

## RAILWAY REFORM IN GERMANY - CHANCES, RISKS AND FIRST EXPERIENCES

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### 1. INTRODUCTION

In January 1994 the reform of the two German state-owned rail-companies Deutsche Bundesbahn (DB) and Deutsche Reichsbahn (DR) was initiated with the foundation of the German Rail Corporation (Deutsche Bahn AG - German Rail PLC). Following the transition from a public to a private company and extensive financial refloating measures, the newly founded German Rail PLC is expected to regain lost market shares and start showing a profit again.

On the one hand, the reform became necessary against the background of shrinking market shares and increasing deficits of the railways and the resulting financial burden on the federal budget. On the other hand, the European Union's plans to incorporate European railway systems more in their endeavours towards deregulation (EU-directive 91/440 EEC) is a further aspect.

The most remarkable features of the German railway reform are the opening of the rail-network to third parties and the charging of fees for the use of the tracks on the basis of a detailed and for all users available price system. With these measures, Germany belongs to the countries with the most consistently realization of the EU-directive 91/440 EEC. Therefore, the experiences made with the usage charges may be of interest for other countries.

The following paper will give an overview on the reform model and the experience one year after its implementation and will then focus on the problems concerned with the separation of infrastructure and transport, the opening of the network and the charging of usage fees.

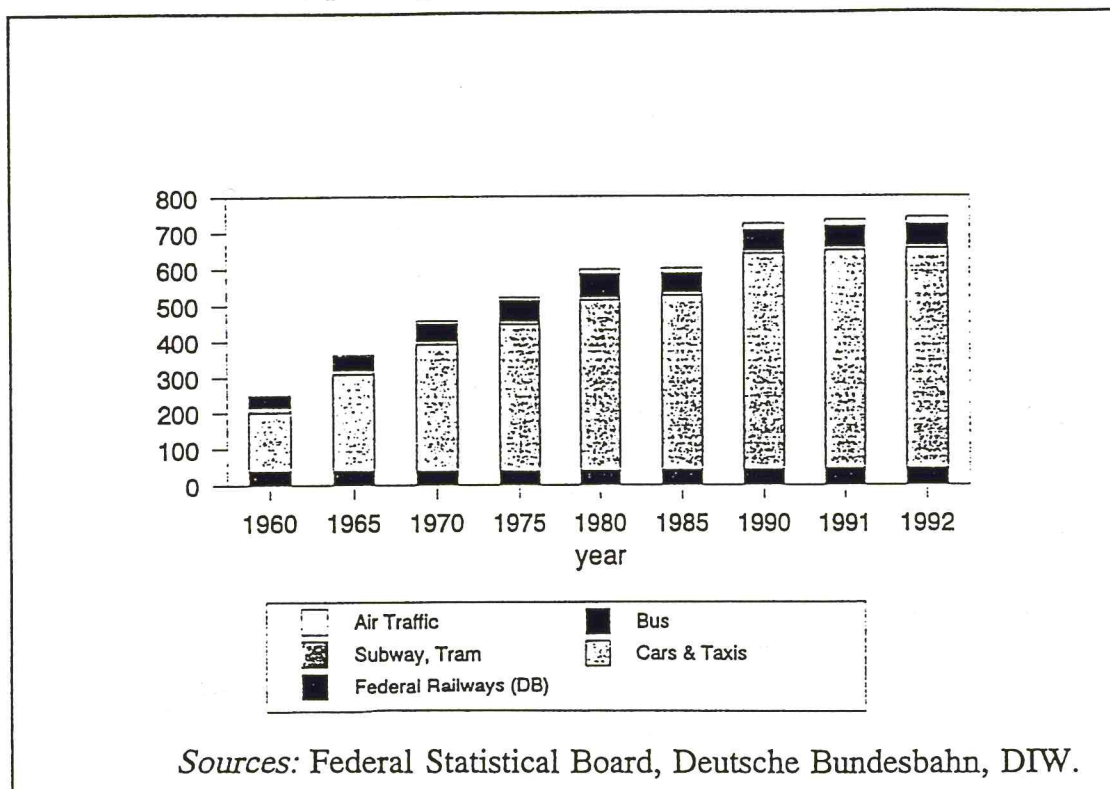
### 2. THE RAILWAY REFORM IN GERMANY

#### INITIAL SITUATION

In western Germany, the state-owned Deutsche Bundesbahn (DB - Federal German Railways) was unable to participate in the explosive growth in transport services which occurred from 1960 onwards. In fact, increased motorisation, transport, housing and industrial-location policies which favoured roads, and the railway's lack of flexibility due to its status as a state-run company all led to a serious decline in market shares for Deutsche Bundesbahn. In 1992, with a total transport volume of around 46 billion passenger-kilometres (pkm), Deutsche Bundesbahn provided 6 % of overall passenger

