CERRE CENTRE ON REGULATION IN EUROPE

Development of rail freight in Europe: What regulation can and cannot do

Germany Case Study

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Table of Contents

1. Introduction

The beginning of the liberalisation process of railway markets in Germany was marked by the railway sector reform in 1994. The reform set out two major goals. First, by restructuring the railway sector, the competitiveness of rail vis-à-vis other modes of transportation should be improved through increased efficiency. Declining market shares of rail in intermodal competition made a reorganisation necessary and the attractiveness of rail as a mode of transport needed to be increased. Second, in line with the overall European Union strategy, competition should be effectively introduced into the markets for train operating services. Thus, the second goal concerned the introduction of intramodal competition. As in other network based industries, the railway sector is marked by a natural monopoly with respect to the infrastructure. Therefore, the railway sector reform aimed at introducing competition on the transport service and operating levels, while ensuring a free and non-discriminatory access to the network infrastructure.

20 years after the beginnings of liberalisation, a comparison of the situation in the German rail freight market to other EU Member States shows a positive development with respect to intra- as well as intermodal competition: the overall positive trend in market shares of rail vis-à-vis other modes of transportation was also visible for Germany. Table 1 shows the market shares of rail freight in transport performance of selected EU countries. Between 2003 and 2012, rail freight increased its market share from 18.4 to approximately 23.1 %. Compared to the other EU-countries, the market share of rail in intermodal competition thus is above the EU-28 average, which has remained rather constant over time.

Table 1: Market Shares of Rail 2003-2012, Transport Performance, in %

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Belgium	11	12	13.4	14.2	15.3	15.9	12.8	14.5	15.2	17.5*
Austria	28.7	31.4	32.8	33.8	34.8	37.4	36.4	39	39.9	40.8
France	18.1	17	16	15.7	15.7	15.9	15	13.5	14.9	15.2
Germany	*18.4*	*19*	*20.3*	*21.4*	*21.9*	*22.2*	*20.9*	*22.2*	*23**	*23.1**
Italy	10.4	10.1	9.7	11.4	12.3	11.7	9.6	9.6	12.2	14
Netherlands	3.8	4.2	4.4	4.8	5.5	5.4	4.9	4.7	5	5.1
Switzerland	41.4	42.2	42.5	43.3	44	46.9	44.5	45.6	45.9	46.1
Sweden	35.5	36.1	36	35.8	36.4	35.1	36.8	39.3	38.2	39.7
UK	10.1	12.2	11.7	11.7	11.1	11.6	12.1	11.2	12	12.1
EU-28	18.2	17.9	17.7	18	17.9	17.9	16.6	17.1	18.3	18.2

*Source: Eurostat. * Estimated market shares.*

With respect to intramodal competition, entrant railway undertakings (RUs) could gain and persistently increase their market shares since 1994. In 2013, their market shares increased again up to 33 %.

Table 2: Market Shares of Incumbents and Entrant RUs Measured by Transport Performance, 2011, in %

	Incumbent	Entrant RUs
Belgium	90	10
Austria*	82	18
France*	68	32
Germany*	*70*	*30*
Italy	80	20
Netherlands	55	45
Switzerland	68	32
Sweden	44	56
UK*	46	54

*Source: IRG-Rail, 2014; IBM LIB-Index, 2011. * Market shares refer to 2012.*

Despite this rather positive development in the past years, a closer look reveals that several challenges exist in intra- as well as intermodal competition: although rail plays a key role in transport strategies of the German government, the dominance of road haulage seems hard to be contested by rail in the near future. Additionally, changing demand structures and the decline of transport markets in which rail has traditionally been strong pose new challenges to all RUs. How operators react to this changing environment will determine how rail can position itself in intermodal competition. Although regulation cannot address all necessary measures to promote rail freight in this respect, effective regulation can promote efficiency in the rail freight sector and can therefore contribute to the competitiveness of rail freight vis-à-vis other modes of transportation.

Furthermore, also intramodal competition needs to be further ensured. Entrant RUs and public institutions such as the Monopolies Commission caution against existing discrimination potentials in the rail sector: entrant RUs have repeatedly complained about discriminatory practices by the incumbent Deutsche Bahn AG, which operates railway undertakings in all market segments as well as the infrastructure manager, especially with respect to discrimination in access to essential facilities and infrastructure charges. Regulation therefore plays an important role to ensure a level playing field for all RUs. Further development of the regulatory framework should therefore address this issue and promote effective competition.

The remainder of this case study is organised as follows. Section 2 presents the demand side for rail freight in Germany and presents the changing environment of traditional markets. In Section 3 the supply side is analysed and trends in inter- as well as intramodal competition are explained. Section 4 offers a description of the regulatory framework in Europe and presents the

major challenges to rail freight in intra- and intermodal competition. Based on this analysis the role of future regulation is described. Finally, Section 5 offers some concluding remarks.

2. Demand for rail freight in Germany

2.1 Recent Developments

In 2013, the overall transport performance in Germany was 496,644 billion ton-kilometres and a total of 3.9 billion tons of freight were transported.[1] Compared to 2012, this resembles an increase of 0.7 % in transport volumes. Of this transport volume 374 million tons were transported by rail, rendering rail freight the second most important mode of freight transportation in Germany. Although rail freight was the most important driver of this increase in freight transportation, witnessing an increase in 2.1 % in transported volumes, this positive development needs to be assessed with care. Since new railway undertakings were included in the statistics in 2013, the reported increase in transported volumes does not refer to the same number of carriers (Federal Statistical Office, 2014; Deutsche Bahn AG, 2014). A detailed analysis of the goods segments carried by rail reveals that the development has been rather unequal for different product or transport categories. While most traditional freight markets like metals, metal ores etc. showed a persistent decline over the past years, new markets, such as containers and intermodal transportation, have gained more and more importance. This section gives an overview over these trends.

