

Rail Restructuring in Germany —8 Years Later

Heike Link

Germany's national rail companies Deutsche Bundesbahn (DB in western Germany) and Deutsche Reichsbahn (DR in eastern Germany) saw fundamental restructuring in 1994, creating Deutsche Bahn AG (DB AG). It has already been 8 years since the restructuring and it is time to evaluate the outcomes. Apart from analyzing the general performance of DB AG, this article discusses separation of operations and infrastructure as well as experiences of open network access and on-track competition.

The Reform Measures

The German railway reform was intended to be a 10-year process as outlined below:

- Foundation of DB AG as a private-sector company in 1994
- Institutional separation of infrastructure and transport
- Opening of rail network to third parties with payment of track charges
- Assumption of federal responsibility for investment in rail infrastructure
- Financial refloating measures by federal government
- Transfer of responsibility for suburban

passenger transport to federal states from 1996 onwards

Details of these first measures have been described previously (*JRTR* 2, pp. 19–22) so this article only discusses further measures and amendments in the last 8 years.

Right from the start, separation of infrastructure and operations caused remarkable political discussion in Germany, especially because different EU Member States have adopted different practical solutions since 1994. While EU Directive 91/440/EEC obliges all Member States to separate tracks and operations at least at accounting level, the original intent of the Germany government was institutional separation. In the first stage (1994–98), DB AG was split into four subdivisions: DB Netz (track network), DB Reise & Touristik (long-distance passenger transport), DB Regio (regional passenger transport) and DB Cargo (freight transport). In the second stage (from 1999), these subdivisions became public companies operating as part of a holding company German Railways Group (DB). Meanwhile, the two passenger companies were merged into a single Business Sector.

A third optional phase would—if realized—imply dissolution of the holding company. After intense political debate, it was decided that further separation (dissolution of the holding company) would not occur. This situation where both the infrastructure owner and operators operate as parts of one holding company is what economists call vertical integration. It offers the ability to discriminate against other third-party operators intending to offer on-track competition by running train services on DB Netz tracks.

Some explanatory remarks about network access and charging rules are necessary. Although introduction of on-track competition was not an explicit aim of the rail reform, in mid-1994, DB Netz opened up the network to third parties for payment of access charges. Compared to the other Member States, Germany and the UK have taken the lead in full implementation of EU Directive 91/440/EEC. However, apart from some general rules about network access and charges, DB Netz is completely free to decide the level and structure of the charges. This led to discrimination against non-DB track users who took their complaints to the Federal Antitrust Commission with the result that the access charge system has been revised three times in 8 years. The institutional separation of infrastructure and operations as well as problems of on-track competition are discussed in detail later in this article. The regionalization (meaning that federal states request and finance (subsidize) all regional passenger services) from 1996 is also related to problems of on-track competition because the federal states can put these services out to tender.

Finally, some remarks on investment financing are necessary. The federal government finances construction and replacement of tracks. DB Netz pays the annual depreciation for these tracks to the federal government and raises the



The long-term Netz 21 strategy follows the idea of separating tracks for slow trains such as freight trains from those for higher-speed trains such as long-distance ICE, Intercity and EuroCity passenger trains.

(S. Cramer, ice-page.de.)

necessary funds via access charges from the operators. However, if the federal track investment is not in DB's commercial interest, the depreciation payments can be either reduced or abolished, or DB can receive investment grants (€4.5 billion in 1998; €1 = \$1.03). This financing scheme changed from 1997 and DB now receives all investments for new infrastructure and renovations as grants that do not have to be repaid to the federal government. However, this new arrangement implies that the saved depreciation repayments must be invested—it is debatable whether this will actually happen.

Reform Outcomes

Table 1 shows some DB indicators from 1994 to 2000. Some cost savings, such as closing unprofitable lines and reducing staff were achieved; the track length was decreased from 41,300 km in 1994 to

36,600 km in 2000. More lines are now in the official line closure negotiation process and continued reduction of the network length in the future seems likely. Notwithstanding these closures, the length of electrified lines has increased.