transport; in 1960, at 40 billion pkm, Deutsche Bundesbahn's market share had been as high as 16 % (Fig. 1). In the same period, the company's freight traffic volume rose from 53 to 56 billion tonne-kilometres (tkm) - representing a decline in market share from 37 % to 18 % (Fig. 2). Steadily rising deficits and increasing debt were the consequences of this development.

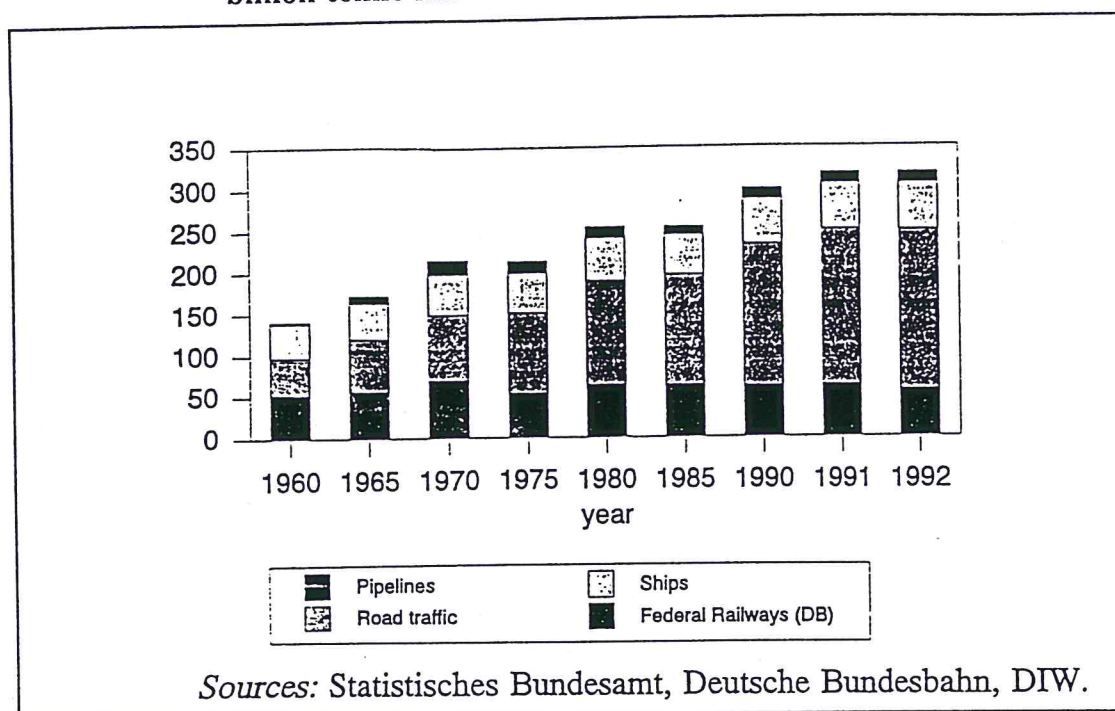
**Fig. 1: Modal Split of Passenger Transport in West Germany**  
- billion passenger-km -



In eastern Germany, Deutsche Reichsbahn (DR - German State Railways) suffered comparably large losses over a much shorter period of time than Deutsche Bundesbahn: its passenger traffic volume fell from 24 billion pkm in 1989 to 10 billion pkm in 1992, and its freight traffic from 59 billion to 14 billion tkm. Market shares fell from 17 % to 8 % in passenger traffic and from 72 % to 32 % in freight traffic. The reasons behind this development were the collapse of the state-regulated transportation market (e.g. the replacement of brown coal), the drop in output in the east German economy, the fact that the north-south rail network was inadequate, and, not least, the lack of marketing experience at DR.