2.2 Decline in Traditional Rail Freight Markets

Due to its high capacities, rail has several advantages in transporting these goods. Specifically, key freight markets in Germany include metals, metal ores, coke, coal, chemical products, and transport equipment (for details see Table 3).

As can be seen from Table 3, the rather positive trend in transport volumes since 2009, which was due to a modest recovery after the economic crisis, could not be upheld for most key product categories in 2013. Instead, the development of quantities carried by rail strongly differs for special product categories. The product category most transported is metals, with about 61 million tons transported in 2013. Compared to the previous year this indicates another decrease of 5.1 %, after an already significant drop in 2012 compared to previous years. Overall, total quantity carried in this category stayed below pre-crisis levels of 2008. A similar trend is visible for metal ores and mining products as well as chemical products. For the other categories, small positive developments could be observed; however, these may have been

[1] These numbers refer to all major modes of freight transportation: road haulage, rail freight, air cargo, inland water, sea water and pipelines.

mainly due to the effect of including more RUs in the statistics. The only product category which witnessed a persistent growth over the past years was coal and lignite.

Table 3: Transport Volume 2008-2012 by Product Division (NST-2007)

Year	Coal and lignite, crude petroleum and natural gas	Metal ores and other mining products	Transport equipment	Coke and refined petroleum products	Chemical products	Other non-metallic mineral products	Metals
In 1,000 tons							
2008	35,195	53,704	9,312	50,807	29,153	11,109	66,014
2009	28,161	45,207	7,842	50,977	26,329	11,684	45,194
2010	32,604	50,134	9,612	52,097	30,119	11,204	62,319
2011	34,716	57,787	10,102	49,974	30,603	11,370	67,693
2012	40,956	52,603	12,687	43,223	32,041	10,768	64,238
2013*	43,568	51,659	12,866	46,818	30,514	11,264	61,023

*Source: German Federal Statistical Office, 2013a, 2014a. * Includes data from additional RUs. The reported data therefore do not refer to an identical group of firms observed as in previous years.*

Similar trends are visible for transport performance. While transport performance increased since 2009 for coal and petroleum products, other key freight markets witnessed only a small positive development (which may be due to the additional RUs included in the data) or decreased compared to 2012. The most drastic reduction was for metals and metal products, decreasing by 5.3 % in 2013 compared to 2012, another sharp reduction after previous years.

Table 4 gives an overview for the key goods markets.

Table 4: Transport Performance 2008-2012 by Product Division (NST-2007)

Year	Coal and lignite, crude petroleum and natural gas	Metal ores and other mining products	Transport Equipment	Coke and refined petroleum products	Chemical products	Other non-metallic mineral products	Metals
In million ton-kms							
2008	6,070	12,392	4,422	13,124	9,544	2,582	15,568
2009	5,252	10,055	3,594	11,486	7,817	2,746	10,309
2010	5,453	11,096	4,381	11,675	9,165	2,404	13,083
2011	6,285	13,080	4,654	11,092	9,655	2,416	14,362
2012	6,849	12,302	5,298	10,442	9,985	2,447	13,081
2013*	7,466	12,584	5,255	10,819	9,747	2,517	12,392

*Source: German Federal Statistical Office, 2013a, 2014a. * Includes data from additional RUs. The reported data therefore do not refer to an identical group of firms observed as in previous years.*

A major difference between the product categories presented here is that some product types are typically shipped as trainloads in unit or block trains, while others are usually part of single wagonload traffic. From this perspective it can be concluded that single wagonload traffic declined more strongly in the past years than traffic with block trains. While metals and metal ores, which are usually shipped as single wagonloads witnessed a decline in quantities carried and transport performance, especially the increase in transport of coal and lignite showed a rather positive development for block train traffic (Deutsche Bahn AG, 2013).

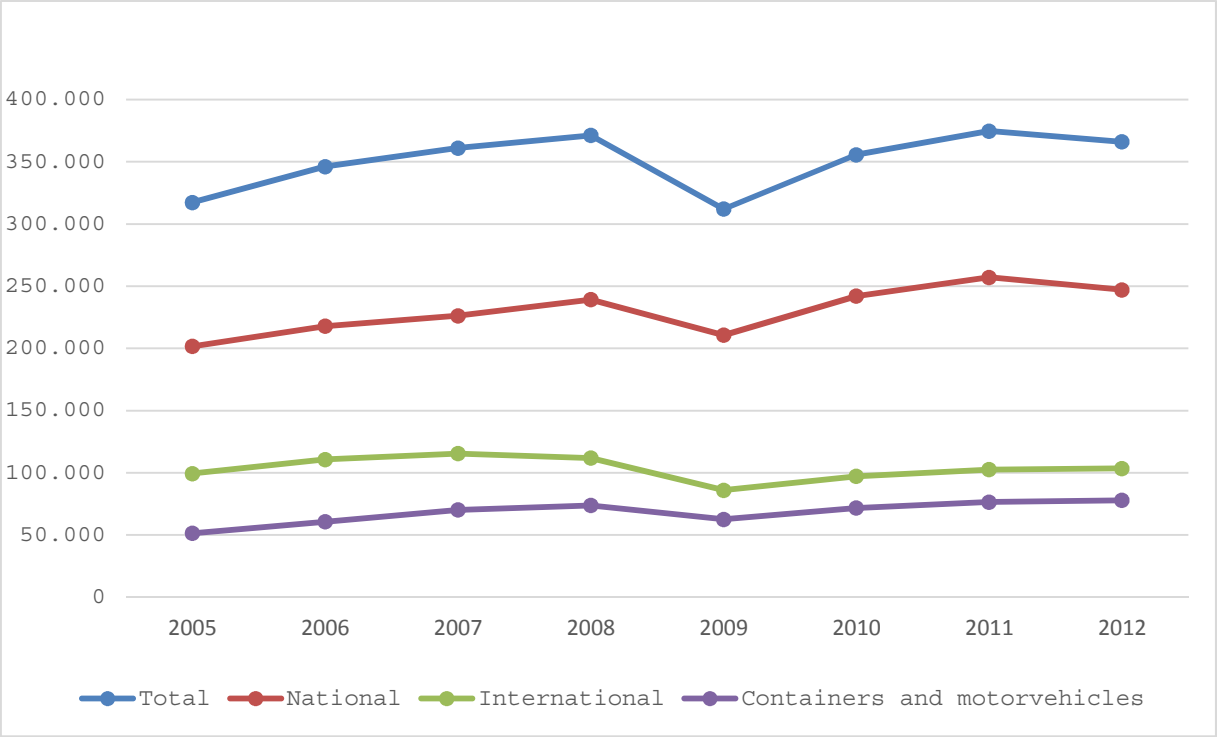
2.3 Increasing Demand for Intermodal Transport