Staff numbers have been drastically cut by more than 30% from 376,000 employees in 1994 to 242,000 in 2000. On the other hand, DB has made efforts to modernize the network and services by making investments of about €42 billion (2000 prices) from 1994 to 2000.

Performance differences have developed in passenger and freight transport. From 1994 to 2000, regional passenger transport increased by 33% but long-distance transport increased by just 4% (number of passengers and passenger-km). There were temporary drops in passenger numbers in 1994–95 and 1997–2000 (with passenger-km decreasing in 1995–98). Freight tonnage fell by 9% between 1994 and 2000 but freight tonne-km

increased by 9%, indicating more long-haul transport.

The financial indicators confirm DB's performance problems in 1994–2001. Turnover fluctuated around €15 billion with increases in 1994–97, decreases in 1997–99 and increases in 1999–2001. Pre-tax results have been decreasing since 1996 and DB went into the red in 2001—the first time since the 1994 reform. Losses of €500 million and €200 million are expected in 2002 and 2003, respectively, with a return to profit from 2004. However, this optimistic forecast is based on unrealistic assumptions about the recovery of the German business cycle. DB also faces the problem that depreciation increased by 80% from 1994. This huge increase occurred because the assets of DB and DR were greatly undervalued by the 1994 reforms, so the early low depreciation payments have increased with subsequent new investments.

Table 1 DB Business Indicators 1994–2000

	1994	1995	1996	1997	1998	1999	2000
Track length (km)	41,300	41,700	40,800	38,400	38,100	37,500	36,600
No. of electrified lines	17	17.4	17.8	18	18.2	18.9	19.1
Passenger-km (million)							
Long-distance passenger transport	34,845	36,277	35,620	35,155	34,562	34,897	36,226
Regional passenger transport	28,073	34,057	35,408	36,475	37,291	37,949	38,162
Freight tonnes (million)	309.1	302.4	289.4	295.5	288.7	279.3	282.2
Tonne-km (million)	69,488	67,609	67,882	72,612	73,273	71,097	75,752
Employees (thousand)	376	350	312	293	274	258	242
Investment (€ million)	5,986	6,458	5,707	5,400	4,732	8,003	6,071
Depreciation (€ million)		586	708	827	887	1,003	1,048
Revenues (€ million)*	18,720	19,110	20,250	19,630	22,980	23,730	23,060
Turnover (€ million)	14,771	15,226	15,429	15,554	15,325	14,725	15,465
Pre-tax profits (€ million)	251	282	368	183	201	91	37

*Including subsidies for reduced tickets for disabled persons, students, etc., and subsidies for maintaining level crossings and for combined transport. From 1998 including revenues from DB Netz access charges
Sources: Transportation in figures, DB AG

The performance problems are also reflected in decreased consumer satisfaction (Fig. 1a). In 1994, the DB Global Satisfaction Index stood at 2.87 (on a 5-point scale where 1 = Completely satisfied and 5 = Dissatisfied). By 2001 it had fallen to 3.19, the worst value since 1994. This suggests that the decrease in passenger numbers is largely due to lack of customer-focused business. Figure 1b shows the details of the dissatisfaction.

Summary of DB Company Strategy

Evaluating these outcomes of the German railway reform requires understanding the company's strategy. This section summarizes this strategy based on DB's official statements and actions taken over the last 8 years. It is a personal opinion and not a description of any official strategy.

Three issues—separation of DB Netz from the other DB companies; track access, access charges and on-track competition; and investments, especially the Cologne–Frankfurt project and Berlin north-south axis—are discussed in more detail in later

sections. Here they are mentioned only to help understand the company's overall strategy.