The two state-run railway companies concluded the year 1993 with a deficit of DM 15.6 billion and debts of almost DM 70 billion. At the end of 1993, DB had DM 1.9 billion less in assets than liabilities. If the existing structure of both railways had been maintained, the burden on the federal budget between 1994 and 2003 would have

Fig. 2: Modal Split of Freight Transport in West Germany  
- billion tonne-km -



amounted to DM 570 billion\*. At Deutsche Bundesbahn the need for reform due to the company's financial situation had been indisputable for several years; DR's difficulties increased the pressure even further. The European Union's plans to incorporate European railway systems more in their endeavours towards deregulation is a further aspect. It was with this aim that EU Directive 91/440/EEC was passed, according to which all Member States are obliged to guarantee entrepreneurial autonomy for railways, to achieve through appropriate measures a sound financial structure for the highly indebted national railways, to distinguish between infrastructure and transport at least for financial purposes, and to open national rail networks to other firms wishing to offer rail services.

#### THE MODEL FOR REFORM

The German railway reform encompasses the following measures:

- The foundation of Deutsche Bahn AG (DB AG - German Railways PLC) as a private-sector company.
- The foundation of the Eisenbahnbundesamt (EBA- Federal Railway Office) which is charged with national responsibilities.
- Use of a residual special asset fund to take over staff who had been laid off, long-term DB and DR liabilities, and property not required for operating purposes.
- Division between the track network and transport.

\* See the draft version of a law on restructuring the railway system. *Deutscher Bundestag*, 12. Wahlperiode, Circular 12/6269, Bonn 1993.

- DB AG will first be split into the three sections: track network, passenger traffic, and freight traffic, which are to become public limited companies in their own right in five years' time at the latest.
- Payment of charges to the Track Network PLC for use of their railway lines<sup>†</sup>.
  - Opening up of the rail network to third parties.  
In accordance with the terms of EU Directive 91/440/EEC, other firms offering railway services (including those based abroad) are granted equal access to railway lines belonging to German public-transport railway companies.
  - Federal responsibility for infrastructure.  
The rail network's real assets are to be transferred to Track Network PLC, which will carry the costs of operating and maintaining the railway. Central government will finance investment (construction, expansion, replacement investments) on DB AG's railway lines and will assume liability for interest payments. Track Network PLC must make the annual depreciation payments to the state<sup>©</sup>.
  - Financial refloating measures on the part of the state.  
The state assumes liability for payments totalling DM 287 billion. Included here are outstanding DB and DR debts (around DM 70 billion), additional material and personnel costs arising from the outmoded technology used at DR (around DM 50 billion), the cost of 'catching-up' investments (around DM 20 billion) and expenses arising from DR's ecological legacies, obligations concerning civil servants employed by Deutsche Bundesbahn (DM 57 billion), and the adjustment of the opening balance sheet (around DM 80 billion).
  - Regionalisation of short-distance passenger rail traffic.  
From 1996 onwards regional authorities (to be determined by the law of the federal state in question) will have functional and financial responsibility for all public short-distance passenger traffic. The federal states will receive government transfers for running the public transportation system, which, on top of the regular funds under the terms of the Municipal Transportation Finance Act (MTFA funds), will also include additional transfers from central government revenue yielded by the tax on mineral oil.

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<sup>†</sup> The price system for the use of railway lines was presented to the public in July of this year. Cf. *Deutsche Bahn öffnet ihr Streckennetz für Dritte* (Deutsche Bahn grants network access to third parties). *Artikelservice der Deutschen Bahn AG, July 1994*.

<sup>©</sup> For projects which are not - or are only partially - in the interests of DB AG, the company makes depreciation payments only on a part of the sum invested, or receives a corresponding subsidy from the state.

	Transport volume (million pkm, million tkm)			Turnover (DM million)		
	1993	1994 <sup>1)</sup>	growth on previous year (%)	1993	1994 <sup>1)</sup>	growth on previous year (%)
Passenger traffic	56173	59340	5,6	15032	15682	4.3
Short-distance traffic	23133	25540	10,4	10206	10804	5.9
Long distance traffic	33040	33800	2,3	4826	4878	1.1
Freight traffic <sup>2)</sup>	63454	69382	9,3	8225	8997	-1.6
Cargo traffic	62712	68600	9,4	6995	6963	-0.5
Package and other freight	742	782	5,4	1230	1134	-7.8
Total turnover				23257	23779	2.2
Total turnover including non-railway business areas				24045	23785	-1.1

<sup>1)</sup> Preliminary figures. - <sup>2)</sup> Domestic traffic, excluding railway-internal freight.  
Sources: Deutsche Bundesbahn, Deutsche Reichsbahn, Deutsche Bahn AG.

