



# Regulation of the Railway Industry

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Across the world, railways are poised to face new challenges, as all transport modes are transformed by technological innovations, liberalisation, competition with other modes of transport and most recently by digitalisation. Consequently, the railway industry is required to increase efficiency while ensuring security and safety, as it has to address multimodality, such as buses, as well as compete with new transport modes, such as car-sharing. Regulation of the railway industry and its various dimensions, not the least competition, is central factor in the process of its transformation and will ultimately decide whether railways will or will not increase their modal share.

This issue of the Network Industries Quarterly (NIQ) is dedicated to some of the best papers presented at the Florence Conference on the Regulation of Railways, which took place on November 16 and 17, 2018. Selected academics and practitioners were invited to Florence to discuss the latest developments in the field of railway regulation, such as competition in the market, role of regulatory agencies and economic perspectives.

**Vicente Mampel** assesses the content of lease agreements concluded by the state-owned rolling stock operating company in compliance with the sectoral legislation.

**Herfurth** presents a brief result of a cross-sectional analysis of the full population of the 28 public transport authorities in charge of short-distance rail services in Germany.

**Quinet and Brunel** look at the role of climate change in the traditional cost - benefit analysis in France, and analyse the impact of the shadow price of carbon on the socioeconomic evaluation of rail projects.

**Schmotz** presents a research project that is to explore the shortcomings of cross-border passenger rail from an institutionalist perspective.

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# Access conditions for rolling stock leasing in Spain\*

Ciara Vicente Mampel\*\*

*The offer of locomotives available in the lease market of rolling stock in Spain is basically reduced to the one that the state-owned rolling stock operating company can make available to third parties. This paper assesses the content of lease agreements concluded by said company in compliance with the sectoral legislation.*

## 1. Addressing the issue

The specificities of the railway sector remain an obstacle to free competition among real or potential operators that are prevented from competitive access to the market for transport services due to the existence of barriers to the entrance. In Spain, one such obstacle is the access to rolling stock, in particular to locomotives. This was reiterated by the Spain's National Commission for Markets and Competition (known by its Spanish acronym, CNMC) in a Decision of 23 May 2018 on the access conditions to rolling stock of *Renfe Alquiler de Material Ferroviario S.A.* (hereinafter, *Renfe Alquiler*), which will be analysed below.

Several reasons substantiate the statement of the regulatory body. The high cost of acquiring the rolling stock and the long deadlines for its manufacture and authorisation for placing it in service, as well as the existence of technical differences to the European rail network (track gauge and signalling and traffic control systems), make it quite difficult to manufacture a rolling stock to be used across frontiers. This is why the rental is naturally the most beneficial alternative with which to acquire rolling stock in property. Nevertheless, the market for rolling stock leasing is not widespread in Spain. Unlike other European countries, there are only two companies engaged in the purchase of railway rolling stock for its subsequent leasing. One is *Alpha Trains Iberia S.L.*, which has its locomotive fleet leased as a whole. The other is *Renfe Alquiler*, which is a state-owned rolling stock operating company (ROSCO) set up in 2014 and owned by the incumbent *Renfe-Operadora*.

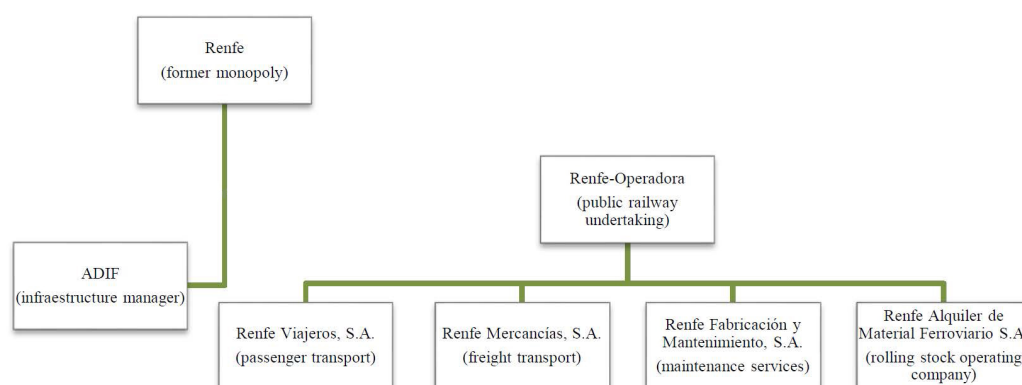
The Spanish railway market was traditionally characterised by a vertically integrated public monopoly, whereby the State was responsible for the management of the infrastructure and the provision of transport services. Both activities were entrusted to *Red Nacional de los Ferrocarriles Españoles* (Renfe) (Fernández Acevedo 2014). Nevertheless, in order to meet the European requirements, the restruc-

turing of the traditional market took place by detaching the activities of administration of railway infrastructure, which constitutes a natural monopoly, from the exploitation of the transport services, which are progressively open to competition (Cuerdo Mir 2007, Bermejo Vera 2014). On one hand, the construction, management and administration activities of the infrastructure were entrusted initially to *Renfe* and later *Administrador de Infraestructuras Ferroviarias* (*Adif*) (Carbonell Porras 2007). On the other hand, Spanish State created *Renfe-Operadora* for the provision of passenger and freight rail transport services, which integrated in its assets all the movable and immovable property of the former monopoly (Rams Ramos 2007). The commercial activity of *Renfe-Operadora* is now divided into four lines of activity (passengers, cargo and logistics, manufacture and maintenance, and asset management) by means of four commercial companies fully owned by the State. These are *Renfe Viajeros, S.A.*, *Renfe Mercancías, S.A.*, *Renfe Fabricación y Mantenimiento, S.A.* and *Renfe Alquiler de Material Ferroviario, S.A.* (Renfe 2013) (Figure 1). Therefore, despite having a large fleet of rolling stock, this company did not develop the lease until 29 April 2014 with the start-up of its subsidiary *Renfe Alquiler*, which, as has already been pointed out, is the quasi-monopolistic provider of rental services for rolling stock nowadays.

Given that the meaningful market power of the incumbent and its link with the ROSCO might bring about anticompetitive behaviours intended to hamper the proper functioning of the railway sector, the Spanish legislator envisaged an ex-ante regulatory framework of obligations that imposed certain conditions in the rental services of the latter. It is said that the imposition of ex-ante obligations is appropriate during a transition period for the complete liberalisation of economic sectors; mostly 'where former monopoly operators continue to benefit from inherited market power or where firms are vertically integrated' (Slot P.J., and Skudder A. 2001). Thus, *Renfe Alquiler* has a legal obligation to provide access to rolling stock that it owns to third

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\*\* Predoctoral Researcher, Institute for Transport Law (IDT), Universitat Jaume I de Castelló, Spain, [vicentec@uji.es](mailto:vicentec@uji.es)



**Figure 1.** The restructuring of the Spanish rail sector

Source: Authors' own compilation

parties under objective, transparent and non-discriminatory conditions pursuant to the 16<sup>th</sup> Additional Provision of the Railways Act no. 38/2015, of 29 September, which extensively refers to the obligation of *Renfe-Operadora* to ensure the independence of the board members of its subsidiary from the transport operators who demanded the rental services of railway rolling stock, whether public or private. Thus, it is expressly prohibited for *Renfe Alquiler* to carry out activities that could impede access to the rolling stock that it owns by means of the establishment of access conditions that are not acceptable to railway undertakings (such as undue economic conditions) or that only enable them to access it under unfavourable conditions (such as a limited or delayed availability of rolling stock or the availability of older and, therefore, less competitive rolling stock).

It is specifically here, in the realm of providing access to rolling stock of *Renfe Alquiler* on a non-discriminatory basis, that the aim of this paper is focused. The following pages offer an assessment of the legal basis and content of the leasing contracts concluded by such a state commercial company to make its rolling stock available to third parties. According to the aforementioned decision of the CNMC, this particularly concerns what contractual conditions contained therein are inappropriate to this kind of lease because they increase the costs of leasing rolling stock and can affect the competitiveness of railway undertakings in the provision of rail transport services.

