

ANNEX 5

CASE STUDY GERMANY

CASE STUDY – GERMANY

1. Scope

There are a multitude of passenger and freight RUs in Germany, as well as numerous IMs, and even network owners. However, the railway system is dominated by the incumbent Deutsche Bahn AG (DB AG). DB AG is essentially the former Deutsche Bundesbahn transformed from a public corporation to a limited company with all the shares held by the Federal Government. Dominance of DB AG is particularly strong in infrastructure and long-distance rail passenger services (LRPS).

As far as infrastructure is concerned, this report will focus on DB AG and ignore other small companies that also provide some infrastructure services. Moreover, the term “infrastructure” herein usually refers to the provision of railway network, passenger stations, and the management of traction current. A reference to other infrastructure or related services (e.g. workshops and fuel provision) is only intended if made explicitly.

Rail transport in Germany is usually differentiated into three main market segments:

- regional passenger services (RRPS);
- LRPS; and
- freight.

This Case Study will deal with the first two of these main market segments, while freight will be mentioned only occasionally, where relevant to the Study.

2. Regulatory Structure

2.1. Overview of current regulatory structure

As a result of restructuring in 2008, DB AG has been divided into two holdings as follows:

- **DB AG, main and infrastructure holding company;** which owns 100% of the following subsidiaries:
 - DB Netz AG which runs the railway network;
 - DB Station&Service AG which runs the passenger stations;
 - DB Energie GmbH which manages traction current;
 - Other miscellaneous infrastructure or related companies;
- **DB Mobility Logistics AG (DB ML);** which owns 100% of the following subsidiaries:
 - DB Regio AG, the regional passenger RU
 - DB Fern AG, the long-distance passenger RU;
 - DB Schenker Rail Deutschland AG, the freight RU;
 - DB Stadtverkehr GmbH the regional bus services operator;
 - Schenker Logistics GmbH which provides logistics services;
 - Other miscellaneous companies.

Thus, the German railway system is vertically integrated. Note that DB AG is a “natural” monopolist in infrastructure, as well as practically a monopolist in receiving financial support from the federal government for its infrastructure. It is the dominant firm in all three railway market segments as well as in regional bus services, and it is one of the big players in the German (and worldwide) logistics markets.

At the same time, Germany adopted an open access regime in every market segment (RRPS, LRPS, and freight). The RRPS market, however, has in fact become a franchise market due to the large amounts of state aid for this segment, since – with few exceptions - it is simply not viable for a non-subsidised company to compete with publicly financed services. Hence, in this Case Study, it is necessary to treat the RRPS and LRPS markets separately.

Two regulatory bodies are responsible for the railway system on the federal level. The Eisenbahnbundesamt (EBA) is responsible for setting up and monitoring all technical and safety regulations. While the Bundesnetzagentur (BNetzA) is responsible for the regulation of non-discriminatory access to infrastructure and of the access charges. In addition there are regulatory bodies on the level of the federal states that are responsible for technical and safety regulation of regional RUs and RUs that do not need a safety assurance - several states have delegated this responsibility to the EBA.

2.2. History & evolution of regulatory structure

2.2.1 Pre reform

In the 1980s, the crisis of the West German rail industry was as visible as those in many other European states. The debt burden was soaring, while market share and quality deteriorated. In 1990, problems were aggravated by the fact that the West German public utility Deutsche Bundesbahn was fused with its East German counterpart, Deutsche Reichsbahn (DR), which had even greater problems.

2.2.2 The railway reform of 1994-1999

The railway reform of 1994 was intended to be, and indeed turned out to be, a major step towards creating a viable system. The existing debt burden and the burden arising from existing pension obligations were taken over by the government. Deutsche Bundesbahn was transformed into DB AG, a joint stock corporation held by the government (formal privatisation). In two subsequent steps of the reform, first, a Regionalisation Fund was created in 1996, which gives substantial sums of money to the Federal States to procure regional passenger services. Moreover, in 1999 several branches of DB were created as subsidiary joint stock companies (DB Netz AG, DB Station&Service AG, DB Regio AG, DB Fernverkehr AG, and Railion (now DB Schenker Rail Deutschland AG). The Federal Railway Agency, the EBA was formed as a body independent from DB AG, but answerable to the Ministry of Transport (MoT). Finally, an open access regime was instituted in every market segment (RRPS, LPRS, and freight), long before being required by any EU legislation (which in case only applied in the freight sector). The 1994 reform was accompanied by an amendment to the German Constitutional Law (Grundgesetz Art. 87e) stating the following:

- DB AG must be formally privatised.
- At the same time, a material privatisation of the *infrastructure companies* of DB AG was ruled out, unless specific legislative consent is obtained from both Houses of Parliament (i.e. Bundestag, Lower House of German Parliament, and the Bundesrat, Federal Council of the Federal States). Even if this consent were to be obtained, Constitutional Law dictates that the Federal Government must always hold more than 50% of the infrastructure companies. Shares in the *transport companies* of DB AG, by contrast, may be sold in the market at any time without any fresh legislation.
- The Federal Government has a general duty of care for the national rail infrastructure and traffic (except regional). Although not quantified or described in detail, this duty in the Constitutional Law is the basis of the government financing of infrastructure investment.

It should be noted that Constitutional Law can only be changed by a two-thirds majority in both Houses of Parliament.

Although the Federal Government owns DB AG, and thus the infrastructure, the Federal States are also major players in German railway politics and have a profound interest in the development of the railway system. Their political weight draws mainly on two sources: firstly, any change in railway legislation needs the consent of the Bundesrat; and secondly, with the Regionalisation Fund, large sums of money to support regional passenger services are channelled through the Federal States, who in turn grant them to the RUs. Moreover,

parts of the infrastructure grants that are given by the Federal Government to DB AG are earmarked for the benefit of regional traffic.

2.2.3 Achievements since the railway reform of 1994-1999

It is widely recognised that the German Federal States used their political power in the railway reform of 1994 to boost the amount of money given to the Regionalisation Fund.

It is generally acknowledged that DB AG developed much better after the reform than it would have done without the reform; although this is, of course, difficult to validate and quantify. One indicator of improved profitability is the reduction in headcount: In total Deutsche Bundesbahn¹ had a total of 263,000 employees in 1990, and together, Deutsche Bundesbahn and DR had 461,000 employees in 1991. In 1994, when both railways were merged and transformed into DB AG, the newly formed company had 337,000 employees. By 2005, DB AG had about 220,000 employees in the rail related businesses, since then the number has been further reduced, but the acquisition of logistics interests has pushed the total headcount for the group up: to about 240,000 staff in 2008. Profitability has increased strongly, turning round from permanent deficits to consistent profits from 2004 onward². Naturally however, the basis of railway profitability is the constant subsidisation of the railway system at a level of about 10 billion euro annually by the state (infrastructure subsidies plus Regionalisation Funds and other). Notwithstanding this, DB AG was still in deficit until 2004.

To achieve profitability, DB AG launched a series of cost-cutting campaigns including modernisation of assets and processes. In addition the general environment became more favourable to the railways. In freight, although lorry productivity has increased in recent decades, the international process of globalisation increased the competitive advantage of freight railways, since long-distance movement of large numbers of containers from North Germany ports to the industrial centres in the South are particularly suited to rail. In the passenger market, restrictive policies towards cars in inner-city centres favour the use of regional passenger trains (as do the Regionalisation Funds from the supply side), and the heavy investment in high-speed rail favours the use of long-distance trains (although competition from low-cost airlines is a negative factor).

The debt borne by DB AG has risen drastically in the years 1994-2005 (net financial debt in 2005: 19.7 billion Euro), since then, debt has been reduced significantly (net financial debt in 2008: 15.9 billion euro, including 3.5 billion euro interest-free public loans)³. But this is mainly due to the logistics acquisitions implying that the debt is backed by much more profitable assets than it was before the reform (unless the current crisis leads to a permanent downturn of the logistics trade). However, critics also point to investment backlogs and a deterioration of the infrastructure due to inadequate maintenance and replacement. Since adequate data is not available, it is impossible to assess the magnitude of these potentially grave problems.

The dominant position of DB AG in all market segments has continued to the present. In 2008, DB AG's share of the German rail market (passenger-km resp. train-km) was 89.8% in RRPS, 99% in LRPS, and 79% in rail freight (DB AG, Competition Report, 2009). The

¹ For the following data see DIW, 2009, p. 52.

² See DB AG, 2009a, p. 28 et seq.

³ See DB AG, 2009b, p. 91; Mai, 2002, p. 2. However, this is still less than before the reform: 1990: 23.1 billion EUR.

increased market share held by competitors in rail freight corresponds to overall growth of rail freight. Thus, competitors have helped to keep up railway productivity and modal share in freight. In LPRS, in contrast, DB initially cut services in order to increase profitability. The reduction was not offset by entry of competitors, so that rail's market share fell initially and has only started to rise again recently. In RRPS, rail's modal share developed well due to the Regionalisation Funds. Competitors have steadily increased their market share.

2.2.4 The railway reforms of 2006 - today and near future

Since market opening, competitors have raised accusations of price and non-price discriminating practices by the overpowering incumbent. It took more than ten years after the reform for the German economic regulatory agency BNetzA to be put in charge for the railway system, in 2006. BNetzA was placed in charge of supervising non-discriminatory practices in the railway industry and to control infrastructure charges. From the point of view of competitors, problems of discriminatory behaviour have reduced since, but they claim that regulator's rights to intervene, or even to get the information it needs, are still quite limited. Additionally, the possibilities to control access charges are currently quite restricted (see 2.3). However; this may change in near future since the new government elected in 2009 appears to be committed to strengthening the regulator's position and defining the judicial basis for regulation.

The reform of 1994 was intended to lead to some form of privatisation of DB AG or parts of it in future. After 2002, the privatisation issue gained momentum, particularly since DB AG itself strove for it. The highly controversial political debate centred on the question of whether the infrastructure manager should be part of the (partly) privatised company.⁴ It was understood that an integrated privatisation would mean that the integrated model was prolonged for decades to come, while at the same time the majority of DB's RUs and logistics companies were to remain in the hands of the government (since the German constitutional law requires that a majority share of the DB infrastructure manager has to remain with the Federal Government). This is precisely why it was supported by the railway unions for a long time. Politicians, particularly of the then ruling party SPD, were caught between the prospect of creating job stability and a "European Champion" on the one hand, and the threat of "giving away the infrastructure" to a "profit maximising monopolist" on the other hand.

A privatisation law for integrated privatisation was drafted in 2007, supported by government but however lost political support the same year. After that, political parties agreed on the so-called holding model which was set up in 2008. DB AG is now divided into an infrastructure holding company (DB AG) and a mobility and logistics holding company (DB ML) (see section 1.1.2.1). At the moment, DB ML is owned 100% by DB AG, which in turn is owned 100% by the state. Thus, the integrated system is still in place, it is also backed by "dominating" contracts such as Control Agreements (*Beherrschungs- und Gewinnabführungsvertrag*)⁵. However, as soon as capital markets will allow, up to 25% of the shares of DB ML will be sold to the public and the Control Agreements will be cancelled. This might be seen as a step towards vertical separation in the long run.

⁴ See particularly Booz Allen Hamilton et al., 2006.

⁵ German corporate law allows a so-called Control Agreement ("Beherrschungsvertrag") between a controlling (i.e. dominating) company and a company under control (i.e. owned company). The contract allows the controlling party to interfere directly with the business of the company under control.

As another step towards privatisation (in an integrated form), a firm contractual basis for government support for the infrastructure was deemed to be needed. This led to negotiations between the MoT and DB AG about a “multi-annual contract for rail infrastructure quality” (*LuFV: Leistungs- und Finanzierungsvereinbarung*) in which the state guarantees to pay 2.5 billion euro per year (before inflation adjustment) to the DB infrastructure companies, while these companies promise to raise complementary financing and to maintain the infrastructure. After controversial discussion of several drafts of the LuFV, the first LuFV was agreed on (and adopted by Parliament, although this was not legally required) by the end of 2008 and came into effect at the beginning of 2009 for five years.

While the institutional step of setting up such a long-term contract was approved by all sides, the contract itself was also criticised. The critics regarded the quality indicators, the contractual sanctions, as well as the control system (which relied on the subservient EBA taking initiatives) to be insufficient⁶.

In 2007, whilst integrated privatisation was still in prospect, the Federal Transport Minister made one concession to the critics of this organisational form by promising to strengthen the position of the regulator BNetzA. Thus, BNetzA was asked in the summer 2007 to develop a plan to reform the regulatory system. BNetzA then proposed an incentive regulation with improved access to information. However, with the political move away from integrated privatisation and towards the holding model, the political need for regulatory reform was no longer thought to be first on the agenda. However, this issue was only in effect postponed, and the new government elected in 2009 has already made it clear that it will pursue the concept of an incentive regulation.

Thus, the period starting in 2006 can be regarded as a being a period of intense organisational and regulatory reform in the German railway system. It is likely that this will last for some time to come. Most of the reforms were initially spurred by DB AG’s drive for an integrated privatisation, but they may lead to quite different outcomes. Reforms were also spurred by the EU’s railway packages and related policies and by attempts to reconcile integrated privatisation with them. With the economic regulation, the long-term LuFV-contract, and the partition of DB into two separate holdings, all the elements to form a new organisational and regulatory structure for German railways are present. At the same time, these elements are still weak compared to the integrated forces of DB AG. Reforms will be necessary in future to strengthen the regulatory set-up.

2.3. Role of Regulator

As described above, the first regulatory agency was the EBA, set up in the reform of 1994. The EBA is responsible for monitoring all technical and safety regulations. Moreover, EBA is also regarded as the state’s agency vis-à-vis DB AG. It supervises DB AG’s stewardship of the infrastructure and monitors the use of infrastructure financing given to it. For example, before the setup of the LuFV-contract, the EBA had to approve on every single re-investment carried out by DB and financed by the Federal Government.

In 2006, when BNetzA was made responsible for the regulation of non-discriminatory access to infrastructure and of observing fair and equal access charges, staff were taken from the EBA and other departments of BNetzA. Preceding this decision were discussions whether this task should be given to the EBA or whether two separate institutions should deal with the

⁶ See Mitusch, Beckers & Brenck, 2008

railways. In the end, BNetzA was chosen for its enhanced independence of the government. Whereas EBA is a sub-agency of the MoT and subject to its directions, BNetzA has been set up as an independent agency, responsible for national regulation of most network industries (telecommunications, post, electrical power, gas, and railways). This is likely to strengthen its independence with respect to politics, the public, and companies from any particular sector.⁷ At the same time it ensures that general principles of regulation are applied in a more consistent manner in all sectors.

However, the responsibility for monitoring the independence of the IM's track allocation department from the central management of DB AG, as required by EU legislation, was left with the EBA. Moreover, the supervisory functions connected to the LuFV-contract between government and DB is also undertaken by the EBA. Finally, it is well known that some decisions on technical standards or on new infrastructure investments, all under the control of EBA, have implications for competitors and the ability of potential competitors to enter the market.

This led to some duality and rivalry between the EBA and BNetzA. One consequence of this is that the EBA now acts in a more independent manner than it used to (at least in some issues) in order to improve its reputation as a regulatory agency.

Drawing the right line between competencies of the EBA and BNetzA will remain an issue of concern in the future. However, at the moment it is dwarfed by the problem that BNetzA has insufficient powers to perform even those functions that are clearly within its purview. Its rights to gather information are very restricted. For example, when dealing with track access disputes, the BNetzA can obtain only very limited information about the particular situations, even if a broader picture would be more relevant for the issue in question. To monitor track access charges, BNetzA's powers to demand information are unclear and will, if not changed by law, give rise to legal dispute. Even if the BNetzA receives powers to demand detailed information on costs, it will only be allowed to check whether cost elements are related to the main functions of IMs, while it cannot criticise the adequacy of the cost statements. A reform towards an incentive regulation might change this in the future.

The restrictions on regulation go further than that. The regulator has no say on network development, be it new investments or network reductions, although there are long-standing allegations that network development is geared towards the needs of DB ML, and not those of competitors. An important issue for regional franchising is the fact that DB AG might tie infrastructure investment or maintenance decisions to the granting of RRPS contracts. Even the general suspicion that good relationships with DB might influence infrastructure investment decisions can distort franchise competition substantially, even more since the law still allows Federal States to avoid an open tender procedure.

