discounts are obtainable may vary with type of train, direction of travel or even boarding point, typically to manage overall demand within the capacity available. Exceptions to general rules may also be permitted on specific trains which would otherwise be lightly-loaded, or to travel to or from specific stations which have few other services.

Discounts may reflect local needs or national social policy

4.64 Products devised by railways to meet different revenue, volume or social objectives are almost invariably designed in the context of local markets. For example:

- Bulgaria, Spain and France offer discounts for families. However, our understanding is that discounts of this type may not have been introduced by the railway or as a matter of transport policy, but as social policies towards the family originating in different parts of government.
- Switzerland offers four different types of season ticket because passengers might reasonably require local travel to their home, to their workplace, to both, or to all points in between, but may require a child to obtain up to six cards to travel with parents and grandparents.
- The Netherlands has a system of Keuzedagen allowing holders of some ticket types to nominate days on which they may travel free.
- In Sweden, some children's tickets have been limited to the hours of travel to and from school for one term, with a different ticket permitting travel from after-school activities.

4.65 Notwithstanding the difficulties described above, it is possible to make generalisations regarding the broad types of discount available in case-study Member States.

Complexity

4.66 Stakeholders in a number of Member States reported that fares and discounts can be complex and confusing. The apparent complexity of rail fares has been raised by stakeholders in Germany and in Great Britain, from which an extreme example of complexity is illustrated in Appendix B. Appendix A also suggests that the interaction of fares and discounts is also complex among our case studies in Switzerland (Table A.8), the Czech Republic (Tables A.10 and A.11), Spain (Table A.22), France (Table A.25) and the Netherlands (Table A.29), particularly when deciding in advance whether to obtain one or more types of railcard.

4.67 In practice, buying any rail ticket other than for immediate travel requires the passenger to make a judgement. Even in the simplest fares systems we have examined, with only single, return and season tickets, and paid railcards offering standard discounts:

- With return tickets, how certain is the passenger that they will return by rail, within the time period(s) permitted by the ticket?
- With season tickets, how certain is the passenger that they will travel enough for it to be good value? This is particularly an issue for those who work part-time or in a variety of locations, of who travel elsewhere regularly on business or leisure.
- With railcards, how certain is the buyer that they will make enough trips, in the right groups, during the validity of the card, for it to be good value?

4.68 However, the decision can become more complex, as we illustrate in Appendix B, when in addition to these common variables there are also choices of route, operator and degree of

flexibility and, as we discuss above, further decisions are required on what railcards to buy and in what groups to travel.

Clarity and sales channels

4.69 In many Member States not all fares are sold via all sales channels and information sources. This means that, in addition to the issues of complexity discussed above:

- Passengers may not know whether the information source they are using provides all relevant information, and in particular identifies the best or cheapest fare for their requirements.
- Passengers who have identified the fare they require may find that it is not available via the sales channel they have chosen. This can be particularly problematic when fares advertised online cannot be bought at stations or ticket machines.

4.70 Table 4.11 below summarises stakeholders responses to a number key questions seeking information about the relationship between fares and sales channels and the clarity of fares.

Table 4.11: Relationships between fares and sales channels

State		Do fares vary by sales channels?	Are lower off-peak fares available for early booking?	Are any fares available only via specific sales channels?	Are there complaints about the complexity or unpredictability of rail fares?
BE	Belgium	✓	×	×	×
BG	Bulgaria	×	×	×	✓
CZ	Czech Republic	✓	✓	✓	×
DK	Denmark	✓	×	✓	✓
DE	Germany	✓	-	✓	✓
IE	Ireland	✓	✓	✓	✓
IT	Italy	✓	✓	×	-
EL	Greece	✓	✓	×	✓
HR	Croatia	×	×	×	✓
HU	Hungary	✓	✓	✓	✓
NO	Norway	✓	✓	✓	✓
AT	Austria	✓	✓	✓	✓
PL	Poland	×	✓	✓	✓
PT	Portugal	×	✓	×	×
RO	Romania	✓	✓	×	✓
SK	Slovakia	✓	✓	✓	×
FI	Finland	-	✓	-	-
SE	Sweden	✓	✓	-	✓
SI	Slovenia	✓	×	✓	×
UK	United Kingdom	✓	✓	-	✓

Source: Steer Davies Gleave analysis of stakeholder responses.
Note: "-" means no response provided.

4.71 Overall, it indicates that practices such as varying the fares offer according to the sales channel, restricting certain fares to specific channels (e.g. discounted fares available only online) and offering discounts for early booking are widespread. It also suggests that passengers in many Member States find the range of fares available and the restrictions applying to them confusing.

4.72 Examples of where the availability of rail fares and products differs according to the sales channel used include the following:

- Many travel agents or websites do not sell low value fares for relatively short trips. This is likely to be a consequence of low sales commission (usually a fixed proportion of the ticket face value) and fixed listing, advertising and transaction costs which mean it is less profitable for third-parties to sell these products.
- Some fares are only available online, which may reflect the lower costs associated with electronic, rather than manual, transactions. Online sales channels may be the only route through which a rail operator can sell rail tickets directly to its customers. However, it is often suggested that the limited wider availability of online discounts effectively discriminates against some categories of passengers, such as the elderly and disabled passengers.
- Ticket vending machines may only sell a subset of tickets. For example, in London the fares available from TVMs vary by route, exclude fares for travel more than day-ahead and do not offer advance purchase products.
- In many smaller stations, predominantly in rural locations, it is not possible to buy off-peak products from ticket offices during the off-peak period when many such offices are closed.

4.73 To investigate further the transparency and clarity of fares by Member State, we simulated the online ticket buying process for an off-peak return ticket and made a subjective assessment of operator or operator association ticketing websites as reported in Table 4.13 according to the following criteria:

- ease of buying tickets online;
- availability of information regarding the cheapest fare;
- transparency and simplicity of fares on offer; and
- quality of information provided regarding ticket restrictions.

4.74 We assessed the quality and clarity of online information available for each Member State and gave it a subjective combined score according to the criteria in Table 4.12.

Table 4.12: Transparency and clarity: information criteria and scoring

Finding	Score
No information available	N/A
Limited or poor quality information available	1
Reasonable information available	2
Exhaustive and clear information provided	3

4.75 Table 4.13 shows how, in most Member States, the information available to passengers wishing to buy tickets online is at least satisfactory, although in some cases the structure of fares available via this channel is relatively complicated.

Table 4.13: Transparency and clarity: online ticket sales channels

Member State	None	1 - Limited	2 - Satisfactory	3 - Good	Comment	Website
BE				✓	Simple booking process, clear information on fares and restrictions	http://www.belgianrail.be
BG			✓		Simple booking process, clear information on fares and restrictions, must register to book online	http://www.bdz.bg
CH				✓	Simple booking process, clear information on fares and restrictions, cannot buy all tickets online	http://www.sbb.ch
CZ				✓	Simple booking process, clear information on fares and restrictions	https://www.cd.cz
DK				✓	Simple booking process, clear information on fares and restrictions	http://www.dsb.dk
DE				✓	Simple booking process, clear information on fares and restrictions	http://www.bahn.com
EE				✓	Simple booking process, clear information on fares and restrictions	http://elron.ee
IE				✓	Simple booking process, clear information on fares and restrictions	http://www.irishrail.ie
EL		✓			Complex online booking process, fare structure unclear	http://www.trainose.gr
ES			✓		Complicated fare structure, ticket information available but unclear	http://www.renfe.com
FR			✓		Simple booking process, limited clear information on fares and restrictions	http:// voyages-sncf.com
HR			✓		Clear information on timetable and fares, but cannot buy online	http://www.hzpp.hr
IT			✓		Simple booking process, clear information on fares and restrictions, high speed rail site has complicated fare structure	http://www.trenitalia.com
LV		✓			Clear information on fares and timetable, less so on ticket type, cannot book online	http://www.pv.lv
LT				✓	Simple booking process, clear information on fares and restrictions	https://www.traukiniobilietas.lt
LU				✓	Simple booking process, clear information on fares and restrictions	http://www.cfl.lu
HU				✓	Simple booking process, clear information on fares and restrictions	http://www.mavcsoport.hu
NL				✓	Simple booking process, clear information on fares and restrictions, must register to book online	http://www.ns.nl
NO				✓	Simple booking process, clear information on fares and restrictions	https://www.nsb.no
AT				✓	Simple booking process, clear information on fares and restrictions	https://www.oebb.at
PL				✓	Simple booking process, clear information on fares and restrictions	http://www.intercity.pl

Member State	None	1 - Limited	2 - Satisfactory	3 - Good	Comment	Website
PT			✓		Simple booking process, clear information on fares and restrictions, cannot buy all tickets online, need to register to book online	https://www.cp.pt
RO			✓		Limited clear information on fares and restrictions, website difficult to navigate	http://www.cfrcalatori.ro
SI			✓		Cannot book online, clear information on timetable, fares and restrictions	http://en.slo-zeleznice.si
SK				✓	Simple booking process, clear information on fares and restrictions	http://www.slovakrail.sk
FI				✓	Simple booking process, clear information on fares and restrictions	https://www.vr.fi
SE			✓		Simple booking process, clear information on fares and restrictions, fare structure unclear	https://www.sj.se
UK			✓		Simple booking process, clear information on fares and restrictions, fare structure unclear	http://www.nationalrail.co.uk

Source: Steer Davies Gleave analysis

4.76 Taken with the evidence from the stakeholder responses, it also highlights the potential trade-off between, on the one hand, providing passengers with a wider range of fare options (and encouraging them to use channels that reduce distribution costs) and, on the other, enabling them to make simple choices between options. This trade-off is not unique to the rail industry but, given the range of rail users purchasing tickets in any Member State (from regular, well-informed commuters to occasional travellers and new users across all potential station pairs), the difficulty of identifying the appropriate balance is also challenging for, say, mobile phones or electricity contracts.

4.77 This examination identified a number of points regarding the clarity of rail fares across all non-suburban market segments:

- It is often not possible to identify the name of the fare, how and by whom it has been set, and whether the process of setting the fare takes any account of market conditions.
- It is often not possible to establish whether a particular fare quote is the maximum or minimum fare, or some intermediate value. Where fares are extensively yield-managed, a passenger researching a particular journey may have no way of knowing whether the fares being quoted include the cheapest (or most expensive) fare which may be available at other times of travel.
- The availability of season tickets is often difficult to determine. Some websites routinely quote single, return, weekly, monthly and annual fares, and others provide a link to a "season ticket calculator". Even where this exists, however, it may not always provide a price, as we found in the example of Cambridge to Ipswich.
- Even within a small sample we found a number of anomalous fares, such as return fares costing more than two single fares.
- Booking specific trains in advance may be either more or less expensive than buying a discounted return ticket. This means that a passenger may need to check both approaches before deciding which ticket(s) to buy.

4.78 A further specific issue was the difficulty on finding the availability, and conditions of use, of fares for persons with reduced mobility (PRM). We identified a number of issues:

- Telephone call centres rarely provide information in all the official European languages.
- Websites claiming to be cover many languages often only include partial information in some of them.
- Websites sometimes do not provide full information even in the official national language(s).
- Websites, or railway conditions of carriage, sometimes refer to documents which must be held before PRM fares or assistance can be obtained, but in some cases the documents specified may not be available, or issued, to all persons legally entitled to such fares or assistance. A particular issue is where obtaining entitlements is effectively linked to the passenger's nationality, which is not permitted.

5 Intermodal competition

Introduction

5.1 In parallel with collecting data on rail fares and journey times, we captured data on the travel costs and journey times associated with equivalent journeys by car, bus or coach and air travel, as summarised in Table 5.1. We sampled corridors similar to those chosen in Chapter 4.

Table 5.1: Modal competition: data collection for competitor modes

Member State		Regional (50-100 kilometres)	Interurban (under 300 kilometres)	Interurban (over 300 kilometres)	Domestic high-speed	International
SI	Slovenia	🚗				
LU	Luxembourg	🚗				
LV	Latvia	🚗	🚌 🚗			
CH	Switzerland	🚗	🚗			
DK	Denmark	🚗	🚗			🚌 🚗 ✈
IE	Ireland	🚗	🚌 🚗			🚌 🚗
HR	Croatia	🚗	🚌 🚗			
LT	Lithuania	🚗	🚌 🚗			
EE	Estonia	🚗	🚗			
BG	Bulgaria	🚗	🚌 🚗	🚗 ✈		🚌 🚗
EL	Greece	🚗	🚌 🚗	🚗 ✈		
SK	Slovakia	🚗	🚗	🚗 ✈		🚌 🚗 ✈
FI	Finland	🚗	🚌 🚗	🚗 ✈		🚌 🚗 ✈
RO	Romania	🚗	🚌 🚗	🚗 ✈		🚌 🚗 ✈
PL	Poland	🚗	🚌 🚗	🚗 ✈		🚌 🚗 ✈
PT	Portugal	🚗	🚌 🚗	🚗 ✈		🚌 🚗 ✈
NO	Norway	🚗	🚗	🚗 ✈		🚌 🚗 ✈
HU	Hungary	🚗	🚌 🚗			
ES	Spain	🚗	🚌 🚗	🚗 ✈	🚗	🚌 🚗 ✈
FR	France	🚗	🚌 🚗	🚗 ✈	🚗	🚌 🚗 ✈
NL	Netherlands	🚗	🚗		🚗	
BE	Belgium	🚗	🚗		🚗	
SE	Sweden	🚗	🚌 🚗	🚗 ✈		🚌 🚗 ✈
AT	Austria	🚗	🚌 🚗	🚗 ✈		🚌 🚗 ✈
DE	Germany	🚗	🚌 🚗	🚗 ✈	🚗	🚌 🚗 ✈

Member State		Regional (50-100 kilometres)	Interurban (under 300 kilometres)	Interurban (over 300 kilometres)	Domestic high-speed	International
IT	Italy	🚗	🚌 🚗	🚗 ✈	🚗	🚌 🚗 ✈
UK	United Kingdom	🚗	🚌 🚗	🚗 ✈	🚗	🚌 🚗 ✈
CZ	Czech Republic	🚗	🚌 🚗	🚗 ✈		🚌 🚗 ✈

Source: Steer Davies Gleave analysis with some simplifications.
Material competitive modes are shown as coach (🚌), air (✈) and car (🚗).
"Domestic high speed service" is defined as those that operate mainly or wholly on high speed lines.

Competition with car

5.2 We gathered data on car competition for all rail market segments. In doing so we extracted data for car journey times, distances, routes and tolls using *viamichelin*, an online map and route planner, and used this data to generate an estimated point-to-point car cost:

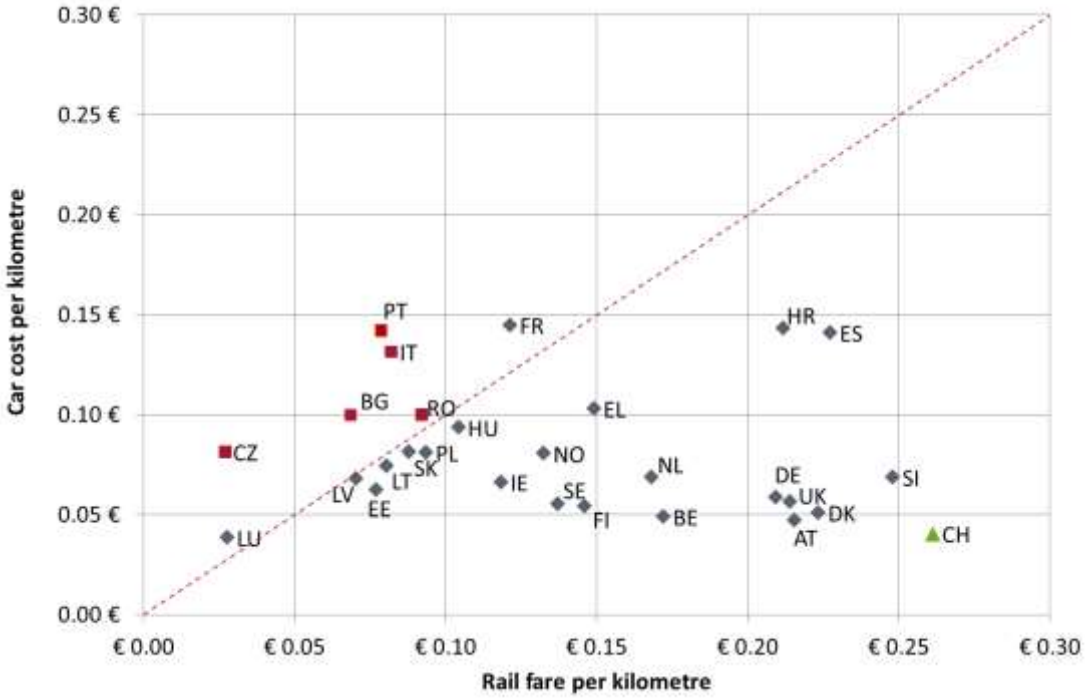
- We estimated the proportion of the private car fleet by fuel type (diesel, petrol and LPG) by Member State.
- We used average vehicle consumption rates by fuel type to estimate weighted fleet average fuel consumption (litres per 100 kilometres) by Member State.
- We multiplied the point-to-point distance by the fleet average fuel consumption and pump price (PPP-adjusted) to estimate fuel costs.
- We applied a multiplier to fuel costs to represent the non-fuel marginal costs (that is, the perceived costs at the point of usage) of car travel, such as tyre wear and tear and consumables such as oil and brake fluid[28].
- We added the toll charges provided directly by *viamichelin*.

5.3 For the suburban market segment we collected car cost and journey average speed data. However, without detailed information or assumptions on car parking charges, congestion levels and journey time reliability, we could not readily draw comparisons between modes. Given that such factors are likely to represent a significant proportion of the total cost of a short (approximately 10 kilometre) suburban trip, we have not presented any analysis on car competition for the suburban market segment.

5.4 Our findings for regional, interurban and international corridors are shown in Figure 5.1 to Figure 5.4 below.

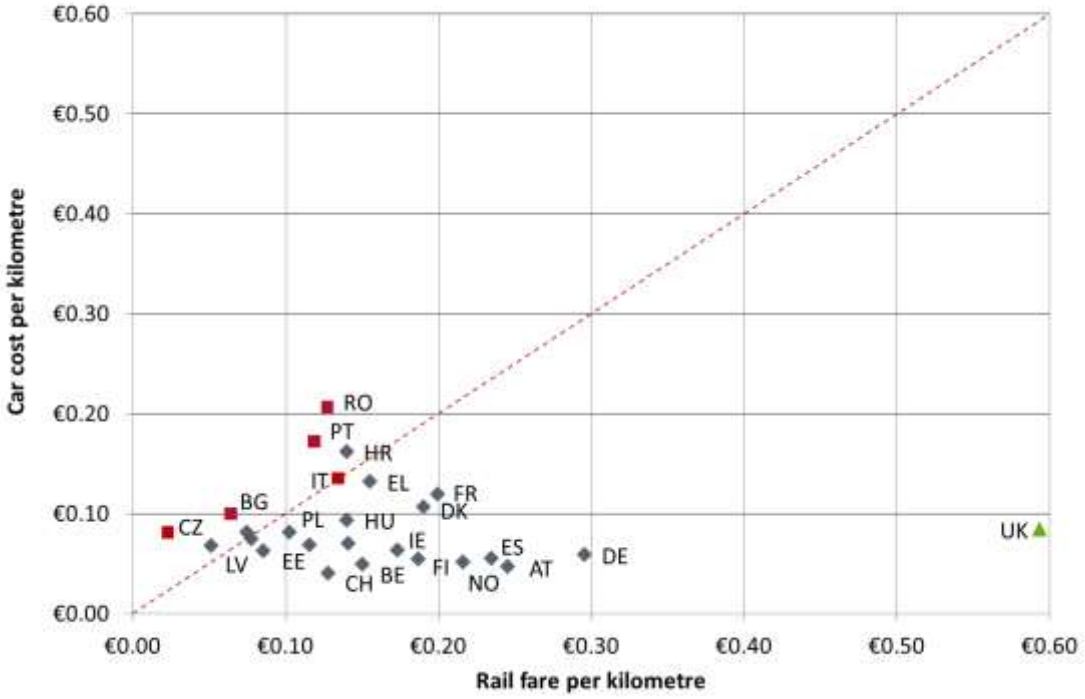
[28] In Member States with no published data we used UK-based multipliers from Department for Transport Appraisal Guidance (https://www.gov.uk/guidance/transport-analysis-guidance-webtag)

Figure 5.1: Rail and car costs: regional trips



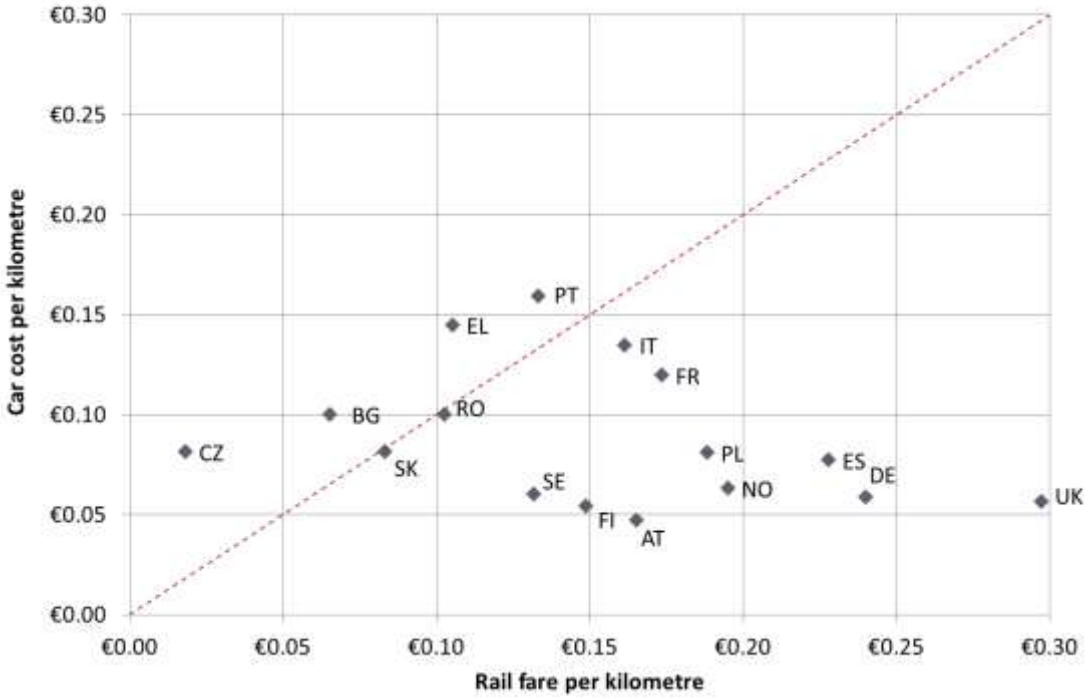
Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.1 for details) and may not be representative.

Figure 5.2: Rail and car costs: interurban trips under 300 kilometres



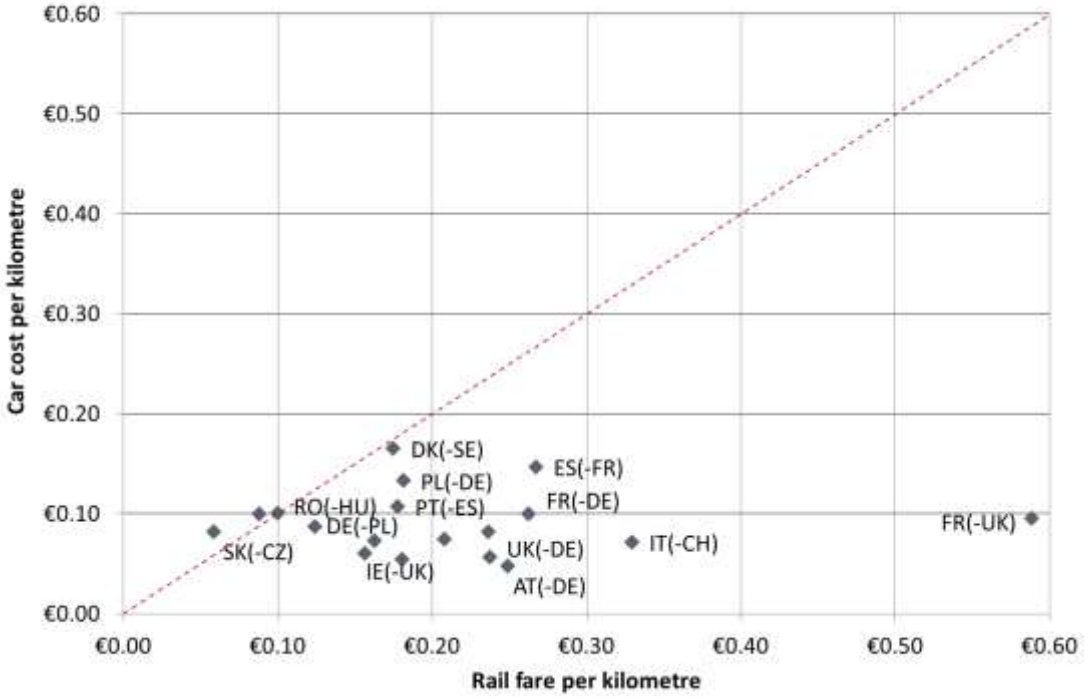
Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.2 for details) and may not be representative.

Figure 5.3: Rail and car costs: interurban trips over 300 kilometres



Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.3 for details) and may not be representative.

Figure 5.4: Rail and car costs: international trips



Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.5 for details) and may not be representative.

5.5 For most regional and interurban trips less than 300 kilometres, rail journeys appear more expensive, on a fare per kilometre basis, than the equivalent journey by car. In most EU15 countries, rail travel is more than twice the cost of travel by car. The largest disparities for regional and interurban journeys less than 300 kilometres (shown as a green triangle in Figure 5.1 and Figure 5.2) are in Switzerland (CH) between Lausanne and Biel, and the United Kingdom between London and Cardiff, where we estimate that the cost of a rail journey is more than five times the cost of a car journey. While rail journeys are generally more expensive than car journeys among EU13 Member States, the disparity is less marked. Rail journeys are cheaper for both regional and interurban journeys less than 300 kilometres in Bulgaria, the Czech Republic, Italy, Portugal and Romania (shown as a red square in Figure 5.1 and Figure 5.2).

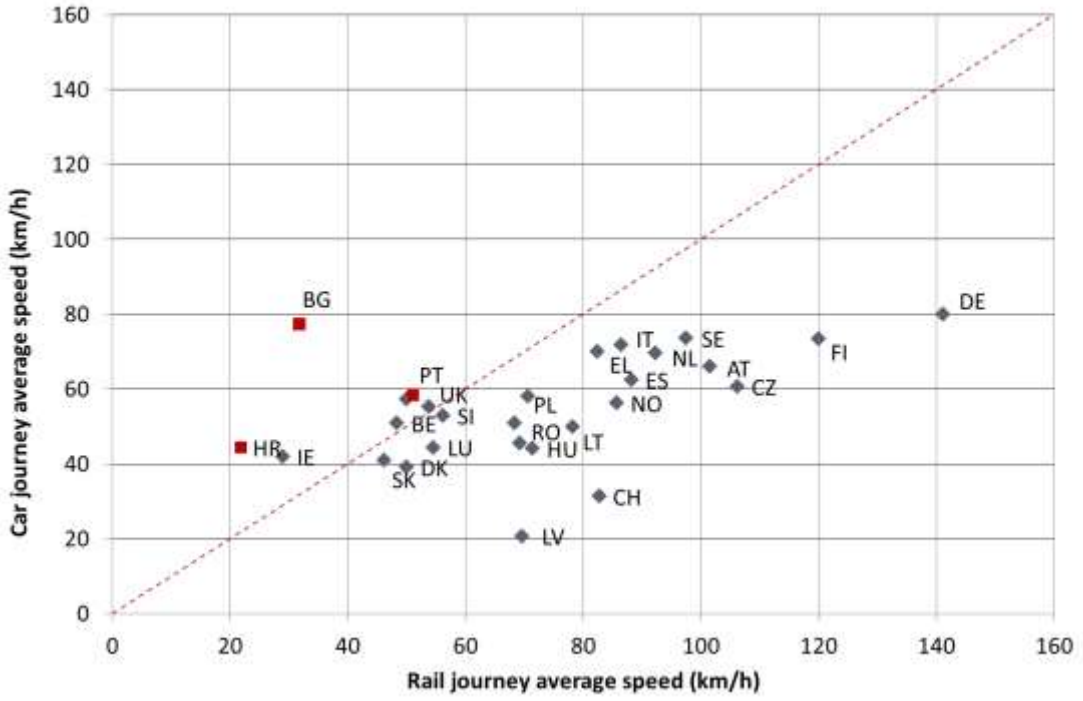
5.6 We found similar trends in the longer distance interurban market (over 300 kilometres) and the international market, with rail journeys only cheaper than the equivalent journey by car in a handful of cases.

5.7 Since the prevailing oil price at the time of completing this study was at historically low levels, we carried out sensitivity tests on fuel pump prices that were 10%, 20% and 30% higher than at present. While this narrowed the gap between car and rail costs, rail remained more expensive in the majority of cases. The greatest impact was in the regional market, where there is a large number of corridors in which the cost differential between rail and car trips is small.

5.8 We anticipate that other factors, in particular group size, are likely to have a far greater impact on the relative cost between car and rail. All of the analysis above is based on the presumption of individual journeys and solo car occupancy. If two individuals were travelling together, in the absence of group discounts, the cost per journey of travelling by car would (approximately) half, while the cost per journey of travelling by rail would remain the same.

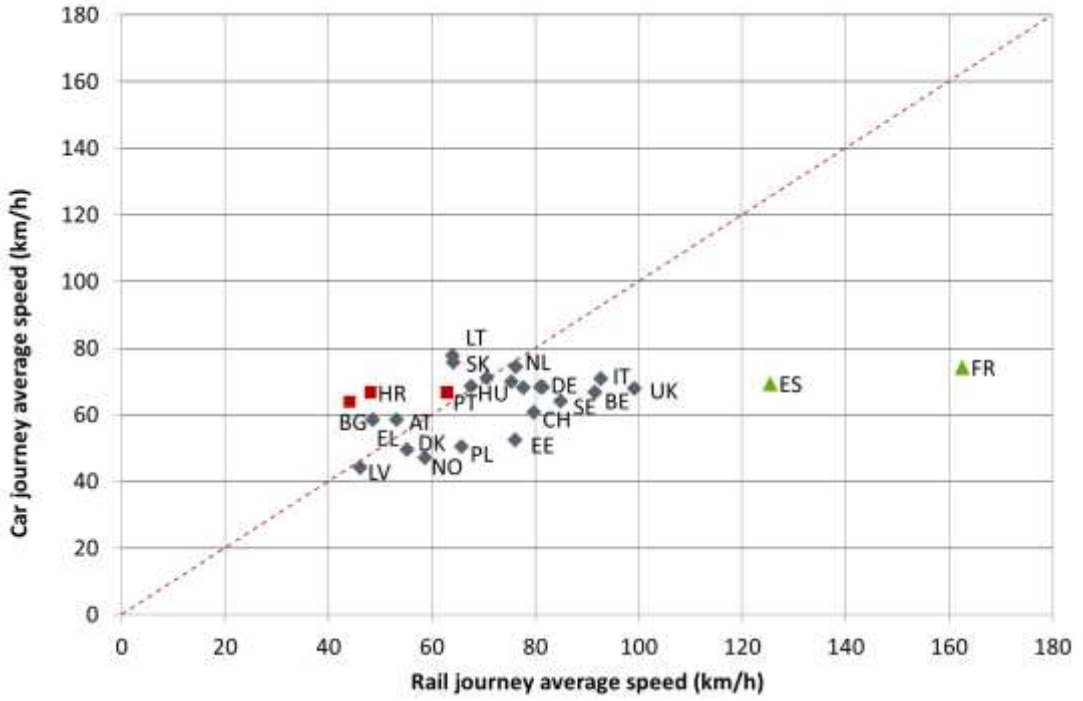
5.9 Another important factor individuals take into account when considering their choice of mode is the convenience (or otherwise) each mode provides. Figure 5.5 to Figure 5.8 show the relative average speed between rail and car for the regional, interurban and international markets. As a proxy for the city centre, journey times and distances are calculated to/from the central train station at the origin and destination. In those cities with more than one rail terminus we identified a suitable central point for calculating the equivalent car journey time and speed, such as Notre Dame in Paris and Charing Cross in London.

Figure 5.5: Rail and car average speeds: regional trips



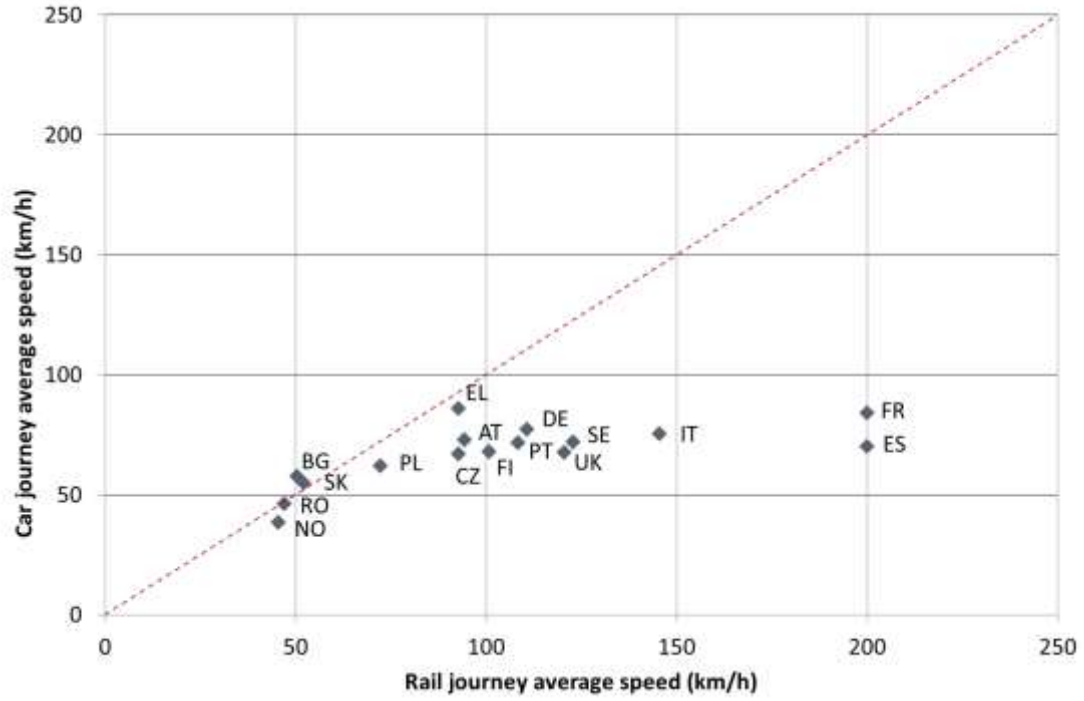
Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.1 for details) and may not be representative.

Figure 5.6: Rail and car average speeds: interurban trips under 300 kilometres



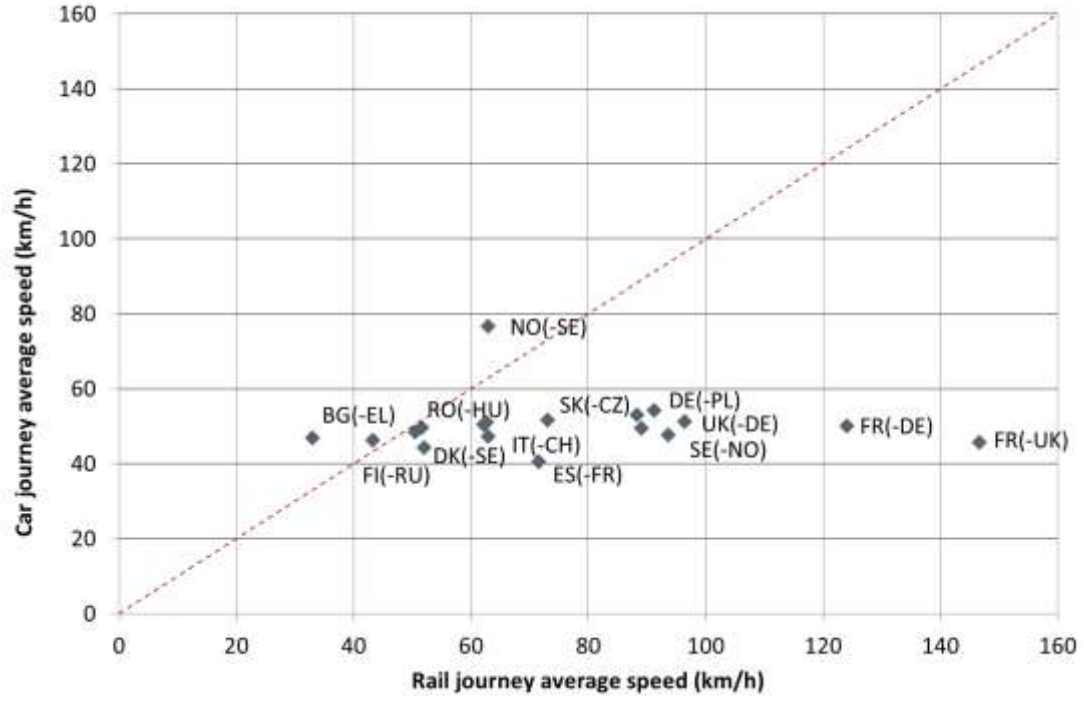
Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.2 for details) and may not be representative.

Figure 5.7: Rail and car average speeds: interurban trips over 300 kilometres



Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.3 for details) and may not be representative.

Figure 5.8: Rail and car average speeds: international trips



Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.5 for details) and may not be representative.

5.10 The figures indicate that across all market segments, more expensive rail journeys also tend to be faster. Rail has a higher average speed than car for both regional and interurban trips less than 300 kilometres in most EU15 countries. The fastest rail journeys, relative to the equivalent journey by car, are interurban trips in France (FR) between Paris and Reims and Spain (ES) between Madrid and Cuenca (shown as green triangles in Figure 5.6) where rail has twice the average speed of car. Interurban trips over 300 kilometres and international trips are almost always faster by rail.

5.11 In contrast, car travel is faster than rail for both regional and interurban trips in Bulgaria, Croatia and Portugal (shown as red squares in Figure 5.5 and Figure 5.6). The slowest rail service relative to car is the regional corridor in Bulgaria (BG) between Burgas and Zimnica (Figure 5.5) where car is more than three times faster than rail.

Competition with coach

Coach market liberalisation

5.12 The extent to which coach competition to rail services is permitted varies widely across Europe. In Appendix E we summarise how EU legislation had harmonised the definitions and procedures for international services, but the arrangements for domestic services vary widely between Member States.

5.13 This means that barriers to entering the coach market can exist at a number of levels, ranging from tight national control of services, through regional awards of concessions with exclusive rights (whether directly awarded or competitively tendered), to local requirements for, or prohibitions on, stopping in particular locations.

Competition with coach

5.14 We collected comparable fare and journey time data for both peak single and off-peak return journeys where coach services run parallel to rail for:

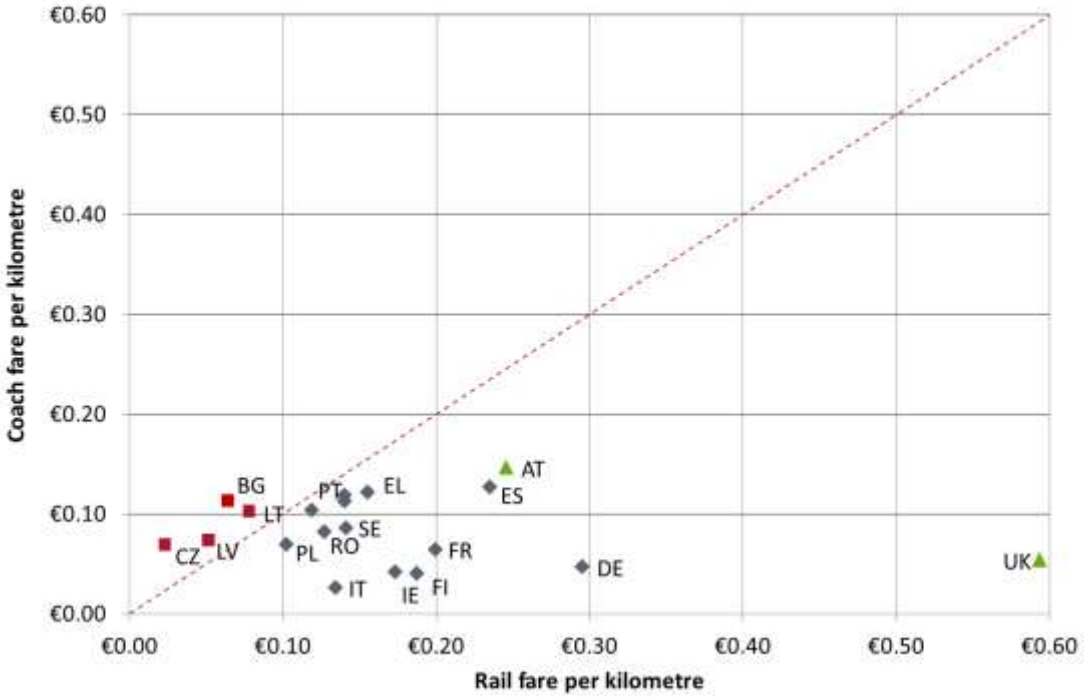
- the interurban station pairs under 300 kilometres listed in Table 4.2; and
- the international station pairs listed in Table 4.5.

5.15 We sampled both rail and coach fares one day, one week and one month ahead on a range of operator and booking agent websites. For the coach market we captured both the minimum and maximum fare available, but include only the minimum fare identified in the modal comparisons in this section. We stress that our findings are for a single city-to-city pair and should not be considered representative.

Competition on interurban routes under 300 kilometres

5.16 Our findings for interurban trips less than 300 kilometres are presented in Figure 5.9 and Figure 5.10.

Figure 5.9: Rail and coach costs: interurban trips under 300 kilometres (lowest observed fare)

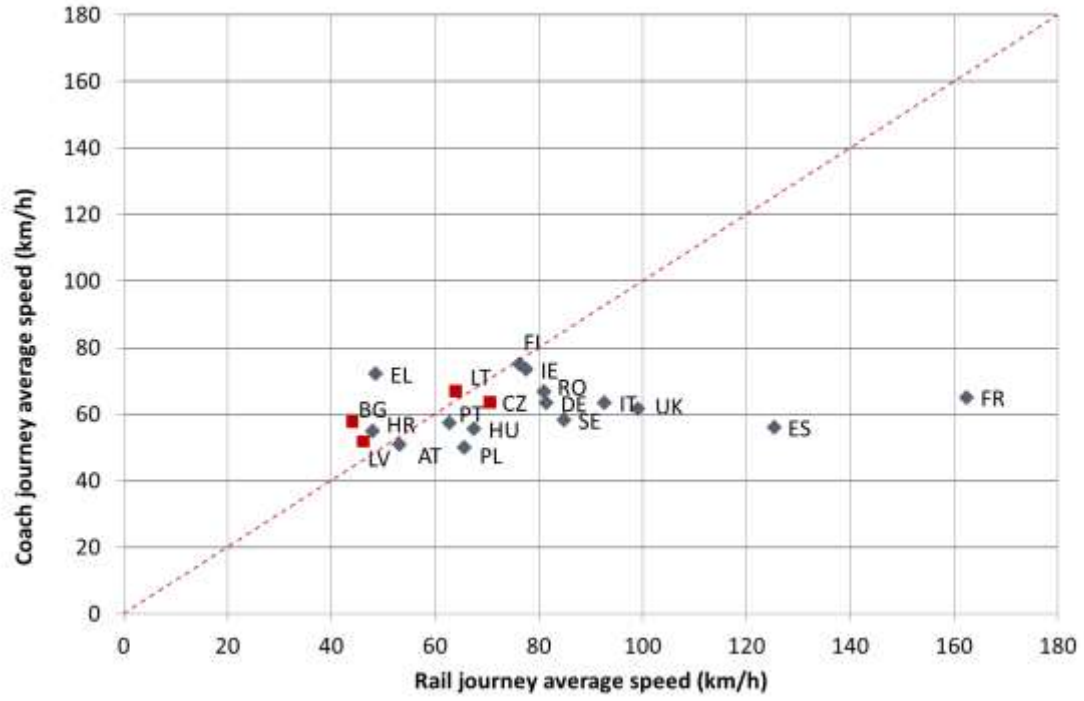


Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.2 for details) and may not be representative.

5.17 Most interurban rail journeys appear to be more expensive, on a fare per kilometre basis, than the equivalent journey by coach. This may be because rail offers superior journey time, comfort and reliability, and coach is often perceived as an inferior mode. We found no interurban coach fare higher than €0.2 per kilometre; the highest coach fare we found was €22 between Vienna and Graz in Austria (AT) shown as a green triangle in Figure 5.9, equivalent after PPP adjustment to over €0.15 per kilometre.