General strategy

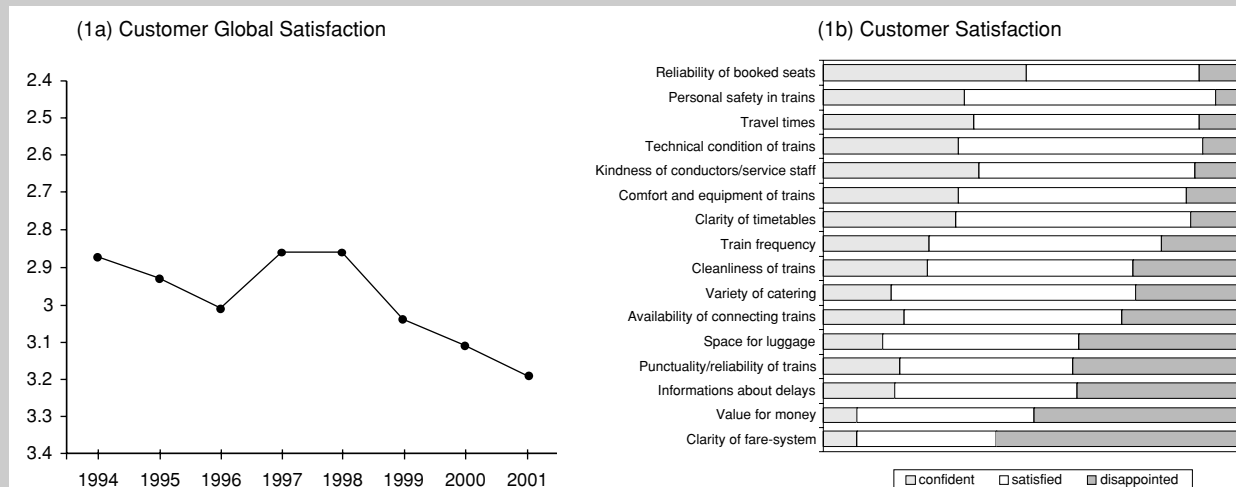
The overall strategy is to focus on the strengths of rail transport, such as highly utilised high-speed lines (ICE), regional passenger transport services with high traffic volume and regional subsidies where revenues cover costs, and long-distance freight services. This implicitly suggests closure of loss-making lines. On one hand, DB has introduced a cost-cutting programme, as well as an infrastructure investment programme on the other hand. Mr Hartmut Mehdorn, Chairman and Managing Director of DB, strongly prefers keeping DB Netz in the holding company to ensure centralized control of all activities. In other words, he is vigorously opposed to further separation of infrastructure and train services. From his announcements, the first shares will be sold around 2005.

Integration of network and operations

DB's current strategy is to keep DB Netz

in the holding, causing serious discussion within the company and intense political debate. Mr Dieter Vogel, former Chairman of the Supervisory Board, argued strongly against Mr Mehdorn's preference for a vertically integrated group and hinted that the high demand for subsidies by DB Netz would reduce the chances of selling DB share. In addition, Mr Kurt Bodewig, a former Federal Transport Minister, favoured clear institutional separation of DB Netz from DB in order to prevent any possible discrimination against non-DB track users. It was finally decided that DB Netz would remain in the holding company but will introduce and publish its own accounting system as obligated by EU Directive 91/440/EEC. An independent agency will monitor network access for non-DB users to ensure freedom from discrimination. Mr Mehdorn also revised the structure of the holding company by merging DB Regio and DB Reise & Touristik into one Business Sector to provide more integrated passenger transport. This merger may have positive effects on the supply of passenger transport services but may cause a loss of accounting transparency,

Figure 1 DB Customer Satisfaction



Source: Servicebarometer AG Deutschland, Kundenmonitor Deutschland 2001

which is important because regional passenger services are subsidized while long-distance passenger services are provided at DB's own business risk.