There is a long-standing conviction that the final prices to customers should not be regulated. For regional passenger traffic, this is irrelevant, since passenger fares are part of the franchise contract. In freight, the on-track competition works fairly well so that it has been assumed that something similar is possible for passenger and direct regulation of fares has not been considered. However, in LRPS open access competition has not worked thus far. In principle, therefore, there are three regulatory options for Germany:

⁷ See e.g. Thatcher, M. (2006): Independent Regulators in Europe, deliverable of the project "Project on New Modes of Governance", available at http://www.eu-newgov.org/database/DELIV/D06D04_Analysis-Independent_Regulators_in_Europe.pdf.

1. stick with the current open access policy and hope that competition will develop (or that contestable market forces of potential competition will work) or that intermodal competition will work;
2. regulate LPRS fares of the incumbent directly;
3. replace the current system by a franchise system.

While the first option is currently in place (and its prospects will be discussed below), the second option has never really been discussed, while the third option is now being advocated forcefully by several market participants in Germany under the headline of “Deutschlandtakt”. The new government elected in 2009 has announced that it will investigate this option in detail.

3. The Rail Passenger Market

3.1. Overview

Germany has both densely and sparsely populated regions. RRPS is an essential medium of mass transportation in the densely populated regions. While it could be operated to cover costs in densely populated areas, it is still being subsidised in order to get even more people off the roads. In sparsely populated areas, in contrast, RRPS cannot cover costs, but is often seen as essential for keeping up regional economy and population. Thus RRPS is subsidised everywhere.

The geographical population distribution in Germany is characterised by a dispersed settlement structure across the whole country, with fairly big cities in every part of the country. As a consequence, the railway network is also spread out, highly interconnected, with some major lines going North-South or East-West. Due to this settlement structure, DB's LPRS network is also a polycentric, highly meshed network. Another consequence is that LPRS stops at larger cities quite often on a typical journey. Even outside the particularly densely populated regions (like the Ruhr-Rhein agglomeration or the Rhein-Main agglomeration), population distribution justifies traffic stops something like every 70 km. This polycentric structure limits the advantages of very high-speed rail links, since trains need considerable time and energy to speed up and slow down again. These facts limit German high speed options by comparison with French and Spanish long-distance passenger networks.

Furthermore, contrary to the French TGV for example, the German InterCity Express (ICE) system has mainly been integrated into Germany's pre-existing railway infrastructure system. Since the 1960s, many existing lines have been upgraded to permit speeds of at least 200 km/h. Five new lines for high-speed rail have been built since 1991, while others are planned or currently under construction. One of the effects of this is that the ICE trains can only reach a speed of 300 km/h on a few stretches of line, and cannot currently reach their maximum speed of 330 km/h anywhere on German infrastructure.

The main intermodal competition in all geographical market segments is the car. However, for many people, and for politics, the question is what alternatives there are to the car? For several social and environmental reasons, much public money has been spent to find alternatives to the car. At the same time, there is no open access in the bus sector. By law, any private offer of public bus services has to demonstrate its "necessity" to the public planning agency before it is allowed to operate. In particular, private buses are never permitted to compete with railways. Therefore, private buses are not found in Germany, either in long-distance traffic or in local traffic (although a major exception is bus transport to airports). Public authorities sometimes opt for buses instead of railways to provide regional services (for example, if there is no rail infrastructure) and in cities, but whenever possible, rail is usually preferred. The new government elected in 2009 has, however, announced that it will consider an opening up of long-distance passenger markets for bus services.

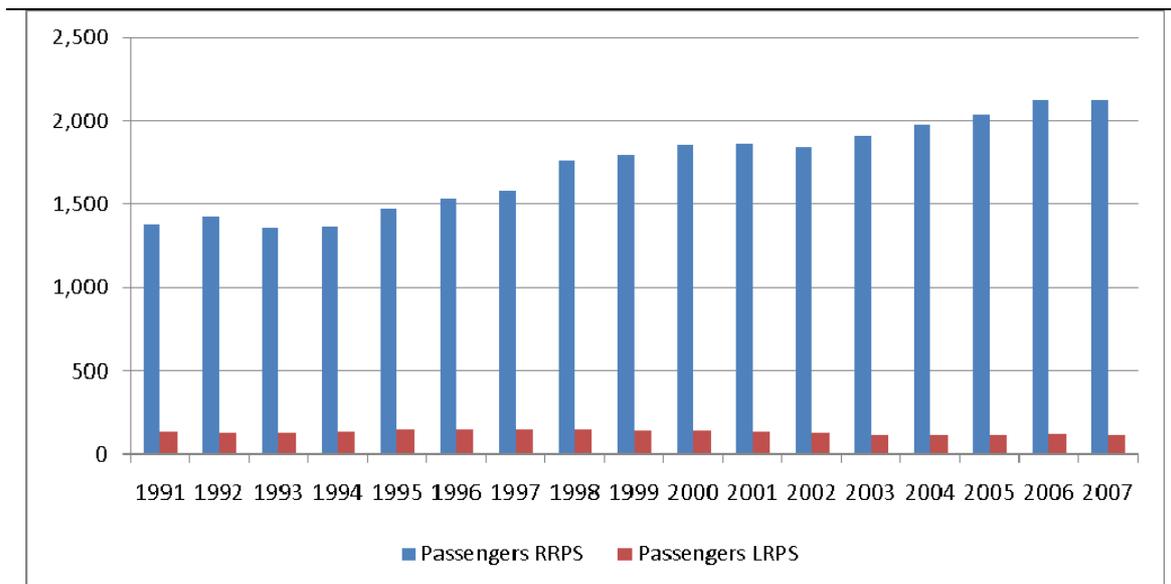
Germany, as most other countries, witnessed a strong increase in the number of flights and a large fall in air fares starting in the 1980s. On very long distances between large cities (i.e. cities with airports), air services are in intermodal competition with long-distance rail. This is, for example, the case for Berlin-Köln or Hamburg-München, competition from airlines is enhanced by the fact that high-speed rail in Germany is not ultra-fast. However, the location of railway stations in city centres, in contrast to airports, makes up for much of the time loss

on the route. Moreover, as already said, there are many major cities situated fairly close to one another, like Berlin-Hamburg or Köln-Frankfurt, where the comparative advantage lies with rail. Rail can also realise economies of scale when, for example, one single train carries passengers Berlin-Hannover, Hannover-Köln, and Berlin-Köln.

3.2. Market trends

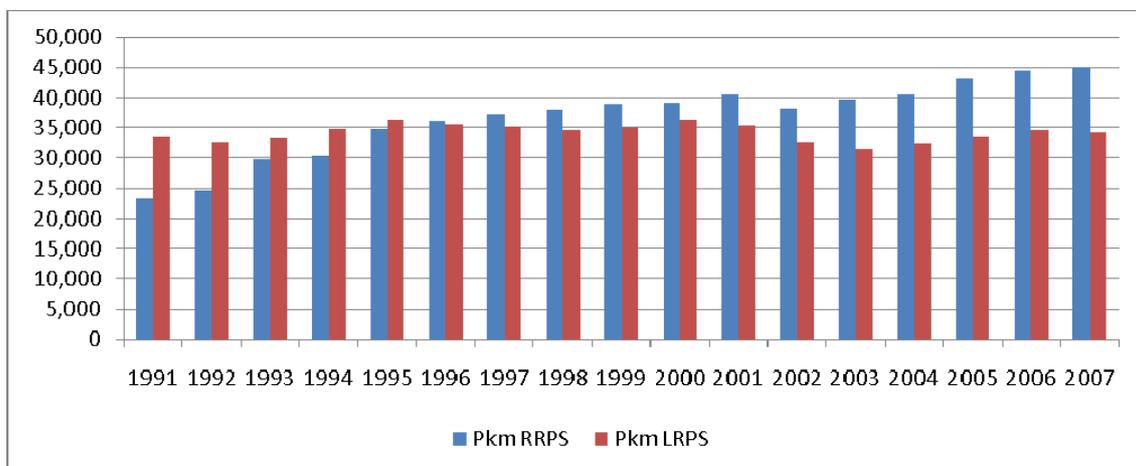
The following figures show the development of passenger numbers and passenger kilometres since 1991, i.e. before the railway reform (see Figures 1 & 2). Numbers are given for both RRPS and LRPS.

Figure 1. Passenger numbers in RRPS and LRPS 1991-2007 (in million passengers)



Source: DIW, 2009

Figure 2. Passenger volumes in RRPS and LRPS 1991-2007 (in million passenger km)



Source: DIW, 2009

Both figures show an increase in both passenger numbers and passenger kilometres for RRPS. This is mainly due to an increase in service and quality levels and the introduction of modern rolling stock; supporting factors were e.g. the introduction of modern pricing, ticketing and passenger information systems and rehabilitation of stations.⁸ In LRPS, however, passenger numbers and passenger kilometres are stagnating. This is partly due to the fact that the DB AG cancelled some so-called InterRegio (i.e. long-distance rail) services and replaced them by RRPS services. The fall in long-distance rail passenger kilometres between 2002 and 2003 was caused by the introduction of a new pricing system. This system was not accepted by the public and thus later withdrawn.

3.3. Passenger rail services

3.3.1 Regional rail passenger services

3.3.1.1. Market organisation

The German railway reform of 1994 led to fundamental changes in the organisation of regional rail passenger transport by shifting responsibility for funding and procuring services from the federal level to the German Federal States. Until then, the Federal States and local municipalities had been responsible only for road-based public transport (buses, tramways etc.) whereas the state-owned Deutsche Bundesbahn traditionally provided regional and long-distance rail services.

With the adoption of the Regionalisation Act (*Regionalisierungsgesetz*) in 1996, the responsibility for planning, managing, and financing public transport passed on to the Federal States. In order to be able to do so states are provided with substantial amounts of money from the Federal budget each year. The level of Regionalisation Funds (*Regionalisierungsmittel*) given to the States grew from 6.2 billion euro in 1997 to 6.7 billion euro in 2008 (see also below).

Most states established specific regional authorities (*Aufgabenträger*) assigned with the tasks of planning, managing and financing public rail transport. Since the implementation of the act, regional authorities provide public transport as part of their normal duties. Transport contracts between regional authorities/states and RUs govern the scope of the services to be provided.

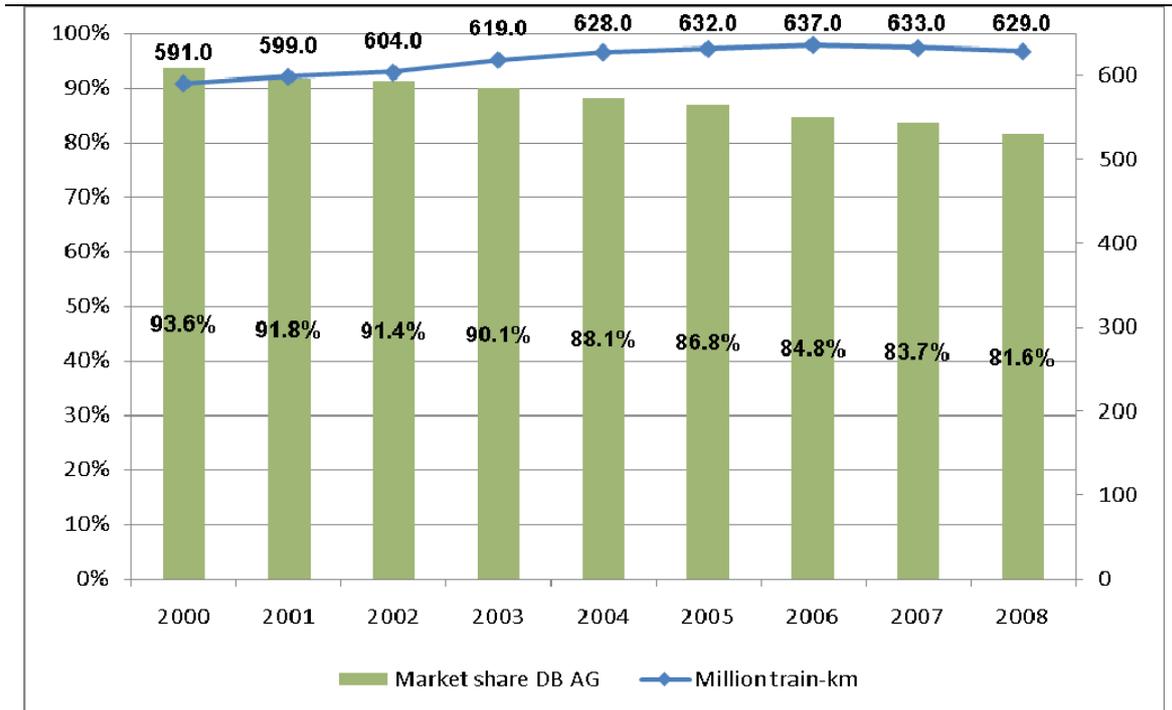
As a consequence, the quality of RRPS increased strongly after 1996 and so did traffic volume and performance. In particular, the regional authorities required new train sets meeting strict quality conditions, they defined lines and frequencies, and had the money to subsidise these services.

3.3.1.2. Competition in regional rail passenger services

During the first years after regionalisation, contracts were almost automatically granted to DB Regio, the respective transport branch of DB AG. Later on, several competitors were also successful in acquiring traffic contracts, but in 2008 the market share of DB AG is still 81.6% in traffic volume and 89.8% in traffic performance (see Figures 3 & 4).

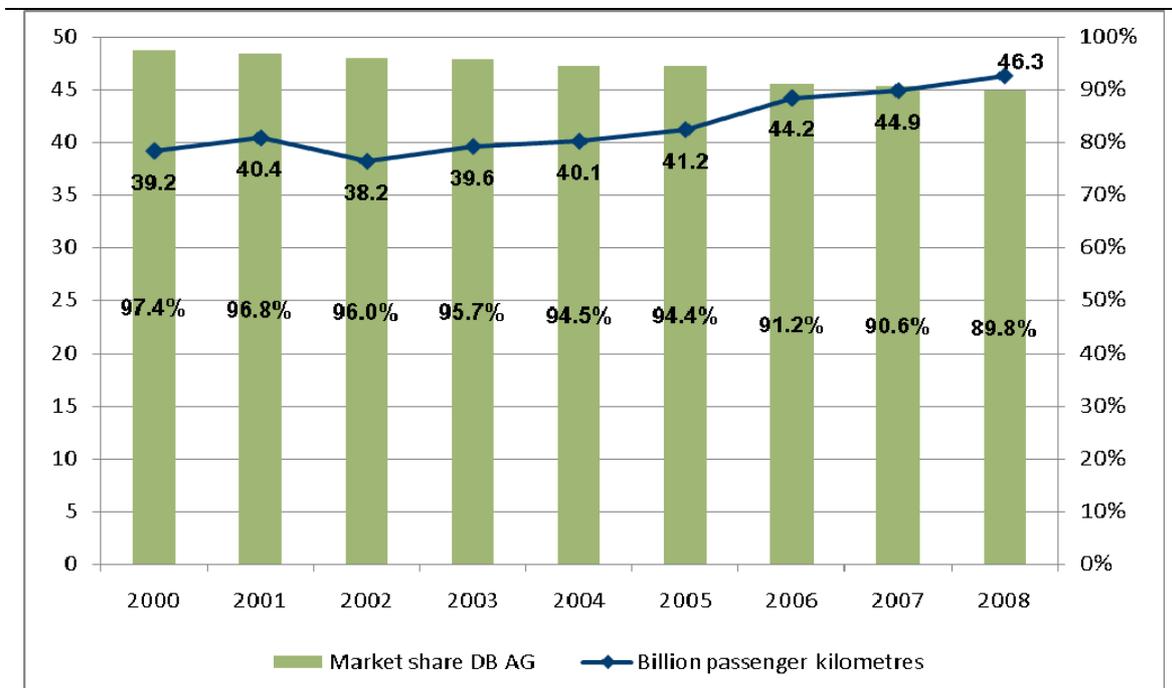
⁸ See Böttger, Chr. / Pörner, R. (2007): Der SPNV in Deutschland - Eine Erfolgsstory mit Potenzialen ?. In: Jahrbuch des Bahnwesens, pp. 132 – 140.

Figure 3. Train km and DB market share 2000-2008



Source: DB AG, several issues

Figure 4. Passenger km and DB market share 2000-2008



Source: DB AG, several issues

In principle open access for RUs exists even in the regional passenger traffic market, so that publicly funded trains (e.g. of a competitor) might compete with privately run trains on the

same route. However, this has been rarely observed to date, and cannot be expected to become more pronounced in the future since subsidisation of RRPS is heavy; on average, the grants account for 60% of the total revenues while ticket revenues make up only 40%.