## 2. Lease agreements of rolling stock of *Renfe Alquiler*

### A. Common structure

The main activity of *Renfe Alquiler* consists of carrying out leasing operations for the provision of the railway roll-

ing stock that it owns, and its facilities, as well as, when appropriate, the management of rolling stock that belongs to third parties. Under a lease agreement, one of the signing parties, called the lessor, is obliged to assign the full enjoyment of services of goods to a third party, called the user or lessee, for a specific period of time in return for regular expressly agreed-upon rental payments (Serra Rodríguez, 2016a). This legal business could be considered as renting (the lessor transfers the use of the good to a third party in exchange for a certain rent during the period of time agreed, without a purchase option, including the provision of additional services, among which is the maintenance of the good leased) or operational leasing (the manufacturer of the equipment directly cedes its use to the manufacturer's client, which acquires it in exchange for a periodic canon agreed). However, from a legal perspective, none of them do go beyond the structure or purpose of the typical lease contract, the content of which shall be substantially ruled by the general provisions of the Spanish Civil Code (hereinafter, CC), for everything that was not expressly agreed to by the contracting parties (Morillas Jarillo 1993; Cámara Lapuente 2008, Moreno Serrano 2017, Mercurio and Moschera 2011). Accordingly, all the lease agreements concluded by *Renfe Alquiler* are generally based on the following common structure.

It is a legal business that has bilateral character. Therefore, the contractual relationship arises between *Renfe Alquiler* (the lessor) that takes on the main provision of giving the exclusive use and enjoyment of the locomotives during an expressly agreed upon period, and a third party (the user or lessee) that acquires the use and enjoyment of locomotives transferred for their industrial or commercial exploitation, but not the property, in exchange for a price consisting in the regular payment of fees. However, besides the transfer

of the use of locomotives, the leasing contracts between *Renfe Alquiler* and its customers necessarily include the comprehensive maintenance of those (both preventive and, partially, corrective) to ensure the peaceful enjoyment of them. The comprehensive maintenance contract will be concluded by *Renfe Alquiler* with a single maintenance entity.

Accordingly, the lessee will mostly be obliged to affect the locomotives to their industrial or commercial exploitation and to pay the price to the lessor, as agreed (Sánchez Hernández 2016b). It is a periodic payment, usually monthly, which will depend on the type of locomotive leased, in accordance with the commercial offer of *Renfe Alquiler*. More specifically, this monthly rent will be the total amount of two elements. The first is a fixed fee for each vehicle leased that will depend on the type of locomotive that is subject to the contract, the number of those and the lease period. The second is a variable fee that is determined based on the price per kilometre driven for each vehicle leased. That obligation shall be fulfilled if the lessor carries out its own obligations (Sánchez Hernández 2016a). Especially, that *Renfe Alquiler* delivers the leased tractor rolling stock in the place and according to the previously agreed conditions (Article 1554.1 CC) having the lessee the right to review the state in which it is supplied. Moreover, unless otherwise agreed, *Renfe Alquiler* is obliged to make all the necessary repairs for the peaceful enjoyment of the leased locomotive if it is not attributable to the acts of the lessee (Sánchez Hernández 2016a).

Nevertheless, against the lessor, the user is obliged to receive the leased locomotive, to use it in accordance with its nature and to preserve it in the state in which it was received according to the expressly agreed upon use or according to commercial uses or usage (Article 1555.2 CC). This obligation is not met with the loss or deterioration of the leased locomotive (Sánchez Hernández 2016b). On the whole, the lessees assume the risk for loss or deterioration of the locomotive leased, whether it is not proven that they acted with all the due diligence to avoid causing a harmful event or, at least, that they have taken the necessary measures of care and vigilance to avoid causing the harmful event. The Spanish Supreme Court considers it to be a rebuttable presumption of responsibility for the deterioration or loss of the leased asset, which operates against the lessee, which has the obligation to prove that it acted with all due diligence to avoid the production of the harmful event, not being enough to prove that the leased asset was used as agreed – Judgment no. 70/2016, of 17 February (RJ 2016, 545) reiterating the Supreme Court doctrine, e.g., in its Judgments no.1097/2006, of 24 October (RJ 2006, 671) and no. 134/2001, of 12 February (RJ

2001, 850). In this case, there is a distribution of responsibilities and risks between *Renfe Alquiler* and the lessees in the event of defects, breakdowns and damages in the locomotives. However, the latter must conclude, in any case, a fully comprehensive coverage of locomotive risks prior to its reception, civil liability insurance and a guarantee in case of breaching its contractual obligations. The lease contracts define the availability and reliability index of the locomotives that the lessor agrees to comply with, together with the penalties that the latter will assume against the lessee in case of non-compliance. These availability indexes, which depend on the technical characteristics and age of each vehicle, will allow the operator to know the days on which the locomotives will be subject to a preventive maintenance intervention, detailing the duration of these in the contracts as well as other additional causes that are described and that they will be, in any case, the responsibility of *Renfe Alquiler*.

Furthermore, the lease agreements include a wide range of assumptions on which both *Renfe Alquiler* and the lessee railway undertaking can terminate the contract with the corresponding compensation for damages, as well as the cases in which the parties must pay penalties for non-compliance (for example, by early termination of the contract without due cause or breach thereof). These penal clauses fulfil a double function. One function is a guarantee of compliance with the main obligation, since the penalty compels the debtor to perform the due service. The other is the indemnity function of the damages that may have produced the breach or defective fulfillment of the main obligation – Judgment of the Supreme Court no. 197/2016, of 30 March (RJ 2016, 1153) with reference to its own settled case law, e.g., Judgments of the Supreme Court no. 586/2013, of 8 October (RJ 2013, 7802); no. 93/2012, of 21 February (RJ 2012, 4524); no. 930/2006, of 28 September (RJ 2006, 6390). Hence, besides reproducing the general decisional regime of mutual obligations, pursuant to the breach of one party empowers the other to choose between claiming the performance of the obligation or to urge the termination of the contract (Art. 1124 CC), penal clauses for non-compliance with the main obligation have also been agreed upon, by which the debtor of the benefit that is to be guaranteed (lessor or lessee) is obliged to pay a certain amount of money, as agreed.

Finally, the lessee is empowered to sub-lease the locomotive transferred by entering into a new lease contract with a third party provided that it has the prior consent of *Renfe Alquiler*. Once the term of the lease stipulated in the contract has elapsed, the lessee must return the locomotives to *Renfe Alquiler* in the same state in which they were received, presuming that the lessee receives the leased asset

in good condition, unless otherwise agreed or proven (Articles 1561 and 1652 CC) (Cámara Lapuente, 2008). The locomotives whose lease contracts expire and are therefore returned to *Renfe Alquiler* could be again offered in lease to all railway undertakings.

### B. Clauses that can restrict the access to Renfe's locomotives

A question that needs to be addressed is which of these contractual conditions can, according to the aforementioned decision of the CNMC, restrict the access to *Renfe's* locomotives in an objective, transparent and non-discriminatory conditions, as envisaged in Spanish law. Essentially, the regulatory body focuses on the provision of maintenance services, especially the choice of a company in charge of them, on the economic conditions applied and on other relevant clauses to access to locomotives such as penalty or damage insurance clauses.

As pointed out above, *Renfe Alquiler* is responsible for choosing the maintenance entity and the approved centre, both of which are charged with full maintenance of the locomotives in accordance with the law in force. Because of this, the incentives of the lessor and the lessee in the maintenance and conservation of the rolling stock are not aligned mostly in those leases that are of a shorter duration. *Renfe Alquiler*, as owner of the locomotives, looks after conserving them in running order so as to extend their economic life as much as possible. On the contrary, lessees will be willing to maximise their use at the lowest possible cost. *Renfe Alquiler* has concluded a comprehensive maintenance contract of all its locomotive fleet with an undertaking integrated in its own business group: *Renfe Fabricación y Mantenimiento*. *Renfe Fabricación y Mantenimiento* is also a state-owned company that is fully owned by *Renfe-Operadora*, which is entrusted with the provision of manufacturing services. This maintenance entity meets all the legal requirements to operate maintenance services and also has the necessary know-how to guarantee the proper conservation of the locomotives because it has traditionally been providing these services. Nonetheless, the regulatory body claims that not all of these circumstances are enough to justify this choice, given the conflicts of interests effectively posed by vertically integrated structures. This is not only because of the link between the lessor (*Renfe Alquiler*) and the company in charge of the maintenance of locomotives, but also because of the integration of these companies into a holding company (*Renfe-Operadora*) that also controls railway undertakings (*Renfe Mercancías* and *Renfe Viajeros*) (Figure 2).

