The Reform process of the railway sector in Europe: A disaggregated regulatory approach*

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Abstract:

The railroad package of 2001 focusing on access regulation is in the process of a reform. Particularly, the European Commission intends to remove the obstacles to fair competition that have been identified since 2001. In this context, the paper points out the relevance of the disaggregated regulatory approach. It is necessary to differentiate between infrastructure components which are monopolistic bottlenecks (e.g. railway tracks) and competitive components (e. g. service functions like ticketing). Competition on the markets for railway transport services requires non-discriminatory access to the railway infrastructures. As well the horizontal interoperability between national railway networks is a prerequisite that full competition on European markets for railway services can evolve. Train access charges should provide incentives for the different track companies to participate in collaborations offering international cross-border based track capacities, whereas a regulatory prescription of international track corridors conflicts with the competence to allocate the track capacities of the different track companies. Finally, the complex question of the interplay between discrimination and the deficit problem is addressed in order to present solutions to avoid cross-subsidization between track infrastructure and markets for transport services and to guarantee the efficient usage of public funds.

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1. Introduction

The regulatory reform process in Europe is gaining momentum, although strongly characterized by its path dependency. Starting already two decades ago the long lasting vertical integration approach has been challenged. Until now two phases can be identified. Liberalisation of the markets for train services started in 1991. Based on the Directive 91/440/EC[1], there was no doubt that competitive supply of train services requires non-discriminatory access to railway infrastructures. However market power regulation of access charges was only introduced ten years after by the first railroad infrastructure package of 2001. The purpose of the three European railway packages implemented during the last decade was to revitalise railway transport service markets by strengthening the entrepreneurial role of railroad companies and searching for a more transparent division between the role of the state and the markets in railroad industries.

Nevertheless the functioning of competition on European railroad markets is still considered as unsatisfactory, due to insufficient track access regulation, interoperability gaps etc. According to a Communication from the Commission concerning the development of a Single European Railway Area (European Commission, 2010a, p. 6 f.), market access conditions are partly considered as not being sufficiently precise; as well interoperability issues are partly considered as entry barriers (p. 9); and the observable trend of less investment and funding in the railway sector and thus declining quality of infrastructure is seen as a further obstacle (p. 4 f.). In some states, lacking independence, competences and powers by national regulatory authorities are complained. E. g. it can take years before a regulatory measure against an anti-competitive practice is finally enforced (p. 7).

To tackle these issues, the European Commission initiated a so called ‘Recast’ of the First Railway Package of 2001. Besides simplifying and consolidating the rules by merging the three directives of the first railway package into a single text, the ‘Recast’ is to clarify existing provisions and dissolve inconsistencies

[1] Directive 91/440/EC of the Council of 29 July 1991 on the development of the Community's railways, OJ L 23, 24/08/1991.

within the railway sector regulation identified during the last decennium. Thus the main goal of the ‘Recast’ is to increase competition on the railway markets by improving and partly guaranteeing access as well to rail-related services such as maintenance facilities, terminals, passenger information and ticketing facilities etc. for freight and passenger trains (European Commission, 2010b, chapter 2, section 4). In meantime, the Proposal of the European Commission has passed the first reading by the European Parliament with great majority (Council of the European Union, 2011). In the following we refer to the Recast version passed by the first reading of the European Parliament. It is analysed in section 3, inasmuch these additional access obligations can be legitimated by network specific market power localized by the network economic concept of monopolistic bottlenecks.

In Germany, open access for commercial passengers exist since 1994. As well Sweden and UK meanwhile have a small amount of open access operation, whereas the most interesting open access case is Italy, where competition with Tren Italia on new high speed routes is active (Nash, 2011, p. 12 f.). However, in a lot of member states, there are still considerable differences regarding cross-border train services between European countries as well in terms of the permission of cabotage. In countries like Belgium, Finland, France, Ireland, the Netherlands, Norway, Portugal and Spain railway based passengers transports between two points in one of these countries cannot be performed by a railway undertaking registered in another member state or elsewhere. After all, in countries like Bulgaria, Greece, Poland, Rumania, Slovenia, Hungary, Slovakia and the Baltic countries, meanwhile market access is open for profitable national rail passenger transport services; though these services must be provided under asymmetric market conditions, in competition with ordered and public subsidised rail passenger transport services (IBM and Kirchner, 2011, p. 57 ff.). Since market opening will not be finished as long as train companies in Europe do have free entry to the markets for domestic passenger train services throughout Europe, the issue of cabotage – unfortunately not examined in depth by the ‘Recast’ – is