Thus competition occurs only during the awarding process for RRPS. This process can take various forms. In practice, many contracts (especially the large ones) have been directly awarded to DB AG. Only 29% of all train-km in place in 2007 have been granted in an open and formalised tender procedure. DB AG won only 48% of these open tenders between 1995 and 2007 (see Section 4 of this Appendix). Whether direct awards will also play an important role in Germany in the future is of central importance for the development of competition and, according to the public authorities, costs and quality of services. Currently, the legitimacy and economic pros and cons of direct awards are being intensively discussed in Germany again as a consequence of 1370/2007/EU. Interestingly, the DB AG stated in the course of the Consortium's interview that it expects the use of competitive awards (public tender or competitive dialogue) to become the rule.

3.3.2 Long-distance rail passenger services

3.3.2.1. *Political attitudes towards long-distance rail passenger services*

In contrast to RRPS, the railway reform emphasised that LRPS should be operated without subsidies, i.e., they were perceived as being financially viable from fare box revenues alone. It was envisioned that open access would lead to competition and to create a financially viable long-distance passenger service that would operate without public influence.

In consequence of open access, however, DB AG reduced its LRPS as well as its freight services. With regards to the competitive environment, a certain degree of competition was effectively achieved in freight transport, such that the services of *all* operators in freight were not reduced. In the case of LRPS, however, competition is a rare exception, rather than the rule, while a further reduction of services by DB AG remains possible.

With an amendment to the German Basic Law (Art. 87e § 1) in 1994, the railway reform also enhanced the fundamental responsibility of the federal state for railway services. The law makes the federal level responsible for a well-functioning LRPS throughout the country. In practice, this leads to a degree of tension, as the federal level constantly needs to cross-check its constitutional responsibility while relying on the commercial decisions of a monopolistic transport operator. As a result, some selective political interventions by the federal level concerning management decisions of DB RUs may be observed. The pricing systems planned for 2002 and other instances of price increases by DB AG led to political and public protests, resulting in DB AG withdrawing them. A major political concern that arises quite frequently is that DB AG might “uncouple” certain towns from its long-distance traffic network. In these discussions public pressure is put on DB AG to retain the service, usually without any reference to the possibilities of third party access. German rail policy still lacks clear political targets, institutions, and rules with regards to the overall organisation of LRPS.

3.3.2.2. *Products offered by DB Fernverkehr AG in long-distance rail passenger services*

LRPS by DB AG is run by its subsidiary DB Fernverkehr AG (a 100% subsidiary of the DB Mobility Logistics AG holding company) and comprises of two main train categories: the Intercity-Express (ICE) high-speed rail and the Intercity (IC) and Eurocity (EC) trains.

Services are offered at either 30-minute, hourly or two-hourly intervals. Additional services run during peak times.

The ICE system comprises approximately 180 stations in Germany and neighbouring countries. Out of 130 ICE stations within Germany, approximately 80 stations are served at least every two hours (15 stations out of the 50 in neighbouring countries). The EC/IC network in Germany is even more tightly meshed.

However, there are still some bigger cities (i.e. with more than 100,000 inhabitants) that are not connected to the ICE/IC network (e.g. Mönchengladbach, Leverkusen). Until the 1990s, DB was running an additional category of long-distance trains, the InterRegio (IR), which connected such cities. These trains were abolished by DB, since they were making losses, leading to political discontent by the cities, regions and Federal States affected. Since at the time third party access was unlikely to take place (and was quite difficult due to discriminatory practices in place), some Federal States decided to replace former IR services by subsidised RRPS. As a consequence, the distinction between RRPS and LRPS became blurred.⁹

Another way to illustrate the coverage by DB is to look at the accessibility of stations connected to DB's long-distance network. A comprehensive analysis of the German Federal Office for Building and Regional Planning from 2004 showed that nearly 50% of the German population (some 39 million inhabitants) can reach a station providing LRPS by DB (i.e. either IC/EC or ICE services) within 15 minutes by car (Table 1). Accessibility is rather poor in rural areas; however, major shortcomings (i.e. > 60 minutes by car) only occur for approximately 1.5% of the population in some remote areas (e.g. parts of Mecklenburg Pomerania).

⁹ In the official statistics, RRPS used to be defined as services on distances of less than 50km, LRPS as those of more than 50km. Nowadays, LRPS are defined by products offered, i.e. ICE, IC, EC and some other are "long-distance", the remaining ones are regional.

Table 1: Accessibility of stations where LRPS by DB AG is provided

	Population that can reach a long distance station, classified in time groups (in million inhabitants)					
	Time groups (in minutes)					
	0 - 15	15 - 30	30 - 45	45 - 60	> 60	total
Total Germany	39.0	26.3	12.1	3.9	1.0	82.3
Western Germany	31.1	22.3	9.1	2.8	0.5	65.7
Agglomeration areas	19.9	11.6	3.0	0.5	0.1	35.2
Urban areas	8.8	8.2	4.5	1.4	0.3	23.1
Rural areas	2.3	2.5	1.6	0.8	0.1	7.3
Eastern Germany	8.0	4.1	3.0	1.1	0.5	16.6
Agglomeration areas	5.3	1.6	1.0	0.2	0.0	8.1
Urban areas	1.9	1.4	1.2	0.6	0.3	5.3
Rural areas	0.8	1.1	0.8	0.4	0.2	3.2

Source: BSB, 2008

From a market perspective, accessibility is of course a rather limited indicator for market coverage, since competition between RUs takes place on individual OD-connections, not at stations. Moreover, there are other important quality parameters (such as frequency of services, speed, and others) that differentiate products. Nonetheless, the very broad market coverage by DB AG as illustrated by the accessibility indicator already indicates that competitors can only enter the market either by a very selective strategy (e.g. entry on routes on which DB currently offers a poor service) or in direct competition with DB AG's services.

3.3.2.3. Products of competitors in long-distance rail passenger services

In the past decade some third party RUs entered the LRPS market in Germany, although their market share is trifling by any standard. The best known new RU is Veolia Verkehr's brand **Inter Connex**. It was established in 2002 and has been in competition with DB AG since then. Service was launched on the Gera-Leipzig-Berlin-Rostock route, where DB's offers were rather unattractive to passengers due to long travel times (seven and a half hours) and the need to change trains twice on the route. Inter Connex, however, recognised the value of this route (e.g. strong passenger familiarisation to this service) and used it as an entry to the German market with a focus on both new customers and former DB AG customers.

Another third party service is the **Berlin Night Express** operated by the Swedish incumbent RU SJ AB and the German Georg Verkehrsorganisation GmbH (GVG). The Berlin Night Express is a night train service between Berlin and Malmö, which is currently the only direct service between Sweden and Germany.

GVG has tried several times to set up other cross border services from German cities. For instance, a service to Milano planned since 1995 was inhibited by the Italian state railway abusing its monopoly power (decision of the European Commission COMP/ 37,685 GVG/FS 27 August 2003). Then in 2006, DB Netz AG rejected six applications by GVG for train slots between Mannheim and Paris. However, the German regulator BNetzA later dismissed protests against this decision after the infrastructure provider DB Netz AG was able to demonstrate that the train plan was not feasible.

The **Vogtland-Express** is a service between Hof-Plauen-Berlin that was established in 2005. It is operated by Vogtlandbahn GmbH (part of the UK-based Arriva Group).

The total market share of Inter Connex, Berlin Night Express, and Vogtland Bahn is minute in terms of both train-km and passenger-km. If the connections set up by the Federal States to replace former IR connections were included, the picture would probably look slightly different (no numbers available), but not very much. Thus, more than a decade after introduction of open access, DB AG is still by far the dominant firm, in fact a practical monopolist in this segment.

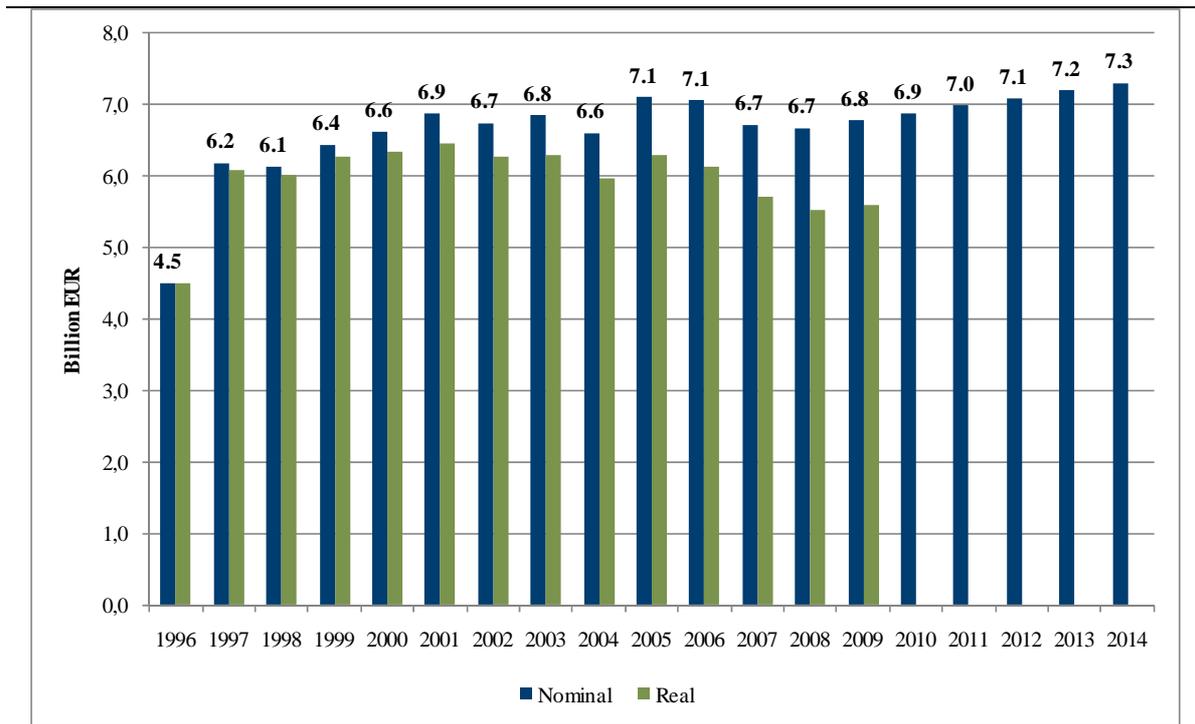
3.4. Commercial issues

3.4.1 Subsidies to regional rail passenger service

Figure 5 shows the level of public support via the Regionalisation Fund from 1996 to the present and those projected to 2014¹⁰. The forecast for the period to 2014 is based on long-run agreements between the Federal Government and the Federal States. While public support increased considerably since 1997 (from 1996 to 1997 the funding system was changed), it slightly decreased in real terms.

¹⁰ At the same time the DB infrastructure companies receive funds from the federal government directly. The total sum spent for new construction, upgrading and replacements of infrastructure amounted to 2.8 billion euro in 1997 and 3.7 billion euro (planned) for 2008. Source: BT-Drs. 16/8014.

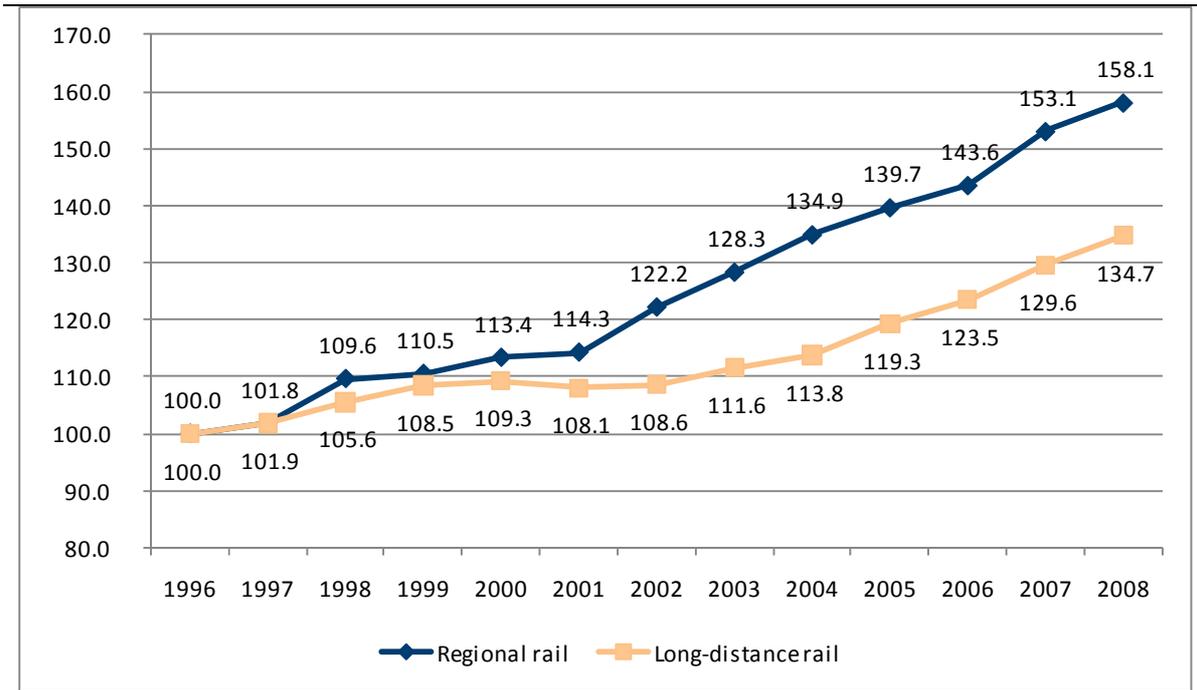
Figure 5. Regional Funds 1996-2014 (in billion EUR)



Source: DB AG, 2003; Haushaltsbegleitgesetz, 2006

Figure 6 shows the price development of RRPS prices compared to LRPS as of 1996. Although both rates have increased, prices for RRPS have risen actually sharper than the ones for long-distance rail passenger services.

Figure 6. Price indexes for RRPS and LRPS, 1996-2008 (base year 1996)



Source: DIW, 2009

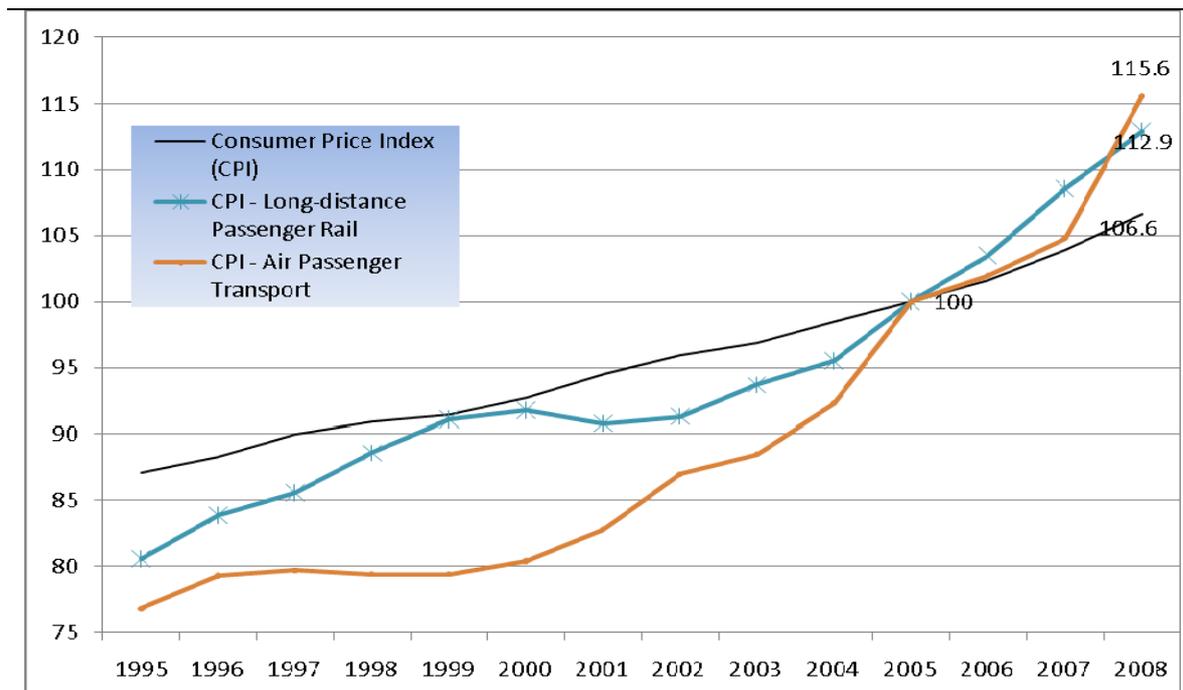
The subsidies for public service contracts are of central importance for the market segment and the whole rail business; DB Regio AG, for example, receives annually approx. 3.4 billion euro or two-third of its revenues from these contracts. DB Regio is of central importance for DB AG since it generates (2007) 16% of the company's EBIT and is the most important financier of infrastructure (approx. 60% of rail related revenues). This is due to firstly, the dominant position of DB and secondly, the large amounts of state money in these markets.