5.18 The largest price difference is the journey in the UK between London and Cardiff, also shown as a green triangle in Figure 5.9, where rail is six times the cost of the journey by coach. Peak rail fares between these points are not regulated, and the connecting M4 motorway may be congested at peak times.

Figure 5.10: Rail and coach average speeds: interurban trips under 300 kilometres (lowest observed fare)



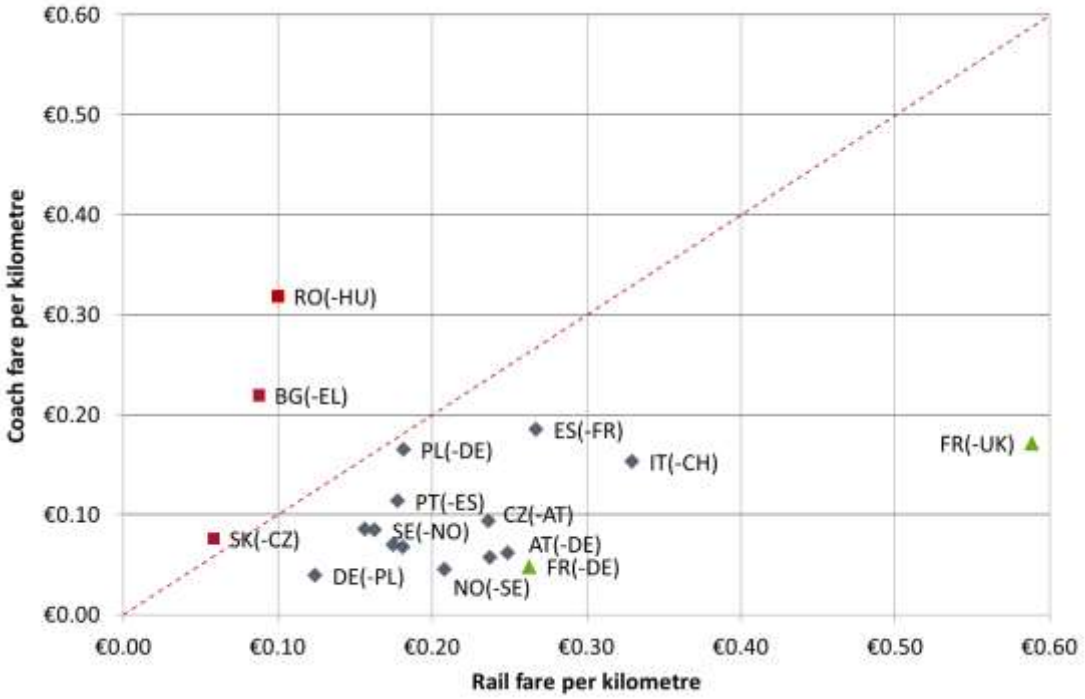
Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.2 for details) and may not be representative.

5.19 For those Member States shown in red in Figure 5.9 (Bulgaria, the Czech Republic, Latvia and Lithuania) coach fares are higher than the equivalent rail fare. As can be seen in Figure 5.10, these coach journeys are only marginally faster (or only slightly slower in the Czech Republic) than the corresponding rail service. In all other Member States apart from Greece and Croatia, rail services are typically faster than the parallel coach service.

Competition on international routes

5.20 Similar findings for international trips are presented in Figure 5.11 and Figure 5.12.

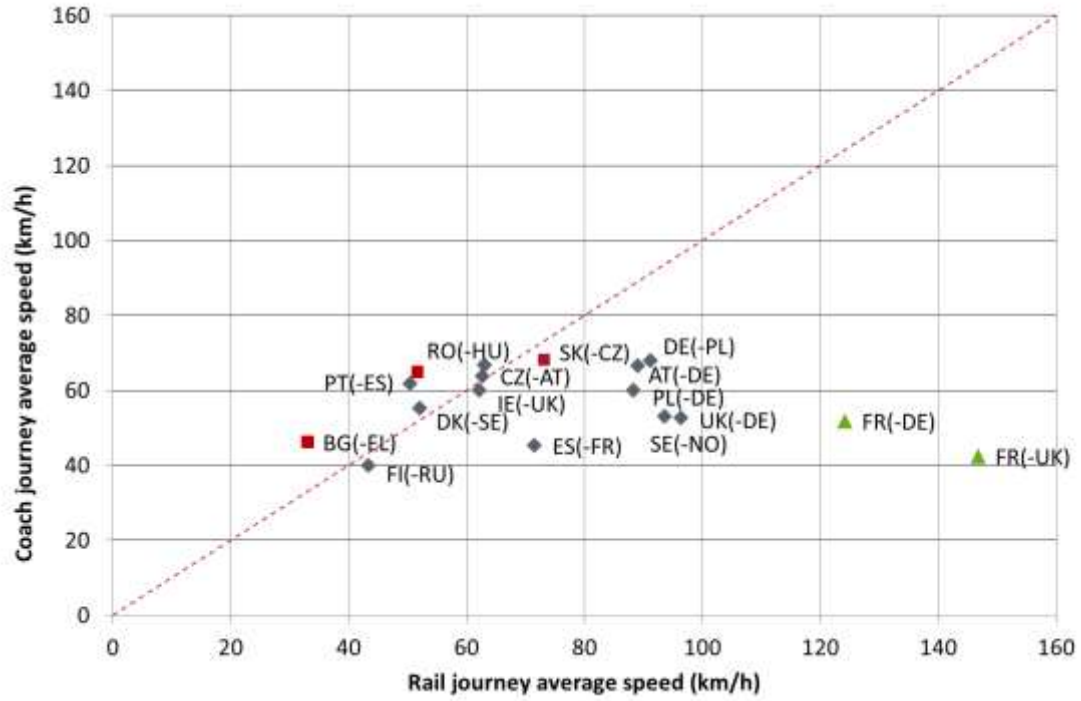
Figure 5.11: Rail and coach costs: international trips (lowest observed fare)



Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.5 for details) and may not be representative.

5.21 Most international rail services are more expensive, on fare per kilometre basis, than the equivalent coach service. As with interurban domestic journeys, this may be because rail often offers faster journeys, as shown in Figure 5.12, and can therefore operate as a market "price-maker". However, in two corridors between Romania and Hungary, and Bulgaria and Greece, coach fares are between two and three times greater than the equivalent rail fare, despite average speeds being similar between modes. In this case it is likely that there are additional factors such as service frequency and quality which permit coach operators to charge a much higher fare.

Figure 5.12: Rail and coach average speeds: international trips (lowest observed fare)



Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.5 for details) and may not be representative.

5.22 The high speed rail services from Paris to London (FR-UK) and Frankfurt (FR-DE), shown as green triangles in Figure 5.12 are the fastest relative to the equivalent coach services. The percentage difference in fares is largest on the Paris to Frankfurt route, where the rail fare is over five times the cost of the equivalent coach fare. However, the absolute difference is largest on the Paris to London route (FR-UK) where the rail fare per kilometre is €0.42 higher than the equivalent journey by coach. The Paris to London journey is operated by Eurostar, which, as noted in paragraph 4.41, is one of the most expensive European operators. Coach operators may be able to charge more on the London to Paris route is because there is less price competition from Eurostar compared with TGV on the Paris to Frankfurt route.

5.23 International coach journeys are more expensive than rail between Sofia and Thessaloniki (BG-EL), Timisoara and Budapest (RO-HU) and Bratislava and Prague (SK-CZ). These journeys are shown in red in Figures Figure 5.11 and Figure 5.12. Along these corridors, and as with domestic interurban services, coach can compete because it is as fast as, or faster than, the parallel rail service. Largely as a consequence of poor rail infrastructure, travel in Bulgaria is consistently cheaper and slower by rail than by car or coach, suggesting that rail is the inferior mode of land transport.

Competition with air

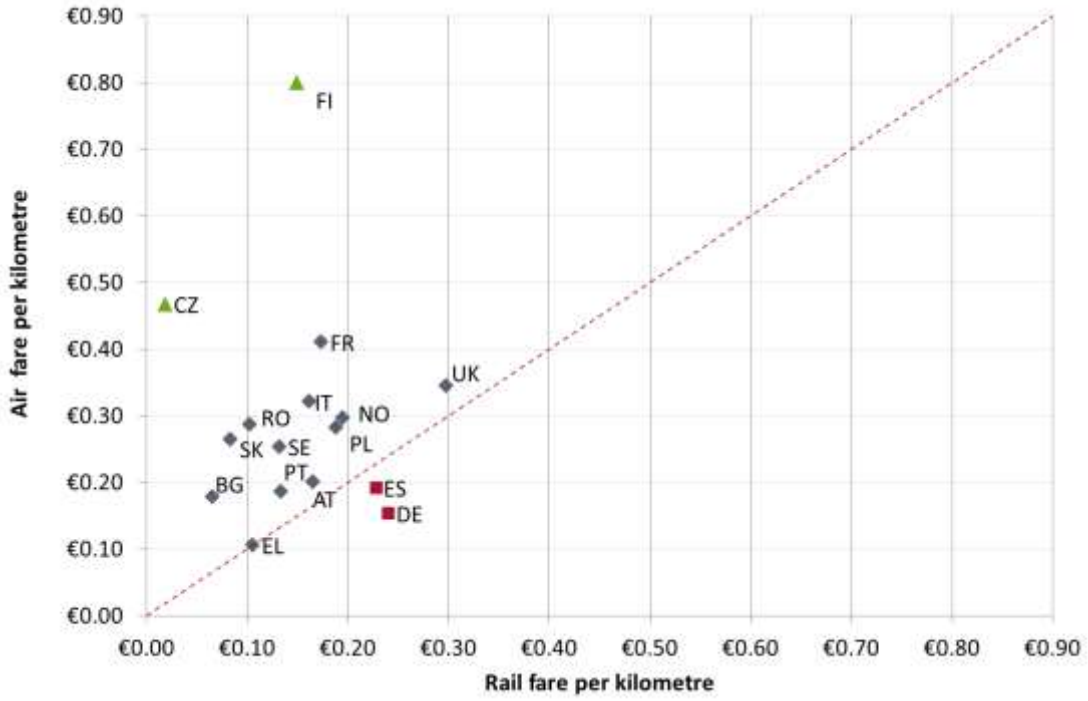
5.24 We collected comparable fare and journey time data for the sample of interurban (over 300 kilometre) and international station pairs described in Table 4.3 and Table 4.5. We used *Skyscanner*, an online web portal comparing prices from airlines and travel suppliers. We collected the maximum and minimum fares one day, one week and one month ahead but include only the minimum fare identified in the modal comparisons in this section.

5.25 In addition to air fare and journey time we included allowances for access and egress costs and time and check-in and border controls at the origin and destination airports.

- In the same way as we estimated car costs, city centre origins and destinations were defined with reference to the central train station at the origin and destination. In those cities with more than one rail terminus we identified a suitable, alternative central point.
- We assumed that journeys to and from the airport from the city centre were made using taxis licensed to and using the fare structure of *Uber Technologies Inc*. We assumed that these were under free-flow road conditions and we used local tariff structures where we could identify them.
- We extracted taxi journey times and distances using the same *viamichelin* website used to generate car costs.
- We assumed that check-in times were thirty minutes for domestic flights and one and a half hours for international flights.
- We assumed that exit times at the destination were thirty minutes for both domestic and international flights.

Figure 5.13 to Figure 5.16 below summarise our findings.

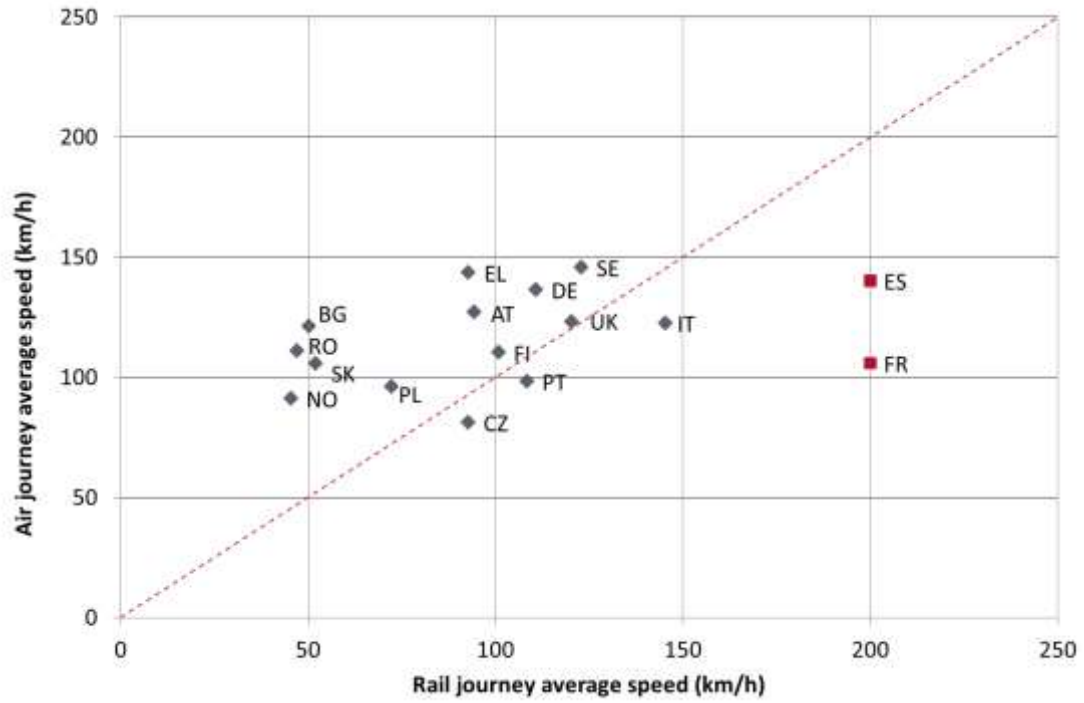
Figure 5.13: Rail and air costs: interurban trips over 300 kilometres (lowest observed fare)



Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.3 for details) and may not be representative.

5.26 The costs of travelling by air were more than rail, on a fare per kilometre basis, on all interurban routes except in Germany (DE) and Spain (ES) shown as red triangles in Figure 5.13. The most expensive air costs, relative to rail fares, were in Finland (FI) between Helsinki and Vaasa and the Czech Republic (CZ) between Prague and Ostrava shown as green triangles in the same figure. Both air routes have few flights per day by a single airline, whose main market is likely to be business travellers with a relatively inelastic demand for travel.

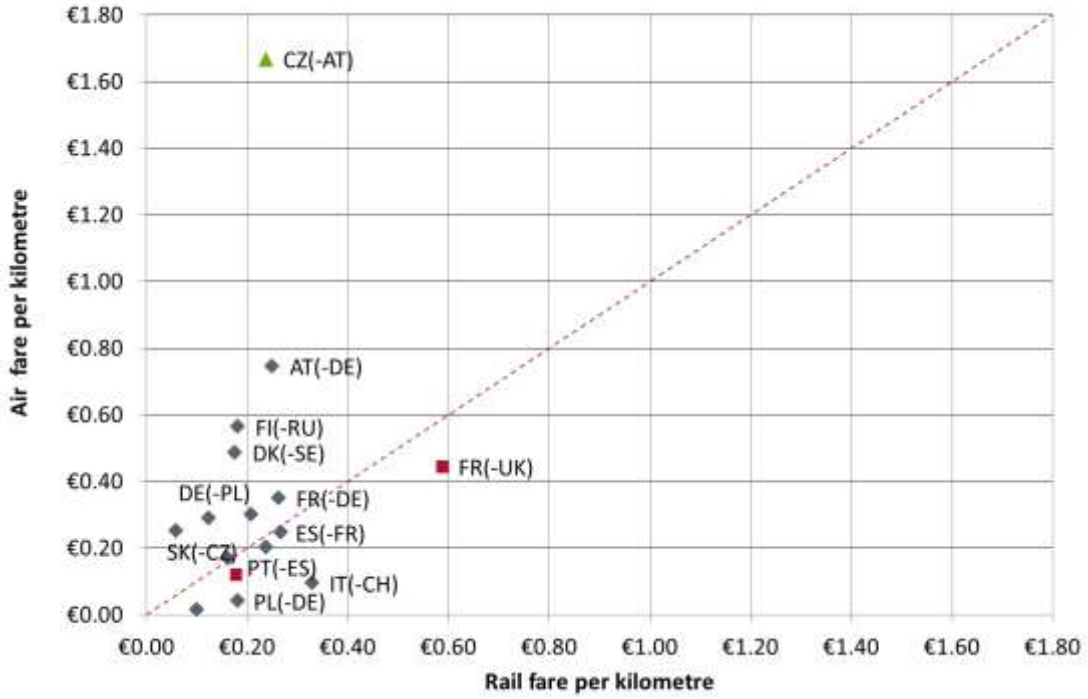
Figure 5.14: Rail and air average speeds: interurban trips over 300 kilometres (lowest observed fare)



Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.3 for details) and may not be representative.

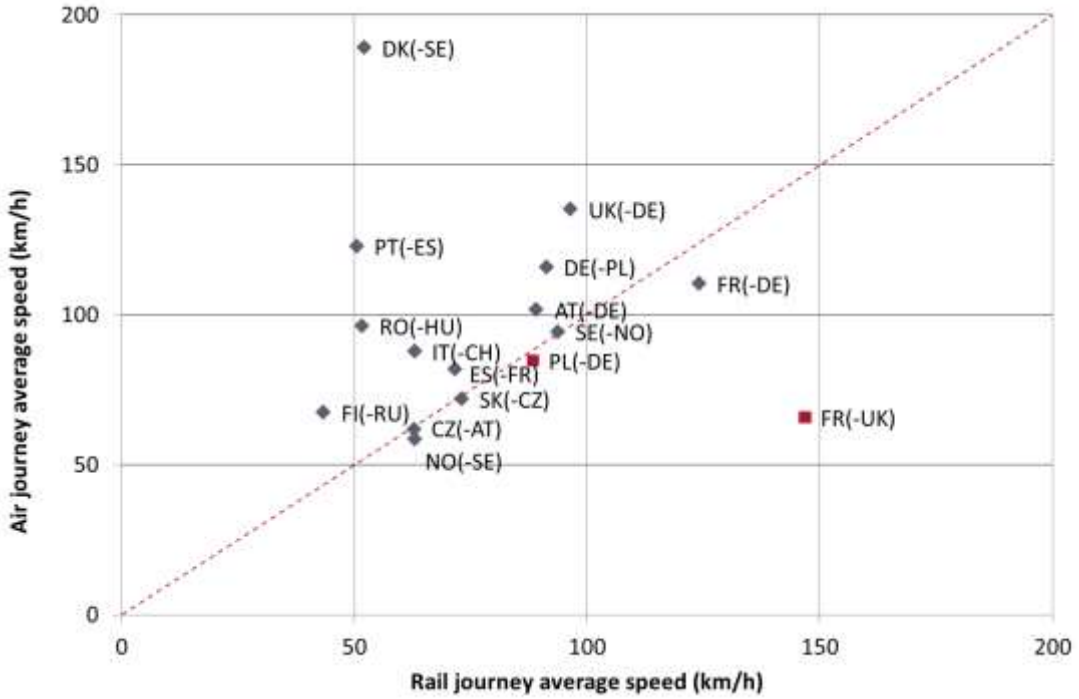
5.27 In most cases, on routes where rail travel was faster than air travel it was nevertheless, less expensive. For example, between Paris and Lyon (FR) shown as a red square in Figure 5.14, rail offered double the average speed, and half the price, of air travel. In practice, air fares bought on the day of travel on this route might be priced for last minute business travellers with a relatively inelastic demand. The corridor between Madrid and Barcelona (ES), also shown as a red square in Figure 5.14, is the only route on which rail was both faster and slightly more expensive than the air, suggesting that rail is the superior mode on this route.

Figure 5.15: Rail and air costs: international trips (lowest observed fare)



Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.5 for details) and may not be representative.

Figure 5.16: Rail and air average speeds: international trips (lowest observed fare)



Source: railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.5 for details) and may not be representative.

5.28 Rail was more expensive than air for more international journeys than domestic interurban journeys. The largest difference in fares was on Eurostar between Paris and London (FR-UK), shown as a red square in Figure 5.15 and Figure 5.16, which is twice as fast as the equivalent journey by air and 30% more expensive. The journey between Poznań and Berlin (PL-DE), also shown as a red triangle in Figure 5.15 and Figure 5.16, was the only other international route on which rail is both faster and more expensive than air, although only marginally so.

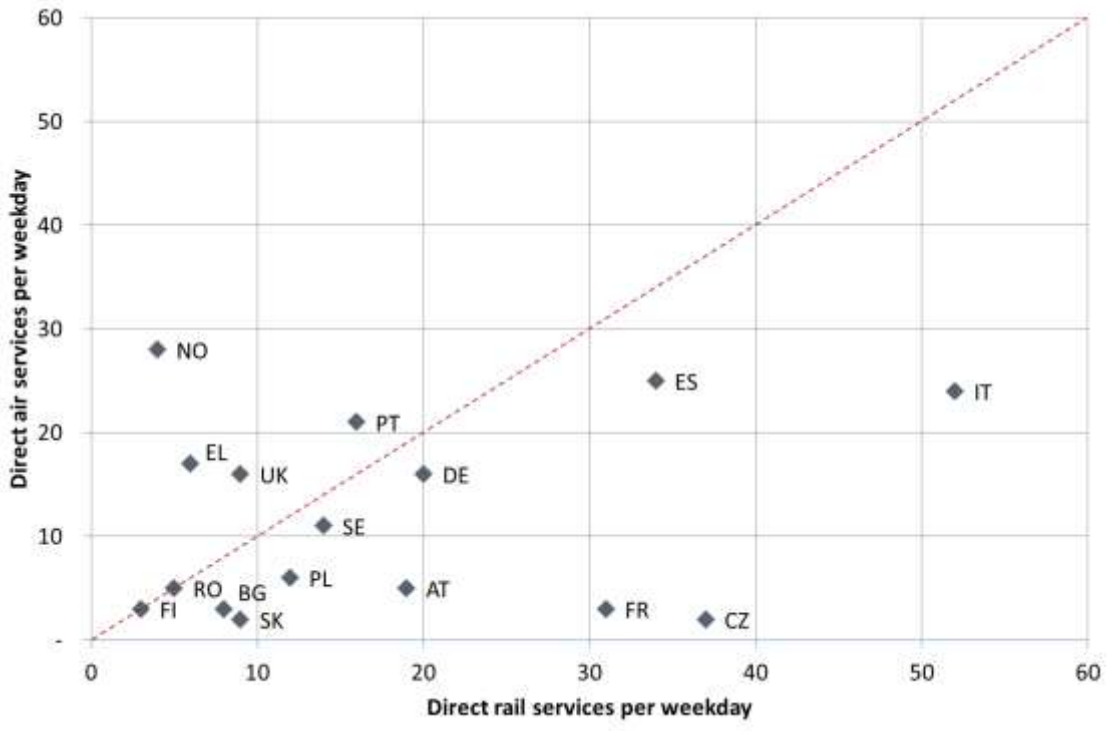
5.29 Air fares between Prague and Vienna (CZ-AT), shown as a green triangle in Figure 5.15 were eight times higher than rail fares. As with the domestic route in the Czech Republic, this route is operated by a single airline and the main market may be last minute business travellers with a relatively inelastic demand.

Frequency and reliability

Frequency

5.30 Timetable-related quality attributes, such as service frequency, have an important influence on rail demand and rank alongside fares and exogenous variables as the prime determinants of the volume of rail travel. For the corridors included within the sample for this study, it has only been possible to draw comparisons between the frequency of rail services and domestic air services. For the sample of routes described in Table 4.3, a comparison of rail and air frequency is provided in Figure 5.17.

Figure 5.17:Direct air and rail services per weekday (interurban trips over 300 kilometres)



Source: European Rail Timetable (January 2016) supplemented by railway websites, Skyscanner, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.3 for details) and may not be representative.

5.31 There are no domestic city pairs within our sample that provide more than 30 direct air services per day, and only four city pairs with more than 30 direct rail services. In the majority of Member States the frequency of rail and air services is reasonably well matched although,

in general, rail frequencies tend to be higher. Further analysis of the frequencies of regional, interurban and high speed rail services is provided in Chapter 7.

5.32 It has not been possible to gather meaningful frequency data for the coach market as a consequence of the fragmentation of the market and the flexibility of coach as a transport mode. Subject to sufficient capacity at terminal facilities and other stops, coach timetables can vary from one month to the next in response to changes in demand. Moreover, the liberalisation of the international coach market and the emergent liberalisation of domestic markets facilitates market entry and exit. As a consequence, and unlike rail where operators have limited degrees of freedom on constrained networks, it is difficult to provide a comprehensive snapshot of all coach services at a point in time on a given corridor.

Reliability

5.33 Journey time reliability refers to the variation in journey times that individuals are unable to predict. Such variation could come from recurring congestion at the same period each day (day to day variability) or from non-recurring events, such as incidents. In the case of scheduled transport services, reliability is often referred to as punctuality.

5.34 Evidence on reliability for other modes is not available, for the following reasons:

- Car journey time reliability data is seldom published and often inconsistent between Member States. Where data is published it typically covers journeys within urban areas and/or on the trunk road network[29]. It is not, therefore possible, to generate an end-to-end journey reliability measure which captures city-centre to city-centre journeys.
- Coach punctuality data is not recorded or published. Neither the *Comprehensive Study on Passenger Transport by Coach in Europe* (SDG, 2016), or its predecessor *Study of Passenger Transport by Coach* (SDG, 2009) found any evidence of the proportion of coach services which arrive at their ultimate (or intermediate) destination on time. This reflects the fact that coach services are generally operated by private companies which have no obligation or indeed incentive to publish service quality indicators.
- Air punctuality data is routinely collected and published by third parties based on information collected by airports, air traffic control and trade associations). However, data is typically disaggregated by airline or airport, rather than nationally by domestic and international services, as we would require for this study[30].

5.35 In light of these difficulties, we have not been able to present a comparison of journey time reliability between rail and other modes.

Summary

5.36 We have only examined a small sample of routes, with different market conditions and levels of intermodal competition. However, our findings are consistent with the twin hypotheses that:

- the operator with the best cost-quality mix is best able to set fares in marketplace (the "price setter"); and

[29] See, for example, **https://www.gov.uk/government/statistics/road-congestion-and-reliability-statistics-table-index**

[30] Data can be bought through commercial organisations such as OAG Aviation Worldwide.

- fares offered by other modes ("price takers") are determined by the relative quality of their mode, subject to the constraint that they must either remain profitable or be supported through a PSO.

5.37 At very long distances, outside the scope of this study, airlines offers both the lowest costs and the fastest journey time, and are the dominant mode.

5.38 For the domestic or international journeys over 300 kilometres which we have examined in this study, rail operators may have to charge less than airlines unless they can offer a faster city centre to city centre journey time. It can often do this in Western Europe and in particular where it makes use of dedicated high speed lines, such as on routes radiating from Madrid and Paris. Coach operators can often compete with both air and rail because they can offset longer journey times with lower fares. Car is less attractive because of the cost and time penalties of entering and parking in large cities, and because it is not possible to work or rest while driving.

5.39 For the domestic interurban journeys under 300 kilometres which we have examined, air travel is not normally available, and coach and rail fares tend to depend on their relative speed and frequency, and hence their market power. In much of Eastern Europe, coach is faster than rail and operators can charge higher fares (rail is an "inferior good"), whereas in Western Europe the reverse is more typically the case. Car remains relatively unattractive because of the cost and time penalties of entering and parking in large cities, and the journey time variability that arises from journeys into congested city centres.

5.40 On regional journeys, rail may face competition from coach but, without the cost and time penalties of entering and parking in large cities, car may set an effective ceiling on their fares. Both rail and coach operators may be constrained to set fares, in some cases through PSO contracts, at levels low enough either to attract passengers from car or to be affordable to those with no car.

5.41 On suburban journeys, as we noted in paragraph 5.3, we could not readily draw comparisons between modes without detailed information or assumptions on car parking charges and other factors. Our 2009 study for Passenger Focus highlighted the fact that the cash costs of parking and road tolls dominated the decision in some cities, but that for some journeys parking charges would apply to rail (at a suburban station) but not to road (where free parking is available at the destination).

5.42 In every case the actual choice of mode may depend on the characteristics of the travelling party. Airlines can offer extremely low fares up to one year ahead, whereas rail can rarely confirm timetables this far ahead due to its reliance on engineering timetables issued by the infrastructure manager. In many cases these are not required to be made available more than twelve weeks in advance. This constrains the scope for rail operators both to compete with airlines over longer booking horizons, or to provide complementary travel services and through-ticketing.

5.43 Coach operators can often provide additional capacity at short notice and for demand peaks, allowing them to keep fares low when rail operates have to price off excess demand. Car (or taxi) may be used by large groups with heavy luggage, unless rail reduces average fares through family or group discounts.

6 Intramodal competition

Introduction

6.1 In Chapter 5 we discussed intermodal competition between rail and other modes. In this chapter we discuss intramodal competition within the rail industry, and Figure 6.2 illustrates some of the ways in which this can arise.

Table 6.1: Intramodal competition

Type of competition	Examples
Within operator or group	First and Second Class products
	Day and night trains
	Express or premium services
	Flexible and restricted fares
	Slow and fast routes and high speed lines
	Low cost services
For the market	Management contract
	Gross cost contract
	Net cost contract
	Flexible “franchise”
In the market	Parallel routes
	Overlapping services
	Open access operation

Source: Steer Davies Gleave analysis

6.2 We discuss each of these types of competition in turn below.

Competition within an operator or group

6.3 Even where there is a single operator on the railway, there may be effective competition between some of the products it offers. This competition can arise either naturally, as a result of the network, timetable and fares, or deliberately, through the design of products to offer choices to passengers, which typically involve trade-offs between price and some element of quality. We discuss briefly below examples of how such competition arises.

First and Second Class products

6.4 A very early example of offering passengers a trade-off between price and quality was the offer of more than one class of travel, which in many railways have become standardised as First Class and Second Class, although some operators name the classes differently or offer

more of them. Airlines subsequently adopted the same principle, and long haul aircraft may carry up to four types of seating – typically First, Business, Premium Economy and Economy – offering gradations in price, seat size and personal space, and the quality of additional features such as food, drink and, more recently, the quality of inflight entertainment headphones and screens.

6.5 Some railways which still offer two or more classes may offer fixed differentials between them, such as three rather than four seats across the vehicle, or a 50% higher First Class fare, but others may manage quality differentials, and use dynamic pricing, with the aim of making the best use, and extracting the maximum revenue, from the space available on each vehicle and train.

Day trains and night trains

6.6 Some railways offer a choice between day trains and night trains, which typically operate with no or few stops for several hours overnight, and often have special sleeper or couchette carriages[31]. Where they are offered, passengers are able to make a trade-off between price and quality, or price and the convenience of travelling in "dead time" and avoiding overnight accommodation costs.

Express or premium services

6.7 Some railways have historically offered premium services which offer faster journey times, higher quality rolling stock, or additional on-board services. Examples have in the past included brands such as "Express", "Rapido", "Pullman", "Intercity" and "Eurocity" or named trains such as the Flying Scotsman, le Train Bleu, the Rheingold and the Danube Express. Some of these distinctions have been withdrawn, and replaced with others such as the flexibility of the fares, or the use of high speed lines, as we discuss below.

Flexible and restricted fares

6.8 In addition to the range of seating types they offer, many airlines now also offer three or four different combinations of fare and flexibility, typically including a fully flexible fare, a slightly more restricted fare, special fares which are tied to a particular flight and cannot be changed, and "reward" travel paid for with accumulated loyalty of "frequent user" points. This means that, at any one time, passengers on a single long haul flight may be offered up to four classes of travel and up to four ways of paying for each, giving up to 16 different combinations of quality, price and flexibility.

6.9 A number of rail operators now offer "frequent user" schemes and, as our analysis in preceding chapters has shown, also offer travel flexibility as an element of "quality" which can be paid for. We set out an extreme example in Appendix C, based on an example in the UK, but note that many operators offer a choice between fares valid on any train, off-peak trains only, or a single train.

Slow and fast routes and high speed lines

6.10 Operators may also charge premium fares for faster routes between the same points, and this has become increasingly common with the introduction of dedicated high speed lines. High speed services, with different or higher fares, began in France in 1981 and now operate in a

[31] We have not investigated fares or quality for night trains, but note that their use is in gradual decline. Both Germany and France have recently announced major reductions in their night train networks.

number of Member States, including dedicated and non-stop airport services in a number of cities, and the Javelin domestic high speed commuter services operating in the UK since 2009.

Low cost services

6.11 We noted above how many airlines have increased revenues by offering a wider range of seating classes and fares types. An alternative approach, pioneered by Southwest Airlines in the USA from 1967 and Ryanair in Europe, effectively from 1991, was to offer a single product but to focus on reducing every aspect of costs. Ryanair now carries more passengers than any other airline in Europe.

Ouigo

6.12 A broadly analogous attempt to introduce low cost rail services was made by SNCF in 2013, through its subsidiary Ouigo. Ouigo uses a number of features analogous to those used by the low cost airlines, as summarised in Table 6.2.

Table 6.2: Intramodal competition through low cost services

Feature	Low cost airline model	Ouigo model
Operating hours	Long operating day	Long operating day
Classes offered	Single class	Single class
Seating density	High density	High density
Catering and on-board staff	Minimal	Minimal
Locations served	Often secondary airports	Often secondary stations
Sales and ticketing	Online or app only	Online or app only

Source: Steer Davies Gleave analysis

6.13 Ouigo trains carry no buffet car, and serve secondary stations such as Marne-la-Vallée for Paris, TGV Haute Picardie for Arras and Amiens, and Tourcoing for Lille. As with the low cost airlines, use of secondary destinations may enable Ouigo to reduce unit costs, either through more efficient operating patterns or through avoiding congested infrastructure where the opportunity cost of capacity is high.

6.14 The combination of small percentage gains in each of the factors listed in Table 6.2 can result in a material reduction in the direct operating costs of the train service and hence the levels of fare at which they become commercially viable. This in turn allows SNCF, through Ouigo, to offer a wider range of price and quality while minimising direct "cannibalisation" of demand from its core TGV high speed services.

Izy

6.15 A second low cost approach is the Izy concept between Paris and Brussels launched by Thalys on 3 April 2016. As shown in Figure 6.1, Izy offers low fares which vary with the quality of seating provided.

Figure 6.1: Izy's service offer

Source: Izy (**www.izy.com**), each train has 10 tickets for a non-guaranteed seat and 25 tickets for folding seats.

6.16 Izy has no bar car or WiFi on board, and offers a journey time of 2 hours 15 minutes on the conventional network compared with Thalys's 1 hour 22 minutes on high speed lines. The absence of facilities, and longer journey time, appear to be designed to abstract from Thalys those passengers who are less willing to pay for facilities and speed.

Summary

6.17 None of the variations described above is a form of direct competition between different providers of rail services, but they still have the potential to benefit the passenger by increasing the choices available, and in particular by allowing passengers to select from a range of combinations of quality, price and flexibility.

Competition for the market

6.18 Liberalisation of access to rail networks also allows two distinct types of competition between operators, either for the market or in the market.

6.19 Competition for the market can in practice take a number of forms, which we summarise briefly in Table 6.3.

Table 6.3: Intramodal competition for the market

Type of competition	Competition on fares	Competition on quality	Comments
Management contract	×	✓	Cost risk is not transferred
Gross cost contract	×	✓	
Net cost contract	Possible	✓	
Flexible "franchise"	Yes, with regulation	✓	Common model in the UK
"Concession"	✓	✓	Examples include Arlanda Express

Source: Steer Davies Gleave analysis

Management contract

6.20 In some cases a competitive tender is used to award a management contract in which the "operator" does not bear cost risk but is instead rewarded either with a fixed fee or with elements of payment linked to performance or to delivery of specific outputs. We are aware of management contracts having been used in a number of circumstances:

- In the UK, management contracts have been used when a franchisee withdraws and services are temporarily managed under contract by a "manager of last resort" appointed by the competent authority.
- In the UK, management contracts have been used when a franchisee and competent authority cannot agree terms for the transfer of cost risk, such as when costs are subject to factors over which the operator has little control.
- In New Zealand, Veolia operated suburban services in Auckland under a management contract.

6.21 In these circumstances the competition is typically limited to the award of the management contract, and based on the cost and quality of the management staff, and the subsequent service performance, rather than on the cost and quality of services.

Gross cost contract

6.22 A more widely used arrangement is a gross cost contract in which an operator provides all services and bears all the risks associated with their costs, but does not bear any risk in relation to revenue. Fares are typically set by the competent authority, although they may be collected by the operator on the authority's behalf.

6.23 Gross cost contracts are relatively common in urban and suburban systems, particularly where some or all fares are multimodal and there is neither an opportunity for the rail operator to vary fares nor, in some cases, even any allocation of fares revenue to modes or operators, some of whom may be internal operators owned by the competent authority. This approach allows the authority to change fares, or to introduce new services, which may abstract revenue from those already operating, without the need for frequent and/or major contract renegotiation.

6.24 Gross cost contracts may still allow operators to vary quality, however, either through their proposals for how they will operate the service, such as whether new or existing stock will be used, or through performance payments related to aspects of quality such as punctuality, reliability, cleanliness, security and the introduction of additional features as the contract progresses. Competition for the market may therefore be based not only on low cost but also provision of high, and improving, quality.

Net cost contract

6.25 Under net cost contracts, operators typically accept risks associated with revenue as well as with costs, although the extent to which they are able to manage pricing and revenue varies. Even where fares are fixed by the competent authority, however, higher quality, effective information, marketing and promotion can increase revenues. The operator can be incentivised to grow revenue through any of these means, but may still also be subject to a performance regime.

Flexible "franchise"

6.26 Progressively more flexibility can be offered to operators through the competitive process through a number of measures. These have included:

- In the Netherlands, operators have been paid on the basis of a percentage uplift on revenue, rather than a fixed PSO payment. This incentivises them to provide whatever services are most valued by the public and, subject to safeguards to ensure that minimum service levels are met, means that bidders can not only propose their own service levels

and quality standards, but also vary them over the life of the PSO contract to reflect changing market conditions.

- In the UK, the initial rail franchises had considerable flexibility to vary service patterns, subject to a minimum service level, and fares, subject to regulation of the extent to which certain fares, or "baskets" of fares, could be raised. One effect was that operators introduced a wide range of discounted fares, with reduced levels of flexibility, contributing to the major growth in passenger demand since franchising began.

"Concession"

6.27 Perhaps the most flexible model of competition for the market is a concession such as that awarded for the provision of direct services between Stockholm and Arlanda airport. Potential operators competed for the exclusive right to build infrastructure and operate trains, with no restrictions on what services they operated or what fares they charged.

6.28 The concession model may be suitable for a relatively simple service such as a point-to-point airport shuttle, which has incentives to provide services throughout the hours of operation of the airport. It may, however, be less suitable where not all socially valuable services are commercially viable, including operation at the beginning and end of the day, and calls at minor stations.

PSO services

6.29 Our review of stakeholder responses found that that:

- only Poland makes exclusive use of gross cost contracts;
- PSO contracts with national operators tend to be net cost, as in the Czech Republic and Hungary, but there is variation in the allocation of revenue risk at the regional level;
- even where contracts are gross cost, with operators taking little or no revenue risk, operators may nevertheless face significant financial risk as a result of contractual incentive mechanisms in the form of reward or penalty schemes (as in Sweden); and
- national legislation providing for competitive tendering of PSO contracts does not guarantee the application of competitive procurement procedures, as in Spain where Renfe, the incumbent national operator, continues to benefit from a direct award.

6.30 The specification and award of a PSO contract gives a competent authority a choice over the extent to which it will either:

- specify the quality of the required services, such as journey time, frequency and punctuality; and/or
- regulate some or all of the fares offered, whether through a kilometric or zonal fare, specific individual fares, or through regulation such as with a fares basket.

6.31 In most cases a clear specification of what is required, and what flexibility will be offered, will enable train operators to estimate costs and (where relevant) revenues and allow passengers and other stakeholders to comment on the proposed service and fare levels in advance. It will also provide authorities with the means to assess the delivery of the service, for example through regular monitoring of operational performance and service quality metrics defined by the specification.

6.32 As we noted above, however, it may not always be possible to transfer to the operator risks associated with costs which are not under their control. This can be the case if they are

required to provide services during a period in which there will be major changes to the infrastructure, rolling stock or other facilities made available to them.

The specification of quality

6.33 A more rigorous specification of rail services in a given PSO contract will not necessarily either increase or optimise service quality:

- Over-specification of features such as punctuality may merely result in a performance target which cannot be met, particularly if the operator is constrained by the reliability of the infrastructure or of other operators.
- Over-specification of features such as frequency, or levels of comfort, may result in a more additional costs to the competent authority than additional value to the passengers.

6.34 Mechanisms such as the flexibility provided in many franchises in the UK allow operators either to select the most cost-effective level of quality, whether:

- at the time of the competition, as part of their price/quality offer to the competent authority; or
- during the life of the contract, as part of their price/quality offer to the passenger.

6.35 More recently in the UK, steps have been taken to encourage innovation through the application of a weighted scoring system to assess bids, reflecting initiatives in bids that drive service quality improvements for passengers. One practical issue, however, is that operators competing to win a PSO contract may naturally tend to add "quality" to their offer as a means of improving their chances of being awarded the contract. For example, the rapid proliferation of WiFi on trains may be driven in part by a competitive environment in which manufacturers, or the operators they supply, do not want to lose competitive advantage to other manufacturers, operators or modes.

6.36 Our own experience of supporting franchise and concession bids, and observations of open access operations in Italy and the UK, demonstrate that train operators participating in a competition face a powerful incentive to identify service quality improvements. These can range from maintenance at stations, through facilities for cycle storage, to better customer information on station platforms, through innovative apps and through website tools.

6.37 In their recent consultation document *Competition in passenger rail services in Great Britain* (2015) the UK Competition and Markets Authority provides a case-study of service quality and innovation following competition between Grand Central (market entrant) and Virgin East Coast (incumbent). They note that:

- The entrant was the first company (in the UK) to offer free WiFi to all passengers.
- The entrant introduced a 'carnet' ticket offer where a book of 20 fully flexible tickets is sold at a 25% discount. The incumbent at the time (GNER) responded by offering its own carnet.
- When the entrant launched its services from London to York, the incumbent responded by adding additional services to York.
- The entrant makes provides a wider range of walk-up tickets available for purchase on-board the train, compared to the incumbent.
- A new service offered by the entrant led to infrastructure improvements, including the refurbishment of Wakefield Kirkgate station, and the use of a former freight-only line.

6.38 This can, however, result in a "ratchet" effect in which ever-increasing quality is demanded by stakeholders, or offered by bidders, and bought by competent authorities, without being valued by passengers. Over time, this can have the effect that competitive tendering leads to increases in costs, at least relative to a situation in which quality was no higher than was valued or required. We are aware that some competent authorities, including Transport for London (TfL), have developed mechanisms to assess the value placed by passengers on particular quality increments and to avoid buying quality enhancements which passengers value less than the alternative of reducing fares[32].

The specification of fares

6.39 Regardless of the allocation of revenue risk, competitive tendering of PSO contracts can be expected to benefit competent authorities and/or passengers, since it encourages operators to make cost savings which can, in principle, be used to lower fares. However, control, or reduction, of costs does not necessarily result in a reduction in fares, unless either:

- The competent authority explicitly reduces fares, or subjects the operator to a regulatory regime which requires it to reduce fares.
- An operator bearing revenue risk identifies markets which are highly price-elastic, and is permitted to introduce lower fares, in some cases subject to restrictions on flexibility, as a means of growing overall revenue.

6.40 In Germany, the introduction of tendering for regional services resulted in tender prices up to 50% lower than offered prior to competition for the market, and reductions in subsidy of 18-25%. As noted by Alexandersson and Hultén (2006) there have been cases of very low bids in German regional tenders, and optimistic efforts to establish new long-distance passenger services, leading to the exit of some firms[33]. In the absence of disaggregate time-series fares data it is not possible to identify whether competition affected fare (or cost) levels, although the quantity and coverage of local transport networks in Germany (whose transport associations are responsible for setting local multi-modal tariffs within the local boundary) means the scope for entrants to vary fares is limited.

6.41 In the UK a number of different approaches to fares policy have been adopted:

- Initially (from 1995) operators were required to reduce regulated fares by less than inflation, but free to increase unregulated fares and to introduce new fares.
- Subsequently, operators were permitted to increase fares by slightly more than inflation, in exchange for accepting less subsidy from (or paying higher premia to) the competent authorities.
- Most recently, policy has included an explicit cost-recovery target for the industry, and operators are permitted to increase fares by amounts which vary from year to year, again in exchange for accepting less subsidy or paying higher premia.

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[32] TfL's Business Case Development Manual (BCDM), which provides details of the process used, can be downloaded here **https://www.whatdotheyknow.com/request/197881/response/495035/attach/3/Business%20Case%20Development%20Manual%20May%202013%20Redacted.pdf**.