as well highlighted in section 3. In this context also Regulation EC No. 1370/2007[2] which was enforced in December 2009 is also considered.

With regard to interoperability, the 'Recast' emphasises the need of a better coordination of allocation schemes to improve the attractiveness of rail for international traffic (European Commission, 2010a, p. 9). A competitive bidding process for well-specified train control regions could promote transnational competition on the market for train services. The issue of compatibility standards and interoperability from the perspective of competition is also not within the focus of the 'Recast'. However the goal of removing administrative and technical barriers has been reinforced by the Commission, in particular the removing of interoperability barriers (European Commission, 2010a, p. 8 ff.). Therefore interoperability from the perspective of competition is considered in section 4.

A main goal of the 'Recast' is to improve the framework for investment in railways by encouraging private and public engagements (Council of the European Union, 2011, Art. 8 ff.). This issue is partly discussed in section 5 by addressing the complex issues of discrimination, of deficit problems and of the efficient usage of public funds.

The ‚Recast' as well tackles politico-economic issues. It aims to strengthen the power of national sector specific regulators particularly by extending its competencies regarding rail-related services (Council of the European Union, 2011, Art. 55 ff.). From an institutional perspective, meanwhile a lot of member states introduced sector-specific rail regulators (Austria, Belgium, Germany, Denmark, Greece, France, Italy, Luxembourg, the Netherlands and UK). But still the majority of member states have not yet established a sector-specific regulatory agency. In some countries railway regulation issues are still tackled by the ministry of transport, at the same time owing and controlling the incumbent railway undertaking (IBM and Kirchner, 2011, p. 59 f.). Politico-economic issues however are not in the focus of the present paper; but institutional issues are ad-

[2] Regulation (EC) No 1370/2007 of the European Parliament and of the Council of 23 October 2007 on public passenger transport services by rail and by road and repealing Council Regulations (EEC) Nos 1191/69 and 1107/70, OJ L 315, 3.12.2007.

dressed in section 2 in a broader sense. In particular the background of the 'Recast' is explained using a brief overview on the EU railway reform process of the last decade.

2. The development of liberalization and regulation and the obstacles to competition in the European railway sector

In order to analyze the role of competition and remaining need for regulation in infrastructure based industries as telecommunications, energy, the railway industry the disaggregated approach to network industries is applied. In this respect, three vertically related network levels within the railway industry have to be differentiated (Knieps, 2006). There is the railway track infrastructure, the system of traffic and safety controls and the passengers and freight transport services. Competition on the markets for train services and market power regulation – as far as monopolistic bottlenecks are concerned – is a precondition for efficient and customer friendly train services.

In this respect the European reform of the railway sector started two decades ago. With a focus on accounting separation between infrastructure and operations, Directive 91/440/EC differentiates between two network levels, namely railroad infrastructure and infrastructure management to run the track based network and railway companies using the track paths for transport services. Issues of licensing[3] and the allocation of track capacity as well as nondiscriminatory access charges of international railway undertakings[4] were further issues already tackled in the nineties in order to provide access rights for international freight operators. But a thoroughgoing railway liberalisation process was not yet initiated by the EU. It started at the beginning of the last decade:

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[3] Directive 95/18/EC of the Council of 19 June 1995 on the licensing of railway undertakings, OJ L 143, 27/06/1995.

[4] Directive 95/19/EC of the Council of 19 June 1995 on the allocation of railway infrastructure capacity and the charging of infrastructure fees, OJ L 143, 27.6.1995.

