Independent Regulators' Group – Rail

IRG–Rail

2nd IRG-Rail Annual Market Monitoring Report

27 February 2014

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Available as a separate document:

Annexes to the 2nd IRG-Rail Annual Market Monitoring Report

Annex 1: Country sheets market structure.
Annex 2: Common list of definitions and indicators
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Country abbreviations

AT	Austria
BE	Belgium
HR	Croatia
DK	Denmark
EE	Estonia
FI	Finland
FR	France
DE	Germany
GB	Great Britain
GR	Greece
HU	Hungary
LV	Latvia
LU	Luxembourg
MK	FYROM (Former Yugoslav Republic of Macedonia)
NL	Netherlands
NO	Norway
PL	Poland
SK	Slovakia
SI	Slovenia
SE	Sweden

1. Summary of findings

7. IRG-Rail findings show that in 2012 there were more countries with a market without a 'new' passenger entrant than without a freight entrant. This can be explained by the later and often partial opening of the rail passenger markets. The change in freight train kilometres between 2011 and 2012 was -4.7%, whilst passenger train kilometres increased by 0.4%. The magnitude of change is greater for freight train kilometres which reflects the ability of freight operators to adapt to fluctuating market demand whereas the majority of passenger trains run under multiannual public service contracts with an obligation to run services. With the exception of Latvia, in most countries rail traffic was more dedicated to passenger services than to freight services.

Freight

8. The share of freight slightly decreased in the monitored countries. This was mainly due to the overall decrease of freight train kilometres between 2011 and 2012. However this decline was compensated for by the growth in the load factor in the countries monitored. Total tonne kilometres in the countries monitored decreased by 4% between 2011 and 2012. Macedonia had the largest decrease in freight train kilometres in 2012, namely 17.8%. This may be a reflection of the reduction in the GDP of Macedonia and a further negative influence of the deep economic crisis in Greece. The biggest increase in freight train kilometres was observed in Latvia in 2012 (+10.8 per cent), which could be explained by the growth in transit traffic from CIS countries and by the recovery from the economic crisis.

9. The average load factor rose between 2011 and 2012 by 1% which indicated that economics of rail freight improved due to a higher load factor. Rail freight operators also managed to increase their revenue per tonne kilometre. The average revenue did not vary too much across countries demonstrating that revenues are driven by a functioning market. Market shares of non-incumbents are higher in those countries with early liberalisation of the freight market. Market shares of new entrants were either stable or increased in all countries and the average market share of new entrants increased as well.

Passenger

10. In the passenger market, train kilometres grew to the greatest extent in Austria (+2.6 per cent) as a result of the establishment of a new passenger operator. The largest decrease was in Hungary (-4.8 per cent), where several trains running on regional lines were cancelled in 2012. Norway and Croatia recorded the highest growth in passenger kilometres. In most countries the market share of the incumbent passenger operator declined in 2012. The strongest growth of non-incumbent operators was seen in Austria, Norway and Poland.

11. Compared to 2011, most countries saw an increase in the number of passengers. This may be due to a number of factors including longer trains and more seats being occupied. The majority of countries, showed an increase of passenger kilometres per resident. The only country to experience a fall was Slovenia. The data on passenger kilometres per resident showed that in most countries observed, people made more trips by rail and/or travelled longer distances.

12. There was no general trend in the evolution of revenues for passenger railway undertakings. The greatest change was in Great Britain which was the only country with a negative value for public compensation payments because the government was in net receipt of money. In the majority of the countries monitored, passenger fares represented the largest proportion of revenue for railway undertakings.

Charges

13. Most countries monitored have higher average charges for freight than for passenger trains. Nevertheless, the average charge across countries monitored (weighted by the volume of traffic of each country) is lower for freight compared to passenger traffic. This is due to the fact that three large countries (France, Germany and Great Britain) have much higher passenger charges. In 9 out of 15 countries observed in 2012, IRG-Rail found an inverse reaction between the evolution of freight train charges and freight train kilometres; a decrease in access charges was accompanied with an increase in freight train kilometres. This could be explained by either the elasticity[1] of freight operators and/or the inclusion of fixed costs in charges. A further correlation was found between operators' revenue per train kilometres and track access charges per train kilometre. This could suggest that access charges are dependent on the revenue of train operators (or vice versa) and that the share of revenue allocated to access charges is the same across countries.

Rail-related Services

14. Stations in the countries monitored were almost exclusively operated by incumbent railway undertakings or related companies. This might increase the risk of anti-competitive behaviour. Austria, Slovakia and Slovenia had relatively many stations per resident and per track kilometre. Sweden has a low station density, i.e. a high number of stations per track kilometre, possibly explained by the fact that Sweden is a large country with a low population density. France and Greece have relatively few stations per resident. Greece had a low average of passenger kilometres per station, indicating a low use of rail as a mode of transport. France had a high average of passenger kilometres per station, indicating that rail passenger transport was concentrated around relatively few stations.

15. IRG-Rail found a strong positive correlation between network length and the number of stations, possibly indicating that the longer the network, the more stations were needed. A further positive correlation was evident between total passenger kilometres and stations, implying that stations were being created to cope with increasing demand.

16. Unlike passenger stations, most freight terminals were not related to the incumbent railway undertaking. The room for choice was probably more limited in practice as the geographical location was an important factor, making the market for terminals a regional or even a local market. Sweden and Poland had the most purpose-built intermodal freight terminals. Regarding marshalling yards, in Austria, Denmark, Hungary, Poland, Slovenia and Sweden yards with gravity hills were owned by one single incumbent operator. This implied that competitors have no other options at national level.

17. There were several countries with a high number of maintenance facilities for rolling stock operated by other companies. Other countries showed (near) exclusive operations by the incumbent railway undertaking. In France, Norway and Slovenia, the facilities were exclusively operated by one incumbent. The risk for anti-competitive behaviour was mitigated by the fact that under certain circumstances, the market for maintenance facilities was an international market. A strong positive correlation between maintenance facilities and both, train kilometres and freight tonne kilometres indicates, that the number rather than the scale of facilities tended to grow when rail traffic increased. In almost all countries reported, refuelling facilities were predominantly operated by the incumbent railway undertaking or a related company. The correlation between total train kilometres and the number of refuelling facilities was high, indicating that there was a strong relationship between traffic volume and facilities.

18. Finally, IRG-Rail draws your attention to the fact that the figures presented in this report are not meant, nor could be used, to assess the relative performance of the national railway systems.

[1] Elasticity is a measurement of how responsive a variable (like freight train kilometres) is to the change of another variable (like user charge).

2. Introduction

1. IRG-Rail is a group of independent regulatory bodies, whose overall aim is to facilitate the creation of a single, competitive and sustainable internal rail market in Europe. The group was founded in June 2011 and acts as a platform for national railway regulators in order to exchange information and to share best practice, so that in future regulatory challenges can be dealt with in a consistent manner across Europe.

2. Regulatory bodies have a formal duty to monitor the development of competition in rail services market, and in particular in the rail transport market pursuant to Article 56 (paragraph 2 and 7) of Directive 2012/34/EU (Recast). As part of this IRG-Rail has established a market monitoring working group. One of the tasks of the working group is to produce an annual IRG-Rail monitoring report covering developments in the rail markets of some IRG-Rail members.

3. This report is the second market monitoring report of IRG-Rail and covers the year 2012, unless stated otherwise. In addition to last year's report, that focused only on the railway transport market, this year IRG-Rail also presents the market monitoring results of certain rail-related services for the first time.

3. Aim of the report

4. Rail market monitoring is an important instrument for gathering market information, setting directions to the activities of the regulatory bodies and stimulating market participants to improve their activities. The objective of the IRG-Rail market monitoring report is to present the results of the corresponding data collection process led by IRG-Rail. Members of IRG-Rail will use the report for developing their knowledge of the rail market itself as well as of the market development and evolution.

4. Methodology

5. Since 2010, members of the IRG-Rail market monitoring working group have been collecting data on their respective rail markets based on a common list of indicators. Despite the differences in the scope of the national market monitors, the working group identified a number of common indicators, agreed on their definitions and on the form in which they should be collected. For the report year 2012 the working group extended its focus and included certain rail-related services in the market monitoring process. Given the different national market conditions it became necessary to define the types of service facilities that should be monitored and to agree on common indicators for these rail-related services. In the context of this report the focus of the initial analysis of rail-related services is on passenger stations, freight terminals, marshalling yards, maintenance and refuelling facilities.

6. In 2013 the IRG-Rail market monitoring working group established commonly agreed guidelines on market monitoring. These guidelines define indicators for the market description, set principles on data quality and data quality checks and lay down the time schedule of the complete market monitoring process[2].

[2] Available at http://www.irg-rail.eu/public-documents/2013/

19. A consistent definition of the data and limitation of the scope are necessary in order to ensure comparability of the data. In total, there are 98 common indicators used to assess the current situation in the respective rail transport markets. The main focus has been clearly set on competition and on infrastructure charges. In addition, IRG-Rail has used the indicators as a basis to determine further normalized key figures, e.g. average number of passengers per train. A similar method is used for the rail-related service markets. An overview of used indicators for rail transport and for rail-related services can be found in Annex 2 to this report.

20. The collected data originates both from external sources (e.g. state institutions for transport statistics) and the market surveys of the individual members of IRG-Rail. Not all regulatory bodies participate in the survey. Consequently the coverage is not equal to Eurostat which covers the EU27. On the other hand the IRG-Rail report includes some countries outside EU27 such as Croatia (which is now an EU member), Macedonia[3] and Norway. Since several countries have not been able to provide a full set of data to IRG-Rail, this is reflected in the conclusions of IRG-Rail. Readers should notice that some indicators only reflect a selection of European countries.

21. IRG-Rail is aware of the difficulties associated with producing a market monitoring report in terms of consistency and reliability of data and has carried out quality assurance checks on the data to ensure its accuracy. Moreover, thanks to the close cooperation between data contributors, it has been possible to improve the consistency and quality of the data. The 2012 data collection started in August 2013 and results were finalised in December 2013, after further refinements and revisions of the data collected.

22. In this year's market monitoring report time-series analysis for the rail transport market were carried out for the first time. The considered time period ranges from 2010 until 2012. The evolution over time is shown as the actual value of 2012 either combined with a trend indicator or with an indexed overview of the development. Besides a descriptive statement, the working group has tried to provide some explanations and detailed analysis, where possible, of the significant differences observed in the national markets and of specific developments in the monitored indicators over time. Therefore the group carried out correlation and regression analysis, both for the rail transport market and for rail-related services. It should be noted that a high degree of correlation only refers to a possible relationship between indicators but does not constitute a proof of cause.

23. The next period of data collection is planned for summer 2014. For the next market monitoring report, IRG-Rail intends to continue and intensify the implementation of time analysis in the railway market, covering data from 2010 until 2013. The use of detailed analysis in the rail transport as well as in the rail-related service market will be further developed. Furthermore, next year IRG-Rail will seek to optimize the use of definitions and identify additional commonly agreed indicators particularly for rail-related services. Regarding rail-related services IRG-Rail plans to expand the focus to more types of facilities as well as identify and evaluate systematically the differences and particularities of national markets. IRG-Rail draws your attention to the fact that the figures presented in this report are not meant, nor could be used, to assess the relative performance of the national railway systems. As highlighted by a study issued by the Centre of Regulation in Europe[4], such an objective would require a much more intensive analysis.

[3] The official name of Macedonia is FYROM (Former Yugoslav Republic of Macedonia). The name Macedonia will be used for FYROM from this point.

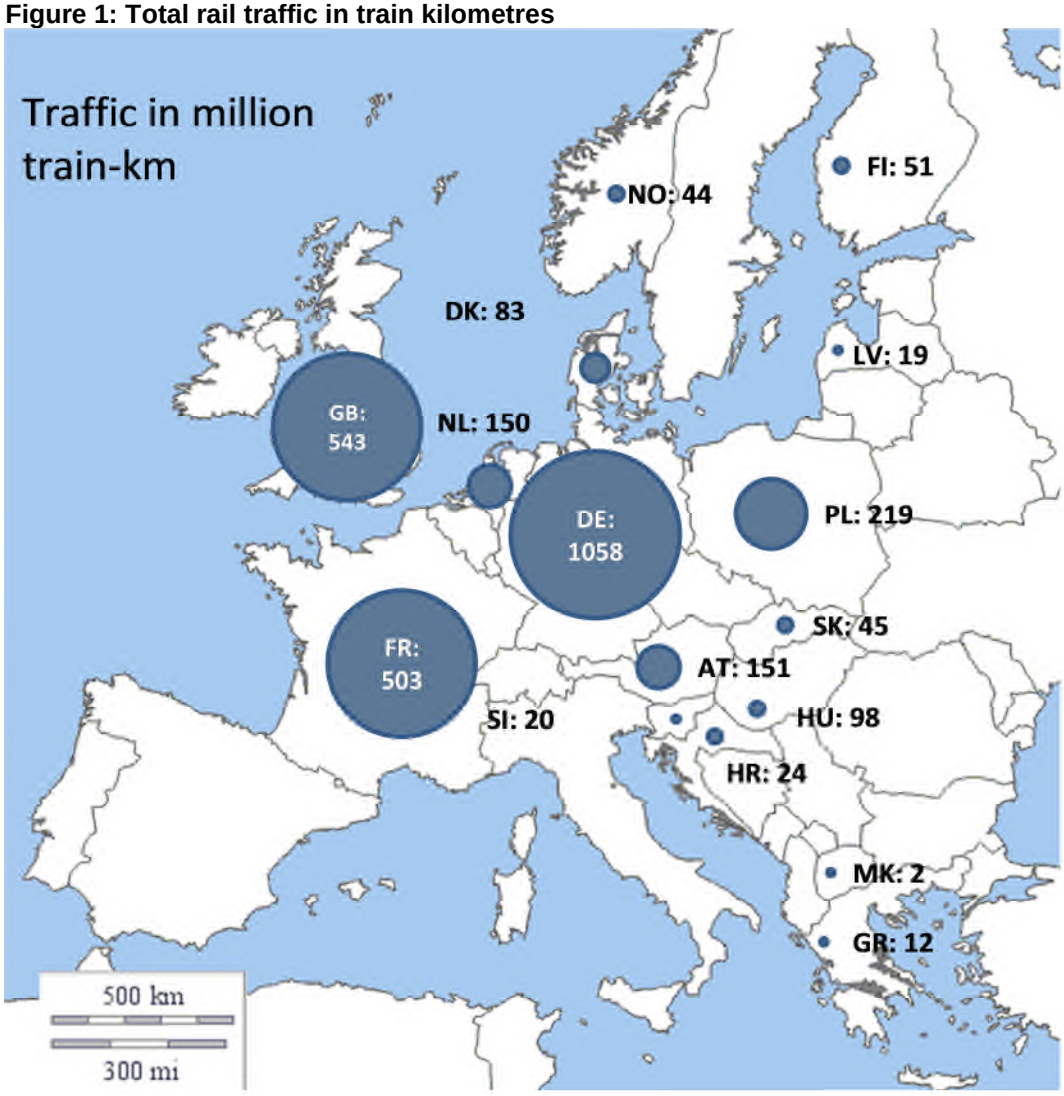
[4] A. Bottasso, M. Conti, *Quantitative techniques for regulatory benchmarking*, CERRE (2011).