[33] Alexandersson. G and Hultén. S (2006) *Competitive tenders in passenger railway services: Looking into the theory and practice of different approaches in Europe,* European Transport n33

6.42 In Prague and Tallinn, in contrast, administered suburban fare levels do not appear to have been changed since 2011.

6.43 However, where competition for PSO services leads to a multiplicity of operators with responsibility for adjacent and overlapping services, it can result in a range of fares that passengers find difficult to understand. This is highlighted by the case study of Exeter to Fareham in Appendix C. Simplification of the fare structure is advocated by passenger representative bodies such as Passenger Focus in the UK. However, it is likely to require more prescriptive fares regulation, whether through contracts or the broader regulatory framework, which will constrain operators' ability to offer market-based fares to meet the needs of particular groups of passengers. However, competent authorities may conclude that this is justified either:

- as a principle, where passengers collectively value simplicity and transparency more than the saving from fares which are lower but difficult to understand and use; or
- in practice, where the complexity of the existing fare offer prevents passengers from making informed decisions about the appropriate ticket for them.

6.44 The interaction between services provided by different operators also needs to be considered where transport authorities wish to ensure that interavailable tickets continue to be available. Any such tickets create a need for systems to allocate or apportion the value of the ticket to the operator(s) on whose services it has been, or is likely to have been, used. Allocations and apportionments can be based on electronic gating and ticket checks, or on diary systems and behavioural models such as the UK's ORCATS revenue allocation model.

Summary

6.45 Two-thirds of all rail travel is made on services contracted under PSO, and so there are significant opportunities for competent authorities both:

- to specify the quality and fares of the services they procure; and
- to benefit from the innovation and efficiency offered by a competitive supply market, at least to the extent that the market is willing to bear cost and revenue risk.

Competition in the market

6.46 We set out in Table 6.1 above how the presence of multiple operators on a network, even if providing PSO services and even if required to accept interavailable fares, can result in competition in the market, either between PSO operators or between a PSO operator and a commercial operator:

- alternative routes, where a journey between two stations is possible by two or more routes served by different operators, as is the case with many of the larger rail networks; or
- overlapping services, where services of different operators use the same route.

6.47 Both types of competition are common in networks on which long-distance services operated commercially use the same route as regional or suburban services operated under a PSO.

6.48 In the remainder of this section, however, we focus on the potential effects of the introduction of new competition, in particular through the introduction of commercial open access services.

6.49 We examined routes with two or more operators, at least one of them in private ownership, and looked for evidence of changes in the level and structure of fares after the introduction of competition. Table 6.4 lists where there has been market entry by domestic open access operators.

Table 6.4: Liberalisation: market entry by domestic open access operators

State		Operator	Begun	Ended
UK	United Kingdom	Hull Trains	September 2000	
DE	Germany	InterConnex	December 2001	December 2014
UK	United Kingdom	Grand Central	December 2007	
UK	United Kingdom	Wrexham Shropshire & Marylebone	January 2008	January 2011
IT	Italy	Arenaways	November 2010	February 2012
CZ	Czech Republic	RegioJet	September 2011	
SE	Sweden	Blå Tåget	November 2011	
SE	Sweden	Öresundståg (Veolia)	December 2011	
AT	Austria	Westbahn	December 2011	
IT	Italy	NTV	April 2012	
DE	Germany	Hamburg-Köln-Express	July 2012	
CZ	Czech Republic	LEO Express	December 2012	
SE	Sweden	MTR Express	March 2015	

Source: Steer Davies Gleave analysis for Fourth Railway Package impact assessment, updated August 2015.
Note: excludes cabotage by high speed international services and airport-only operators.

6.50 Our approach focused on the best-documented cases of new entry:

- In the UK (with which we are familiar through other work), Hull Trains and Grand Central operate open access services on the East Coast Main Line.
- In Italy, NTV operates high speed services on the corridor between Turin and Naples, described in a paper by Bergantino et al.[34]
- In the Czech Republic, RegioJet and LEO Express operate services in the Prague-Ostrava corridor, described in a paper by Tomes et al.[35]

Findings

6.51 Our findings on patterns of entry and their effects, including on fares, are summarised in Table 6.5.

[34] Bergantino *et al.* (2015), The impact of open access on intra- and inter-modal rail competition. A national level analysis in Italy

[35] Tomes *et al.* (2014), Competition in the railway passenger market in the Czech Republic

Table 6.5: Liberalisation: market entry and effects in the UK, Italy and the Czech Republic

Member State	Operator	Entry					Effect								
		Year of entry	Share of train services	Initial stock	Entry unrestricted?	Target markets	Incumbent adds services	Incumbent cuts elsewhere	Capacity now constrained	Connections difficult	Share of rail passengers	New entrant fares	Incumbent fares	Share taken from air	Market profitable
UK	Hull Trains	2000	10%	New	NPA test	New direct services	No	No	Yes	?	10%	Lower than incumbent*	?	N/A	Yes
	Grand Central	2007	10%	Old											
IT	NTV	2012	25%	New	Yes	Major cities	Yes	Yes	?	No	30%	Lower by around 25%	?	Yes	?
CZ	RegioJet	2011	10%	New	Yes	Major cities	Yes	Yes	Yes	Yes	?	Price war, some fares down 75%		N/A	N/A
	LEO Express	2012	10%	New											

Source: Bergantino et al, Tomes et al, Steer Davies Gleave research, see text for details.
Note: NPA test is "Not Primarily Abstractive", see text for details.
* Lower incumbent fares have been observed for equivalent distances on other routes with no competition

Share of train services

6.52 New entry has typically been on a relatively small scale, with an operation broadly 10% the size of the incumbent on the route and a particular focus on serving major city pairs at peak times. The exception is NTV in Italy, which has entered the "spine" high speed route linking with principal Italian cities with an operation around 25% the size of the incumbent, Trenitalia.

6.53 Entry on a small scale may be possible with a small fleet of leased stock that is appropriate to a niche strategy and which minimises overall financing needs and risk[36]. Doing so, however, means offering services less frequent than the incumbent which may, in turn, mean offering passengers lower fares as we discuss below.

Initial rolling stock

6.54 In the UK, Hull trains entered the market in 2000, initially with leased "Turbostar" stock. After a number of changes it announced in 2015 an order for new Hitachi trains, to be named Class 802, similar to the Class 800 stock ordered by the Department of Transport for use by the incumbent PSO operator. Grand Central's entry was conditional on operating stock capable of 200 km/h, and it entered the market with leased High Speed Trains (HSTs) but has since also acquired Adelante 200 km/h Diesel Multiple Units (DMUs).

6.55 In Italy, NTV entered the market with new and purpose-built Alstom AGV train sets equipped with its Club, Prima and Smart classes of accommodation.

6.56 In the Czech Republic, RegioJet entered the market using ex-ÖBB stock which, at the time, were of higher quality than incumbent ČD's stock. LEO Express entered the market with new

[36] Many airlines begin "opportunistically" with a single aircraft procured on a short term lease.

Stadler Flirt rolling stock. Tomes et al argue that, when incumbent ČD subsequently upgraded its rolling stock, the quality of LEO Express's stock became the worst on the route.

6.57 New entrants may either lease existing stock or buy new stock, sometimes, as in the case of Hull Trains, as a "follow-on" from a large fleet being bought by another operator. Once a commitment has been made to a long lease or new stock has been bought, however, it may become a sunk cost which may not be recovered, even if the service covers its recurring direct operating costs. We discuss this point further below under market profitability.

Entry restrictions and target markets

6.58 In the UK, the independent safety and economic rail regulator the Office of Rail and Road (ORR, formerly the Office of Rail Regulation) generally requires that new operators satisfy, inter alia, the "not primarily abstractive" (NPA) test that a service generates £3 of revenue for every £10 that it abstracts from other operators. This had the effect that new entry to date has focused on providing direct services between London and medium-sized cities, off the main lines, which previously required a connection.

6.59 In Italy and the Czech Republic there is no directly analogous restriction, and in both cases new entrants have focused on providing direct connections between the largest cities along a single main route.

Incumbents' responses and cuts to smaller markets

6.60 One possible effect of new entry is that the incumbent moves resources to markets where it faces competition at the expense of other markets. This is difficult in the UK, where the incumbent operator on the East Coast Main Line must continue to meet detailed PSO specifications and its own franchise commitments, and has only limited scope to rebalance services between markets. However:

- In Italy, Bergantino et al note that, in advance of the introduction of competition from NTV, Trenitalia added high speed services but cut conventional services. They argue that the aim was to deter, or minimise the benefits, of entry.
- In the Czech Republic, Tomes et al noted that "the pressure of competition has forced the incumbent to concentrate on peak times and main stations while reducing connections at off-peak times and stops in medium-sized cities", and that there has been a reduction in late night trains.

6.61 Therefore it is important to ensure that service agreements are set up in a manner which does not allow the incumbent to respond to competition on certain routes by cutting services elsewhere.

Capacity constraints

6.62 One potential concern is that new entry may place additional strain upon limited capacity, particularly where it duplicates existing services rather than introducing new ones, or increases frequencies. We understand that capacity on the routes with competition in the UK and the Czech Republic are now constrained. At the same time, overall ridership has increased.

6.63 In Italy, in contrast, the limited number of potential stops in the 940-kilometre corridor between Turin and Naples appears to mean that both operators have similar stopping patterns, and we did not identify any capacity constraints on the route.

Connectivity

6.64 Tomes et al also reported that the increasing capacity constraints in the Prague to Ostrava corridor had required bunching of long-distance trains, making it difficult to provide connecting and local services which were both convenient and regular. As far as we were able to identify, this has been less of an issue in the UK, where the East Coast Main Line timetable is increasingly based on a standard hourly service pattern.

New entrant share of rail passengers

6.65 We found no data on market shares in the Czech Republic, but in the UK and Italy the new entrants' share of rail passengers appears to be broadly consistent with its share of supply.

New entrant fares

6.66 A number of studies suggest that new entrants in the UK generally offer lower fares than incumbents. Bergantino et al compared NTV and Trenitalia fares and concluded that the new entrant's fares were typically lower by 10-25%. In Sweden, the introduction of services by MTR Express has led to a reduction in fares as the incumbent, SJ, has been forced to lower its fares and provide faster services to compete with MTR Express[37].

6.67 In the Czech Republic Tomes et al refer to a price war. In 2011 incumbent ČD's standard fare was CZK 438, but by the end of 2012 LEO Express had entered with an average fare of CZK 209, and fares as low as CZK 95 were available. In January 2012 the Anti-Monopoly Office initiated proceedings against ČD regarding the alleged abuse of its dominant position on the line in the form of inadequately low (predatory) prices in response to the new entry. In 2015, ČD's Interim Report stated that the proceedings with the Anti-Monopoly Office were still continuing, and that the Anti-Monopoly Office was collecting supporting documents for its ruling[38]. The Anti-Monopoly Office will subsequently either issue a statement of objections, which will formally open the proceedings against ČD, or it will not issue the statement of objections and will discontinue the proceedings and thereby effectively allowing ČD to push LEO Express out of the market.

6.68 We examined the number of services offered, and the "walk-up" fares for immediate travel, on a number of routes with new entrants summarised in Table 6.6.

[37] The services between Stockholm and Gothenburg are split as follows, 8 MTR Express services and 18 SJ operated services.

[38] *2015 Interim Report*, České Dráhy Group

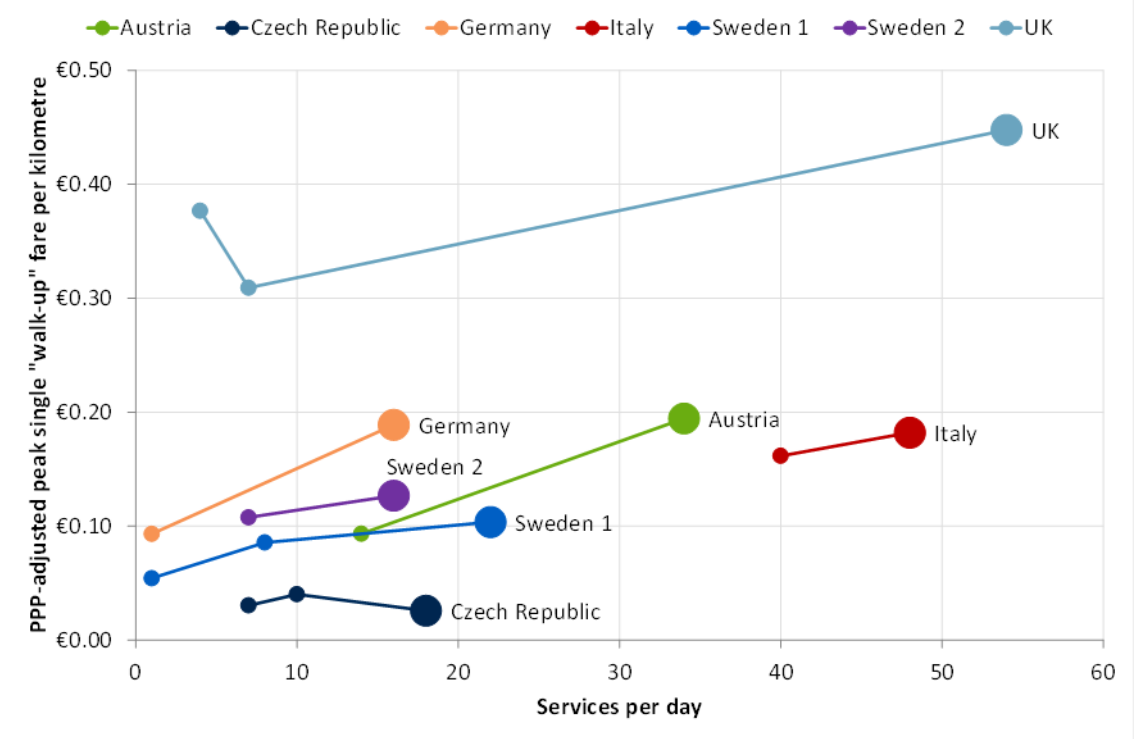
Table 6.6: Liberalisation: routes, incumbents and new entrants for comparison

State		Station pair	Incumbent	Entrant 1	Entrant 2	Comments
AT	Austria	Vienna-Salzburg	ÖBB	Westbahn		
CZ	Czech Republic	Prague-Ostrava	České Dráhy (ČD)	RegioJet	LEO Express	
DE	Germany	Hamburg-Köln	DB	Hamburg-Köln-Express		Hamburg-Köln-Express has only one train per day
IT	Italy	Rome-Milan	Trenitalia	NTV (Italo)		
SE	Sweden	Gothenburg Stockholm	SJ	MTR Express	Blå Tåget	Blå Tåget is a once-a-day service using "classic" rolling stock
		Gothenburg Malmö	SJ	Öresundståg (Veolia)		
UK	UK	London-Doncaster	East Coast	Hull Trains	Grand Central	

Source: operator websites, Steer Davies Gleave analysis.

6.69 In our analysis, shown in Figure 6.2 the incumbent operator is shown with a larger data-marker than the new entrant(s).

Figure 6.2: Market entry: incumbent and new entrant frequency and fares



Source: Steer Davies Gleave analysis of 2016 timetables and fares, see Table 6.6 for details of routes in each Member State.

6.70 The chart illustrates a number of points. First, comparing only the incumbents (large data-markers), it can be seen that more frequent services are normally associated with higher fares. At one extreme, between London and Doncaster, the incumbent offers 54 trains per direction

per day, but the PPP-adjusted walk-up fare is almost €0.45 per kilometre. At the other extreme, between Gothenburg and Malmö, the incumbent offers 16 trains per day, but the PPP-adjusted walk-up fare is less than €0.13 per kilometre. A noticeable outlier is services between Prague and Ostrava where, as we noted above, all the operators may be engaged in a price war.

6.71 Second, new entrants usually offer many fewer services than the incumbent but in exchange offer at least slightly lower fares (all the lines slope downwards from right to left). In Austria, Germany and Sweden between Gothenburg and Stockholm, the cheapest new entrant fare available on the day was approximately half that of the incumbent. The exception to this finding is again services between Prague and Ostrava, where incumbent ČD offered the lowest fares on the day for which we simulated a booking.

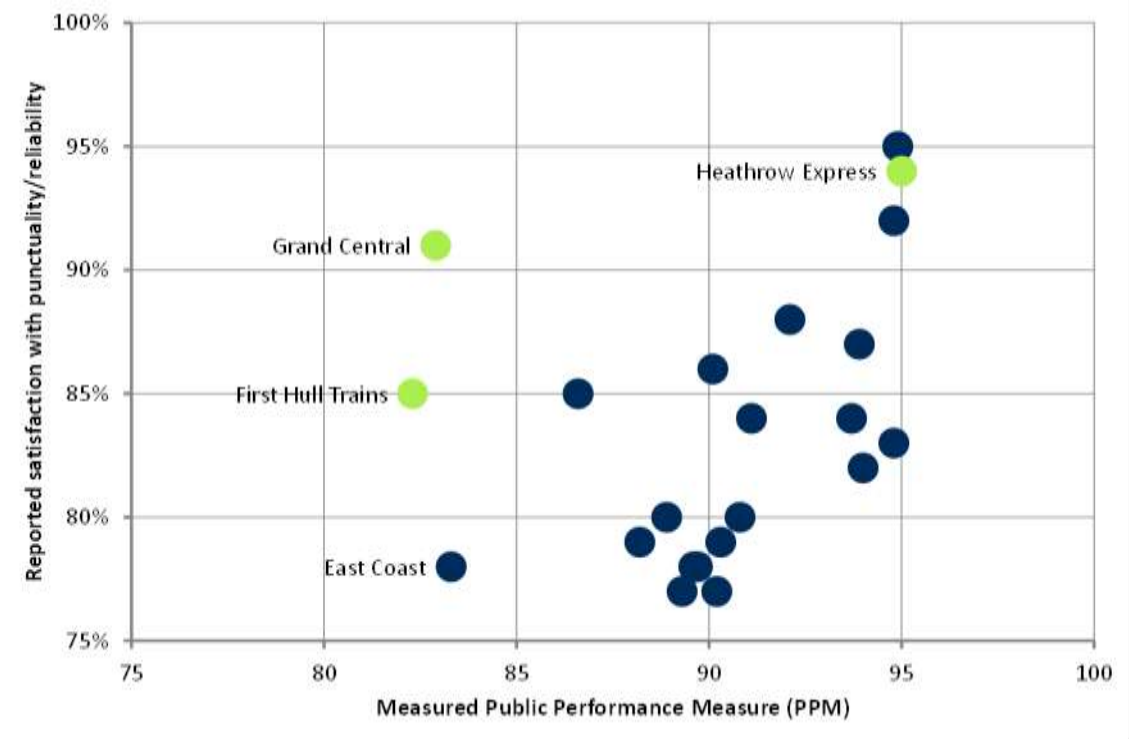
6.72 Third, none of the routes is a duopoly of two operators offering almost identical services, as has emerged in some transport markets although, on the Rome to Milan route, NTV now offers almost as many services, and charges almost the same prices, as incumbent Trenitalia[39]. We have, however, as yet seen no claims that the route has the characteristics of a duopoly.

6.73 We understand from research in the UK that the limited experience available provides no conclusive evidence that new demand can be attributed to the offer of additional or better on-board services by new entrants. However, we have in the past found that new entrants may benefit from targeting a different mix of passengers with different journey purposes and preferences. In our work on the Fourth Railway Package we compared an objective measure of performance with the subjective satisfaction with punctuality reported by passengers, which we repeat below as Figure 6.3[40].

[39] Under Australia's Two Airlines Policy, QANTAS and Ansett offered near-identical timetables and fares on many domestic routes until Ansett entered administration in 2001.

[40] See "Further Action at European Level Regarding Market Opening for Domestic Passenger Transport by Rail and Ensuring Non-Discriminatory Access to Rail Infrastructure and Services" at http://ec.europa.eu/transport/modes/rail/studies/rail_en.htm

Figure 6.3: Market entry: measured punctuality and reported satisfaction with punctuality



Source: Steer Davies Gleave analysis for Fourth Railway Package.

6.74 The figure shows that on the objective Public Performance Measure (PPM) of punctuality, three operators on the East Coast Main Line achieved similar scores which were lower than those of all the other operators in the sample shown by blue blobs. However, passengers using the open access operators reported much higher subjective satisfaction with punctuality (high satisfaction was also reported with Heathrow Express, an open access operator on another route). We concluded that this was partly due to the fact that the new entrants cater for more leisure and less commuter travel.

Incumbent competitive response

6.75 None of the evidence we examined suggested that the incumbent had reduced its services in response to competitive entry. In the UK this would not be possible because the incumbent must continue to operate the services specified or agreed as part of its franchise agreement.

6.76 Other than the price war in the Czech Republic, evidence on incumbents' fares is more mixed:

- In the UK, researchers have found no clear evidence that the incumbent, obliged to maintain its PSO services and constrained by the fares it charges between station pairs with no competition, has reduced its fares.
- In Italy, NTV reported to the competition authorities that Trenitalia's pricing policies amounted to dumping and cross-subsidisation, but no abuse of Trenitalia's dominant position was found. We did not, however, find any time series data on average Trenitalia fares before and after NTV entered the market. A further complication is that both NTV and Trenitalia have introduced multiple classes of travel as an aid to market segmentation, preventing direct comparison with the previous First and Second Class fares.

6.77 Table 6.7 matches those corridors examined in Figure 6.2, with other domestic corridors sampled for this study. While we have attempted to compare corridors with and without on-rail competition, in some cases, such as between Rome and Naples, there may also be competition on the comparator corridor. The observed differences in fares (shown in Figure 6.4) may be due, in part, to the presence of on-rail competition. However, there is a multitude of other factors that may influence fare levels between rail corridors in each Member State, and the differences in fare levels presented here cannot be directly attributed to the number of operators on each corridor.

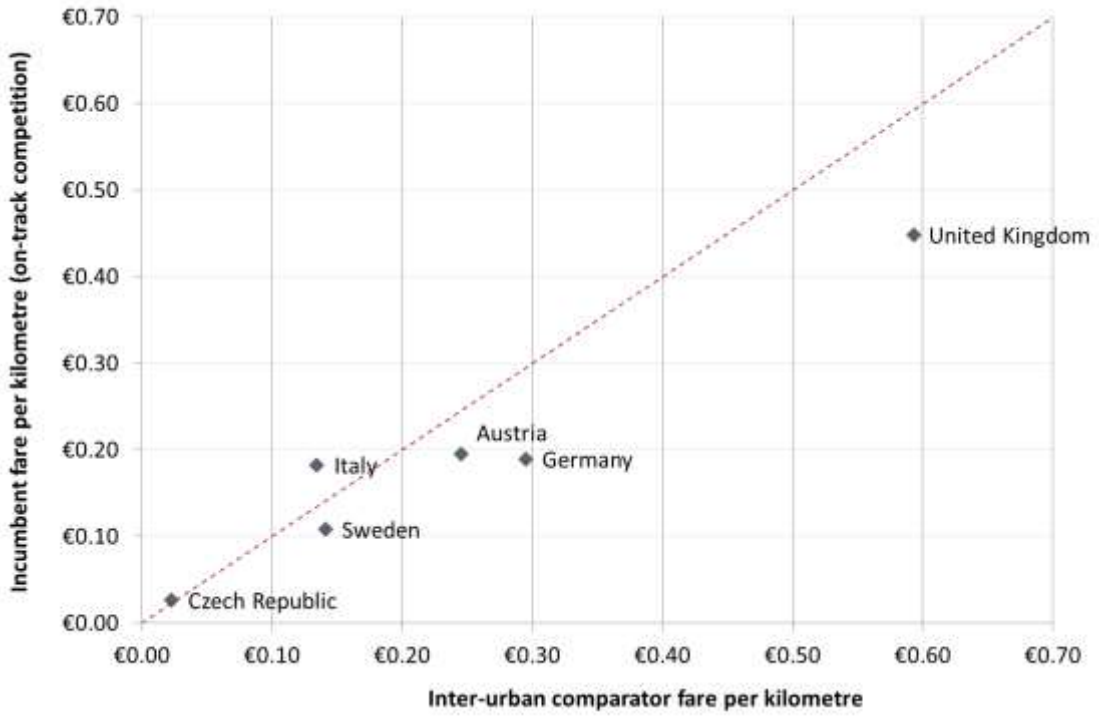
Table 6.7: Corridors with more than one operator and comparator corridors

Member State		Corridor with more than one operator	Interurban comparator
AT	Austria	Vienna-Salzburg	Vienna-Graz
CZ	Czech Republic	Prague-Ostrava	Prague-Brno
DE	Germany	Hamburg-Köln	Munich-Stuttgart
IT	Italy	Rome-Milan	Rome-Naples
SE	Sweden	Gothenburg-Malmö	Stockholm-Örebro
UK	United Kingdom	London-Doncaster	London-Cardiff

Source: Steer Davies Gleave analysis

6.78 Figure 6.4 compares fares on corridors with more than one operator with those with less or no competition.

Figure 6.4: Comparison of fares on routes with one or more operators



Source: railway websites, Steer Davies Gleave analysis.
Note: data are for a single illustrative station-to-station pair (see Table 6.7) and may not be representative

6.79 Fares for the incumbent operator on corridors with intramodal competition appear to be lower than the comparator corridor, on a fare per kilometre basis on the majority of routes shown. In Italy, fares appear to be marginally more expensive on the Rome-Milan corridor than the Rome-Naples corridor but, as noted previously, this corridor also experiences on-rail competition. The largest disparity is in the UK, where the fare per kilometre on the corridor with a single operator is €0.14 higher than the fare on the corridor with more than one operator.

Share taken from air

6.80 Only in Italy has new entry been in a corridor in which air has a large share of total demand. Bergantino et al note that that the air share of the Rome to Milan market fell from 51% in 2008 to 26% in 2012, and estimate that average air fares fell by up to €13 as a result of the increased rail services.

Market profitability

6.81 In Great Britain, some parties have claimed that open access operators are loss-making, but we note that Hull Trains has reported profits in some years. It is also committing to buy new trains, which suggests that its shareholders consider the market to be commercially viable.

6.82 In Italy, Trenitalia has expanded services and NTV has accused it of dumping, but these representations have been dismissed.

6.83 In the Czech Republic, Tomes et al reported that "all three operators are most likely currently operating at a loss". RegioJet announced 2012 losses of CZK 76 million on revenues of CZK 267 million CZK (70% cost recovery) and LEO Express announced 2013 losses of CZK 159 million on revenues of CZK 193 million (18% cost recovery).

6.84 Unless operators are able to sell trains that they own, or return trains that they lease, then they may stay in the market as long as cash revenues exceed the variable costs of infrastructure, rolling stock maintenance, fuel and staff. This does not, however, mean that the services are commercially viable and represent a positive return on investment at current levels of demand and fares. On the evidence to date:

- It is unclear which new entrants will be commercially viable in the longer term, particularly if incumbents reduce fares but do not, or cannot, reduce service levels.
- It is unclear to what extent incumbents have responded to open access operators by better pricing or quality, increased efficiency or, where permitted, service reductions, or whether the principal effect has been lower earnings for the same cost base.

Summary

6.85 Competition and choice can arise through a number of mechanisms, including between the products of a single operator, through competition for the market, and through competition in the market.

6.86 New entry can offer a wider range of services and price/quality options, but may have offsetting disbenefits including infrastructure congestion, less effective timetables, and a reduction in services elsewhere to focus on markets with competition. In the Czech Republic, prioritising competing interurban services may have led to a loss of regular services and connections.

6.87 New entrants typically offer many fewer services than incumbents, which means that to be attractive they must offer a combination of higher quality, better service timings, or lower fares, which may be as low as half of those of the incumbent.

6.88 The evidence of the effect of new entrants on incumbents' fares is varied:

- In the UK, researchers have found no clear evidence that the incumbent has reduced its fares.
- In Italy, we found no time series data, and note that the incumbent now offers different classes of travel, making comparison with its previous fares difficult.
- In the Czech Republic, there has been a price war, with the incumbent offering some of the lowest fares, but it may be loss-making and its prices are under investigation by the Anti-Monopoly Office.
- In Sweden, the introduction of competition on the Stockholm to Gothenburg market has forced the incumbent to lower its fares.

6.89 It is not yet clear either:

- which new entrants will be commercially viable in the long term; or
- whether incumbents' response to competition has been improvements to quality or efficiency or merely a loss of the revenue earned, and hence profit, with the same cost base.

6.90 Competition in rail markets, particularly through open access operations, remains limited and relatively new, and the longer-term dynamics of competition are not yet known.

7 Quality and customer satisfaction

7.1 Table 7.1 summarises the analysis presented in this chapter.

Table 7.1: Quality: analysis by market sector

Market segment	Train service: average speed	Train service: length of day trip	Train service: frequency	Punctuality	Reliability	Station facilities
Suburban						●
Regional	●	●	●	●	●	
Interurban under 300 kilometres	●	●	●			●
Interurban over 300 kilometres	●	●	●	●	●	●
Long-distance high speed	●	●	●			●

Note: Information regarding station facilities was only gathered for the capital city of each Member State. Since, by definition, regional services do not call at the capital city, no information regarding station facilities has been gathered for the regional market segment.

7.2 In the absence of consolidated data on rolling stock fleets across Europe, one notable omission from this chapter is an analysis of fleet quality by Member State. Even if such data were available, quality attributes tend to be fleet-specific and may vary according to operator, time of day, day of week, service pattern and even within the same train formation, if rolling stock of different levels of equipment or from different fleets is joined to form a single train.

7.3 When passengers travel by rail, having accepted the primary factors such as fare, journey time and the frequency and costs involved in accessing the rail network, they have a number of requirements or 'needs'. From the perspective of rolling stock quality and the passengers' in-train experience, these 'needs' can be usefully grouped into six on-train factors:

- Cleanliness;
- Environment;
- Catering;
- On-train information provision;
- Technology; and
- Security.

7.4 It is unlikely that the extent to which an individual passenger's needs are being met by rolling stock quality attributes will be linear. In practice, there may also be a minimum threshold that passengers expect. Hence, while moving from 'reasonable' to 'good' quality rolling stock may only have modest benefits, an equivalent deterioration may have significant disbenefits.

7.5 It is also likely that incremental improvements to specific attributes are valued less after a certain quality thresholds are achieved. Moving from a good condition to a very good condition is likely to be valued higher than moving from a very good condition to an excellent condition. In some cases, passengers may not even notice additional improvements to conditions that were already considered to be very good.

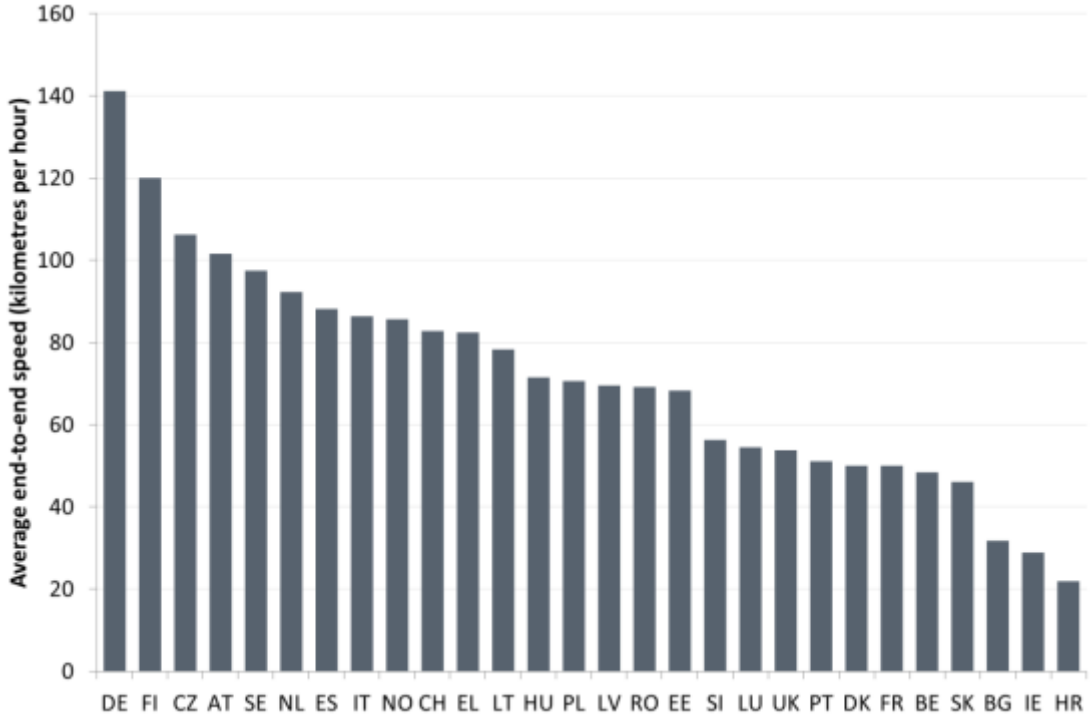
7.6 A second notable omission from this chapter is quality and satisfaction data for Switzerland, which is not covered by the monitoring sources identified. Alternative sources, such as the *European Railway Performance Index* compiled by Boston Consulting Group, consistently rank the Swiss railway system as the best in Europe when measured against the intensity of rail use, the quality of service and railway safety standards[41]. Looking at rail service quality in isolation (which captures whether trains are punctual and fast, and whether rail travel is affordable), Switzerland ranks fourth behind France, Finland and Denmark.

Journey time and feasible day trips

Regional

7.7 For a sample of stations described in Table 4.1 we estimated the average end-to-end speed from the direct distance between the two stations and the timetabled rail journey time. The results are shown in Figure 7.1.

Figure 7.1: Regional trips: average effective speeds



Source: railway websites, Steer Davies Gleave analysis
Note: average speed is for a single illustrative station-to-station pair (see Table 4.1 for details) and may not be representative

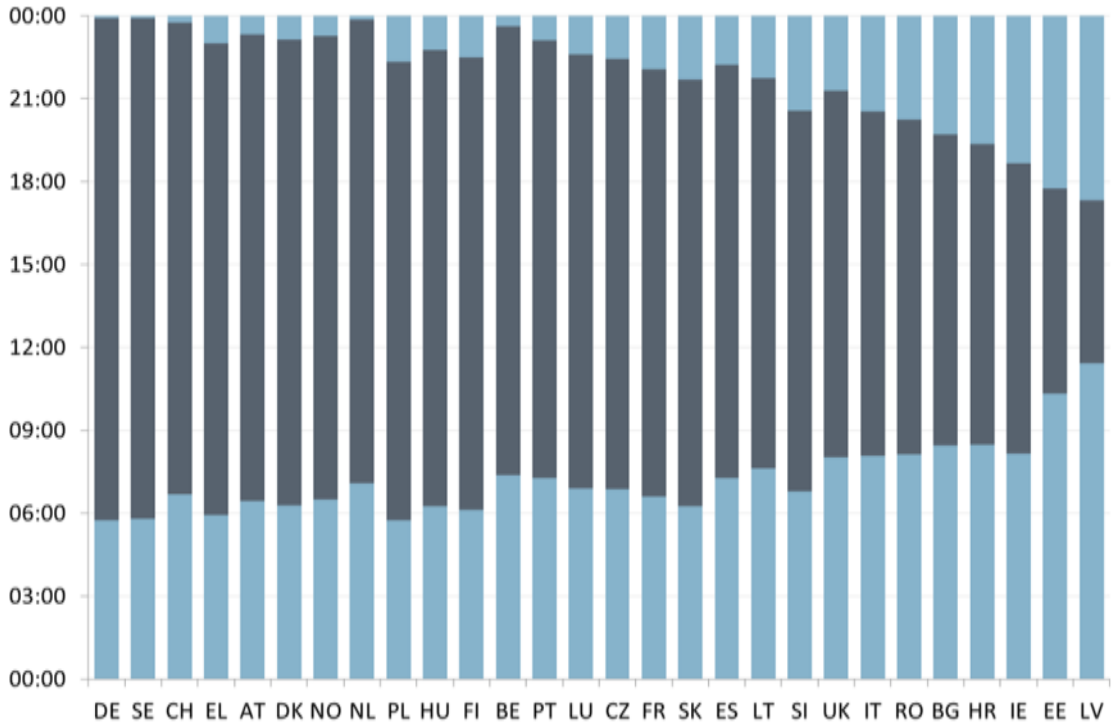
[41] See **https://www.bcgperspectives.com/content/articles/transportation_travel_tourism_public_sector_european_railway_performance_index/#chapter1**

7.8 The figure suggests that average speed is a function both of the infrastructure provided and of the number of intermediate stops, which may in turn be a function of patterns of settlement in the relevant region[42]. For example:

- The fastest regional journey in the sample, from Cologne to Duisburg in Germany, may have only one intermediate stop, in Düsseldorf.
- The slowest regional journey in the sample, from Zagreb to Varaždin in Croatia, may have up to 30 stops.

7.9 We also estimated the longest midweek day trip which could be made between the sample of stations, selecting the first outbound departure after 05:00 and the last return departure before 00:00 (midnight), using the timetable current from December 2014 to early December 2015. The results are summarised in Figure 7.2, which shows the earliest arrival and latest departure that can be achieved within a day, subject to the restrictions described above. The dark blue shaded area represents the duration of time that can be spent at the destination.

Figure 7.2: Regional trips: longest day trip



Source: railway websites, Steer Davies Gleave analysis
Note: length of day trip is for a single illustrative station-to-station pair (see Table 4.1 for details) and may not be representative, December 2014 timetable

7.10 It was possible to spend more than 18 hours at the destination in Germany and Sweden and more than 16 hours in a total of ten States. At the other extreme, in Latvia, the earliest possible arrival in Daugavpils from Krustpils was 11:26, and the last departure was at 17:20, giving a maximum stay of 5 hours 54 minutes. Following the introduction of the December

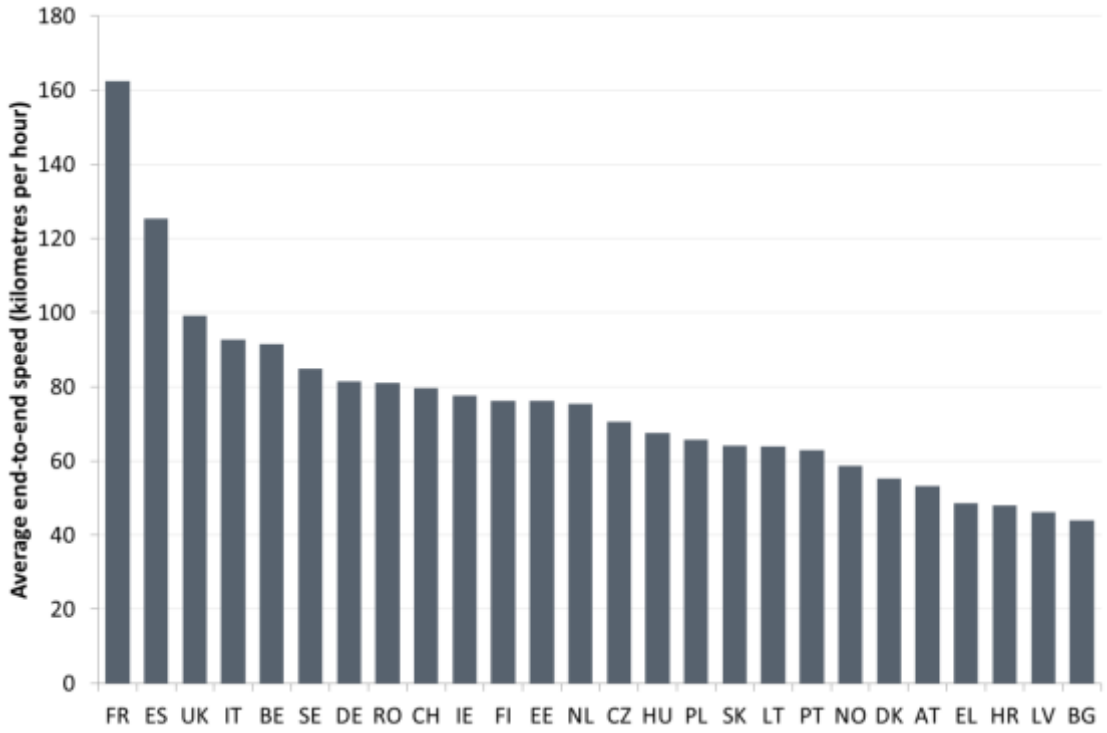
[42] In unpublished work for the Commission on the coach market we noted that, in the event of coach deregulation, operators might target end-to-end passengers on regional or interurban rail services with low average end-to-end speeds.

2015 timetable, we rechecked this journey option, and noted that the new timetable made it possible to arrive at 11:04 and leave at 17:35, giving a maximum stay of 6 hours 31 minutes. This illustrates how the length of stay available between any pair of stations may vary from year to year.

Interurban trips under 300 kilometres

7.11 For a sample of stations (described in Table 4.2) we estimated the average end-to-end speed from the direct distance between the two stations and the timetabled rail journey time. The results are shown in Figure 7.3.

Figure 7.3: Interurban trips under 300 kilometres: average effective speed



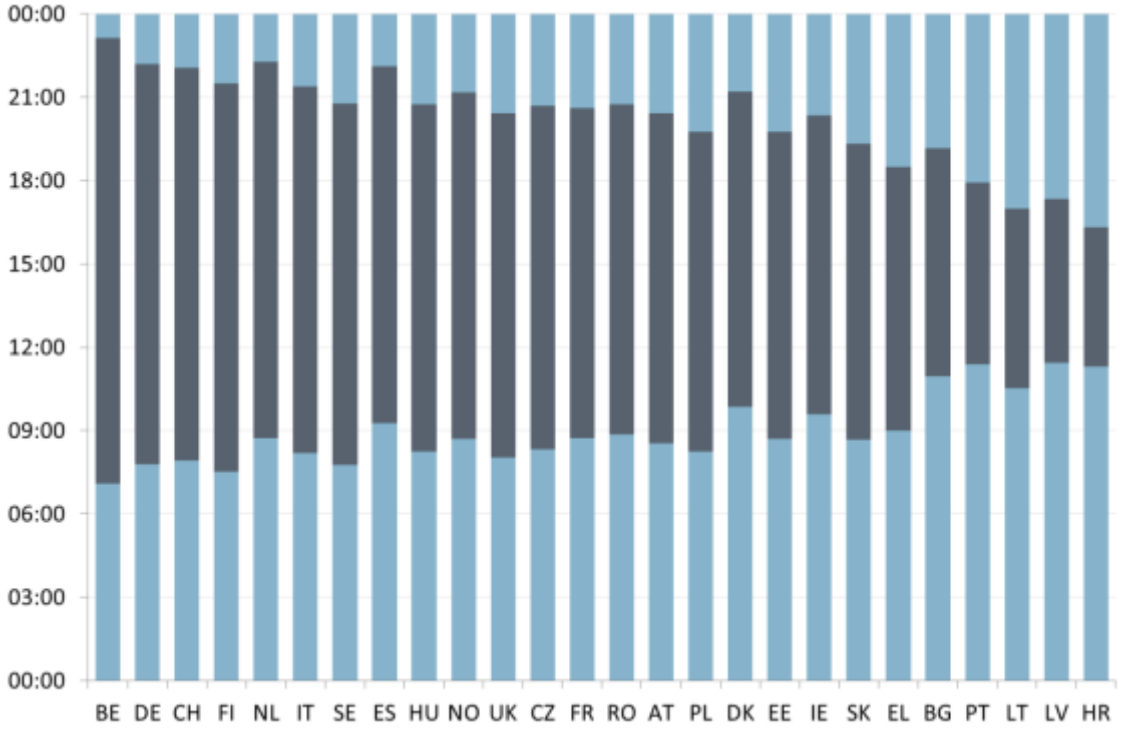
Source: railway websites, Steer Davies Gleave analysis. Note that services in France and Spain use high speed lines
Note: average speed is for a single illustrative station-to-station pair (see Table 4.2 for details) and may not be representative

7.12 Average speeds varied from over 160 kilometres per hour, between Paris and Reims, to 40-50 kilometres per hour, in Greece, Croatia, Latvia and Bulgaria.

7.13 We also estimated the longest midweek day trip which could be made between the sample of stations, again selecting the first outbound departure after 05:00 and the last return departure before 00:00 (midnight), using the timetable current from December 2014 to early December 2015. The results are summarised in Figure 7.4.

7.14 It was possible to spend more than 16 hours on a visit from Brussels to Liege, although the cities are only 90 kilometres apart, and over 14 hours on a visit from Munich to Stuttgart. At the other extreme, it was only possible to spend between five and six hours at the destination in Latvia and Croatia.