Tackling increasing competition in rail market

Germany has opened its rail network to third parties paying track access charges so DB faces competition from third-party services on its network. Regional passenger services, which are subsidized by the federal states, are increasingly put out to competitive tender to get the best service quality and cost. Freight companies and two long-distance non-DB operators are also running trains on DB tracks. However, DB has pursued an aggressive strategy against competing operators because a lack of regulations enables DB Netz to levy access charges that act against non-DB companies. Since DB Netz is closely linked with the DB operators, it gives information advantages and even privileges with regard to paths, time slots and access charges when DB Regio bids for tendered regional train services. Moreover, when DB sells old locomotives and railcars, a special clause in the bill of sale prevents the stock being used in competition against DB; breakers are even forbidden to sell scrapped stock to DB's competitors. Amazingly, DB refuses to include Connex long-distance services in published timetables and it uses every political means to provide federal-state-subsidized services without going through the normal public tendering. Typical pressures are threatening to dismiss employees with consequences for regional unemployment levels, not ordering new trains from builders in regions that might put services out to tender—with consequences on regional unemployment, and providing train services only at the lowest level. DB lobbying of the federal government resulted in a new regulation allowing the federal states to sign train-service contracts

without tendering if the contracts are longer than 3 years and if the train services are partly tendered during the contract duration.

Cost-cutting programme

DB has introduced a number of cost-cutting measures such as downsizing staff (Table 1), closing loss-making tracks (11% decrease in network length) and closing 8 rolling stock maintenance workshops (5900 employees). Unprofitable services, especially long-distance passenger trains, are either closed or reduced in frequency. DB also drives hard bargains with builders when ordering new stock.

Infrastructure development

While the infrastructure strategy is closure of tracks with low traffic, annual investments in infrastructure average €6 billion (at 2000 prices). From 2001 to 2007, DB has and will receive additional funds from the federal government generated by auctioning Universal Mobile Telecommunications System (UMTS) licences. The focus of the investment programme is new projects such as the Cologne–Frankfurt high-speed line, the Berlin rail node and the so-called German unification transport projects. However, this focus has led to neglect in performing necessary replacement of existing tracks, especially in western Germany. The long-term Netz 21 strategy follows the idea of separating tracks for slow trains such as freight trains from those for higher-speed trains such as long-distance ICE, Intercity and EuroCity passenger trains. This harmonization of speeds and increased track capacity is expected to lower running costs (*JRTR* 11, pp. 30–39).

Passenger transport strategy

DB focuses its activities on highly utilized high-speed lines while under-utilized and loss-making services are closed. The closed services have mostly been Interregio trains (IR trains) that were

originally introduced to connect regions up to 160 km apart. In 1995, DB operated 424 Interregio trains on 24 lines carrying 62 million passengers, a figure that exceeded the numbers on ICE and ordinary Intercity/Eurocity lines. However, DB has been closing these services step-by-step since 2001 and the process is expected to be completed this year. The closure affects 42 million train-km or about 25% of all long-distance train-km. The DB rationale for closure is that these trains are mainly used by regional commuters and should be requested and financed by the federal states and it hopes that about 25 million train-km will be taken over by the states. The necessary financial resources would come from other closed regional services that have low passenger levels. Some Interregio services may be upgraded to Intercity lines.

These closures and DB's justification caused intense public and political debate. Although regional commuters do use these trains, it has never been proven whether the share of regional commuters really justifies DB's request. Obviously, DB is trying to shift unsubsidized long-distance services towards becoming subsidized regional services. The disadvantages for customers are clear—the replacement of these services means more stops, longer journey times and less comfort because they are not designed for journeys of 3 hours or more. Train frequency will be reduced and no substitute will be offered for most services. Another intensely disputed measure is the introduction of a new fare system in December 2002. Unlike the former tapered fares, the new system defines prices per relation similar to airfares, which are further differentiated by service quality (higher prices for high-speed lines). Discounts are available for early booking (up to 40% discount for booking 7 days in advance), for users with the BahnCard (25% discount with reduction in

BahnCard price from €140 to €60 per year) and for accompanying persons (50% discount). Children under 14 accompanied by parents or grandparents pay nothing. At first glance, this system seems reasonable and advantageous for travellers and DB is using large advertising campaigns to convince them so. However, the German Association of Consumers analyzed various ticket prices for different groups and demonstrated that the new fare system causes drastic price increases for most people.