Whereas demand in traditional markets declined over the past years putting significant pressure on single wagonload traffic, the importance of intermodal transport for rail freight has increased over the last decade (German Federal Statistical Office, 2013b). In general, intermodal transport (or combined transport) refers to a transport system "whereby at least two different modes are used in a door-to-door transport chain" (European Commission, 1997). A distinct characteristic of intermodal transport is the unitisation of goods, such that transportation units are carried over the entire distance of the supply chain. Transportation units can either be containers, semi-trailers or complete trucks.

Especially containers allow for a simple and fast transhipping and simplify the shift of transportation from road to rail, inland water and sea transport. Transport performance of rail in container shipping in Germany grew by more than 33 % between 2005 and 2010 (BMVBS, 2012). Figure 1 gives an overview over the transport volumes in intermodal transport since 2005, in comparison to total rail freight, which is given by the blue line (split into national (red) and international (green) freight). The violet line represents combined transport. While still at a comparatively low level, the Figure shows that intermodal transport came relatively strong out of the economic crisis in 2009. Between 2009 and 2011, intermodal transport involving rail increased by approximately 20 %, and even grew from 2011 to 2012 although overall rail freight decreased.

Intermodal transport has distinct advantages over traditional freight transport, especially from an ecological perspective. It is therefore very likely that its role will continue to grow in the next years as part of Germany's "energy transition". The German Ministry for Transport estimates that energy consumption in an intermodal transportation chain can be reduced by approximately one third compared to road transportation (BMVBS, 2010). In addition, the Ministry expects intermodal transport to grow by more than 120 % until 2025 and considers it a key variable in transport policy (BMVBS, 2012).

Figure 1: Transport Volume in Intermodal Transport Involving Rail 2005-2012, in 1,000 tons



Source: Federal Statistical Office, 2014b.

To further enhance the potential of rail in intermodal transportation, the UBA (2010) identifies several necessary reforms. First and foremost, the time needed for transhipping would have to be reduced, since time delays create a major obstacle for the attractiveness of rail in this transport segment. According to UBA (2010, p. 23-24), the creation of a more decentralised network of terminals or further automatic transhipping can increase the attractiveness of rail in intermodal transport significantly.

Rail freight also plays a key role in the connection of sea ports to the hinterland, since it is able to load large, bundled quantities in transportation units. German rail freight therefore has a strategic advantage due to its dense rail network. This advantage has led to an increase in market shares of German harbours Hamburg and Bremen compared to their closest competitor Rotterdam (FiS, 2013). To increase quality and bundle transportation, cooperation between harbours, rail freight companies and shipping agents has emerged: according to the Hamburg Port Authority (2007), a joint position paper was issued in cooperation with the German rail network operator DB Netz AG to address future investment options into transportation networks, estimating a significant increase in intermodal transport by 2015.

3. The supply side: inter- and intramodal competition

Rail is the second most important mode of freight transportation in Germany. However, it was only about one third of the size of the largest transport market – road goods – in 2013. Road haulage continues to dominate the transport market, and it will be a key challenge for the rail freight sector to increase its strength vis-à-vis road haulage in intermodal competition.

Within the rail freight market, the incumbent Deutsche Bahn AG still serves approximately two thirds of the market through its subsidiary DB Schenker Rail. Nevertheless, entrants and small competitors were able to increase their market shares steadily since the beginning of the liberalisation process. This positive development was partly the result of the changing demand structure in rail freight outlined above: whereas the incumbent is traditionally the almost exclusive provider of the complex single wagonload traffic, entrant RUs have become active predominantly in intermodal transportation and block train traffic. The future development of rail freight will depend on how RUs adapt to changing demands and environments. For the moment, the niche strategy of entrant RUs has proven to be successful in promoting competition in the market.

3.1 Strong Intermodal Competitive Pressure

After a slight negative development in 2012 due to a slowing business cycle, overall freight transportation increased slightly in 2013. Overall, transport volumes increased by 0.7 % compared to 2012, however, they remained under the level of 2011. While road transportation remains by far the dominant mode of transportation, its transport volumes increased only by 1.6 %,[2] whereas rail witnessed an increase of 2.1 %. The first quarter of 2014 showed a persistent positive development: in the first quarter of 2014 a total of 92 million tons of freight were transported by rail. This corresponds to an increase of 4.4 % compared to the first quarter of 2013 and means the strongest increase in transport volumes for the first quarter since 2011 (+ 10.6 %).[3]

[2] It should be noted though that these figures only include national trucks and do not account for the rising number of foreign trucks.