When competition set in, it showed that there was ample room for a decrease in subsidies. According to some statements, subsidies have been reduced by about 20% after a change from DB Regio to a competitor.

3.4.2 Prices of DB Fernverkehr AG in long-distance rail passenger services

Figure 7 shows the price levels in DB's LRPS market. Since 1995, levels of prices have increased annually by 2.6%, compared to an increase in consumer prices of only 1.6% per year. Between 2000 and 2003 there was a temporary stagnancy of prices due to changes in the pricing system which led to ticket price decreases particularly for longer distances.

Figure 7. Price index for LRPS, 1995-2008 (base year 2005)



Source: IGES calculations based on data from the Federal German Statistical Office

The pricing system of DB AG currently distinguishes between three product classes.

- Product class A: ICE, ICE Sprinter, Thalys, TGV
- Product class B: IC, EC, D, night trains
- Product class C: regional trains (e.g. RE, RB, S)

In case that trains of different product classes are combined, the prices of the higher product class are applied. With regards to LRPS, product classes A and B are of particular importance. Within each of these two product classes, prices are calculated according to individual route specifications (e.g. the extent of competition on a certain route). However, prices still mainly depend on the distance to be travelled. The price system comprises a depression with increasing travel distance and a maximum price (currently 127 euro for Second Class).

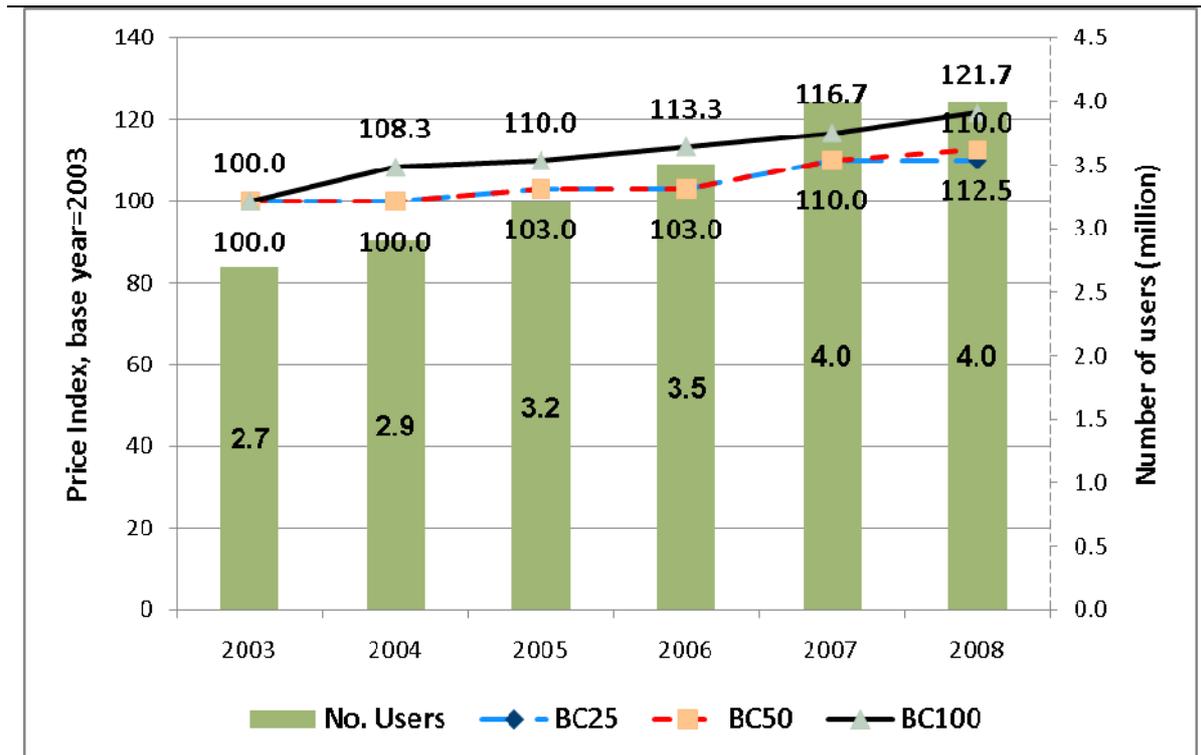
This route and product based pricing system was introduced in 2002/2003. With the introduction of the new system price cuts for long-distance routes could be observed. However, intermodal competition might explain these price cuttings; in fact prices were actually reduced on longer routes that were in competition with airline services in 2002.

The above refers mainly to DB AG's standard prices ("*Normalpreise*"). However, about 90% of DB AG's customers use discount tickets. Particularly the BahnCard introduced in 1992 is of great importance for customer retention in LRPS. Three variants are sold by Deutsche Bahn: BahnCard 25, BahnCard 50, and Mobility BahnCard 100. The first two variants allow passengers to get 25% or 50% discount on standard fares, while the Mobility BahnCard 100

is a type of annual ticket that allows free unlimited travel on most of the German railway network for a fixed price.

As of 2008, there were some 2.23 million BahnCard 25 owners, 1.75 million BahnCards 50 owners and 28,000 BahnCards 100 owners. BahnCard tickets account for more than 50% of DB AG's turnover in LRPS. Currently (i.e. as of May 2009) the prices for a BahnCard (2nd class) are 57 euro (BahnCard 25), 225 euro (BahnCard 50) resp. 3,650 euro (BahnCard 100). Figure 8 shows the trends of BahnCard prices and numbers of users between 2003 and 2008.

Figure 8. BahnCard prices and number of BahnCard users (in million)



Source: DB AG, 2008

Once a customer has bought a BahnCard, it incentivises him/her for an increased use of the DB, since after purchase the costs of the BahnCard are sunk and no longer of interest for decisions by the owner. This strengthens the position of the DB AG with regards to intra- as well as intermodal competition. Thus, the pricing systems of DB AG's competitors (e.g., Inter Connex) follow the price levels of BahnCard discount prices, not the standard prices.

Whilst the BahnCard mainly targets frequent travellers and regular customers, other discount prices focus on the price sensitivity of customers. For instance, the introduction of a "Happy Weekend Ticket" ("*Schönes-Wochenende-Ticket*") in 1995 led to massive demand. Although it was DB AG's intention that users would use it only for short distance purposes (the ticket is only valid in RRPS trains), many users actually use it for long-distance journeys. Thus, DB AG has tried several times to withdraw the ticket; however, this has failed so far due to political resistance. Nonetheless DB AG has introduced several price increases as well as making the terms and conditions of the product more onerous.

Other discount offers are the "saving ticket 25" and "saving ticket 50" ("*Sparpreis*") that were introduced in 2003. Both tickets can be combined with a BahnCard 25 and offer a 25% or 50% reduction on the standard ticket prices. However, a price minimum of 38 euro applies and supply of these tickets is limited. Tickets have to be booked three days in advance and are tied to a certain train.

Introduced in 2007, a further discount ticket is the "permanent-special" ("*Dauer-Spezial*"): This ticket needs to be booked three days in advance, is also limited in supply and tied to a certain train. There are five price categories varying from 29 to 69 euro. According to DB AG, between 2007 and April 2009 more than 14 million tickets were sold, half of these for 29 euro.

3.4.3 Prices of Competitors in long-distance rail passenger services

Veolia's Inter Connex was launched on the route Gera-Leipzig-Berlin-Rostock, a route where DB's offers were rather unattractive to passengers due to long travel times (seven and a half hours) and the need to change trains twice on the route. It introduced a new pricing system in 2006 with three ticket categories:

- a normal ticket that can be purchased on-board the train;
- a saver ticket available in advance and on the internet;
- a super saver ticket available only on the Internet.

Inter Connex' ticket prices follow the discount prices that DB AG is offering with its BahnCard50 (Table 2).

Table 2: Ticket prices and services, Inter Connex and DB AG (May 2009)

	InterConnex						DB AG				
	Ticket prices			Duration	Change	Fre- quency	Ticket prices		Duration	Change	Frequency
Super Saver Ticket	Saver-Ticket	Normal Ticket	Normal				BC50				
Berlin-Leipzig	12,00	17,00	20,00	1:19	0	2/day.	42,00 (ICE)	21,00	1:13	0	hourly.
Berlin-Rostock	12,00	17,00	20,00	2:26	0	1/day.	35,10 (RE)	17,55	2:41(*)	0	every 2 hrs.
Leipzig-Rostock	21,00	29,50	35,00	3:58	0	1/day.	50,60 (RB + RE)	25,30	4:33	1	every 2 hrs.
							77,00 (ICE + RB)	38,50	4:13	1 (**)	every 2 hrs.

Source: own calculations, based on price quotes from Inter Connex and DB AG

Remarks: (*) There is also one regional train that needs 2:21 hours, it departs 15 minutes ahead of the Inter Connex (May 2009).
 (**) There is one ICE service Leipzig-Rostock per day. Due to different departure times (16:51 vs. 9:26) it is not competing with Inter Connex (May 2009).

The **Berlin Night Express**, operated by the Swedish SJ AB and the German Georg Verkehrsorganisation GmbH (GVG), is a night train service between Berlin and Malmö. Ticket prices vary between 88 euro and 250 euro, the travel duration is 9 hours 5 minutes. There is no alternative night service available at the moment offered by any other RU. In the daytime there are services provided by DB AG with comparable travel duration between 9 and 10 hours and ticket prices around 140 euro and one change of train.

The **Vogtland-Express**, operated by Vogtlandbahn GmbH, is a service between Hof-Plauen-Berlin that was established in 2005. Before Vogtlandbahn started its service, the route was operated until 2001 by DB AG. DB AG offered one daily service; travel duration was 4 hours 32 minutes (Berlin-Hof) resp. 3 hours 54 minutes (Berlin-Plauen). In terms of ticket prices, Vogtlandbahn appears to follow the BahnCard 50 prices of DB AG. The Vogtland-Express has an advantage on the route, since as a direct service there is no need to change trains. Vogtland Express offers a 25% discount for travellers below 26 years of age. Moreover, frequent travellers can purchase 10 tickets with a 15% reduction. Table 3 shows a comparison of prices and services between Vogtlandbahn and DB AG.

Table 3: Ticket prices and services, Vogtlandbahn and DB AG (May 2009)

	Vogtlandbahn				Deutsche Bahn AG				
	Normal ticket	Duration	Change.	Freq- uency(*)	Normal ticket	BC 50	Duration	Cha- nge	Freq- uency(*)
Riesa - Berlin	19,00	2:21	0	1/day	32,00 (RB+IC)	16,00	2:01	1	hourly
					49,00 (RE+ICE)	24,50	2:34	1	
Chemnitz - Berlin	25,00	3:26	0	1/day	33,70 (RE+RE)	16,85	4:10	1	2/hour
					53,00 (RE+ICE)	26,50	2:50	1	
Zwickau - Berlin	28,00	4:07	0	1/day	56,00 (RE+ICE)	28,00	2:51	1	every 2 hrs.
Plauen - Berlin	29,00	4:54	0	1/day	56,00 (RE+ICE)	28,00	3:20	1	3/day

Source: own calculations, based on price quotes from Vogtlandbahn and DB AG

Remarks: (*) outbound journey

3.5.Safety

Before the railway reform and during the first 10 to 12 years after the reform, safety issues have not been a major concern. The retention of vertical integration and the dominance of the national incumbent may be the major reasons for this. This has changed during the discussion whether DB AG should be privatised; now, negative effects of commercialisation and competitive pressure are suggested by the opponents of privatisation. The discussion has

also been spurred by several recent incidents or accidents e.g. break of ICE-axles that resulted in drastically shortened maintenance intervals. In view of most market participants, safety issues are not touched by rail reforms.

The discussion suffers from a general lack of reliable, adequate data:

- The German Federal Statistical Office publishes only the number of rail accidents that resulted in damage to persons and the number of injured or killed persons. This is the only statistic that allows longitudinal analysis.

But the number of accidents that resulted in damage to persons is not a suitable risk indicator. The risk assessment methodology defines risk as the result of probability of incidences, e.g. events that can result in derailments, probability of accidents, e.g. derailment, probability of different exposures, e.g. number of travellers, and probability of specific consequences.¹¹

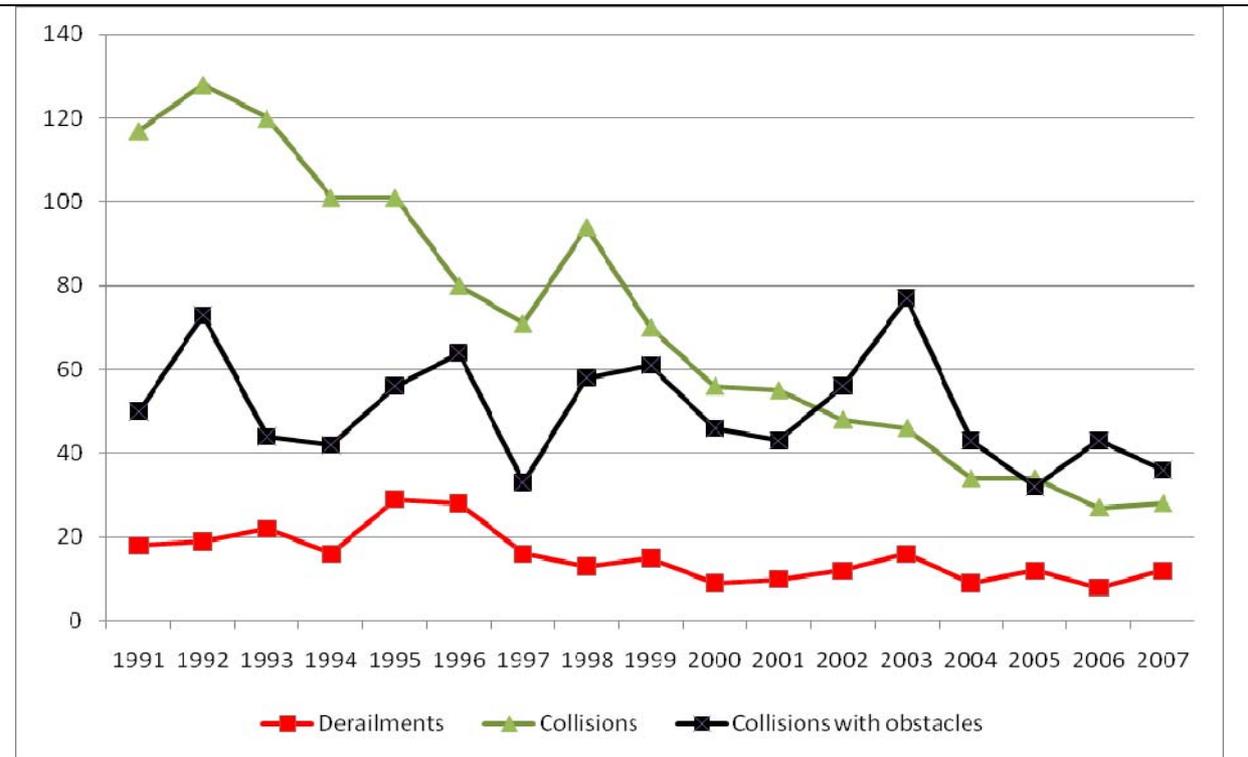
- A statistic that systematically captures accidents - regardless of damage to persons - and incidents is now required by the EU Safety Directive 2004/49/EC; in Germany the EBA is responsible for collecting the data. While this statistic is much more appropriate, up to now it includes only the period 2006-2008.
- Both statistics do not allow distinguishing between passenger and freight services.