Since DB aims to increase ticket revenues by 20% using this new system, it is likely that travellers will be paying more rather than revenues will increase through higher patronage.

Indeed, prices increase for travellers unable to book tickets in advance: using regional trains up to 142 km (the old tariff system will continue to apply here while at the same time the discount for BahnCard users falls from 50% to 25%); using ICE and IC/EC trains for distances up to 180 km (price increase by 10%); wanting to rebook (they have to pay a charge of up to €45).

Furthermore, there are no discounts for

early bookings on regional trains. Moreover, early booking discounts are only available for a defined number of seats per train. Unlike airlines, who have to consider their competitors' number of early booking tickets when defining their own amount of low-price seats, DB has no competition pressure and can exploit its monopolistic power by keeping the number of discount tickets low on high-demand trains.

Freight transport strategy

Rail freight has continued to decline since the 1994 restructuring and DB's strategy is to focus on long-distance freight as evidenced by the increase in average haul length. The ratio between tonne-km and tonnes hauled has increased from 225 (in 1994) to 268 (in 2000). A large number of regional freight services were closed including their respective yards and handling services. On the other hand, DB is intending to offer a complete package of logistic services; it bought EuroStinnes Group holdings including the logistics company Schenker for €2.5 billion in 2002. This purchase and several other joint ventures in cross-border freight

transport and Alpine transit will enable it to provide integrated freight transport services on one hand and to close the gap between the rail terminal and the customer. However, it has to be remembered that the success of this strategy depends greatly on progress in EU harmonization of cross-border transport.

Current Network Access and Charges

Germany has achieved Europe's most comprehensive opening up of its rail network but has failed to establish a workable regulatory framework for on-track competition. DB and all other rail companies offering public transport services in Germany have opened up their routes for payment of usage charges to:

- Public railway companies possessing own rail networks
- Non-public railway companies who grant access to their infrastructure to other public railway companies under similar terms
- Railway companies from EU countries for cross-border intermodal traffic
- Railway companies from non-EU countries guaranteeing mutual access to rail network on the basis of international agreements

This exceeds the requirements of EU Directive 91/440/EEC and DB even grants other companies such as haulage contractors, travel companies and government bodies access to its routes. DB Netz is responsible for operation and management of the tracks and for negotiations with companies applying for network access.

Since both DB's operators and competitors can use DB Netz tracks, DB Netz should be highly regulated to prevent it discriminating in favour of DB operators. The German government has failed to do this and the rules leave DB Netz with too much freedom as follows:



DB had to face competitive pressure in long-distance passenger transport when Connex opened two long-distance passenger services on DB tracks in eastern Germany. (M. Buchholz)

- DB Netz may freely define the level and structure of track charges.
- DB Netz does not need to apply for approval of track charges. Charges are not regulated by an independent authority.
- There are only general rules about access charges. For example, DB Netz may consider the route type, service operating days/times, rolling stock type, track wear-and-tear and line utilization level.
- DB Netz is not compelled to publish charges but provides them to customers on request.
- DB Netz may grant discounts for some volume of train-km when justified by respective cost reductions (by official auditor's certificate).
- In case of competing demand, DB Netz is allowed (but not obliged) to grant track access to the highest bidder.
- If competitors feel discriminated against they may appeal to the Antitrust Commission or the Federal Railway Board (EBA).