[3] See Press release No. 196 of the Federal Statistical Office published on 4 June 2014, available at https://www.destatis.de/DE/PresseService/Presse/Pressemitteilungen/2014/06/PD14_196_461.html, Note again that these numbers do not appear to include foreign trucks.

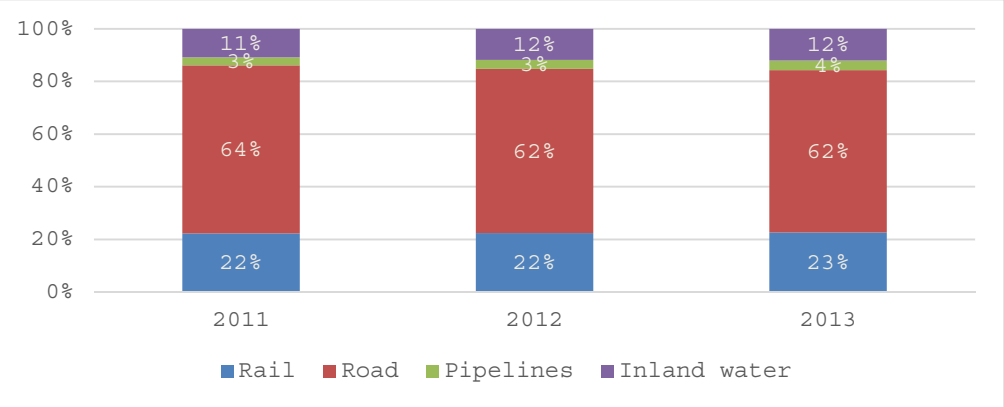
Table 5: Modal split by Transport Performance in Germany 2011-2013

	2011	2012	2013
In billion ton-kms			
Rail	113,317	110,065	112,613
Road	323,848	307,106	305,781
Pipelines	15,623	16,207	18,180
Inland water	55,027	58,488	60,070
Total	507,815	491,866	496,644

Source: Federal Statistical Office 2014a.

Figure2 presents the market shares of all main modes of transportation between 2011 and 2013. The market share of rail has remained rather constant over time, with a slight positive trend. The dominant mode of transportation has been road goods traffic over the past two decades. This dominance remained unaffected also by the introduction of a heavy goods vehicle charge in 2005. In fact, no significant positive impact of the charge on the modal split of rail could be found (Bühler, 2006; Daduna, 2009).

Figure 2: Market Shares of Main Modes of Transportation 2011-2013



Source: Own calculations, German Federal Statistical Office, 2014a.

A more detailed look at rail freight transportation reveals that the majority of goods is carried domestically, which accounted for approximately 66 % of transport volumes in 2013. Table6 summarises the development of quantities carried by rail from 1991 to 2013. However, in recent years the share of domestic transport declined. Whereas domestic transport increased at rapid speed between 2009 and 2011, which can be explained by the fact that Germany experienced a stronger economic growth rate than its neighbouring countries after the economic crisis of 2009, this strong growth did not continue for 2012 and 2013. In 2012 domestic transport volumes declined and increased again in 2013, although still remaining under the 2011 level. On the contrary, international transport has caught up speed again, most importantly unloaded and transit traffic.

Table 6: Transport Volume by Main Traffic Relations, 1991 - 2012

Year	*Total*	National transport	International transport: total	International transport: loaded	International transport: unloaded	Transit
In 1,000 tons						
1991	*415,500*	329,000	78,900	40,400	38,500	7,600
1995	*333,100*	247,800	76,700	32,900	43,800	8,600
2000	*299,100*	198,600	90,000	42,300	47,700	10,500
2005	*317,294*	201,725	99,344	48,220	51,124	16,225
2006	*346,118*	217,890	110,775	54,628	56,157	17,454
2007	*361,116*	226,307	115,526	56,425	59,101	19,283
2008	*371,298*	239,266	111,889	54,336	57,553	10,143
2009	*312,087*	210,722	86,009	41,779	44,231	15,356
2010	*355,715*	242,073	97,206	45,117	52,089	16,437
2011	*374,737*	257,202	102,579	46,256	56,323	14,957
2012	*366,140*	247,117	103,512	45,286	58,226	15,512
2013	*373,738*	247,472	108,449	45,530	62,919	17,817

Source: German Federal Statistical Office, 2014a.