The following presents and interprets the results of both statistics: a statistical analysis is not possible due to the limited number of incidents. Figure 9 shows the number of accidents involving personal injury in Germany between 1991 and 2007. The numbers include East German Rail (1991-1993), DB and other RUs; the method of data collection has changed within the displayed period, so the numbers for 2004 and later are not strictly comparable to the period before. The picture does not indicate that the rail reform had a negative influence on ongoing trends.

Figure 10 shows the number of accidents per Million train-km in the period 1998-2007. Since the train-km increased by 10% in this period the aforementioned conclusion is further strengthened.

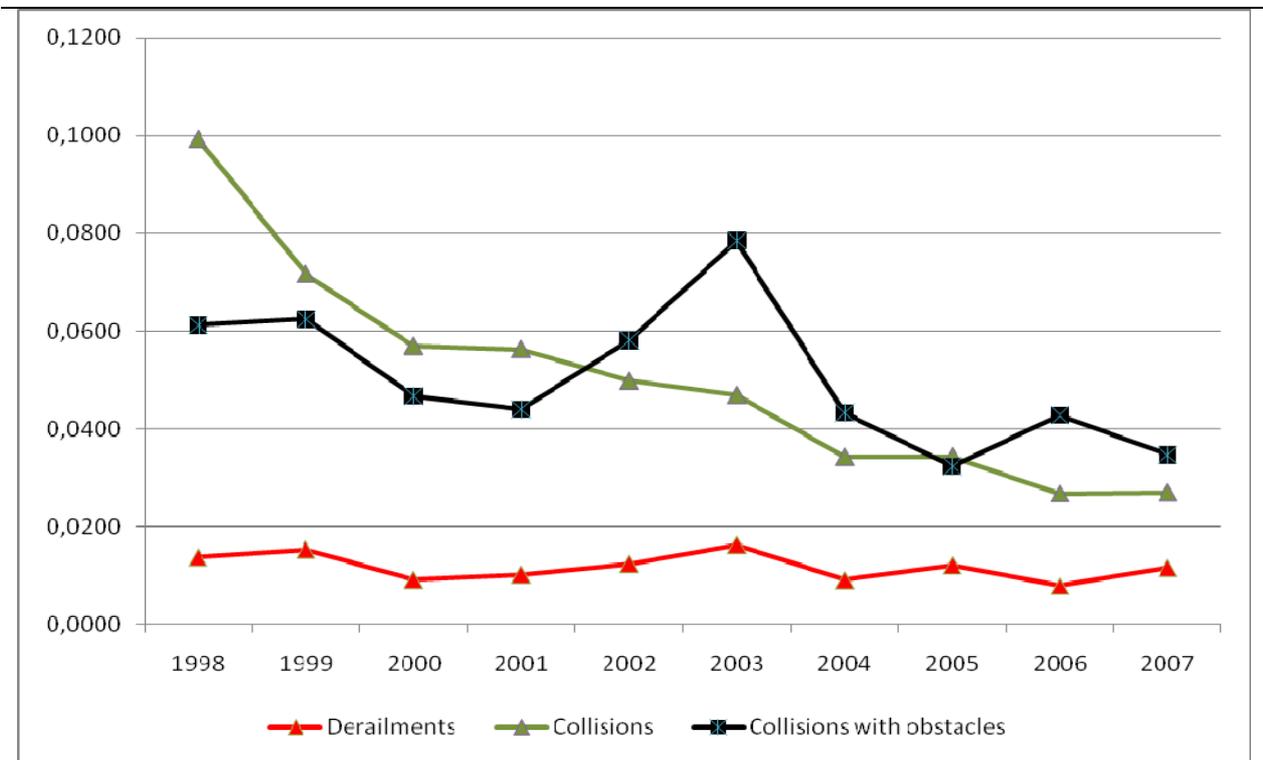
¹¹ See e.g. Covello, V.T. / Merkhofer, M.W. (1993): Risk Assessment Methods, London/New York.

Figure 9. Number of rail accidents involving personal injury in Germany between 1991 and 2007



Source: Statistisches Bundesamt (2009): Verkehrsunfälle, Fachserie 8 Reihe 7, Wiesbaden, p. 307

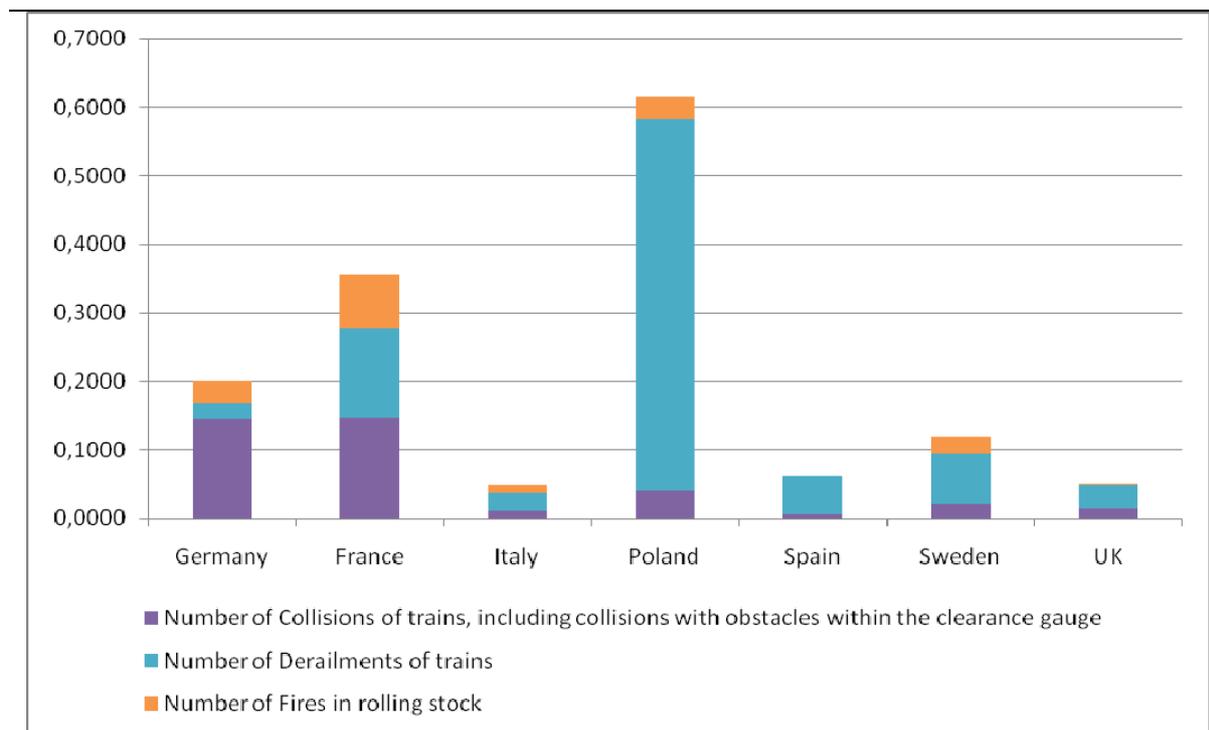
Figure 10. Number of rail accidents per M train-km involving personal injury in Germany between 1998 and 2007



Source: Statistisches Bundesamt (2009): Verkehrsunfälle, Fachserie 8 Reihe 7, Wiesbaden, p. 307

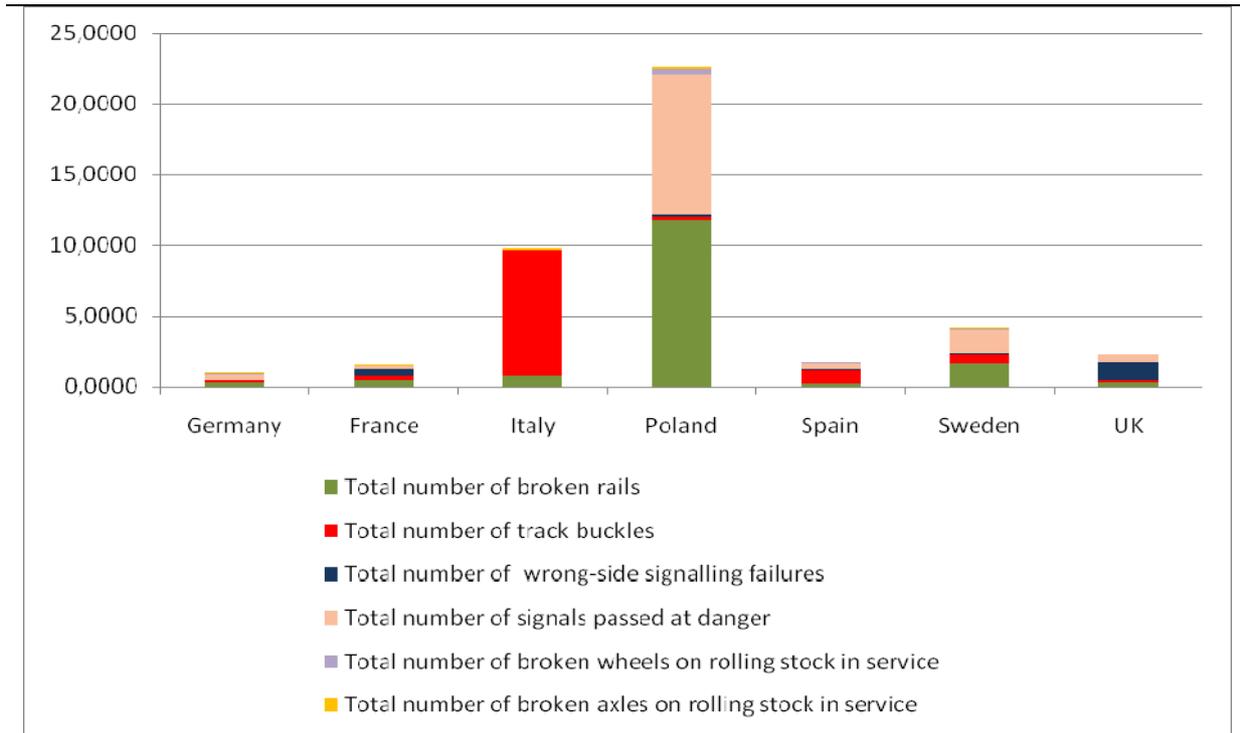
The next two figures present the relative (per Million train-km) number of accidents, Figure 11, and incidents, Figure 12, for several European countries. This cross-section analysis shows that Germany scores fairly well compared to other countries with less market opening, i.e. France, Spain, Italy and Poland.

Figure 11. Number of rail accidents per Mio. train-km (2006-2008)



Source: European Railway Agency, <http://www.era.europa.eu/Core-Activities/Safety/Pages/safety-reporting.aspx>

Figure 12. Number of rail incidents per Mio. train-km (2006-2008)



Source: European Railway Agency, <http://www.era.europa.eu/Core-Activities/Safety/Pages/safety-reporting.aspx>

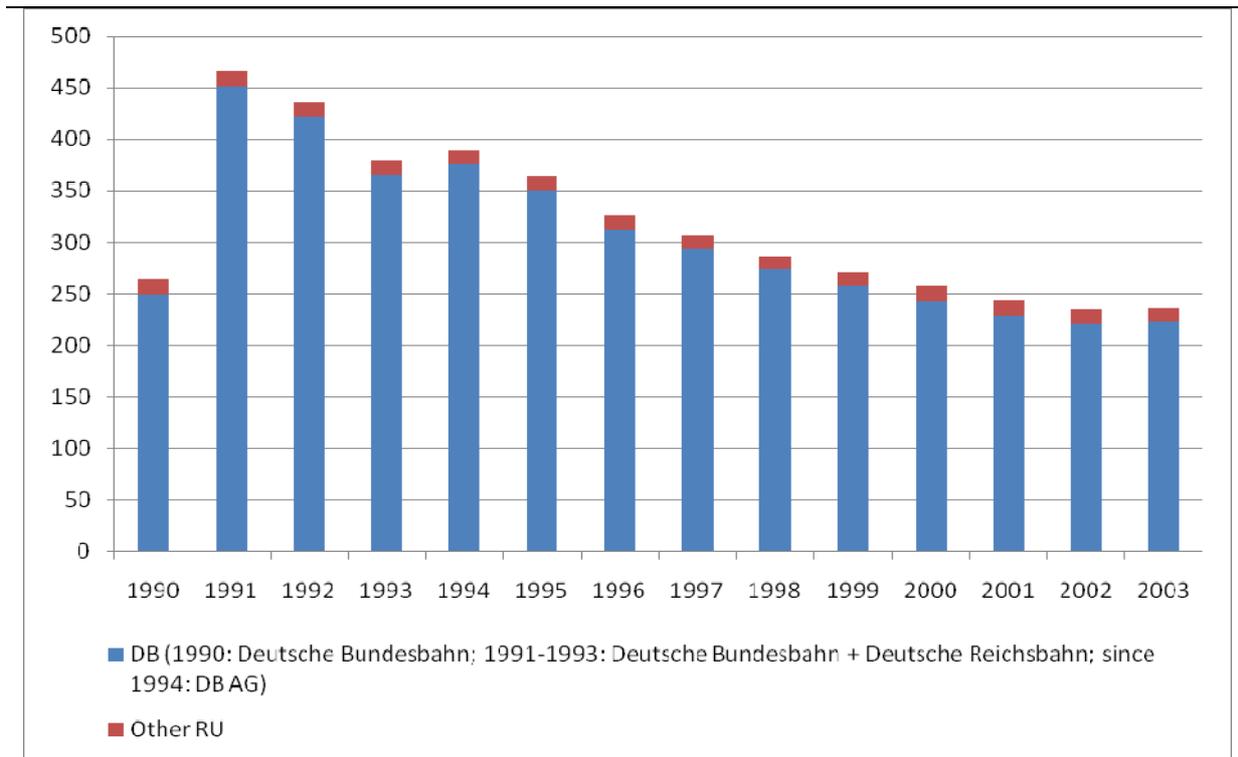
All in all, the existing statistical information does at least not allow the conclusion that the rail reform in Germany has had negative effects on railway safety.

3.6. Employment

The development of employment in the German rail sector, as measured by the German Federal Statistical Office, is clearly dominated by DB's restructuring, especially by the necessity to reduce staff after its consolidation with the East German Rail. Thus, employment effects in Germany are surely not representative for west European countries but informative for east European countries.

The following figure 13 displays the official statistics for the period 1990-2003 (afterwards, employment was only surveyed every 5 years; please also note that the statistic does allow distinguishing between passenger, freight and infrastructure companies). Astonishingly, other RU display no employment growth at all - but this reflects the above mentioned fact that tendering of regional services on a larger scale started quite late in Germany.

Figure 13. Employees in the German rail sector in thousands between 1990 and 2003

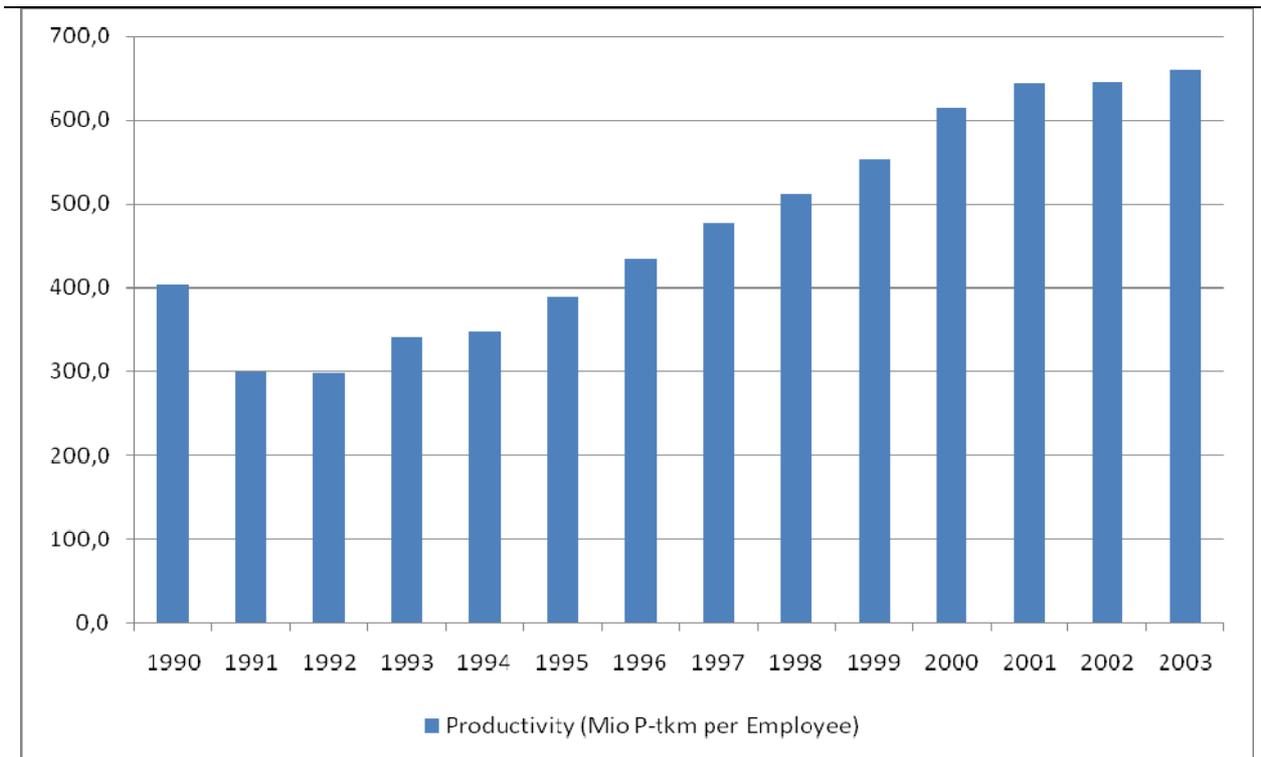


Source: DIW, 2009, pp. 44-45

3.7. Productivity

The sector shows a remarkable productivity growth since the rail reform – mirroring especially the just mentioned reduction of staff. Using a popular, though restricted indicator, the following figure 14 shows the development of passenger- and ton-km per employee for the period 1990-2003. Between 1990 and 2003 the indicator has increased by 64% and between 1993 and 2003 by 94%.