5. Findings

a) Market Structure

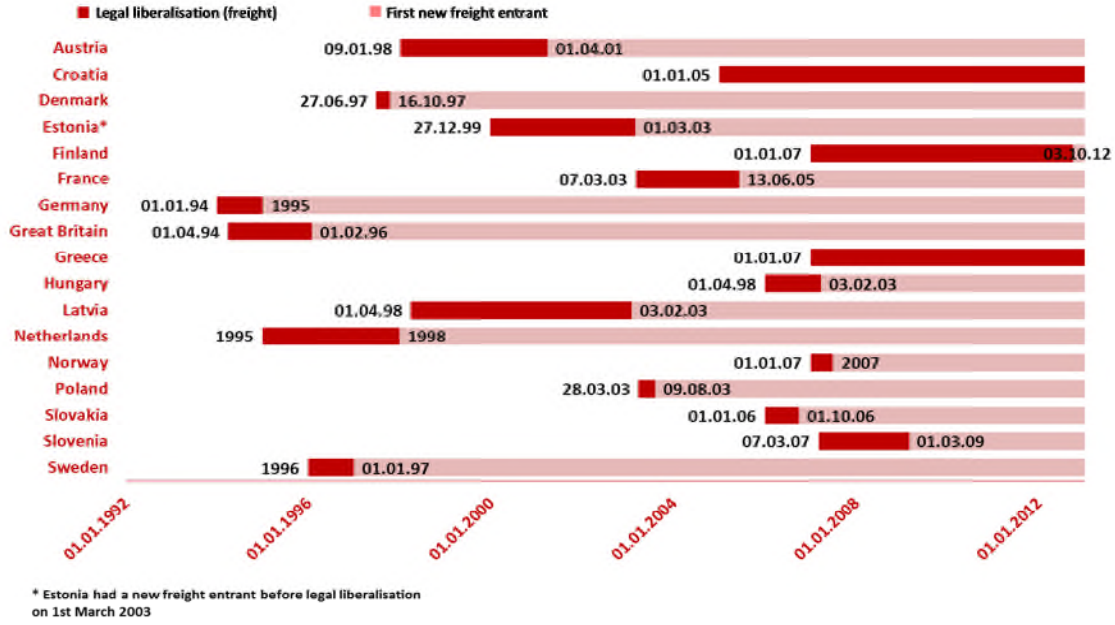
25. This section provides some background information on the current status of the rail market in the countries monitored. This includes the timescales for the liberalisation of the rail freight and rail passenger markets, the ownership structure of the freight and passenger rail markets, the number of active railway undertakings in 2012 and the extension of rail freight and passenger markets in terms of train kilometres.

Figure 1: Total rail traffic in train kilometres



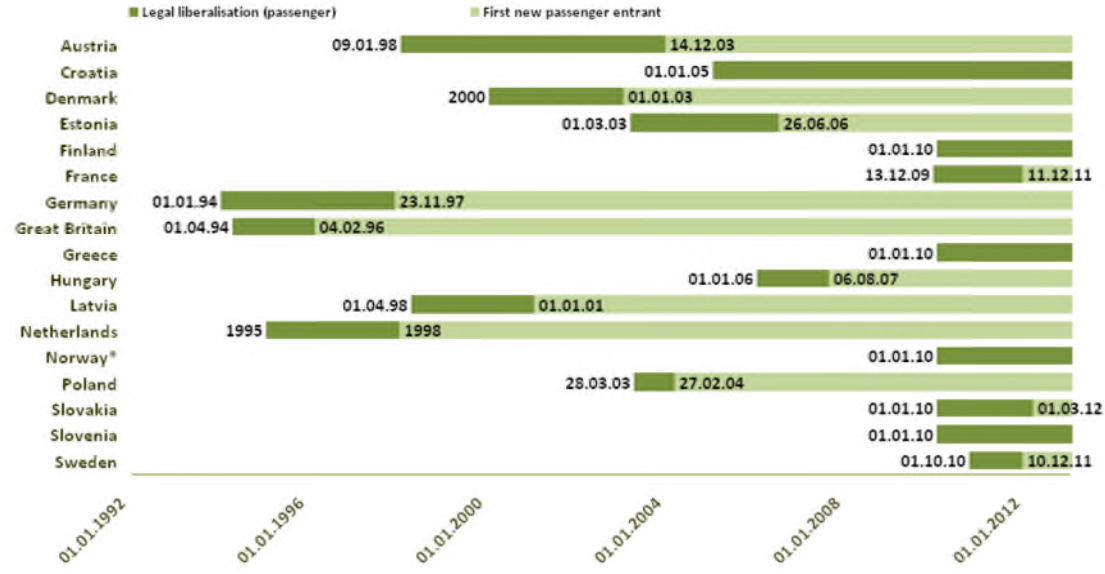
26. Figure 1 depicts the relative size of the railway markets in the countries observed in terms of train kilometres. It shows that the market size varies significantly from one country to another amongst the countries observed, with Macedonia having the smallest and Germany the largest rail market.

Figure 2: Liberalisation of the freight market



* Estonia had a new freight entrant before legal liberalisation on 1st March 2003

Figure 3: Liberalisation of the passenger market



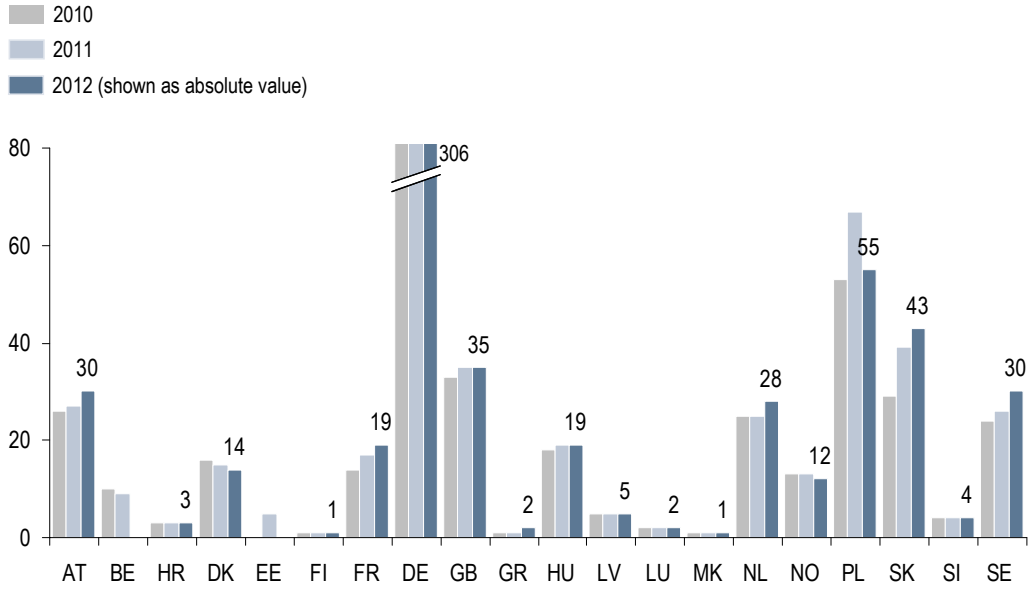
* IRG Rail considers the market of Norway partly liberalised in January 2010 although a new operator entered the market already in 2006 (see annex).

Where exact dates are not available, they have been set to the appropriate year.

27. The liberalisation of the rail freight and passenger markets is shown in figures 2 and 3, respectively. The date of legal liberalisation is the date of entry into force of the relevant national legislation opening (partly) the freight or passenger market. The rail freight markets have been legally liberalised in all of the countries observed. There are only two countries (Croatia and Greece) where there are no new entrants in the freight market (see figure 2). In Finland the first non-incumbent rail freight undertaking was granted a license in 2012, though it does not actively operate any freight services.

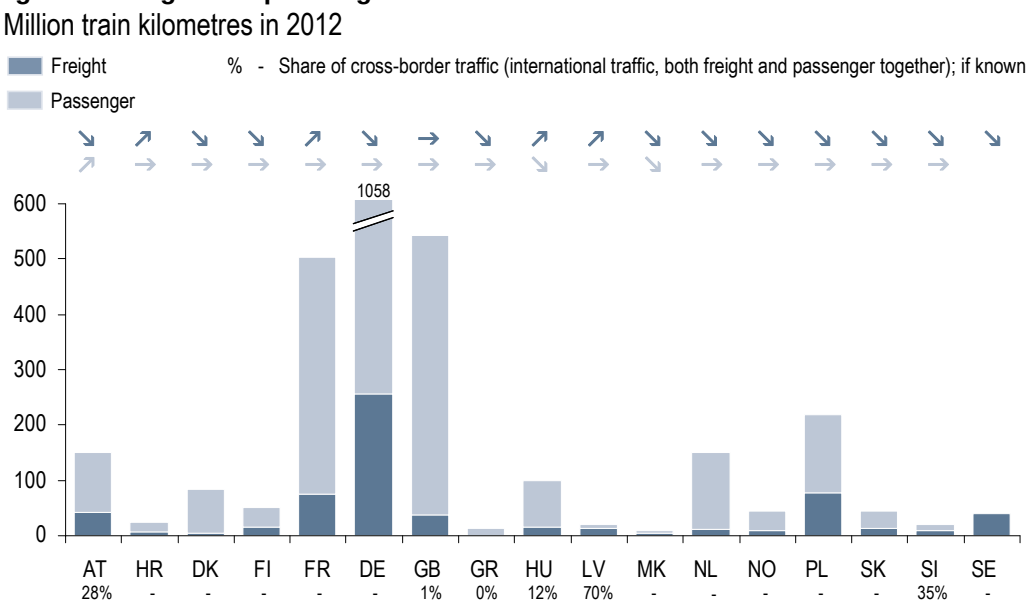
28. The legal liberalisation of the rail passenger market has also started in some of the countries observed. However, the opening up of rail passenger markets has been limited in several countries (i.e. only for international or for regional traffic). There are five countries where there have been no new passenger operators (see figure 3). The first non-incumbent operator entered the passenger market in Slovakia in 2012. Annex 1 provides details of the ownership structure of the major railway undertakings in the countries monitored. IRG-Rail observes that there are still a significant number of railway undertakings with public ownership, both for passenger and freight operators.

Figure 4: Number of active railway undertakings



29. Figure 4 shows the number of active railway undertakings in each country in 2010, 2011 and 2012. It varies significantly among the countries observed, with Germany showing the highest number of active railway undertakings in each year. In 2012, the number of active operators grew in six countries and decreased in four. In comparison to 2010 there were nine countries in 2012 with a higher number and only three countries with a lower number of active railway undertakings. It should be noted that there were only two railway markets (Finland and Macedonia) with a single active railway undertaking in 2012.

Figure 5: Freight and passenger traffic in train kilometres



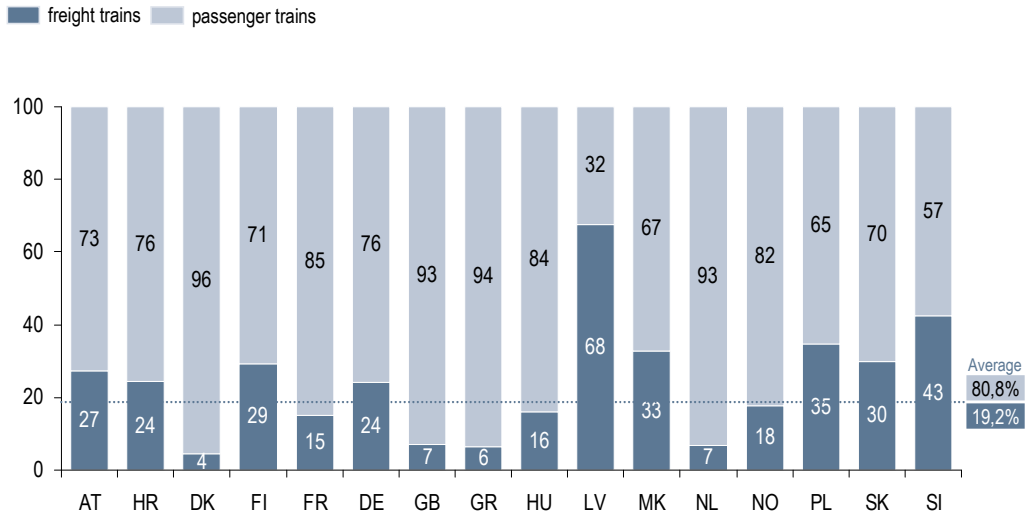
30. Figure 5 depicts the national railway markets in terms of train kilometres for freight and for passenger transport. Like in previous years, Germany had the largest volume of train kilometres, where trains ran more distance than in the next two countries in the ranking (Great Britain and France) combined. The biggest increase in total train kilometres was observed in Latvia in 2012 (+7.2 per cent), whilst Macedonia had the largest decrease in 2012, namely -8.2 per cent.

31. Latvia saw the biggest increase in freight train kilometres (+10.8 per cent). This could be explained by the growth in transit traffic of CIS[5] countries and by the recovery from the economic crisis. The largest reduction in freight train kilometres was observed in Macedonia (-17.8 per cent). This may be a reflection of the decreased GDP[6] of Macedonia and the negative impact of the deep economic crisis in Greece.

32. In the passenger market, train kilometres grew significantly in Austria (+2.6 per cent) as a result of the emergence of a new passenger operator. The largest decrease was observed in Hungary (-4.8 per cent), where several trains running on regional lines were withdrawn in 2012. It should be noted that the variation of change in passenger train-kilometres was lower than in freight train-kilometres, which may reflect that the majority of passenger trains are run under public service contracts concluded for several years, whilst freight operators adapt to the fluctuating market demand.

Figure 6: Use of the network

Percentages (by train kilometres), 2012



33. Figure 6 shows the use of the network, based on total train kilometres for freight and passenger transport. In 2012, the networks in most of the countries being monitored were dedicated more to passenger services than to freight services. Only one country stands out: Latvia with 68% of total train kilometres dedicated to freight, which can be explained by its role in transit traffic to CIS countries. Overall in 2012, the share of rail freight compared to rail passenger traffic is decreasing in the monitored countries. This is due to the overall reduction in freight train kilometres between 2011 and 2012. The share of passenger transport in total train kilometre is above 90 per cent in four countries: Denmark, Great Britain, Greece and the Netherlands. Denmark, Great Britain and the Netherlands, which have high density of population, also show the highest number of passenger trains per route kilometre per day (see also chapter 4c).

[5] Commonwealth of Independent States
[6] Gross Domestic Product

b) Infrastructure

34. This section reports on the characteristics of the rail network, including the size and its use. The measures of train kilometres and route kilometres give an indication of how the rail network is being used in the national passenger and freight markets and how they compare with other national markets. Similarly, the normalised track access charges data shows how passenger and freight charges differ between countries.