Figure 7.4: Interurban trips under 300 kilometres: longest day trip



Source: railway websites, Steer Davies Gleave analysis. Note that services in France and Spain use high speed lines
Note: length of day trip is for a single illustrative station-to-station pair (see Table 4.2 for details) and may not be representative, December 2014 timetable

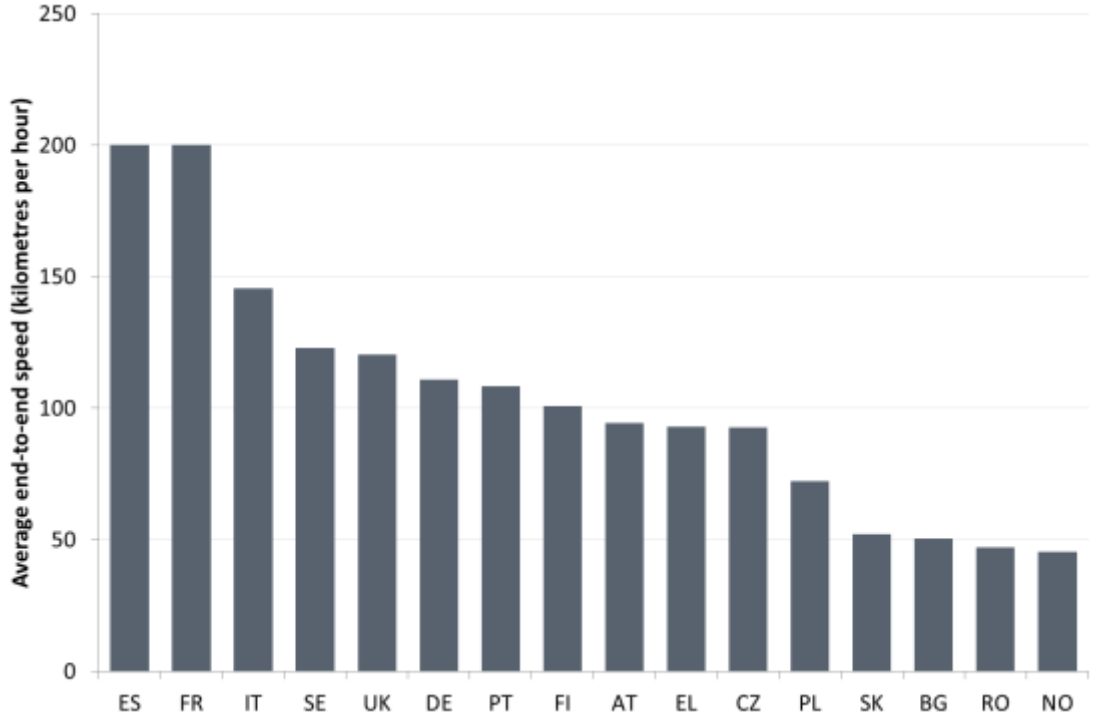
Interurban trips over 300 kilometres

7.15 For the sample of stations described in Table 4.3 we estimated the average end-to-end speed from the direct distance between the two stations and the timetabled rail journey time. The results are shown in Figure 7.5.

7.16 The highest average end-to-end speeds were around 200 km/h in Spain and France, where Madrid-Barcelona and Paris-Lyon services both use part of the dedicate double-track domestic high speed network. In contrast, Norway's Oslo to Bergen service operates over Europe's highest main railway line which climbs to, and descends from, an altitude of 1,237 metres en route. It is mainly on single track, which means that trains have to wait to pass in loops, and Oslo to Bergen services average less than 50 kilometres per hour.

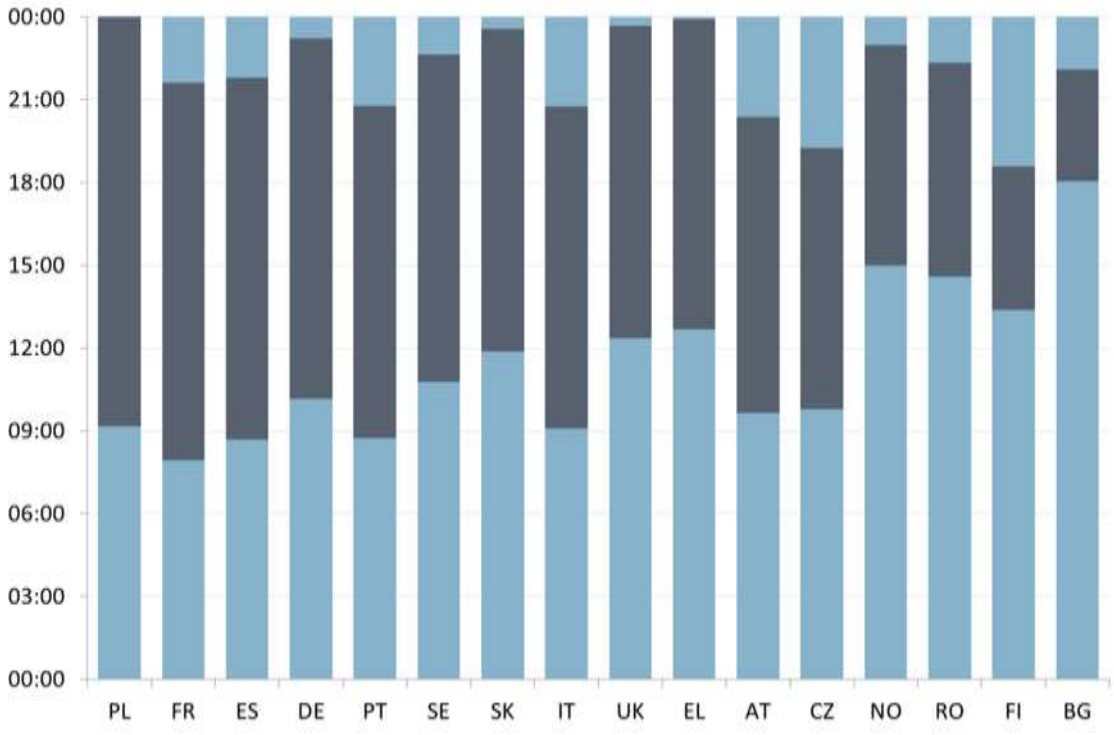
7.17 We also estimated the longest midweek day trip which could be made between the sample of stations, again selecting the first outbound departure after 05:00 and the last return departure before 00:00 (midnight), using the timetable current from December 2014 to early December 2015. The results are summarised in Figure 7.6.

Figure 7.5: Interurban trips over 300 kilometres: average effective speed



Source: railway websites, Steer Davies Gleave analysis. Note that services in France and Spain use high speed lines
Note: average speed is for a single illustrative station-to-station pair (see Table 4.3 for details) and may not be representative

Figure 7.6: Interurban trips over 300 kilometres: longest day trip



Source: railway websites, Steer Davies Gleave analysis. Note that services in France and Spain use high speed lines
Note: length of day trip is for a single illustrative station-to-station pair (see Table 4.3 for details) and may not be representative, December 2014 timetable

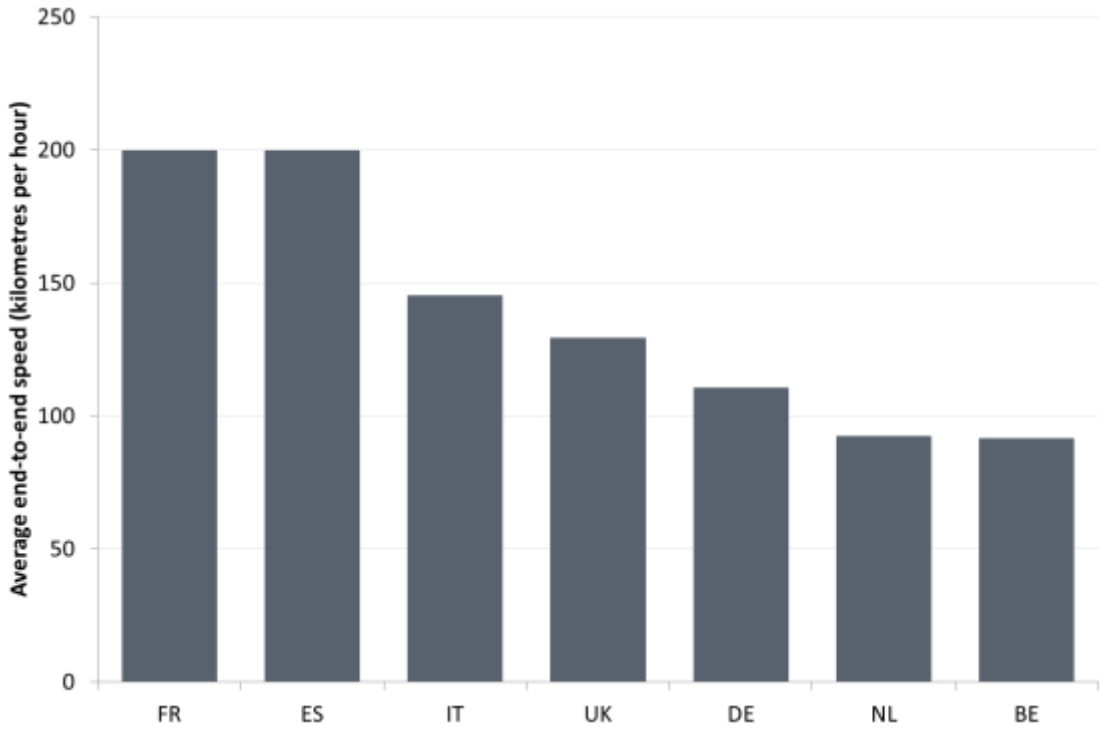
7.18 It is possible to spend over 14 hours in Wroclaw on a day trip from Warsaw and almost as long in Lyon on a day trip from Paris. Among other examples:

- To spend more than one hour in Bergen on a day trip from Oslo, it is necessary to return on the overnight train departing at 23:59 and not arriving until 06:25.
- We identified an option allowing 5 hours in Thessaloniki on a day trip from Athens, rather than the 23:55 return overnight shown, but it was not available on the day we researched.

Domestic high speed

7.19 For the sample of stations described in Table 4.4 we estimated the average end-to-end speed from the direct distance between the two stations and the timetabled rail journey time. The results are shown in Figure 7.7.

Figure 7.7: Domestic high speed trips: average effective speed

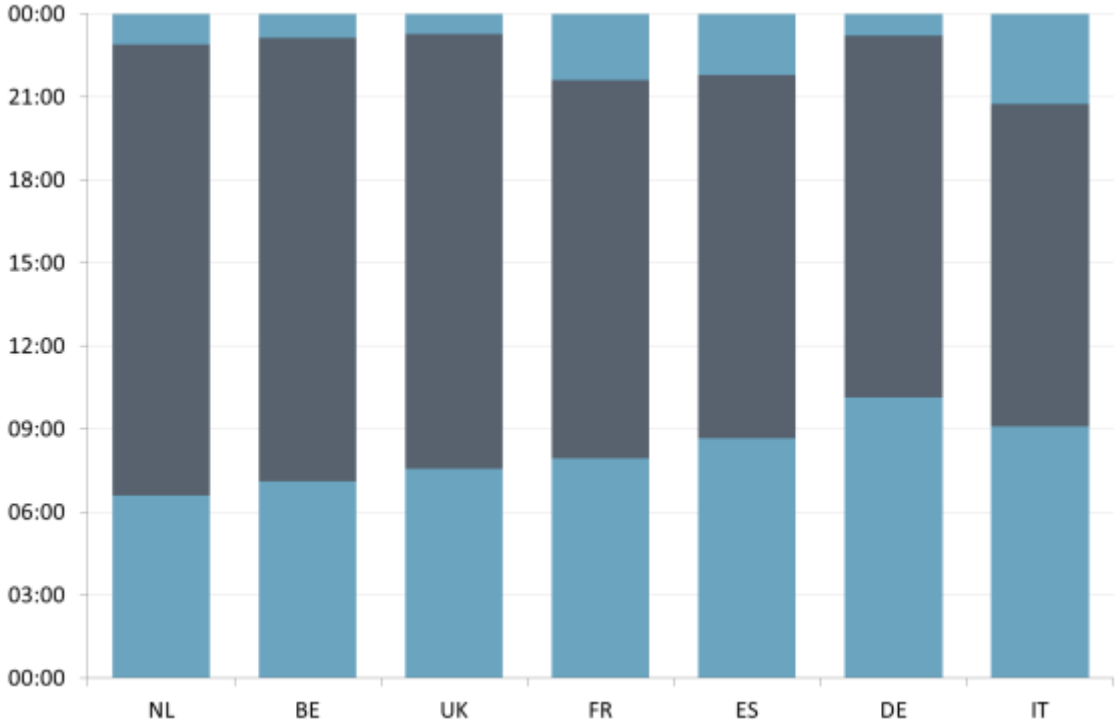


Source: railway websites, Steer Davies Gleave analysis
Note: average speed is for a single illustrative station-to-station pair (see Table 4.4 for details) and may not be representative

7.20 The highest average end-to-end speeds were around 200 kilometres per hour in Spain and France, where Madrid-Barcelona and Paris-Lyon services both use part of the dedicated double-track domestic high speed network. Average speeds are lower over shorter distances, as in the UK, Netherlands and Belgium, or where high speed infrastructure is only available over part of the route, as in Germany.

7.21 We also estimated the longest midweek day trip which could be made between the sample of stations, again selecting the first outbound departure after 05:00 and the last return departure before 00:00 (midnight), using the timetable current from December 2014 to early December 2015. The results are summarised in Figure 7.8.

Figure 7.8: Domestic high speed trips: longest day trip



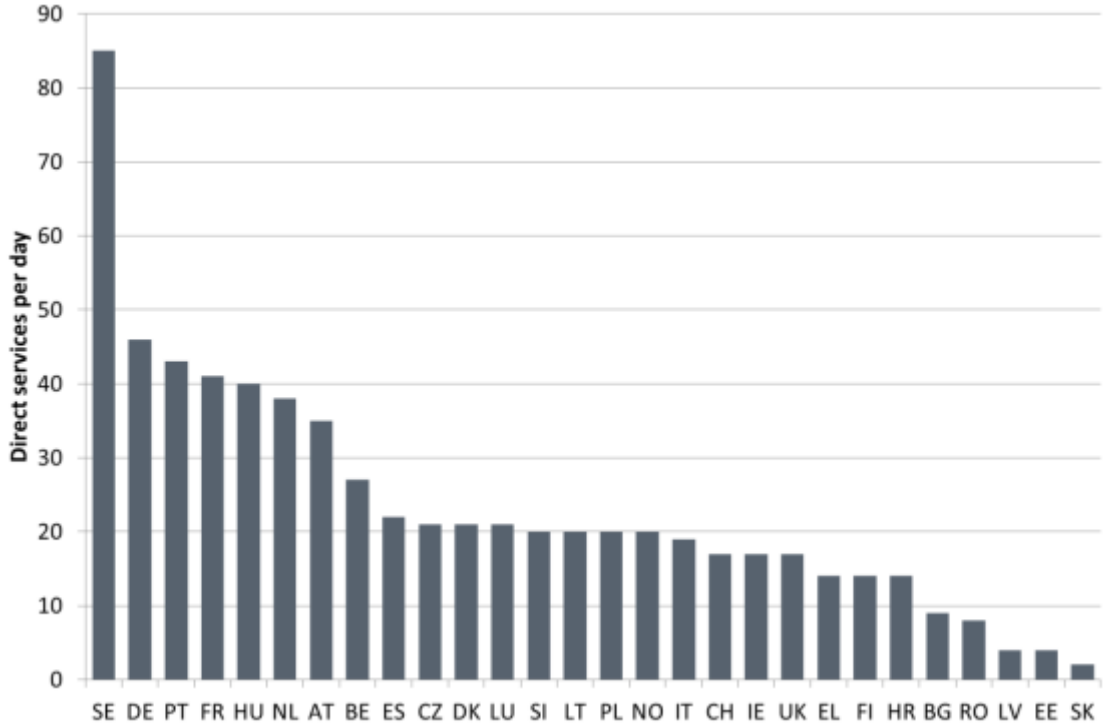
Source: railway websites, Steer Davies Gleave analysis
Note: length of day trip is for a single illustrative station-to-station pair (see Table 4.4 for details) and may not be representative, December 2014 timetable

7.22 High speed services generally make it possible to spend a relatively long period away on a day trip. The shortest time at destination in the sample is 8 hours in Milan, 480 kilometres from Rome.

Service frequency

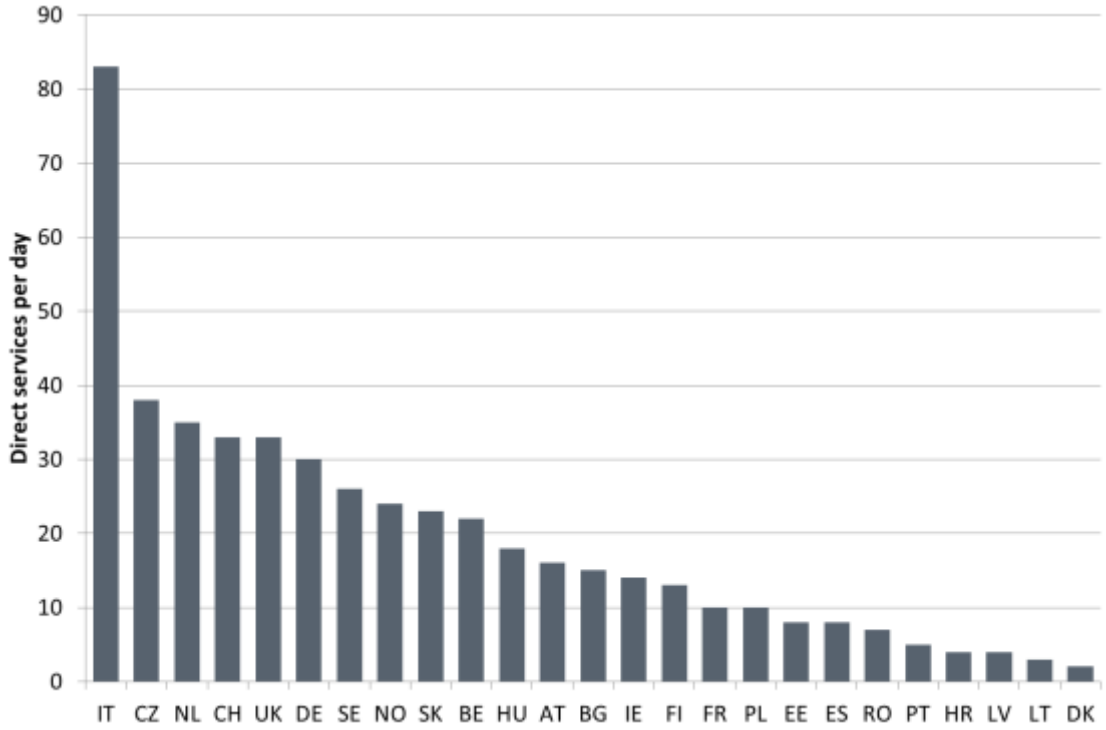
7.23 Rail service frequency data was taken from the *European Rail Timetable: January 2016*, supplemented with information from railway booking websites where necessary, for regional, intercity and high-speed services. The station pairs examined are reported in Table 4.1 to Table 4.4, and the results are presented in Figure 7.9 to Figure 7.12 below.

Figure 7.9: Regional trips: rail service frequency



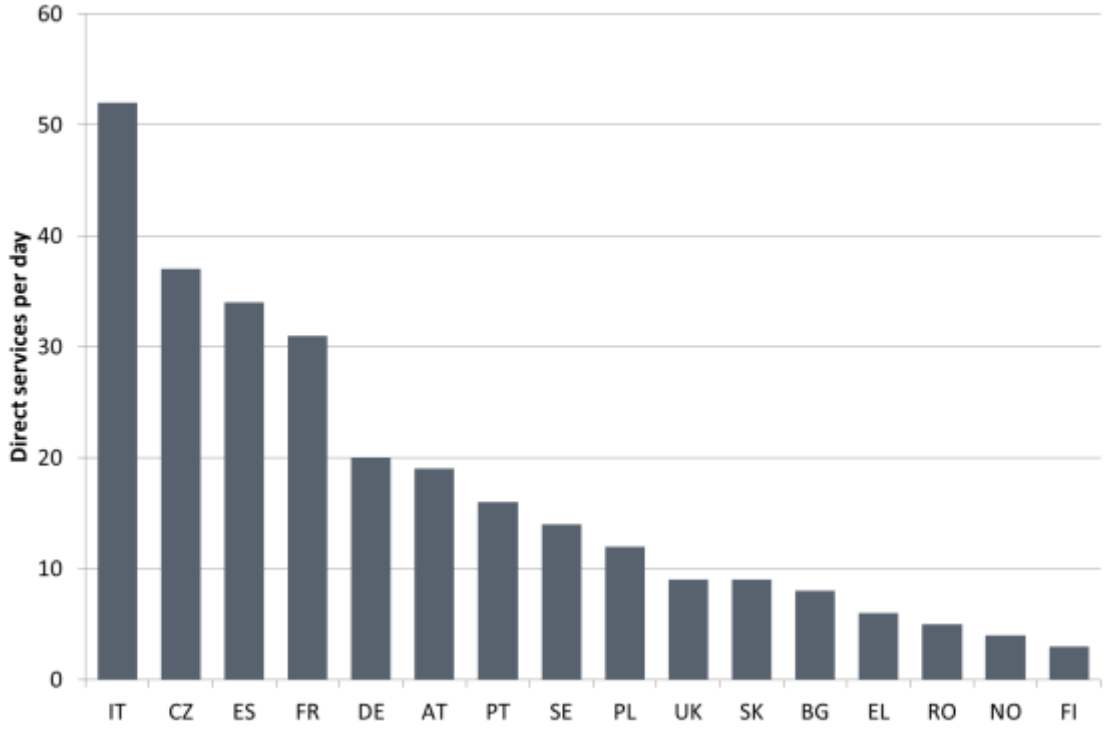
Source: European Rail Timetable (January 2016) supplemented by railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.1 for details) and may not be representative.

Figure 7.10: Interurban trips under 300 kilometres: rail service frequency



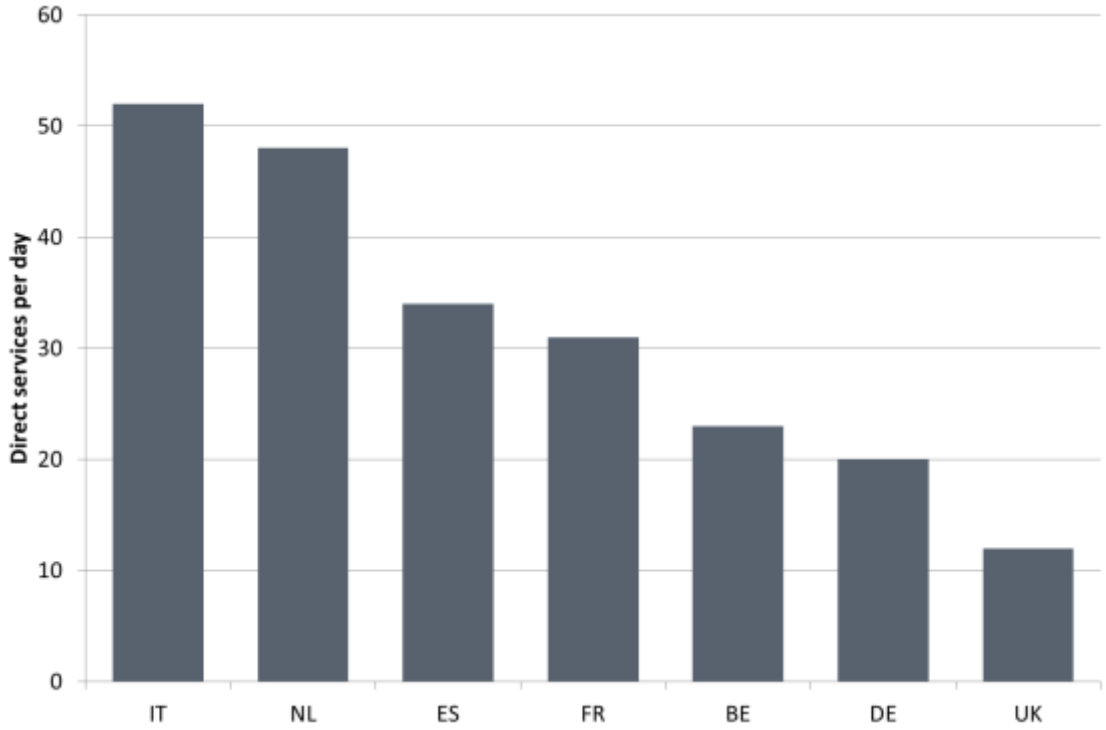
Source: European Rail Timetable (January 2016) supplemented by railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.2 for details) and may not be representative.

Figure 7.11: Interurban trips over 300 kilometres: rail service frequency



Source: European Rail Timetable (January 2016) supplemented by railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.3 for details) and may not be representative.

Figure 7.12: Domestic high speed trips: rail service frequency



Source: European Rail Timetable (January 2016) supplemented by railway websites, Steer Davies Gleave analysis
Note: data are for a single station-to-station pair (see Table 4.4 for details) and may not be representative.

Punctuality and reliability

7.24 We extracted punctuality and reliability data from the Rail Market Monitoring Scheme (RMMS) dataset. RMMS does not include data for all Member States and data is shown for all years (2012-2014) where it is available[43].

Punctuality

7.25 RMMS punctuality data is almost complete, with only Greece and Switzerland (which is not a member of the RMMS scheme) not recorded. Most Member States define a train as being on time if it is delayed by 5 minutes or less for regional services, and by 15 minutes or less for long-distance services. Member States that define on time services differently from this are reported in Table 7.2 below.

Table 7.2: Quality: services defined as on time in RMMS

	Regional services	Long-distance services
Austria	Delayed 5 minutes or less	Delayed 5 minutes or less
Denmark	Delayed by 2 minutes 29 seconds or less	Delayed by 4 minutes 59 seconds or less
France	Delayed 5 minutes and 59 seconds or less	Delayed by: • 5 minutes or less for a journey of a maximum duration of one hour and a half • 10 minutes or less for a journey of a duration between one hour and a half and three hours 15 minutes or less for a journey of a minimum duration of three hours
Germany	Delayed by 5 minutes 59 seconds or less	Delayed by 5 minutes 59 seconds or less
Lithuania	Delayed 5 minutes or less	Delayed 5 minutes or less
Netherlands	Delayed 3 minutes or less	Delayed 5 minutes or less
Spain	Delayed by: • Less than 10 minutes for 'middle distance' services • Less than 3 minutes for 'commuter services	Delayed by: Less than 5 minutes (AVE long-distance services) Less than 10 minutes (other long-distance services)
Poland	Delayed 5 minutes or less	Delayed 5 minutes or less
United Kingdom	Delayed 5 minutes or less	Delayed 10 minutes or less

Source: Rail Market Monitoring Scheme dataset

7.26 Given the range of exogenous and endogenous factors that might affect the level of punctuality recorded, it is difficult to draw meaningful comparisons between punctuality data. Nonetheless, Figure 7.13 illustrates that the proportion of regional and local services arriving at their destination "on-time" ranges from 99% in Estonia to 78% in Hungary.

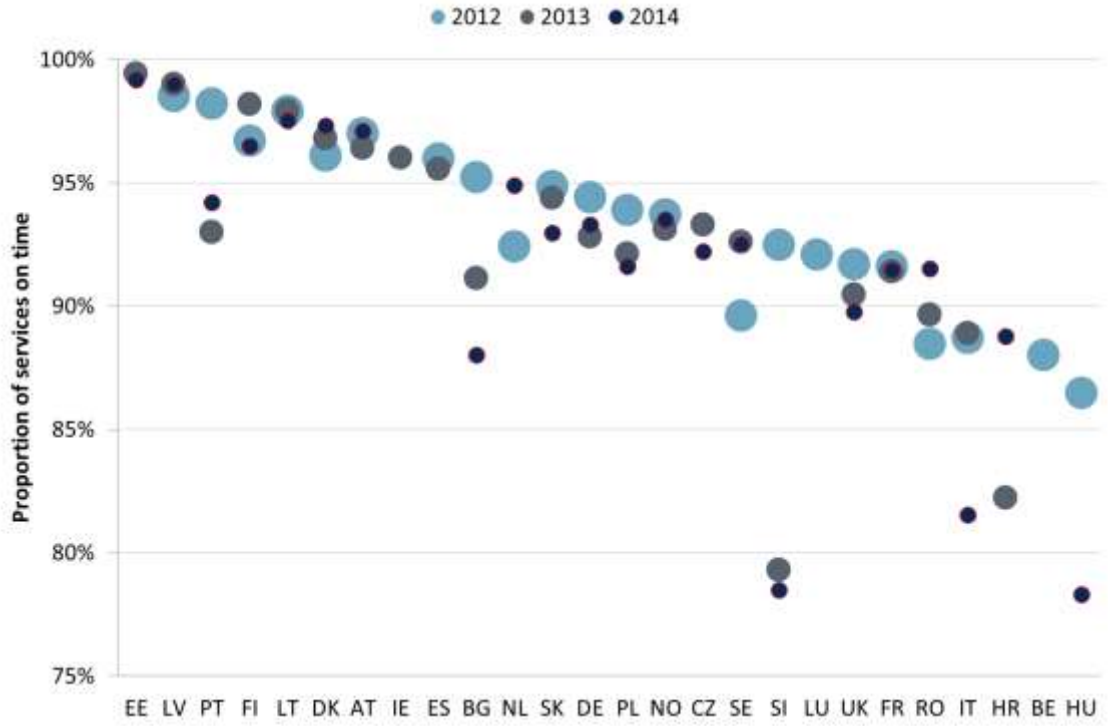
7.27 The best performing Member States have small passenger rail networks, and Spain is the only large network recording punctuality over 95%. Three of the best performing regional and local networks are those of the Baltic States where the number of passenger services is limited on fixed infrastructure dominated by freight traffic. This may be because the relatively sparse

[43] RMMS punctuality and reliability data is only available from the years 2012-2014

passenger timetable reduces the consequential impact of service disruptions, or because of greater recovery times in the timetable which limit the impact of perturbations.

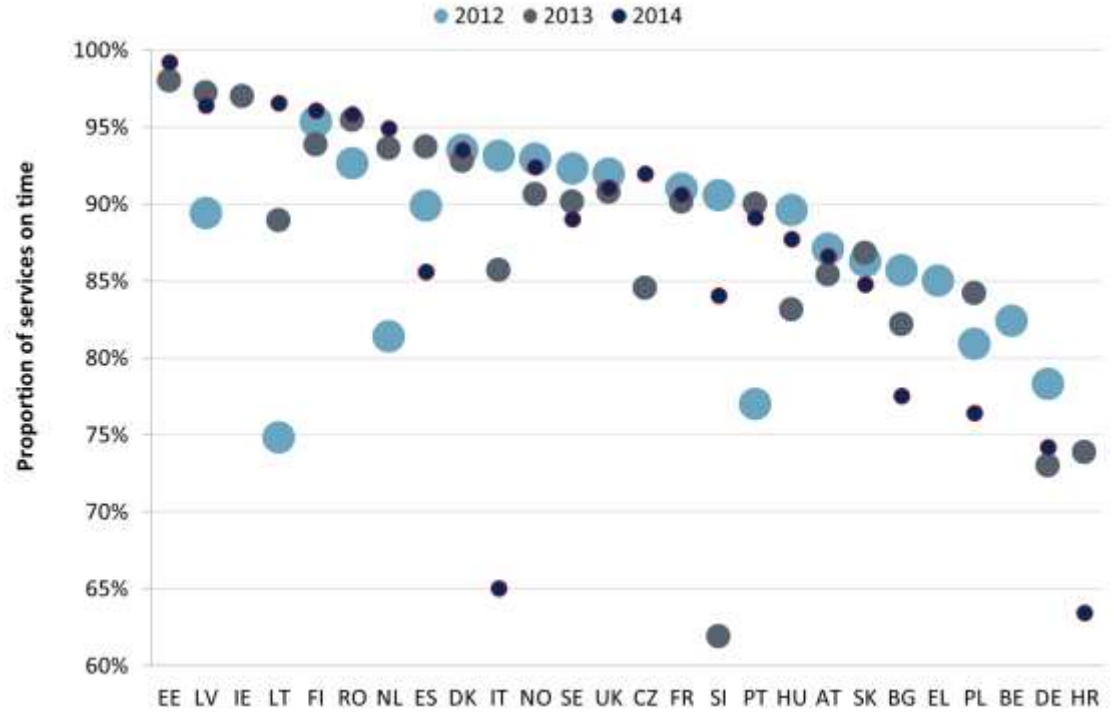
7.28 The punctuality of long-distance services is shown in Figure 7.14 and tends to be worse than regional and local services. The number of on-time trains ranges from 99% in Estonia, to 63% in Croatia. Germany and Italy, two of the largest networks, have some of the lowest long-distance punctuality scores, both with under 75% of services being on time. While the punctuality threshold used in Germany is stricter than in Italy (5:59 and 15 minutes respectively) the punctuality of long-distance services in Germany is nevertheless significantly worse than in Austria, the Netherlands and Denmark which apply an even stricter 5-minute threshold. As with regional and local services, the relatively small networks of the three Baltic States (and Ireland) are the best performing.

Figure 7.13: Punctuality of regional and local passenger services by Member State



Source: Steer Davies Gleave analysis of RMMS punctuality data.
Note: definition of "on time" varies and may include trains up to 15 minutes late in some States.

Figure 7.14: Punctuality of long-distance passenger services by Member State



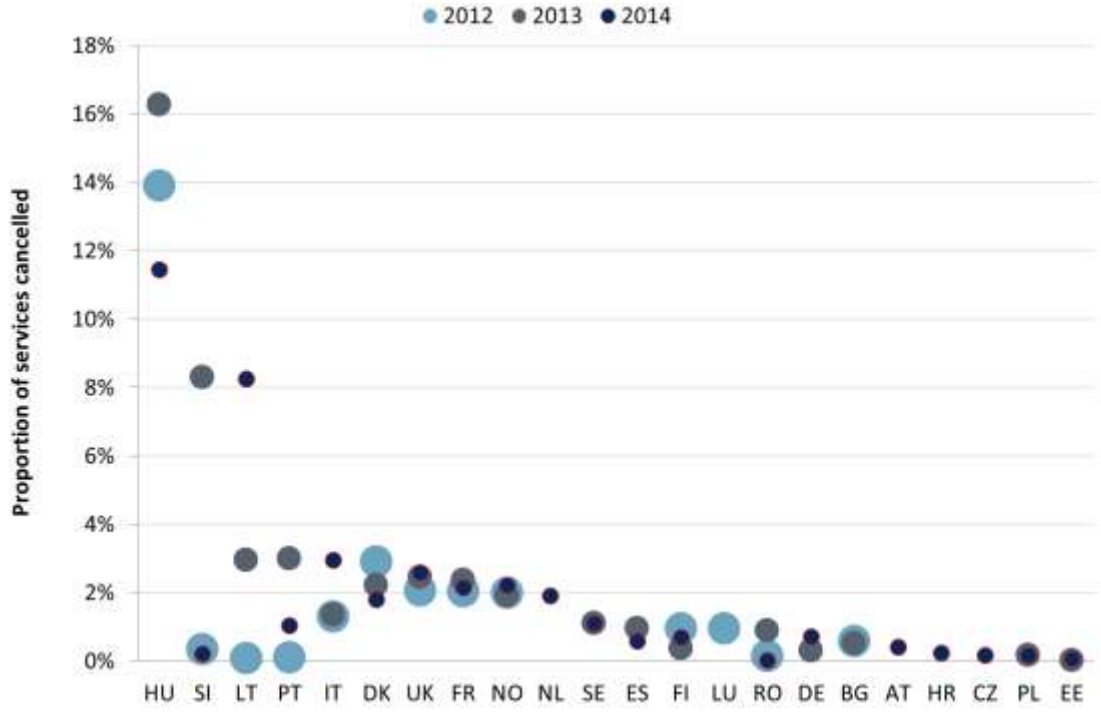
Source: Steer Davies Gleave analysis of RMMS punctuality data
Note: definition of "on time" varies and may include trains up to 5 minutes late in some States.

Reliability

7.29 Reliability is defined as the proportion of scheduled passenger services that are cancelled. As can be seen in Figure 7.15 and Figure 7.16, comparable data is only available for a sample of Member States. As a consequence it is not possible to make meaningful generalisations on the data.

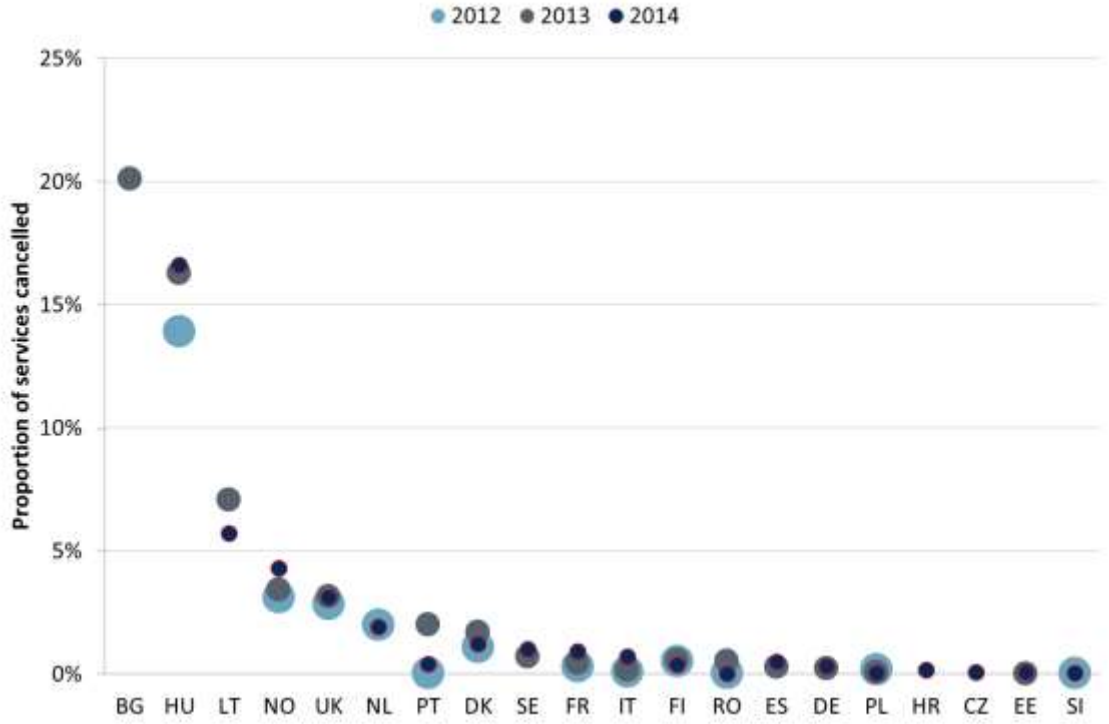
7.30 With the exception of regional services in Bulgaria, Eastern European Member States for which we have data appear to cancel a far high proportion of their services than elsewhere. This may, in part, explain Lithuania's relatively strong performance against punctuality metrics: if a train is cancelled it cannot be recorded as late. No Western or Central European Member States cancelled more than 3% of regional or 5% of long-distance services.

Figure 7.15: Reliability of regional and local passenger services by Member State



Source: Steer Davies Gleave analysis of RMMS reliability data

Figure 7.16: Reliability of long-distance passenger services by Member State



Source: Steer Davies Gleave analysis of RMMS reliability data

Station facilities

7.31 We based our assessment of station facilities primarily on desk research, supplemented where necessary with information gathered through Member State case studies and questionnaire responses. Our principal source of information was the infrastructure manager or operator website for a main railway station identified in each capital city (Table 7.4 below lists the stations selected).

7.32 We assessed and scored the quality and clarity of online information available for each Member State against a range of criteria, to provide a subjective measure of the quality of the information from the perspective of a passenger planning a journey. We examined both the local language website and, where it existed, the English language website, focusing on the former.

7.33 To obtain a score for each station we identified a list of station attributes which may be of interest to prospective passengers. These include:

- Train departure times and platforms;
- Ticketing facilities (such as ticket vending machines and booking office facilities);
- Ticket office opening hours;
- Connections with other public transport services;
- Accessibility and facilities for persons of reduced mobility and hours in which assistance is provided;
- Parking areas and cycle facilities; and
- WiFi connectivity.

7.34 The majority of the websites we examined provide information on ticket facilities and on booking office opening times. Information is also available on services for persons of reduced mobility and the hours in which it is possible for assistance to be provided at each facility.

7.35 However, few station facilities websites provide clear and easy accessible information on train times or departure platforms, which may be the responsibility of either the operator or infrastructure manager. Many operators or infrastructure managers provide real time information on train arrival and departure times at stations, but do not normally state on their website whether or what information is available on screens at the station. The provision of information at stations could only be confirmed either by visiting each station or contacting station facilities managers, and is beyond the scope of this study. In addition to scoring the station attributes themselves, we also scored the quality and clarity of online information using the evaluation and scoring criteria shown in Table 7.3.

Table 7.3: Quality: station facilities scoring system

Finding	Score
No information available	N/A
Limited or poor quality information and/or provision	1
Reasonable information and/or provision	2
Exhaustive and clear information and/or extensive provision of facilities	3

7.36 Table 7.4 shows the results of our assessment.

Table 7.4: Quality: online information on station facilities

Member State		Principal railway station	Station facilities									
			Ticket buying facilities	Train times/ platform	Public transport connections	Assistance hours	PRM facilities	Booking office hours	Parking facilities	Cycle hire scheme	Wi-Fi	Total score
BE	Belgium	Brussels Gare Centrale	3	3	3	3	3	3	3	3	n/a	24
BG	Bulgaria	Sofia Central Railway Station	1	2	n/a	2	1	2	n/a	n/a	n/a	8
CH	Switzerland	Bern Hauptbahnhof	2	2	n/a	2	3	2	3	3	n/a	17
CZ	Czech Republic	Prague hlavní nádraží	3	2	3	3	1	3	n/a	2	n/a	17
DK	Denmark	Copenhagen Hovedbanegård	2	n/a	n/a	3	3	3	3	2	n/a	16
DE	Germany	Berlin Hauptbahnhof	3	3	3	3	3	3	3	3	3	27
EE	Estonia	Tallinn Balti jaam	1	1	3	n/a	n/a	n/a	n/a	n/a	2	6
IE	Ireland	Dublin Connolly	3	3	2	3	3	3	3	3	3	26
EL	Greece	Athens Syntagma	2	1	1	1	2	1	n/a	n/a	n/a	8
ES	Spain	Madrid Chamartín	n/a	3	3	3	3	3	2	n/a	n/a	17
FR	France	Paris Gare de Lyon	2	3	3	2	2	1	n/a	n/a	n/a	13
HR	Croatia	Zagreb Glavni kolodvor	1	2	n/a	n/a	n/a	1	n/a	2	1	7
IT	Italy	Rome Termini	1	3	n/a	1	1	1	n/a	n/a	n/a	7
LV	Latvia	Riga Centrālā stacija	n/a	n/a	n/a	n/a	1	n/a	n/a	n/a	n/a	1
LT	Lithuania	Vilnius Geležinkelio stotis	2	2	n/a	1	3	1	n/a	n/a	n/a	9
HU	Hungary	Budapest Keleti palyaudvar	2	2	n/a	2	3	2	n/a	2	n/a	13
NL	Netherlands	Amsterdam Centraal	3	3	2	2	3	2	3	3	2	23
NO	Norway	Oslo sentralstasjon	3	3	3	3	3	3	3	3	n/a	24
AT	Austria	Vienna Hauptbahnhof	n/a	3	2	n/a	3	n/a	3	n/a	3	14
PL	Poland	Warsaw Centralna	2	n/a	n/a	n/a	1	1	1	n/a	1	6
PT	Portugal	Lisbon Rossio	2	n/a	1	3	3	2	n/a	n/a	n/a	11
RO	Romania	București Gara de Nord	1	2	n/a	n/a	1	1	n/a	2	n/a	7
SI	Slovenia	Ljubljana Central train station	1	n/a	n/a	2	2	2	n/a	n/a	n/a	7
SK	Slovakia	Bratislava hlavná stanica	1	1	n/a	1	1	1	n/a	1	n/a	6
FI	Finland	Helsinki Päärautatieasema	2	3	3	2	3	2	3	2	n/a	20
SE	Sweden	Stockholms Centralstation	2	3	n/a	3	3	3	3	n/a	3	20
UK	UK	London Kings Cross	3	3	3	2	3	2	3	3	3	25

Customer satisfaction

7.37 The principal source of comparable pan-European data on customer satisfaction with rail services is the Eurobarometer survey of *Europeans' satisfaction with rail services*[44].

7.38 Reports on service quality performance are also made available through ERADIS (European Railway Agency Database of Interoperability and Safety), published according to Article 28(2) of Rail Passenger Rights Regulation 1371/2007, which states that railway undertakings shall publish each year a report on their service quality performance[45,46].

7.39 A preliminary review of information available in the ERADIS database identified a number of heterogeneous reports on different aspects of service quality provided by train operators. We have undertaken a further review of this information in the context of customer satisfaction data and note that:

- ERADIS contains incomplete operator level data, and therefore does not necessarily provide a comprehensive indication of levels of customer satisfaction across the relevant national network;
- the data comes from diverse sources and is therefore rarely comparable between Member States or even between individual operators; and
- Responses provided under Article 28(2) of Regulation 1371/2007 typically describe the nature and approach to undertaking customer satisfaction surveys, rather the results of the surveys.