Figure 14. Productivity development (P-tkm per employee) between 1990 and 2003



Source: DIW, 2009, pp. 44-45, 54-55

In a more sophisticated approach, Friebel, Ivaldi and Vibes compare the passenger traffic efficiency of national railroad companies by means of a production frontier model and evaluate the effects of reforms on efficiency.¹² They find that reforms have had positive impact on output. For Germany they state that “in 1999, Germany is relatively more efficient than the other countries. Moreover, one can see that the relative efficiency of Germany increased from 1993 to 1999, and decreases in 2000. This does not necessarily mean that Germany starts to become “less efficient” in 2000: Germany may continue to be more and more efficient, but other countries’ efficiency gains may be stronger than the ones of Germany.”

¹² See Friebel, G. / Ivaldi, M. / Vibes, C. (2003): Railway (De)Regulation: A European Efficiency Comparison.

4. Potential Entry Barriers to the Rail Passenger Market

4.1. Public procurement policies in regional rail passenger services

With regards to potential entry barriers to RRPS, the German procurement policy is of particular importance. As outlined in Section 2, the RRPS market is primarily organised as a market driven by the demand of the regional authorities. Thus, the first crucial question regarding potential entry barriers to the RRPS market is whether service contracts are actually publically procured (i.e. in an open tender procedure) or whether they are directly awarded.

In fact, many large contracts are still directly awarded to the DB AG. Until 2007, only 184.7 million train-km out of 630 million train-km in total (i.e. 29%) were publically tendered in Germany.¹³ Moreover, the contracts directly awarded cover the overwhelming share of services in passenger-km, so that the figures cited overstates the importance of competitive tendering.

An example of awarding of services without competitive tendering is the states of Thuringia and Saxony-Anhalt. In 2002, Thuringia signed an exclusive contract with DB AG. The contract comprises the whole regional passenger transport in Thuringia (i.e. 17 million train-km per year), has a duration of ten years, and is worth 1.5 billion euro in total. Likewise Saxony-Anhalt signed a similar contract with the DB AG of a value of 2 billion euro (see Table 4).

Table 4: Contracts directly awarded to DB

State	Conclusion of contract	M Train-km (first year)	Value (bn €)	Duration of contract
Berlin / Brandenburg	December 2002	35.0	1.9	10 years
Lower Saxony	January 2003	27.8	2.5	10 years
Saxony-Anhalt	March 2003	16.2	2.5	12 years
Hesse (Rhine-Main-Area) ^{a)}	April 2003	33.0	4.4	11 years
Baden-Wuerttemberg ⁾	July 2003	49.0	4.6	13 years
Hamburg (S-Bahn-light rail)	July 2003	12.5	0.7	6 years
Rhineland-Palatinate	January 2003	29.5	2.4	11 years
North Rhine-Westphalia	July 2004	44.0	6.0	15 years
Saarland	July 2004	6.3	0.8*	14 years

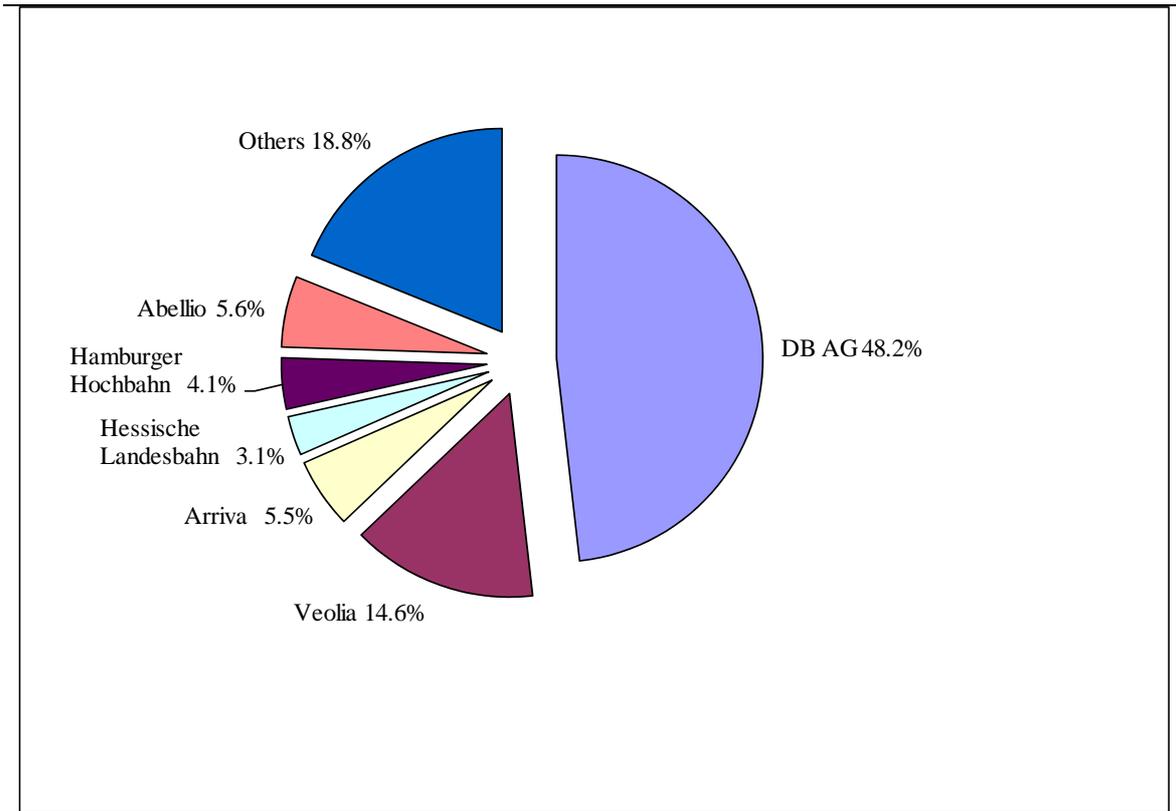
¹³ See Brenck & Mitusch, 2008

State	Conclusion of contract	M Train-km (first year)	Value (bn €)	Duration of contract
Berlin (S-Bahn)	August 2004	32.4	3.0	15 years
Bavaria*	November 2004	98.1	ca. 8.0	10 years ^{e)}
Lower Saxony*	January 2005	5.3 ^{c)}	n.a.	12 years
Saxony**	April 2005	2.6	n.a.	10 years
North Rhine-Westphalia ^{d)*}	June 2005	12.7	1.1	11 years
Bremen**	November 2005	2.4	0.02*	10 years
Hesse**	November 2005	2.4	n.a.	5 years
Bavaria**	November 2005	0.5	n.a.	12 years

a) Rhein-Main-Verkehrsverbund; b) excludes Stuttgart Region; c) Verkehrsverbund Rhein-Ruhr; d) five contracts with different authorities

Out of the publically procured contracts, DB AG won 48% up to 2007 (See Figure 15). The first international player to enter the German RRPS market was the Veolia group. It won roughly 15 % of the competitively tendered services and is the largest competitor to DB AG.

Figure 15. Percentage of train-km won by different RUs (1995-2007)



Source: DB AG, several issues, IGES calculations

4.2. Access to infrastructure

4.2.1 Regional rail passenger services

Representatives of the regional authorities as well as competitors of the DB maintain that the DB AG implicitly or explicitly makes bundle offers linking services derived from its infrastructure ownership to the granting of RRPS contracts by the Federal states (e.g. Leister, 2004, 109ff). The critics claim that infrastructure measures such as electrification, dismantling and maintenance of tracks or the modification and maintenance of railway stations have been directly interlinked with DB's RRPS contract proposals. Apart from the advantage which this gives DB, actual and potential competitors worry about a number of options which DB has to discriminate:

- DB heavily influences the infrastructure investment decisions and the infrastructure pricing;
- the IM has the opportunity to disrupt train services and thus influence directly the operation costs for RUs;
- RUs interested in the tendering processes have to let DB Netz test and certify their plans, sometimes their maintenance plans also hinge on cooperation with DB;

- DB's rolling stock has been partly financed with public money, money which is not available for competitors.

Note that some of these aspects also apply to competition in long-distance passenger.

4.2.2 Long-distance rail passenger services

Access charges are generally considered a problem by market participants. In particular, they complain about the following issues:

- **Level of charges:** many market participants complain that the level of access charges are too high, leading to a systematic disadvantage compared to intermodal competitors. Particularly with regards to traction power, market participants urgently call for this to be supplied by third parties. Currently, a market opening is prevented through transit fees set by DB Energie GmbH.
- **Uncertainty of infrastructure charges:** in general, the levels of access and traction current charges have substantially increased in recent years. Most of the changes came quite unexpectedly. In the light of the importance of infrastructure costs and energy costs this results in a substantial risk for RU's.

It is a general conviction that there is scarcity of paths on the national rail network to run additional regular long-distance trains, particularly at some key nodes. This creates uncertainty whether an entrant's investment in rolling stock and other start-up costs can be recovered in the long run.

In connection with this, the issue of long-term framework contracts between RUs and IMs for track access has attracted some attention, since framework contracts are regarded as a precondition by banks or leasing firms to grant credit. In reality, the legal status of framework contracts is questionable, since track allocation rules are completely described in a German legal ordinance (EIBV) without any reference to framework contracts. However, in view of the obvious importance given to framework contracts by market participants, the timing of these contracts should be improved so as to make them more accessible for new entrants. At the moment, framework contracts can only be made in fixed five-year intervals and have to be used at once. Entrants would need such contracts some two years ahead in order to get finance and order rolling stock.

In any case, the information on train path capacities released by DB Netz AG is criticised by nearly all market participants as being too highly aggregated. The data provided is wholly inadequate for planning purposes. Moreover, the information rights of the regulator BNetzA in track access issues are insufficient to give financiers of rolling stock the confidence that entrants will effectively have equal rights to track access.

In general, access to other infrastructure institutions (like maintenance facilities) presents few problems; however, some market participants complain about difficult maintenance procedures. This is due to the fact that whole trains need to be maintained. Hence, facilities for regional passenger transport cannot be used. A particular problem in this regard is that third parties' services offered in this context are available only to a minor extent across Germany.

4.3. Access to rolling stock & financing

4.3.1 Regional rail passenger services

A potential hindrance for RUs wanting to enter the regional passenger market is the availability of rolling stock. According to studies, 49% of contracts require the bidders to provide new rolling stock (Brenck/Peter, 2007). Other contracts require a maximum age of these assets at the start of the services or during the entire contract duration. Only 24 % of the contracts exhibit no requirements for the age of the rolling stock. Consequently, the cost of capital of rolling stock amounts to 18% of the total cost of providing a service (including track and station charges) (Laeger, 2004). Taking into account that nearly all contracts regard track and station charges as pass-through cost components, these figure raises to 30-34 % (Laeger, 2004).

The lifetime of the rolling stock is longer than that of the franchises. This causes an investment risk for the RUs. At the moment, there are limited possibilities to deploy used coaches, although the attitude of the special regional authorities seems to be changing in the face of tighter budgets. Regional authorities choose four ways in order to mitigate this investment risk for the bidders:

- some public authorities have set up rolling stock pools for parts of their rail traffic or act as leasing company;
- an instrument which is more often found in service contracts are takeover-guarantees for the rolling stock, in this case the contracts contain provisions to pass rolling stock on to the next service provider at the end of the franchise;
- guarantees for the residual value of the rolling stock are a rather new instrument, in this case the regional authorities offer to take over the rolling stock at the end of the franchise at an agreed price;
- some authorities support the RUs with financial means for the buying of rolling stock

Some RUs have raised concerns about obligatory public rolling stock pools. They argue that the characteristics of the trains are part of their own product strategy. Others claim comparative advantages in the financing of rolling stock. A further possibility for the RUs to ease their investment risk is the growing activity of private rolling stock pools in Germany. There is limited information about the influence of financing risks on the number of bidders. In a recent study, Beck found no evidence for a positive relationship between the number of bidders and the use of rolling stock pools or residual value guarantees (Beck, 2005), a finding which is confirmed by the Consortium's data. This result is rather surprising given the importance of capital costs for a RU in the RRPS.

Residual value guarantees can help RUs to get a bank loan and public rolling stock pools do even more than that. If there is no financing problem it might reflect the fact that there are some big international companies in the German market and on the other hand a lot of smaller RUs which are publicly owned and backed by states or local governments.

4.3.2 Long-distance rail passenger services

In LRPS, there are similar problems as in RRPS, but there are no regional authorities requiring new rolling stock, helping either in obtaining rolling stock or by reducing long-term risks. The absence of well-developed international markets for used rolling stock in long-distance passenger is one of the biggest entry barriers in this market. According to market participants, the existence of different national processes and philosophies for the certification of rolling stock still inhibits the use of rolling stock from other Member States, even if Cross Acceptance Memorandums of Understanding exist. Some experts also claim that TSI norms for passenger rolling stock (as opposed to freight rolling stock) are not that well developed, which may be an obstacle to the planned simplification of certification of railway vehicles.¹⁴

As stated above, the industry appears to have developed the conviction that long-term framework contracts to track access are a kind of assurance for the long-term use of rolling stock. But framework contracts would need to be institutionally tailored to the needs of new entrants, which they are not at present.

4.4. Access to ancillary services

Access to commercial facilities (e.g. ticketing systems, station advertising etc.) and the access to information, the issues are similar in RRPS and LRPS, although long-distance rail passenger service is probably more vulnerable to them.

Competitors seek to avoid using the existing distribution channels of DB AG; instead they make use of the following distribution channels:

- distribution via the Internet;
- on-board sales on trains;
- call centre distribution;
- distribution via ticket machines in stations.

The use of such diverse strategies has different reasons:

- ticket counters currently available in stations belong to the incumbent DB Fernverkehr, as a consequence, these facilities cannot be rented by competitors, attempts to rent its own facilities in stations by a new entrant RU often fails due to the fact that such facilities are either not available or need to be rented in form of a whole floor;
- a co-sale through DB AG is only regulated for RRPS but not for LRPS. Moreover, DB charges fees of 15-16%, which makes it rather unattractive for a competitor;

¹⁴ See e.g. Starlinger, Alois: Der Einfluss der Interoperabilität auf die Zulassung von Schienenfahrzeugen, presentation 13 November 2009. http://www.suissetraffic.ch/Portaldata/10/Resource/dokumente/fachtagungen/interoperabilitaet/Einfluss_Starlinger.pdf

- reportedly, shops in railway stations do not sell tickets of competitors since this is prohibited to them by their rental contract with DB's Station & Service (the DB subsidiary that runs all passenger stations).

The disadvantages that competitors face in gaining access to information concerns not only the information about train path capacities (see above) but also the information regarding demand data. With regards to both issues potential and current competitors have systematic disadvantages. This is due to the fact that the DB AG possesses sales data and information from reservation systems, passenger counts and surveys as well as from its own panels. This data forms an important basis for DB AG's service planning.