The Antitrust Commission and the EBA only have passive regulatory powers—they can only react on the basis of received claims but cannot actively regulate the market. While the Antitrust Commission oversees all claims about competition, the EBA deals mainly with issues of technical compatibility, safety, staff qualification requirements, etc. However, DB's competitors can appeal to both institutions about track charges. The Antitrust Commission can introduce formal procedures to prohibit the price system, while EBA can decide on the level of prices. This, however applies only to the respective claimed case.

Track access charges have an 8-year history in Germany. The first price system was introduced in 1994, followed by a price list for use of stations in 1995 and three quick price revisions. The first

revision in 1995 reduced discounts the structure of which clearly favoured the DB operators; the second revision in 1998 changed the system from a single tariff to a two-part tariff consisting of a fixed charge and a variable part per train-km; the third revision in 2001 returned to a single tariff. The 2001 revision was required by the Antitrust Commission, which had identified anti-competitive features in the two-part tariff.

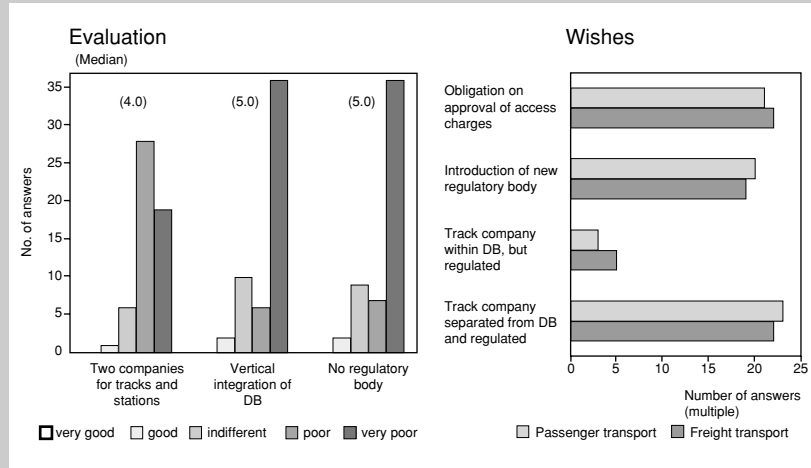
Due to DB's restrictive information policy there is not much official information on the degree of track use by non-DB operators. According to a survey, there were 43 non-DB operators on the DB network in 2000. Of these, 21 were running passenger services (mainly regional), 18 were running freight services, and 4 were running both types of services. Since 2000, DB has had to face competitive pressure in long-distance passenger transport when Connex opened two long-distance passenger services on DB tracks in eastern Germany. Most non-DB operators using DB tracks have their own rail network (66% of passenger operators and more than 75% of freight operators). In the freight sector, most of the companies are rather small with less than 25 employees. In the passenger sector, the company sizes seem more balanced—38% have less than 25 employees; 38% have between 26 and 100 employees; and 25% have more than 100 employees. Most possess locomotives but only 25% have their own wagons.

The survey revealed a variety of discriminatory problems as well as problems arising from the market situation in general. First, charges had clearly discriminatory features for non-DB operators either because of the large quantity discounts granted to DB operators in the first charging schemes (1994–98), or because of the digressive effects of the two-part tariff (1998–2000), which generated huge discounts for DB

operators. The digressive effect comes from the two-part scheme with a fixed charge and a variable charge. As more train-km are ordered the charge per km becomes lower because the fixed charge is distributed over a more train-km. A second problem is track allocation where half of non-DB operators have faced problems of competing track access. According to the survey, in most of these cases, DB Netz suggested alternative track access (either timetable or route), which was usually accepted. However, in 25% of the cases (mostly in regional passenger transport), DB Netz refused track access. So far, there is no known case of the bidding process foreseen in the network access rules being used. A third problem concerns the information provided by DB to competitors. When the two-part tariff was in use from 1998 to 2000, DB Netz did not publish the track access charges. Half of the track users had no information on the most price-relevant factors such as the route category and the utilization class of the track they wanted to use. Also information on possible discounts for rolling stock causing less track wear and tear, for low-noise stock and for timetable flexibility was not given to non-DB users. Since the new tariff system was introduced in 2001, DB Netz has changed its information policy and publishes the access charges.