The two facts highlighted above pose negative elements, especially for lessees. On one hand, there is a lack of trans-

parency in the conditions of the provision of maintenance services arising from not contracting such services under competitive conditions in the market. On the other hand, *Renfe Fabricación y Mantenimiento* is currently responsible for executing maintenance services in locomotives owned not only by *Renfe Alquiler* but also by *Renfe Viajeros* and

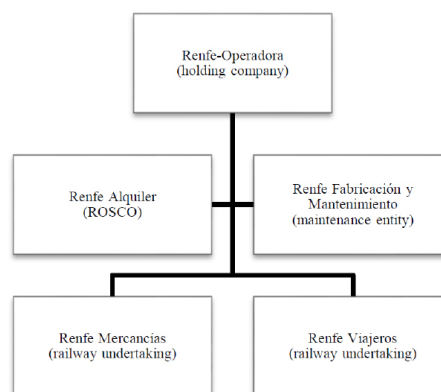


Figure 2. The structure of the model discussed

Source: Authors' own compilation

*Renfe Mercancías*. This is why the regulatory body has required *Renfe Alquiler* to band the locomotives in batches and submit the maintenance services of each of them to competitive agreements, through a tender procedure that is open to any entity under the administrative principles of equity, transparency and non-discrimination.

As far as the economic conditions of the agreements are concerned, the commercial offer of *Renfe Alquiler* is not discriminatory against any lessees, beyond the existing differences on the variable fee, which will depend on the number of kilometres driven for each vehicle leased. However, the CNMC points out that the monthly rent that the lessees must pay to *Renfe Alquiler* is not objective depending on the type of the locomotive leased. The prices for the rental services of the most modern *Renfe's* locomotives, which are the most competitive ones, are similar to those set in the market by its competitors. However, the prices for the oldest ones, which do not face any competition in the market, are disproportionate to their residual value. This is why *Renfe Alquiler* has been urged to justify why the fixed rental fee that the lessees must satisfy is based on objective parameters (such as technical characteristics, cost of maintenance services, residual value or expected profitability of the asset).

Other essential issues that have been discussed are the penalties for early termination of the contract without

due cause or breach thereof, and the fully comprehensive coverage of the risks that affect the locomotive. The lease agreement includes penal clauses that dissuade both the lessor and the lessee from breaching their contractual obligations by paying a pecuniary amount, as agreed. One of these penalty clauses states that the lessee must pay to the lessor if there is an early termination of the agreements by the lessee without just cause or by *Renfe Alquiler* due to the breach of the lessee. This penalty is not applied vice versa (that is, if *Renfe Alquiler* is the party that breaches the agreement or ends it in advance and without just cause). In this case, the regulatory body has considered that this contractual term is unfair since it entails a significant imbalance in the parties' rights and obligations arising from the lease contract. This situation is again due to the conflicts of interest posed by the vertically integrated structures in compliance with the obligation of the ROSCO to provide access to locomotives on a non-discriminatory basis. In particular, this is because this undertaking can involve incentives to terminate the lease contracts without just cause, with the aim of favouring the railway undertakings integrated in its group to the detriment of its competitors in the market. Thus, it is requested that all lease agreements also incorporate a penalty clause for breach or early termination of the lessor in the same way as they do for the lessees, so that there is a symmetry in the penalties that may correspond to both contracting parties.

The damage insurance clause, for its part, has been described as disproportionate because the total amount of the insurance required is very high compared to the residual value of the locomotives, thus entailing an unjustified increase in the costs that the railway undertakings must bear. This clause is discriminatory as well because it does not apply to the lease agreements concluded between *Renfe Alquiler* and the railways undertakings integrated in its group. On the contrary, these contracts include clauses that set the amount that lessees must pay in case of loss or destruction of locomotives, which is not as high as that of the mandatory damage insurance for the rest of the alternative railway undertakings. The fact that the independence of the board members of *Renfe Alquiler* is granted by *Renfe-Operadora* should assume that *Renfe Alquiler* behaves independently from the policy of its group, treating all the lease undertakings equally. Therefore, the obligation to conclude a damage insurance should be required from any lessees in a similar way to avoid any possible preferential treatments.

### 3. Closing remarks

As claimed by the Spanish regulatory body, *Renfe Alquiler* has set specific contractual conditions of access to its

railway rolling stock, which are economically unaffordable to potential railway undertakings or, at least, which gives them unrestricted access to it compared other undertakings integrated in its group, closing the competitiveness of those in the market for rail transport services.

Fulfilling all of the requirements addressed by the CNMC will ensure the enforcement of contractual terms that are equally favourable for all the lessee railway undertakings to reduce the well-known conflicts of interest posed by the vertical integration of *Renfe Alquiler* in a holding company (*Renfe-Operadora*) that simultaneously controls the entity responsible for the provision of the maintenance services of the leased locomotives (*Renfe Fabricación y Mantenimiento*) and the largest railway companies in Spain (*Renfe Mercancías* and *Renfe Viajeros*). This is because the structural separation of *Renfe Alquiler* and *Renfe-Operadora* does not prevent *Renfe-Operadora*, as the owner of the rental services provider company, from carrying out behaviours aimed at hindering the entry of potential newcomers. Thus, the principle of party autonomy on which the whole private legal relationship is based has been slightly restricted in compliance with the obligation of *Renfe Alquiler* to provide access to railway rolling stock on a non-discriminatory basis. However, the situation in other European countries should be taken into account as well. An example is the British ROSCOs, privately owned rolling stock operating companies that have been disassociated from the incumbent.

Be that as it may, this is just the beginning of a new competitive controversy that is particularly raised at the Spanish railway sector. The 16<sup>th</sup> additional provision has remained in the last amendment of the of the Railways Act no. 38/2015, following the Royal decree-law no. 23/2018, of 21 December, which transposes into Spanish law the Directive (EU) 2016/2370 of the European Parliament and of the Council of 14 December 2016 amending Directive 2012/34/EU regarding the opening of the market for domestic passenger transport services by rail and the governance of the railway infrastructure. The new provision adds a new paragraph stating that the conditions of leasing rolling stock services of *Renfe Alquiler* to alternative railway undertakings shall have to be established in the regulations. Thus, the conclusions reached by the CNMC should at least be born in mind for a further regulatory development.

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# PTA Design and Rail Transport Quality

Daniel S. Herfurth\*

*The more centralised the design of a PTA within the federal states is, the better the rail transport quality. This is the brief result of a cross-sectional analysis of the full population of the 28 PTAs in charge of short-distance rail services in Germany.*

## I. Introduction

Public transport authorities (PTAs) play a key role in the transformation process from traditional intramodally segregated transportation realms into intermodal mobility services. They have the capacity and the legitimacy to serve as the neutral platform and steering authority required by any integration process of fragmented public mobility providers. In modern terms, a PTA can be the administrative counterpart of the often proclaimed 'Mobility as a Service' (Hietanen 2014) model.

Before politicians start to award PTAs new competencies with regard to future mobility, we should examine how well they are doing with their current obligations. Let us start with PTAs in charge of short-distance passenger rail services. The evaluation contains two major obstacles. The first is how to compare existing PTA designs across Europe without being confronted with incomparable national contexts. Second, what is actually to be measured and what is 'rail transport quality'?

Section II addresses the first question and delivers the results of a study conducted in Germany. Due to its federalism, Germany offers a variety of institutional designs, also with regard to PTAs. Those PTAs represent a pool from which cross-case analyses within the same national context are possible. Section III addresses the second question and reports the measurement procedure applied in the above-mentioned study. It builds on DIN EN 13816 and develops it for the realm of railways. Section IV provides an overview of the design of the study, after which Section V discusses the data sources and results. The study is meant as a policy evaluation of the different institutional settings of PTAs in Germany. Although it only covers the situation in short-distance services in one country, the mechanism behind it is of general interest for both other countries and other divisions of rail transport. Since all EU member states have to open their markets for short distance rail services, pursuant to the 4<sup>th</sup> European Railway Package, best-practice knowledge of key variables for successful PTAs will be valuable. Other divisions of rail transport can be provided

similar benefits; particularly when tendering models for long-distance passenger services, open freight services or infrastructure maintenance come on the agenda. The discussion of the results is to be found in Section VI.

## II. PTA Design

The structure of PTAs in Germany is very heterogeneous, so the present study focuses on Public rail transport authorities (PRTAs) in particular. After the country's major Railway Reform in 1994, the federal states were given the competency to plan and fund the services in the realm of short-distance passenger rail transport. All PRTAs installed since have been genuinely new, because no explicit PRTA had been needed for this kind of rail services before the reform – the former German Federal Railways just provided the service on behalf of the federal administration (Grandjot & Bernecker 2014).