### GERMAN RAIL PLC'S RESULTS OF THE FIRST YEAR

The aim of the railway reform is to put the DB AG in a position where it can achieve a higher transport volume and a higher turnover and reduce its operating costs. At the first glance, the results of German Rail PLC's first year seem to be satisfying. DB AG achieved in all areas considerable rises of the transport volume (Table 1). At the top of this positive development ranks the short-distance passenger transport with a rise of 10 %, followed by cargo traffic which increased its tonne-kilometres by 9 %, an unexpected high rise. Obviously, the freight business of DB AG participated in the recovery both of the German and the European economy. Additionally, the high investments of DB AG (DM billion 13,5 in 1994) contributed to the rise of transport volume: Speeding-up of routes, the introduction of new trains and the redesigning of existing trains led to more attractiveness of rail-transport. This point was especially important for the passenger traffic because the economic indicators influencing passenger traffic (real income, number of employed persons, car-density) developed rather unfavourably. With this development, the DB AG was able to achieve a total turnover of its rail-business of DM 23.8 billion, which is 2.2 % higher than the turnover of the previous year. The profit (before taxes) amounted to DM 88 billion while DB and DR concluded the year 1993 with a deficit of DM 15.6 billion.

Despite of this success Table 1 shows very clearly the remaining structural problems of DB AG. Although the freight traffic achieved a higher transport volume than in 1993 the annual turnover of this business area fell by 1.6 %. Package freight was particularly worse affected; turnover in this section dropped by 7.8 %. These figures lead to the conclusion that the rise in transport volume was dearly purchased by dumping-prices especially in the competition with the internal waterways shipment. Also the achieved

profit of DM 88 billion should be considered critically. Of course, the efforts of DB AG to reduce the operating costs, especially the personnel costs (reduction of the number of employees by 41000 persons in 1994) are one reason for this positive result. Besides, it is worth to mention that the rise of transport volume was achieved with a fall in train-kilometres which led to a better utilization of capacities and a reduction of costs. On the other hand, the gained profit is - to a considerable extent - based on the extremely generous measures for financial restructuring provided for by central government. The evaluation of these measures with their consequences should be done very carefully and it is to be distinguished between the types of the measures.

Measures such as total release from existing debt and the assumption both of obligations towards civil servants employed by Deutsche Bundesbahn and additional expenditure arising from DR's use of outmoded technology will not only overcome the financial consequences of the company's previous status as a public-sector firm, but also provide considerably improved initial conditions for the railway. By contrast, the DM 80 billion adjustment of DB AG's opening balance sheet is clearly aimed at raising the company's price competitiveness in the short-term. According to the Federal Railway Government Committee, an adjustment of only DM 50 billion would have sufficed; amongst other reasons cited for this disparity were overvalued fixed assets due to excessive depreciation periods, and failure to include pension provisions<sup>‡</sup>. DB AG's opening balance sheet for 1.1.1994 shows a balance of DM 30 billion, with fixed assets of DM 20 billion. By contrast, Deutsche Bundesbahn and DR's combined balance sheet for 1993 registered a total of DM 110 billion, with fixed assets of 100 billion DM<sup>\*</sup>. In view of the investments made in recent years - DM 15 billion alone for the newly constructed Hannover-Würzburg and Mannheim-Stuttgart lines - the considerable undervaluation of fixed assets to DM 20 billion is questionable. While DB AG can, as a result, calculate the track charges on the basis of these undervalued fixed assets at least for the first few years, in the long term the depreciation costs at least of all post-reform investments in the track network must be covered by receipts<sup>\*\*</sup>. There is a danger that the balance sheet adjustment might obscure this fact. The problems related with the track charges will be discussed more detailed in the following chapter.

### 3. THE SEPARATION OF INFRASTRUCTURE AND TRANSPORT

In order to meet the terms of EU Directive 91/440 EEC, the German public-transport railway companies are obliged to open their routes to the following groups of users:

- public-transport railway companies with their own rail network

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<sup>‡</sup> Cf. Bericht der Regierungskommission Bundesbahn (Report of the Government Railway Commission), 1991.