Figure 7: Track length in kilometres

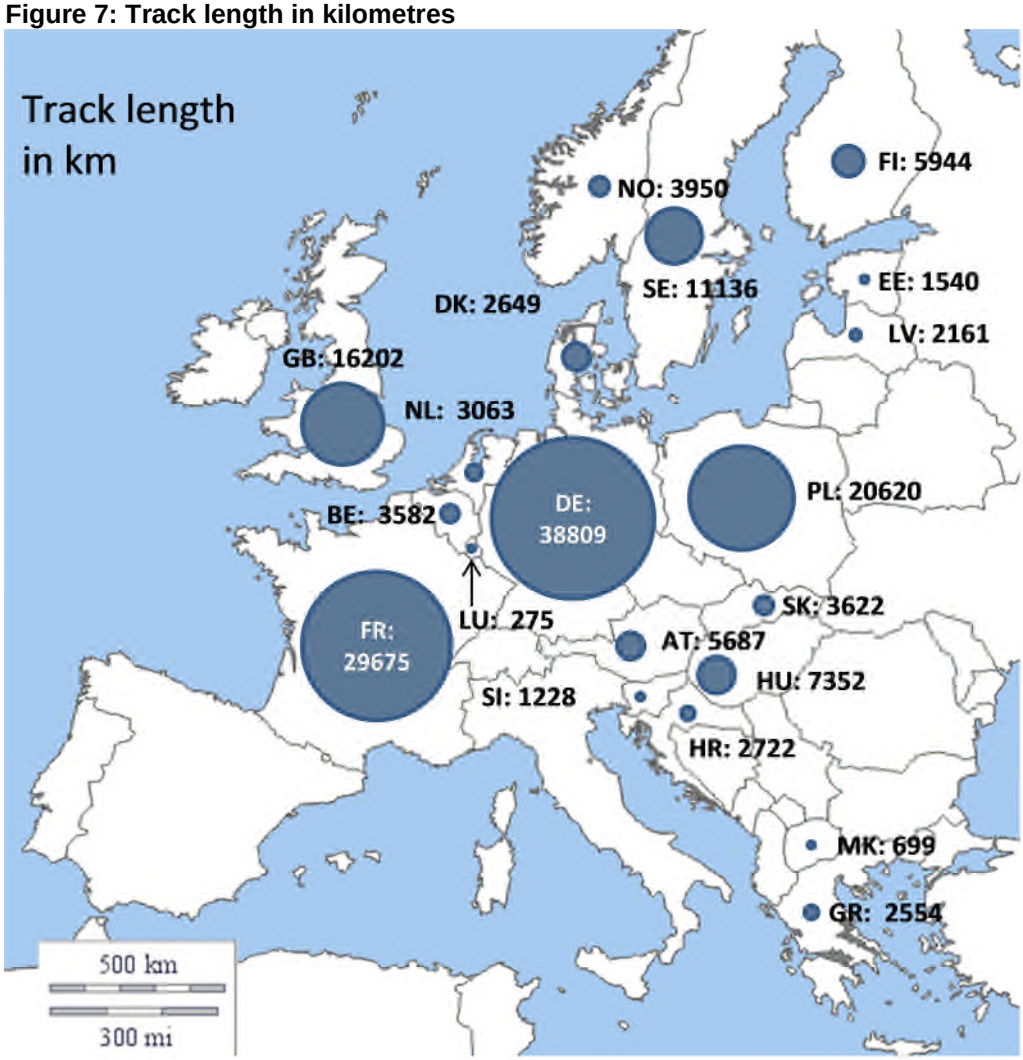
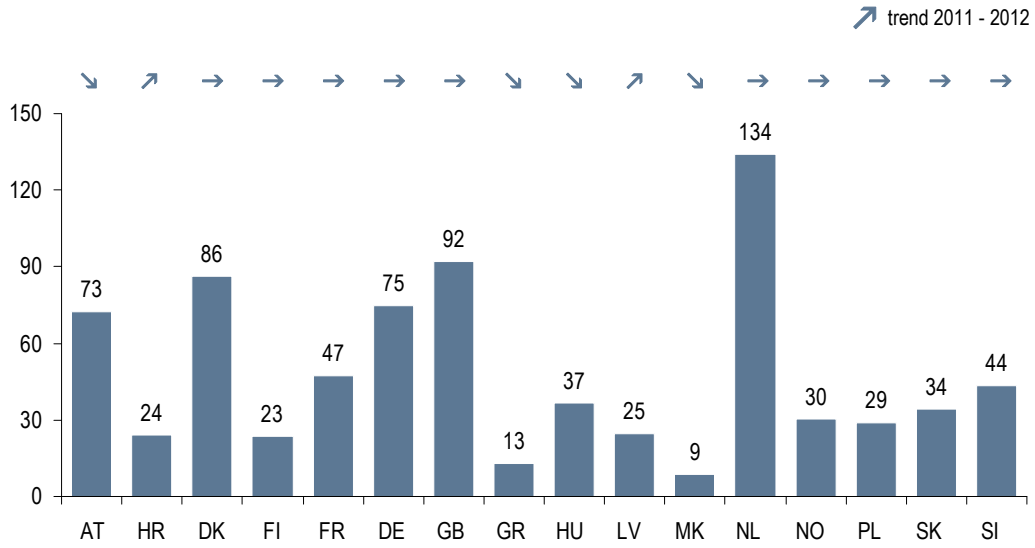


Figure 8: Network usage intensity

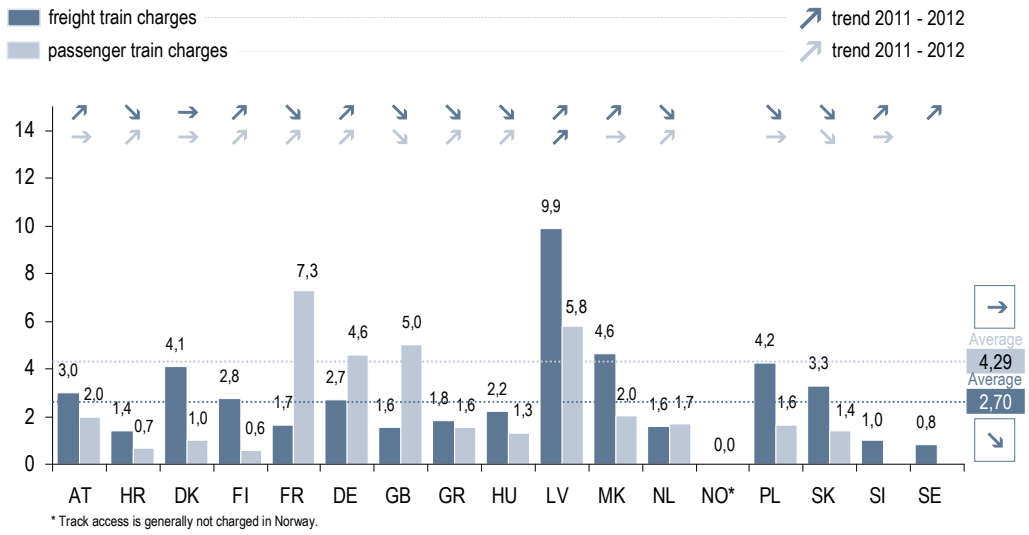
Trains per route kilometre per day, 2012



35. Figure 8 divides the total train kilometres by the track length and by the number of days. The result shows the average number of trains per route kilometre per day for each country being monitored. The indicator varies from 9 trains per route kilometre per day in Macedonia to 134 in the Netherlands. This is a variation of a factor 14. Between 2011 and 2012 there has been very little variation in terms of train volumes on the network.

Figure 9: Average track access charges[7]

Euro per train kilometre, 2012



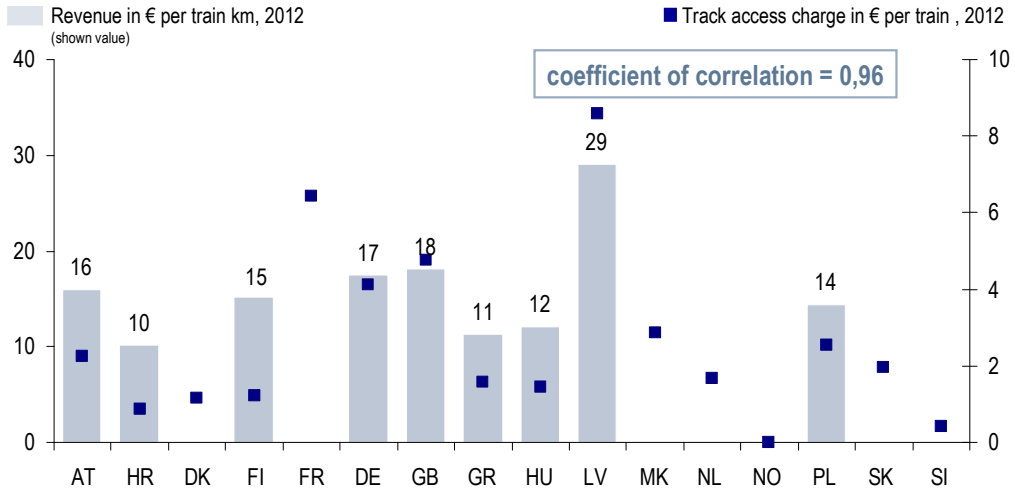
36. Figure 9 shows the average access charge per train kilometre for the passenger and freight market.

[7] In some countries, the access charges may be completed with sector specific public compensation. Therefore the overall charges levied by IMs could be higher than those shown.

37. Freight access charges vary from € 9,90 per train kilometre in Latvia to € 0,80 per train kilometre in Sweden. Passenger access charges vary from € 7,30 in France to € 0.60 in Finland. The average track access charges across the monitored countries are € 2,70 per freight train kilometre and € 4,29 per passenger train kilometre. The majority of countries monitored have higher average charges for freight trains. Despite this, the overall average access charge for freight is lower than that for passenger trains because three of the largest countries in terms of network size - France, Germany and Great Britain - have higher access charges for passenger services. IRG-Rail has observed that in 2012 9[8] countries out of 15 showed an inverse reaction[9] between the evolution of freight train charges and freight train kilometres. This could either be attributed to the elasticity of freight operators to access charges or to the fact that access charges are fixed according to the expected traffic. The first hypothesis merely reflects that as access to the network is becoming less expensive, the network may be used more by freight operators despite access charges only being a fraction of the total cost of the freight operator. The second hypothesis is that access charges may cover in part the fixed costs of the network. As the number of trains is increasing, access costs can be spread over by a larger number of trains, and therefore lowering the access charges.

38. It is worth noting that in the passenger market, we find no such inverse reaction. The variations in terms of train kilometre are smaller and less significant. This is probably due to the importance of PSO[10] traffic in the passenger market, therefore making it less sensitive to access charges in the short run.

Figure 10: Share of track access charges in terms of revenue per train kilometre



39. Figure 10 shows the correlation between total operators' revenue per train kilometre and track access charges per train kilometre. The metric highlights a strong positive correlation which could suggest that access charges are dependent on the revenue of train operators and that the share of revenue allocated to access charges is the same across countries. This could be an illustration of access charges set according to what the market can bear. Despite the heterogeneity in track access charges per train kilometre, they amount on average to 17% of the revenue per train kilometre of operators. This share ranges from 29% in Latvia to 8% in Finland.

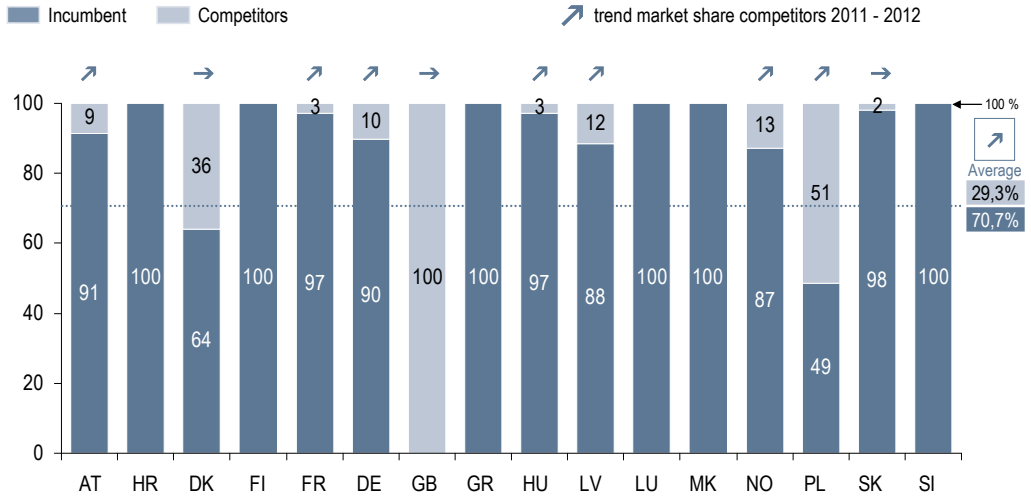
[8] The relationship is satisfied in Austria, Croatia, Finland, Germany, Great Britain, Hungary, Macedonia, Slovenia and Sweden.
[9] Meaning that total freight train kilometres increases when the average freight track access charge decreases.
[10] Public Service Obligation

c) Passenger market

40. This section on the passenger market compares the degree of liberalisation in each national passenger market and assesses how the markets have evolved since liberalisation in terms of market share for new entrants. By combining the passenger market indicators with other metrics such as infrastructure, revenue and population, we have developed a number of other measures to analyse the rail market.

Figure 11: Market shares of passenger train companies

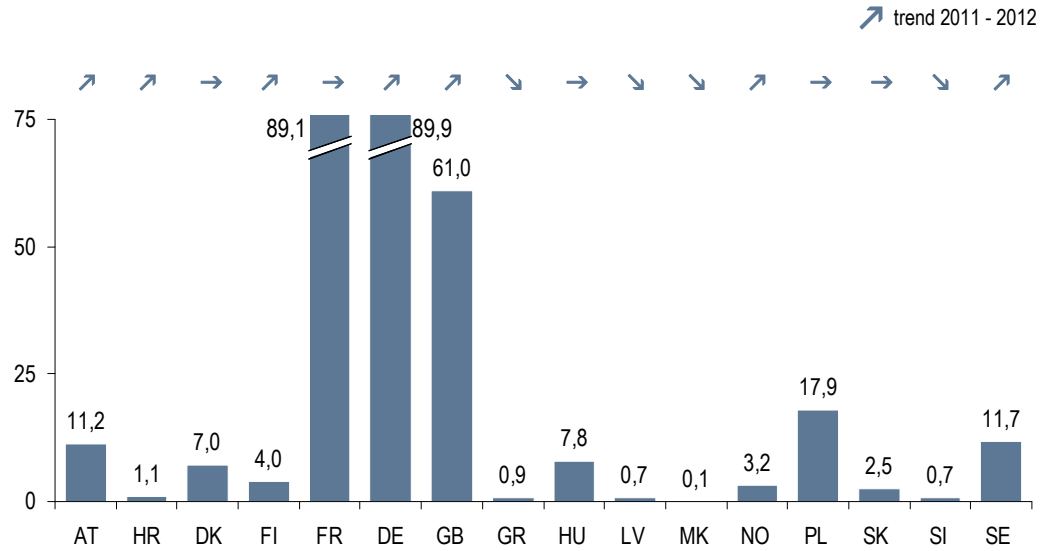
Percentage of passenger kilometres in 2012



41. Figure 11 shows the proportion of passenger kilometres carried by incumbent operators and competitors. Croatia, Finland, Greece, Luxembourg, Macedonia and Slovenia continue to operate with the incumbent operator accounting for 100% of passenger kilometres. Austria has seen the most notable increase since 2011 with competitors' share rising from 6% to 9%. This is partly due to the introduction of open access operations between Vienna and Salzburg from December 2011 onwards. The share of the market for non-incumbent operators has also increased in Norway, going from 11% in 2011 to 13% in 2012. Furthermore, Poland has seen an increase of 2% due to increased passenger kilometres for regional non-incumbent operators.