5. Market Entry Strategies

5.1. Market entry in regional rail passenger service markets

Due to the tender policy, the RRPS market is characterised by completely different options (e.g. bidding strategies) compared to the open access market of LRPS. There is no standard contract for RRPS in Germany. Even within a single state there are sometimes different types of contract. This holds for the service definition as well. This is likely to increase the costs of bidding and tendering. However, some general observation can be made:

- **Operational factors** (routes, running time, frequency, first and last services, etc.): The majority of contracts leave almost no operational decisions to the RUs. An analysis of vital elements of contracts concerning tariffs (e.g. different fare types, through-ticketing), the timetabling (e.g. service frequency, daily hours of operation) and the rolling stock (e.g. personnel, equipment) found that 29% of contracts specified requirements precisely and 71% required minimum standards to be met (Brenck & Peter, 2007). Often, an offer to exceed the predetermined standards is not taken into account in the awarding process. In negotiation procedures, minimum standards (and more degrees of freedom) are more often to be found than in open tenders. One reason for this is the legal status of both procedures.

A central reason for the strict policies is the introduction of synchronised timetables by several German states. The coordination of bus systems and intercity rail traffic with RRPS restricts the ability to make individual decisions by RUs. The regional authorities usually have strict requirements to be met for the intra- and intermodal interchanges. They grant less freedom to the RUs in the departing times of the first and last daily services.

Additionally, synchronised timetables can also severely reduce available infrastructure capacity, complicating the introduction of additional trains, and limit the scope for profitable additional services.

- **Pricing decisions** of RUs are also severely restricted. Public transport associations offer “one stop shops” to public transport users and have set up integrated RRPS offers or at least require RUs to accept tickets of other local public transport modes respectively to offer tickets which are also applicable for other local public transport modes. Consequently, RUs have only very limited possibilities to implement innovative, profit-maximising tariff systems.

Additionally, tariffs of DB still play an important role. Generally, for inter-regional services crossing the borders of public authorities as well as for combinations of regional and long-distance services tariffs of DB are used to secure degressive tariffs (average price decreases with increasing travel distances) and acceptance of tickets. While a dedicated organisation, Tarifverband der Bundeseigenen und Nichtbundeseigenen Eisenbahnen in Deutschland, has been set up to coordinate tariffs, the Association of the German Public Authorities and competitors claim, that actually DB tariffs simply have to be accepted (see also section 6).

- **Informational advantage:** Demand and ticket-sale information is of importance when it comes to so-called “net cost contracts”. Under these contracts the RU keeps ticket revenues and the specific regional authority only pays the difference between

revenues and costs. In this case, demand information plays a crucial role in the bidding process. Although some of this information is made available with the call for tender the present operator, which will normally be DB Regio, has an advantage since it possesses the most detailed information on demand and an area-wide ticket sales system. Recently, DB Regio has announced to follow a more open policy with respect to information sharing.

The vast majority of non-DB operators do not conduct any regular RRPS but work as contractors or as seasonal holiday operators. The remainder of the competitors can be subdivided in three strategic groups: (i) national publicly owned RUs, (ii) national privately owned RUs and (iii) international players. These competitors use two different business models:

1. The first group are small and medium sized firms with regional or railway-related skills, their expertise and organisational flexibility allows them to offer cheap and high quality train-services. However, it prevents them from taking part in larger, more complex tenders. The strategic focus of these operators is the delivery of carrier-functions in minor networks or co-operation with operators, which can compensate for the handicaps described.
2. The other group consists of management-orientated, often internationally focussed operators. The organisation of transport undertakings, transport services, and a keen market-orientated approach are the strengths of these companies. They are also able to acquire regional and special operational skills, either by transfer of their international experiences or by acquisition of regional RUs. These operators are in the position to conduct complex train-services with an adjusted, cost-focussed approach.

The strategic orientation for DB is different from its competitors: DB focuses on the delivery of complex train-service solutions with a strong interconnection to its other, more comprehensive services (mainly passenger transport, but ultimately offering their broad portfolio of logistic services).

5.2. Market entry in long-distance rail passenger service markets

In order to assess entry strategies by potential entrants, one has to consider the strategic opportunities of the incumbent DB Fernverkehr to react to such entry. It appears to be necessary to distinguish between two different segments of the long-distance passenger market:

- The core network connecting the large German cities
- The peripheries connecting medium-sized cities with the core

There are several reasons why DB Fernverkehr cannot react very flexibly to an entry in the core network. DB Fernverkehr is constrained by network considerations for its train scheduling. After an entry (say on the route Berlin-Hannover), DB Fernverkehr cannot easily remove a train from that route if this train has important functions to bring passengers to other commuting trains of DB Fernverkehr or take passengers from them. Relying on the competitor's train in this connection can be dangerous: the competitor might not want to facilitate the transfer of passengers by aligning timetables. Note that some passengers do not

require to change trains where appropriate DB Fernverkehr train still run (in the example, the train may continue to Köln, so that passengers Berlin-Köln will not have to change trains if DB Fernverkehr keeps up its service on the whole route Berlin-Hannover-Köln). Moreover, if it retreats from a route DB Fernverkehr would become dependent on the cooperation with the competitor regarding price setting. In the event of the competitor not co-operating, it might set a monopoly price after the retreat of the DB Fernverkehr. Also, if DB Fernverkehr reduces frequency or duration of its services on the competing route, it would reduce the attractiveness of the DB BahnCard or other special offers. It might be easier to introduce additional trains to compete more strongly with entrants, however, that will be costly as well unless rolling stock is in abundance.

Inflexibility of DB Fernverkehr on the core network also extends to the setting of prices. When an entrant starts to compete on a route, DB might want to react by cutting prices on that particular route; however, this can upset a coherent price system that DB Fernverkehr wants to follow. For example, reducing price on the Berlin-Hannover section (due to competition there) and leaving the price unchanged on the Hannover-Köln section (because the competitor does not go there) can have result that sales of through Berlin-Köln tickets decline, due to passengers preferring to buy the cheaper combination of two tickets (Berlin-Hannover and Hannover-Köln). Note that many passengers dislike changing trains (which also imports the risk of delays and missed connections) so that the best response of DB Fernverkehr to market entry on the Berlin-Hannover route might be to change price on that route only a bit and focus on passengers travelling between Berlin-Köln and Hannover-Köln. Such interdependencies arise quite likely in an integrated network, so that DB Fernverkehr's responsiveness to a selective entry is likely to be rather small.

There are some additional, related reasons for the inflexibility of DB Fernverkehr in the core network. One is the complexity of an overall optimisation in a meshed network. In the above example, DB Fernverkehr could adjust all three prices to a market entrant. In other examples it will be even more than three. However, finding an optimum with many market prices in many markets simultaneously is difficult. Usually this can only be achieved as a result of a long-run process. This will lead to some basic inertia in DB Fernverkehr's reactions to an entrant. In a similar vein, DB Fernverkehr also lacks the empirical information to evaluate the effects of rather large price movements. Although there is substantial experience in DB Fernverkehr about demand and its characteristics that can be used to refine a complex system, the ability to forecast the effects of substantial and simultaneous price changes in many interdependent markets is remote.

Finally, DB Fernverkehr as the dominant player is also constrained by the public and politics. In recent years attempts to raise prices or change the long-distance network have been heavily criticised leading to their abandonment. This also restricts DB's flexibility. (In the above example, DB Fernverkehr might want to increase the price on Hannover-Köln to compensate for the losses on the Berlin-Hannover segment. However, public pressure might prevent it from doing so.)

What does this imply for a competitor considering entry to a part of the core network? It knows that it will very unlikely be able to drive out the incumbent from this segment in any way. On the other hand, if it offers an attractive price, it is not likely that it will face an aggressive "price war" from DB AG either. Thus, the new entrant can calculate pretty much on the assumption that an entry will cause little reaction. If the train is profitable on the basis of the current data, it might well be worth the while to try and enter.

A market entry into the core network could still take the form of avoiding competitive pressure if the entrant chooses a low speed low price strategy with stops at every small city. On the other hand, a competitor can also enter in the high-speed rail sector (i.e. speeds > 200 km/h) offering services between major cities and agglomerations. Such an entry would be a direct attack by the entrant on the core network of DB Fern and its ICE/IC services.

Entry in the peripheries of the network takes place in a different strategic environment. In contrast to the core network, DB Fernverkehr is in the peripheries quite flexible and hence not easy to predict in its behaviour. It may well be that DB Fernverkehr moves out on a route once a competitor has moved in. This could be expected on routes that are not profitable for DB Fernverkehr. In fact, DB Fernverkehr might even invite such entry and offer co-operation. This would match its strategy in rail freight in some instances. On the other hand, DB Fernverkehr can also decide to cut prices in order to fight the competitor, without strong repercussions on its core network.

Thus, entrants are probably faced with greater uncertainties in the peripheries. They will probably try to find niches not yet covered by DB Fernverkehr in a decent quality, where DB Fernverkehr is likely to retreat or not tries to improve as a response. On a larger scale this would need some cooperation with DB Fernverkehr to clarify where the latter retreats.

For customers the result of entry in the peripheries is minor, since competition does not increase if the incumbent retreats, or if he drives out the entrant. It might, however, be that entrants offer different qualities than DB Fernverkehr so that customers get more choices or a higher frequency of services.

Representatives of DB are sceptical about the economic viability of on-route competition even without strategic actions of the incumbent. They stress especially two points: the size of the markets might be too small and intermodal competition is of central importance; thus competition that reduces the attractiveness of the rail system, e.g. if tickets are not inter-available, could be counterproductive.

5.3. Market entry in international rail passenger service markets

DB participates, as discussed in Section 4 of the main report (Cabotage), in a network of bilateral agreements and joint ventures with foreign RUs. According to DB, international alliances are of central importance since;

- they offer cost advantages (better utilisation of e.g. rolling stock, distribution channels, personnel),
- reduce entry barriers (track access rights, protection of public services), and
- avoid on-track competition that may reduce the attractiveness of rail services compared to other modes.

Accordingly, cooperative entry is the mode DB prefers for its own services and the entry mode it expects to be used by other RUs entering the German Market.

6. 'Network' Issues

Network issues require some form of implicit or explicit co-operation as soon as several companies or decision makers are involved. In Germany, some network issues are explicitly taken on in the General Law on Railways (AEG):

- § 12 I AEG establishes an obligation for all RUs to co-operate in setting up: (1) a distribution system for integrated 'through tickets' for a journey, i.e. possibility to book and purchase an entire trip on a single occasion, irrespective of which companies provide services for the various parts of the journey, (2) inter-ticketing (acceptance of tickets issued by other companies and safeguarding of distance related rebate systems).
- § 12 III AEG places duties on all RUs to obtain a permit for their terms of business and tariffs. The Federal Government has to permit the terms of business (not tariffs) of its long-distance passenger services. The Federal States have to permit terms and tariffs of regional rail passenger services.
- § 12 VIII AEG obliges every RU to provide information about all connecting trains (not about tariffs) in a non-discriminatory way in their travel information systems.

There are no further laws on or regulation of network issues. Consequently, there is no centralised coordination of services, tariffs or other service dimensions (e.g. handling of lost property). Nevertheless, co-ordination of services, tariffs and terms takes place within the areas controlled by the public regional authorities and, to a lesser extent, between them.

Additionally, several companies and public authorities have (coordinated by the VDV, the Association of German Transport Companies) set up initiatives to raise the attractiveness of rail and bus services as a whole (e.g. Electronic Fare Management, Integration Interface for Automatic Vehicle Management Systems, etc)¹⁵.

Currently, two network issues are under intensive discussion: the implementation of § 12 I AEG and service coordination between long-distance and regional passenger services. The public authorities responsible for regional services and the non-DB RUs that participate in that market claim that the current ticketing system gives DB an advantage. Since DB, as the most important RU, is the only company that can provide nation-wide connections, every other RU has to contract with DB Vertrieb GmbH in order to fulfil the requirements of § 12 I AEG (usually, also the tendered public service contracts require this). While it is possible for a RU to implement an own distribution system for its own services (at least as long as public authorities have not excluded this in their tender specifications), selling of tickets that reach beyond requires the use of DB's distribution system to assure that the tickets are accepted. And this means, that competitors have to accept the contractual terms DB Vertrieb GmbH demands. The Association of the German Public Authorities claims that this has given DB the power to establish a non-transparent process (e.g. determination of distribution margin, handling of revenue sharing) and to decide on tariffs that are of central importance for the system.¹⁶

¹⁵ See http://www.vdv.de/en/wir_ueber_uns/vdv_projekte/index.html?pe_id=46.

¹⁶ See BAG-SPNV (2007): Diskriminierungspotenziale durch Tarif und Vertrieb im SPNV beseitigen!, 18.12.2007.

The Public Authorities also complain that DB Fernverkehr is unwilling to cooperate with them by, stating that information flows are insufficient and that cooperative design of services almost impossible.

7. Additional remarks: Further developments

There are three fields of regulatory options for further market opening in German rail passenger transport:

1. Further development of infrastructure regulation
2. Further opening up of RRPS markets
3. Fundamental or incremental changes in the LRPS markets

These issues will be addressed in turn.

7.1. Further development of infrastructure regulation

As set out in Section 2, the regulatory setup is still evolving. To date the legal rights of the regulator BNetzA are insufficient and inadequate, particularly the simplistic and cost-based rules for regulating infrastructure charges. Therefore, it is currently discussed to replace this regulatory setup by a modern, benchmark-based *incentive regulation*, as is already in place in other regulated sectors. The regulator's rights to demand information are inadequate for both aspects of his job: the prevention of discriminatory access to network and stations (at given prices, since in railways there are many issues of non-price discrimination) as well as the regulation of access charges. Moreover, the supply of energy also has to be opened, mainly by regulating the access charges to the energy networks currently run by DB Energie.

In a broader sense, infrastructure regulation also encompasses the further development of the long-term contract *LuFV* between government and DB AG. In this contract the state provides financing and the DB guarantees to keep the infrastructure to a defined quality. In future, the defined quality needs to be specified in more detail by choosing more adequate quality measures (e.g. also covering bridges and tunnels), moreover, the quality measurements and particularly the system of sanctions need to be strengthened and designed in a credible manner.

Finally, the privatisation of almost 25% of the transport holding DB ML is due. Once this is done, the ties between infrastructure and transport will probably loosen a bit. Further steps will be needed afterwards.

7.2. Further opening up of RRPS markets

The German regional railway passenger franchise market has witnessed a gradual market opening during the last decade. In the coming years, many major contracts will expire, there are also some ongoing contracts stipulating that larger parts will have to be tendered in the meantime. It is likely that DB will lose market share in this process. However, it is now the right moment, before the wave of renewals is through, to think about measures to improve the opening of this market. Two issues are predominant: firstly, the use of open tenders instead of direct contracting should be insisted on; and secondly, tying infrastructure measures by DB AG to the granting of RRPS contracts to DB ML, be it explicit or implicit, must be eliminated.

The second issue is clearly the more complicated one, since the "tying" can be extraordinarily implicit. For example, a Federal State may just think that granting RRPS to DB Regio may be "helpful" for the negotiations scheduled for next year with DB Station&Service about

renewal of train stations. As long as there is vertical integration, the “tying” may simply be in the heads of politicians, and very effectively discriminate against competitors. Note that the regulatory agencies (BNetzA and EBA) have no say about the franchise processes, currently, only the courts can evaluate franchise rules.

Note also, that tying will not be removed by a 25% privatisation of DB ML. First, the upper holding DB AG will still be concerned about its 75% subsidiary; in fact, that subsidiary with its logistics branch will be the part where all the free cash flow of the corporate company will go for further growth and investments. Moreover, there is ample room for side-contracting between the two companies. For example, if DB Station&Service makes a concession in order to push an RRPS contract for DB Regio (of DB ML), then DB ML can in return agree to an increase of infrastructure charges which it will have to pay (and which will hit competitors in particular). Apart of that, there are many common functions (like employee training and other) within the corporate company which can be used for hidden transfers.

7.3.Fundamental or incremental changes in the LRPS markets

The German experience in LRPS raises the question why on-track competition has not developed during the past one and a half decades. Or, more to the point: why has not even a 10-20 percent market share of competitors developed, as in the other market segments (regional passenger and freight)?