The legislation process left a lot of leeway for the federal states in terms of how to fulfil their new competency for short-distance passenger rail transport (Wachinger & Wittemann 1996). The German Constitution just assigns the federal states the competency (Art. 143a III GG) and the accompanying federal law is only as precise as to prescribe the states to name 'institutions' that manage this competency (§ 1 II RegG).

Consequently, the federal states have followed their own ideas of what a 'good' PRTA should look like (Eckstaller 2001). The PRTAs were created between 1994 and 1996 and then set into force in the context of the 'regionalisation' that is still in place, with minor modifications of the PRTAs in some states only. The design of those PRTAs differs in three dimensions: (1) the degree of autonomy of the PRTA from their state, (2) the degree of centralisation, and (3) the scope of tasks of the PRTA.

The first dimension (degree of autonomy) arises from the fact that some states decided to take on responsibility for rail planning on their own, without creating a new institution. Others, however, decided to form a separate insti-

\* M.A. Student, Politics and Public Administration, University of Constance, [daniel.herfurth@uni-konstanz.de](mailto:daniel.herfurth@uni-konstanz.de)

tution and – again a sub-differentiation – equipped them with different degrees of autonomy, either as a dependent body or as an institution that is largely allowed to make decisions on its own. The latter clearly comes closest to the ideal type of an ‘agency’ in the sense of Giandomenico Majone (1999), while the former represents the ideal type of core administrative action. The dependent body represents the intermediate solution.

The second dimension (degree of centralisation) addresses the phenomenon that some states founded more than one PRTA for their territory. In those cases, the composition of the managing board can vary substantially – starting with models where only the state has a say in the PRTA and ending with a system where the counties and the communities also have decision making power.

The third dimension (scope of tasks) reflects the fact that some PRTA are not only in charge of short-distance rail services, but also in charge of other branches of public transport. The latter competency had already been with the states before the ‘regionalisation’ was set into force. Some states then decided to merge both competencies in a single institution in 1996, but others did not.

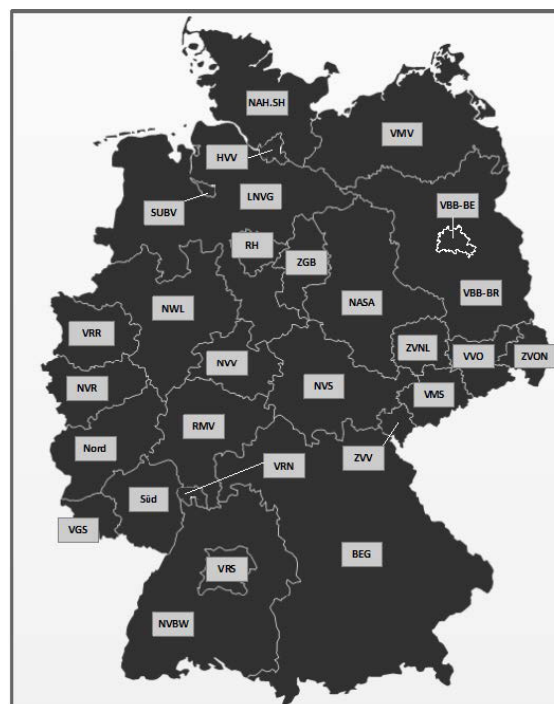
Currently, 28 PRTAs have been established in Germany, all shaped differently on each of the three dimensions (Figure 1). Although they were founded on the basis of conjectures (since no best practice was available at that time), they never had to give proof of their performance (Aberle 2004). Differences in terms of performance are either negated *ex ante* (Wewers 2004) or claimed to be ignorable due to a general increase in quality (Holzhey et al. 2014). The present study steps into this gap and examines the performance of the PRTAs on a cross-sectional basis.

Unlike other studies (for an overview, see Finger 2014), the present study not only measures performance – which is hard enough, as will be shown in Section III – but also regresses performance on the three above-mentioned dimensions of institutional design.

### III. Rail Transport Quality

The ‘quality’ of a service is a latent construct that has many pitfalls when trying to measure it. On the one hand, some aspects of quality are accompanied by a highly subjective overtone. On the other hand, the quality of rail transport depends on the viewpoint of different stakeholders involved in this business.

First, I address the viewpoint issue. The PRTA is the ‘advocate’ of the citizens as passengers of and taxpayers for public transport (Schnieder 2015). It should be in the PRTA’s interest to plan its services with regard to the passengers’ needs and to fund the services with regard to the tax-



**Figure 1.** Territories of the German PRTA

*Source:* Author’s own compilation (based on BAG 2018)

payers’ bearing capacity. The other actors involved in the rail business – mainly train operators, infrastructure managers and train manufacturers – are not politically related but, if at all, contractually related to the PRTA. They settle service and purchase contracts and in case of any dispute, private law is usually applied. With respect to passengers, however, the PRTA is politically accountable, although it is legitimated only very indirectly (usually via the appointment of managers through a political actor, such as the transport minister of the state). It is important to note that parameters of the demand or ‘success’ side, such as the ‘modal split’ or the ‘number of passengers carried’ are not to be taken into consideration for a definition of service quality here. Doing so would be misleading because legislation only assigns the states the duty to implement a supply of rail transport, and does not, of course, assign the citizens the duty to use it.

Second, ‘quality’ must be defined from the viewpoint of the passenger and the taxpayer. DIN EN 13816 provides some criteria that give hints for how to measure quality of public transport from this viewpoint: accessibility, availability, punctuality, consumption of resources, comfort, service and information are listed there (Richter 2014). The former four of these seven criteria are quite manifest in themselves. The present study suggests employing the variables ‘train kilometres’ (Y1) and ‘train stops’ (Y2) in

order to measure accessibility and availability. ‘Punctuality’ can be directly used as a variable (Y3). Variables Y1 to Y3 are of particular interest for citizens as passengers. However, ‘consumption of resources’ is rather affiliated with the citizens’ viewpoint as a taxpayer and is represented by ‘need of subsidy per km’ (Y5).

The latter three of those seven criteria (comfort, service, information) touch on a rather subjective matter. This problem can be solved when attention is directed not so much to the results that PRTAs achieve content-wise in any of these criteria. Instead, attention is paid only to the number of criteria that PRTAs consider in order to measure comfort, service and information. Therefore, this study looks at the meta-level and ‘counts’ indicators that the PRTAs apply in order to measure quality from the perspective of the passengers. To achieve this aim, a quality score (Y4) is constructed that simply counts the criteria of the PRTA. Additionally, the score counts the number of ‘styles’ they use to gather information (such as relying on self-reports of the train operators, employing own evaluation staff and others). Last, it values the accuracy of information that PRTAs seek to have for their own quality reports (network-wide, per train category, per train line or per each single train; see Klein 2007).

Finally, the requirement of comprehensive ‘information’ includes not only information about the journey, but also information on a meta-level regarding the performance of a PRTA. As a public entity using taxpayers’ contributions, PRTAs must record their work and present it to the public. This rule is fixed at the European level via EU Regulation 1370/2007. Nevertheless, the levels of documentation vary a lot among PRTAs, so ‘documentation’ is introduced as a variable (Y6) in order to satisfy the right of the taxpayer to transparency of public action.

These six variables (Y1 to Y6) serve as performance indicators in order to measure rail transport quality from the viewpoint of the citizen and in the realm of responsibility of the PRTA. The six variables are designed in such a way that they are in the sole responsibility of the PRTA. For ‘train kilometres’, ‘train stops’, ‘quality score’ and ‘documentation’, this is clear from the nature of the variable. However, it is not so clear for ‘punctuality’ and ‘subsidy per km’. The infrastructure manager influences both criteria, too, through making operational decisions on which train to prioritise in case of congestion and through imposing fixed infrastructure fees that increase the need for a subsidy. To assign ‘punctuality’ to the PRTA only, the study emphasises the bargaining power of the PRTA. It is the PRTA’s choice to avoid contracts that offer untrustworthy timetable calculations and to demand additional standby trains in order to reduce delays. To address varying infra-

structure fees as a non-negotiable part of operational costs, the study controls for districts with different levels of infrastructure fees.

#### IV. Study Design

The preparatory work pictured in Section III makes it possible to establish a ranking of the 28 PRTAs with regard to their performance on each of the six variables. This could be done via six different rankings but not via one total score ranking since the variables are about to measure very different things. Therefore, the study refrains from establishing single score rankings and instead applies regression and matching methods. This procedure makes it possible to analyse the causes of diverging performance patterns.