Figure 12: Passenger kilometres

Billion passenger kilometres in 2012



42. Germany, France and Great Britain have the highest volume of passenger kilometres in Europe in 2012. This is to be expected given the size of their respective networks and that they are the three most populous countries. Compared to 2011, Norway and Croatia have recorded the highest overall growth rate of 5.7%. Despite a fall in international traffic, Croatia has recorded strong growth of 6.9% in the national market whilst Norway has seen an increase in traffic coinciding with the growth in the non-incumbent's share of the market.

Figure 13: Evolution of passenger kilometres 2010-2012

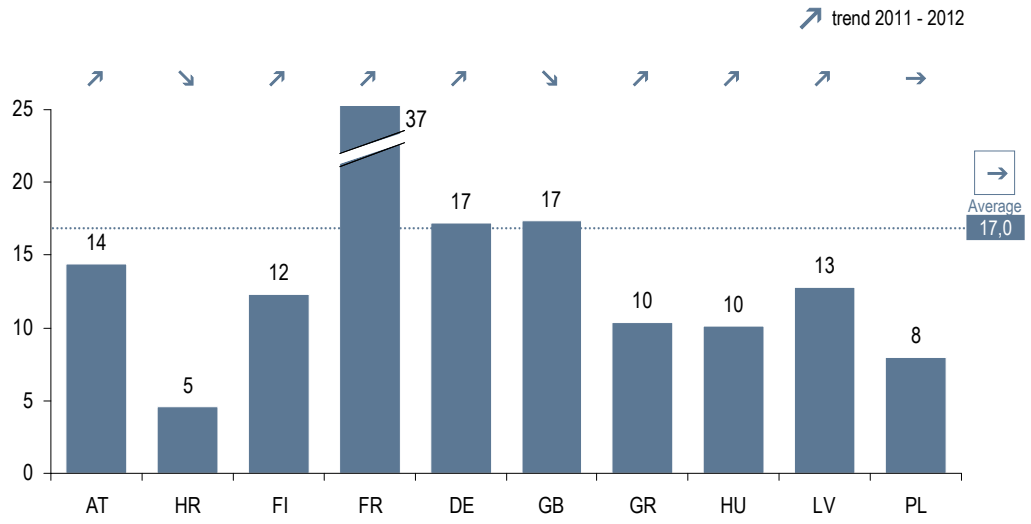
Weighted index; 2010 = 100

Country	2010	2011	2012
HR	100.0	105.2	111.2
GB	100.0	105.0	109.2
SK	100.0	105.3	107.3
DK	100.0	104.8	106.8
DE	100.0	101.2	105.8
AT	100.0	101.6	104.8
Total	**100.0**	**102.3**	**104.6**
SE	100.0	101.9	104.2
FR	100.0	102.7	102.8
FI	100.0	98.1	101.9
NO	100.0	96.3	101.7
HU	100.0	101.6	101.6
PL	100.0	101.4	99.7
LV	100.0	98.9	96.8
SI	100.0	95.1	91.2
MK	100.0	93.9	64.1
GR	100.0	69.3	61.6

43. Figure 13 shows the index of passenger kilometres showing the evolution of the market between the base year 2010 (index = 100) and 2012. Croatia has seen the largest growth of 11.2% since 2010. Over that period, the market for international transport in Croatia has fallen by 9.8% but that has been offset by a 13.1% increase in the national market. Great Britain has grown by 9.2% since 2010 with the largest increases occurring in commuter services in and around London.

Figure 14: Revenue of passenger railway undertakings

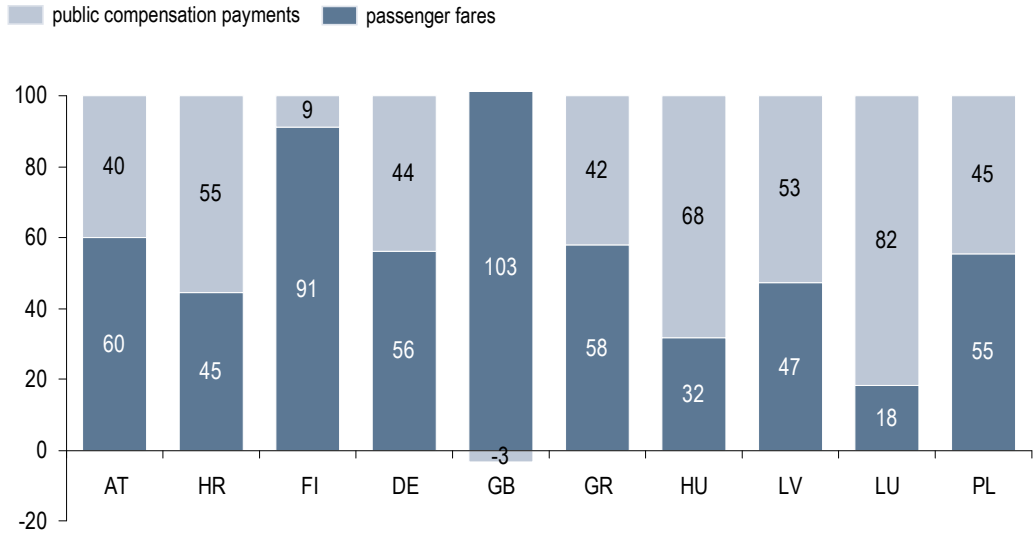
EUR per train km performed by passenger trains, 2012



44. Figure 14 shows the revenue per passenger train kilometre in 2012. Similarly to 2011, France has the highest revenue of €37 per train kilometre, a slight increase since last year. The next highest are Germany and Great Britain with €17 per train kilometre. Great Britain is one of the few countries where revenue per train kilometre has fallen since last year, along with Croatia and Luxembourg, as a result of a drop in the amount of government subsidy paid to the railway undertakings in 2012.

Figure 15: Sources of revenues of passenger railway undertakings

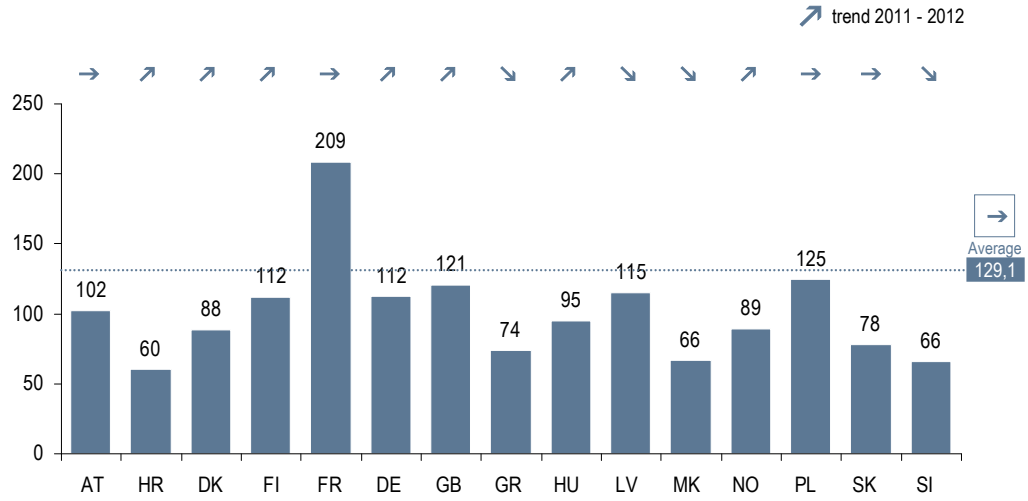
Percentage of total revenues of passenger railway undertakings, 2012



45. In the majority of the countries monitored, passenger fares represent the largest proportion of revenue for railway undertakings. The exceptions to this are Croatia, Hungary, Latvia and Luxembourg. In Great Britain, the negative value for public compensation payments is because the government was in net receipt of money from the railway undertakings.

Figure 16: Train Occupancy rate

Average Number of Passengers per Train, 2012

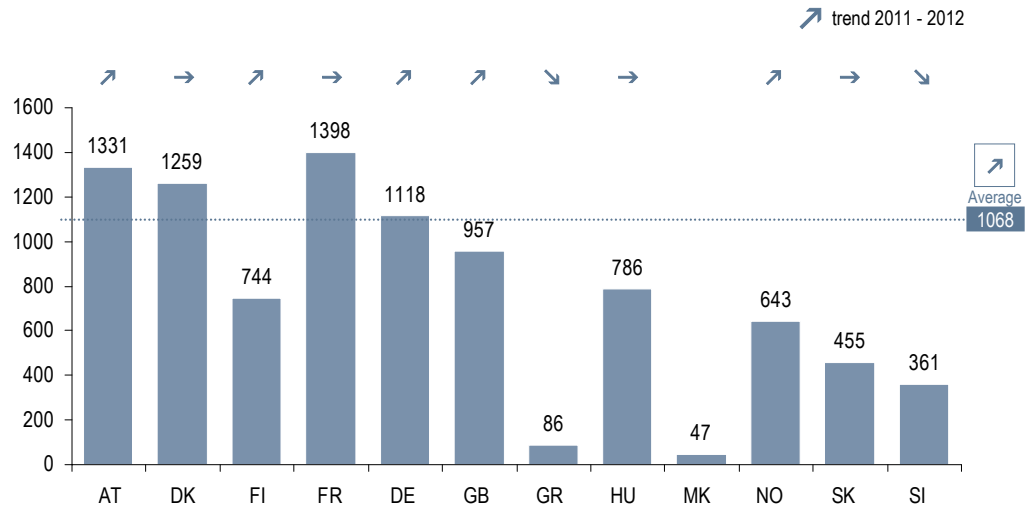


46. The average number of passengers per train in the countries monitored is 129 although this is skewed by France which has the highest number of passengers per train, 209, 67% higher than Poland, which is second in the list. If we exclude France, the average number of passengers per train falls to 112 with Great Britain, Latvia and Poland all in excess of the adjusted average.

47. Compared to 2011, most countries have seen an increase in the number of passengers boarding services. This may be due to a number of factors including some or all of longer trains or more seats being occupied. The largest increase between 2011 and 2012 was in Great Britain which has gone from 108 passengers per train last year to 121 in 2012. Within Great Britain, it was services in and around London that accounted for the largest increase in average passengers per train, possibly as a result of increased patronage during the 2012 London Olympics.

Figure 17: Distance travelled per resident per year

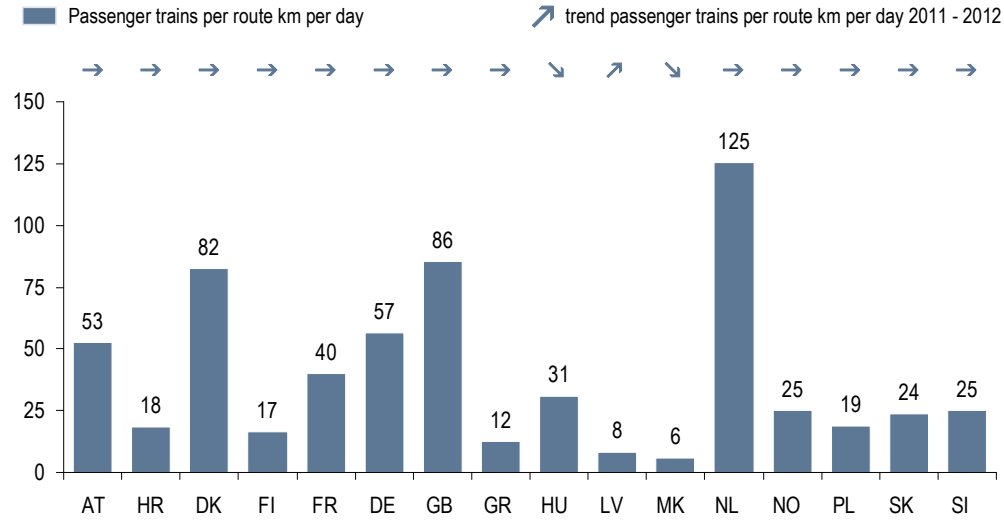
Total passenger kilometres per resident, 2012



48. Figure 17 shows the total number of passenger kilometres travelled in a year per resident. In the majority of countries, the data shows that residents are making more trips by rail and/or travelling longer distances than in previous years. The only country to experience a fall in the total passenger kilometres travelled per resident is Slovenia, falling from 381 passenger kilometres to 361 in 2012. This coincides with a 4.2% fall in national traffic and a 3.2% fall in international traffic.

Figure 18: Passenger network usage intensity

Passenger trains per route km per day, 2012

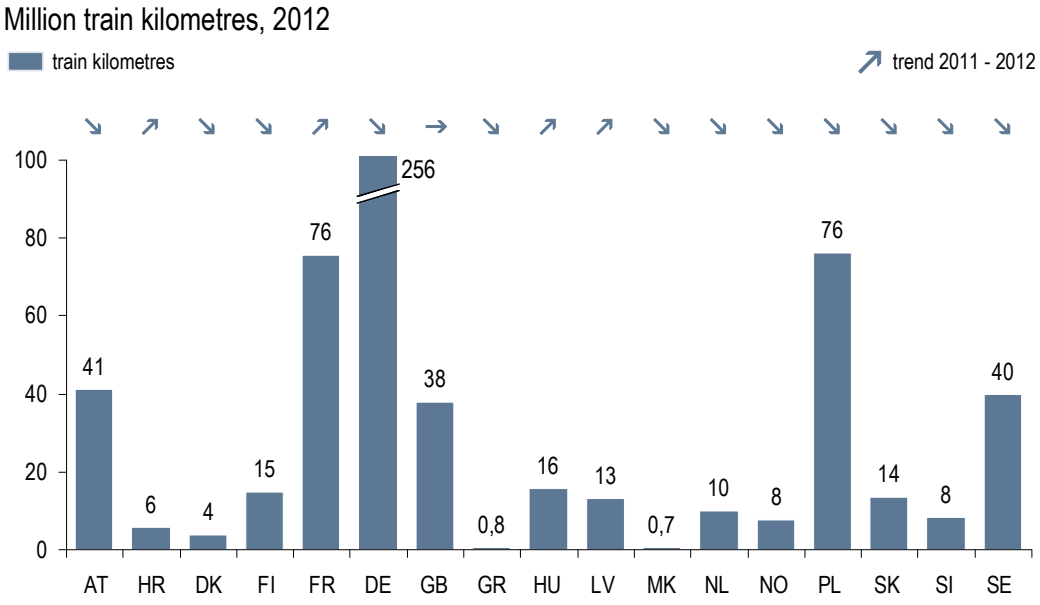


49. The intensity of usage on the network has shown very little change compared to 2011. The Netherlands remains the most used with an average of 125 passenger trains per day on each route kilometre of the network. The two countries with the lowest density of passenger trains are Latvia and Macedonia, which we would expect as their revenue data shows they are more reliant on the freight market.

d) Freight market

50. The section on the freight market analyses the current status and recent development in national freight markets. It also assesses and compares the degree of competition of each national freight market by calculating the market share between incumbent and non-incumbent railway undertakings based on tonne kilometres. In a similar way to the passenger market, other measures have been derived such as average load per train and intensity of freight usage on the network.