- A First Railway Package issued in 2001 contained three directives[5], referring to the improvement of competition, international freight rail services and the efficient use of infrastructure capacity and further directives in order to eliminate technical and legal barriers[6]. The package in summary contains accounting separation between infrastructure management, freight services and passenger traffic, the requirement of non-discriminatory track access charges and allocation of track capacity, the appointment of an independent sector regulatory body, a performance regime and incentives for a self-financing infrastructure based on track access charges (and public financing on the basis of multi-annual contracts).

- A further reform step was made with the Second Railway Package, focusing on a legally and technically integrated European railway area. It was adopted by the European Commission in 2004 and it contains directives on rail safety[7], on the interoperability of European (high speed and conventional) rail systems[8] and on domestic and international freight services

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[5] Directive 2001/12/EC of the European Parliament and of the Council of 26 February 2001 amending Council Directive 91/440/EEC on the development of the Community's railways, OJ L75/1, 15. 3. 2001; Directive 2001/13/EC of the European Parliament and of the Council of 26 February 2001 amending Council Directive 95/18/EC on the licensing of railway undertakings, OJ L 75/26, 15. 3. 2001; Directive 2001/14/EC of the European Parliament and of the Council of 26 February 2001 on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification, OJ L 75/29, 15. 3. 2001.

[6] Directive 2001/16/EC of the European Parliament and of the Council of 19 March 2001 on the interoperability of the trans-European conventional rail system, OJ L 110, 20.04.2001 and Directive 96/48/EC of the European Parliament and of the Council of 14 June 2006 on the capital adequacy of investment firms and credit institutions (recast), OJ L 177, 30.06.2006.

[7] Directive 2004/49/EC of the European Parliament and of the Council of 29 April 2004 on safety on the Community's railways and amending Council Directive 1995/18/EC on the licensing of railway undertakings and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification, OJ L 220, 21.06.2004, amended by Directive 2008/110/EC of the European Parliament and of the council of 16 December 2008, OJ L 345, 23.12.2008.

[8] Directive 2004/50/EC of the European Parliament and of the Council of 29 April 2004 amending Council Directive 96/48/EC on the interoperability of the trans-European high-speed rail system and Directive 2001/16/EC of the European Parliament and of the Council on the interoperability of the trans-European conventional rail system, OJ L 220, 21.06.2004.

on the entire European network from 1 January 2007[9] and a regulation[10] as a legal basis to establish a European railway agency.

- Finally a Third Railway Package, consisted by two further directives and a regulation[11], was adopted by the European Commission in September 2007. The main focus of the package was to liberalise international passenger traffic services within the EU by 2010.

In the course of the implementation of the railway packages, rail operators meanwhile are able to run national and international rail freight transport services within and between EU countries. As well markets for international passenger services are open. Any licensed railway undertaking has the right to transport passengers at any station along international routes in competition with domestic operators. However, in terms of liberalisation issues, particularly the implementation of the first railway package is still unsatisfactory. As main obstacles to competition most often the European Commission stresses a lack of independence between railway infrastructures and railway services with regard to integrated operators, a lack of transparency of access conditions, discriminatory track access charging and allocation of track capacity, still not appointed independent regulators and insufficient incentives to reduce cost (European Commission, 2006, p. 10. f.; Everis et al., 2010, p. 127). Accordingly, in June

[9] Directive 2004/51/EC of the European Parliament and of the Council of 29 April 2004 amending Council Directive 91/440/EEC on the development of the Community's railways, OJ L 220, 21.06.2004.

[10] Regulation (EC) 881/2004 of the European Parliament and of the Council of 29 April 2004 establishing a European railway agency, OJ L 164, 21.6.2004, amended by Regulation (EC) 1335/2008 of the European Parliament and of the Council of 16 December 2008, OJ L 354, 31.12.2008.

[11] Directive 2007/58/EC of the European Parliament and of the Council of 23 October 2007 amending Council Directive 91/440/EEC on the development of the Community's railways and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure, OJ L 315, 03.12.2007. Its aim is to open the market for international passenger services to competition from 1 January 2010; Directive 2007/59/EC of the European Parliament and of the Council of 23 October 2007 on the certification of train drivers operating locomotives and trains on the railway system in the Community, OJ L 315, 03.12.2007; Regulation (EC) 1371/2007 of the European Parliament and of the Council of 23 October 2007 on rail passengers' rights and obligations, OJ L 315, 03.12.2007.