7.40 In light of the observations above we did not attempt to normalise the information provided in ERADIS in order to draw conclusions regarding levels of customer satisfaction between Member States.

The Eurobarometer survey

7.41 The Flash Eurobarometer Survey on *Europeans' satisfaction with rail services* was conducted in 2012-13 to analyse public satisfaction with a number of features of rail transport. The two main objectives of the survey were to:

- "measure satisfaction with rail services"; and
- "understand the accessibility issues that arise when using rail services and measure satisfaction with rail service accessibility (particularly among those with accessibility issues)[47]."

7.42 Headline satisfaction scores for stations and rail services by Member State are presented in Figure 7.17. These are composite measures which are based on the full range of satisfaction questions for stations (four measures) and rail services (seven measures).

---

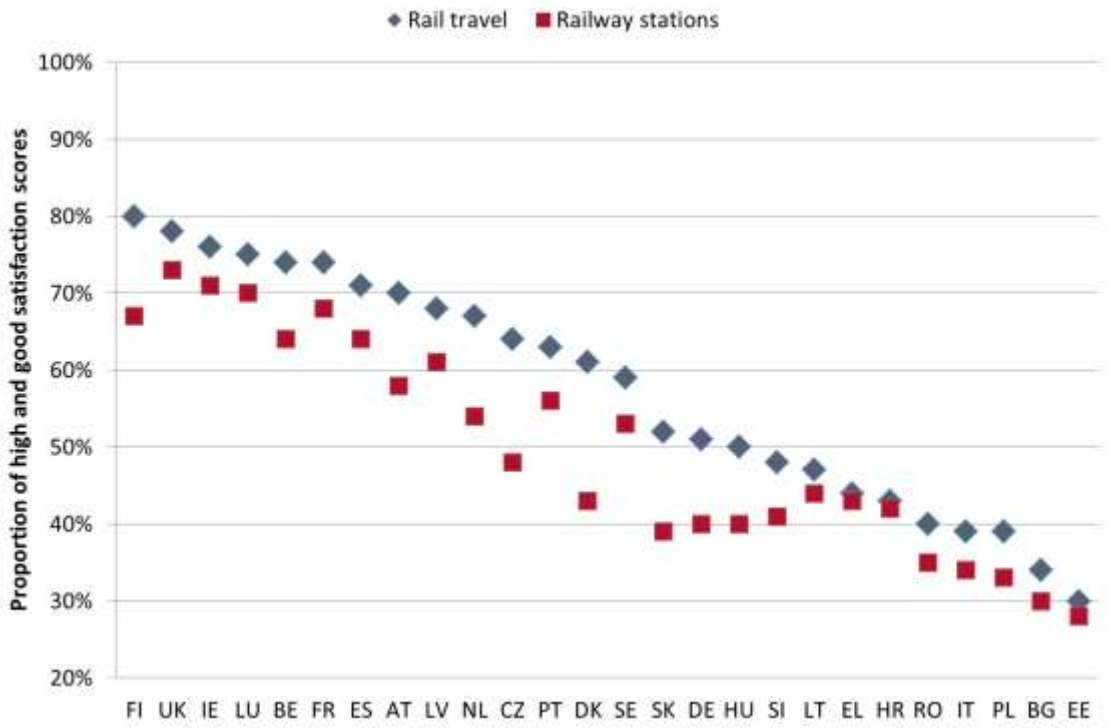
[44] Flash Eurobarometer 382a *European's satisfaction with rail services*, DG MOVE European Commission, 2013

[45] Article 2 of Regulation 1371/2007 allows Member States to exempt domestic services from this obligation

[46] Member States may exempt domestic services from this obligation (see Article 2 of Regulation (EC) 1371/2007)

[47] Respondents were asked whether they are satisfied with various aspects of the accessibility of railway stations for persons with reduced mobility. Results were disaggregated according to whether the respondent was mobility impaired.

Figure 7.17: Eurobarometer scores: railway stations and rail services (2012-2013)



Source: Flash Eurobarometer 382a, Steer Davies Gleave analysis.
Note: "High" and "good" satisfaction scores have been combined.

7.43 Overall, roughly half (51%) of respondents score their level of satisfaction with railway stations as "high" or "good", with the remainder (49%) recording "medium" or "low" satisfaction levels. "High" and "good" satisfaction scores are typically more prevalent in Western European Member States. However, Germany and Denmark underperform compared to their Northern European peers, and Latvia outperforms other Baltic States by a considerable margin. Respondents in Italy were particularly dissatisfied with their railway stations.

7.44 A slightly larger proportion (55%) of respondents score their level of satisfaction with rail services as "high" or "good" compared to satisfaction with railway stations. While there is a clearer distinction in satisfaction levels between Western and Eastern European Member States, we note that satisfaction with railway services in Italy is considerably lower than in other Mediterranean countries.

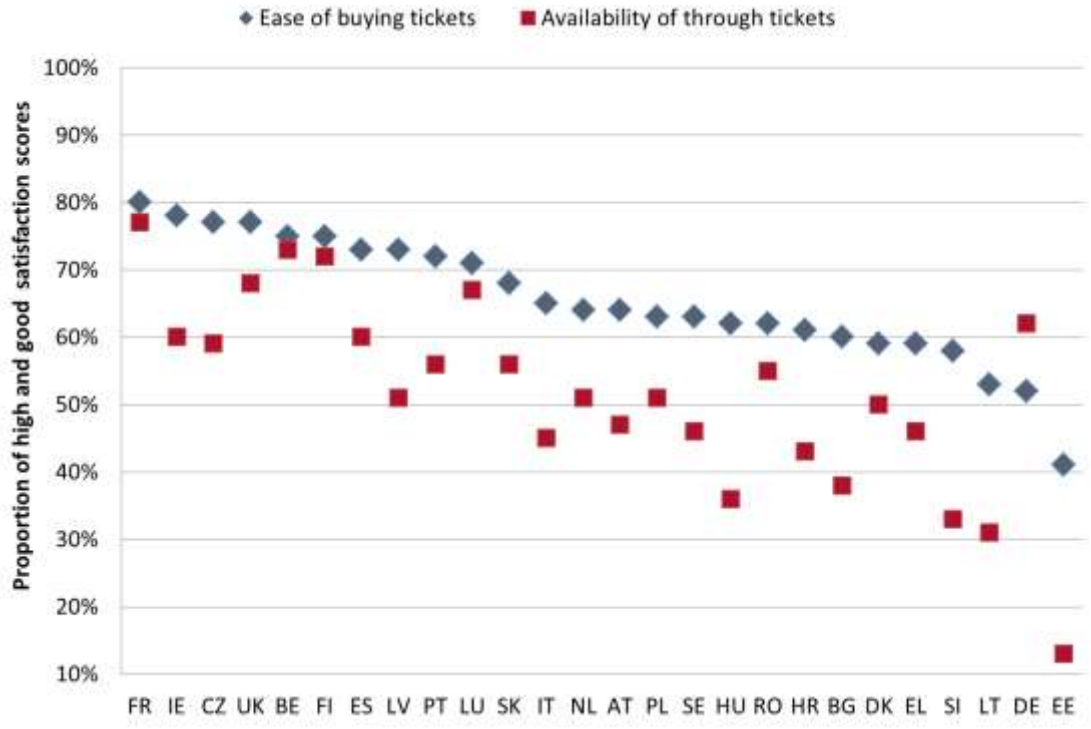
7.45 The Eurobarometer survey also collected satisfaction data on a wide range of railway station and rail service characteristics, many of which are of direct relevance to this study. In particular, the survey considered:

- ease of buying tickets;
- frequency of trains;
- punctuality and reliability; and
- availability of through tickets for journeys which may require the use of more than one train, provided by more than one operator, or funded by more than one authority.

7.46 Satisfaction levels for each of these attributes by Member State are shown below.

7.47 Figure 7.18 shows the proportion of survey respondents recording “high” and “good” satisfaction for two measures related to ticket sales, the ease of buying tickets and the availability of through tickets.

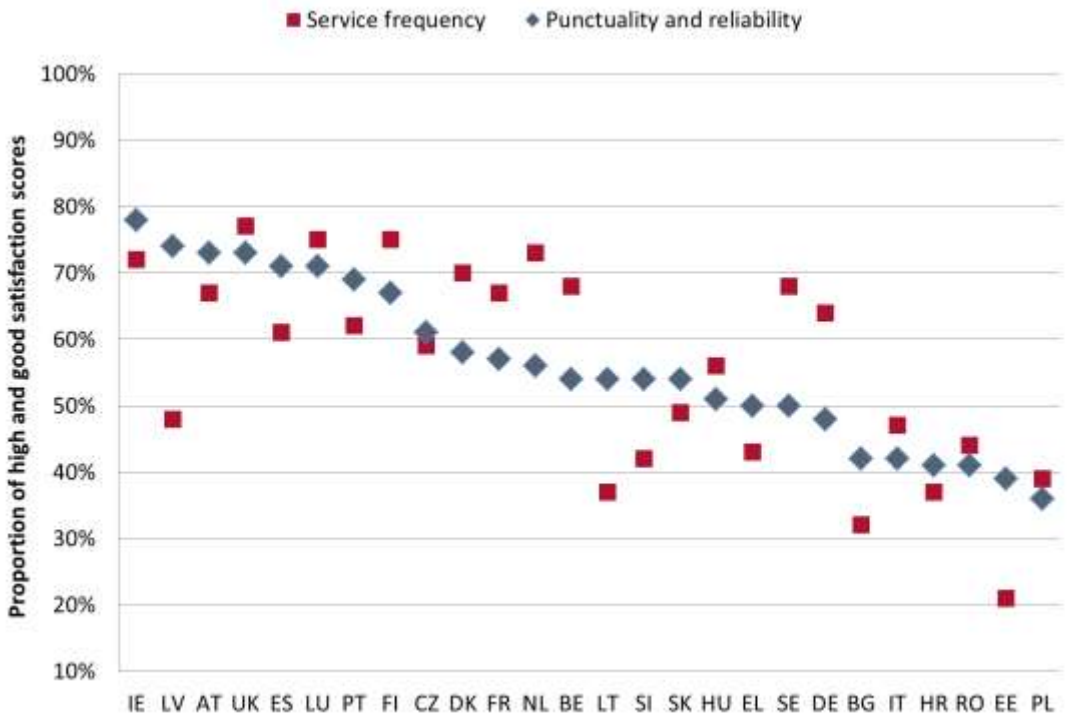
Figure 7.18: Eurobarometer scores: ticketing attributes (2012-2013)



Source: Flash Eurobarometer 382a, Steer Davies Gleave analysis.
Note: “High” and “good” satisfaction scores combined.

7.48 French railways received the highest rating for both the ease of buying tickets (80%) and the availability of through tickets (77%). Satisfaction with ease of buying tickets exceeded 50% except in Estonia. Satisfaction with through ticketing was often low.

Figure 7.19: Eurobarometer scores: frequency and punctuality and reliability (2012-2013)



Source: Flash Eurobarometer 382a, Steer Davies Gleave analysis.
Note: "High" and "good" satisfaction scores combined.

7.49 Most railways received satisfaction scores of 50-80% for punctuality and reliability. As with all subjective measures, however, it is not clear whether this reflects the quality of the facilities themselves or a disparity between customer expectations and actual performance. As an example of this, Figure 6.3 shows how operators with similar actual punctuality can be given widely different subjective scores.

8 Conclusions

Introduction

8.1 In Chapter 2, we discussed trends in rail demand and noted that in the ten years to 2013 the European rail sector experienced an increase in demand of 61.8 billion passenger kilometres, equivalent to average growth of 1.6% per annum. Further, rail's share of surface passenger transport was 7.4% in 2013. However, this overall performance masks substantial variation between Member States.

8.2 The most significant increases in rail demand have been in Western Europe, with Austria, Luxembourg, the Netherlands, Sweden and the United Kingdom all experiencing growth in rail passenger kilometres of at least 2.5% per year. The factors underlying this growth also vary between Member States, but include rising income, changes in employment in major cities, road congestion as well as national rail policy (and notably major rail investment, such as the construction of the HSL-Zuid line in the Netherlands in 2009 and the West Coast Main Line upgrade works in the UK in 2008).

8.3 Conversely, 11 Member States have experienced declining rail patronage over the same period. Rail usage in Romania fell by more than 6% per year, the result of a major consolidation of rail services under the country's Railway Reform Programme. Substantial annual declines were also experienced in Lithuania (-4.3%), Greece (-3.9%) and Bulgaria (-3.2%), a reflection of general economic conditions, constraints on public sector funding and, in the case of Greece, the effects of the fiscal austerity packages implemented in the wake of the recent sovereign debt crisis.

8.4 In the context of this study it is important to highlight the range of factors that can influence travel demand in general and the demand for rail services in particular before commenting on the effects of fares and service quality. We therefore briefly discuss the determinants of rail demand before drawing conclusions from the analysis reported in previous chapters.

Factors influencing rail demand

8.5 Through time there have been rapid extensions to social and business networks, major changes to the way in which people shop for both essential and luxury goods, and increases in the time available for holidays and other leisure trips. At the same time, households seeking a better quality of life have moved further away from employment opportunities to enjoy the amenity offered by larger properties outside urban centres. In all of these changes, the price and availability of motorised transport, in particular the flexibility offered by the private car, has played a key role.

8.6 The analysis presented in Chapter 2 indicates some of the factors that may affect rail fares and, therefore, the demand for rail travel. While necessarily limited by the size of the data

sample, this suggested a correlation between average yield and not only average incomes but also rail connectivity, as proxied by the length of the national network.

8.7 There is, however, a very broad range of demographic, geographic and economic factors that can affect the demand for travel. Table 8.1 is derived from analysis presented in *Understanding Transport Demands and Elasticities* (VTPI 2013) and demonstrates the complexity in explaining travel patterns and the demand for any particular mode of transport within a given area[48].

Table 8.1: Factors affecting travel demand

Factor	Key influences
Demographic and socioeconomic factors	Level and structure of population (residents, employees and visitors) Employment rate Average levels of wealth and income Composition of population by age group Lifestyles and preferences
Commercial activity	Level and profile of business activity Number of jobs Extent of freight transport Level of tourist activity
Transport options	Extent and reliability of public transport network Level of car ownership Opportunities for walking, cycling and car sharing Provision of taxi services Extent of home/teleworking Availability of delivery services
Land use	Land use density Profile of land use Connectivity of different locations Quality and availability of pedestrian routes Proximity of public transport Design of road and other transport systems
Demand management	Road use prioritisation Parking management Policy towards pricing of roads and public transport systems Passenger information and promotions
Prices	Fuel prices and motoring taxation Road tolls and parking fees Vehicle insurance and other motoring costs Public transport prices

Source: *Understanding Transport Demands and Elasticities: How Prices and Other Factors Affect Travel Behaviour* (VTPI, 2013), adapted by Steer Davies Gleave

8.8 Against this background, it is clear that distinguishing the impact of rail fares and service quality on rail demand from that of the other factors listed in Table 8.1 is challenging. Hence,

[48] Litman. T., *Understanding Transport Demands and Elasticities: How Prices and Other Factors Affect Travel Behavior* (March 2013), Victoria Transport Policy Institute

while the following observations reflect a broad consensus on key determinants of rail demand, experience will vary significantly between different Member States, areas within Member States and individual markets:

- Rail tends to dominate where large numbers of passengers travel to a common destination on a regular basis, particularly where it is located in an area subject to road congestion and limited parking capacity.
- Rail demand tends to rise with average income, although this effect may be offset by increasing car ownership (particularly in Member States where the extent of car ownership has, until recently, been limited) and the influence of dispersed land use.
- Rail fares and the comfort, convenience and journey times offered by rail services, nevertheless have a significant impact on mode choice and the willingness of some passengers to travel at all.

8.9 Appendix D sets out a small sample of the empirically derived parameters used in forecasting the impacts that different changes in fares and service quality can have on rail demand. However, the wide range of factors that may influence an individual's propensity to travel by rail demonstrates the difficulty of drawing general conclusions about rail demand based on the findings of a study of fares and service quality across Europe. Nevertheless, as reported in previous chapters, we sought to assess rail's attractiveness from the passenger's perspective based on:

- comparisons of fares in different rail markets in different Member States;
- comparisons of rail fares with the price of using other transport modes to make equivalent journeys;
- an assessment of the different pricing policies and distribution mechanisms currently in place; and
- a review of different aspects of the quality of different rail networks across the EU.

8.10 We consolidate below our findings in each of these areas before drawing conclusions on the implications of rail market liberalisation for fares and service quality.

Summary of findings

8.11 Table 8.2 provides a snapshot of findings regarding rail fares (Chapter 4), fares for other modes (Chapter 5) and service quality (Chapter 7) for the regional market segment. This segment has been presented as it provides the widest coverage of Member States, and aligns well with service quality indicators.

8.12 Given the sample basis upon which rail fares and service characteristics have been gathered, reaching conclusions on the basis of these observations should be treated with caution. Nonetheless, the table suggests that there is some evidence for a direct relationship between absolute levels of fares and service quality, on the one hand, and rail demand, on the other[49].

8.13 While rail fares and service quality appear to be determinants of rail demand, it has not been possible within the scope of this study to isolate their impact from the wider range of influences described in Table 8.1. Appendix D, however, presents the results of a number of empirical exercises intended to produce demand forecasting elasticities which measure the

[49] The elasticity approach used within the majority of rail passenger demand forecasting literature concerns itself with how changes in the influences of demand (such as fares and service quality) affect demand, rather than the absolute quantity of demand.

sensitivity of rail demand to both timetable-related factors and other factors such as rolling stock quality and station facilities.

Table 8.2: Rail fares and service quality (regional)

State	Rail kilometres per capita	Rail fare per kilometre	Rail fare/car costs	Punctuality (local and regional)	Reliability (local and regional)	Daily service frequency	Average speed
BE	942	0.17	3.51			27	48
BG	250	0.07	0.69	88%		9	32
CH		0.26	6.45			17	83
CZ	714	0.03	0.33	92%	0.2%	21	106
DK	1,211	0.22	4.38	97%	1.8%	21	50
DE	1,105	0.21	3.57	93%	0.7%	46	141
EE	169	0.08	1.23	99%	0.1%	4	68
IE	342	0.12	1.79			17	29
EL	96	0.15	1.45			14	82
ES	508	0.23	1.61		0.6%	22	88
FR	1,332	0.12	0.84	91%	2.2%	41	50
HR	219	0.21	1.48	89%	0.2%	14	22
IT	817	0.08	0.62	82%	3.0%	19	86
LV	356	0.07	1.03	99%		4	70
LT	94	0.08	1.08	98%	8.3%	20	78
LU	717	0.03	0.72			21	55
HU	792	0.10	1.11	78%	11.5%	40	71
NL	1,053	0.17	2.45	95%	1.9%	38	92
NO		0.13	1.64	94%	2.2%	20	86
AT	1,453	0.22	4.57	97%	0.4%	35	102
PL	438	0.09	1.16	92%	0.2%	20	71
PT	348	0.08	0.55	94%	1.0%	43	51
RO	219	0.09	0.92	92%		8	69
SI	330	0.25	3.61	78%	0.2%	20	56
SK	459	0.09	1.08	93%		2	46
FI	747	0.15	2.69	97%	0.7%	14	120
SE	1,241	0.14	2.48	93%	1.1%	85	98
UK	970	0.21	3.80	90%	2.6%	17	54

Source: Steer Davies Gleave analysis
Note: peak-single rail fares purchased on the day of travel have been used in this comparison

Conclusions on market liberalisation

8.14 As discussed in Chapter 6, the policy and regulatory framework governing national rail sectors has a significant influence on both fares and service quality, a reflection of the fact that the European rail industry continues to be heavily dependent on public subsidy (see Chapter 2). While the industry has been moving in the direction of greater commercialisation and market liberalisation within the evolving framework of EU legislation and, in some Member States, in

response to changes in national policy, rail services are still largely specified by transport authorities in line with a wide range of societal objectives. The majority of services are therefore operated as PSOs, although it is often difficult to make clear distinctions between PSO and purely commercial services.

8.15 It follows that the fares and service quality observed across much of the European rail market will continue to be determined in large part by decisions taken within national, regional and local transport authorities rather than market conditions, although these same authorities may be constrained by competition from other modes. Furthermore, there is a spectrum of possibilities regarding how and by whom rail services are specified. At the same time, on-rail competition can be expected to have an increasing influence in some markets where available capacity and levels of demand support the introduction of new commercial services.

PSO services

8.16 The specification and award of a PSO contract, whether competitively tendered or awarded directly, provides a transport authority with an opportunity to specify the quality of the required services (e.g. in terms of journey time, frequency and punctuality) and to regulate some or all of the fares offered (either individually or through a fares basket). A clear specification will enable train operators to estimate the costs of service provision and determine the required level of subsidy with greater confidence, while enabling passengers and other stakeholders to comment on the proposed service and fare levels in advance. It will also provide authorities with the means to assess the delivery of the service, for example through regular monitoring of operational performance and service quality metrics defined by the specification.

8.17 However, it does not necessarily follow that a more rigorous specification of rail services in a given PSO contract will tend to drive up service quality. Rather, it is likely to reflect more explicit consideration of the cost-fare-quality trade-off, which may lead to a decision to require lower quality in recognition that this will enable an operator to offer lower fares (for a given level of public subsidy). At the same time, explicit reductions in service quality, defined in a contract open to public consultation, are more likely to be met with objections from stakeholders, potentially resulting in a ratchet effect whereby quality improves with each successive contract award (notwithstanding changes to the demand for the service).

8.18 Similarly, the inclusion of explicit mechanisms for regulating fares in a PSO contract (or as part of a supporting regulatory framework) will not necessarily result in lower fares. In the UK, most franchise agreements have included provisions for regulating a basket of defined fares as well as some individual fares, but fare levels since 2005 have nevertheless increased by more than the rate of inflation (see Chapter 2). This was a response by the competent authority at the time (the Strategic Rail Authority) to a policy decision to change the balance of rail industry funding in favour of the tax payer and against the fare payer (with the aim of moving from a broadly 50:50 tax payer-fare payer allocation to a 75:25 allocation over time). By contrast, in In Prague and Tallinn, administered suburban fare levels do not appear to have been changed since 2011.

8.19 In our discussion of PSO services in Chapter 2, we identified different approaches to the allocation of revenue risk, with some Member States awarding net cost contracts, some gross cost contracts and others a mix. The use of gross cost contracts is particularly attractive in major cities where the transport authority wishes to establish and integrated fares structure covering a range modes and services within modes (any or all of which may be operated by

different organisations, including subsidiaries or departments of the authority itself). This approach allows the authority to make changes to fares and introduce new services (which may abstract revenue from those already operating) without the need for frequent and/or major contract renegotiation. Moreover, even where individual operators providing urban services accept revenue risk, it is likely that they will continue to charge administered fares set, or at least heavily constrained by, the relevant transport authority.

8.20 Regardless of the allocation of revenue risk, competitive tendering of PSO contracts can be expected to benefit passengers, since it encourages train operators to bear down on costs and (in the case of net cost contracts) offer lower, more affordable fares for a given level of subsidy. This effect is difficult to observe in fares data alone, given the wide range of factors influencing fare levels (and not least the policy stance in relation to tax payer funding noted above). However, we would expect competitive tendering to lead to lower fares, lower subsidy, improved services or some combination these impacts.

8.21 In addition, competitive tendering encourages bidders to consider ways of improving service quality at an acceptable price. Again, the evidence is difficult to interpret, since the information on the origins of a particular service innovation is invariably limited. Nevertheless, the rapid proliferation of WiFi on board trains may be symptomatic of a competitive (or at least contestable) environment in which operators do not want to lose competitive advantage to other bidders, other operators or other modes. In addition, our own experience of supporting franchise and concession bids, as well as open access operations, in Italy, Spain and the UK, demonstrates that train operators participating in a competition face a powerful incentive to identify service quality improvements. These can range from the introduction of new methods of providing customers with information on station platforms, through innovative apps and website tools to facilities for cycle storage and maintenance at stations.

8.22 However, we also note that competition for PSO services, where it leads to a multiplicity of operators with responsibility for adjacent and overlapping franchises and concessions, can result in complex fare structures that passengers find difficult to understand. This is highlighted by the case study of Exeter to Fareham in Appendix B. Simplification of the fare structure, of the kind advocated by passenger representative bodies such as Passenger Focus in the UK, is likely to require more prescriptive fares regulation, whether through contracts or the broader regulatory framework, which will constrain operators' ability to offer market-based fares to meet the needs of particular groups of passengers. However, this may be justified where the complexity of the existing fare offer prevents passengers from making informed decisions about the appropriate ticket for them.

8.23 The interaction between services provided by different operators also needs to be considered where transport authorities wish to ensure that tickets valid on any service continue to be available. In Chapter 6, we noted that such tickets typically give rise to the need for revenue allocation mechanisms, depending on the party receiving the ticket revenue generated by the relevant services.

8.24 As shown in Figure 2.1, since two-thirds of all rail travel is made on services contracted under PSO, there are significant opportunities for competent authorities to specify the quality of rail services within Member States. Combined with competitive tendering procedures these quality initiatives can be secured cost-effectively for taxpayers, so long as the market is able to support a sufficient quantity of bidders. Subject to low barriers to market entry, for the remaining one-third of rail travel which uses commercial, or non-PSO, services, competitive pressure also comes from within the market for rail travel as discussed below.

Competition and service offer

8.25 On-rail competition can similarly lead to improvements in the attractiveness of rail services by providing passengers with a greater choice of services. Our case studies of competition in the Czech Republic, Italy and the UK demonstrate that it can lead to the availability of lower fares. Experience in the Czech Republic, in which LEO Express entered the market with new Stadler Flirt rolling stock, also demonstrates that entrants may choose to invest in new rolling stock, raising service quality significantly, although in the UK open access operators have introduced new services by leasing existing rolling stock.

8.26 However, the introduction of on-rail competition, while it has been limited to specific markets, has raised complex issues concerning both operational and financial impacts, which will need to be resolved if the overall effect on service quality and fares is to benefit passengers. On the operational side, it may become increasingly difficult to combine competition with efficient timetable planning within constrained networks, especially as capacity expansion almost invariably requires additional public support. Each route will require a different balance between making infrastructure capacity available to open access operators and specifying a timetable that is reliable, minimises journey times and offers attractive connections. The role of regulatory bodies in assessing the trade-off between the benefits of competition and efficient operational planning is therefore likely to increase. Such assessments are likely to need to consider complex interactions between aspects of service quality including frequency, journey time and punctuality, as well as the potential impact of competition on fares.

8.27 Any growth in the extent of on-rail competition is likely to raise issues concerning the complexity of the fares structure of the kind highlighted above, not least because of the challenges of encouraging operators to compete on fares while maintaining network benefits such as through ticketing and interavailable fares. The case study on Exeter to Fareham demonstrates the potential for confusion when different operators set some fares valid on any permitted route and others only valid on particular trains. Any attempt to simplify fare structures through policy change is likely to have implications for independent fare setting and hence for on-rail competition.

8.28 Identifying the appropriate fare structure will need to consider the trade-off between offering customers a wide range of fares and providing them with sufficiently simple fares information to enable them to make informed travel choices.

Complexity and consumer choice

8.29 This chapter has highlighted the inherent trade-off between complexity and consumer choice. The ease with which passengers can compare different fares and service offers has been highlighted by consumer representative groups as an important issue for the rail industry to address. However, this is challenging due to the broad range of sources from which complexity can arise.

8.30 Complexity may be observed:

- in the rail market where a range of routes and journey times may be available between any two stations;
- in suburban markets characterised by administered fares with zonal structures and complex discounts;
- in longer distance markets where the range of fares can also be wide and the need to compare with the cost of using other modes adds further complexity; and

- in markets subject to on-rail competition, where fares valid only on particular services are offered alongside interchangeable fares, and these are similarly overlaid with different discount arrangements.

8.31 Operators have an incentive to offer a range of fares based on price, flexibility, time of day and quality since it allows them to capture some of the market's consumer surplus through price discrimination. This surplus arises because, in a market with a single clearing price, some passengers would have been prepared to pay more than the single market price. Price discrimination therefore transfers some of this surplus from the passenger to the operator. However, since in many cases the operator cannot distinguish between passenger types, and cannot prevent those individuals with a high willingness-to-pay from obtaining the lower priced tickets, there are also opportunities for such passengers to realise windfall gains. Moreover, some discounted tickets may be available at price lower than would be available in the absence of differential pricing.

8.32 Given the considerable range of products on offer it is important that passengers from all Member States can access good quality information about their ticket options within and between all Member States so they can confidently select the best ticket for their journey, and understand its terms and conditions. This should not require the passenger to understand all of the layers of complexity set out above and the resultant fare structure, but should instead guide the passenger to timely and accurate information tailored to their travel requirements. Consequently, explicit consideration of the trade-off between passenger choice and ease of decision-making in the development of fare and service quality offers across Europe should be encouraged.

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Appendices

A Country case studies

A.1 In this Appendix we collate a range of information on each of the Member States listed below.

Table A.1: Country case studies

Subject	Bulgaria BG	Switzerland CH	Czech Republic CZ	Germany DE	Estonia ES	Spain EE	France FR	Italy IT	Netherlands NL	Poland PL	Sweden SE	United Kingdom UK
Overview of the rail market	●	●	●	●	●	●	●	●	●	●	●	●
Journey planning and sales channels	●	●	●	●	●	●	●	●	●	●	●	●
Station website(s)	●	●	●	●	●	●	●	●	●	●	●	●
Operator website(s)	●	●	●	●	●	●	●	●	●	●	●	●
Ticket types	●	●	●	●	●	●	●	●	●		●	●
Availability of discounts	●	●	●	●	●	●	●	●	●	●	●	●
Service quality				●	●	●	●	●	●			●
Persons with reduced mobility (PRM)	●	●	●	●	●	●	●	●	●	●	●	●

A.2 In developing the case studies, we drew on RMMS, ERADIS, stakeholder responses to the questionnaire, stakeholder interviews and desk and telephone research. In practice RMMS and ERADIS proved to be incomplete, and rarely up-to-date, while interviewees and telephone research are sometimes ill-suited to obtaining detailed factual data. For some Member States we received one or more stakeholder responses, but these often either referred us to, or summarised, information on the internet. As a result, much of the verifiable factual information for these case studies has been drawn from infrastructure manager and operator websites.

A.3 The majority of the information in these case studies was collected prior to the end of February 2016, but information on websites may be refreshed or updated at any time.

A.4 We also note the existence of a range of third-party travel agents and websites, such as Rail Europe (**www.raileurope.com**), which provide a common interface for reserving rail travel across Europe, sometimes in a number of languages. However, these sites may not have access to, or offer, all fares, and may charge a commission which would not be paid if booking locally or through an operator website, app, call centre, station or ticket vending machine.

A.5 Similarly, Germany's Deutsche Bahn provides an online journey planner, supported in a number of languages, covering public transport across most of Europe, but this does not have access to all service details, fares and reservation systems.

BG: Bulgaria

Bulgaria: sources

A.6 Bulgaria has provided information to RMMS and ERADIS and we also received one stakeholder response.

Overview of the rail market

Table A.2: Bulgaria: overview of the rail market

Measure	Value	Units or details	Year
Area	110,879	square kilometres	
Length of rail network	110,879	kilometres	
Population	7,245,677		2015
Reported rail passenger-kilometres	1,698	million kilometres	2014
Reported rail passenger-kilometres per inhabitant	234.3	kilometres	2014
Reported rail passenger revenue	€41	million	2012 at 2010 prices
Reported rail share of passenger surface transport	2.9%		2013
Routes with price competition	No		
Rail market share not held by incumbent (percentage of reported passenger-kilometres)	7.4%		2014
Reported punctuality	88% 77.5%	Regional Long-distance	2014
Reported reliability (percentage cancellations)	N/A		

Sources: various, note that definitions and consistency of reported data vary.

A.7 Bulgaria has a single national operator, BDZ, and the majority of information on rail travel is provided through its website at **www.bdz.bg** in Bulgarian and English.

Bulgaria: journey planning and sales channels

A.8 Journey planning information such as timetables, fares and conditions of travel are provided at railway offices and stations, either in person or by phone, or via the BDZ webpage.

A.9 Tickets are sold at stations, shops and offices, on trains and online, as shown below.

Table A.3: Bulgaria: sales channels

Sales channels	Comments
Railway stations, stops and offices	As of the end of 2014, passenger service was available at 276 stations and stops: • BDZ staffs 81 stations and 8 stops • The infrastructure manager provides sales staff at 177 stations, stops and mixed points. At 10 stations, servicing is mixed. In addition, 409 stations and stops have no sales service.
On train	Train crew sell tickets on trains.
Online	BDZ introduced online reservations and sales at the end of December 2013. The system currently has a restricted range and functions, but a larger and more integrated information system is being constructed. Since September 2014 the system has included an additional six fast trains, on which customers can buy tickets online.

Source: stakeholder engagement, interpreted by Steer Davies Gleave.

A.10 ERADIS records that information on the arrival and departure of trains, platforms and, additional coaches on the major lines, are usually provided through announcements in the mass media; and on the BDZ website.

A.11 Timetable changes or traffic disruption due to repairs or reconstruction work are also provided in the same way. Information on delays to trains en route are provided in a number of ways:

- Stations have electronic information boards and loudspeaker systems operated by station staff, where these exist, or by telephone information staff.
- Train staff provide information on trains.
- Online data is available at BDZ's website, although at present this only covers a limited number of stations.

Bulgaria: station website

A.12 BDZ's website provides telephone numbers and opening hours of on stations in both Bulgarian and English. Telephone numbers and opening hours differ between the two languages.

Bulgaria: operator website

A.13 BDZ website acts as the operator website.

Bulgaria: ticket types

A.14 RMMS lists a range of ticket types for travel at different times, to different locations and for different types of individual or group of travellers.

Table A.4: Bulgaria: types of tickets

Weekend travel
Travel to particular destinations
Travel with discount cards for different age groups
Family travelling together
Travel by persons with reduced mobility (PRM)
Travel by children aged 7-10
Transportation of pets

Source: RMMS 2015, interpreted by Steer Davies Gleave.

A.15 BDZ also accepts a range of passes such as Interrail and Rail Plus.

Bulgaria: availability of discounts

A.16 BDZ's website currently reports the range of discounts summarised below.

Table A.5: Bulgaria: availability of discounts

Discount	Group
10%	Return tickets
15%	Small groups of 3-6 passengers
20%	Return tickets on certain routes
25%	Second Class on fast and ordinary trains for holders of Youth, Classic and Railcard "O", valid for three months
50%	"Adults" and "students"
75%	Students up to the age of 26
100%	Children up to 7 years old Groups including children up to 7 years old (subject to signed and sealed documentation of their dates or birth) Disabled passengers with a 71% disability, subject to a certificate of disability, plus an accompanying person War veterans Holders of the Order of Valour Mothers with "many" children, subject to a certificate and a medical card Members of Parliament, subject to an identify card issues by the National Assembly

Source: BDZ website, interpreted by Steer Davies Gleave, definitions have been summarised or omitted for brevity.

A.17 RMMS provides some earlier details on these entitlements, as set out below.

Table A.6: Bulgaria: passengers entitle to free travel

Category	Free travel
Mothers with three or more children	Two free return tickets per year
Disabled and blind persons reached 71% or more permanent disability, disabled soldiers, affected soldiers by the war, both children with severe physical and mental disabilities and their assistants	Two free return tickets once a year
Veterans	One free return ticket once a year, and unlimited free travel in the area in which they live, using a special issued free travelling card
Holders of the military cross	Three free return tickets once a year

Source: RMMS 2015, interpreted by Steer Davies Gleave.

Bulgaria: service quality

A.18 We did not identify any documentation setting out standards of service quality in Bulgaria.

Bulgaria: persons with reduced mobility (PRM)

A.19 PRMs are offered transport on six fast trains with obligatory reservations, two fast trains with seats provided for PRMs, and two fast trains with obligatory reservations. The night trains between Sofia and Varna and Sofia and Burgas also include sleeping cars with separate cabins for the disabled and PRMs.

Switzerland

Switzerland: sources

A.20 Switzerland does not provide information to RMMS and ERADIS and we have had no stakeholder responses or interviews. Our analysis therefore relies wholly on desk research.

Switzerland: overview of the rail market

Table A.7: Switzerland: overview of the rail market

Measure	Value	Units or details	Year
Area	41,277	square kilometres	
Length of rail network	3,588	kilometres	
Population	8,139,631		
Reported rail passenger-kilometres	18,277	million kilometres	
Reported rail passenger-kilometres per inhabitant	2245.4	kilometres	
Reported rail passenger revenue	N/A		
Reported rail share of passenger surface transport	17.1%		
Routes with price competition	No		
Rail market share not held by incumbents (percentage of reported passenger-kilometres)	Nil		
Reported punctuality	N/A		
Reported reliability (percentage cancellations)	N/A		

Sources: various, note that definitions and consistency of reported data vary.

A.21 Switzerland has a dense rail network with a highly-integrated timetable. There are three distinct railway systems:

- SBB (or CFF or FFS) is the federal railway and operates the majority of the network.
- BLS (Bern–Lötschberg–Simplon railway) operates a smaller network.
- SOB (Südostbahn) is a relatively small network.

A.22 There is close integration between the systems include operations between the networks and in seven different urban and suburban tariff areas, including the Libero pass covering Bern and Solothurn, examined in our analysis of suburban fares.

A.23 Switzerland offers a General Abonnement (GA) all lines annual Travelcard which we understand is held by a relatively high proportion of the population.

Switzerland: journey planning and sales channels

A.24 The major systems all provide some form of journey planning information:

- SBB's website **www.sbb.ch** provides an online timetable facility in German (the default language), French, Italian and English.
- BLS provides a simple online facility **www.bls.ch** in German (the default language), French and English, with facilities to download detailed timetables, station departure posters or personalised timetables.
- SOB **www.sob.ch** provides more limited information but includes a detailed network plan.

A.25 SBB also provides a map with real time information on the progress of each train.

A.26 Tickets are generally available at stations, from ticket machines, online and via apps such as the SBB Mobile App. SBB's website lists a Ticket Shop, Leisure Shop, Online Tickets, Mobile Tickets and E-vouchers. However, not all ticket types or discounts are obtainable by all channels, particularly where the application must be supported by evidence such as identity documents.

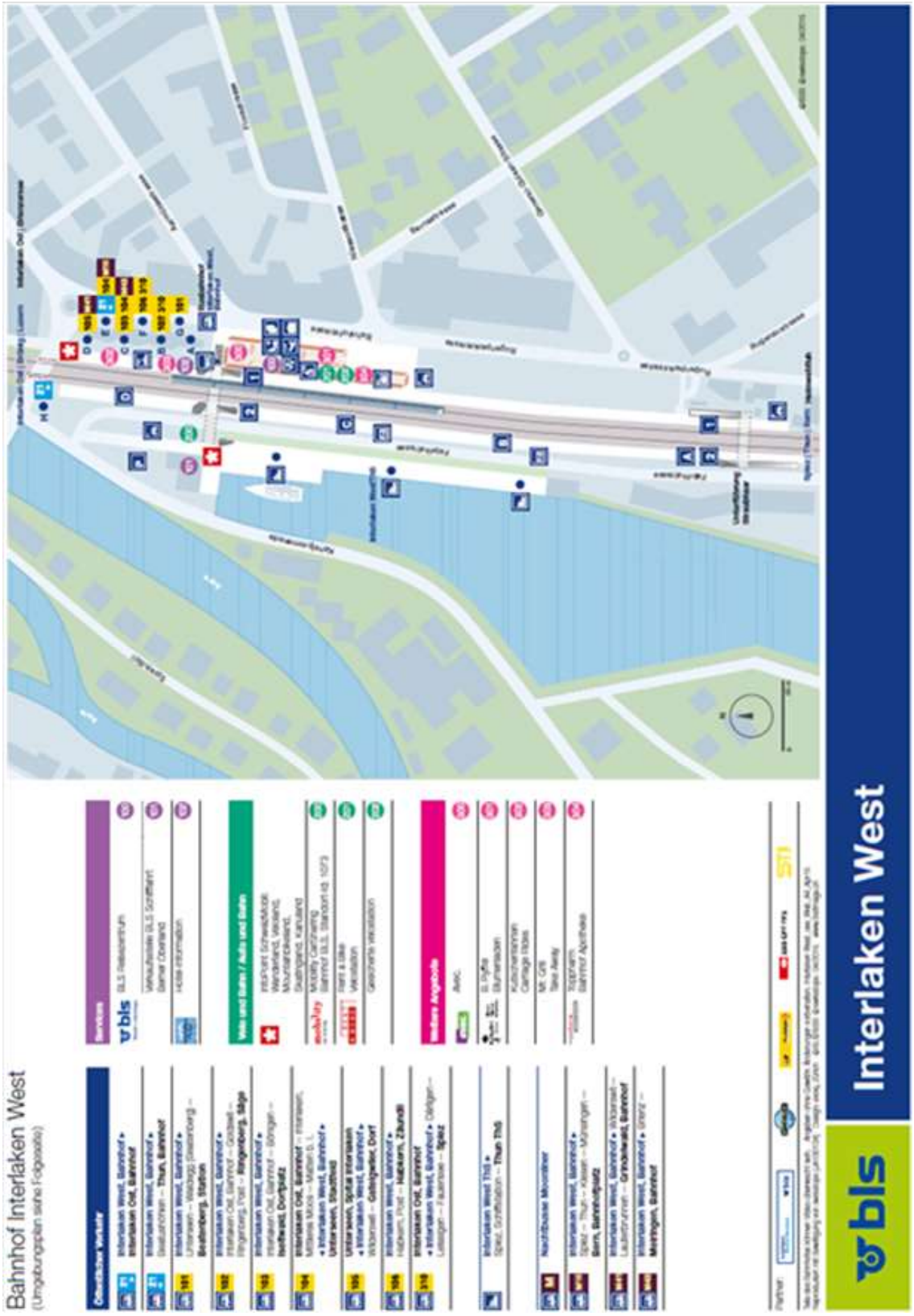
Switzerland: station website

A.27 SBB provides details of station facilities at **www.sbb.ch**. This site operates in German (the default language), French, Italian and English. This provides details of the following:

- "Services" provides details of opening hours and contact information.
- "Equipment" provides information on equipment for PRM and details such as the availability of lockers and pricing.
- "Mobility" provides information and pricing for parking and surface connections.

A.28 SBB's website also provides access to station maps, plans, and arrangements for rail replacement services, for stations on all the networks. The example below is from the BLS station at Interlaken West.

Figure A.1: Switzerland: station facilities information



Source: SBB website.

Switzerland: operator website

A.29 Each system has its own website, as listed above.

Switzerland: ticket types

A.30 SBB's website lists a wide range of ticket types, although the website is complex and could be confusing: for example we found no concise list of the discounts available to different types of passenger.

Table A.8: Switzerland: ticket types

Type of ticket	Options	Comments
Tickets for Switzerland	Swiss Travel Pass	
	Individual tickets	Tickets are available for single, return or round trips, although round trip journeys cannot be bought online. Multipacks are available for six journeys on the same route and are transferrable, with a 50% discount for those who hold a half fare Travelcard. City-Tickets include a 1-day Travelpass at the destination city, and City-City-Tickets include a 1-day Travelpass at both origin and destination cities.
	Supersaver tickets	Supersaver tickets are E-tickets sold online or via the SBB Mobile app. They are specific to a train but include a discount of up to 50%. If passengers miss their train, these tickets can be refunded online with proof of purchase of a full-fare ticket for the same journey on another train.
	1-day Travelpass	A range of 1-day tickets allowing unlimited travel or Class upgrade, for all day or for after 09:00, for those with a half fare Travelcard. 1-day Travelpasses are also available for children and dogs.
	First-class upgrade	These are add-on upgrades to Second Class tickets or 1-day Travel passes.
	Seat reservations	Seats can be reserved for CHF 5 online, using the SBB Mobile app, or by telephone.
	Group tickets	Group travel booked at least two working days in advance for ten or more people gives a 20% discount and every tenth passenger is free.
	Children	Children under 6 travel free when accompanied by a person at least 12 years old with a valid ticket escorting up to four children or a person at least 16 years old escorting up to eight children. Children aged 6 to 16 are entitled to a range of reduced fares.
	Night supplement	Night supplements are charged for travel on Friday and Saturday nights.
	Dog	Dogs require a ticket for half the Second Class fare, which can include 1-day Travelpasses and a GA Travelcard (see below).
Swiss Travelcards and SwissPass	General Abonnement (GA) Travelcard	Unlimited travel for a fixed price in either First Class or Second Class. Prices vary for those aged 6 to 16, 16 to 25, 24 to 64/65 (depending on sex), and from 64/65, the disabled (see below), partners in the same household, families and dogs.