DB's competitors know that most of these problems occur because DB Netz operates under the umbrella of the DB holding company. Apart from favouring clear institutional separation of DB Netz, most non-DB users of DB tracks consider the separate responsibilities for tracks (DB Netz) and stations (DB Station & Service) as inefficient. They would prefer to transfer the shunting yards, which are currently owned by their direct competitor DB Cargo, to DB Netz. The non-DB companies perceive one of the most serious problems to be the lack of sector-specific regulation of DB Netz. In most

Figure 2 DB Competitors' Evaluation of Institutional Framework and Reform Suggestions



Source: Deutsches Institut für Wirtschaftsforschung

cases of discrimination, they have contacted the EBA and Antitrust Commission but they are dissatisfied with only passive regulation. The majority prefers a new independent, sector-specific regulatory body, similar to the telecommunications regulator (Fig. 2). DB's competitors also favour approval of tariffs by an independent regulator. Apart from these problems caused by DB's discriminatory behaviour, non-DB operators face rolling stock problems and difficulties in recruiting qualified staff. Locomotive pools are just starting their business but the problem is aggravated by DB's restrictive clause in bills of sale for old rolling stock mentioned earlier.

Separation of DB Netz and DB Operators

I have already discussed the problems arising from the vertical integration of DB. Although Germany originally envisaged a clear institutional separation between the track owner (DB Netz) and the DB operators, the process has stalled. To guarantee non-discrimination, the Federal Transport Minister has drafted a new law on network access and access regulation as follows:

- From 2004, a new independent track access agency with 25 employees that

is part of the EBA will monitor network access and charges.

- To clarify responsibilities between the new agency and the Antitrust Commission, the Antitrust Commission will continue to be the body responsible for overseeing the rules of network access and charges. The new track access agency will be in charge of technical issues such as analyzing track availability.
- The executive board of DB Netz will be independent of the DB Chairman and Managing Director.
- DB Netz will use its own separate accounting system.
- Penalties of up to €500,000 can be levied on DB for discriminatory behaviour.

It is not clear whether these new rules will enable non-DB companies to use DB's tracks without discrimination. Problems might arise between the Antitrust Commission and the EBA Track Agency. On one hand, DB's competitors mistrust the EBA because many EBA staff are former DB staff. From this perspective, it seems a good idea for the Antitrust Commission to monitor the network access and charges. On the other hand, the Antitrust Commission only has passive regulatory powers. Moreover, DB's

competitors in regional passenger transport are often reluctant to appeal to the Antitrust Commission because they are DB subcontractors in freight transport and do not want to lose this business. Furthermore, it is unclear how the independence of DB Netz from the decisions of the DB holding group can be guaranteed and supervised.

DB Investment Policy

As already mentioned, DB invested about €42 billion from 1994 to 2000—€30 billion of which was invested in the track network. According to a study for the Transport Ministry, about 60% was spent on renovations. However, the same study shows that this amount was insufficient to cover the replacement needs, especially in western Germany. One focus of new investments is the German unification investment projects that aim to improve the east-west links. About €7 billion was spent on these projects from 1992 to 1999. There are two other main projects—the new high-speed Cologne–Frankfurt link (opened in 2002) and the Berlin north–south axis. The 177-km Cologne–Frankfurt link costs about €6 billion. The travel time at speeds of 300 km/h is 1 hour and 16 minutes—a reduction of about 1 hour. Tickets on ICE trains on this line cost €12 more than on other ICE trains.