<sup>\*</sup> Data provided at DB AG's balance-sheet press conference on 26.05.1994.

<sup>\*\*</sup> These include, in addition to investment in new routes, replacement investments for the existing network.

- non-public-transport railway companies who likewise grant - under similar terms - other public railway companies access to their infrastructure
- railway companies from EU countries for cross-border intermodal traffic
- foreign railway companies, when mutual access to the rail network is guaranteed, otherwise on the basis of international agreements.

In addition, DB AG also grants equivalent operators (e.g. haulage contractors, travel companies, and government bodies) access to its routes.

With this step the DB AG belongs to the pioneers among the European rail companies. Connected with the opening of the rail-network is the introduction of a price system for the use of tracks which will be described in the following section.

### THE PRICE SYSTEM FOR THE USE OF TRACKS

The price system, which was published in July 1994, is applied both to the DB-companies (passenger transport and freight transport) and all other users of DB-tracks. A track is defined as the use of the infrastructure between two locations for a limited time. The track fees are charged for the provision, the operation and management of the tracks and for the compilation of the time table. Not included are the use of stations, marshalling services, electric power for the electrified sections and VAT.

The prices consist of so-called basic prices, which can be modified according to individual requirements of the track-users (for example reliability, dimensions and weights of the operated trains). Additionally, depending on the ordered train-kilometres and on the time-horizon of the contracts for use of tracks, a discount can be provided.

For the calculation of the basic prices both the type of line and the type of train were considered (Table 2). Regarding the type of line 10 prices categories were defined according to factors such as the quality of tracks (radius of curves, maximum speed, technical standard such as type and quality of the signalling equipment) and the traffic potential (economic importance of the line, capacity etc.). Regarding the type of trains, the prices are divided into 7 categories in passenger transport and 5 categories in freight transport which are defined according to speed and weight of the train and the so-called planning-requirement<sup>††</sup>.

The basic prices may be modified according to the individual wishes of the track users regarding reliability, train-weight etc. For this, the basic prices are multiplied with factors which take into account the wear-and-tear of tracks depending on the train weight and which consider also the already mentioned planning-requirements. For example, if very heavy trains shall be operated the basic price will be multiplied by the factor 1.1 and vice versa in case of very light trains the factor 0.9 is applied. Has a train-operator very strict requirements on the reliability of the train (may be 1 or 2

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<sup>††</sup> The planning-requirement defines how many per cent of the theoretically possible travel time on a route the operated train will exceed at maximum.

minutes delay at maximum) the factor 1.2 is applied while operating less time-sensitive trains leads to a factor of 0.8.

**Table 2: PRICE CATEGORIES FOR THE USE OF DB AG-TRACKS**

Price category		Weight	Speed	Planning-requirement	
<b>Passenger transport</b>	P 1	High-speed transport	max. 1000 t	200 km/h and more	max. 105 %
	P 2	Fast passenger transport	max. 750 t	up to 200 km/h	max. 108 %
	P 3	Fast passenger transport	max. 550 t	up to 160 km/h	max. 110 %
	P 4	Slow passenger transport	max. 750 t	up to 140 km/h	max. 120 %
	P 5	Regional short-distance passenger transport	max. 400 t	-	max. 120 %
	P 6	Local short-distance passenger transport	max. 400 t	-	max. 120 %
	P 7	Suburban railways	max. 450 t	-	max. 108 %
<b>Freight transport</b>	G 1	Fast and high-quality freight trains	max. 1500 t	120 km/h and more	max. 125 %
	G 2	High-quality freight trains	max. 1300 t	up to 120 km/h	max. 130 %
	G 3	Heavy freight trains	max. 2500 t	up to 100 km/h	max. 150 %
	G 4	Other freight trains	max. 1800 t	up to 100 km/h	max. 150 %
	G 5	Local freight trains	max. 800 t	up to 80 km/h	max. 170 %
<p><sup>1)</sup> The planning-requirement defines how many per cent of the theoretically possible travel time on a route the operated train will exceed at maximum.  <i>Source: Deutsche Bahn AG.</i></p>					

As already mentioned, a discount can be provided depending on the ordered number of train-kilometres and on the time-horizon of the contracts (Table 3). Regarding the ordered train-kilometres, the discount system starts with 1 % discount in case of 14 million train-kilometres p.a. in long-distance passenger transport as well as in freight transport. The possible discounts increase linearly up to 20 % (at maximum) for 280 million train-kilometres. In the field of short-distance passenger transport 1 % discount can be provided for 0.3 million train-kilometres. This rate increases progressively up to 20 % in case of 740 million train-kilometres.