It is clear that PRTA design is not the only explanatory variable for every performance indicator. Socio-geographic differences among the PRTA territories also play a role, as well as the amount of money available for a PRTA. An exploratory process to detect other possible explanations of performance variance (that is, the covariables) led to a single variable that covers them all: the number of inhabitants of a PRTA territory is the only variable that must be controlled for. The number of inhabitants is highly correlated with other possible covariables, such as the territory size, the existing railway network and the funds a PRTA can employ for its work, provided according to the German Constitution (“Regionalisierungsmittel”, Art. 106a GG). The latter correlation is no surprise since those funds are mainly distributed in relation to the number of inhabitants (Dziekan & Zistel 2018).

Based on the assumptions of this study, there are no common causes of PRTA design and performance output; that is, there are no confounders. PRTA design was determined by conjectures (see Section II), so there is no prior variable to this and all other circumstances of the tendering process or the contract modalities are consequences of the actions of PRTA, temporally after the design had been fixed. Those variables serve as mediators (temporally between PRTA design and performance output) and are therefore not to be controlled for (for a statistical explanation, see Morgan & Winship 2015).

#### V. Data and Results

Section IV allows to establish a regression of rail transport quality (measured by the six performance indicators) on PRTA design as the variable of interest and on the number of inhabitants as a control variable. Data for the regression is collected on cross-sectional basis for 2015. Sources were reports from PRTAs due to EU Regulation 1370/2007,

state budget documents, publications of the national statistical office and direct requests for data to the PRTAs and their umbrella organisation, the “BAG-SPNV”. In addition to the cross-sectional approach, it was possible to gather longitudinal data for Y1 and Y2, covering 1996, 2010 and 2015. Regression, matching and the longitudinal approach follow a hierarchy of methods, with regression as the main method and the two other methods providing supporting or objecting evidence.

Since the study is conducted over the whole population of the 28 PRTAs, statistical significance is not the main criterion for quality of results here. Instead, correspondence in the results across methods plays the most important role (for further justification, see Loftus 1996 and Behnke 2005).

Table 1 shows that the three dimensions of PRTA design each have a different impact on performance output, especially in terms of unambiguity across methods. Only the ‘degree of centralisation’ dimension has an effect that

The effect of the ‘degree of autonomy’ dimension is mainly not concordant across methods, except for Y2 and Y5. It has a negative effect throughout but not a significant effect on either of the indicators. The effect of the dimension ‘scope of tasks’ is concordant for Y1, Y2 and Y5 and has a positive effect throughout, but also a non-significant effect there.

### VI. Discussion

The degree of centralisation proved to be the most unambiguous dimension of PRTA design in this study. Note that ‘centralisation’ only denotes the degree of centrality within a federal state. Hence, it is not possible to propose that a single PRTA on the federal level of Germany would lead to higher levels of service quality as well. Furthermore, it is not possible to draw any conclusions about the ‘importance’ of one dimension relative to another since only the direction of effects is considered. Effect sizes are not meaningful here and need further standardisation in measurement of input and output variables in order to be comparable. Concerns about omitted ‘third’ variables are welcome and might stimulate the debate.

PRTA design does not explain the lion’s share of variance in performance outcomes for almost all of the indicators (except for Y6, documentation). For Y3 to Y5, the coefficient of determination is quite low. For Y1 and Y2, however, the design variables explain a considerable part of the variance. Considering the high amounts of train kilometres and of taxpayers’ money that are employed here, explaining ‘just’ additional variance is also reasonable. Criticism stating that PRTA design is just the least important element in the causal chain between state action and rail transport quality must acknowledge the substantial effect of centrality of design on the ‘hard facts’, namely train kilometres (Y1) and train stops (Y2). Admittedly, however, criticism seems to be accurate for the scope of tasks and the autonomy of a PRTA.

Is this result valuable as a policy recommendation for other PTAs? Yes it is, as long as a country follows a tendering model for public transport; that is, a ‘competition for the market’, not a ‘competition in the market’. When this precondition is met, the study can serve as a guideline not only for PTAs dealing with short-distance passenger rail transport.

Effect on indicator...	Effect of dimension...		
	autonomy	centralization	task-scope
train kilometers - Y1		+	+
train stops - Y2	-	+	+
punctuality - Y3		+	
quality score - Y4		+	
subsidy - Y5	-	+	+
documentation - Y6		+	

	no concordant direction of effect
+ / -	concordant positive / negative direction of effect
	Effect is significant on 5 % level
○	Direction of effect confirmed by DiD (possible only for Y1, Y2)

**Table 1.** Main effects

Source: Authors’ own compilation

is concordant for all performance indicators and is positive throughout. It can be concluded that a more centralised PRTA leads to higher levels of rail transport quality on all indicators. Results for Y1, Y2 and Y6 are also significant at the 5 per cent level.

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# To what extent are rail investments desirable for tackling climate change?

Alain Quinet\* and Julien Brunel\*\*

*Climate change has increased the opportunities to invest in rail transport. However, the impact of the shadow price of carbon on the socioeconomic evaluation of projects is far more pronounced for freight than for passengers.*

Public investments are not driven exclusively by maximising financial returns. A benevolent authority should also consider the welfare implications of its decisions, notably the impact on externalities. During the last few decades, pressure has grown on policy makers to tackle climate change. Rail services are relatively efficient in terms of carbon emissions and they can play a critical role in achieving climate change mitigation. In this article, we investigate whether rail investments are an economically desirable means of limiting climate change. The first section of the paper briefly presents the long-tradition of cost-benefit analysis (CBA) in France. The second section exhibits the role of climate change in the traditional CBA. The third section highlights the rising role of climate change in socio-economic analysis. Finally, the fourth section points out two factors that may counterbalance this evolution.

## I. Cost-Benefit Analysis in France

For economists, CBA is a common way of assessing the social desirability of a project or a public policy. In France, the practice of CBA has a long-standing tradition. Jules Dupuit, the nineteenth-century French engineer, is considered as the precursor of modern cost-benefit analysis. CBA is also a well-established practice for transport infrastructure and it is mandatory for major public investments.

From a technical point of view, CBA is based on complex engineering that estimates the total costs and benefits of an investment for the society. Of course, given the long-term impacts of transport investments, this calculation is realized for a long period ( $N$  years). Moreover, it not only considers the market consequences of a project, but also internalises a broader variety of impacts. For a transport infrastructure, it notably considers non-monetised costs and benefits like time savings or environmental externalities. Hence, this calculation requires a framework that sets the monetary value for these externalities. In France, CBA is regulated by a common framework, set by the govern-

ment, for every transport investment (rail investment, airports, or highways).

This framework is regularly reassessed by reports commissioned by the French Government. This is why there is a collection of reports, beginning with the reports prepared by Marcel Boiteux in 1994 and 2001, that establishes the doctrine of the French cost-benefit analysis.

This framework has been updated by a series of thematic reports focusing on discounting (Lebegue, 2005) or on the shadow price of carbon (A. Quinet, 2009). More recently, a commission chaired by E. Quinet (2013) pursued this tradition reviewing the practice of cost-benefit in France. Thereafter, the French Government published a new framework for cost-benefit analysis at <https://www.ecologique-solidaire.gouv.fr/evaluation-des-projets-transport>. In 2018, a commission chaired by Alain Quinet was initiated to review the shadow cost of carbon.

## II. The Traditional Role of Climate Change in CBA

Historically, climate change has only had a marginal impact on CBA. This is particularly true for investments in high-speed lines as illustrated by the economic appraisal of the new line between Vaudrecourt and Strasbourg (Figure 1). This project, which has been underway since December 2016, is the second phase of the high-speed line between Paris and Strasbourg. It represents 106 km of railways and costs €2.1 billion. The modal shift from air or car transport to rail provides a benefit in term of greenhouse gases emissions. According to the framework in force in 2004, this benefit only represents 1.4 percent of the total cost of investment. In other words, modal shift provides a reduction of greenhouse gases emissions, but only has a marginal impact on CBA.

However, carbon emission reduction can have a significant impact on CBA for investments in a certain type of rail services. This is notably the case for investments dedicated to freight services. Figure 1 illustrates this point with

\* Chief operating officer SNCF Réseau and chairman of the Commission on the Social value of Carbon, 15 rue Jean-Philippe Rameau, 93418 La Plaine Saint Denis Cedex, France (email: [alain.quinet@reseau.sncf.fr](mailto:alain.quinet@reseau.sncf.fr)).