2008 the Commission addressed infringement letters to 24 of 25[12] concerned member states with the request to correctly implement the first railway package. Some of them followed the request and continued to implement EU rules properly. However, thirteen member states[13] did not comply with the request, why the Commission brought the matter before the Court of Justice of the European Union according to Art. 258 of the Treaty[14] (Everis et al., 2010, p. 130 ff.). Currently infringement procedures continue in the cases of the Czech Republic, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Poland, Slovenia and Spain.

3. The reform of access regulation

3.1 Identification of monopolistic bottlenecks within railroad systems

A major goal of the 'Recast' is to strengthen market power regulation to exhaust the potentials of competition on the markets for train services. From the perspective of the disaggregated regulatory approach firstly, the proper regulatory basis has to be identified, secondly proper regulatory instruments should be applied to the minimal regulatory basis.

In contrast to telecommunications regulation where a three criteria test in meantime has been developed which is compatible to network economic foundations (Blankart, Knieps, Zenhäusern, 2007) railroad regulation is applied by ad hoc specification of rail infrastructure elements to be access regulated. In contrast to the first railroad package focusing on railroad tracks and stations, Annex III of the 'Recast' also considers service facilities like train formation facilities, storage sidings, port facilities, maintenance as components which the minimum

[12] Malta and Cyprus don't have a railway network.

[13] The member states were Austria, the Czech Republic, Germany, Greece, France, Hungary, Ireland, Italy, Luxembourg, Poland, Portugal, Slovenia and Spain.

[14] European Commission, Rail services: Commission legal action against 13 Member States for failing to fully implement first railway package, Press Release, IP/10/807 of 24 June 2010, Brussels.

access package should comprise, irrespective whether these components can also be offered by alternative providers (Council of the European Union, 2011, Annex III).

In order to avoid an oversized regulatory basis apt the theory of monopolistic bottleneck is of particular relevancy (c. f. Knieps 1997, p. 327 ff.). The characteristics of a monopolistic bottleneck are met when:

(1) A facility is necessary for reaching customers because no active substitute is available. This is the case if the relevant market is characterized by a natural monopoly situation, and one provider can offer this facility at lower cost than several providers; and

(2) At the same time, the facility cannot economically feasible be duplicated and thereby no potential substitute is available. This holds if the costs of the facility are irreversible.

Since irreversible costs are no longer decision-relevant for the incumbent whereas potential entrants have to decide whether to incur these irreversible investments. Thus, irreversible costs in combination with a natural monopoly create a credible threat potential for the incumbent. If for example a potential competitor would plan an entry with a parallel track, the incumbent railway owner could threaten to reduce his tariffs to the short- run variable costs, discouraging a second rail infrastructure provider. Once a railway network is completed, further entry with additional tracks cannot be expected. The decision-relevant costs of entry include the costs of track infrastructure, which cannot be covered by tariffs according to short-run variable costs. Since neither active nor potential competition can be expected the incumbent provider of track access possesses stable market power (Knieps 2005, p. 24).

Under absence of natural monopoly this credible threat no longer holds, because the relevant market is sufficiently large to allow two active viable providers of network components. Thus the question arises which of the components listed in Annexes I, II and III of the ‘Recast’ (Council of the European Union, 2011) may be provided by at least two firms even if irreversible costs are involved. Where-

as tracks, passenger stations and freight terminals typically are characterized as monopolistic bottlenecks; there may be sufficient room for alternative providers of maintenance facilities and other service related markets. Storage siding and train formation facilities are based on track facilities which are characteristised as monopolistic bottlenecks, whereas logistic activities of train formation belong to the market of railway traffic services.

For the case that there are no irreversible costs due to potential competition, network specific market power does not exist even in the case of a natural monopoly. Thus, train control systems are not monopolistic bottlenecks although technical regulation in enforcing the control borderlines is required. Potential competition in form of a competitive bidding procedure should work.