Figure 19: Freight train kilometres



51. In most countries freight train kilometres fell between 2011 and 2012 which is mirrored by the development of tonne kilometres (see below). Germany has the highest volume of freight train kilometres with Poland and France sharing second place and Austria, Great Britain and Sweden in the third category. As IRG-Rail has in this year's report data from three different years it is now possible to present the development of tonne kilometres for the period 2010 – 2012.

Figure 20: Freight transport 2010 – 2012

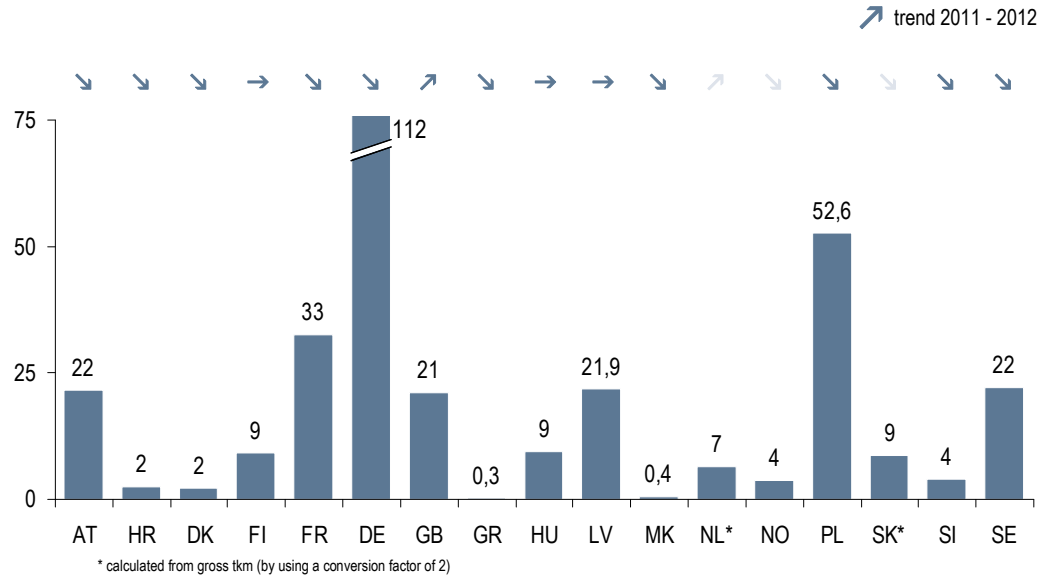
Weighted Index; 2010 = 100

Country	2010	2011	2012
LV	100.0	124.9	127.4
GB	100.0	112.9	115.5
NL	100.0	97.1	109.7
FR	100.0	114.1	108.6
HU	100.0	105.7	107.7
DE	100.0	107.6	104.2
Total	**100.0**	**107.7**	**103.5**
DK	100.0	116.7	101.7
SI	100.0	105.5	98.7
PL	100.0	111.7	98.7
NO	100.0	103.6	97.9
AT	100.0	98.7	95.9
FI	100.0	96.4	95.1
SK	100.0	98.8	95.0
SE	100.0	97.4	93.9
HR	100.0	92.3	88.7
MK	100.0	91.2	80.6
GR	100.0	57.2	45.9

52. The development of rail freight traffic varies widely across the different countries reviewed in 2012. Latvia reports a growth of 27% (2010 – 2012) whilst Croatia and Macedonia report a drop of more than 10%. In total, freight traffic grew by 8% in 2010 - 2011, whilst in 2012 the growth compared to 2010 amounted to just 4%. This is largely due to a 4% decrease of total freight traffic from 2011 to 2012. Interestingly the development of freight traffic in Germany is almost identical to the average of the countries monitored. Germany is clearly one of the key drivers of the market as it contributes around 30% of the total freight transport covered in this report (27% of EU27 total) and has a lot of international traffic with other countries, so this parallel movement is not surprising.

Figure 21: Freight tonne kilometres

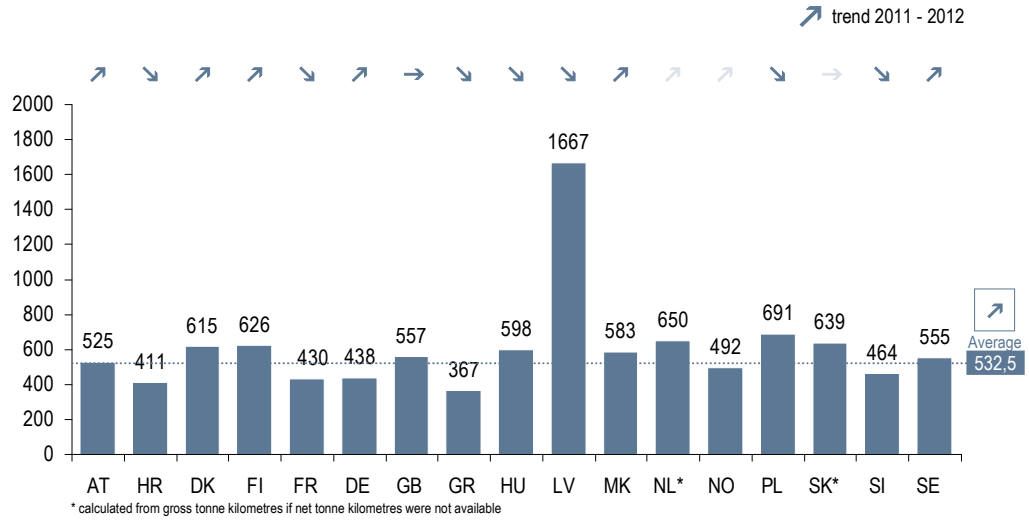
Billion net tonne kilometres in 2012



53. Figure 21 shows the freight tonne kilometres hauled in 2012 in billon net tonne kilometres per monitored country. For countries where the respective data is only available for gross tonne kilometres a conversion to net weight has been used based on a factor of 2[11]. The comparison of all countries monitored shows that Germany has by far the highest figure followed by Poland and France.

Figure 22: Load factor (net weight per freight train)

Average Freight Load per Train (excluding rolling stock weights) in tonnes, 2012

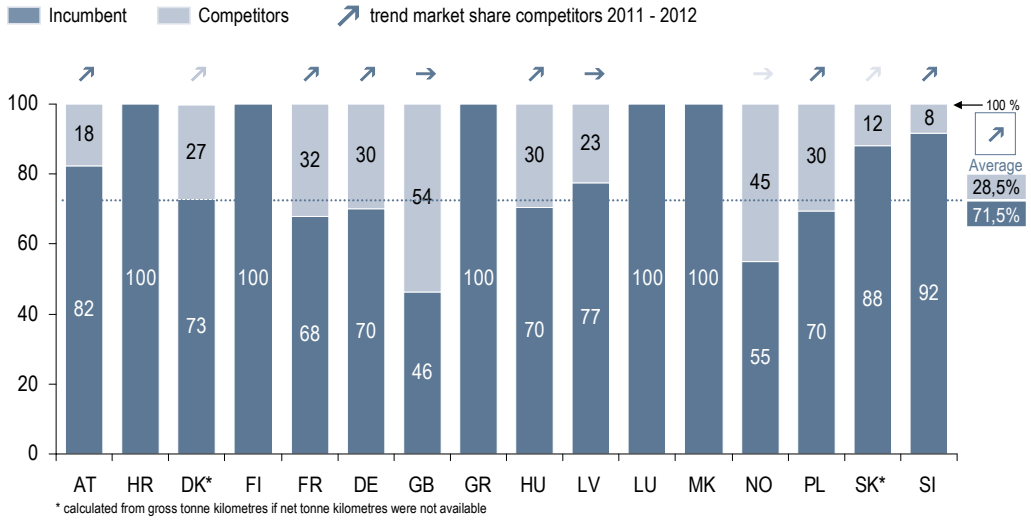


[11] Net tonnes are not available from all countries and so in some cases an estimate has been calculated based on gross tonnes. IRG-Rail uses the following ration: Net tonne kilometres = Gross tonne kilometres / 2.10 Analysis of the net/gross ratio from several data sources reveals that this ratio does not vary a lot so we can estimate net tonnes with some confidence.

54. Figure 22 shows the average net weight per freight train. It is calculated as load factor by dividing the countries' net tonne kilometres (see figure 21) by the total freight train kilometres (see figure 19). This figure does not differ much across the countries monitored with one exception – Latvia. In this country the technical parameters of freight trains are completely different to other countries due to the broad gauge[12]. Second in this ranking is Poland which carries a lot of heavy bulk traffic (coal, ore, oil etc.) This figure also explains why France is equal to Poland in train kilometres but not in tonne kilometres – the trains have a lower load factor.

55. The average load factor has risen by 1% between 2011 – 2012. There are no indications of substantial changes in the structure of commodities carried by rail. Therefore a higher load factor indicates an improvement in the economics of rail freight through transporting greater loads on fewer trains. For example in Austria, freight volume dropped in 2008 as a result of the recession, but the number of freight trains remained almost unchanged, leading to lower load factors. Since then freight volumes have remained relatively stable but railway undertakings have reacted by making trains longer and reducing the number of train kilometres.

Figure 23: Market shares of freight operators

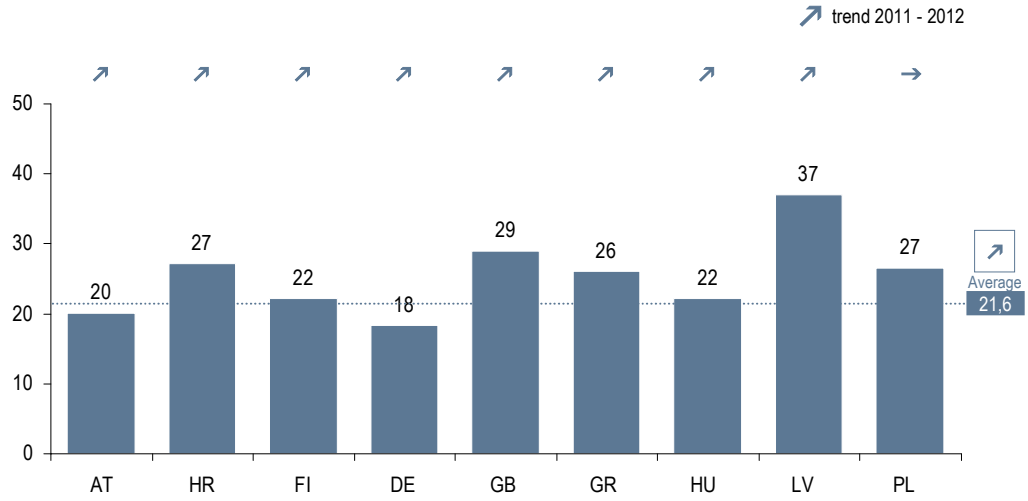


56. Figure 23 shows the market shares of incumbent and non-incumbent freight operators in 2012. The shares of non-incumbent railway undertakings are in general higher compared to those in the passenger market. It seems that the market shares of non-incumbents operators are higher in those countries with early liberalisation of the freight market – for example Great Britain. Market shares of new entrants were either stable or increased in all countries. Furthermore the average market share of new entrants in the countries monitored increased to 28.5%.

[12] Finland which also uses broad gauge has similar train weights as the rest of Europe because of the use of European standards for rolling stock.

Figure 24: Revenue of freight railway undertakings

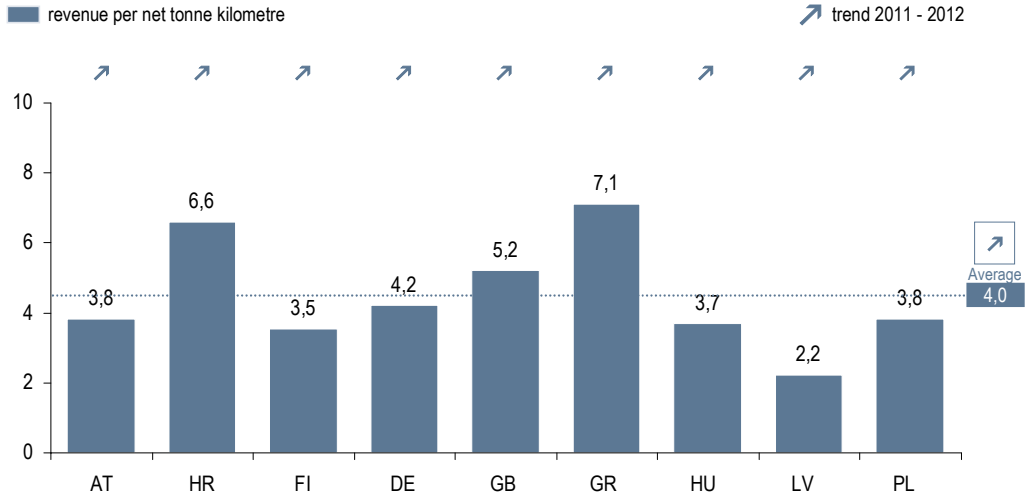
EUR per train km, 2012



57. Despite the overall decline in freight traffic in 2011 – 2012,operators have increased their revenue. While some countries show a moderate rise in revenue around 2% (Greece, Latvia and Poland), in other countries revenues have increased significantly; by 6% in Germany and up to 13% in Austria. Reasons for such increases include higher load factors and other measures to respond to decreasing demand. If more goods are carried per train kilometre due to the higher load factors, the revenue per train kilometre increases. The reason for the high revenue per train kilometre in Latvia is the much higher average weight of trains due to different technical specifications on the broad gauge network. Generally, the average revenue does not vary too much which indicates that revenues are driven by a functioning market.