\*\* Corresponding author, chief economist, SNCF Réseau, 174 avenue de France, 75013 Paris, France, (email: [j.brunel@reseau.sncf.fr](mailto:j.brunel@reseau.sncf.fr)).

the project between Serqueux and Gisors. This project, which is estimated to cost €230 M, consists of enhancing and electrifying an existing regional line in Normandy (approx. 50 km). It will improve the quality of the railway for freight trains between Le Havre, one of the main French maritime ports, and the Paris region. For this project, the benefit in terms of greenhouse gases emissions is significant and represents 25 percent of the cost of investment.

	<i>benefit in M€</i>	<i>in % of invest.</i>
New high-speed line Paris–Strasbourg	35 M€	1.4%
Electrification of Serqueux–Gisors line	72 M€	25.1%

**Figure 1.** Climate change benefits

*Source:* Authors' own compilation (using the CBA framework of 2004)

In conclusion, according to the traditional CBA, rail investments are generally not an efficient means of tackling climate change. These investments are very costly compared to their return in greenhouse gases savings. The main socioeconomic benefit of high-speed lines is time savings. However, there are some exceptions; for instance, the impact of climate change may be noticeable for freight projects since there are no equivalents to time savings for this kind of project.

### III. The New Role Climate Change in CBA

During the last decades, the greater concern of the society for climate change has influenced the practice of CBA. It has notably resulted in an increasing role of climate change in the economic appraisal.

#### A. Social Discounting

Climate change has provoked intense debate over the right discount rate. In particular, the appropriate discount rate for climate change has been extensively debated by Stern (2008), Weitzman (2007), and Nordhaus (2007). This is a crucial issue for CBA because the conclusions of the analysis strongly depend on which discount rate is used.

In France, the social discount rate during the 1980s was 8 percent. Since the beginning of the 2000s, this value has been investigated by different commissions, in particular one chaired by Lebegue (2005). This commission concluded that the social discount rate should be reassessed at 4 percent, which represents a significant decrease of this parameter.

However, regarding the controversy over the value of the public discount rate, this commission did not take the side of those who estimate that discounting is not ethical. The arguments advanced by the commission were based on market considerations. More specifically, the value recommended by Lebegue (2005) was derived from the standard Ramsey (1928) formula:

$$r = \delta + \gamma\mu$$

where  $r$  is the social discount rate,  $\delta$  is a combination of pure time preference ( $\delta = 1\%$ ), under which the future affects would be eliminated or severely altered,  $\gamma$  is the elasticity of marginal utility of consumption ( $\gamma = 2\%$ ) and  $\mu$  the economic growth rate ( $\mu = 1.5\%$ ).

More recently, a report by E. Quinet (2013) reassessed the social discounting rate used for CBA. It recommended the use a constant social discount rate of 4.5 percent, including a risk premium (which was not the case in the previous rate). This rate is currently considered for public evaluation in France.

#### B. The Shadow Cost of Carbon

Like any non-market good, the inclusion of the climate change in CBA supposes a monetisation of this damage. The recognition of this issue was progressively completed during the last two decades. Many developed countries have defined a social cost of carbon for CBA. In the United States during the 2000s, for instance, a wide range of values were used by governmental agencies such as the Department of Transport (DOT), the Department of Energy (DOE) or the Environmental Protection Agency (EPA) to take into account this element in economic appraisal. These divergences ended in 2009 with an interagency process that provides an assessment of the social cost of carbon.

In France, a first set of value for the shadow price of carbon was defined by a French official guideline at the beginning of the 2000s (Boiteux, 2001). Since then, this value has been reconsidered by a specific working group commissioned on this topic chaired by Alain Quinet (2009).

This commission did not apply the standard Pigovian approach to estimate the social cost of carbon (that is, the present value damages of the marginal emission). Instead, it applied an alternative method, also known as the cost-effectiveness method, in which the shadow price of carbon is set on the basis of exogenously determined emission reduction objectives, namely carbon neutrality. In this approach, the shadow price of carbon is the value of carbon that is

necessary to introduce in order to achieve the emission reduction objective.

Given the French objectives in terms of CO<sub>2</sub> reduction, the commission chaired by Alain Quinet (2009) recommended considering a social value of carbon of €100<sub>2008</sub>/tCO<sub>2</sub> in 2030. A new commission, also chaired by Alain Quinet, is currently reviewing this value after the 2015 Paris Climate Agreement. According to this Commission, the shadow price of carbon should increase significantly (€250/tCO<sub>2</sub> in 2030).

### C. The Optimal Path of the Cost of Carbon

Climate change also raises questions about the evolution of the social cost of carbon in the long-term. Indeed, in the CBA, the effect of discounting may offset the evolution of the social cost of carbon.

The literature has offered different contributions on this issue recently. One of its propositions is to extend a seminal model developed by Hotelling, which states that the optimal evolution of a nonrenewable resource is the discount rate. This was a notable conclusion of the commission chaired by Alain Quinet (2009) devoted to the shadow price of carbon.

Thus, greenhouses gases emissions can be treated as a non-renewal resource. The objective of Paris agreement is 'to hold the increase in the global average temperature to well below 2 °C above pre-industrial levels'. A greenhouses gases concentration level can be defined in order to correspond to this objective, and greenhouses gases emissions forbidden above this level. Therefore, the optimal rule for carbon emissions is the application of Hotelling principle: the percentage change of the social cost carbon should

equal the discount rate. This practice has been institutionalised for CBA in France.

### D. The Assessment Period

CBA was traditionally performed for a limited time period. An infrastructure investment was generally assessed for a period of 30 or 50 years. The benefits for the collectivity upon this period were not considered. With the increasing sensibility of society over the issue of greenhouse gases emissions, which are a long-term pollution, several authors have suggested that we should adapt CBA and value the long-term effects of policies and investments.

In this context, the French guideline for CBA has been recently adapted. The commission chaired by E. Quinet (2013) suggested enlarging the period of assessment. It proposes calculating the costs and benefits until 2070 and, upon this date, valuing a residual value of the investment, which corresponds to the net present value of benefits for the next 70 years; that is, until 2140. In order to be consistent with the Hotelling rule, this residual value should be calculated stabilising the unit price of all costs and benefits while the social cost of carbon will continue to increase like the discount rate.

### E. Application

During the last decade, socioeconomic methods have been adapted significantly in order to increase the role of carbon emissions in CBA. With this new framework, climate change represents has a non-negligible impact for CBA (Figure 2). For instance, the reduction of greenhouse gases can represent 50 percent of the total cost of high-

	Boiteux (2001)	Lebegue (2005)	A. Quinet (2009)	E. Quinet (2013)	A. Quinet (tpb)
Social discounting rate	8%	4%	4%	4.5%	4.5%
Shadow price of carbon					
in 2010	€32/tCO <sub>2</sub>	€32/tCO <sub>2</sub>	€32/tCO <sub>2</sub>	€32/tCO <sub>2</sub>	€32/tCO <sub>2</sub>
in 2030	€58/tCO <sub>2</sub>	€58/tCO <sub>2</sub>	€100/tCO <sub>2</sub>	€100/tCO <sub>2</sub>	€250/tCO <sub>2</sub>
in 2050	€104/tCO <sub>2</sub>	€104/tCO <sub>2</sub>	€180/tCO <sub>2</sub>	€180/tCO <sub>2</sub>	€775/tCO <sub>2</sub>
Long run growth of the shadow price of carbon (% p a.)	3%	3%	4%	4.5%	4.5%
Period of assessment	50 years	50 years	50 years	Until 2140	Until 2140

Figure 2. Evolution of socioeconomic methods

Source: Authors' own compilation



speed rail investment or 800 percent of the cost of a freight investment (Figure 3).

	<i>benefit in M€</i>	<i>in % of invest.</i>
Electrification of Serqueux – Gisors line	2463	859%
New high-speed line Paris – Strasbourg	1184	47.3%

**Figure 3.** Climate change benefits

*Source:* Authors’ own compilation (using the CBA framework of 2018)

#### IV. New Issues

The above can lead to the conclusion that rail investments are very desirable in order to achieve carbon neutrality. However, such a conclusion may be fallacious. The opportunity of rail investment is counterbalanced by two issues: the inclusion of construction phase emissions and the evolution of emission factors.

Firstly, a series of studies recently highlighted that the construction of a new high-speed line is responsible for massive CO<sub>2</sub> emissions. In certain circumstances (such as large tunnel sections and low traffic sections), these emissions may offset the reduction of emissions provided by modal shift. For CBA, it suggests that we should also take into consideration the construction phase emissions, which have often been ignored until now. There was no rationale for this practice except that environmental issues were not monetised in CBA or their value was very low. Nowadays, this is no longer the case. Environmental externalities are not negligible, so it is essential to value their cost during both the operation phase and the construction phase.