Type of ticket	Options	Comments
	Half fare Travelcard	Allow half price travel on a range of rail, bus, tram and ferry services.
	Track 7	Provides unlimited travel for "young people" after 1900. This is an addition to the half fare Travelcard for passengers under 25 travelling Second Class.
	Point-to-point Travelpass	This is a season ticket between two defined points, available for seven days, one month or twelve months.
	Regional Travelcard	These are Travelcards for the seven regional urban and suburban fares networks described below.
	Interregional Travelcard	Interregional Travelcards are intended for commuting journeys which span more than one Travelcard area. A route-zone Travelcard (equivalent to a period City-Ticket) allows travel on local transport at one end of the route. A zone-route-zone Travelcard (equivalent to a period City-City-Ticket) allows travel on local transport at both ends of the route. An annual interregional Travelcard usually costs as much as nine, or sometimes ten, monthly cards.
	Junior and Grandchild Travelcard	Junior Travelcard, costing CHF 30, allows free travel for a child aged 6 to 16 if accompanied by a parent with a ticket, on production of proof of date of birth. The third child receives the Travelcard free. The Grandchild Travelcard has broadly the same terms and conditions but allows the child to travel with a grandparent and also includes same sex grandparent couples. No more than four Grandchild Travelcards will be issued for the same child. It appears that a single child can be issued with up to six cards.
	SwissPass	Now includes the half fare Travelcard.
From Switzerland to Europe	International supersaver	
	Interrail	
	Rail Plus	

Source: SBB website, interpreted by Steer Davies Gleave, summary of conditions as set out on the website.

A.31 The website also provides links to the urban and suburban fare networks of:

- Bern and Solothurn (Libero, examined in our analysis of suburban fares);
- Geneva (unireso);
- Zürich (ZVV);
- Lucerne, Obwalden and Nidwalden (Passepartout);
- Vaud (Mobilis);
- Ticino and Moesano (Arcobaleno); and
- northwestern Switzerland (TNW).

A.32 In effect, four distinct types of season ticket are available in Switzerland:

- Point-to-point Travelpasses allow only travel on the route between two stations.
- Route-zone Travelcards allow travel in the zone around one of the of journey.
- Zone-route-zone Travelcards allow travel in the zones around both ends of the journey.
- Regional Travelcards allow travel by all modes throughout the region covered.

Switzerland: availability of discounts

A.33 SBB does not clearly list discounts but a range of discounted tickets are available through the ticket types listed above.

Switzerland: service quality

A.34 We did not identify any documentation setting out standards of service quality in Switzerland.

Switzerland: persons with reduced mobility (PRM)

A.35 SBB's website provides information in German, French, Italian and English on "passengers with a handicap". Features include:

- a call centre;
- discounts for the General Abonnement, international traffic, and for assistance dogs; and
- ID cards for persons with reduced mobility (PRM), distinguishing disabled passengers and blind and visually impaired passengers.

A.36 As noted above, SBB's website provides, in German, under "Equipment", details of facilities for PRM such as lifts, wheelchair-friendly entrances and exits, wheelchair-accessible ticket counters, wheelchair-accessible toilets and step-free access.

CZ: Czech Republic

Czech Republic: sources

A.37 The Czech Republic has provided information to RMMS and ERADIS and we also received two stakeholder responses.

Czech Republic: overview of the rail market

Table A.9: Czech Republic: overview of the rail market

Measure	Value	Units or details	Year
Area	78,867	square kilometres	
Length of rail network	9,459	kilometres	
Population	10,512,419		2015
Reported rail passenger-kilometres	7,664	million kilometres	2014
Reported rail passenger-kilometres per inhabitant	727.1	kilometres	2014
Reported rail passenger revenue	€290	million	2012 at 2010 prices
Reported rail share of passenger surface transport	8.5%		2013
Routes with price competition	Yes		
Rail market share not held by incumbent (percentage of reported passenger-kilometres)	8%		2013
Reported punctuality	92.21% 91.94%	Regional Long-distance	2014
Reported reliability (percentage cancellations)	0.17% 0.07%	Regional Long-distance	2014

Sources: various, note that definitions and consistency of reported data vary.

A.38 The Czech Republic has an incumbent national operator České Dráhy (ČD) and two open access operators, RegioJet and LEO Express, providing competing services on the principal corridor between Prague and Ostrava.

A.39 Most other services are covered by a national net cost PSO, although there are some regional and local PSOs on both gross cost and net cost bases.

Czech Republic: journey planning and sales channels

A.40 ČD's website **www.cd.cz** provides timetable and ticket information.

A.41 ČD's website also provides a map display with the real time location of all trains, which can be clicked on for further details.

A.42 ČD offers reservations for seats, sleepers and couchettes.

A.43 Tickets are sold online and at ticket offices.

Czech Republic: station website

A.44 ČD's website provides station details with a list of services available including, where appropriate, contact telephone number and opening hours.

Czech Republic: operator websites

A.45 ČD and the open access operators all have websites:

- ČD at **www.cd.cz**, in Czech (the default language), German and English.
- RegioJet at **www.regiojet.cz**, in Czech (the default language), Slovak, English and German.
- LEO Express at **www.le.cz**, Czech (the default language), English, Polish, Russian and Ukrainian.

Czech Republic: ticket types

A.46 ČD provides an online guide to searching for ticket types, summarised below.

Table A.10: Czech Republic: ticket types for domestic travel on ČD

Traveller(s)			Type of ticket	Comments
Individuals	One-day travel	Outbound journey	Basic Fare	Discounts for children and students
			First Minute Česko	For travel between 114 cities
			Action ticket	For travel between selected cities
			IN 25%	25% discount card
			IN 50%	50% discount card
		Outbound and return journey	Return Fare	Discounts for children
			First Minute Česko	For travel between 114 cities
			Action ticket	For travel between selected cities
			With IN 25%	25% discount card
			With IN 50%	50% discount card
		Multiple journeys in a day	Whole Day Ticket	One day of travel: the ticket is transferrable but may only be used by one person at a time
	Frequent travel	Travel on a single line	Commuter ticket	Weekly, monthly, quarterly, with further discounts available
		Travel throughout the network	IN 100%	100% discount
			IN 25% or IN 50%	25% or 50% discount
			IN Senior	For over-70s, free travel on some trains, 50% discount on others, discounts on Pendolinos
For groups		Group of 2-5	Group weekend ticket	Valid for up to 2 adults and 3 children, offers unlimited travel on a Saturday, Sunday or state holiday, either nationally or within a region
		Group of 2-30	Group ticket	Discount on Basic Fare and Return Fare
Business	Transferrable company ticket	Incidental journeys	Kilometric bank	Pre-pay 2000 kilometres
			Basic Fare	
			Return Fare	
			Action Ticket	
		Frequent journeys	IN Business	100% discount
	Non-transferrable individual ticket		IN 100%	100% discount

Source: ČD website, interpreted by Steer Davies Gleave, other fares apply for international travel.

Czech Republic: availability of discounts

A.47 Rail fares are subject to price controls set by the Ministry of Finance under Act 526/1990 Coll. "On prices". Some tariffs and discounts must be honoured by all operators.

A.48 RegioJet summarises tariffs and discounts in a clear table on its website, summarised below, but does not clearly state the level of discount which applies.

Table A.11: Czech Republic: discounts available on RegioJet

Tariff	Conditions	Validity	Details
Adult	Default tariff.	All rail services	
Czech student pass under 26	Students with a valid Czech under-26 student card issued by a carrier.	All rail services	
Czech student pass under 15	Students with a valid Czech student card for students under 15 issued by a carrier.	All rail services	On coaches, the passenger may not sit in the front row.
ISIC	students with a valid ISIC international student card.	All rail services	
Child under 15	Children aged 0-14 inclusive with any identity card with their date of birth.	All rail services	On coaches, the passenger may not sit in the front row.
Attended child under 6	Children aged 0-5 inclusive travel free if accompanied by a person over 10 years of age with any identity card with their date of birth.	All rail services	On coaches, the passenger may not sit in the front row. Each person over 10 years of age can only accompany 1 child with this tariff. The ticket must be bought as a group ticket.
Senior over 60	Seniors aged 60 or more with an identity card with their photo and date of birth.	Selected rail services	
Senior over 70	Seniors aged 70 or more with an identity card with their photo and date of birth.	Rail services in Slovakia only	
Disabled person ZTP (ZTP/P)	Disabled people with a valid Czech ZTP or ZTP/P card	Domestic rail services in the Czech Republic	
Disabled person attendance ZTP/P	A person accompanying a disabled person with a valid Czech ZTP/P card must present the card of the person they are travelling with, and they are entitled to transport free of charge on domestic lines in the form of a group ticket in the Disabled person ZTP/P tariff	Domestic rail services in the Czech Republic	
EYCA (Euro26)/ALIVE	Students with a valid EYCA/ALIVE international student card issued by a carrier	International rail services	

Source; RegioJet website, interpreted by Steer Davies Gleave, table omits discounts not valid on rail services.

A.49 LEO Express provides documentation on tariffs including entitlements to a special fare for children, school pupils, PRM and their assistants, parents and guardians visiting disabled children in institutions and disabled citizens holding ZTP and ZTP/P. We understand that the LEO Express documentation complies with the elements of tariff regulations and discounts set out by the Ministry of Finance under Act 526/1990 Coll. "On prices".

A.50 A stakeholder summarised the discounts available as shown below.

Table A.12: Czech Republic: availability of discounts

Discount	Category
25%	Disabled persons (PRM)
40%	Students up to 15 years
50%	Children under 15 years
60%	Students over 15 years

Source: stakeholder engagement, interpreted by Steer Davies Gleave.

Czech Republic: service quality

A.51 We did not identify any documentation setting out standards of service quality in the Czech Republic.

Czech Republic: persons with reduced mobility (PRM)

A.52 ČD's website provides detailed accessibility for stations, as shown in the example below, in which detailed standards are assigned a code.

Table A.13: Czech Republic: facilities for PRM

Facility	Code	Details
Mobile Platform Lift		The station is equipped with a mobile platform lift for the boarding and disembarking of passengers using a wheelchair into and out of the carriage.
Station Accessibility	b1	Access to the statin building is disabled accessible, including marked accessible ticket counters.
Platform Accessibility	n1	All platforms are disabled accessible.
Accessibility for the Visually Impaired	z2	The station is equipped for the visually impaired (guiding line).
Accessibility for the Visually Impaired	z3	The station is equipped for the visually impaired (information panels with voice output).
Accessibility for the Hearing Impaired	s2	The station is equipped for the hearing impaired (electronic information system).
Accessibility for the Hearing Impaired	s1	The station is equipped for the hearing impaired (induction loop in the ticket office).

Source: ČD website for Praha hlavní nádraží station, interpreted by Steer Davies Gleave.

A.53 However, the table cannot be interpreted without the more detailed guide summarised below.

Table A.14: Czech Republic: coding of facilities including PRM

Issue	Code	Meaning
Degrees of station accessibility	b0	Not accessible even with the assistance of a ČD employee.
	b1	Accessible without the assistance of a ČD employee (access from in front of the station to at least one platform in some manner – even outside the building) without the possibility of additional services.
	b2	Accessible without the assistance of a ČD employee (access from in front of the station to at least one platform in some manner – even outside the building) with the possibility of additional services.
	b3	Accessible including the platforms (access from in front of the station to all platforms) without additional services.
	b4	Accessible including the platforms (access from in front of the station to all platforms) with substitute measures with the assistance of a ČD employee, without additional services.
	b5	Accessible including the platforms (access from in front of the station to the railway building premises and to all platforms) including an accessible toilet.
	b6	Accessible including the platforms (access from in front of the station to the railway building premises and to all platforms) including an accessible toilet, with substitute measures with the help of a ČD employee.
	b7	Accessible and usable (access from in front of the station to all platforms) including an accessible toilet and other services or at least one ticket counter designated as accessible where persons using wheelchairs will be provided all necessary information as well as assistance during ticketing.
	b8	Accessible and usable (access from in front of the station to all platforms) with substitute measures with the assistance of a ČD employee including an accessible toilet and other services or at least one ticket counter designated as accessible where persons using wheelchairs will be provided all necessary information as well as assistance during ticketing.
Mobile platform lift		Not even after modernising stations and elevating the level of platforms can accessible boarding be assured for trains that are not low-platform and do not have their own platform lift. This problem is addressed at certain stations with a mobile platform lift allowing for boarding of such trains by wheelchair users.
Station accessibility for the hearing impaired	s1	Equipped for the hearing impaired (induction loop in the ticket office).
	s2	Equipped for the hearing impaired (electronic information system).
Station accessibility for the visually impaired	z1	Equipped for the visually impaired (acoustic beacons, handrail plate) .
	z2	Equipped for the visually impaired (guiding line).
	z3	Equipped for the visually impaired (information panels with voice output).

Source: ČD website, interpreted by Steer Davies Gleave.

DE: Germany

Germany: sources

A.54 Germany has provided information to RMMS and ERADIS and we also received one stakeholder response.

Germany: overview of the rail market

Table A.15: Germany: overview of the rail market

Measure	Value	Units or details	Year
Area	357,022	square kilometres	
Length of rail network	33,446	kilometres	
Population	80,767,463		2015
Reported rail passenger-kilometres	90,978	million kilometres	2014
Reported rail passenger-kilometres per inhabitant	1126.4	kilometres	2014
Reported rail passenger revenue	11,547	million	2012 at 2010 prices
Reported rail share of passenger surface transport	8%		2013
Routes with price competition	Yes		
Rail market share not held by incumbent (percentage of reported passenger-kilometres)	8.5%		2013
Reported punctuality	93.3% 74.2%	Regional Long-distance	2014
Reported reliability (percentage cancellations)	0.70% 0.30%	Regional Long-distance	2014

Sources: various, note that definitions and consistency of reported data vary.

A.55 Rail services in Germany can be subdivided into open access long-distance services and regional services, which in the majority of the cases are competitively awarded by regional PSO authorities, such as the Bayerische Eisenbahngesellschaft in the federal state of Bavaria.

A.56 In long-distance services, the operators set their own fares and market their services. The incumbent operator Deutsche Bahn still has a market share of more than 99% in long-distance services, so that its fares dominate the perception of long-distance rail fares in Germany. Tickets for Deutsche Bahn long-distance services are often also valid on regional services on the same route, with the exception of the services of some new entrants.

A.57 For short distances a tariff association may set fares, for travel wholly within its area, which are often valid on other modes such as bus, tram and metro services.

A.58 Some federal states set fares for journeys on regional rail services of medium length within their area. For journeys comprising multiple states and not covered by a single tariff association, Deutsche Bahn's fares generally apply.

Germany: journey planning and sales channels

A.59 Germany has no independent provider of information on rail journeys and/or tickets for all rail operators, and passengers must rely on operator information on services.

A.60 Deutsche Bahn's website offers a rail journey planning tool covering journeys by rail, and by many other public transport services such as metros and local buses, by operators across

Europe and beyond. This tool includes services of open access competitor HKX between Hamburg and Köln. However, our initial research suggests that the algorithm may avoid displaying HKX services, depending on the preferred departure time selected. For example:

- A search for departure at 16:00 lists four Deutsche Bahn services departing between 16:01 and 16:46, but does not list the HKX service departing at 16:49, which is only shown after clicking on "later".
- A search for departure at 16:15 lists only three Deutsche Bahn services departing between 16:10 and 16:46, but still does not list the HKX service departing at 16:49.
- A search for departure at 16:30 lists the HKX service on the default screen.

A.61 Deutsche Bahn long-distance tickets are sold at stations, in ticket offices and at ticket machines, and online, via its website or via an app for mobile devices. Tickets for long-distance services can also be bought on the train with a surcharge of €7.50.

A.62 Deutsche Bahn's annual quality report states that:

- Its website it answers 7.5 million journey planning queries per day and sells around 2.5 million tickets every month.
- Its mobile app, DB Navigator, Deutsche Bahn sells 420,000 tickets per month.

A.63 As of June 2014, tickets bought on the website can be loaded onto DB Navigator, avoiding the need to print the ticket.

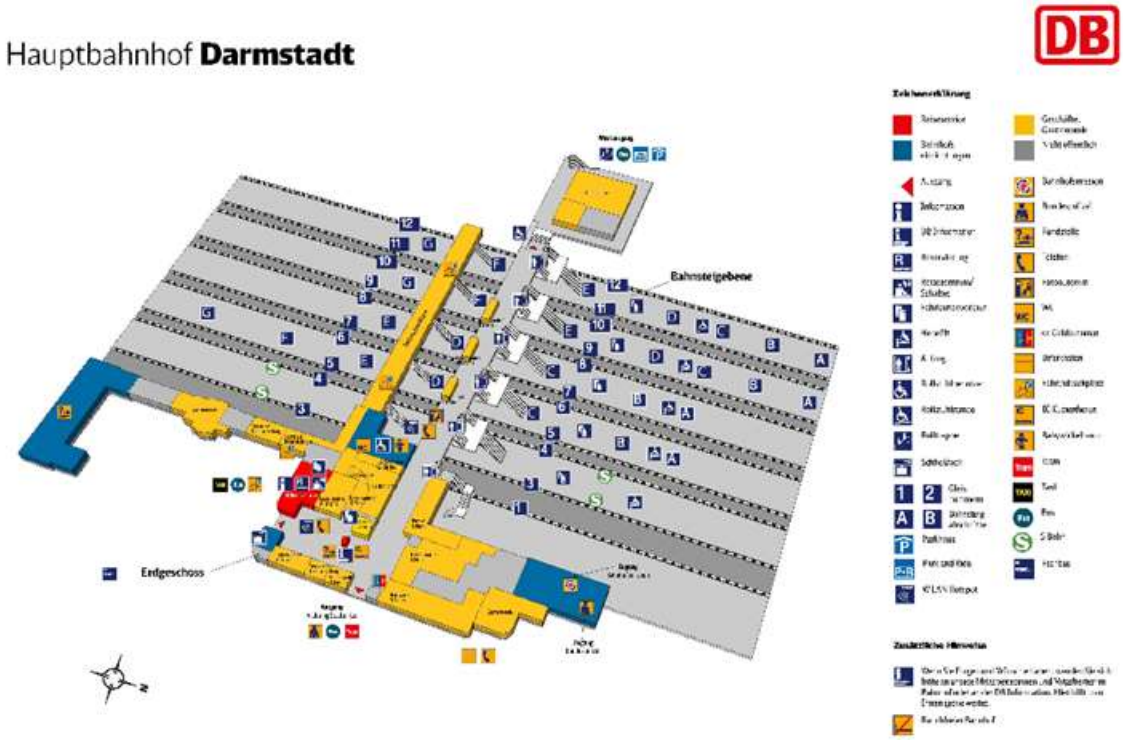
A.64 Deutsche Bahn also offers tickets valid on HKX services, but at a significantly higher price than on the HKX website. This appears to be because it sells "interavailable" tickets such as the Quer-durchs-Land-Ticket or Deutsche Bahn standard fare, which are also valid on HKX trains[50].

Germany: station website

A.65 The company owning and operating many railway stations in Germany is DB Station&Service AG, which like the incumbent operator Deutsche Bahn is a subsidiary of DB Mobility Logistics AG. The website of DB Station&Service AG, www.bahnhof.de, offers basic information on facilities and services available at each station. This includes and basic information such as opening hours, ticket offices, left luggage, barrier-free access, a map of the station location and, for larger stations, a layout map, as shown below.

[50] KCW and Prognos (2015) Wettbewerber-Report Eisenbahn 2015/2016. Report prepared by KCW GmbH and Prognos AG on behalf of mofair e.V. and Netzwerk Europäischer Eisenbahnen e.V.

Figure A.2: Germany: station facilities information



Source: www.bahnhof.de.

A.66 The website also provides a link to an online real time departure and arrival board, showing on each the next 10 trains with up to date information on delays and platforms.

Germany: operator website

A.67 Deutsche Bahn's website provides a variety of information related to rail journeys to passengers:

- There is a detailed description of services provided, including urban, regional, international and high speed services.
- There is information on the different ticket types, fares and discounts available.
- Trains can be tracked on a map in real time. (From April 2014, this service is also available via the DB Zugradar app.)
- Seats can be booked on many ICE services. The website shows a seat diagram of each coach similar to those offered by airlines.

A.68 Open access operator HKX provides its own website (**www.hkx.de**) in German and also with limited information in English (including a specific reassurance that all staff speak English).

Germany: ticket types

A.69 Deutsche Bahn offers special fares (Rail&Fly) for journeys between the airport and the final travel destination in Germany. Rail&Fly tickets can be bought with the air ticket of Rail&Fly partner airlines, and are valid on the day before and the day of the outbound flight, the day of the return flight, and the following day.

Germany: availability of discounts

A.70 A selection of the discounts available on standard fares set out below.

Table A.16: Discounts available in Germany

Category	Discount
Deutsche Bahn Special Price	Non-flexible tariff starting from €29 (or €19 for journeys up to 250 kilometres) Second Class and €39 First Class. Bookable online up to 91 days in advance and in ticket offices up to six months in advance.
Deutsche Bahn BahnCard	BahnCard 25: 25% discount on Deutsche Bahn standard fare and Special Price; €62 Second Class, €125 First Class. BahnCard 50: 50% discount on Deutsche Bahn standard fare only; €255 Second Class, €515 First Class. BahnCard 100: 100% discount, or free travel, on all Deutsche Bahn services and most other rail operators across Germany: €4,090 Second Class, €6,890 First Class.
Quer-durchs-Land-Ticket, and similar tickets	Ticket valid one day in all regional services operated by Deutsche Bahn and other participating operators across Germany. Price for one person is €44, and an additional €8 for each additional passenger up to a group of five. On weekdays valid from 09:00 until 03:00 the following day, on weekend days valid the whole day. Ländertickets are similar tickets valid only in one federal state (such as Bayernticket), or a combination of smaller states. In addition there are variations of this ticket, such as valid after 18:00. Another variation of the Quer-durchs-Land-Ticket is the Schönes-Wochenende-Ticket which is valid on a weekend day and costs €40 for one person and €4 for any additional passenger for a group of up to five. In addition to all regional rail services, this ticket is also valid in all public transport modes in many tariff associations across Germany. It is therefore not clear why this ticket is substantially cheaper than the Quer-durchs-Land-Ticket which can also be bought for a weekend day.
Deutsche Bahn monthly commuter ticket	Valid for an unlimited number of journeys on Deutsche Bahn services between two stations; available for station pairs with distances of up to 400 kilometres. On Saturdays one additional person and up to three children travel at no additional charge. Annual tickets cost the same as 10 monthly tickets.
Deutsche Bahn Job Ticket	Deutsche Bahn grants additional discounts on monthly commuter tickets when an employer buys at least 20 Job Tickets. Discounts rise gradually from 5% for 20-49 Job Tickets to 13% for 2,000 or more Job Tickets.
Deutsche Bahn discounts for groups	Available as an online group ticket for 6-20 passengers, bookable up to three months in advance, and as Group Special Price ticket for 6-99 passengers, bookable up to 12 months in advance.

Source: Deutsche Bahn website, interpreted by Steer Davies Gleave.

A.71 KCW and Prognos (2015) point out that Deutsche Bahn recognised in internal analysis that over time its tariff system became rather chaotic, and lost a clear structure. Some tariffs are cannibalising others, and neither passengers nor its own staff fully understand it. For example, for some long-distance commuter journeys an annual Bahncard 100 may be the most cost-effective ticket.

Germany: service quality

A.72 DB Fernverkehr publishes an annual quality report (Qualitätsbericht) which includes information on its activities related to passenger information and ticket sales, including information on the quality of its services, services related to PRMs, and complaint management.

A.73 We did not identify any documentation setting out standards of service quality in Germany. However, DB's website provides, in a number of languages, details of passenger rights under the Passenger Rights Act which came into force on 29 July 2009. Links in various languages are provided to a Passenger Rights Claim Form, which is available in German and English.

A.74 This section of the website specifically states that rights apply to through tickets on trains operated by different operating companies.

Germany: persons with reduced mobility (PRM)

A.75 DB's website provides detailed information in German for PRM. It makes clear that PRM includes those with learning disabilities, the deaf and hard of hearing, the blind and those with impaired grip, dwarfism or other disabilities. The website provides information, in German, that:

- Booking of assistance can be carried out through the Mobility Service Centre, contactable by email, fax and telephone, and with provision for deaf customers.
- Boarding lifts or ramps are available at "almost all passenger stations"[51], many trains including integrated lifts, ramps or manual levellers, and approximately 300 stations have staff who can provide assistance.
- Wheelchairs spaces are available on trains in limited numbers and booking is recommended.
- Those with at least a 70% disability can buy a BahnCard 25 or BahnCard 50 (see above) at a reduced price.
- A special luggage service is available, for €16.50, for those with a disabled pass.

A.76 DB provides specific details on periods when assistance is available, the availability of lifts and ramps, meeting arrangements and minimum transfer times. Conditions for the carriage of wheelchairs, mobility scooters, Zimmer frames, and crutches is covered, including where appropriate details of the maximum sizes and weights that can be accommodated.

A.77 Disabled passengers are also reminded of the Passenger Rights legislation.

[51] " fast alle Bahnhöfe des Personenfernverkehrs"

EE: Estonia

Estonia: sources

A.78 Estonia has provided information to RMMS and ERADIS but we have received no stakeholder responses.

Estonia: overview of the rail market

Table A.17: Estonia: overview of the rail market

Measure	Value	Units or details	Year
Area	45,228	square kilometres	
Length of rail network	1,510	kilometres	
Population	1,315,819		2015
Reported rail passenger-kilometres	280	million kilometres	2014
Reported rail passenger-kilometres per inhabitant	212.8	kilometres	2014
Reported rail passenger revenue	€2	million	2012 at 2010 prices
Reported rail share of passenger surface transport	1.7%		2013
Routes with price competition	No		
Rail market share not held by incumbent (percentage of reported passenger-kilometres)	2%		2013
Reported punctuality	99.18%		2014
Reported reliability (percentage cancellations)	0.06%		2014

Sources: various, note that definitions and consistency of reported data vary.

A.79 Estonia has a single national rail operator, ELRON.

Estonia: journey planning and sales channels

A.80 ERADIS reports that information about Elron's services is available via:

- Elron website at **www.elron.ee**;
- By phone, open 24 hours per day, and office phones during office working hours; and
- on board trains, which usually have a customer service member ready to provide information and help.

A.81 Information about trains is published on platforms and at stations. On some trains electronic displays provide information about on the destination, next and subsequent stops, speed and outside temperature.

A.82 Tickets for same day travel can be bought at information kiosks at the Baltic Station (Balti Jaam, see above) and Tartu Station.

A.83 Advance ticket sales at ticket kiosks ends:

- 15 minutes before departure, for Second Class; and
- 1 hour before departure, for First Class tickets.

A.84 30 day tickets can be bought from:

- Elron's website and **www.pilet.elron.ee**;
- On train, with cash or money loaded onto the Elron fare card or with a bank card.

Estonia: station website

A.85 Elron provides only limited information on station facilities, but its website does have a plan of the main Balti Jaam station in Tallinn, reproduced below.

Figure A.3: Estonia: station facilities information

Source: ELRON website, station shown is Balti Jaam in Tallinn.

Estonia: operator website

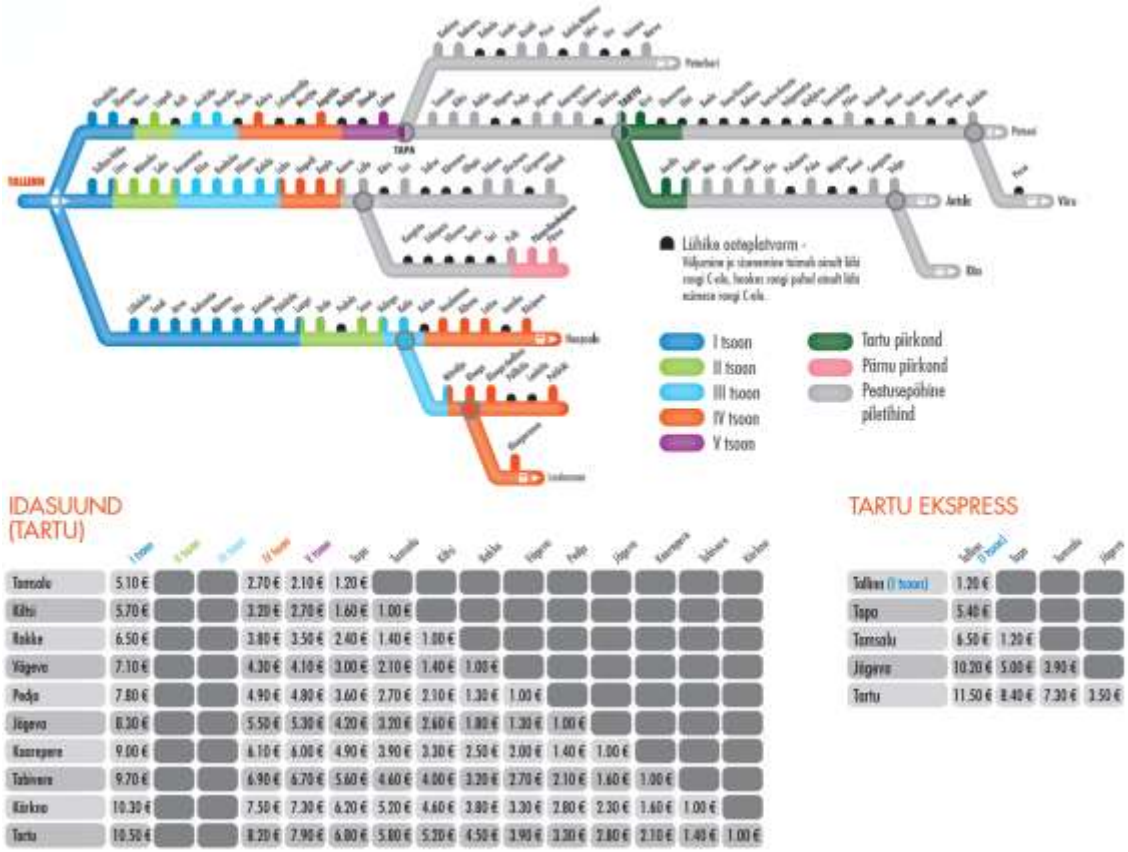
A.86 Timetables are published on Elron's website and are available on every platform. Information on arrival and departure platforms is published in large stations such as Tallinn and Tartu.

Estonia: ticket types

A.87 Fares are published at Elron's website, by telephone, at selected platforms at large stations, and inside the trains.

A.88 There are zonal fares around Tallinn and Tartu, but other fares are still "kilometric", based on a price per kilometre.

Figure A.4: Estonia: example of presentation of fares



Source: ELRON.

A.89 A stakeholder reported the ticket types as listed below, but made no reference to the Ekspress fares shown above.

Table A.18: Estonia: ticket types

Ticket types
Single tickets, valid on board a specific train
First Class tickets
24 hour Travelcards
30 day Travelcards

Source: stakeholder engagement, interpreted by Steer Davies Gleave.

Estonia: availability of discounts

A.90 A stakeholder reported the availability of the discounts shown below, although Elron's website provides a slightly different list.

Table A.19: Estonia: availability of discounts

Discount	Eligibility
10%	Travelcards
50%	School pupils
	College and university students
	People aged 65 and older
	Retired persons
	Persons accompanying disabled children
	Persons aged 16 years or more who have a serious or moderate disability
	Persons accompanying a person having a profound disability aged 16 years or more
100%	Pre-school children (only one pre-school child can travel for free with a parent in First Class)
	Disabled children under 16 years old
	Profoundly disabled people over 16 years old
	Person accompanying a person having a profound or severe visual disability
	A guide dog accompanying a person having a visual disability

Source: stakeholder engagement, interpreted by Steer Davies Gleave.

A.91 Documents accepted as certifying the right for a discount are listed below.

Table A.20: Estonia: documents necessary for discounts

Documents certifying the right for a discount
Student card or the equivalent ISIC Scholar Card
Student identification card or the equivalent ISIC Student Card
Republic of Estonia pension certificate
Disability certifying document issued by the Estonian National Social Insurance Board, with an identity document

Source: stakeholder engagement, interpreted by Steer Davies Gleave.

Estonia: service quality

A.92 The rights and obligations of passengers and the rail operator are set out in the passenger transport rules, accessible on Elron's home page with extracts publicised on trains. The passenger transport rules include a section on the management of passenger complaints. A separate document, issued by Elron, covers terms and conditions for refunds and the voluntary return of tickets. This document is also accessible on Elron's webpage.

A.93 Customer complaints and inquiries, by telephone, by email and online, are registered with an individual identification number in the general document management system.

Estonia: persons with reduced mobility (PRM)

A.94 ERADIS reports that information for PRM is provided through general procedures but that, as of 2014, no station in Estonia had personnel to provide help for PRM. New FLIRT type electrical trains are in compliance with TSI for disabled persons. Together with appearance of new type of modern trains railway stations were reconstructed, platforms lowered and infrastructure modernized to be in accordance with TSI. Elron's customer service crew on board provides necessary help only on board to the extent possible. Rules on carriage of disabled passengers are under implementation.

ES: Spain

Spain: sources

A.95 Spain has provided information to RMMS and ERADIS and we also received one stakeholder response.

Spain: overview of the rail market

Table A.21: Spain: overview of the rail market

Measure	Value	Units or details	Year
Area	505,370	square kilometres	
Length of rail network	15,937	kilometres	
Population	46,512,199		2015
Reported rail passenger-kilometres	24,915	million kilometres	2014
Reported rail passenger-kilometres per inhabitant	535.7	kilometres	2014
Reported rail passenger revenue	€1,875	million	2012 at 2010 prices
Reported rail share of passenger surface transport	6.1%		2013
Routes with price competition	No		
Rail market share not held by incumbent (percentage of reported passenger-kilometres)	6%		2013
Reported punctuality	91.88% 97.35% 85.57%	Local Regional Long-distance	2014
Reported reliability (percentage cancellations)	0.58% 0.48%	Regional Long-distance	2014

Sources: various, note that definitions and consistency of reported data vary.

A.96 Spain has a single national operator RENFE, providing conventional and high speed services. RENFE also operates commuter services ("Rodalies" in Barcelona, "Cercanías" elsewhere) for competent authorities in the major regional cities.

Spain: journey planning and sales channels

A.97 Information on timetables, fares and arrival and departure platforms is available at ticket offices located in the stations, and on the information panels, screens and data display monitors. Information about timetables and fares can be found at:

- Renfe's website **www.renfe.com**;
- a mobile app with Internet connection;
- a telephone service, RENFE CONTIGO, which offers commercial information; and
- web-based social networks.

A.98 Tickets can be bought through Renfe's website, at travel agencies, at station ticket offices and at ticket vending machines. With the exception of stations with very few passengers, stations are staffed by employees who sell tickets and offer information to customers. Unstaffed stations have automatic ticket vending machines which offer contact with sales staff.

Spain: station website

A.99 Infrastructure manager ADIF provides information on stations , as in the examples below.

Figure A.5: Spain: station facilities information

Source: ADIF website.

Figure A.6: Spain: station facilities information

Source: ADIF website, note that plan does not show security-related barriers and equipment.

Spain: operator website

A.100 Renfe's website is at **www.renfe.es**.

Spain: ticket types

A.101 Renfe's website at **www.renfe.com/viajeros/tarifas** offers the following fares in Spanish.

Table A.22: Spain: ticket types

As listed	Meaning	Conditions
Ida y vuelta	Return	Available for AVE, long-distance, Avant and medium distance conventional services
Niños	Children	40% discount for children under 14 who occupy a seat 100% discount for children under 4 who do not occupy a seat 100% discount for up to two children, who do not occupy seats, under six (on Cercanías services) or four (on Rodalies services in Barcelona)
Compra Múltiple	Multiple purchase	20% discount on three journeys completing a circuit back to the starting point
Billete Promo		For AVE and long-distance trains, dynamically priced with discounts of up to 70%
Billete Promo+		For AVE and long-distance trains, dynamically priced with discounts of up to 65%
Billete Flexible		The same price as the General/Base tariff, but with better conditions regarding changes and cancellations
Tarifa 4 Mesa		For AVE and long-distance trains, up to four people seated around a table, at 60% of the cost of four seats, only available on suitable trains and cannot be combined with other offers
Combinado Tren+Autobús	Combined train and bus	Combines a rail ticket with a ticket on one of five interurban bus operators to provide connections beyond the rail network
Turista Plus		For some AVE and long-distance trains, a 20% discount on Turista class, which can be combined with any tariff
BonoAVE		For all AVE and some long-distance trains, a non-transferrable ("nominative") ticket giving a 35% discount on the General/Base fare for ten round trips between named stations
BonoAVE Flexible		For all AVE and some long-distance trains, a non-transferrable ("nominative") ticket for ten round trips anywhere on the trains covered, for €725 (Turista) and €1,200 (Preferente), for travel to be completed within four months
BonoAVE Colaborativo		For all AVE and some long-distance trains, a non-transferable ticket for four named people for eight round trips between named stations
Abono Plus (Avant)		For 30 or 50 journeys, to be completed within a 30-day period within six months of purchase
Abonos Mensuales	Monthly tickets	Non-transferrable ticket for travel between two name stations, with up to two journeys per day on Rodalies services in Barcelona or unlimited travel elsewhere, some variation between regions
Tarjeta Plus 10		On Avant trains, a non-transferrable ticket for ten single journeys to be completed in eight days within two months of purchase
Tarjeta Plus 10 Estudiantes		On Avant trains, a non-transferrable ticket for ten single journeys to be completed in ten days within two months of purchase, for holders of a student card
Tarjeta Dorada	Over-60, disabled and disabled companion card	For AVE and long-distance trains, a €6 annual card for passengers aged over 60 or disabled passengers over 18 entitling them to a 25% discount Friday to Sunday and a 40% discount Monday to Thursday: those over 65% disabled can also take a companion

As listed	Meaning	Conditions
Tarjeta +Renfe Joven 50		Non-transferrable €50 card for those aged 14-25 (inclusive) with discounts on AVE and long-distance (50% if booked over 30 days ahead, 40% if booked over 15 days ahead, or 30%), 25% on suburban (Cercanías or Rodalies), medium distance and Avant
Carné Joven	Youth carnet	For AVE, long-distance and medium-distance trains, for those aged 14-25 (inclusive), issued by a local administration, giving a 20% discount on any train and class: for Avant trains, equivalent discounts are also offered to holders of various youth cards issued in other countries
Familia Numerosa	Large family	For families with documents issued by the competent authority, on any fare, a discount of 20% for members of the Familia Numerosa and 50% for members of the Familia Numerosa Especial
Grupos - Descuentos	Group discounts	For AVE and long-distance trains, for groups from 10 to 25, 20% off the General fare and 30% off return tickets For medium-distance conventional trains, for groups of 10 or more, 20% off the General fare and 40% for children under 14 (or 40% for adults and 50% for children from schools, associations and cultural organisations) and free for children under 4 For Avant trains, for groups from 10 to 25, and by application for groups over 25, 15% off the General fare For charter trains, as agreed in the charter contract For Cercanías and FEVE (narrow gauge lines), discounts on the General fare of 30%, 40% for return tickets and 50% for children under 12, with additional discounts in specific local marketing campaigns Different rules apply in the Cercanías of Madrid, Murcia/Alicante and Valencia None of the group discounts can be combined with any other discount
Congresos y Eventos	Conferences and events	Discounts on all trains for a minimum of 75 people assisting an event, applied for 30 days in advance, valid from two days before to two days after the event
Renfe Spain Pass		Valid only for non-residents of Spain, and requires a passport, for 4, 6, 8, 10 or 12 journeys in Turista or Club class completed in a month within six months of purchase

Source: Renfe website, interpreted by Steer Davies Gleave, conditions have been translated and summarised.

Spain: availability of discounts

A.102 See the description of ticket types listed above. The range of discounts is complex.

Spain: service quality

A.103 Every year, Renfe conducts perceived quality surveys disaggregated into long-distance (high speed and conventional), medium distance (high speed and conventional) and commuter.

Spain: persons with reduced mobility (PRM)

A.104 In addition to the information systems available to any passenger, Renfe offers a specific service for disabled persons and persons with reduced mobility (PRM) called ATENDO. This offers help and personalised supervision during the journey and can be accessed by telephone, online or at customer service centres in various stations.

A.105 Permanent assistance is provided at 68 rail network stations and may be requested up to 30 minutes before the train departs. Specific assistance is provided at 59 rail network stations and must be requested at least 12 hours in advance.

FR: France

France: sources

A.106 France has provided information to RMMS and ERADIS and we also received one stakeholder response.

France: overview of the rail market

Table A.23: France: overview of the rail market

Measure	Value	Units or details	Year
Area	643,801	square kilometres	
Length of rail network	30,581	kilometres	
Population	65,835,579		2015
Reported rail passenger-kilometres	89,499	million kilometres	2014
Reported rail passenger-kilometres per inhabitant	1359.4	kilometres	2014
Reported rail passenger revenue	€11,119	million	2012 at 2010 prices
Reported rail share of passenger surface transport	9.4%		2013
Routes with price competition	No		
Rail market share not held by incumbent (percentage of reported passenger-kilometres)	9%		2013
Reported punctuality	91.46% 90.61%	Regional Long-distance	2014
Reported reliability (percentage cancellations)	2.15% 0.92%	Regional Long-distance	2014

Sources: various, note that definitions and consistency of reported data vary.

A.107 France has a single national rail operator, SNCF, providing high speed (TGV) and conventional services including commuter services in Paris and other large cities.

A.108 SNCF Gares et Connexions provides information on station facilities.

France: journey planning and sales channels

A.109 SNCF's main website (**www.sncf.com**) provides information in French (the default language), German and English on reservations, timetables and real-time traffic, and information on stations and points of sale.

A.110 The reservation facility provides functionality to search by origin, destination, time and class of travel, and to specify the age of the passenger(s) and any discount or loyalty cards they hold.

A.111 Passenger services information provides a link to points of sale, which in turn provides details of:

- There is a map-based tool for finding authorised travel agencies.
- There is a map-based tool for finding SNCF sales offices.
- An online help service is based on instant messaging to "Léa", a member of staff.
- There is a client service hotline "36 35".
- There are internet and mobile app options.
- Stations information is provided, including information on self-service machines.

A.112 Information is also accessible on promotions and special deals.

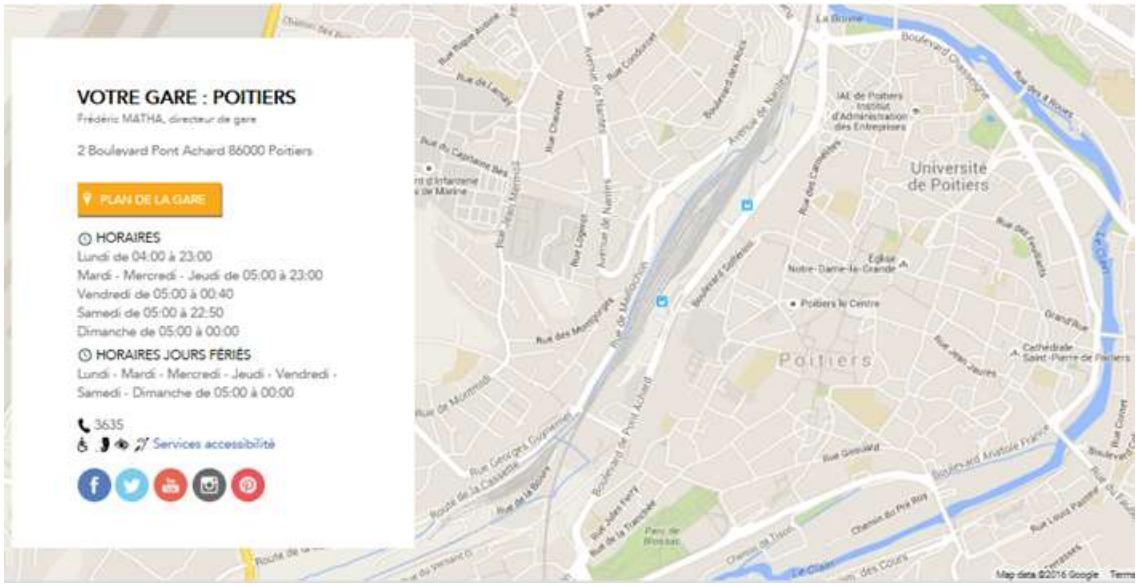
France: station website

A.113 SNCF Gares et Connexions provides a range of information on stations including real time departures, arrivals and platform numbers and details of the facilities available at the station.

A.114 Information on station facilities, shown below, includes opening and closing times and a link to PRM services ("Services accessibilité").

A.115 The information also includes an interactive panoramic viewer of parts of the station with floating blue signs to particular facilities: by clicking on the sign the view will move through the station to show the route between facilities, incidentally illustrating barriers such as steps.

Figure A.7: France: station facilities information



Source: SNCF Gares et Connexions, Poitiers.

Figure A.8: France: station facilities information

Source: SNCF Gares et Connexions, Poitiers, floating blue signs provide links to different parts of the station.