Figure 25: Revenue of freight railway undertakings

EUR-Cent per net tonne km, 2012



58. As well as the revenue per freight train kilometre the revenue per net tonne kilometre increased in all countries monitored in 2012. The increase in revenue per net tonne kilometre against 2011 is higher compared to revenue per freight train kilometre. The smallest change can be seen in Germany (+2%) but the most significant increases are in Hungary (+14%), Latvia (+11%) and Croatia (+28%). It appears that a reduction in costs, as described above, have led to an increase in revenue per tonne kilometre. The growth in the load factor in the countries monitored compensates for the decline of freight train kilometre in some countries.

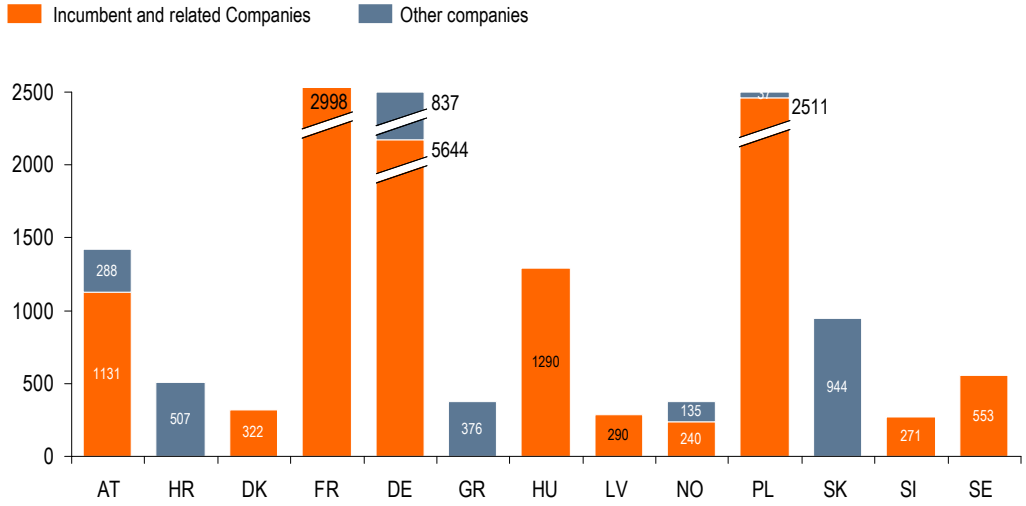
e) Rail-related Services

59. This section of the report presents the findings of IRG-Rail on the monitoring of several rail-related services (RRS); namely passenger stations, freight terminals, marshalling yards, maintenance facilities and refuelling facilities. The indicators for the description of the market in rail-related services were collected in 2012 for the first time. This year's IRG-Rail report focuses on passenger stations.

60. The evaluations of rail-related services are mainly based on three indicators, the number of facilities, the number of operators and the type of operators. Operators are divided into two types: incumbent railway undertakings (or a company which is related to this incumbent railway undertaking) and all other companies. 'Other companies' include incumbent infrastructure managers which are not related to an incumbent railway undertaking. The reasoning behind this classification is that non-discriminatory access to rail-related services is an important issue for the members of IRG-Rail. In particular, incumbent railway undertakings may have strong economic incentives to limit access to services for competitors. Due to limited data from some countries, the focus of the following statements is on the facilities where IRG-Rail has been able to obtain sufficient meaningful and comparable results.

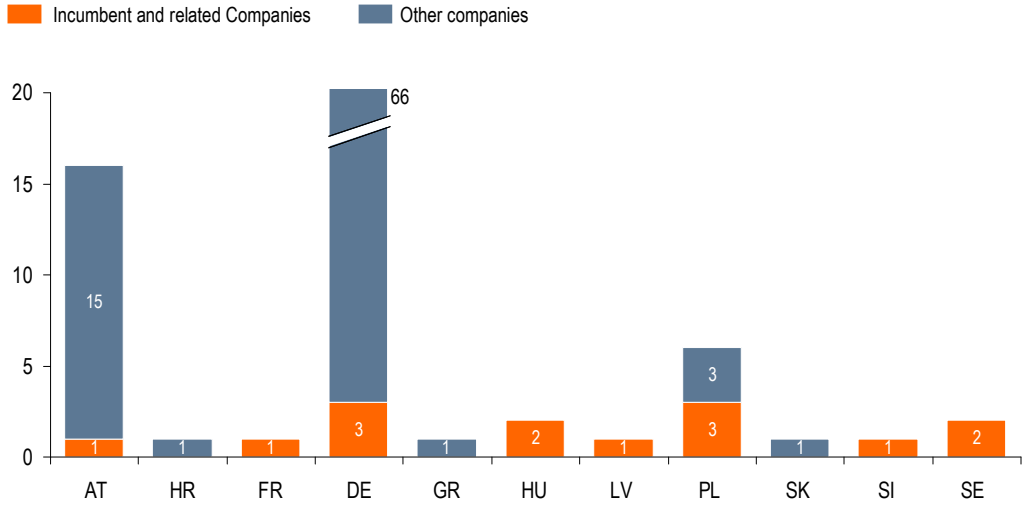
Passenger stations

Figure 26: Number of passenger stations



61. Figure 26 shows that in most countries, stations are almost exclusively operated by the incumbent railway undertakings or related companies. Exceptions are Croatia, Greece and Slovakia.

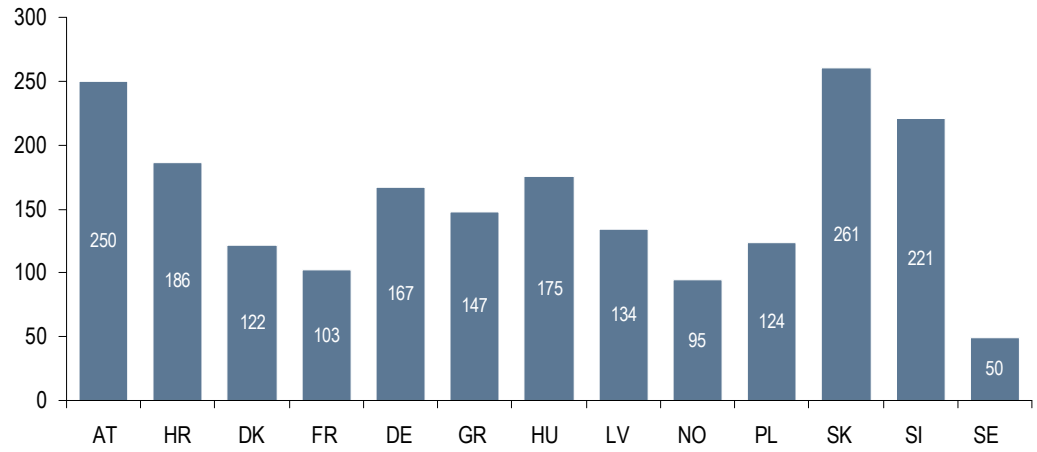
Figure 27: Number of operators for passenger stations



62. Germany and Austria[13] have the largest number of operators of stations. Most countries only have a limited number of station operators. In France, Latvia and Slovenia, there is one incumbent operator which owns all the passenger stations, meaning that competitors depend on this operator for access. In other countries like Austria, Germany and Hungary, a few incumbents operate a large part of the stations. Even in countries with no incumbent operator – Croatia, Greece, Slovakia – railway undertakings might be dependent on the operator. This is due to the fact that stations operators could have a geographic monopoly, meaning that the railway undertaking cannot opt for another station due to its geographical location.

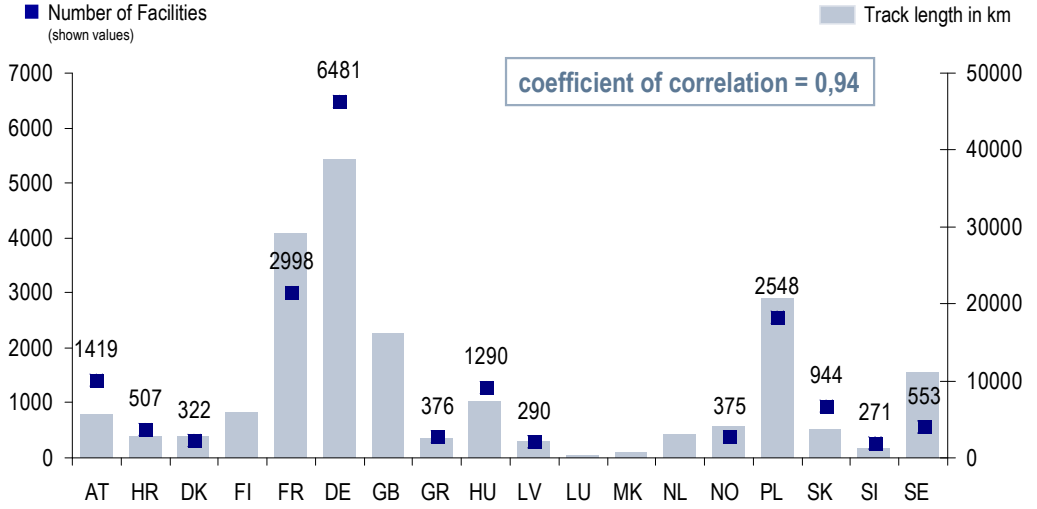
[13] In Austria there are 9 integrated railway undertakings with their own infrastructure and stations. These are not related to the incumbent and therefore listed separately.

Figure 28: Station density in relation to network length
Number of passenger stations per thousand track km , 2012



63. Austria, Slovakia and Slovenia show a relative high station density in relation to network length. A low station density means that the distance between stations is large. One expects to find large distances in countries with a low population density. This could explain the relative low station density in Sweden. Although Norway, a country with similar conditions, has a more average station density.

Figure 29: Correlation between track length and number of passenger stations



64. Figure 29 shows a strong positive correlation between track length and number of passenger stations in relation to network length[14]. A logical explanation is that the longer the network, the more stations are needed. In countries with a low population density one can expect to find relatively few stations. This holds true for Norway and Sweden. Interestingly, France also has relatively few passenger stations, while having a medium population density. This result is also reflected in the next figure.

[14] The correlation coefficient would be 0,92 without Germany.

Figure 30: Station density in relation to population

Number of passenger stations per Mio. residents , 2012

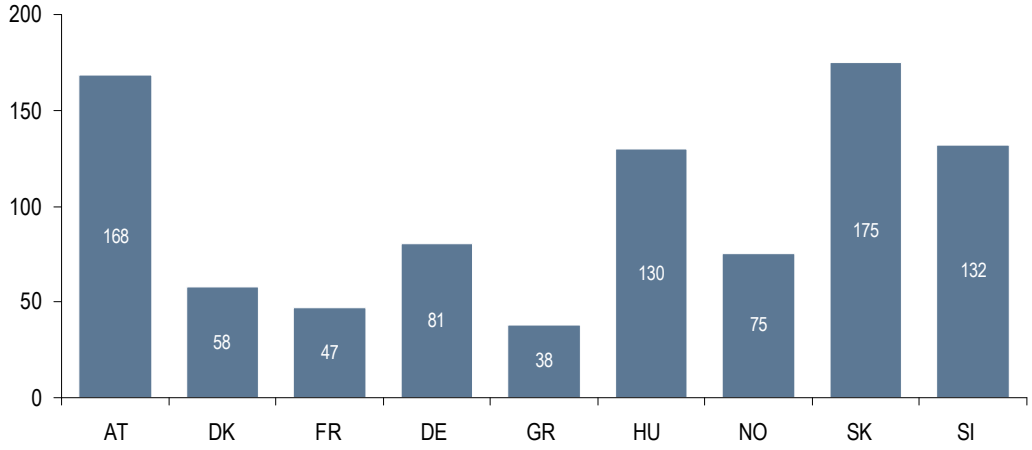
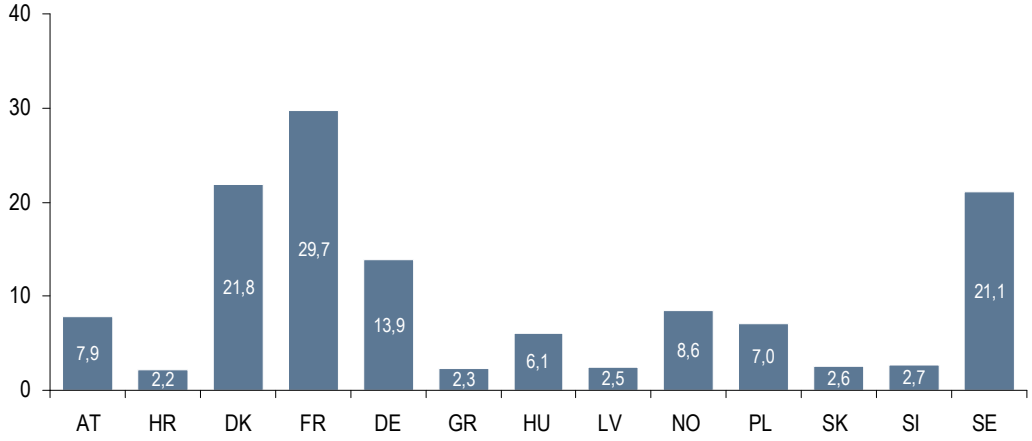


Figure 31: Average million passenger kilometres per passenger station, 2012



65. Austria, Hungary, Slovakia and Slovenia have a relatively high station density in relation to their population. One expects to see a high station density in countries where population is spread over a larger land area. Low station density can be found in France and Greece.

66. Croatia, Greece, Latvia, Slovakia and Slovenia have a relatively low average of passenger kilometres per station. A combination of relatively few passenger kilometres per station and many stations per inhabitant indicates a relatively low use of rail as a transport mode for long distances. Those countries seem to have a good infrastructure for passenger transport (many stations), but few passenger kilometres per station. Austria has relatively many stations per inhabitant and a moderate number of passenger kilometres per station. This could indicate that, in Austria, rail transport is an important mode of passenger transport for relatively short distances.

67. France, Denmark and Sweden have an high average of passenger kilometres per station. For Sweden this is partly explained by the considerable distance between stations as shown on figure 28 (station density in relation to network length). Also in Sweden there is a high level of urbanisation and many passengers travelling between the three large cities of Stockholm, Göteborg and Malmö. France has also a low number of stations per inhabitant. Therefore it might be possible to conclude that rail passenger transport in France is more concentrated around a relatively few stations than in the rest of the reported countries.