Secondly, the objective of a strong reduction of CO<sub>2</sub> emissions questions the reference scenario of the CBA. In accordance with the Paris Agreement, France aims to cut off its greenhouses gas emissions by achieving carbon-neutrality in 2050. In this context, the sector of transport will have to change drastically. The road transport, aviation, and maritime industries will have to significantly reduce their contributions to climate change. For instance, the generalization of electric vehicles can reduce the environmental footprint of road transport.

This yields to a relatively counter-intuitive conclusion for socioeconomic analysis. Public transport would have no advantage in terms of CO<sub>2</sub> emissions relative to private decarbonised cars. Therefore, carbon neutrality would reduce the opportunity to invest in low-carbon infrastruc-

tures. Figure 4 presents the result of CBA assuming that road transport reaches carbon neutrality in 2050. In these circumstances, the impact of modal shift in terms of CO<sub>2</sub> emissions reduction is less obvious. Hence, investing in rail transport is less desirable.

	<i>benefit in M€</i>	<i>in % of invest.</i>
Electrification of Serqueux–Gisors line	469	164%
New high-speed line Paris–Strasbourg	243	9.7%

**Figure 4.** Climate change benefits (in a carbon-neutral society)

*Source:* Authors’ own compilation

#### V. Conclusion

Ultimately, this analysis suggests that rail investments are not necessarily an efficient means of tackling climate change, notably if road transport is decarbonised.

However, one should note that there is considerable uncertainty when looking at long-term emission factors. The evolution of dirty modes of emission factors is very uncertain. Replacing fossil fuels by decarbonised energy is challenging, notably for aviation or maritime transport. This complexity stresses out the importance of the reference scenario for CBA. Traditionally, this was been a critical topic because of the impact on CBA of the macroeconomic context (prices, GDP). With climate change, the evolution of emission factors becomes a critical issue of the reference scenario.

Moreover, we should also point out that rail investments may be an efficient policy for certain services. It is likely that time savings remain the principal advantage of CBA for high-speed investments. However, rail investment can play a role in tackling climate change for certain services, such as freight transport. For these services, the decarbonisation of alternative modes (such as maritime transport) is less obvious. Therefore, rail investment may be an efficient means of reducing the impact of freight transport on climate change. This notably includes several enhancement investments on the existing network that are much more environmentally friendly in the construction phase than a new line.

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# How does liberalisation affect cross-border passenger rail in Central Europe?

Anja Schmotz\*

*This paper presents a research project that is to explore the shortcomings of cross-border passenger rail from an institutionalist perspective. As a first insight, the different national interpretations of the “Public Service Obligation Regulation” are considered as potentially problematic.*

Among the European Union’s main objectives is the idea of territorial cohesion and the abolition of separating effects of state borders. When it comes to passenger rail, the quantity and quality of cross-border services are mostly poor compared to the same kind of services within most nation states. As Lüttmerding and Gather (2013) have shown, the quality of rail transport connecting metropolises in two different countries displays several shortcomings compared to inland services. In many cases, the number of regular daily connections across borders was inferior to internal traffic between metropolises. The average speed often was lower, and, to a certain extent, the number of necessary changes of trains was higher when a state border was crossed on a trip between European metropolises.

A recent working paper directed by the directorate-general for regional policy confirmed that “in most border areas stations across the border are less well connected and trips to these stations tend to be less frequent and slower” (COM 2017: 2). On average, only “44 % of the population of all border areas has access to rail services”, not necessarily including cross-border services (COM 2017: 3).

The full picture is more heterogeneous: there are also examples of efficient and frequent cross-border transport services, for instance between Denmark and Sweden or generally in more densely populated regions (cf. COM 2017). However, notably in the Central Eastern and Southern European Member States, rail connections depict “very low frequencies”, making them “hardly usable for regular cross-border travelling” (COM 2017: 7).

## Accessibility of regional centres and metropolises in Central Europe

This paper focuses on cross-border passenger rail in Central Europe, choosing German–Polish as well as German–Czech rail connections as regional case studies. Since the fall of the Iron Curtain, long-distance cross-border rail in

these two case regions has gradually been cut down, even though both Poland and the Czech Republic joined the EU in 2004. During the last few decades, regional centres such as Plzeň, Wrocław, Poznań, Szczecin, Dresden and the capital cities of Prague and Berlin have grown, giving rise to cross-border flows not only of tourists but also business travellers and work commuters (cf. Knippschild, Schmotz and Wätzig 2014). Nevertheless, the direct rail connection between Nuremberg and Prague was first shifted from long-distance to regional trains on the German side in 2006 and then cancelled in 2012. The trip now requires at least one change of trains. The EuroCity Wawel linking Berlin and Wrocław was withdrawn in December 2014 and the direct regional train from Dresden to Wrocław was temporarily cancelled in 2015 for nine months. Most of the currently existing cross-border connections between larger regional centres that were traditionally served by long-distance rail are now served by regional trains only. The regional replacement services mostly do not provide adequate rolling stock and services often suffer from both low frequencies and average travel speed.

## Research on cross-border rail

For several years, little scientific research was conducted on the specific challenges of cross-border railway services. A recent study on ‘missing links’ concerning cross-border railway connections was commissioned by the European Commission. One of its major findings was that “[g]aps in the cross-border passenger rail network are not necessarily caused by missing elements of infrastructure: In many cases, even on operational railway infrastructure there is a lack of cross-border passenger services” (COM 2018: 6). While the state of the infrastructure and the availability of rolling stock may play an important role, this finding showed that there is a scope for action within the landscape of actors (public authorities, regulatory bodies, and rail operators) to improve the level of services.

However, there have still not been any scientific studies

\* PhD student, International Institute (IHI) Zittau and Faculty of Environmental Sciences, Technische Universität Dresden, anja.schmotz@tu-dresden.de

showing how these different barriers, institutional structures, and technical aspects interact, contributing to the low quality of cross-border passenger rail services. This underway thesis will provide such a study, analysing the current offer in cross-border rail services as a product of the multi-level governance regime created by the EU Single (Railway) Market policy and national railway reforms. The focus is on German–Polish and German–Czech passenger rail, allowing for an in-depth, qualitative analysis.

### Approach and methodology

The main research questions of this ongoing project are:

- Which mechanisms can explain the current shortcomings regarding the quality and quantity of cross-border passenger rail offers?
- To what extent can this be attributed to European and national rules introduced during the process of railway liberalisation?

The project aims (a) to show if and which mismatches have grown out of the specific national ways to implement European railway regulation, and (b) to clarify if there is a need to adapt the national and the European regulatory regimes to provide suitable policy instruments to foster cross-border rail services.

Existing work displays an effect of the state of the infrastructure, the availability of adequate rolling stock, as well as the competition with street and air transport on the provision of passenger rail services. Research needs to be done, not merely on the relevance of single variables, but the causal mechanisms linking these variables.

Within this project, institutional analyses of the German, Czech, and Polish railway systems are realised, followed by case studies of cross-border railway connections. At the current stage of research, three groups of connections between metropolises and regional centres can be distinguished:

- 1) Present-day long-distance services that expose a continuity of offers and are situated on the main TEN-T corridors (such as Berlin–Warsaw and Berlin–Prague).
- 2) Train connections between important regional centres that have previously been operated as long-distance services, but, after experiencing a retreat of the leading long-distance operators in the region, are now being served as regional transport only (“potential long-distance services” such as Berlin–Wrocław,

Dresden–Wrocław, Berlin–Szczecin, Nuremberg–Prague, and Munich–Prague).

- 3) Cross-border connections linking smaller centres (such as Görlitz–Jelenia Góra) clearly defined as regional services and recompensed as public service obligations.

The second group of cases is particularly interesting because it shows most clearly the effects of liberalisation and railway reforms on cross-border connections. These connections are at the centre of the different national interpretations of what a public service obligation comprises and how and by whom it can be organised and financed. Thus, the focus of the case studies will be on this group, while the others are used for comparison purposes.

For the chosen cases of potential long-distance connections, I will study whether comparable arrangements lead to a similar outcome for both German–Polish and German–Czech rail connections and if common denominators can be found. There is evidence of German–Czech connections performing slightly better than German–Polish services from the same group, especially regarding the number of pairs of trains per day, features of the rolling stock, and the organisation of through connections. If this can be confirmed during the data analysis, a case study will check which variables and mechanisms make the difference.