The Berlin north–south axis is still under construction and consists of a link including the new Berlin Lehrter Bahnhof, reconstruction and modernization of the inner-Berlin ring system, several crossings north and south of Berlin, a link to the new Berlin-Schönefeld airport and reconstruction of several stations such as the S-Bahn East crossing (Ostkreuz), Spandau, Papestraße, Jungfernheide, etc. The north–south axis will have a length of 9.5 km with four tracks allowing a

maximum speed of 120 km/h. A 3.4-km four-tube tunnel will be built southwards from Lehrter Bahnhof; the new Potsdamer Platz station will be in this tunnel section. The Lehrter Bahnhof has an interesting architecture with a glass roof of 42,000 m² and four levels. Level 1 will serve the east-west links with regional and long-distance trains as well as S-Bahn trains; level 0 will connect the station to other public transport modes; level 1 will be a dedicated pedestrian zone; and the main hall and level 2 will serve the north-south link with regional and long-distance trains, the U-Bahn and S-Bahn. The originally estimated construction costs of €2 billion have already been revised up and it is now assumed they will reach €3.1 billion. Around 24,000 people are expected to use the station each day.

Conclusions

Despite sound reform measures and optimistic DB forecasts, it is clear that the German rail restructuring is in a difficult situation. The general transport market conditions are still unfavourable for rail transport. Although a full-cost road-pricing scheme will be introduced from 2003 for heavy goods vehicles on German motorways and despite the fuel price increase due to the 1998 ecology tax reforms, road transport has still cost advantages. These advantages together with the higher flexibility and better customer orientation are the reason for rail's continued loss of market share. The focus on long-distance freight and on integrated logistic chains is certainly a step in the right direction for DB. Much will depend on the progress of EU harmonization in cross-border rail transport. It is debatable whether the new strategy in passenger transport will convince travellers and lead to increased patronage. The closure of Interregio lines will obviously lead to passenger losses



Impression of Berlin's New Lehrter Bahnhof

(Archimation)

and fare increases in long-distance transport hidden under the guise of fare rationalization will not produce passenger increases. One problem is rail travellers' perceived sense of reduced service quality (abolishing dining cars, large reduction in ticket offices) but service quality does differ between high-speed and other trains.

Against this background, it is unlikely that DB will be able to sell its first shares in 2005. ■

Further Reading

- A. Aberle, A. Brenner, A. Hedderich, *Trassenmärkte und Netzzugang. Giessener Studien zur Transportwirtschaft und Kommunikation* (Track markets and track access, Giessen Studies in transport and communications), Band 8, Hamburg, 1995.
- H. J. Ewers, G. Ilgman, *Trassenpreissystem der Deutschen Bahn AG. Gutachten im Auftrage der DEG und der Hessischen Landesbahn* (The track access charging scheme of DB. Study on behalf of DEG and Hessische Landesbahn.), Berlin, Hamburg, 2000.

U. Kunert, H. Link, *Prognose des Ersatzinvestitionsbedarfs für die Bundesverkehrswege bis zum Jahre 2020. Beiträge zur Strukturforschung* (Future replacement demand for federal transport infrastructure. Series Beiträge zur Strukturforschung), Duncker & Humblot, Berlin, 2001.

H. Link, On-track competition in the German rail network. *Proceedings of 28th European Transport Conference*, PTRC, Cambridge, 2000.

P. Schäfer, Das Finanzierungsmodell zum Neu- und Ausbau der Schienenwege der DB AG (The financing scheme for new construction and extension of DB's tracks), *Eisenbahntechnische Rundschau* 45, Heft 9, 1998.

M. Schnell, Analyse des Wettbewerbs um SPNV-Leistungen in Deutschland (An analysis of competition in regional passenger transport), *Der Nahverkehr*, 9, 2000.



Heike Link

Dr Link is a senior researcher at the German Institute for Economic Research in Berlin and a member of the Board of Directors of the Association for European Transport. She has published extensively on German railways and visited Japan in 1993 on a fellowship to study Japanese railway restructuring.