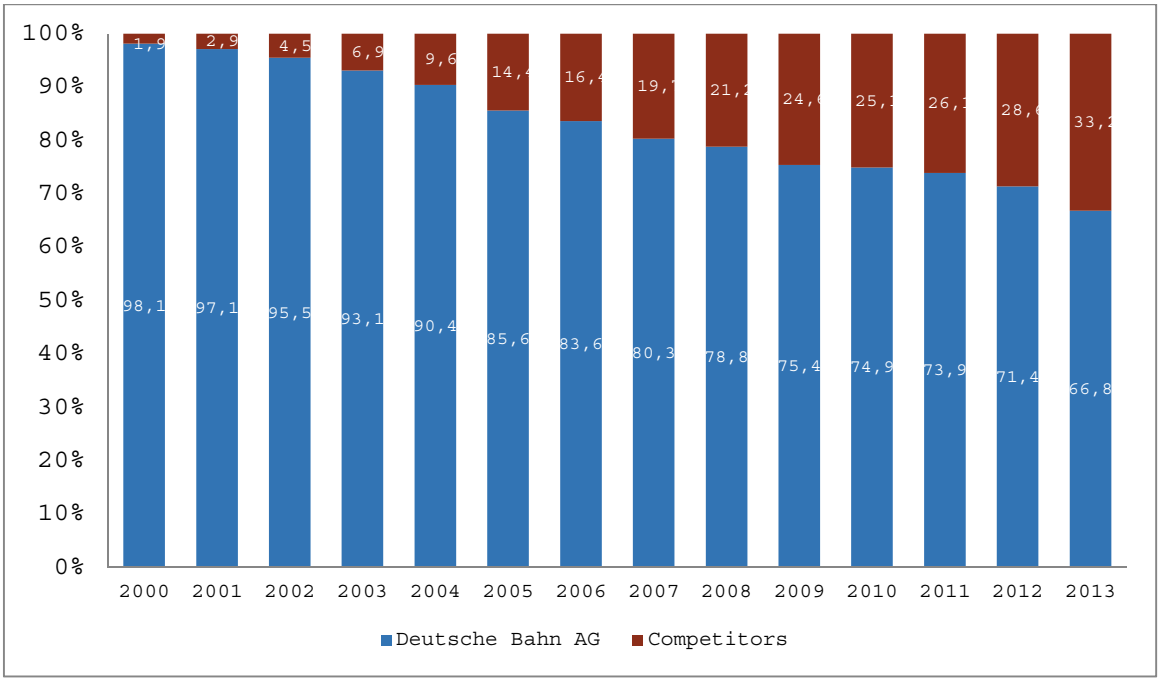
The results presented above suggest that rail freight showed slightly positive trends in recent years, growing faster than road haulage in the same period. Recent data from 2014 indicate that this positive trend could be upheld. On the other hand, it should become visible that rail is currently far from contesting the dominance of road haulage. A particular problem for the rail sector to compete with road transportation seems to be that rail cannot truly compete with road haulage in aspects of customer flexibility and Just-in-time transportation concepts (Institut der deutschen Wirtschaft, 2014). According to Deutsche Bahn AG (2014), only single wagonload traffic is suited to offer a true alternative for customers to road transportation and constitutes the backbone of German rail freight. However, the operating cost of this complex mode of transportation is high and it may require several RUs to cooperate in order to offer the full transportation chain to customers.

3.2 Intramodal Competition Further Expands

Liberalisation of rail markets has led to increased activity in the German rail sector, especially in the rail freight market. In 2013, 289 railway operators were licensed in Germany (Deutsche Bahn AG, 2014).[4] Figure 3 shows the development of market shares of entrant operators for the rail freight market. The incumbent Deutsche Bahn AG still holds the largest market share in rail freight with about 66.8 % through its subsidiary DB Schenker Rail. As shown in Figure , however, entrant operators could increase their market shares over the last years, from 1.9 % in 2000 to 33.2 % in 2013 (Mofair, 2013; Deutsche Bahn AG, 2014). This development indicates that attempts to promote competition in the rail freight sector have proven to be successful in terms of numbers of competitors in the market and market shares.

[4] Numbers include rail freight and passenger transport. As competition is, however, still limited in passenger transportation, most railway operators are active in rail freight.

Figure 3: Market Shares (Transport Performance) of Deutsche Bahn AG and Competitors in the German rail freight market, 2000-2013



Source: Mofair, 2013; Deutsche Bahn AG, 2013, 2014.

In spite of economic crises and constant competitive pressure from other modes of transportation, competing RUs managed to increase their market shares vis-à-vis the incumbent DB Schenker Rail. According to Mofair (2013), this positive development can be explained by the following factors:

- DB Schenker Rail is strongest in traditional freight markets, such as metals and secondary raw materials, which are mainly classified as wagonload traffic. As presented in the Section 2.2, there has been decreasing demand for rail transport in these categories for 2012 and 2013;
- Market entrants are particularly active in intermodal transportation. Demand in this market has increased over-proportionally in the last decade;
- Smaller competitors seem to be more flexible in their organisation and therefore adjust more easily to a slowing business cycle;
- Capital commitment of competitors is more limited compared to DB Schenker Rail, since their rolling stock consists mostly of rented locomotives and wagons.

A closer look at the market actors reveals that the most successful (new) competitors of DB Schenker Rail are subsidiaries of other European incumbents. Nevertheless, their individual market shares in transport performance are still small compared to the incumbent, as can be seen from Table 7. While DB Schenker Rail still served 78.5 bil. ton-kilometres in 2012, its largest competitor Captrain Deutschland (SNCF-Geodis) ranked second with 5.4 bil. ton-kilometres. The

third largest operator in Germany is FS Trenitalia with a transport performance of 3.8 bil. ton-kilometres, which is closely followed by SBB Cargo Deutschland, a subsidiary of the Swiss incumbent SBB, with 3.5 and Rhein Cargo with 3.4 bil. ton-kilometres. Thus, of the five largest rail freight operators in Germany, four are, at least partially, owned by former European railway incumbents. These RUs combined serve approximately 90 % of the German rail freight market.

Table 7: Transport Performance of Five Largest Rail Freight Operators, 2012

	DB Schenker Rail	Captrain Deutschland (SNCF Geodis)	FS Trenitalia	SBB Cargo Deutschland	RheinCargo
In bil. ton-kms					
Transport performance	78.5	5.4	3.8	3.5	3.4

Source: Mofair, 2013.

3.3 Differences in Business Models between Incumbent and Entrant Firms

The success of DB Schenker Rail's competitors is mainly based on their strength in intermodal transport and block train traffic. In the traditional rail freight markets, the incumbent has established an extensive network for wagonload traffic, which is difficult for entrants to perpetrate. According to Mofair (2013), entry into this market and access to the production processes of DB is hardly realistic without regulatory intervention.

Table 8 shows the diversification of services DB Schenker Rail and its competitors are offering with respect to specific segments according to the NST-2007 categorisation. DB Schenker Rail is most active in single wagonload traffic and is, therefore, relatively dependent on goods which are typically transported via this mode of transport like metals, secondary raw materials and chemicals. According to the German Monopolies Commission, the wagonload traffic segment is not characterised by effective competition (Monopolkommission, 2013, p. 118), but constitutes about 70 % of the German rail freight market. Other estimates suggest that single wagonload traffic constitutes a much smaller, but still significant part of German rail freight.