Figure 32: Correlation between total passenger train km and number of passenger stations

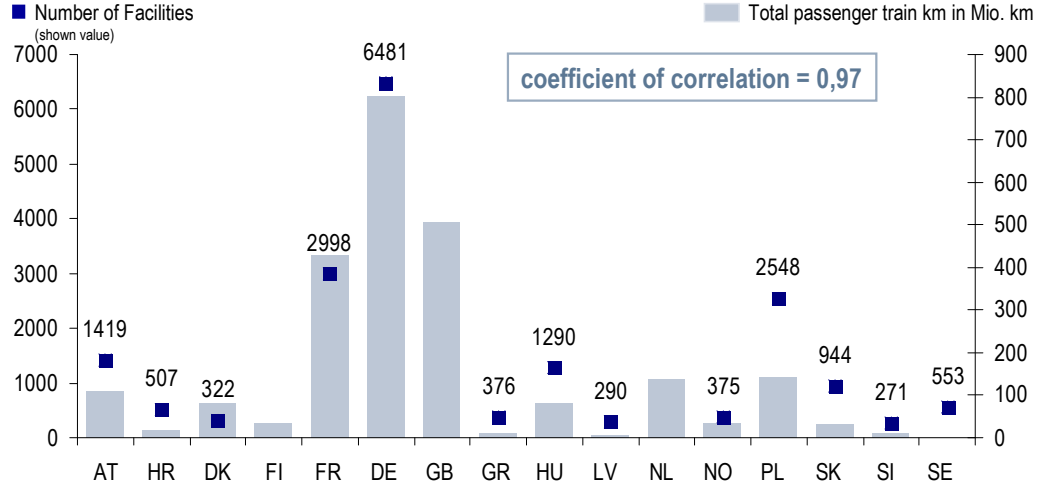
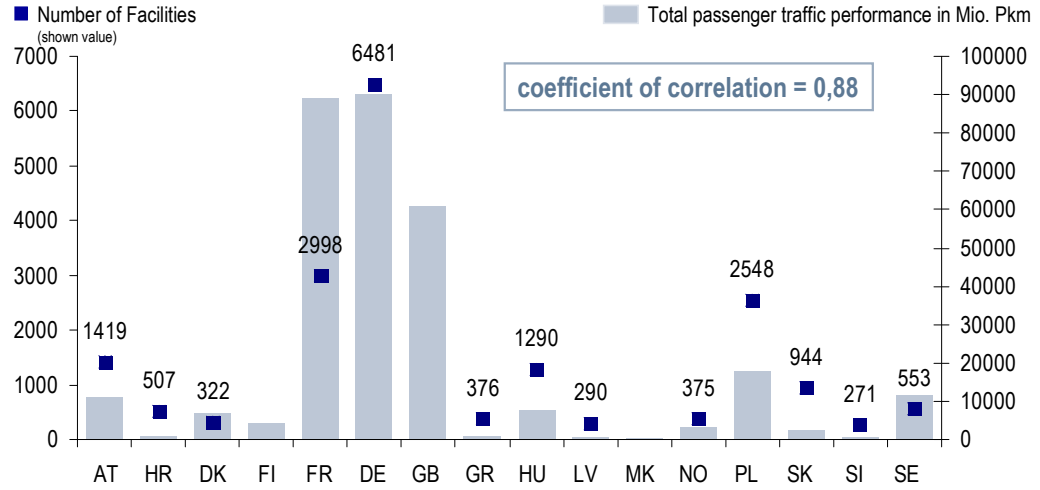


Figure 33: Correlation between total passenger kilometres and passenger stations

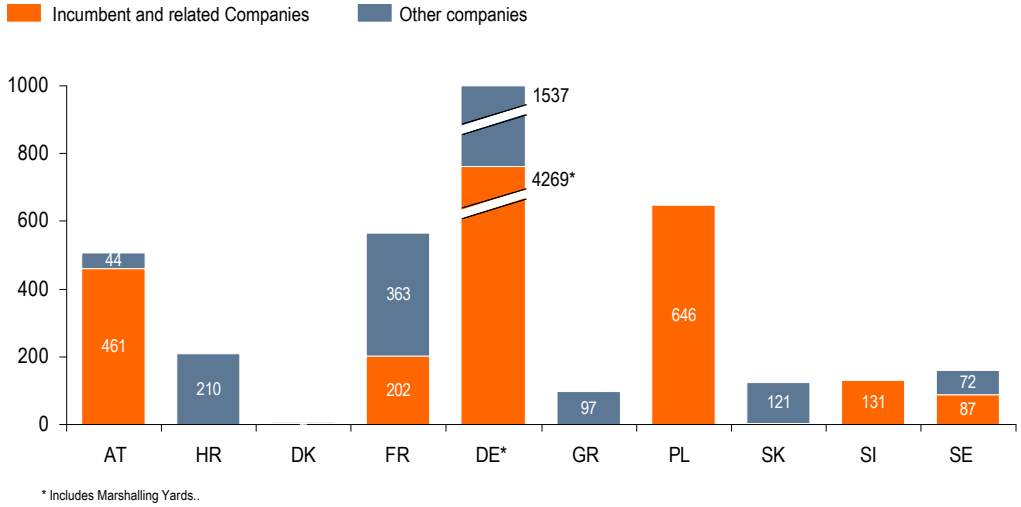


68. The correlation between total passenger train kilometres and the number of passenger stations is lower than that between track length and stations. A possible explanation is that any growth in network length is likely to result in more stations. Growth in passenger kilometres can be driven by more stations but also by increasing capacity at larger stations. Both correlations are strongly influenced by the German data (as Germany shows the highest number of passenger stations). Nevertheless, even by eliminating the German data, the correlation between passenger stations and passenger train kilometres remains high[15].

[15] Excluding Germany, the correlation value between passenger train km and number of passenger stations is 0,87; between passenger kilometres and number of passenger stations 0,80.

Freight Terminals

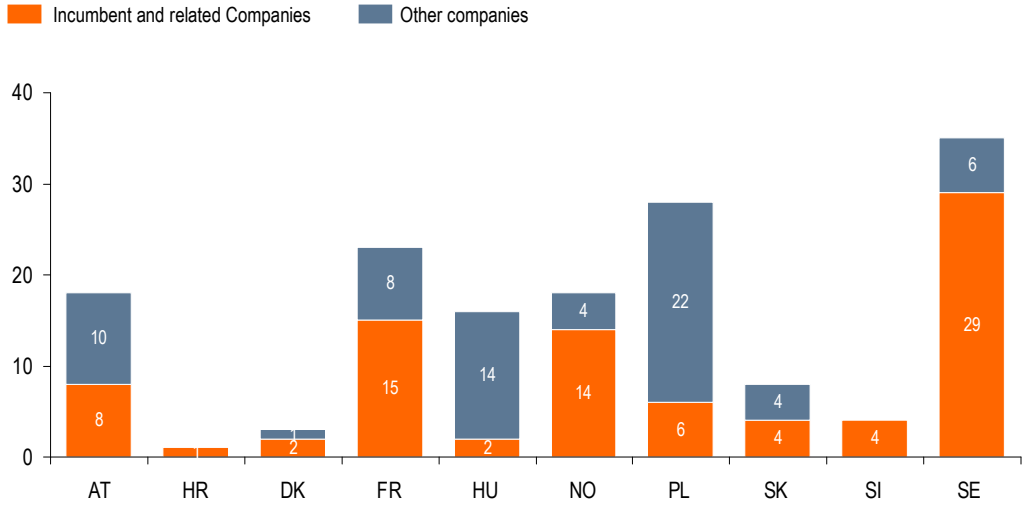
Figure 34: Number of Loading/Unloading facilities



69. It is difficult to compare the number of freight terminals without specifying what freight terminals are and in turn exactly which facilities are considered as freight terminals. Freight terminals can represent loading/unloading facilities at all premises where it is possible to load or unload goods. Their number depends highly on what a country considers a loading/unloading facility. For example, it may be several parts of larger rail yards, or one single large yard. Therefore IRG-Rail prefers to identify intermodal terminals: facilities that are specifically built for loading and unloading to other modes of transport[16].

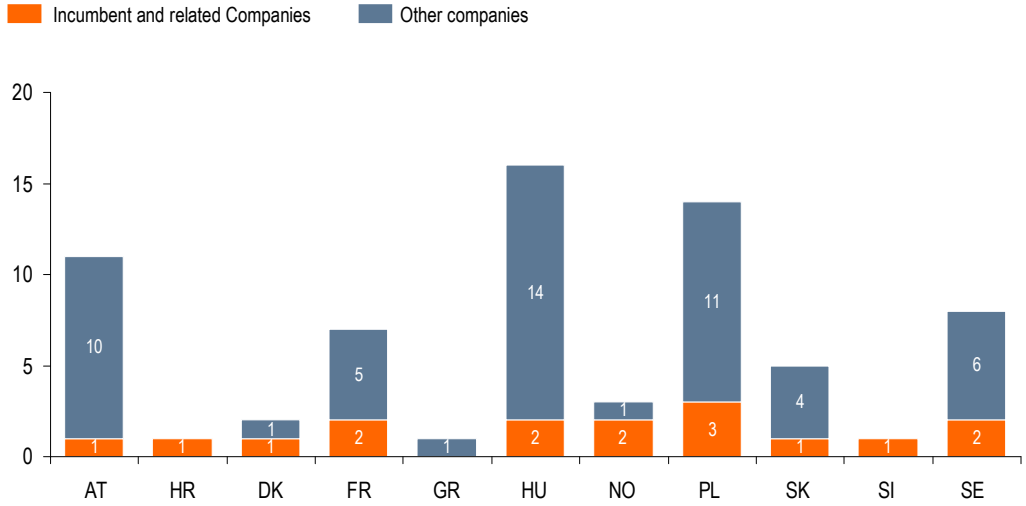
[16] The definition of terminal as used in this monitoring report does not represent a view or interpretation of IRG-Rail and its members for the word 'terminal' as used in European and national law. The definition in this report does not qualify or disqualify any terminal operator under these laws. In any case, the definition used in this report is narrower than what is understood by 'the right of access to terminals and all its services'.

Figure 35: Number of Intermodal Freight Terminals



70. Based only on purpose-built intermodal freight terminals, Sweden and Poland have the highest number of intermodal terminals. Due to relatively little freight traffic in Denmark and Croatia only a few intermodal freight terminals are operated in these countries.

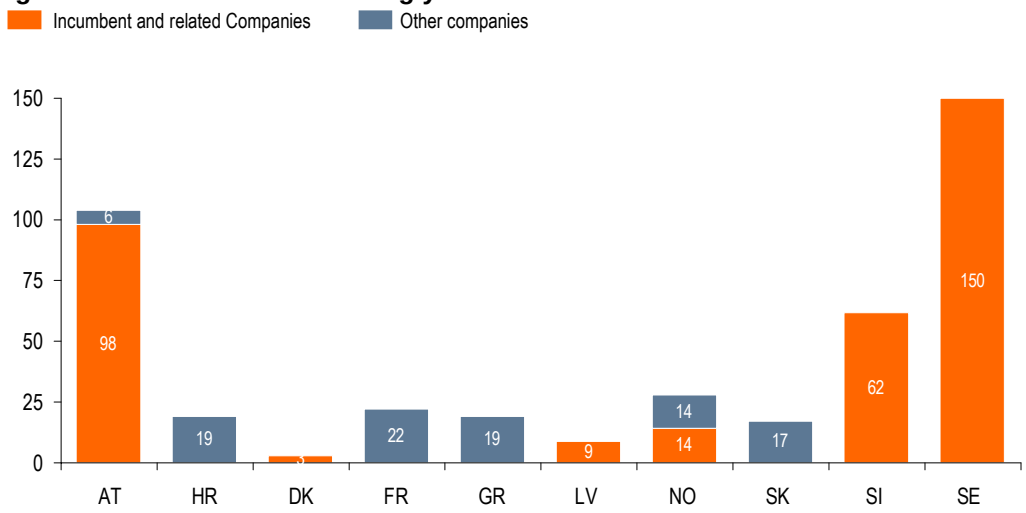
Figure 36: Number of Intermodal Freight Terminal Operators



71. Unlike passenger stations, most intermodal freight terminals are not operated by the incumbent railway undertaking or a related company. Croatia and Slovenia are the only monitored countries where there is just one single incumbent railway undertaking (or related company) which operates intermodal terminals. This means that railway undertakings in most countries can choose between several operators. In practice, the degree of choice is probably limited as the geographical location is an important factor for loading and unloading operations, thus making the market for terminals a regional or even a local market.

Marshalling yards

Figure 37: Number of Marshalling yards

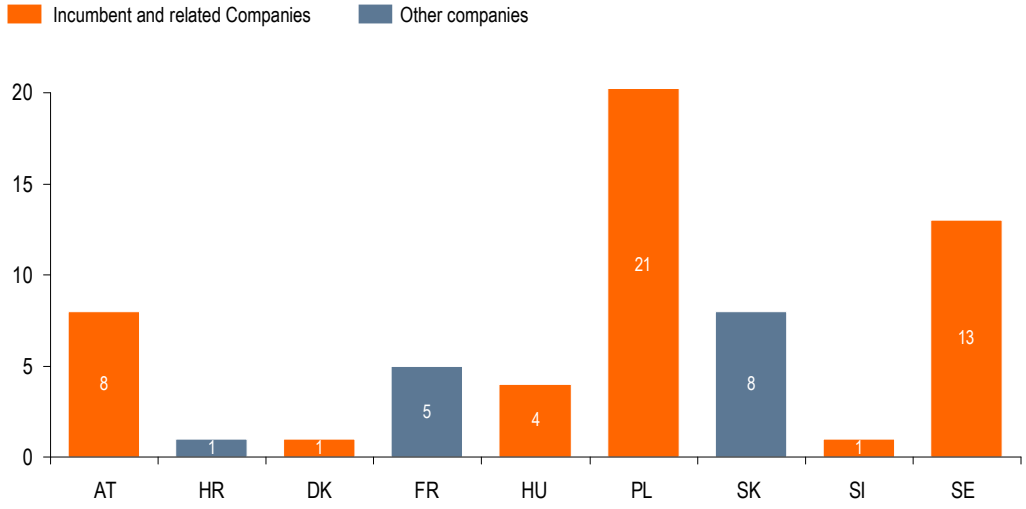


72. It is difficult to attach much meaning to the number of marshalling yards, as some countries count separate parts of the yard, others only complete areas. That partly explains why Germany, which has by far the largest freight market in Europe has 'only 19 yards' and countries with a smaller rail market, like Austria and Sweden have relatively many marshalling yards. For example in Austria, all stations where wagons are added or taken off freight trains on a regular basis with resident shunting staff are classified as marshalling yards. The differences in definitions make it difficult to draw any conclusions.

73. In addition, there could be market-based reasons for the relative high number of yards in Austria and Sweden. For example Austria has an active and substantial single wagon load traffic which requires many facilities where single wagons are added to trains.

74. There is also a wide variation in the ownership structure of marshalling yards. In Austria, Denmark, Slovenia and Sweden they are mostly owned by the incumbent railway undertaking (or a related company). In Croatia, France, Greece and Slovakia the yards are owned exclusively by other companies. For example, in France and Slovakia marshalling yards are owned by the infrastructure manager.