Table 3: DISCOUNTS IN THE FRAMEWORK OF TRACK CHARGES

Discount-rate (%)	Train-kilometres p.a. (from ... mill)		
	Short-distance passenger transport	Long-distance passenger transport	Freight-traffic
1	0,3	14	14
2	3	28	28
3	25	42	42
4	63	56	56
5	134	70	70
6	205	84	84
7	250	98	98
8	293	112	112
9	333	126	126
10	370	140	140
11	407	154	154
12	444	168	168
13	481	182	182
14	518	196	196
15	555	210	210
16	592	224	224
17	629	238	238
18	666	252	252
19	703	266	266
20	740	280	280
Discount-rate (%)	In case of ordering tracks for more than		
2	2 years		
3	3 years		
4	4 years		
6	5 years and more		
<i>Source: Deutsche Bahn AG.</i>			

Additionally to the discount for train-kilometres the track users can be granted a discount for ordering track-capacity at the Track-PLC more than one year in advance. This discount starts with 2 % in case of ordering tracks for more than 2 years and reaches a rate of 6 % for more than 5 years.

By the present date, DB AG signed 47 contracts with other rail-companies regarding the use of tracks which have a financial volume of about DM 25 million.

#### A FIRST EVALUATION OF THE PRICE SYSTEM

The track fees are required to be cost-covering and free of discrimination and they shall lead to more competition and to a higher transport volume at the rail-network.

Especially the first two aspects were heavily discussed before the reform. It was feared that the DB AG would be faced with the following problem: While cost-covering prices would disable the track-users to offer their services at competitive prices, the DB AG would be disabled to cover its costs when charging lower prices.

The first experiences with the track fees confirm this fear. Indeed, the prices are too high, especially for the users in the field of short-distance passenger transport. Currently, the average track fee in this field amounts to DM 8.50 per train-kilometer which is much too high for the regional rail-companies and for the local authorities which have to order and to pay these services from 1996 onwards. It is to fear, that short-distance passenger rail-services will be substituted by busses as operating a bus (including driver) is less expensive. Due to these problems, the price system was already revised in February 1995. On the other hand, the current prices may be cost-covering in the short-run because of the already mentioned undervaluation of the fixed assets (DB AG officials mention track costs of about DM 7 billion p.a. on the basis of the undervaluated fixed assets). In the long-run, however, the track charges have to be calculated in such a way that the DB AG is able to earn at least the depreciation costs of all post-reform investments. To these investments belong also the replacement investments of the existing - currently undervaluated - routes. Therefore, in a few years the DB AG will be faced with "true" capital costs of the lines. It may be expected that a rise of track charges or the closing of lines will be unavoidable.

Another problem is how to guarantee a fair and discrimination - free treatment of non - DB AG users of tracks against the background that the Tracks-PLC is together with the two DB AG transport companies (passenger and freight transport) a part of the DB AG-Holding. The discussion about that problem is actually focussed on the granting of discounts for a defined number of train-kilometres. These discounts favour the two DB-companies, which can easily reach the transport volume required for granting discounts because of their size. Other (new) competitors, however, will have difficulties to offer services of such an extent to obtain the same discounts. This problem occurs especially in short-distance passenger transport: All German regional rail-companies which offer such services would only be able to obtain a 4 %-discount even in case of ordering the required tracks as a group. In contrast, the business-unit short-distance passenger transport of DB AG would obtain 11 % discount (on the basis of the train-kilometres in 1993). The unfavourable position of the smaller rail-companies are particularly in the present stage (the network opening just started, new competitors are in the process of formation) problematic. On the other hand, granting of discounts are usually in business. Nevertheless, DB AG announced to check the discount system.

Beside the already announced revision of the price system regarding price level and discounts, the structure of the prices should be revised too. For example, the current prices are independent on the season, the weekdays and the time of day at which the train shall be operated. Additionally, the prices depend only on the type of the operated train but not on the length of train. This makes it difficult to operate short trains efficiently.