France: operator website

A.116 SNCF's timetable and real-time traffic updates facility provides functionality by journey, train and station:

- By journey, it provides the same functionality as a journey planner.
- By train, it provides information based on a train number, showing timetable, progress and platform numbers and the range of facilities offered on board.
- By station, it provides real-time information on departures including platform number, the stops to be served and the classes of accommodation available.

France: ticket types

A.117 A stakeholder informed us that SNCF fare policy by can be subdivided as:

- commercial fares (freely decided by SNCF);
- national social fares (decided by State); and
- regional social fares (decided by regions as competent authorities).

A.118 Commercial fares, a stakeholder reported, may be designed for professional and/or leisure purposes, such as the weekend discount pass ("*carte week-end*"), youth discount pass ("*carte jeune 12-27*") and senior discount pass ("*carte senior 60+*"), which allow fare reductions but with restrictions on exchanges or refund.

A.119 National social fares are usually defined by the law and offer discounts for specific type of passengers. The current types of discounts are listed below.

Table A.24: France: availability of discounts

Category
Large families (from 3 children under 18)
Military families paying a tribute to the grave of soldiers who have died on duty
War veterans
Work subscription from home to work under 75 kilometres
"Popular" ticket for annual leave
Children's walks
Students/apprentices
Persons accompanying disabled people

Source: stakeholder engagement, interpreted by Steer Davies Gleave.

A.120 National social fares are compensated in order to limit their effect on the commercial results of the railway undertaking.

A.121 Regional fares are set by regions to improve the attractiveness of rail as a mode.

France: availability of discounts

A.122 SNCF's website provides, under "cards & discounts" (the English version, at **www.sncf.com/en/special-deals**) a structured list of the various cards and discounts available, as summarised below.

Table A.25: France: availability of discounts

Category			Discount	Details
Travel for all ages	Under 12	Under 4	100%	Children under four travel free if not using a seat, except on iDTGVs. Three types of discounts are available: Bambin (TGV, TER and Intercité services); Enfant+ Railcard, including a seat, and "kid fares" (on Thalys services)
		Under 11	50%	On all trains except iDTGV. Junior & Cie service for children aged 4-11 to travel in a group.
	12-27		25-60%	Jeune 12-17 Railcard (€50), Jeune 18-27 Railcard (€50) 25% saving on all fares 50% discount on off-peak TER and Intercité trains not requiring booking Up to 60% on pre-booked TGV and Intercité services Special last minute discounts
	28 or more		25-50%	Weekend Railcard (€75) Various discounts at weekends
	60 or more		25-50%	Senior+ Railcard (€60)
Travel with others	Family		30-75%	Familles nombreuses Railcard (€19 for one family) A range of discounts for a family
	Minigroupes			Groups of 3-6 people travelling together on TGVs
	Groups			Group discounts on request for travel by 10 or more people
Daily travel	Paris region			Navigo pass
	Other regions			TER regional passes
	National	All lines		Forfait pass, providing unlimited travel on TGV and Intercité, subject to a €1.50 charge to reserve a seat
		One route		Optiforfait pass, providing unlimited travel on a nominated route
Business	Second Class			Pro 2nde flexible Second Class ticket
	First Class			Pro 1ère flexible First Class ticket
	Period		50%	Fréquence, giving a discount on Pro 2nde and pro 1ère for large volumes of travel for the national network or a single route
Special fares	Employees			Discounted period travel for commuting under 75 kilometres
	Children's groups		75%	Discounts for 10 or more children under 15 years, on TGV, Intercité and TER services
	Students and apprentices		Up to 50%	Under 21 and at school, under 23 and in an apprenticeship, or under 26 and in higher education: nine journeys per month free and 50% off further journeys
	Military personnel		Up to 75%	Militaire card, on TGV, Intercité and TER services, with discounts of 25-50% for spouse and family members
	Disabled veteran		50-75%	Discount depends on disability rating
	PRM		50-100%	On TGV, Intercité and TER services, for passenger and companion

Source: SNCF website, interpreted by Steer Davies Gleave.

France: service quality

A.123 SNCF's website sets out, under "our commitments", information , ombudsman and the general conditions of carriage and a series of guarantees:

- There is reschedule or refund guarantee if a train is delayed more than one hour.
- There is a seat guarantee if no seat is available on a train journey of over 90 minutes.
- There is an assistance guarantee, in the event of major problems, to help passengers continue their journey and find accommodation.
- There is a punctuality guarantee if arrival is delayed more than 30 minutes.
- There is a complaint guarantee of a response within five days to online claim forms submitted to the customer service department.

France: persons with reduced mobility (PRM)

A.124 As noted above, the website of SNCF Gares et Connexions provides a link to accessibility information at each stage, an example of which is shown below.

Figure A.9: France: information in station PRM facilities

Source: SNCF Gares et Connexions, Poitiers.

A.125 The information includes the availability of station staff, assistance for boarding and alighting from trains, wheelchairs, tactile marking on platform edges (only available on some platforms), information screens, passenger announcements, toilets and wheelchair-accessible toilets. There are also links to further information relevant to wheelchair users, those with learning difficulties, the blind and the deaf.

A.126 SNCF's main website also provides information, under passenger services, on "on-board services & special amenities" including an overview of services offered on trains, a link to the disability access services (Accès) with arrangements for PRM access to the network, and a link to a (French language) 84-page "Limited Mobility Guide" (Guide Mobilité Réduite).

IT: Italy

Italy: sources

A.127 Italy has provided information to RMMS and ERADIS and we also received two stakeholder responses.

Italy: overview of the rail market

Table A.26: Italy: overview of the rail market

Measure	Value	Units or details	Year
Area	301,340	square kilometres	
Length of rail network	17,070	kilometres	
Population	60.8	million	2015
Reported rail passenger-kilometres	48,881	million kilometres	2014
Reported rail passenger-kilometres per inhabitant	804	kilometres	2014
Reported rail passenger revenue	€2,950	million	2012 at 2010 prices
Reported rail share of passenger surface transport	6.3%		2013
Routes with price competition	Yes		
Rail market share not held by incumbent (percentage of reported passenger-kilometres)	7.60%		2013
Reported punctuality	81.5% 65.0%	Regional Long-distance	2014
Reported reliability (percentage cancellations)	3.0% 0.7%	Regional Long-distance	2014

Sources: various, note that definitions and consistency of reported data vary.

A.128 Italy has an incumbent operator, Trenitalia, and a new entrant high speed operator, NTV, operating as "Italo" in competition with Trenitalia on the main north-south high speed line.

Italy: journey planning and sales channels

A.129 Trenitalia's website provides extensive information on train services, sales channels and station facilities. Passengers can plan their journey by two means:

- The Trenitalia website provides information on ticket types, discounts, means of payment at the station or online and facilities for passengers with reduced mobility.
- The central stations' webpage provides real time updates on arrival and departure times, platform information, service calling points and disruption.

Italo operates its own website and reservation system.

A.130 Tickets have in the past been sold:

- in advance through travel agents;
- at station ticket offices during opening hours; and
- on board the train, at an additional charge.

A.131 Major stations continue to host travel agencies and local ticket desk as well as ticket vending machines, but tickets are now also sold through call centres, online, and smartphone apps.

A.132 Payment can be by credit card, PayPal, Masterpass or via Bemoov, an online payment system. Those with no credit card can use the "Postoclick" reservation and sales system, in which payment, identified by the passenger name record (PNR) code, may be made between 24 and 48 hours after booking and at least 24 hours before departure at Unicredit cashpoints or online payments systems Lottomatica and Sisal.

Italy: station website

A.133 Most Italian railway station websites provide an overview of the services available, including: ticket sales facilities, accepted payment methods and ticket office opening hours. Station websites also provide information on other services such as local transport connections, parking or cycle facilities and free WiFi.

Italy: operator website

A.134 Trenitalia's website offers a detailed description of services provided, including urban, regional, international and high speed services, and ticket types, fares and discounts available.

A.135 Italo's website provides equivalent information on its own high speed services.

Italy: ticket types

A.136 Trenitalia tickets available, both online and at stations include:

- Base tickets are valid on all services except executive services, and allow unlimited changes to departure day and time before departure. A passenger missing a train is also permitted, within one hour of the original departure, to change to another train.
- Economy tickets are available on Frecciarossa and Frecciargento trains, in First and Second class and for Business, Premium and Standard service, and sleeping cars and couchettes. The date and departure time can be changed to another train of the same category once before departure, subject to the payment of any difference in fare.
- Super economy tickets are available on all trains in First and Second Class, Business, Premium, Standard, and sleeping cars and couchettes. The number of tickets available is limited and varies with the day, train, class and train. This ticket is usually the cheapest available, but cannot be combined with any other reductions.

A.137 First Class, available on some trains, includes a welcome service, free morning newspapers, bar, larger seating and luggage space, a baby changing table, "La Freccia" magazine and an on-board cleaning service.

A.138 Other offers such as same day return, weekend return, blocks of 10 journeys and group travel are available on the Trenitalia website and are usually available for both First Class and Second Class services.

A.139 Cycles can be carried on trains with a bicycle icon in the timetable, usually for an additional fee of €3.50 for urban and regional trains and €12 for international trains.

A.140 Trenitalia also offers reduced fares on rail tickets bought in combination with:

- ferries, including Adria Ferries, Attica Group and SNAV; or
- airlines, including Alitalia, Air France KLM, Meridiana Fly, Emirates, Air Canada, El Al, Egyptair, Qatar airways, Singapore Airlines and Air Transat.

Italy: availability of discounts

A.141 Discounts are available as set out below, in some cases requiring the possession or purchase of a specific card.

Table A.27: Italy: availability of discounts

Category	Discount
Group of 10 or more travelling together	• 30% reduction on Frecciarossa, Frecciargento, Frecciabianca, Espressi and InterCity services in sleeping cars and couchettes • 10% on regional trains
Group including children aged 5 to 12	
Age under 4	100%, if they are with an adult and do not occupy a seat
Age 4-12	50%
Age 12 to 26	By buying a €40 Green Card ("Carta Verde"): • 10% for base fares (First and Second Class) on all domestic trains including sleeping cars and couchette at Business, Premium and Standard service levels • 25% for international services
Age 60 to 75	By buying a €30 Silver Card ("Carta Argento"): • 10% for sleeping cars and couchettes • 15% for base fares (First and Second class) on all domestic trains and at Business, Premium and Standard service levels • 25% for international services
Age 75 or more	With a free Silver Card ("Carta Argento"): • 10% for sleeping cars and couchettes • 15% for base fares (First and Second class) on all domestic trains and at Business, Premium and Standard service levels 25% for international services
"Night&AV"	Discount for travel on night or high speed trains ("Alta Velocità", AV)

Source: Trenitalia website, interpreted by Steer Davies Gleave

A.142 Further offers and discounts, which may vary by time and location, are available online.

A.143 Standard, weekly and monthly fares are set by the regional authorities, who may also offer different discounts for groups such as children and the unemployed.

Italy: service quality

A.144 Stations typically provide real time information on arrivals and departures, platform numbers, delays and disruption, and facilities on each train such as WiFi, conditions of carrying cycles or pets, assistance for children and food and drinks on board.

A.145 Trenitalia and the Ministry of Transport and Infrastructure agreed on a set of minimum quality standards for passenger services, summarised as follows:

- "Carta dei Servizi Passeggeri media lunga percorrenza" setting out quality standards on long-distance and international services.
- "Carta dei Servizi Regionali" in each region, setting out quality standards for regional services.

A.146 Trenitalia publishes an annual monitoring report ("Relazione sulla qualita' dei servizi di Trenitalia") on the quality of the train services including punctuality, cancellations, on-board

cleaning and customer satisfaction. This also sets out services for disabled passengers, procedures for claiming refunds, and proposed service improvements.

Italy: persons with reduced mobility (PRM)

A.147 RFI's website provides details of the notice required to book assistance, the hours during assistance is provided, and a detailed description of the facilities available, as shown below.

Figure A.10: Italy: information for PRM

FIRENZE SANTA MARIA NOVELLA	
indirizzo: **Piazza Stazione - Firenze (FI)**	*regione* : **Toscana**
network di gestione: **Grandi Stazioni**	*categoria*: **PLATINUM**
stazione con servizi di assistenza ai viaggiatori con disabilità e a ridotta mobilità	
SALA BLU di riferimento: **FIRENZE S.M.N.**	I servizi di assistenza da effettuare in questa stazione tra le 7.45 e le 22.30 possono essere richiesti fino a **1 ora prima** dell'orario di partenza/arrivo del treno
facilities	
	**servizi igienici accessibili**
	**parcheggio con posti riservati**
	**sistemi di informazione al pubblico sonori**
	**sistemi di informazione al pubblico visivi**
	**sportelli di biglietteria accessibili**
accessibilità binari	
	*marciapiede rialzato per entrare/uscire dai treni in arrivo/partenza al*: binario 1, binario 1 Est, binario 8, binario 9, binario 10, binario 11, binario 12, binario 13
	*percorso senza barriere (in piano, con ascensore, con rampa) fino al*: binario 1, binario 1 Est, binario 2, binario 3, binario 4, binario 5, binario 6, binario 7, binario 8, binario 9, binario 10, binario 11, binario 12, binario 13, binario 14, binario 15, binario 16, binario 17, binario 18
	*percorso tattile dall'ingresso della stazione fino al*: binario 1, binario 1 Est

Source: RFI website.

NL: Netherlands

Netherlands: sources

A.148 The Netherlands has provided information to RMMS and ERADIS but we have received no stakeholder responses.

Netherlands: overview of the rail market

Table A.28: Netherlands: overview of the rail market

Measure	Value	Units or details	Year
Area	41,543	square kilometres	
Length of rail network	3,032	kilometres	
Population	16,829,289	million	2015
Reported rail passenger-kilometres	17,700	million kilometres	2014
Reported rail passenger-kilometres per inhabitant	1051.7	kilometres	2014
Reported rail passenger revenue	€2,133	million	2012 at 2010 prices
Reported rail share of passenger surface transport	10.5%		2013
Routes with price competition	No		
Rail market share not held by incumbent (percentage of reported passenger-kilometres)	10%		2013
Reported punctuality	94.9%		2014
Reported reliability (percentage cancellations)	1.9%		2014

Sources: various, note that definitions and consistency of reported data vary.

A.149 The Netherlands has a relatively dense network with a national fares system based on the OV-Kaart. Services are provided by incumbent operator NS and a number of operators, including Arriva, Breng and Connexxion (both Transdev companies), Syntus, Veolia, under contract to regional competent authorities.

Netherlands: journey planning and sales channels

A.150 Operator NL's website, **www.ns.nl**, provides information in Dutch and English. It opens with an origin-destination journey planner.

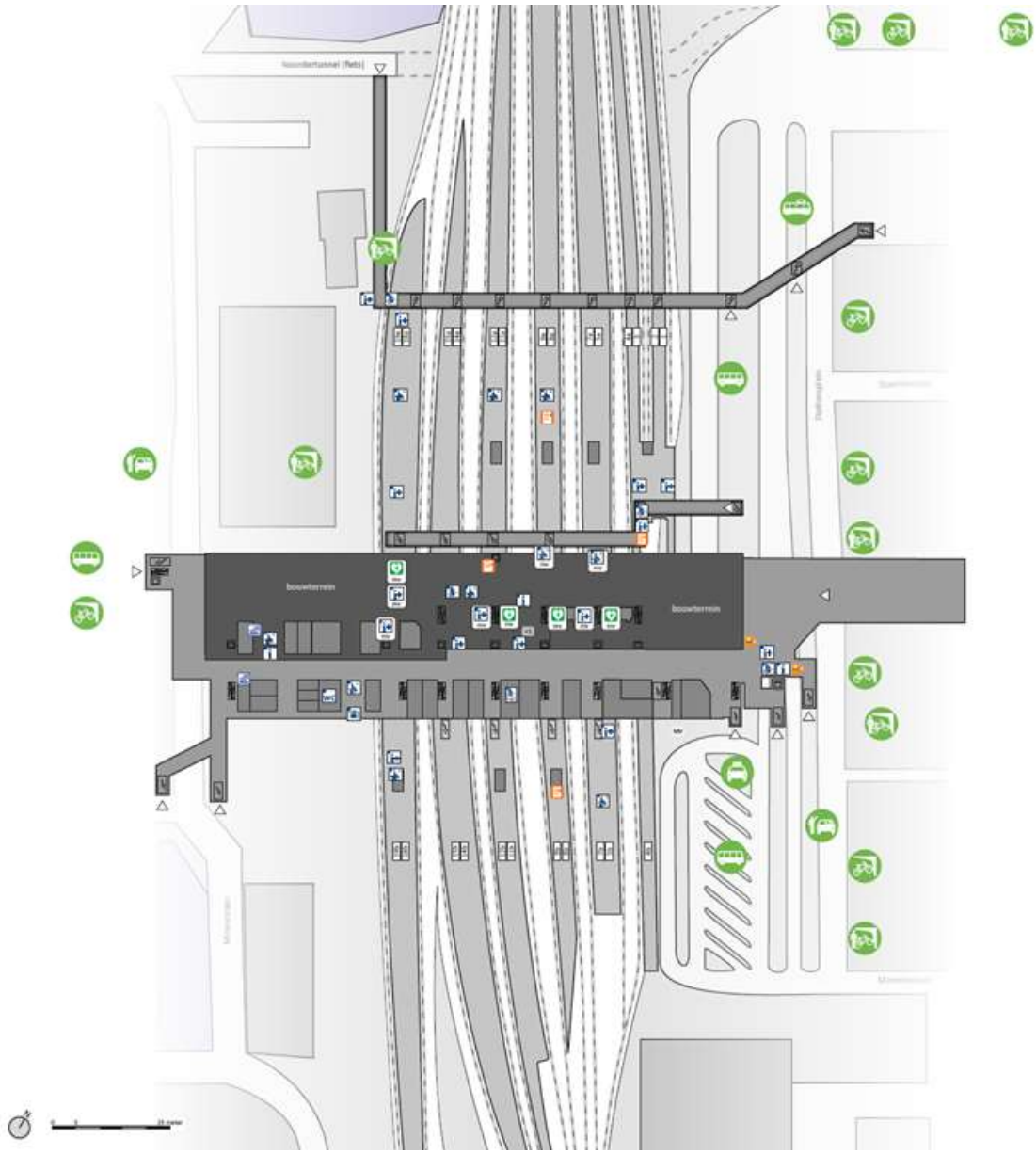
A.151 There is also a travel planner "Reiseplanner Wear" for an Android smart watch.

A.152 Infrastructure ProRail's website, **www.prorail.nl**, provides a network map, although a wide range of other network maps are also available online.

Netherlands: station website

A.153 NS provides detailed information on all stations including plans for some larger stations, as shown below.

Figure A.11: Netherlands: station facilities information



Source: NS website, for larger stations only, example shown is Utrecht Centraal.

Netherlands: operator websites

A.154 The principal operators all have websites, including the following in addition to NL:

- Arriva **www.arriva.nl** is in Dutch only. It provides a journey planner and access to sites for each region in which Arriva provides services.
- Breng **www.breng.nl** and Connexxion **www.connexxion.nl** are in Dutch only. Connexxion's site opens with a journey planner but also provides real-time updates and information on the operator's mobile website and app.

Netherlands: ticket types

A.155 NS's website provides the following information on tickets and supplements.

Table A.29: Netherlands: ticket types

Type		Comments
Tickets	Single	Valid from 00:00 to 04:00 the next morning (28 hours)
	Day return	Break of journey is permitted within this period
	Railrunner	Allows children to travel for €2.50: children under 3 travel free, children 4-11 can travel independently, valid in First Class with an adult aged 18 or over, who can take up to 3 children Valid on NS and InterCity Berlin, ICE International and Intercity direct in the Netherlands, but not Thalys
	NS Group return	€55 for 4 people, €2.50 for passengers 5-10, valid for a day after 09:00 and at weekends
	Day ticket	One day unlimited travel in Second Class (€52.60) or First Class (€89.40) Can be loaded onto the OV-Chipkaart and combined with some other discounts Valid only on NS trains
Season tickets	Dal Voordeel	40% discount off-peak (after 09:00), at weekends and on public holidays, with up to 3 other passengers Holder can also apply for Keuzedagen supplement
	Altijd Voordeel monthly or annual	20% discount at peak times 40% discount off-peak (after 09:00), at weekends and on public holidays, with up to 3 other passengers 20% off on tram and metro if combined with OV Voordeel Holder can also apply for Keuzedagen supplement Gives free magazine and discounts for Greenwheels and Q-Park P+R areas
	Trajet Vrij monthly or annual	Unlimited monthly travel on a fixed route 40% off for 3 people travelling together 40% discount for travel on a different route off-peak Discounts for Greenwheels and Q-Park P+R areas
	Grensabonnement monthly or annual	As Trajet Vrij but for regular cross-border travel Unlimited monthly travel on a fixed route to a border station
	Studentenreis-product	For students, 40% discount outside free travel times 40% off for 3 people travelling together off-peak Available to those eligible for student finance and not receiving any public transport payment abroad
Season ticket supplements	Bijabonnementen	Day, weekend and period versions of season tickets for partners and children
	Intercity direct Altijd Toeslagvrij/	€61 for unlimited travel on Intercity direct for a fixed monthly price (Also referred to as Intercity direct Maandtoeslag)
	Kids Vrij	Children aged 4 to 12 travel for free with a Kids Vrij season ticket Valid with other train operators Children travel with their own OV-Chipkaart Also allows free travel for children into Belgium and Germany
	Keuzedagen	Free travel on 7 nominated days, other than weekdays 06:30 to 09:00 Available to those over 60 or with a Dal Voordeel or Altijd Voordeel season Second Class €24.50 or First Class €49.50 Supplement for travel InterCity direct between Schiphol and Rotterdam Valid on other operators but not InterCity Berlin or ICE International

Source: NS website, interpreted by Steer Davies Gleave, some ticket, supplement and discounts omitted for brevity.

Netherlands: availability of discounts

A.156 See the information on ticket types listed above.

Netherlands: service quality

A.157 We did not identify any documentation setting out standards of service quality in the Netherlands. Unusually, however, the infrastructure manager ProRail (**www.prorail.nl**) provides information on its website on Passenger Rights.

Netherlands: persons with reduced mobility (PRM)

A.158 NL's website has a section on "Travelling with a functional disability" ("Reizen met een functiebeperking") which provides a range of information.

A.159 "Extra facilities on the train and at the station" provides information on travelling with a wheelchair, mobility scooter ("scootmobiel") or special bicycle, and notes that:

- Many Intercity trains are equipped with extra-wide spaces for wheelchairs or mobility scooters. Entrances are marked by the International Symbol of Access (ISA).
- Most Intercity trains are also equipped with a wheelchair-accessible toilet.

A.160 "Making it easier to go to and from the station" provides information on surface access, include details (in Dutch only) of the NS Zonetaxi service offered at a number of station.

A.161 "Assistance while travelling" provides contact details to apply for 24-hour NS Travel Assistance, including by telephone or fax (for those with impaired hearing). Assistance must be requested at least one hour before departure.

A.162 There is a 16-page brochure (in Dutch) on assistance services and contact information, including inter alia information on the maximum sizes of wheelchair accepted on different types of service.

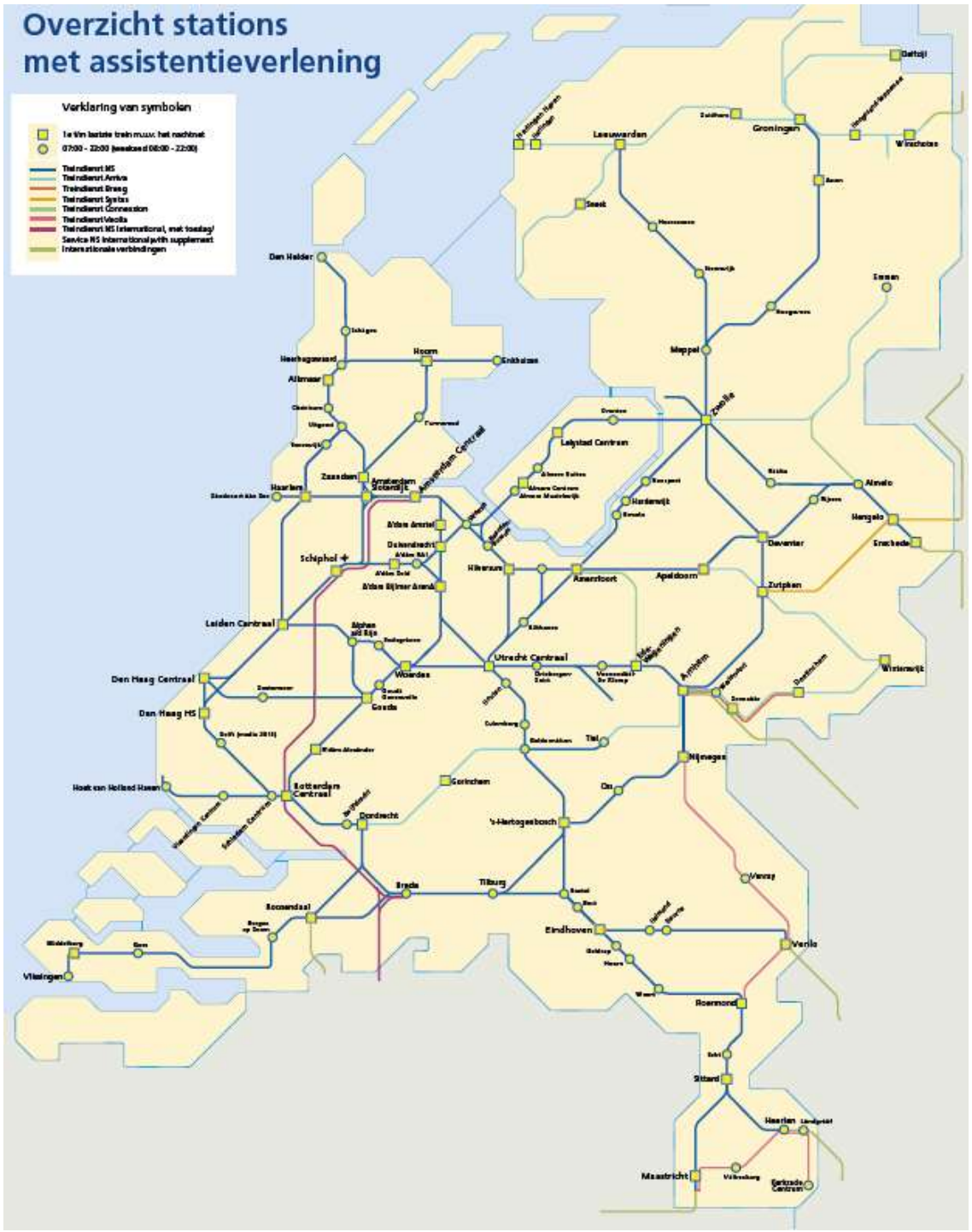
Table A.30: Netherlands: on-train assistance for PRM

Service	Wheelchair	Mobility scooter ("scootmobiel")
ICE International, Intercity Berlin	Maximum 1.25 metres long, 0.7 metres wide including space for feet	Limited: contact Railway Service Centre for advice
Intercity Brussels	Maximum 1.5 metres long, 0.85 metres wide	Maximum 1.5 metres long, 0.85 metres wide Maximum 250 kilograms including user
Thalys	Maximum 0.7 metres wide including space for feet	Not permitted
Eurostar	Too narrow for normal wheelchairs Foldable wheelchair is available	Up to 1 metre. Trip must be registered with EuroDespatch.
City NightLine	Maximum 1 metre wide in couchette cars	Not permitted

Source: NBS website, interpreted by Steer Davies Gleave.

A.163 There is a map of stations offering assistance, reproduced below, and links to details of facilities at each station.

Figure A.12: Netherlands: stations with assistance for PRM



Source: NS website.

A.164 Stations are colour-coded according to whether the operator providing the service is NS, Arriva, Breng, Syntus, Connexxion, Veolia, or NS International with a supplement.

A.165 The website also provides links (in Dutch only) to help for planning and seeking assistance.

PL: Poland

Poland: sources

A.166 Poland has provided information to RMMS and ERADIS and we also received one stakeholder response.

Poland: overview of the rail market

Table A.31: Poland: overview of the rail market

Measure	Value	Units or details	Year
Area	312,685	square kilometres	
Length of rail network	18,959	kilometres	
Population	38,017,856	million	2015
Reported rail passenger-kilometres	15,479	million kilometres	2014
Reported rail passenger-kilometres per inhabitant	407.2	kilometres	2014
Reported rail passenger revenue	€1,237	million	2012 at 2010 prices
Reported rail share of passenger surface transport	6.2%		2013
Routes with price competition	No		
Rail market share not held by incumbent (percentage of reported passenger-kilometres)	7%		2013
Reported punctuality	91.6% 76.4%	Regional Long-distance	2014
Reported reliability (percentage cancellations)	0.16% 0.03%	Regional Long-distance	2014

Sources: various, note that definitions and consistency of reported data vary.

Poland: journey planning and sales channels

A.167 PKP's website **www.rozklad-pkp.pl** provides journey planning information in Polish (the default language), German, Russian and English.

A.168 Only a limited number of fares are available on the internet, but with few exceptions all fares are available at tickets offices. All tickets except season tickets can be bought on trains for a charge of PLN 10, which will not be charged:

- for PRMs; and
- for those providing documentary proof that they are over 70.

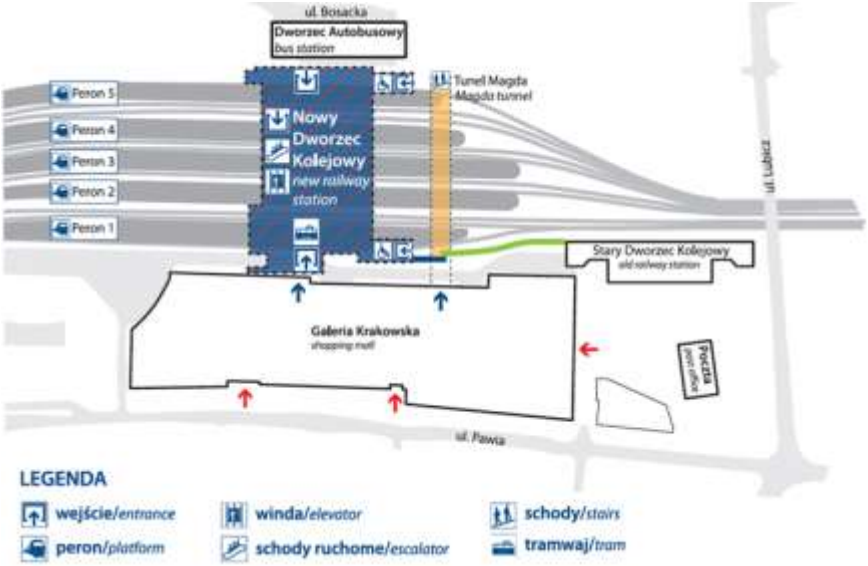
A.169 Smart card tickets are only used in cities where railways services are integrated within the local transport system.

A.170 A stakeholder informed us that some carriers had tried to promote self-service distribution channels (such as the internet and ticket machines) with a slightly lower tariff, but this was criticised by the Ministry of Transport on the grounds that it might lead to a reduction in the number of ticket offices. Nonetheless, on some interREGIO trains run by Przewozy Regionalne (formerly part of PKP), the SuperBilet promotional offer is only available on the internet.

Poland: station website

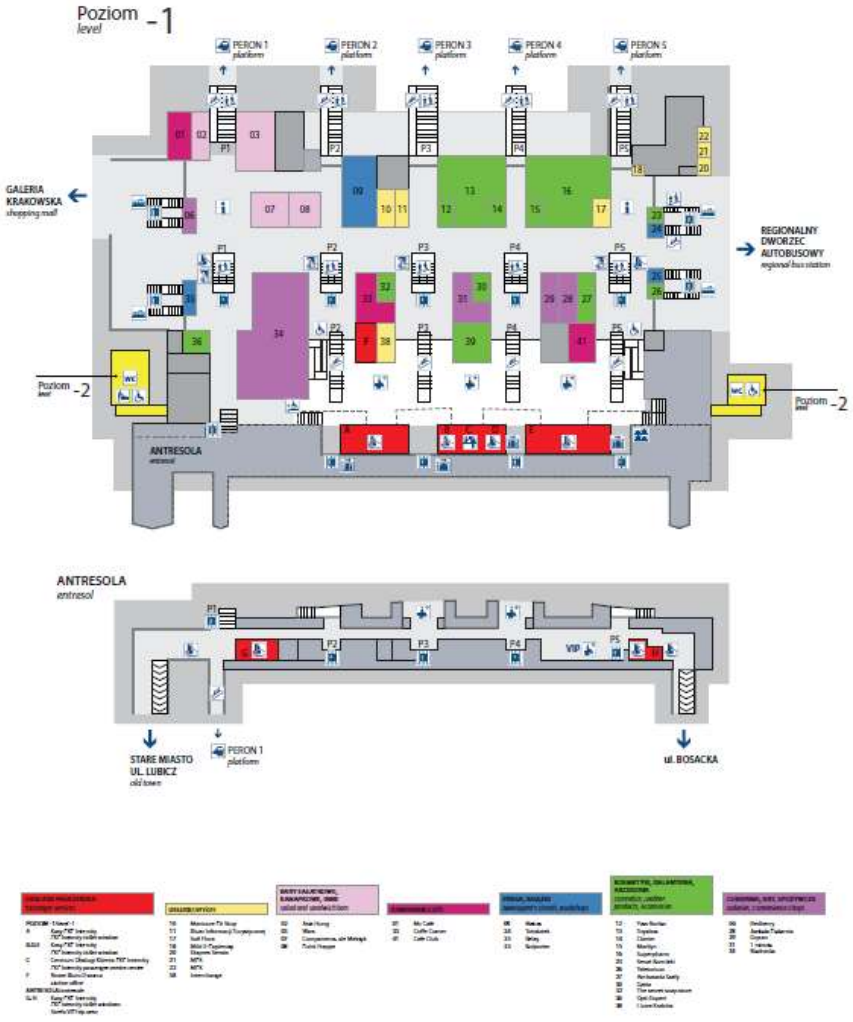
A.171 PKP's website provides details of major stations as shown below.

Figure A.13: Poland: station facilities information



Source: PKP website, station shown is Kraków Główny.

Figure A.14: Poland: station facilities information



Source: PKP website, station shown is Kraków Główny.

Poland: operator website

A.172 PKP's website provides information in Polish (the default language), German, Russian and English.

Poland: ticket types

A.173 PKP's website provides little clear information on the availability and validity of tickets, other than to specify single or return and class of travel, but on searching for a journey it is possible to download complete tables of fares, which can be several hundred pages long.

A.174 First Class fares are typically 50-60% more than the equivalent Second Class fares.

Poland: availability of discounts

A.175 Passenger categories and discounts applied for public obligation services for rail are described in the Act of June 20, 1992 on entitlements to free and reduced fares for traveling by public transport defines the rules that apply for such purposes.

A.176 RMMS reports the following discounts in Poland.

Table A.32: Poland: availability of discounts

Discount	Category
37%	Pensioners and their spouses
	Children over four until the beginning of the mandatory annual kindergarten preparation
	Children and adolescents from the beginning of the mandatory annual kindergarten preparation until the end of middle-school, or secondary school, but not older than 24 years
	Blind people
	The holders of a valid Polish Charter
	Teachers of primary schools, middle schools, secondary schools and schools-above-middle-schools, whether public or non- public with public school rights
	Academic teachers
49%	Disabled persons incapable of autonomic existence
51%	Students until they are 26 years old: for those who have completed their studies the right is granted until 31 October of the year when they completed their studies
	Graduate students until they are 35 years old
78%	Children and young people affected by disability or disabilities This is valid on the basis of a one-time or monthly tickets registered
	One of the parents or guardians of adults, young people or children with disabilities (based on a single ticket) This permission applies only to travel between the place of residence or the place of stay and: kindergarten, school , college, care and education facility, educational and pedagogical facility, special care centre, facilities allowing centre children and young people to fulfil the duty of school and education obligation, rehabilitation and educational centre, nursing home, support centre, health care facility , psychological and educational , including specialist clinics, or rehabilitation holiday
	Non-professional soldiers undergoing military service
	Blind civilian victims of the war declared incapable of self- existence
93%	Blind people declared unable to live independently

Discount	Category
100%	Children under four
	Uniformed Border Guard officers 1) while performing official duties related to the protection of the state border, as well as during the transport of detainees, during patrol activities and activities related to the control of cross-border traffic 2) while protecting the territory of the Republic of Poland on routes of international importance
	Customs officers in the performance of official duties
	Uniformed police officers While escorting detainees or protected property, transfer of the special mail, patrol services and aid or assist in the activities of organs of execution
	Military Police soldiers and military law enforcement bodies While performing acts of patrolling and other activities in service inside the means of transport

Source: RMMS, interpreted by Steer Davies Gleave and edited.

Poland: service quality

A.177 We did not identify any documentation setting out standards of service quality in Poland.

Poland: persons with reduced mobility (PRM)

A.178 PKP provides free assistance for boarding, alighting and transfer between trains at stations staffed with the relevant personnel. 48 hours' notice is required of the need for assistance, via either telephone or an online notification form:

- Passengers must provide date and time of journey, contact phone number, departure, transfer (if any) and arrival stations, a description of what assistance is needed, the type of disability and the time and place at which PKP staff will be met.
- Passengers may optionally provide coach and seat number (if they have a reservation), information on whether they have a companion or guide dog, and any other useful information, such as whether they are carrying luggage.

A.179 The website provides a list of the stations at which assistance is available.

SE: Sweden

Sweden: sources

A.180 Sweden has provided information to RMMS and ERADIS and we also received two stakeholder responses.

Sweden: overview of the rail market

Table A.33: Sweden: overview of the rail market

Measure	Value	Units or details	Year
Area	450,295	square kilometres	
Length of rail network	10,957	kilometres	
Population	9,644,864		2015
Reported rail passenger-kilometres	12,121	million kilometres	2014
Reported rail passenger-kilometres per inhabitant	1,256.7	kilometres	2014
Reported rail passenger revenue	€633	million	2012 at 2010 prices
Reported rail share of passenger surface transport	9.3%		2013
Routes with price competition	Yes		
Rail market share not held by incumbent (percentage of reported passenger-kilometres)	9%		2013
Reported punctuality	92.5% 89.0%	Regional Long-distance	2014
Reported reliability (percentage cancellations)	1.1% 1.0%	Regional Long-distance	2014

Sources: various, note that definitions and consistency of reported data vary.

A.181 Sweden has an historical incumbent operator and a number of other operators who provide either:

- PSO services to the various county authorities; or
- open access services in competition with SJ.

Sweden: journey planning and sales channels

A.182 Journey planning in Sweden is possible via the websites of the County authorities and the train operators. In some stations, ticket offices are available for both local services and SJ long-distance services.

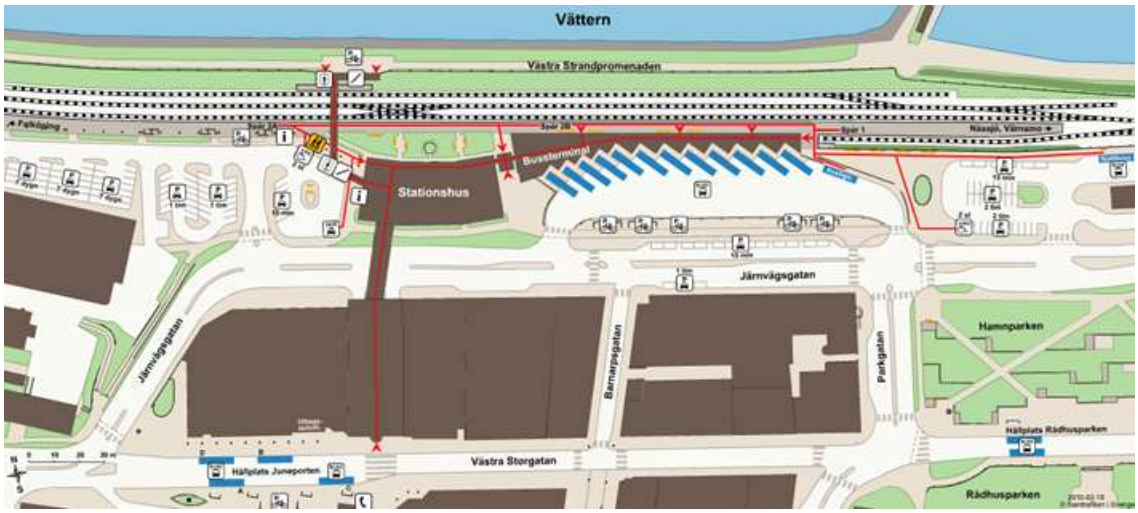
A.183 Most types of tickets can be bought through several different sales channels. The price paid by the passenger, and the commission level paid by the operator, can vary by sales channel.

Sweden: station websites

A.184 Din station (**www.dinstation.se**) provides real time information and lists of facilities, including for PRM, at all railway stations in Sweden. Information is in Swedish only.

A.185 Stations info (**www.stationsinfo.se**) provides details plans of rail and bus stations, including step-free routes between different points, an example of which is shown below. Information is in Swedish only.

Figure A.15: Sweden: example of station facilities information



Source: www.stationsinfo.se.

Sweden: operator websites

A.186 All the principal operators in Sweden have their own websites. For example:

- SJ, the former national incumbent and primary long-distance operator, provides information in Swedish (the default language) and English at **www.sj.se**.
- Blå Tåget ("blue train") provides information in Swedish (the default language) and English at **www.blataget.com**.
- MTR Express, a recent new entrant on the corridor between Stockholm and Gothenburg, provides information in Swedish (the default language) and English at **www.mtrexpress.se**.
- DSB Sverige AB, operator of the Öresundståg, provides information in Swedish at **www.dsb.se**.

Sweden: ticket types

A.187 Ticket types vary according to the requirements of the competent authority, normally at County level, specifying PSO services. For long-distance services crossing County boundaries, dominated by SJ:

- For single journeys SJ offers normal tickets and "Sista Minuten" (last minute) tickets for students, those under 26 and pensioners.
- For regular travel SJ offers Electronic 10-tickets, which give a 10% discount, and Monthly Passes.

Sweden: availability of discounts

A.188 Discounts offered can vary. In general there are discounts for children, youths, students and seniors, but the long-distance market is deregulated and the exact pricing structure is determined by the operators.

A.189 DSB Sverige AB provides information on (in order) commuters, adults, children, the young and students, the old and pensioners, professions, bicycles, groups, tourists, PRM and dogs, but the information is in Danish and on its Danish website.

A.190 Further details of discounts on local services are available on the websites of the relevant County authorities. For example Skånetrafiken, covering Scania, offers:

- Single tickets (Enkelbiljett);
- Duo/Family tickets (Duo/Familj);
- 24/74 hour tickets (24/72-timmarsbiljett); and
- Round the Öresund (Öresund Rundt).

A.191 A further complexity in Scania, where ticketing extends to Denmark via Copenhagen airport, is that the age limits for child and youth discounts differ between Denmark and Sweden. Children aged 16-18 are warned of this issue, and may find it cheaper to buy a child ticket for the Swedish part of their journey and an adult ticket for the final journey element into Denmark.

Sweden: service quality

A.192 We did not identify any documentation setting out standards of service quality in Sweden.

Sweden: persons with reduced mobility (PRM)

A.193 SJ's website provides a section for PRM giving details of assistance and service on board, special seats (wheelchair spaces, and spaces suited to those with a guide dog), trains, non-discriminatory rules for domestic journeys52 and contact information.

A.194 The information on trains summarises the facilities available by type of service and stock including details of the maximum width, length and mass (up to 350 kilograms) of wheelchairs and additional details such as which stock has on-board staff, or level access, or requires a ramp.

A.195 For all other information, such as bookings and details of locations and times of assistance, it is necessary to contact SJ by telephone or online.

[52] This links to a document setting out rules consistent with elements of Regulation 1371/2007.

UK: United Kingdom

United Kingdom: sources

A.196 The United Kingdom has provided information to RMMS and ERADIS and we also received five stakeholder responses.

United Kingdom: overview of the rail market

Table A.34: United Kingdom: overview of the rail market

Measure	Value	Units or details	Year
Area	243,610	square kilometres	
Length of rail network	16,423	kilometres	
Population	64,351,155		2015
Reported rail passenger-kilometres	64,711	million kilometres	2014
Reported rail passenger-kilometres per inhabitant	1005.6	kilometres	2014
Reported rail passenger revenue	€9,186	million	2012 at 2010 prices
Reported rail share of passenger surface transport	8.4%		2013
Routes with price competition	Yes		
Rail market share not held by incumbent (percentage of reported passenger-kilometres)	8%		2013
Reported punctuality	89.8% 91.0%	Regional Long-distance	2014
Reported reliability (percentage cancellations)	2.6% 3.1%	Regional Long-distance	2014

Sources: various, note that definitions and consistency of reported data vary.

A.197 The United Kingdom has two independent railway networks: that of Great Britain, described below, and the much smaller network of Northern Ireland.