There are some pure market-explanations, which are emphasised by DB AG, such as:

- economies of scale, including network effects
- limited demand compared to entry cost, including effects of intermodal competition.

There are certainly scale effects in long-distance passenger, for example concerning workshops and buyer power. There are definitely also network effects, due to train changing possibilities that are possible in a large network and in particular the pricing opportunities (like BahnCard) that give rise to price-induced network externalities for a single firm. Moreover, entry costs are quite high in high-speed transport so that demand may fail to finance operations of several companies. This is aggravated when intermodal competition is present. Although long-distance bus traffic is restricted in Germany (in order to protect rail), there is competition by car and air traffic, with low cost carriers in particular being identified by DB as main competitors. Moreover, the new German government also announced to lift the restrictions on long-distance bus traffic, which would introduce bus v rail competition.

If the reason for the absence of competition observed lies solely in economies of scale and network effects, one could not hope for competition to develop in future. Long-distance passenger markets would then be a candidate for direct regulation and public management. If one also takes the opinion that market coverage by DB is not sufficient, the natural conclusion is that at least some traffic should be subsidised and that a system of planning and tendering regulated traffic is warranted. This is exactly the conclusion and position of the “*Deutschlandtakt*” campaign that is currently going on in Germany. The new government has promised to give this position a thorough consideration.

If, on the other hand, the reason for the absence of competition observed lies not only in economies of scale and network effects, but also in the strength of intermodal competition, one could also not hope for competition to develop in the future. However, if the effect of

intermodal competition is considered to be strong, the need for regulation and public tendering becomes weaker. One may even go further and say that the economics of scale and network effects are important protective elements of railways as such, in order to meet the challenge of intermodal competition. Not surprisingly, this is exactly the position of DB AG.

However, there is also indication that on-track competition in LRPS can develop in future, at least up to a market share of, say, 10-20 percent. Correspondingly, some particular and potentially non-permanent reasons can be given why such competition has not developed so far:

- during the first decade after the reform of 1994 there were quite substantial handicaps for competitors, for example, train path availability, equal treatment at stations, and availability of qualitative rolling stock were all unsatisfactory. It was the effort by Inter Connex to act as a pioneer in many respects and, by several legal challenges, to pave the way for future entrants:
- in the beginning it was difficult to obtain rolling stock: DB AG refused to sell its excess stock of passenger coaches, and international leasing firms were not trading in Germany, or had no experience with the German market;
- in the beginning the degree of market coverage by DB AG was even stronger than today, until the system of InterRegio (IR) was abolished.
- during the first decade after the reform, the other two markets (regional and freight) were simply more attractive than long-distance: it is completely natural that new entrants focused on the markets with the best entry conditions first, and that they don't do everything at the same time. Regional passenger markets were much easier to enter for the following reasons:
 - After the Act of Regionalisation there was ample money in this market. There was nothing comparable in the long-distance market.
 - Although DB AG exerted its full influence on Federal States to grant traffic contracts to its subsidiary DB Regio AG, there were some States that could not be convinced. Some of them were even determined to change the transport provider. In these cases entrants faced favourable conditions: Low uncertainty about revenues, about access financing and rolling stock, low uncertainty about track access, low risks of strategic behaviour by DB. All this was in contrast to long-distance markets.
 - Finally, some public companies, owned by Federal States, were allowed and enabled to participate in the RRPS market as competitors to DB AG;
- similarly, freight transport markets were much easier to enter than long-distance passenger markets for the following reasons:
 - market entry is quite simple in block train freight traffic: the business is fairly easy; availability of rolling stock was a problem, but not too grave; track access is usually less of a problem, since freight trains are variable with respect to time schedule and exact route;
 - until recently, international freight transport volume grew at unprecedented rates, as a result of globalisation and containerisation, in particular long-

distance freight traffic from the big North Sea ports grew, this traffic suited block trains. For a potential entrant it is always preferable to choose a growing market rather than a stagnating one such as LRPS;

- some ports even helped to set up new rail freight companies in order to assure their connections with the hinterland in competition to other ports.

Note that these reasons favouring entry into regional and freight markets are (partly) valid today, but have nothing to do with the long-distance passenger market *per se*. There are good reasons why potential entrants focused on the other market segments *at first*, but nonetheless, long-distance passenger markets can also promise some profits for a suitable entrant.

And indeed, at present, two companies are considering entry into the German long-distance passenger market on a larger scale. One is Keolis, a French company owned by SNCF (57%), Investors (41%), and its management,¹⁷ which has already been active in the regional passenger markets. The other one is Locomore, a new German start-up that plans to specialise in long-distance traffic in Germany as competitor of DB.

In view of this, one can at least take the view that the open access regime still has a chance to lead to some intra-modal competition in the long run, although in near future, most of the potential competitors will again focus on RRPS markets due to the large lots that will be coming to the market there.

If one sticks to the open access regime, the most important further options to open up markets in LRPS in Germany are the ones mentioned above under "Further development of infrastructure regulation". This would include a reform of the instrument of framework contracts, which should be tailored to the needs of new entrants. In addition, further work on the interoperability of rolling stock in Europe and the development of secondary markets are an important issue that should be addressed by European policy measures. In particular, a strengthening of TSIs for passenger rolling stock would be beneficial, to replace the national fragmentation and the institutional hurdles to import secondhand rolling stock from another country. Within Germany, the access to marketing systems of DB would be a further issue of consideration.

¹⁷ See http://www.keolis.de/no_cache/news-medien/aktuelles/detailansicht/article/17/fusion_von_keolis_und_effia_abgeschlossen.html

8. Summary & Conclusions

8.1. Qualitative

The restructuring of DB had widespread public support and is, from a management perspective, approaching completion. Despite the allowance of open access as early as 1994, the German approach can best be characterised as a gradual one: the regulatory system has been developed step by step over the last fifteen years, and major revisions are just frequently discussed. For regional passenger services, a new institutional infrastructure (public authorities) and a new financial system were implemented quite early (1996). However, the use of competitive tendering has evolved only slowly, while direct award of public service contracts secured the financial viability of the incumbent.

What are the lessons to be learned?

- Rail restructuring in Germany required massive financial public support, which was aggravated by the unique problem of German reunification. The transfer of historic debt and employees from DB to Government as well as the creation of the regionalisation fund was necessary to for clear allocation of roles: DB as a commercially oriented, although publicly owned enterprise; government as purchaser of services and as regulator. Additionally, the public support gave restructuring a smooth passage, e.g. the use of job security contracts by DB.
- The **regional rail passenger market** is now dominated by public service contracts. Due to the financial support, but also due to the evolving competency of the public authorities, this segment has achieved stable traffic growth. Public service contracts are now much more sophisticated than at the beginning of regionalisation, comprising regular interval timetables, new tariff systems, targets on service quality, bonus-malus-schemes and so on.

The use of competitive tendering, though still limited, has also proved successful. Public authorities' costs per train-km have declined significantly; the authorities have used this effect to further improve quality. Some large competitors have established themselves, and the incumbent is gradually, but consistently losing market share. The degree of competitiveness would be considerably strengthened if the vertical ties between the infrastructure manager and DB Regio were loosened, so that tie-sales would be reduced. The Consortium considers that stricter rules forcing federal states to use more competitive instruments when awarding PSO contracts would also be helpful.

Accordingly, a key conclusion of the German Case is that not only can rail reform secure public services but that it can even improve them.

- The **long-distance passenger market** is characterised by open access and the absence of public service obligations. Since 1994, the incumbent RU has restructured its services comprehensively, introducing new services (especially high speed ICE-services), a new tariff system and so on. The commercialisation of DB has resulted in some economic successes, but also in the downgrade of several services. Whether PSOs are also required for this market segment is a point currently under discussion in Germany.

It is notable that despite open access rights almost no new entrant open access RUs have emerged so far. Several reasons can be given, e.g. regulatory uncertainty (mirroring the evolving regulatory system), the strong market position of the incumbent, and commercial risk of entry.

In future, it is considered to be plausible that some on-track competition will finally evolve in Germany, if the general regulatory environment were to be improved along the following lines:

- stricter access regulation with improved information rights for the regulator about the allocation of slots, which would reduce entrants' and their financiers' uncertainties about the practical realities of access;
- adaptation of framework contracts to the needs of entrants would help in the same way;
- more effective regulation of access charges is also important, particularly since access charges are comparatively high in Germany (by Western European standards);
- improved interoperability, based on a strengthening of TSI norms, would greatly improve the availability of rolling stock for entrants;
- access to DB's marketing systems would further improve conditions for new entrants.

Overall, open access is clearly not an easy approach and requires a sound implementation of regulatory principles and a commercially attractive environment if it is to succeed.

8.2. Quantitative

8.2.1 Raw data

The following summation of key quantitative measures distinguishes between regional and long-distance rail passenger services. Several circumstances impede the quantitative assessment:

- some information for the years preceding restructuring of the rail system in 1994 is not available, including differentiated price statistics (published since 1995) and service frequencies (published since 2000);
- before the rail reform, almost all DB activities were quite heavily in deficit; however, public funds were not strictly assigned to infrastructure and the individual transport services (freight, regional and long-distance passenger), thus, the development of public funding for passenger services cannot be traced back;
- classifications and methods of several statistics have been changed over the period examined, this is relevant for passenger volume and modal split.

For these reasons, the following quantitative information should be viewed and used quite cautiously. Please also note that different time periods had to be used to illustrate different

developments, reflecting the availability of data. Additionally, 1995 has been used as the year before the implementation of the Regionalisation Act, as the base year, although the rail reform commenced in 1994; again, this reflects the availability of data.

Between 1995 and 2007 regional services developed as follows:

- Passenger volume has increased by 30%.
- Modal share has increased from 3.4% to 4.1% (a relative improvement of 19%).
- Fare level has increased (inflation-corrected) by 50%; with a ten per cent increase in 1995 alone, so the result is very sensitive against the choice of the base year. Compared to the consumer price index for car use the fare level increased by 34%.
- Service frequency, measured as train-km, has increased by 27.7% between 1994 and 2007.
- The level of public support of regional rail services has increased by 8% between 1997 and 2007 (total amount of Regionalisation Funds, i.e. including money spend on purposes other than regional rail services).

In long-distance rail passenger services, the following changes occurred between 1995 and 2007:

- Passenger volume has declined by 4%.
- Modal share has declined from 3.5% to 3.1% (a relative decline of 12%).
- Fare levels have increased (inflation-corrected) by 15.5%, it is interesting to note that fare increases almost exactly mirrored the increase of the consumer price index for car use.
- Service frequency of DB AG, measured as train-km, declined by 15% between 2000 and 2008.
- In terms of public support, the profitability of long-distance passenger which has turned from an unquantifiable, but nonetheless substantial deficit before 1994 into a current surplus.

The disparity in performance between the regional segment (operated under public service contracts) and the long-distance segment (open access) is stark. Parts of the network on which rail services have been procured by competitive tendering of public service contracts have performed vastly better in terms of ridership and service level than parts of the network operated under open access: the former expanding considerably while the latter has declined (it should be noted that to a certain extent this simply reflects “redefinitions” between the two segments). Conversely the parts of the network operated under open access exhibited a lower fare increase than where operation was by means of public service contracts, and also has reduced deficits drastically, while the network operated under public service contracts requires heavy public support. As such, the German case shows that to forego intra-modal competition does not secure the provision of unprofitable, but socially beneficial services.

These services can only be protected on a contractual basis between public authorities and an RU, but this contractual basis also allows the introduction of competition for the market.

8.2.2 Adjusted data

As outlined in the case study, the quantitative development described in the previous section has been the result of at least four major developments:

- the organisational and financial restructuring of DB (including, DR, the former East German Railway);
- regionalisation;
- change of governance structure, i.e. formal privatisation of DB and introduction of a regulatory system;
- liberalisation, i.e. allowance of open access and increasing importance of competitive awarding of regional rail passenger services.

To disentangle the influence these developments had on the quantitative changes mentioned above is almost impossible. Additionally, general market trends (e.g. as general traffic growth) that are at least partially, although clearly not totally exogenous interfere with politically induced changes. Thirdly, the quality indicator used (service frequency) is a poor measure for quality since it ignores several further dimensions of quality, e.g. synchronised timetables, quality of rolling stock and so on.

To get an impression of the development one could expect if a similar reform would be implemented in other Member States the following evaluations might be helpful:

- Most public authorities report significant cost reductions in the costs of regional passenger services if competitive tenders are used. Experience in Germany would suggest a cost reduction per train-km of 17% as a conservative assumption.

Whether this cost reduction is used to reduce public funding and/or lower fares and/or to increase quality (service frequency or other quality dimensions, e.g. new rolling stock, introduction of synchronised timetables and so on) is a political decision. It also has to be noted that due to the deficits that are generally realised in this market segment fare level changes also reflect rather political decisions. Due to the inherently political nature of these decisions no general conclusions can be drawn but, naturally, one can look at different scenarios.

If one assumes, that public funding is not reduced, the achievable cost reduction allows a notable increase in quality, e.g. an increase by 17% of service frequency without increasing fare levels. Pending on the elasticity of demand this will translate into a higher passenger volume and modal share. These elasticities depend on a whole raft of factors (e.g. level of services already offered and all factors that determine the relative attractiveness of rail services like total journey time and costs, punctuality and so on) and can only be determined for a specific country. While the results for Germany are inconclusive (this simply reflects that the elasticity depends on several factors) empirical studies are rare one can conservatively, i.e. if no country-specific information is available assume values for the elasticity between 0.75

(metropolitan areas) and 1.5 (rural areas);¹⁸ accordingly, an increase of frequency by 17% can result in an increase of passenger volume by 13% - 26%. Higher elasticities can and should be used if it is plausible that additional quality improvements can be expected.

- In long-distance passenger markets, the German example first of all shows that entry is dependent on a whole raft of conditions. The last fourteen years of open access to the German market have had almost no effect at all. Nevertheless, based on the current situation (declarations of several RUs that they are interested in entry) and the Consortium's interviews it is considered that it is likely, that a small but significant development can be expected if open access is implemented in other countries.

Relying on the experiences in Germany, one cannot expect that the service frequency (measured by train-km) to increase by more than 2% in the foreseeable future. But, again, a general number can hardly be defended since the level of entry depends, beside the regulatory regime, especially on the degree of market coverage realised by the incumbent, his efficiency and his perceived aggressiveness. Entrants will usually have to undercut the incumbent's price level, so the fare level will decrease, but only slightly (due to the small scale of entry).

The development of the passenger volume mainly depends on the degree of product differentiation and the pricing decisions of the entrants. Again, to convert service frequency into passenger volume one can make use of demand elasticities. Plausible values for the price and service frequency elasticity are -0.6 and 1 respectively. Without any country-specific information available and assuming an increase in service frequency by 2% and a price decrease (entrants) of 10% one could deduct an increase of passenger volume by 2.12%.¹⁹ The entrant's strategy has to be backed by a cost advantage (cost per train-km) to be profitable; in Germany, such an advantage will first of all result from better adapted rolling stock; here, an advantage of 10% is assumed by the Consortium.

The Consortium considers that the applicable changes that one could infer from experience in Germany of introducing a franchising process for regional rail passenger services in another EU state on the industry's performance in 2020 would be as follows:

Passenger volume change	+20 %
Modal share change	+19 %
Fare level change	0 %
Service frequency change	+17 %
Productivity improvement	+17 %

Concerning long-distance passenger services, the case study has shown, that barriers to entry may result in very few entries after formally opening the market; and it has been shown, that adjustments made by the incumbent, i.e. re-organisation of services to improve profits, can

¹⁸ All elasticity values are taken from R. Balcombe et al.: The Demand for Public Transport, TRL Report TRL593, 2004.

¹⁹ This only holds for very restrictive assumptions: (1) No interaction between the elasticities. (2) Same loading factor on all routes. (3) No competitive reactions by the incumbent.

result in a decrease of passenger volume and modal share. So, to give an impression of possible market changes due to open access solely, it assumed herein, that entry barriers caused by regulation are removed instantaneously and that efforts of the incumbent to re-organise its services (i.e. efforts that are not caused by open access, but commercialisation) do not appear²⁰:

Passenger volume change	+2.1%
Modal share change	+2.0%
Fare level change	-0.2 %
Service frequency change	+2.0%
Productivity improvement	< 0.2%

²⁰ All values are given for the total market segment; i.e. incumbent's and entrant's services, an addition assumption has been that rail had a modal share of 3.2% originally.