In article 13 of the ‘Recast’ (Council of the European Union, 2011) the criterion of a dominant position in at least one of the railway transport service markets is applied for regulating the provision of service facilities on those transport service markets. The question arises whether such a regulation is justified by network specific market power. Since network specific market power does not originate on the markets for network services regulation should be limited to the market power at its roots. Thus, instead of regulating the components of transport service markets the monopolistic bottleneck components should be regulated.

3.2 Incentive regulation versus cost-based regulation

The focus of the ‘Recast’ is on cost-based regulation of pricing structures whereas the disaggregated regulatory approach is based on price-cap regulation, leaving the pricing structure flexible under the entrepreneurial flexibility of the owner of the monopolistic bottleneck components. Starting point is the market for infrastructure capacities, in particular track capacities. The ruling in Article 28 of the ‘Recast’ (states that agreements between train companies (railway undertakings) and infrastructure managers should be non-discriminatory and transparent , that charging scheme in use is based on the same principles over the

whole network resulting in equivalent and non-discriminatory charges for different train companies. As long as access to monopolistic bottleneck components is required, active and potential competition cannot mitigate market power, guaranteeing non-discriminatory access via private bargaining (Knieps 2006, p. 151). Thus the non-discriminatory and transparency requirements of access charges are justified. Principles of charging (Articles, 31-37, Annex VIII of the 'Recast') are laid down in the "flavor" of traditional cost-based regulation well-known from traditional regulations in telecommunications and electricity sector. Charges for the minimum access package should be based on the cost directly incurred caused by infrastructure usage (wear and tear) resulting from operating the train. Mark-ups on the basis of demand elasticities for infrastructure access are allowed in order to obtain full recovery of the infrastructure costs (Article 32 of the 'Recast'). However efficient allocation of track capacities based on scarcity prices is still missing. Instead, if an infrastructure has been declared to be congested, the infrastructure manager may employ priority criteria to allocate infrastructure capacity. In particular international freight services should be given adequate consideration in determining priority criteria (Article 47/5 of the 'Recast'). However the question on the consistency of the 'Recast' arises whether the allocation of infrastructure capacities can be based on legally prescribed ad hoc criteria, and at the same time being discriminatory-free. In contrast the principles of incentive regulation would leave the entrepreneurial flexibility to the infrastructure companies to develop access charging systems reflecting the relevant opportunity costs of infrastructure capacities and simultaneously creating the proper investment incentives for capacity extensions.

4. Interoperability from the perspective of competition on the markets for train services

According to Article 3 of the 'Recast' (Council of the European Union, 2011), infrastructure managers are responsible for establishing, managing and maintaining railway infrastructure including traffic management, whereas these functions may be executed by different actors.

The entrepreneurial flexibility to allocate infrastructure capacities is also important from the transborder perspective of international train services. The construction of international train paths and a related demand for a one-stop-shop for rail corridors requires the cooperation between the infrastructure managers owing the competency of capacity allocation of the individual network. The conclusions of the 'Recast' can be supported, that this goal may result into the establishment of a joint body by the infrastructure managers dealing with the construction of international train paths (Article 43/2; 44/5 of the 'Recast'). Since the track capacities should remain under the entrepreneurial competency of the railroad infrastructure the construction and implementation of international train path is indeed not a regulatory task.[15]

The provision of train services requires simultaneous access to rail infrastructure and traffic control system, regardless of whether these functions are provided by a vertically integrated enterprise or by different undertakings. A precondition for competition on the markets for train services is that train companies have non-discriminatory access not only to railway infrastructure but also have access to the different train control systems. Train control systems are the decisive link between railway infrastructure capacities and train operations. The throughput of train traffic as well as repairs of infrastructure components (tracks etc.) must be co-ordinated by train control systems. The cost of such coordination depends on the number of trains and their operating speeds rather than the number of train companies active on the network. The geographical borderlines of train control systems have to be clearly defined and enforced by technical regulation. However, this does not imply that train control systems would have the characteristics of a monopolistic bottleneck. Computer software and know-how required needed to set-up a train control system are not geographically sunk. Thus, competitive bidding procedures via auctioning of a predefined geographical train