A.198 Great Britain's former incumbent operator was subdivided in the mid-1990s into a number of operators, now managed by the private sector, providing PSO services specified by national and metropolitan governments, and a number of open access operators, including Heathrow Express which provides a shuttle service between central London and its largest airport.

United Kingdom: journey planning and sales channels

A.199 The structure of the industry in the UK means that both responsibilities and information provision are dispersed:

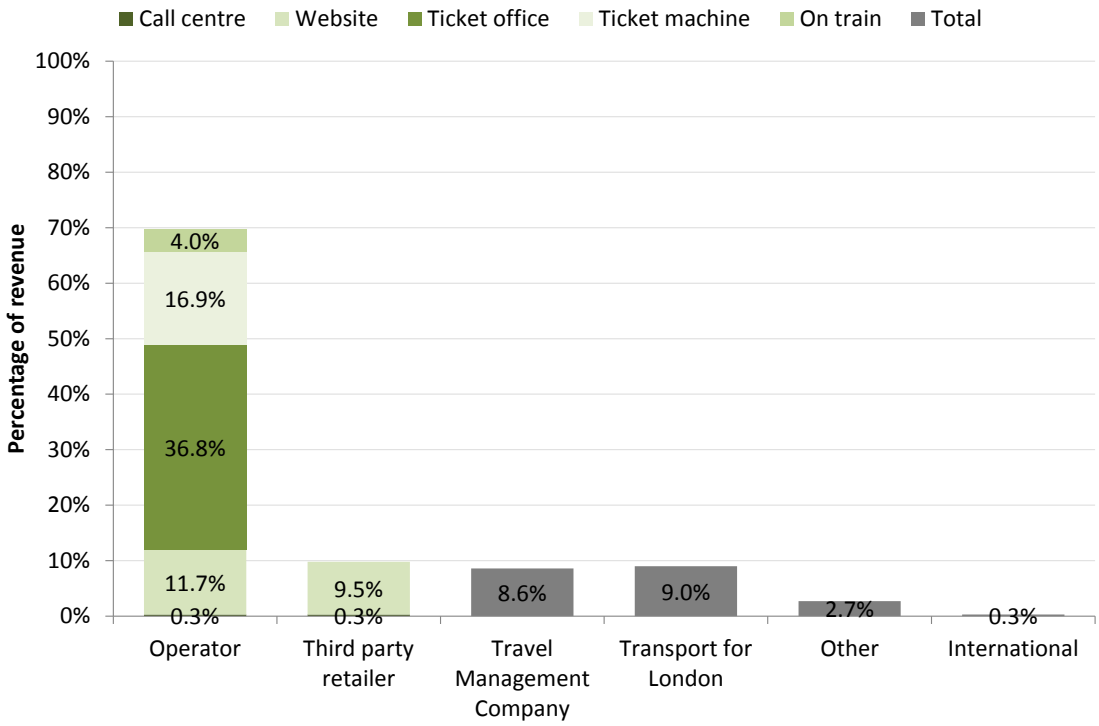
- Network Rail, the infrastructure manager, provides information on stations and generates real time information on train services.
- PSO operators provide information on their own services but, because of requirements for "neutral" retailing, must also describe competing services and may sell tickets for them, subject to an industry standard commission.
- Metropolitan authorities such as Transport for London provide information on services they specify and on their fares and ticketing system.
- Independent websites and apps provide alternative sources of information.

A.200 However, a single website, National Rail Enquiries (**www.nationalrail.co.uk**) acts as a general portal to information on stations, timetables, tickets and real time information. Once a

journey has been selected, this website will direct requests to buy tickets to the operator responsible for setting the fare selected.

A.201 We summarise below the mix of sales channels in Great Britain, as reported by the Office of Rail and Road (ORR).

Figure A.16: United Kingdom: sales channels



Source: Office of Rail and Road stakeholder response, based on ORR's "Retail market review".

A.202 The chart distinguishes the following selling parties:

- Almost 70% of sales are by train operators selling tickets, for themselves and other operators, via call centres, online (including via apps), at station ticket offices, through ticket machines, and on trains.
- Almost 10% of sales are by third party retailers such as Trainline and Raileasy selling tickets mainly direct to passengers, online and through apps, paying a commission to the operator and in many cases adding their own charges.
- Almost 9% of sales are by Travel Management Companies managing travel primarily for businesses.
- Almost 9% of sales are by Transport for London, whose Oystercard and wave and pay payment systems cover a large volume of travel within London.

A.203 It can be seen that call centres handle only around 0.6% of total sales and have been largely replaced by online sales.

A.204 Over half of sales are at stations, and although one-third are now at ticket machines, two-third, comprising 36.8% of total sales, are still by relatively labour-intensive station ticket offices. A further 4% are sold on train, which is also a relatively costly sales channel.

A.205 Ticket sales by operators, including at stations, are covered by the requirements of impartial retailing, which requires them to offer the cheapest option meeting a passenger's

requirements, even in this is via another operator. This requirement has proved difficult to monitor and enforce in practice, particularly where the choice of routes, operators and tickets is complex, as we illustrate with the example of travel between Exeter and Fareham in Appendix B.

A.206 ORR's Retail market review also shows how the mix of sales diverges from the average mix depending on the type of service:

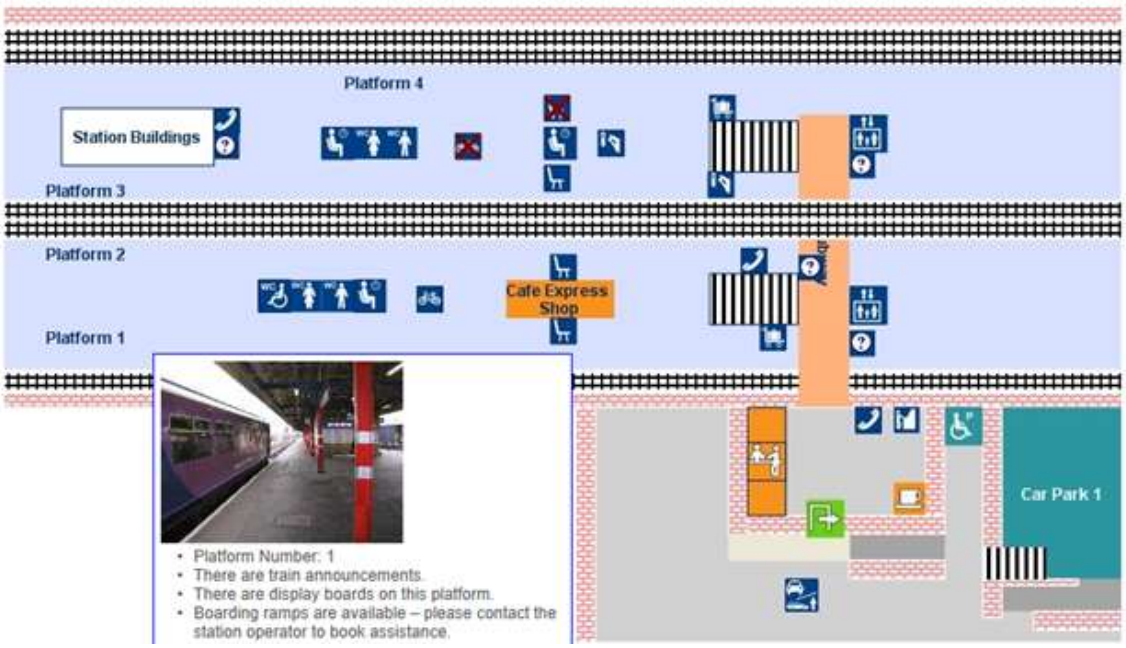
- In the high-value long-distance sector:
  - 43% of sales are online, probably reflecting those booking discounted Advance fares.
  - 19% of sales are by Travel Management Companies, mainly serving business travel.
- In London and the South East:
  - 45% of sales are at ticket offices, possibly reflecting high value season ticket renewals.
  - 23% of sales are at ticket machines, used for simple and regular purchases.
  - 17% of sales are by Transport for London.
- In regional services:
  - 44% of sales are at ticket offices.
  - 14% of sales are on train.

A.207 We would except that patterns of sales channel mix also vary in other States, often for similar reasons.

United Kingdom: station websites

A.208 National Rail Enquiries provides details of stations including schematic diagrams with embedded photographs of the view each platform, as shown below.

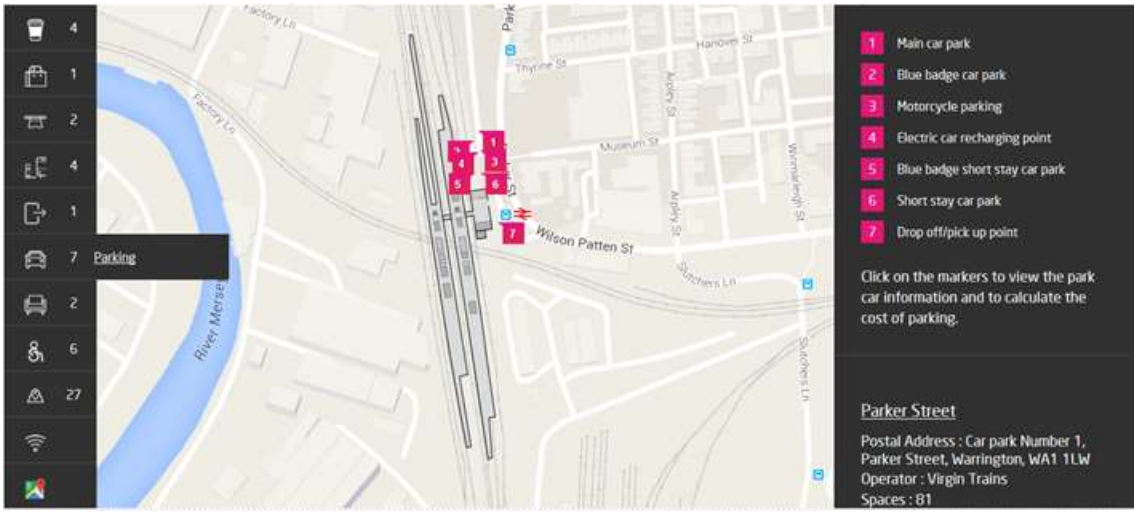
Figure A.17: United Kingdom: station facilities information provided by infrastructure manager



Source: National Rail Enquiries

A.209 Individual operators may also provide similar information on stations on their own websites. Virgin Trains approach to the same station, Warrington Bank Quay, is shown below.

Figure A.18: United Kingdom: station facilities information provided by train operator



Source: Virgin Trains website.

United Kingdom: operator websites

A.210 As noted above, in addition to National Rail Enquires, operators typically provide their own websites, in some cases covering all the PSCs they operate in a common format.

United Kingdom: ticket types

A.211 We summarise here the principal types of tickets available in Great Britain, which differ between urban areas (and particularly London, in which approximately two-thirds of all rail journeys begin and/or end), short-distance journeys of up to approximately 50 miles (80 kilometres) and long-distance journeys.

Table A.35: United Kingdom: ticket types

	Urban areas		Short distance		Long-distance		
	Off-peak	Anytime	Off-peak	Anytime	Advance	Off-peak	Anytime
Day ticket	A	A					
Single	A	A	M	R	M	R	M
Return within a day			M	R			
Return within a month						M	M
Period ticket	A (Smart card)		R (Season ticket)		R (Season ticket)		

Source: Steer Davies Gleave interpretation of typical ticket types. A = administered, R = regulated, M = market.
Note: only Standard Class fares are regulated: all First Class fare are market-priced.
Note: the definition of off-peak varies between operators and routes.
Note: in London "wave and pay" debit and credit cards can pay for single, day and weekly off-peak and peak fares.

A.212 In large urban areas, tickets are valid only on the day of purchase. In London, all fares are administered (by Transport for London):

- Zonal day fares are quoted for off-peak and anytime, but for most zones the prices are now the same.
- Single journeys have distinct off-peak and peak fares, allowing a return trip to mix peak and off-peak legs. Payment may be made by cash but there are discounts for use of the Oyster smartcard or "wave and pay" debit or credit cards.

- Zonal Travelcards for a week or longer are now all on the Oyster smartcard.

A.213 Further details are provided in our analysis of suburban travel.

A.214 For shorter-distance journeys, tickets are only available for travel on the same day. The full single, return and season ticket fares are regulated, but operators may set lower off-peak fares according to market conditions.

A.215 For longer-distance fares, only the return within a month off-peak return ticket and season ticket are regulated, and operators may set lower off-peak fares according to market conditions. These also include quantity-limited and dynamically priced Advance tickets, which must normally be bought at least a day before travel, which are only valid for travel on a specific train and, unlike other fares, include a free seat reservation. Appendix B illustrates how a choice of routes or operators with different underlying fares, discounts and dynamic pricing can lead to an extremely large range of fares depending on the restrictions the passenger is prepared to accept.

A.216 PlusBus tickets are also available including local bus travel at the destination.

A.217 In addition to these fares it is also possible to buy a range of Rover fares giving unlimited travel in an area and period. The most expensive are All Line Rover tickets for 7 or 14 days. In 2016 a 14-day All Line Rover costs £731 (£365.50 for a child) in Standard Class and £1117 (£558.50 for a child) in First Class.

United Kingdom: availability of discounts

A.218 A wide range of national Railcards are available as set out below.

Table A.36: United Kingdom: availability of discounts

Discount	Railcard	Price	Details
33%	Two Together	£30 (1 year)	On First Class and Standard Anytime, Off-peak and Advance fares, for two named adults travelling together, after 09:30 during the week and at weekends.
	16-25	£30 (1 year) £70 (3 years)	On Standard Anytime, Off-peak and Advance fares, airport express services, PlusBus and Rover tickets, and First Class Advance fares.
	Senior	£30 (1 year) £70 (3 years)	On First Class and Standard Anytime, Off-peak and Advance fares, for passengers over 60, airport express services, PlusBus and Rover tickets, except in London and the South East during the weekday morning peak.
	Disabled Persons	£20 (1 year) £54 (3 years)	"Most" Standard and First Class fares, for a passenger with a visual impairment, hearing impairment, epilepsy or in receipt of a disability-related benefit (including War or Service Pensions for 80% or more disability), including one adult travelling with the holder.
	HM Forces	£15	"Most" rail fares, subject to a minimum charge of £12 for travel between 04:30 and 09:59 on weekdays, except on Public Holidays or in July and August.
33-60%	Family & Friends	£30 (1 year) £70 (3 years)	On Standard Anytime, Off-peak and Advance fares, airport express services, PlusBus and Rover tickets.

Source: National Rail Enquiries, interpreted by Steer Davies Gleave.

A.219 In most cases the Railcard originated as a marketing initiative, and the lower fares it offers are not mandated in law, although in practice all operators of PSO services may be contracted to retain existing Railcard arrangements as part of their PSC "franchise agreement").

A.220 As with other States, Regional Railcard discounts may also be offered by particular local or regional competent authorities. For example, we discuss in our analysis of urban fares how residents of London aged between 60 and 65 receive free off-peak rail travel within the area covered by Transport for London.

A.221 Additional discounts may also be offered through special offers and promotions, not all of which may be available through all sales channels.

United Kingdom: service quality

A.222 The National Rail Conditions of Carriage set out a number of details of passenger rights including the minimum levels of compensation in the event of late-running or cancelled trains. Operators also set our their arrangements for handling complaints and providing compensation for delays.

A.223 Operators of PSO services (franchises) are also required to set out details of their approach to passenger service as part of their franchise plan, which forms part of their contract with the relevant competent authority.

United Kingdom: persons with restricted mobility (PRM)

A.224 As noted above, a Disabled Persons Railcard entitles the bearer and an adult travelling with them to a discount of one-third off Anytime, Off-Peak and Advance tickets on Standard and First Class.

A.225 An emerging issue in the UK is the need for some passengers with some mobility restrictions to take a mobility scooter with them on a train[53], which we noted has also been considered in detail in Germany. The passenger can occupy a normal seat but some means is required of lifting and securing the mobility scooter on board, which may be large and heavy, into the train. The conditions for permitting them on the train, and arranging for them to be lifted onto it, vary by operator.

A.226 National Rail Enquiries provides information for disabled passengers including on discounts and travel assistance. Information on facilities on trains provides a link to all the different classes of rolling stock used by each operator and details the facilities available on them, as shown below.

Table A.37: United Kingdom: information on PRM facilities by operator and train type

Train type	Class 47 or 90 locomotives with Mk3 carriages
Routes operated	London Liverpool Street to Norwich (Class 90) Norwich to Great Yarmouth/Lowestoft (Class 47 – summer only)
Accommodation for wheelchair users in First Class?	Yes
First Class accessible toilet?	Yes

[53] Our parallel work for the Commission on the coach industry has identified that mobility scooters are often problematic for the coach industry. This is because in many cases they cannot be lifted into, or carried in, any part of the coach without first being dismantled.

Accommodation for wheelchair users in Standard Class?	No
Standard Class accessible toilet?	No
Standard toilet?	Yes
Boarding ramp available	No, but ramps are available at accessible stations
Priority seating?	Yes
Audible information?	Yes
Visual information?	No
Customer service staff available onboard?	Yes

Source: National Rail Enquiries

B Statistical analysis of national railway characteristics

8.33 This Appendix presents the results of our investigation into the significance of the relationships shown in Figure 2.17 and Figure 2.23 using multiple regression analysis. This involved specifying a regression equation with average yield as the dependent variable and all of the factors identified in Table 2.7 as explanatory variables.

B.1 In the case of network length, we also included a slope dummy variable (taking the value 1 × network length for Member States with networks in excess of 5,000 track kilometres and 0 otherwise) to allow for the different apparent relationship with average yield among Member States with networks of 5,000 kilometres or less. The results of the regression analysis are shown in Table B.1.

Table B.1: Average yield multiple regression analysis: all variables

Variable	Coefficient	t-statistic
Intercept	-0.030435443	-0.911508684
Network length	1.17961E-05	2.191808318
Network length dummy	-9.71248E-06	-2.059292127
Network density	0.028846436	0.080642655
Share of urban population	0.029582421	0.692173593
Population density	1.38508E-05	0.111654979
Passenger-kilometres by rail per capita	-1.17705E-05	-0.424517617
Car ownership per capita	0.047505868	0.716872783
GDP per capita	2.39851E-06	2.598309887
Goodness of fit measure	**Value**	**Number of observations**
R squared	0.760132913	
Multiple R	0.871856016	24
Adjusted R squared	0.6322038	

Source: Steer Davies Gleave analysis

B.2 While the equation exhibits a reasonably high level of explanatory power, the majority of the coefficients are not significantly different from zero. In only three cases (the coefficient on network length, the network length dummy and GDP per capita) are the associated t-statistics

significant at the 95% level of confidence[54]. We therefore re-specified the regression equation to include only the statistically significant coefficients, obtaining the results reported in Table B.2 below.

Table B.2: Average yield multiple regression analysis: selected variables

Variable	Coefficient	t-statistic
Intercept	-0.005388369	-0.406977981
GDP per capita	2.4755E-06	5.388587993
Network length	1.22572E-05	2.711143121
Network length dummy	-1.01394E-05	-2.50787807
Goodness of fit measure	**Value**	**Number of observations**
R squared	0.720791302	24
Multiple R	0.848994289	
Adjusted R squared	0.678909997	

Source: Steer Davies Gleave analysis

B.3 The simpler equation exhibits a similar degree of explanatory power to the full equation, and the t-statistics for each of the explanatory variables are all significant at the 95% level. The adjusted R squared value for the simpler equation is actually higher, indicating that the additional variables included in the full equation do not help to explain the underlying data.

[54] A t-statistic is a measure used to determine whether a hypothesis will be rejected or accepted. In this case, the hypothesis is that we can be 95% confident that the relationship estimated is materially different to zero.

C Fares between Exeter and Fareham

Introduction

C.1 Transport Focus, an organisation representing transport users in Great Britain, provided us with an example of the potential extreme complexity of setting and selecting fares resulting from:

- multiple routes between two stations;
- multiple bodies responsible for setting fares;
- different fares for single tickets, return the same day and return within a month;
- season tickets;
- First Class travel;
- discounts, which may vary, for booking specific trains in advance;
- discounts for groups; and
- special promotional fares.

Multiple routes between two stations

C.2 The example is for travel between Exeter and Fareham, two stations 166 kilometres apart in south west England, shown below

Figure C.1: Rail routes between Exeter and Fareham

Source: Transport Focus

C.3 There are no direct services between the stations, and shorter routes may involve slower trains or longer connecting times, which means that all the routes shown in the figure above may provide a reasonable connection in one or both directions at certain times of the day or

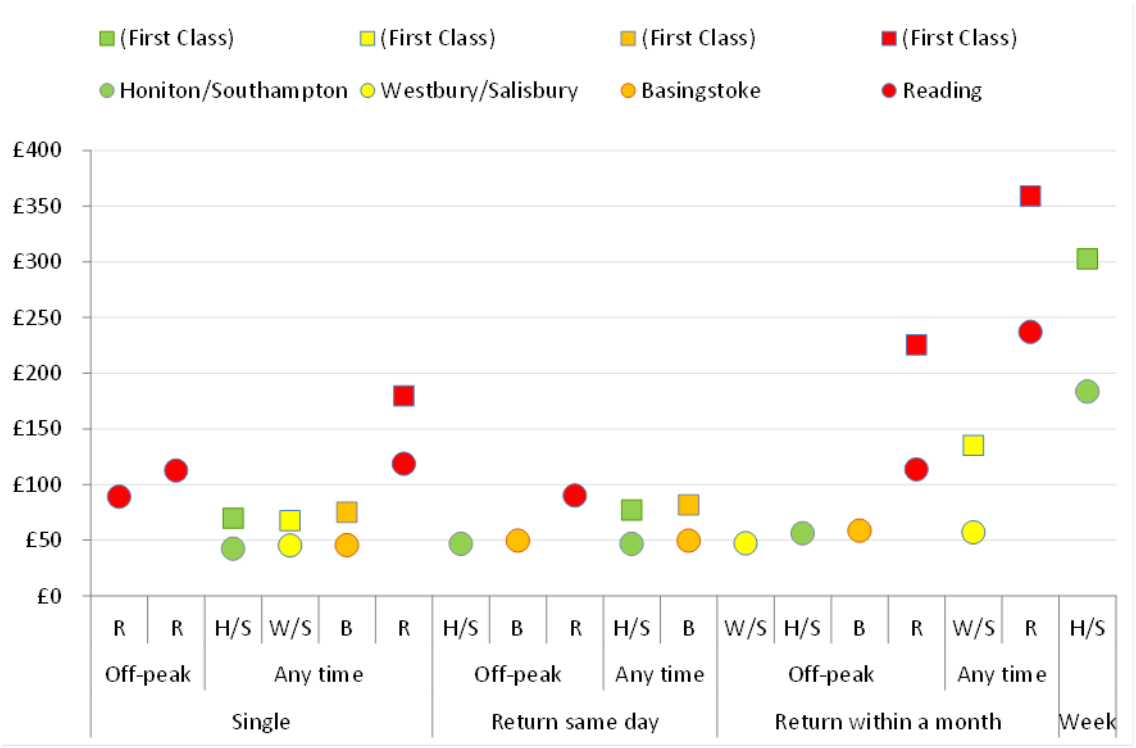
week. Variations in the speed and quality of services on different lines, and the connecting times at intermediate points mean that routes which may be effective include:

- via Honiton/Southampton;
- via Westbury/Salisbury;
- via Basingstoke; and
- via Reading avoiding Basingstoke by following the green line.

Multiple bodies responsible for setting fares

C.4 While no operator provides a direct service between Exeter and Fareham, the regime of fares regulation in Great Britain allocates to one of the PSO operators the responsibility for setting a number of interavailable fares, some of which are subject to regulation. However, other operators are entitled to offer their own fares, and distinct through fares are offered for all four of the routes listed above. The figure below illustrates the 28 fares between Exeter and Fareham offered on a ticket vending machine.

Figure C.2: Rail fares between Exeter and Fareham



Source: Transport Focus research at a ticket vending machine, Steer Davies Gleave analysis.

Fares for single tickets, return the same day and return within a month

C.5 Passengers will typically know whether they wish to make a single or return journey, when they are prepared to travel and when they wish to return, or whether they require a weekly (or longer) season ticket to make multiple journeys. To cater for these requirements, seven distinct types of ticket are available, from left to right in the figure above:

- single tickets valid only on off-peak trains;
- single tickets valid at any time;
- return tickets, for return the same day, valid only on off-peak trains;
- return tickets, for return the same day, valid at any time;

- return tickets, for return within a month, valid only on off-peak trains;
- return tickets, for return within a month, at any time; and
- season tickets for a week, a month, or any period up to a year.

C.6 Many of these tickets are available for more than one of the four routes listed.

C.7 For a single journey, tickets are available at three slightly different fares: £42.20 (Honiton/Southampton); £45.10 (Westbury/Salisbury); and £45.40 (Basingstoke). Fares via Reading are also quoted from £89 to £118.50 and therefore the most expensive single fare is 2.8 times the cheapest. This fare may, however, be irrelevant for the majority of journeys for which the alternatives are both cheaper and faster.

C.8 For a return journey the same day, passengers would pay little more than the single fare, whether committing to travelling off-peak or willing to pay extra to travel at any time. The most expensive day return fare quoted is 1.9 times the cheapest off-peak fare via Honiton/Southampton. At first sight, buying a return by one route restricts travel to that route, but in practice it is possible to buy a return via one route and then return via a more expensive route on payment of half the difference in return fare. This creates a wide range of additional fares not listed on the ticket machines, but such "open jaw" fares can only be bought through ticket offices, and few passengers are aware of their existence.

C.9 For a return journey at any time within a month, another series of slightly higher fares are available. The most expensive return fare, a £237 anytime via Reading, is five times the cheapest £47.10 off-peak via Westbury/Salisbury.

Season tickets

C.10 While the journey between Exeter and Fareham normally takes over three hours, and would not normally be practicable for a daily commute, a weekly season might be cost-effective for a passenger needing to make more than one return trip. For example, season tickets via Honiton/Southampton are available and cost only 4.3 times as much as the cheapest single ticket.

First Class travel

C.11 In addition to these fares, a higher First Class fare is available on all routes, although this does not necessarily mean that every train has First Class accommodation. Some passengers might decide on their preferred time of travel and hence routing and then consider whether to pay extra for First Class. Others might want to select trains with First Class accommodation.

C.12 Note also that 9 of the 28 fares offered are via Reading and alternatives may always be both cheaper and faster. However, any requirement that sales channels offer all fares may mean that passengers must be offered fares which are, in effect, irrelevant. In addition, Advance fares via Reading, which are not sold by ticket vending machine, may be cheaper than fares via shorter or faster routes.

Discounts for booking specific trains in advance

C.13 All the tickets listed above are available at ticket machines for immediate travel. In practice, however, many operators in Great Britain also offer "Advance" tickets, tied to a specific train, at discounted fares bookable online, via apps or at ticket offices. Transport Focus identified single fares as cheap as £10.50, and in February 2016 we found Advance tickets for £17.50 booking one day ahead and as little as £12.00 if booked further in advance. At these fares it

could be cheaper to buy fares in advance on a number of trains than to buy a flexible ticket on the day of travel.

Discounts for groups

C.14 Passengers can key into ticket machines the details of any discounts or Railcards they hold, and will then be offered fares taking these reductions into account. However, "GroupSave" discounts for off-peak travel in large groups are not normally available through ticket machines and can only be obtained online or through ticket offices.

Special promotional fares

C.15 Over and above standard fares, discounted tickets and group discounts, train operators may also provide specific promotional fares for individuals or groups or travellers. These may be available via any or all of website, call centres, ticket offices and other channels, depending on the design of the promotion.

Summary

C.16 While potential passengers may claim to welcome choice, discounts and price competition in principle, the cumulative effect can be an extremely large range of fares in practice. In the specific example of Exeter to Fareham, 28 fares are offered on ticket vending machines, but we estimate that more than 100 fares may be available once "open jaw", Advance tickets and discounts are taken into account. A requirement that all fares must be quoted may mean that passengers must be shown every fare, no matter how poor value or irrelevant. As a consequence, any passenger wishing to make a journey may find it difficult either:

- to identify the most appropriate fare for their journey; or
- once having paid the fare, to ensure that they do not violate any restrictions or conditions associated with it.

C.17 In addition, train operators must generate all these fares. Great Britain's requirement that fares are made available between any two stations means that millions of fares must be generated, published and made available at all times. The overwhelming majority of these fares, however, relate to tickets that are probably never requested.

C.18 Industry commentators have suggested that one approach to simplifying the fares structure would be to abolish return fares and have three types of single ticket, similar to the structure becoming common in the airline industry[55]:

- full fare, valid at any time and fully flexible;
- off-peak, valid on any off-peak train; and
- train-specific, with no flexibility and subject to availability and yield management.

[55] See, for example http://www.transportfocus.org.uk/research/publications/passenger-focus-response-to-the-governments-rail-fares-and-ticketing-review

D Factors influencing travel demand

Trends in travel choices

D.1 The volume of travel in Europe has increased substantially through time, in large part reflecting a tendency for travellers to make longer, rather than more trips. With rising incomes, households demanded more space and increased levels of amenity, and began living further from places of work. At the same time, there have been major changes to the way in which people shop for both essential and luxury goods, rapid extensions to social and business networks, and increases in the time available for holidays and other leisure trips. In all of these changes, the price and availability of motorised transport, in particular the flexibility offered by the private car, played a key role.

D.2 The table below is derived from analysis presented in *Understanding Transport Demands and Elasticities* (VTPI 2013), and highlights the various demographic, geographic and economic factors that can affect the demand for travel[56]. It demonstrates the complexity in explaining travel patterns and the demand for any particular mode of transport within a given area.

[56] Litman. T., *Understanding Transport Demands and Elasticities: How Prices and Other Factors Affect Travel Behavior* (March 2013), Victoria Transport Policy Institute

Table D.1: Factors affecting travel demand

Factor	Key influences
Demographic and socioeconomic factors	Level and structure of population (residents, employees and visitors) Employment rate Average levels of wealth and income Composition of population by age group Lifestyles and preferences
Commercial activity	Level and profile of business activity Number of jobs Extent of freight transport Level of tourist activity
Transport options	Extent and reliability of public transport network Level of car ownership Opportunities for walking, cycling and car sharing Provision of taxi services Extent of home/teleworking Availability of delivery services
Land use	Land use density Profile of land use Connectivity of different locations Quality and availability of pedestrian routes Proximity of public transport Design of road and other transport systems
Demand management	Road use prioritisation Parking management Policy towards pricing of roads and public transport systems Passenger information and promotions
Prices	Fuel prices and motoring taxation Road tolls and parking fees Vehicle insurance and other motoring costs Public transport prices

Source: *Understanding Transport Demands and Elasticities: How Prices and Other Factors Affect Travel Behaviour* (VTPI, 2013), adapted by Steer Davies Gleave

D.3 Note that the pricing and quality of public transport, while they are important influences, compete with many other factors affecting travel demand. Moreover, even if price and quality are considered in isolation, their impact is complicated by the interaction between them. This is because the demand for travel is largely derived, since the majority of journeys are undertaken in order to enable another activity such as work, education, shopping or leisure. Hence, journey purpose is a key determinant of the choices travellers make when considering different modes and, within individual modes, different fares and service offers. For example, business travel is usually particularly sensitive to quality relative to price, because it is undertaken in the time, and at the expense, of the employer. From the employer's perspective, getting employees to the required destination quickly and in a fit state for work is usually an important consideration.

Rail specific factors

D.4 Against this background, it is clear that distinguishing the impact of rail fares and service quality on rail demand from that of the other factors listed in the table above is challenging. Hence, while the following observations reflect a broad consensus on key determinants of rail demand, experience will vary significantly between different Member States, areas within Member States and individual markets:

- Rail tends to dominate where large numbers of passengers travel to a common destination on a regular basis, particularly where it is located in an area subject to road congestion and limited parking capacity.
- Rail demand tends to rise with average income, although this effect may be offset by increasing car ownership (particularly in Member States where the extent of car ownership has, until recently, been limited) and the influence of dispersed land use.
- Rail fares and the comfort, convenience and journey times offered by rail services, nevertheless have a significant impact on mode choice and the willingness of some passengers to travel at all.

D.5 The picture is further complicated by the fact that fares and aspects of service quality may themselves be influenced by the demographic characteristics of an area, the availability of other modes and profiles of land use. The analysis in Chapter 2, while necessarily limited by the size of the data sample, suggested a correlation between average yield and not only average incomes but also rail connectivity, as proxied by the length of the national network. More generally, the dynamic interactions between exogenous and endogenous factors affecting rail demand, while powerful, are difficult to isolate for the purposes of estimation[57].

D.6 In the light of these complexities, much of the research underpinning rail demand forecasting has focused on the concept of generalised cost, a means of expressing the overall disutility of travel in monetary terms. This approach effectively abstracts from the many dynamic interactions affecting rail demand, placing a value on different aspects of a rail journey and aggregating them to derive an overall cost of travel from the perspective of the passenger. When combined with estimates of price elasticity of demand, generalised cost can be used to determine the impact of changes in rail fare and service quality on the demand for rail services, distinguishing between diversion from other modes and newly generated demand.

D.7 Parameter values for the various elements of generalised cost, and the associated demand elasticities, have been extensively researched over may years, and values that are generally accepted for the purposes of forecasting in a number of different countries have been widely documented. The tables below provide examples of fares and income elasticities as well as other value parameters used in estimating the effects of changes in the price of rail travel and particular aspects of service quality.

[57] See *Revisiting the Elasticity Based Framework* (2008), Arup and Oxera for an example of the complexities involved (**https://www.gov.uk/government/publications/revisiting-the-elasticity-based-framework-rail-trends-report**)

Table D.2: Examples of price elasticities of demand for travel in Europe

Travel mode	Peak price	Off-peak price	Income
Vehicle travel (essential trips)	-0.16	-0.43	0.70
Vehicle travel (optional trips)	-0.43	-0.36	1.53
Bus, tram and metro travel (passenger-kilometres)	-0.19	-0.29	0.59
Rail (passenger-kilometres)	-0.37	-0.43	0.84

Source: *Understanding Transport Demands and Elasticities: How Prices and Other Factors Affect Travel Behaviour* (VTPI, 2013) (summarising the results of various studies of European travel demand).

D.8 The price elasticities in the table above, which summarises results from research into European travel demand, indicate that, at current levels of fares, the demand for rail services is generally more sensitive to changes in price than the demand for other public transport modes, and also varies with time of travel, which tends to be related to journey purpose. During the peak, when rail passengers are typically travelling work, rail use is considerably more sensitive to price than car use for essential trips (a 1% increase in price leads to a fall in demand of 0.37% in the case of rail but only 0.16% in the case of travel by car). During the off-peak, both modes have the same sensitivity. Note, however, that in all cases demand is relatively price-inelastic, as the estimated elasticity values are less than one. The sensitivity of rail travel to income exceeds that of all other modes except optional travel by car.

D.9 The table below shows a sample of multipliers applied in estimating the impacts of lateness when forecasting rail demand in the UK.

Table D.3: Late time multipliers in the UK

Route	Multiplier for commuter traffic	Multiplier for non-commuter traffic
London inter-urban	2.5	3.0
Non-London inter-urban	3.9	3.4
Non-London under 20 miles	3.0	2.3
South East outer suburban	2.5	2.3
South East inner suburban	2.5	2.3

Source: UK Passenger Demand Forecasting Handbook v5.1 April 2013

D.10 Each minute of lateness on a non-London interurban journey is worth 3.9 minutes in the case of commuter traffic and 3.4 minutes in the case of non-commuter traffic. This is because lateness represents unplanned journey length, which carries costs for passengers expecting to reach their destination at a particular time. The range of multipliers applied within a single Member State demonstrates the precision needed to assess the impact of one particular dimension of service quality on demand.

D.11 The table below shows parameter values used to determine the impact of other aspects of service quality on demand.

Table D.4: Impact of selected quality improvements in the UK

Change in quality		Commuter traffic	Business traffic	Leisure traffic
From	**To**			
Train service value of time multipliers				
Train very dirty	Train spotlessly clean	0.035	0.039	0.039
Train in poor condition - damaged fixtures/seating	Train in excellent condition – everything as new	0.028	0.031	0.031
Train with no electronic displays/ announcements inaudible	Train with flat screen display showing relevant information	0.034	0.037	0.037
Passengers do not feel secure	Passengers feel secure	0.052	0.057	0.057
Station facilities: demand uplift				
No information about service disruptions	Electronic display showing service disruptions	3.9%	6.5%	
No waiting room or area protected from weather	Wind shelters in some places providing protection	1.2%	1.9%	
No kiosk	Kiosk	1.0%	1.7%	
No CCTV	CCTV	5.0%	8.0%	

Source: UK Passenger Demand Forecasting Handbook v5.1 April 2013

D.12 The impact of train service quality is expressed in terms of value of time multipliers, since the value of an improvement to the passenger (e.g. higher standards of cleanliness) is considered to vary with journey length. The multipliers represent proportionate decreases in journey time that are considered to cause an increase in demand equivalent to the impact of the given quality improvement. For example, in the case of a journey of 1 hour 40 minutes, improving cleanliness from dirty to spotlessly clean would result in an increase in commuter traffic equivalent to that arising from a 3.5 minute (100 minutes × 0.035) reduction in journey time.

D.13 Station improvements are considered to result in a percentage uplift in demand regardless of journey length. As shown, the introduction of electronic customer information displays and CCTV are estimated to have particularly significant effects, although in practice the application of these parameters requires judgement, taking into account the location of the station and types of service operating from it.

E Coach market liberalisation

E.1 On 4 December 2011 Regulation 1073/2009, which provides a set of common rules for access to the international market for coach and bus services, came into force replacing Council Regulation (EEC) 684/92 and Council Regulation (EC) No 12/98. Regulation 1073/2009 was intended to clarify and simplify rules and to improve enforcement and avoid unnecessary administrative burden regarding access to the international coach market.

E.2 Regulation 1073/2009 also defines three types of international coach service:

- "Regular services" means services which provide for the carriage of passengers at specified intervals along specified routes, passengers being picked up and set down at predetermined stopping points.
- "Special regular services" means regular services, by whomsoever organised, which provide for the carriage of specified categories of passengers to the exclusion of other passengers.
- "Occasional services" means services which do not fall within the definition of regular services, including special regular services, and the main characteristic of which is the carriage of groups of passengers constituted on the initiative of the customer or the carrier himself.

E.3 Domestic coach markets, in contrast, are governed by national regulatory frameworks which allocate responsibility for the market between national and other authorities. In practice there are wide variations in how responsibilities are subdivided. In some Member States, for example, different regional authorities interpret their powers in different ways.

E.4 Table E.1 overleaf summarises our findings on the regulatory frameworks in each Member State from data collected through desk research and from stakeholders, gathered for a separate *Comprehensive Study on Passenger Transport by Coach in Europe*.

E.5 The date of the most recent legislation relating to domestic coaches varies widely, from 1980 in the UK to 2015 in France. Partly as a consequence of this, both the types of services which have been liberalised and the extent of liberalisation vary widely between Member States.

E.6 In addition, in different Member States, special regular and occasional coach services may variously be liberalised, a national responsibility, or a regional responsibility with varying degrees of liberalisation in different regions. This has the effect that the extent of liberalisation varies within a Member State, depending on how regional and local competent authorities choose to exercise their powers. For regular and some special regular services, for example, variations include:

- whether regional authorities consider regional coach services to be an extension of urban and suburban services, operated by bus and other modes, or a distinct mode;

- where regional coach services are seen as a distinct mode, whether they are let as an area-wide concession, procured through PSO contracts, or allowed to operate commercially; and
- whether local or urban authorities provide and/or designate terminals, or require operators to use them, or permit them to stop on street.

E.7 This means that barriers to market entry can exist at a number of levels, ranging from tight national control of services, through regional awards of concessions with exclusive rights (whether directly awarded or competitively tendered), to local requirements for, or prohibitions on, stopping in particular locations.

Table 8.3: Domestic coach market regulatory frameworks

State	Liberalisation		Largest operator share	Obligatory use of terminals
	Latest local law	Summary		
AT		Not liberalised: all services are either PSCs or five-year concessions.	60%	No
BE		Direct award of regional concessions to two incumbents.	100% in each region	No, as few terminals exist.
BG	1999	Fully liberalised.		When no terminal space available, mayors allocate locations to operators.
CY	2009	Not liberalised.	100%	N/A
CZ		Fully liberalised. Community licences and authorisations are issued by regional authorities.		Other than at motorway services, restrictions only on safety grounds.
DE	2013	Liberalised if over 1 hour by rail or "50 kilometres between stops".	53% (by 2015)	No
DK	2005	Liberalised if no infringement of a public services.		
EE	2000	Not liberalised.		Stops in Tallinn are permitted, subject to the agreement of the city government.
EL	1996	Not liberalised.	100%	N/A
ES	2009	Competition for national and regional concessions.	54% of national concessions	Yes, unless negotiated with municipalities.
FI		Liberalised.		
FR	2015	Liberalised if over "100 kilometres between stops", otherwise assessed.	May be high, market is evolving	No, as few towns have terminals.
HR	2013	Regular at Counties' discretion. Special regular liberalised. Occasional liberalised.		
HU	2012	Not liberalised.		Any stops can be used if safe, with landowner's permission and if clearly marked.
IE	2009	Liberalised.		
IT	2005	Regular services are liberalised, but regional services within one or two NUTS2 regions are subject to authorisation.		Illegal loading and unloading outside terminals has been reported.

State	Liberalisation		Largest operator share	Obligatory use of terminals
	Latest local law	Summary		
LT		Regular services are subject to authorisation at national or municipal level.		No, except at route end points.
LU		Too small for a commercial interurban market.		
LV	2007	All interurban services are concessions.		Stopping points may be agreed with the competent municipal authorities.
MT	2011	Too small for coach services.	N/A	N/A
NL	2000	Regular and special regular are all concessions: exemptions are permitted but have not been sought. Occasional liberalised.		Yes
PL	1988	Regular and special regular services require authorisation.		
PT	1990	Interurban services are liberalised. Urban, suburban and regional services are concessions.		
RO	2011	Fully liberalised.		No
SE	1993 to 1999	Liberalised if over 100 kilometres or inter-county.	19% plus "partners"	No
SI	2006	Regular only by PSO. Special regular liberalised. Occasional liberalised.		Varies between urban areas.
SK	2012	Interurban services are liberalised subject to protection of PSO services.		
UK	1980	Liberalised fully, except in London.	75-87%	No

Source: Steer Davies Gleave desk research and stakeholder responses.

F Glossary of terms

Term	Meaning
Administered fare	Fares set by the local, regional or national competent authority
Booking horizon	The time between booking date and intended travel date.
Cash fare	Fare if bought in cash or by credit/debit card at the time of travel.
Gross cost contract	A public service contract in which variations in revenue are a borne by the competent authority.
Inferior good	A good for which demand increases when consumer income rises or, conversely, falls when consumer income falls.
Interurban traffic	Domestic journey from the capital city to another major urban area over a distance of at least 100km.
Kilometric fare	Fare determined by distance travelled irrespective of origin and destination
Management contract	A basic contract in which an operator agrees to deliver a service as specified by a contracting party, usually the local/regional authority. Under a management contract an operator may be rewarded or fined if it exceeds or fails to meet minimum requirements set in the contract.
Market liberalisation	Relaxation of rules in order to introduce competition in the market with the aim of improving services and efficiency
Net cost contract	A public service contract in which variations in revenue are borne by the service operator.
Price-maker	An individual or company which is sufficiently influential within the market to be able to affect the price of a product or service.
PSC	See Public Service Contract.
PSO	See Public Service Obligation.
Public Service Contract	One or more legally binding acts confirming the agreement between a competent authority and a public service operator to entrust to that public service operator the management and operation of public passenger transport services subject to public service obligations.
Public Service Obligation	A requirement defined or determined by a competent authority in order to ensure public passenger transport services in the general interest that an operator, if it were considering its own commercial interests, would not assume or would not assume to the same extent or under the same conditions without reward.
Regional traffic	Journeys, over distances of 50-100 kilometres, which typically do not involve a major city
Regulated fare	Fares set by the operator, but under constraints set by the relevant competent authority. Fares regulation may be by a range of mechanisms including price caps and links to inflation indices.
Smart card	An alternative to a paper ticket where the travel document is stored in an electronic chip within a plastic card.
Suburban traffic	Suburban network consisting of at least one line with regular services at intervals of (illustratively) 30 minutes or less connecting at least five stations within 10 kilometres.

Term	Meaning
Through ticket	A ticket for a journey which may require the use of more than one train provided by more than one operator or funded by more than one competent authority.
Yield	Revenue per passenger-kilometre.
Yield management	Managing demand to maximise revenue from a fixed capacity by either or both of two approaches: • defining different ticketing products, but limiting sales of the cheaper ones to ensure that space is available for passengers buying more expensive ones; or • increasing prices over time in response to emerging bookings, so that the price of each service reflects the emerging demand to use it.

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