First results of a study by the European Commission indicate a share of 40 % for single wagonload traffic.[5] The reasons for the lack of effective competition in this segment may be manifold: Single wagonload traffic is characterised by a complex system of marshalling and transhipping, which requires a dense and costly network of infrastructure and rolling stock, to offer services in a reasonable time (Aberle, 2009; Goetz and Pakula, 2011).

[5] See for example a summary of the current state of the EC analysis of single wagonload traffic under http://www.dvz.de/rubriken/schiene/single-view/nachricht/rettungsplan-fuer-einzelwagen.html.

Table 8: Portfolio Diversification of the top five rail freight Operators for main Products (NST-2007), 2012

Kinds of goods	DB Schenker Rail		Captrain Deutschland (SNCF Geodis)		FS Trenitalia		SBB Cargo Deutschland		RheinCargo*	
	Block train	Single wagon	Block Train	Single wagon	Block train	Single wagon	Block train	Single wagon	Block train	Single wagon
Coal and lignite; crude petroleum and natural gas	✓	×	✓	×	×	×	✓	×	✓	
Metal ores and other mining products	✓	×	✓	✓	×	×	×	×	×	
Food products, beverages and tobacco	×	✓	×	✓	✓	✓	×	✓	×	
Products of wood; paper and paper products	×	✓	✓	✓	✓	✓	✓	✓	×	
Coke and refined petroleum products	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Chemical products etc.	×	✓	×	✓	×	✓	×	✓	✓	
Other non-metallic mineral products	×	✓	×	×	✓	✓	✓	✓	✓	
Basic metals; fabricated metal products	×	✓	×	✓	×	×	✓	×	✓	
Transport equipment	×	✓	✓	✓	✓	×	✓	✓	✓	
Secondary raw material	×	✓	×	✓	×	✓	×	✓	×	
Equipment utilized in the transport of goods	×	✓	×	✓	×	✓	×	×	×	
Unidentifiable goods	×	×	×	✓	×	×	×	✓	×	

*Source: Captrain, 2013; Deutsche Bahn AG, 2013; Trenitalia, 2013; SBB Cargo, 2013; Federal Statistic Office, 2013b. * For RheinCargo no separate information on block train and single wagon traffic is available.*

The increase in competing firms' market shares coincides with the consequences of the economic crisis since 2008. Especially a reduction in demand by the coal and steel industry added to a decline in single wagon transportation by DB Schenker Rail. The business model of the competing firms, focusing on intermodal traffic, therefore seems to support further gains in market shares in the future. The incumbent DB Schenker Rail has reacted to this changing environment of rail freight demand by launching its "Netzwerkbahn" (network rail) strategy in 2012. The new business model is intended to integrate the current block train with wagonload traffic, using the same unified planning, booking and control logic. The aim of this business strategy is to also block single wagonloads at an earlier stage of the transportation chain, which can then be transported over longer distances without transhipping (DB Schenker Rail, 2013). With its "Netzwerkbahn" strategy the incumbent has acknowledged the changing demands in

German rail freight and has reacted to the new environment. In order to adapt the single wagonload traffic to increasing international freight transportation, furthermore the network XRail was launched by several European RUs (ČD Cargo, CFL Cargo, DB Schenker Rail, Green Cargo, Rail Cargo Austria, SNCB Logistics and SBB Cargo). According to Deutsche Bahn AG (2014), XRail will initiate a joint capacity booking system for customers. If the implementation of such a system is successful it can enhance the flexibility and reliability of rail freight extensively.

Since these processes are still at an early stage, however, it is hard to evaluate whether they will manage to strengthen the single wagonload traffic and enhance the attractiveness of rail vis-à-vis road haulage and –if so- how they will affect the market position of DB Schenker Rail.

An open question is whether competition should be fostered more strongly in the single wagonload traffic. While several institutions are clearly in favour of such attempts (e.g. the Monopolies Commission), others suggest that this traffic – which is usually associated with very low margins – should not be the centre of attention in forging more effective competition (Goetz and Pakula, 2011). The strategic orientation of both the incumbent and entrant RUs seems to support this view, since demand for single wagonload traffic is decreasing. Therefore, instead of fostering competition in particular market segments, regulation should ensure a level playing field for all competitors in the market. Only when all RUs have identical access possibilities, strategic considerations will determine how the market and rail freight as a mode of transportation evolves. How regulation should address the issue of a level playing field is analysed in the following section.

4. The role of future regulation for rail freight

4.1 Key Challenges for Rail Freight in Germany

The above analysis of demand for rail freight and inter- and intramodal competition suggests that there are several key challenges for rail freight at the present. To improve the stand of rail in intermodal competition, several factors have to be taken into account and have to be approached from different angles.

First, a changing environment of demand for rail services poses a challenge to all RUs and operators have to adapt their business models in order to react adequately. This is especially true for the incumbent, who operates the network for single wagonload traffic and is thereby affected the strongest by the changing demand environment.

Finally, intramodal competition has been a major driver of the positive development of rail freight's market share. New entrants and new business models have fostered competition within the industry and have added to the attractiveness of rail to customers. It is therefore of great importance that intramodal competition is further enhanced and all RUs enjoy the same level of access rights to all essential facilities. This point addresses the regulatory framework

directly: to further promote effective competition, regulation has to ensure a level playing field for all market participants. This is addressed in more detail in the following section.