[15] It is interesting to note that in September 2010 not only the European Commission's Proposal on the Recast was initiated, but also a Regulation (EU) No. 913/2010 of the European Parliament and of the Council of 22 September 2010 concerning a European rail network for competitive freight has been adopted (OJ L 276/22, 20.10.2010). Although directly applicable law this regulations remains rather vague about the future role of regulatory agencies regarding the implementation of freight rail corridors in Europe (Otte, 2011, p. 2).

traffic control area for a well-definedperiod of time can work. The result is awarding the contract to the bidder who is able to offer the train control service at the lowest prices while at the same time covering the required costs. From the perspective of a European market for train services intense co-ordination and harmonization of train control systems is required allowing systematic internalisation of cross-border restrictions either by integrated technical solutions or adequate compatibility standards (Knieps 2006, p. 15 f.).

Whereas interoperability issues were first considered in the context of the trans-European high-speed rail system (Directive 96/48/EC), interoperability of the trans-European conventional rail system (Directive 2001/16 EC) became also relevant after the first railroad package.

According to the European Commission lack of interoperability still creates significant barriers to entry in the EU market for train services. Although some progress with interoperability specifications for high-speed and conventional rail would have been achieved, further harmonization of technical specifications for interoperability (TSI) would remain necessary. In particular the phasing-out of old national oriented systems and their replacement by European Rail Traffic Management System /ERMTS. Whereas at present TSI are applicable only to the Trans-European Network, the whole railway system in Europe should have harmonized specifications by 2013 (European Commission, 2010a, p. 8). The role of the European Commission has been strong by subsidizing the development of ERTMS specifications by funding up to 50 % of the standardization efforts for the development of the new European interoperability standard. The European Rail Agency (ERA) was founded with the task to support the interoperability efforts of the European railroads and in particular the development of ERTMS (de Tilière, 2011, p. 19).[16] Although the ‘Recast’ is not particularly focusing on the European harmonization process of train traffic control systems a temporary reduction of the infrastructure charge for trains equipped with the European Train Control System (ETCS) running on lines equipped with national

[16] See also Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community (Recast), OJ L191/1, 18.7.2008.

command control and signaling systems shall be granted (Article 32 (3) of the 'Recast'). In order to get the bandwagon moving towards competition on the markets for crossborder rail traffic this efforts of the European Community towards increasing interoperability of rail traffic management systems are indeed necessary. Nevertheless, the danger of over-standardization regarding train equipment etc. should be avoided.

5. Deficits and the efficient usage of public funds

It is important to differ between the regulatory task of market power regulation, the political task to decide on public subsidies and the entrepreneurial task of rail infrastructure providers and rail traffic service providers. Liberalization of network industries such as telecommunications, energy, etc. mainly focuses on adequate sector specific access regulations. An additional important element in the railway sector, however, is railway traffic delivered on order and payment. Concomitantly some railway network undertakings like high-speed lines are supposed to be profitable, but a lot are partly state-subsidized on the basis of governmental performance and funding agreements. In a nutshell, the general financing scheme for liberalised railway network undertakings therefore are access charges on the one hand and public subsidies on the other. The reference point is the necessity to cover the decision-relevant cost of infrastructure provision, including the opportunity cost of the invested capital which an efficient enterprise would have to bear. Thus, the costs of efficient provision of infrastructure capacities have to be covered by the sum of access charges and public subsidies.

Most important to notice is that entrepreneurial decisions regarding investment, product design, pricing etc. require a forward looking costing standard (current cost accounting). Only a decision relevant costing methodology is able to reflect the costs of an efficient railway undertaking. The standard for determining the efficient costs should under no circumstances be determined by the regulator. It has to be developed within the railway company. Historical costs as a test object are ineffectual because historical cost accounting focuses on irrelevant cost in-

formation with respect to entrepreneurial decisions (Knieps und Weiss, 2009, p. 146 ff.). The regulatory authority's responsibility is to fix non-discriminatory access prices on the basis of the forward looking costing of the access regulated firm.