Figure 38: Number of marshalling yards with gravity hill

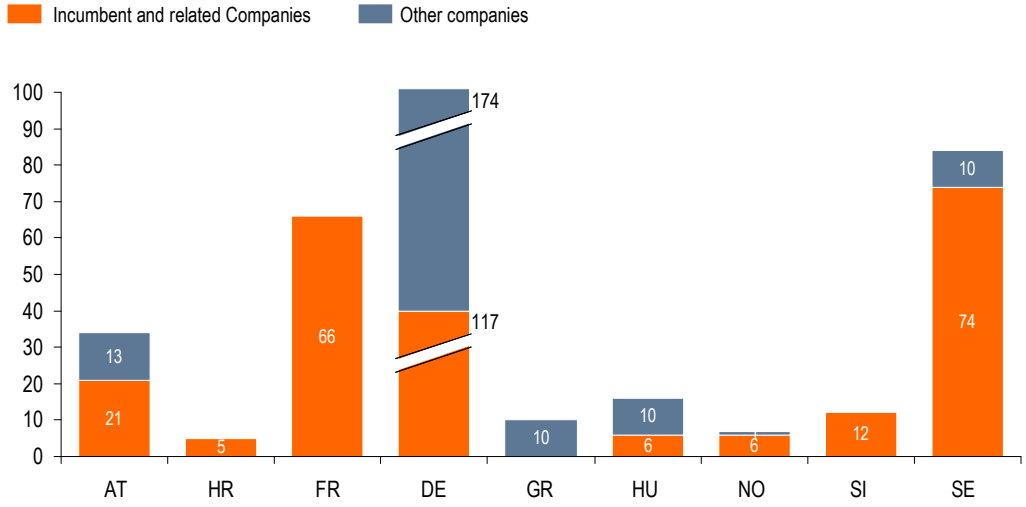


75. To facilitate the comparison of marshalling yards, IRG-Rail has identified the number of marshalling yards with gravity hills[17]. Sweden and especially Poland have the most yards with gravity hills. Regarding the ownership structure for these facilities in the countries monitored, IRG-Rail findings show that they are owned by a single operator. In Austria, Denmark, Hungary, Poland, Slovenia and Sweden the yards are owned by a single incumbent railway undertaking (or related company).

[17] Gravity yards are yards were gravity is used for the formation of trains. For example, an engine pushes a train over a hump. The wagons are uncoupled at the crest of the hump, and roll by gravity onto their destination track.

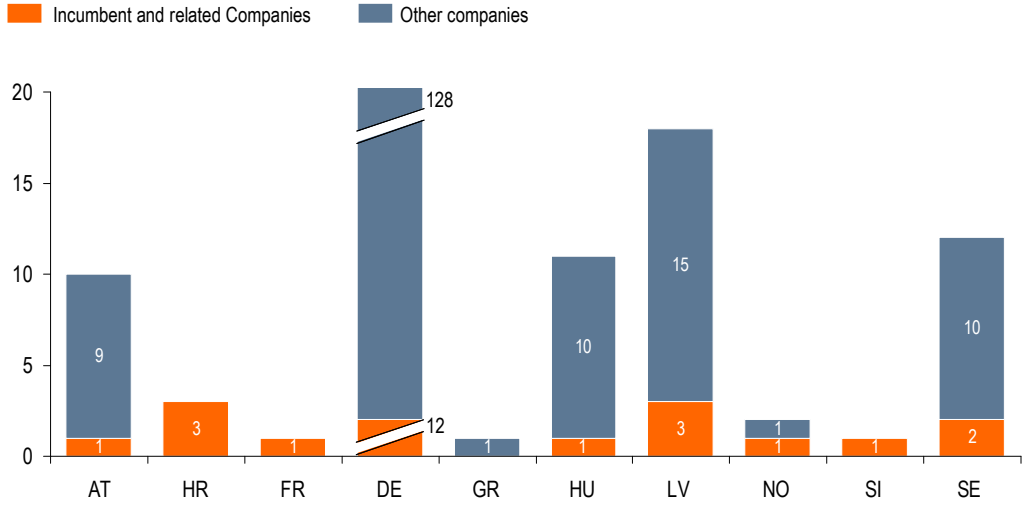
Maintenance facilities

Figure 39: Number of Maintenance facilities



76. IRG-Rail considers that maintenance facilities are those facilities where maintenance of rolling stock is carried out. There are several countries with a large number of maintenance facilities operated by other companies rather than the incumbent railway undertaking. In Greece maintenance facilities are exclusively operated by other companies. In Hungary and Germany, most of these facilities are also operated by other companies. In Austria nearly 40% of the facilities are operated by other companies, whilst other countries show (near) exclusive operations by the incumbent railway undertaking (or related companies).

Figure 40: Number of Maintenance facilities Operators



77. In France and Slovenia, the maintenance facilities are exclusively operated by the incumbent railway undertaking. This implies, that, at a national level, competitors have no other options. In theory, in these countries the risk of anti-competitive behaviour is larger. This risk is mitigated by the fact that under certain circumstances, the market for maintenance facilities is an international market. For example, Swedish railway undertakings operating in Norway do their maintenance in Sweden.

Figure 41: Correlation between total freight train km and number of maintenance facilities

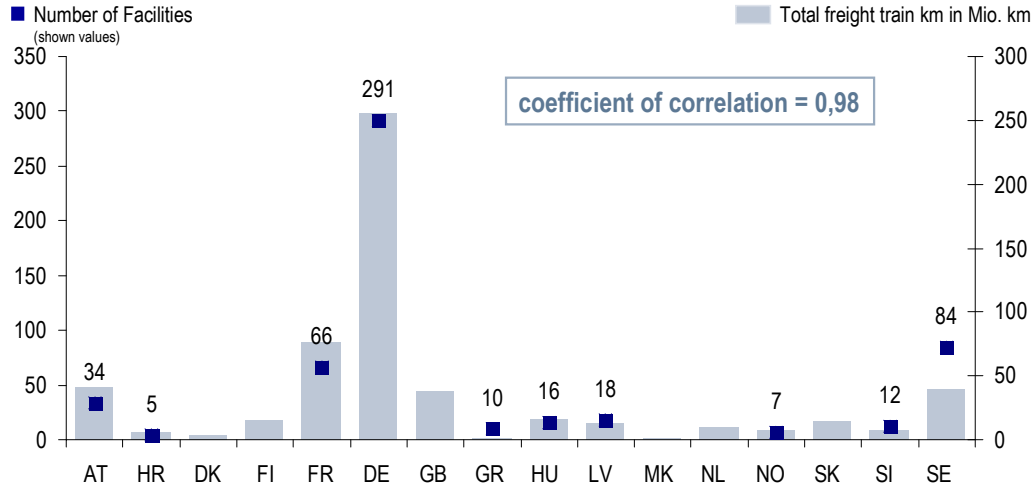
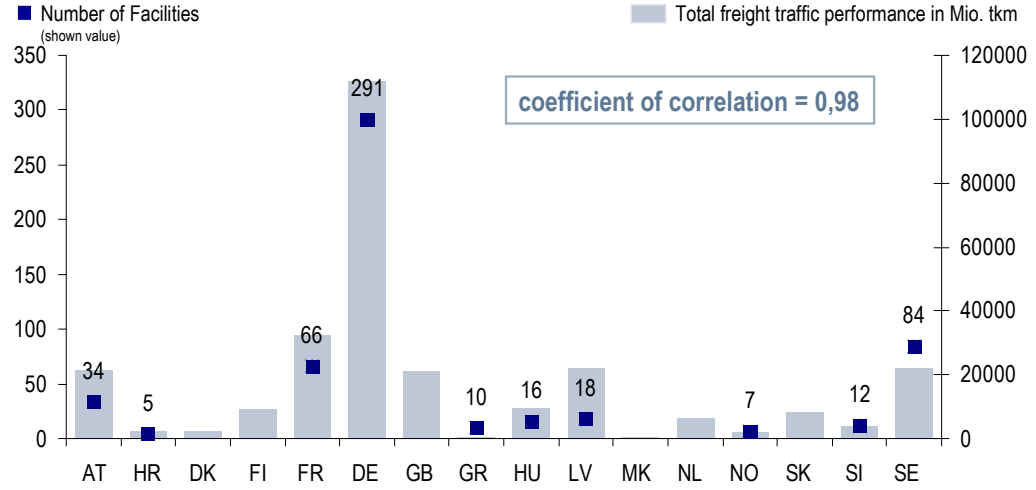


Figure 42: Correlation between total freight tonne km and number of maintenance facilities



78. There appears to be a strong correlation between the number of maintenance facilities and both, train kilometres and freight tonne kilometres. Apparently, the more train kilometres or the heavier the load, the larger the demand for maintenance of rolling stock, resulting in more maintenance facilties. Interestingly, this indicates that not the scale, but the number of facilities grows. This might be due to several reasons such as: limited economies of scale, limited space to enlarge facilities, or preference of railway undertakings to have their own inhouse facility. Sweden shows a relative high maintenance density with respect to freight ton kilometres. Even when eliminating the high German values, the correlations coefficient remains high[18].

[18] Excluding Germany, the correlation value between freight train km and number of maintenance facilities is 0,83; between freight tonne kilometres and number of maintenance facilities 0,79.

Refuelling Facilities

Figure 43: Number of refuelling facilities

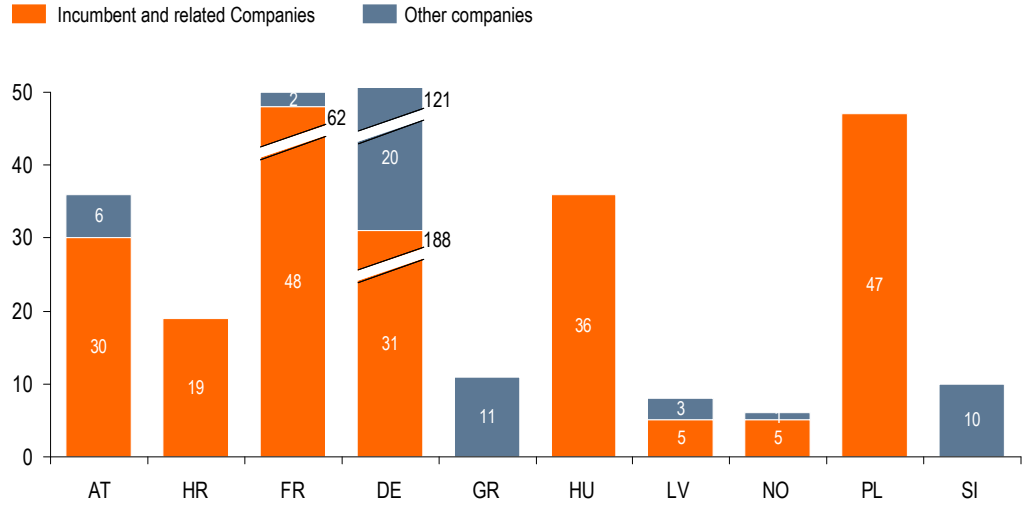
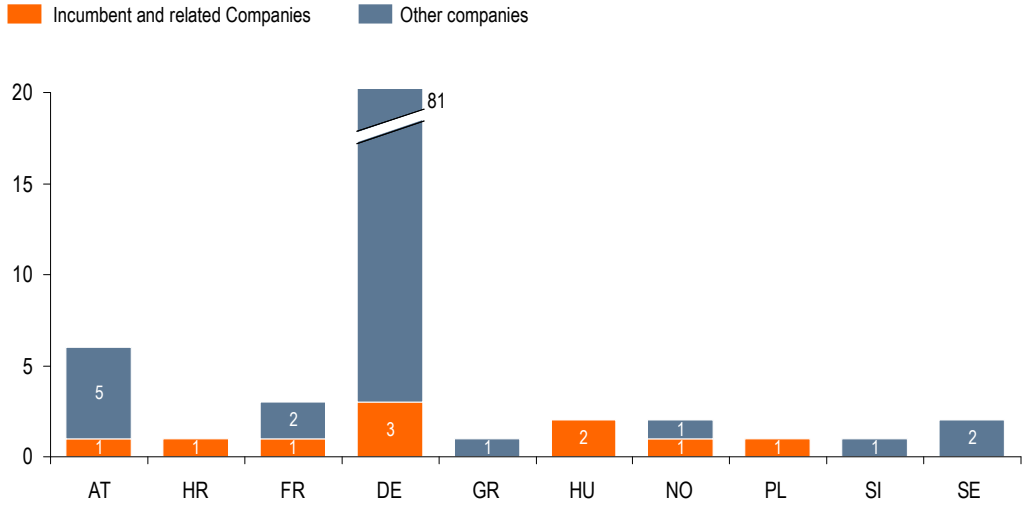
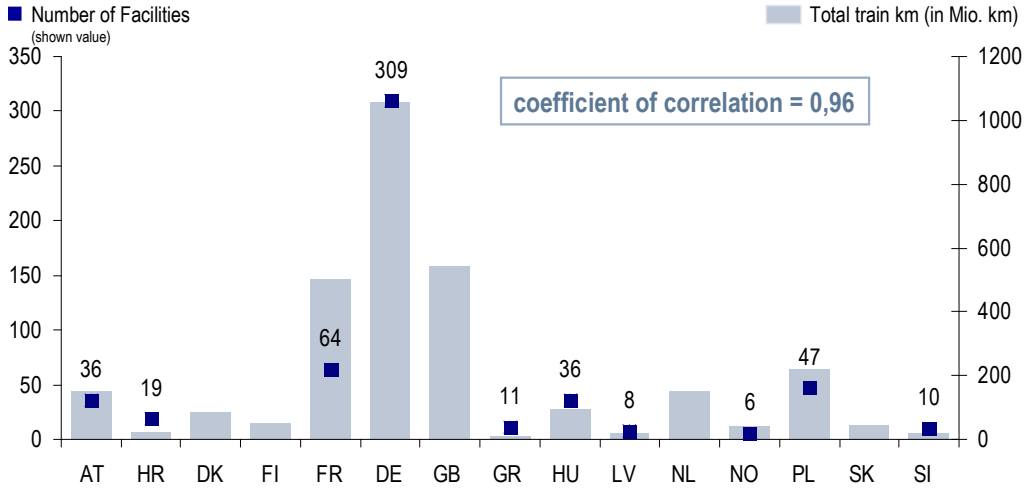


Figure 44: Number of operators of refuelling facilities



79. In most countries monitored, refuelling facilities are almost exclusively operated by the incumbent railway undertaking or a related company. The exceptions to this are Germany, Greece and Slovenia. In Germany almost 40% of the facilities are operated by other companies and facilities in Greece and Slovenia are exclusively operated by other companies. Although there are 5 other operators in Austria, more than 80% of the Austrian refuelling facilities are operated by the incumbent. Railway undertakings can use alternative facilities in neighbouring countries, or, if allowed, they can use 'on the track' refuelling.

Figure 45: Correlation between total train kilometres and number of refuelling facilities



80. The correlation between total train kilometres and the number of refuelling facilities is high, indicating that there is a strong relationship between traffic volume and facilities. Croatia, Greece, Hungary and Slovenia show a relative high 'refuelling density' (number of refuelling facilities per train kilometre). Poland and especially France, show a relative low refuelling density.