4.2 How Regulation can Support the Future Development of Rail Freight

4.2.1 Current Institutional Design of Regulation

The liberalisation process of the German railway sector was initiated in 1994 by the railway sector reform (*Bahnreform*). The former state-owned monopolist was transformed into the Deutsche Bahn AG and transportation markets were opened for entrant firms, implementing Directive 91/440/EC. In a second reform in 1999, Deutsche Bahn AG was separated into five subsidiaries organised under the roof of the Deutsche Bahn AG holding with the aim of organisationally separating infrastructure management and train operating services. Nevertheless, Deutsche Bahn AG remained a vertically integrated company. Although the holding company was reorganised according to private law, the Federal Government remains the majority shareholder up to date. Plans to partially privatise the company failed in 2008.

Since 2006 the Federal Network Agency for Electricity, Gas, Telecommunications, Post and Railway (*Bundesnetzagentur*, BNetzA) is the regulator responsible for the regulation of the German railway market. Its responsibilities are based on the General Railway Law (*Allgemeines Eisenbahngesetz*, AEG) and the Regulation on Railway Infrastructure (*Eisenbahninfrastruktur-Benutzerverordnung*, EIBV), which determines its main task as monitoring and controlling the non-discriminatory access of all railway operators to infrastructure, especially the processes granting access to networks and service facilities, time-table schedules as well as non-discrimination of access charges.[6]

The competence to approve all changes in access charges ex-ante is a key determinant in the regulatory merit of the BNetzA. In general, the competences of the BNetzA with respect to access charges is based on § 14 para. 4 AEG. Infrastructure managers have to give a notification about all changes in access charges, which the BNetzA has to approve in advance. Unfortunately, however, the BNetzA does not have the right to regulate the access charges ex-ante. Instead, it can only verify whether the charges proposed by the infrastructure manager adhere to the basic principles and guidelines of access charge determination according to §§ 21 and 22 EIBV (Monopolkommission, 2013, p. 42).

4.2.2 Reform of the Regulatory Framework

In May 2013, a proposal for a new railway regulatory law (*Eisenbahnregulierungsgesetz*-Entwurf, ERegG-E) was passed in German parliament, however it was blocked shortly after in the second

[6] For a summary of main tasks and responsibilities of the BNetzA in the railways sector see for example http://www.bundesnetzagentur.de/cln_1422/EN/Areas/Rail/AboutUs/aboutus-node.html.

chamber of the German legislative (Bundesrat).[7] The proposed reform of railway regulation aimed at enhancing competition and efficiency in the railway sector, especially addressing the issue of non-discriminatory access to the network infrastructure. The reform proposal therefore included the introduction of a price-cap regulation scheme combined with an ex-ante regulation for access charges, the expansion of access rights as well as restructuring the competencies of the BNetzA. In general, the ERegG was intended to combine the existing legal provisions of the AEG and EIBV and to provide a transparent regulatory scheme for the railway sector.[8] At this point in time, however, the reform of the regulatory framework in Germany has come to a hold. It is unclear, how a reform is going to be resumed by the new government in the near future.

4.2.3 Ensure a Level Playing Field

As it has been outlined above, intramodal competition has developed well in Germany, especially in comparison to markets in other EU member states. With entrant RUs accounting for more than 33% of the rail freight market, the competitive pressure – especially in the market segments of block train traffic and intermodal transport – has increased significantly since the early beginnings of the liberalisation process. However, competitors of Deutsche Bahn AG as well as institutions such as the Monopolies Commission and the Federal Network Agency have repeatedly voiced concerns about several issues relating to non-discriminatory access to essential facilities in the market. From an economic perspective, the incentives to discriminate stem from the vertically integrated structure of Deutsche Bahn AG. As a consequence, the German Monopolies Commission as well as the European Commission have repeatedly suggested to vertically separate the infrastructure and transport services more clearly.

The liberalisation of the railway sector has not induced the ownership separation of rail infrastructure and operating services in Germany. Instead, the incumbent Deutsche Bahn AG is still a vertically integrated company, which is in charge of the network infrastructure and operates railway companies in all downstream transportation segments. Thus – although an operational and legal separation between company parts was introduced in 1999 – the incumbent still owns subsidiaries for transport services (DB Schenker Rail AG, DB Regio AG, DB Fernverkehr AG) as well as the infrastructure manager (DB Netz AG), the traction current supplier (DB Energie GmbH) and the operator of passenger stations (DB Station&Service AG). Thus, the key concerns for effective competition in the German railway sector are based on the incumbent's position to discriminate against competitors in the transport segments with regard to access to essential facilities.

[7] For more details see:
http://www.eurailpress.de/news/politik/single-view/news/bundesrat-eisenbahnregulierungsgesetz-abgelehnt.html.

[8] The EIBV should be abolished completely, a reformed version of the AEG (according to a reform proposal, AEG-E) should only cover technical aspects of security and certification, as well as infrastructure planning and the competencies of the Eisenbahn-Bundesamt (EBA), which is responsible for the certification process and technical organization of railways in Germany (Monopolkommission, 2013, p. 19).

Effective competition in the rail freight market is heavily dependent on the access to infrastructure, naturally being the network itself, but also other essential facilities such as stations and transhipping infrastructure. According to the Monopolies Commission, the complexity of necessary services as well as a lack of transparency in pricing schemes, offer a wide range of discrimination opportunities, which restrain effective competition (Monopolkommission, 2013, p. 124).

Most concerns which have been articulated concern the structure of access charges to essential facilities (Monopolkommission, 2011, 2013), the access to traction current (Mofair 2013; Monopolkommission, 2013) and the structure transparent provision of information to all active RUs (Monopolkommission, 2011, 2013). The vertically integrated structure of Deutsche Bahn AG creates several incentives for the incumbent to shift potential rents in favour of its own railway operating companies. Since costs for infrastructure access and traction current constitute more than half of the total costs of rail service operators (Monopolkommission, 2013, p. 39), discrimination with respect to network access raises serious competition concerns[9].