The costs of an efficient railway service provision should be determined by forward looking investment modeling (volume) and a decision-oriented valuation of user cost of capital and operating costs. As well migration costs of upgrading strategies and the potential of efficiency improvements are to be taken into account (Knieps, 2007, p. 13 ff.). In this context, the problem of financing deficient rail infrastructures has to be solved. The need for subsidies can only be determined by the decision-oriented costing accounting of the infrastructure manager.

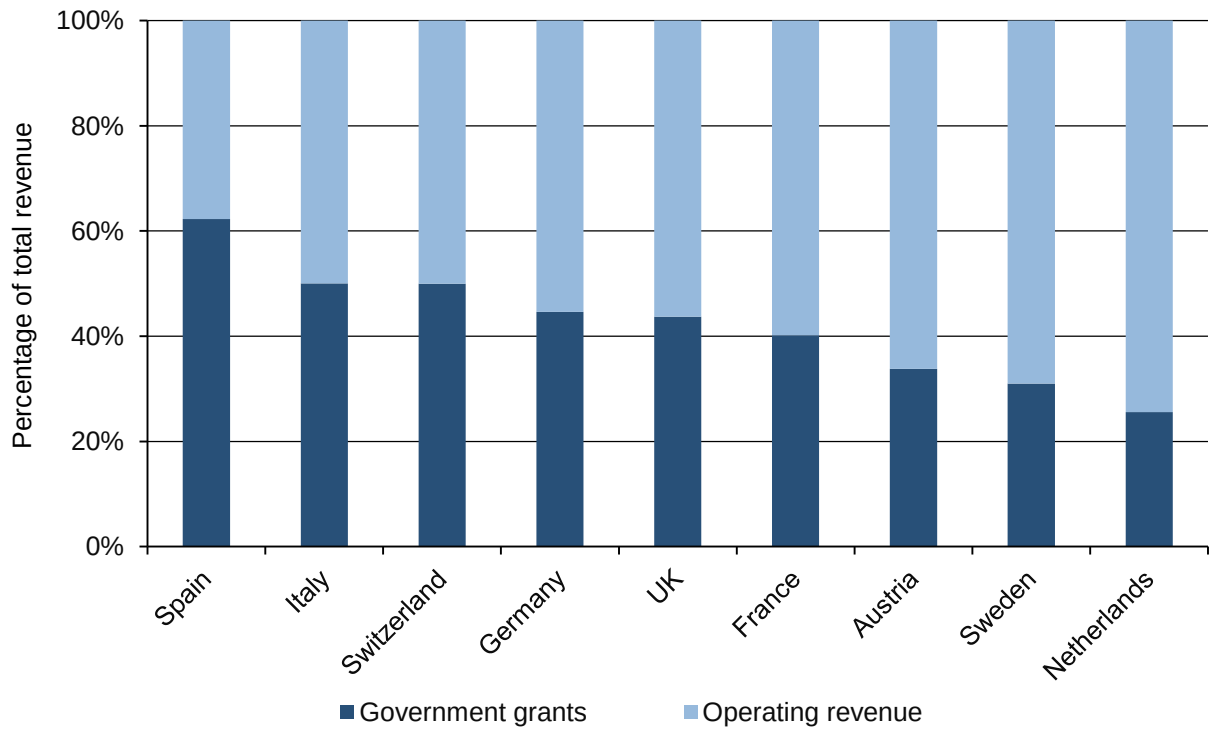
Unfortunately the decision relevant costs of railway undertakings including public service obligation in many cases are hardly known. Railway undertakings often calculate costs based on historical cost accounting rather than decision oriented forward looking cost accounting. The other fact is non-transparent subsidy flows to cover railway deficits (Nera, 2004; Ecorys, 2006). However it has been stated that financial budgets of the public sector for railways have more than doubled in half a decade, whereas the income from operating services and infrastructure management have risen only by about 40 percent (SCI, 2009, p. 18f.).

Countries often focus on distribution policy when subsidising railway undertakings (industrial, regional, environmental policy, etc.). After all, to limit associated negative effects on the efficiency of the provision of transport services, there are guidelines on state aid for railway undertakings (European Commission, 2008). For example, state aid is allowed to support railway undertakings in order that they are able to buy and renew vehicles in time and therefore are in a better position to compete with less environmental friendly modes of transport. "Member States may also accord the infrastructure manager, having due regard to Articles 77, 92 and 93 of the Treaty, financing consistent with the tasks, size and financial requirements, in particular in order to cover new investment" (Directive 91/440/EC, Article 7, section 3). However, this legislation cannot pre-

vent large unexplained differences across countries regarding governmental subsidies for railway infrastructure investment.

State subsidies vary widely between countries. This is shown by the sum of the ratio of public funds to the sum of the railway undertakings operating revenues per country based on operating revenues and public funds from the country reports of SCI (2009). In Western European countries, public funding varies between about 20% and 60% of the total revenue of railway undertakings. The numbers are calculated as averages of the years 2005, 2006 and 2007 (see figure 1).

Figure 1: Financing of railway undertakings in Western European countries



Source: *Based on Fischer et al. (2011, p. 19).*

As well government subsidies vary widely between different railway undertakings in these countries. The differences are particularly significant when comparing subsidies given to integrated railway companies.

It is therefore of interest to find and apply stable regulations, leading to more efficient railway infrastructure and transport services and fewer deficits (see as well Knieps and Weiss, 2009, p. 161 ff.). From the perspective of network economics, incentive compatible access regulations and efficient subsidies are a precondition that competition in the markets for rail traffic can be fully exploited. Therefore a clear-cut localization and separate accounting for monopolistic bottleneck areas in combination with adequate regulation of access conditions is required. As outlined in section 3, rail infrastructure networks are characterised by monopolistic bottleneck areas. Sector specific market power regulation is needed to discipline owners of monopolistic bottlenecks. Sunk costs of railway track infrastructure give the incumbent operator a strategic advantage. Therefore, competitive tendering is only partially functional.[17]

A merit of the ‚Recast' is its emphasis on accounting separation for the railway infrastructure, the track and related equipment (the monopolistic bottleneck) and the operation of rail services (different accounts for passenger transport services under public service obligation and freight transport services) in order to avoid cross subsidies and discrimination practices and easier measurement of performance. Accounting separation in addition is deemed as "a safeguard against State funds devoted to unprofitable activities being shifted to subsidise commercial activities and is thereby necessary for avoiding distortion of competition"(European Commission, 2010b, p. 6). It is also conclusively, that the 'Recast' refrains to demand a regulation on the vertical separation of train transport services and the railway infrastructure. However until the end of 2012 the European Commission will present a draft directive to the separation issue.[18]

[17] It is important to note, that ordering and subsidising deficitary railway infrastructures is to be distinguished from ordering deficitary transport services (Knieps und Weiss, 2009; Knieps, 2010). In the latter case competitive tendering is an efficient way, because railway transport services– as opposed to the provision of railway track infrastructure and strategic behavior of infrastructure managers – are not associated with sunk costs. Insofar, the most efficient and cost-effective service provider can be determined by competitive tendering, thus, the provider that requires the lowest subsidy.

[18] For an in depth analyses of vertical separation issues within the railway industry see OECD, 2005; OECD 2006; RGL Forensics et al., 2009).

In this context, the proposal of horizontal accounting separation is of particular interest (Weiß, 2011). The first step is to differentiate between profitable core networks and non-profitable peripheral networks. Profitable networks are subject to price-cap regulation. Non-profitable parts are subject to politically desired subsidies to the extent that track access charges do not cover the decision-relevant total costs. The decision how to finance the deficit is not in the competence of the sector specific regulator. The question of a subsidy from tax revenues is up for democratic debate. Government subsidies are to be legitimised politically and fixed accordingly. Such a clear-cut separation of competences between regulation and policy then allows both, efficient access charges and the efficient subsidisation of railway deficits.

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