Addressing these concerns, regulation can ensure a level playing field for all active RUs. Ensuring non-discrimination should be at the centre of attention of the Federal Network Agency. Its regulatory remit allows for a detailed analysis of pricing schemes, information provision and non-discriminatory access of all RUs to tracks, marshalling yards etc. The ERegE-E seeks to extend the regulatory power of the BNetzA with respect to ex-ante regulation of infrastructure access charges. As was outlined above, so far there does not exist a full ex-ante regulation of access charges[10]. Since the calculation of access charges, especially in the rail freight sector with many verifying types of transportation, is rather complex, the BNetzA should be given the competence of an ex-ante regulation to ensure a non-discriminatory application of access charges for al railway operators. The ERegG-E includes an extension of the competences of the BNetzA, introducing a regulatory mandate for the BNetzA similar to those in other sectors as telecommunications and energy markets (§§ 51 ERegG-E ff.).

[9] The debate over this question is still ongoing in Germany, and the concerns regarding the integrated structure of Deutsche Bahn AG are not equally shared among stakeholders. For example, prominent organizations such as VDV (Association of German Transport Undertakings) or BDI (Federation of German Industries) do not see a clear link between vertical structure and efficiency of railway systems. See for example the "Mobilitätsagenda Schienenverkehr" (in German) of BDI, p.7 (www.bdi.eu/download_content/InfrastrukturUndLogistik/Mobilitaetsagenda_Schienenpapier_November_2013.pdf) or the VDV "Official Statement by the Association of German Transport Companies (VDV) on the Fourth EU Railway Package" (https://www.vdv.de/positionensuche.aspx?id=a23719db-847b-47b6-9ec0-61fcacc2f8ad&mode=detail)

[10] The infrastructure manager has an obligation to submit the list of charges and the network statements (including charging principles) for checking by BNetzA (process: submission, check, hearings, counter checks, decision). BNetzA has the right to object to the submitted proposal. If BNetzA objects, the status quo ante continues, until the infrastructure manager submits a new proposal.

A second approach in the ERegG-E to strengthen the position of the BNetzA is to explicitly allow for sector monitoring and inquiries, also if no explicit infringement of legal provisions is supposed. By these means, the BNetzA will have the right to collect information and data from infrastructure managers for information purposes. This competence may be particularly effective in addressing problems of lack of transparency and information. While the BNetzA can obtain a more informed position about actual competition concerns and market practices, it can at the same time provide an information basis for railway operators to overcome some informational disadvantages which have been put forward by some entrant railway operators.

4.2.4 Fostering Efficiency: Price Cap Regulation

Another approach to further develop the regulatory framework is the introduction of a price-cap regulation (incentive regulation), which is an effective way to ensure a fair system of access pricing. Such a regulation would address the existing competition concerns related to access pricing and would give railway operators a reliable framework for operating their services reducing uncertainty about future access charges (Bundesnetzagentur, 2008, p. 75).

There are several other well-known positive effects associated with the introduction of a price-cap regulation. The current regulatory framework does not provide strong incentives to induce a cost-reduction for the infrastructure manager (Monopolkommission, 2011, p. 52; Monopolkommission, 2013, p. 47). In contrast, the proposed price-cap regulation offers a long-term sustainable model to realise efficiency potentials and decrease access charges. Since efficiency gains realised in a regulatory period are not considered in the calculation of the price-cap within this same period, an infrastructure manager has an incentive to realise productivity gains and obtain higher profits.

A price-cap regulation needs to take into account the special characteristics of each market it is applied to. For the railway sector in Germany, this means that the high public spending on infrastructure needs to be reflected in the regulation formula (Bundesnetzagentur, 2008, p. 75). Thus, public spending can enter into the regulation formula on the earnings side.

The proposed reform of the regulatory framework ERegG-E provides for the introduction of a price-cap regulation of the rail network as well as passenger stations (§§ 39 ERegG-E ff.). If the policy process to introduce the ERegG is not resumed in the near future, the implementation of a price-cap regulation scheme in the German railway sector should still be envisaged. Only through a transparent and reliable framework can existing complexities in the calculation of access charge schemes be effectively addressed.

5. Summary and conclusions

This case study has outlined current trends in German rail freight. 20 years after the beginning of the liberalisation process, the situation of rail freight in Germany seems to be rather positive: concerning intermodal competition, rail could slightly increase its market share over the past years. With respect to intramodal competition, new railway undertakings have been successful in entering the market and contribute today about one third of rail freight's transport performance.

The analysis of the current situation in the German market, however, also shows a number of challenges for rail freight: on the one hand, demand structures are changing. Traditional transport markets are in decline and railway undertakings have to adjust their business strategies to meet new customer needs. In the past, it seems that entrant RUs have been rather successful in offering new types of customer services, especially in intermodal transport. Compared to the costly and complex single wagonload traffic, which operated mostly by the incumbent Deutsche Bahn AG through its subsidiary DB Schenker Rail, intermodal transport offers new market potentials. It will be the task of all RUs to adapt to this changing environment and thereby strengthen rail in intermodal competition.

Regulation must provide the framework for this development: first and foremost, it must ensure a level playing field for all railway undertakings. Concerns about existing discrimination potentials have been put forward by competing RUs and public bodies. Especially concerns about non-discriminatory access to all essential facilities and about non-transparent network charge schemes have been raised in the past. The regulatory framework should therefore be further developed by introducing a price-cap regulation for access charges. The complexity of rail freight services and different types of traffics offered require a transparent determination of these fees. A price cap regulation would contribute to a clear infrastructure charge system. Additionally, such a regulatory regime would require a clear assignment of costs, which would support the realisation of further efficiency potential and therefore increased competitiveness of rail vis-à-vis other modes of transport.

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