The gathering of data for the institutional analysis is based on pieces of European, national and regional legislation. If necessary, additional expert interviews will be conducted. In the second phase, the case study is mainly built on interviews with actors and experts. The development of cross-border connections over time is treated in a separate analysis based on timetables and statistical data. The following sections present insight into the institutional analysis.

### Liberalisation transforming the field of actors and rules of the game

The EU’s market opening policy had a profound impact on the rail sector. The so-called ‘unbundling’, starting with the Directive 91/440/EEC, strongly changed the landscape of actors, but it still allowed for a broad range of structures to be implemented in the Member States.

Further essential steps for creating a Single European Railway Area were taken from 2001 on, when the first of currently four ‘railway packages’ was adopted. New actors entered the stage with the establishment of regulatory bodies monitoring market and safety issues. Access rights of

railway operators to the infrastructure were subsequently extended, from open access in international passenger transport, including cabotage, effective since 2010, to national passenger transport entering into force in 2019/20.

For cross-border public transport services, Regulation (EC) 1370/2007 is particularly relevant. This so-called “Public Service Obligation (PSO) Regulation” sets the framework for the provision of public transport services of general interest. It requires public service contracts to be concluded by a competent authority when an operator is granted an exclusive right and/or compensation for the discharge of public service obligations (Art. 3). Amended by Regulation (EU) 2016/2338, the PSO Regulation now foresees, as a general rule, that public service contracts in transport shall be awarded by competitive tendering, in case they are not to be concluded with an internal operator. This regulation shall apply to public passenger rail services from December 2019 onwards, given a transition period until 2023. In sum, this regulation defines important procedural rules for the provision of a part of passenger rail services that each Member State must follow. However, it leaves a major scope of action, as will be illustrated in the next section.

### **Adapting national law to the PSO Regulation in Germany, Poland, and the Czech Republic**

Concerning the definition of public service obligations, there is a significant difference between Germany on one side and Poland and the Czech Republic on the other. The two latter countries consider regional, interregional, and long-distance transport to be of general interest. The Polish Act on Public Transport, effective since March 2011, provides that the ministry in charge of transport is responsible for interregional and international public transport lines (Art. 7.1 (6)). To date, the ministry awards PSO contracts directly “to the operator of its choice, i.e. PKP Intercity” (CER 2017: 111), the long-distance branch of the state-owned holding *Polskie Koleje Państwowe*.

In the Czech Republic, the Act on Public Service in Passenger Transport 194/2010 and amendments of other Acts adopted in April 2010 provide an assignment of tasks comparable to that in Poland, with the Ministry of Transport being directly responsible for determining the scope of long-distance and interregional public transport.

In contrast, current German legislation draws a line between the category of long-distance transport being a purely commercial service and (inter)regional passenger rail services. The Constitution (*Grundgesetz*) stipulates in Art. 87e(4) that the Federal State guarantees that the public

good will be considered concerning rail transport services provided by the state-run railway companies, not pertaining to local or regional traffic. As of yet there is no legal act specifying the role of long-distance transport. Only the Federal Act on the Regionalisation of Local and Regional Passenger Transport, effective since 1996, postulates that “guaranteeing a sufficient service of local and regional public transport to the public is a task of general interest (*Da-seinsvorsorge*)” (§ 1 (1), own translation). Public local and regional transport is defined as regular, universally accessible passenger transport “predominantly intended to satisfy the demand in urban, suburban and regional transport.” As a point of reference, the law specifies a maximum distance of 50 km or travel time of no longer than one hour. (Cf. § 2) According to this act, the competent authorities are to be designated by the law of the federal states (*Länder*).

Therefore, the provision of long-distance rail services in Germany is a genuinely commercial decision of each operator. Given the current market structure, mainly the incumbent *Deutsche Bahn Fernverkehr* determines if service on a long-distance connection is profitable and therefore worth being provided. On the other hand, in Poland and the Czech Republic, the respective ministries responsible for transport decide which long-distance services shall be provided as public services, mainly taking the form of direct awards to the state-owned railway companies PKP and ČD. Still, these awards allow for additional commercial services to be delivered by railway operators within open access procedures (such as LEO Express and RegioJet in the Czech Republic). In Germany, the governance mode market prevails, but the incumbent is confronted with little competition; in the other two cases, both market and hierarchical modes play a role in long-distance rail services, with a somehow more vivid competition in the Czech Republic than in Poland.

For regional passenger rail, the variance is not only found on the national level, but also between regions. In Germany, the Länder adjacent to Poland and the Czech Republic chose different models. For instance, Bavaria, as well as a union of Berlin and Brandenburg, each established a single regional authority covering the whole territory, whereas Saxony has delegated the competence to order regional rail passenger services to five distinct dedicated associations (*Zweckverbände*) in the hands of the rural districts (*Landkreise*). The procedure applied in nearly all cases is a competitive tendering of public services.

In the Czech Republic, the competence for local and regional public transport lies with the regions (*kraje*). Some of the regions established distinct bodies, for instance, to

coordinate timetables. PSO contracts are concluded by either direct award or competitive tendering.

In Poland, according to the Act on Railway Transport and the Act on Public Transport, the competent contracting authorities for regional public transport services are the self-governments of the voivodeships (*województwa*). The voivodeships either apply competitive tendering or opt for direct negotiations with a single operator to award PSO contracts. A particularity of the Polish system is that most railway undertakings operating regional services are owned by the voivodeships themselves.

### Conclusion and future work

Member States make use of the scope provided by the PSO Regulation in different ways, and the structures, procedures, and definitions of what can be counted as public service vary greatly from one country to another. The confrontation of different governance modes that do not necessarily fit one another is likely to provoke deficiencies in service provision. Mainly German long-distance passenger rail services are operated at the economic risk of the operating railway company. This operation without subsidies bears the risk of neglecting connections on which passenger demand is too low to be profitable. Future work within this PhD project includes the investigation of what deters Polish and Czech state-owned long-distance operators or other railway undertakings from offering such cross-border services on their own, and if there is a need to provide specific policy tools to foster long-distance services.

Concerning regional public rail services, it will be examined whether the different awarding procedures prevailing in each region tend to be compatible or incompatible with each other. Between Germany and, respectively, the Czech Republic and Poland, joint procedures for competitive tendering currently are rarely applied. Studies should examine how the dissimilarity of regional institutional structures impacts on the cooperation of the competent authorities. Notably, the differences regarding territorial coverage of the dedicated associations in Saxony compared to those in Bavaria and Berlin/ Brandenburg might have effects on their ability to negotiate with partners from the neighbouring country.

This paper only provides a rough outline of the governance regime concerning cross-border railways between Germany and its Eastern neighbours. When completed, the study will allow answers to the question if the policy instruments currently provided by the EU and its Member States are suitable to improve cross-border rail transport.

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# networkindustries

quarterly

**Network Industries Quarterly,  
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## **Current Issues in the Network Industries in Turkey**

In Turkey, following the economic crisis in 2001, comprehensive market-based reforms were launched in several sectors, including the network industries, such as telecommunications, electricity, and airline. The privatisation of certain units has enabled the stimulation of investments in different segments and the establishment of sector-specific regulatory authorities, which in turn have resulted in significant improvements.

However, the introduction of competition and regulatory achievements in the electricity and the telecommunications industries, have been slower than initially anticipated. Excessive infrastructural investments have created uncertainty about the future of the airline industry. Moreover, emerging platforms on the internet are witnessing problematic regulatory interventions.

The next issue of the Network Industries Quarterly will be dedicated to papers related to these current issues observed across the network industries in Turkey. Academics and practitioners will discuss the aforementioned developments in the electricity, telecommunications, airline, and platform industries.

### **Guest editor: Dr. Emin Köksal**

Associate Professor, Department of Economics, Bahcesehir University, Turkey

The guest editor of this issue is Dr. Emin Köksal (B.A. & M. A.: Galatasaray University, Ph.D.: Marmara University). He published extensively on competition and regulatory issues in telecommunications, energy, and in platform industries. Dr. Köksal has experience in platform business models, network neutrality regulations and internet usage. He teaches industrial organisation, platform economics, innovation & competition policy in digital markets.



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The Network Industries Quarterly is a multidisciplinary international publication. Each issue is coordinated by a guest editor, who chooses four to six different articles all related to the topic chosen. Articles must be high-quality, written in clear, plain language. They should be original papers that will contribute to furthering the knowledge base of network industries policy matters. Articles can refer to theories and, when appropriate, deduce practical applications. Additionally, they can make policy recommendations and deduce management implications.

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### QUESTIONS / COMMENTS?

**Irina Lapenkova**, Managing Editor:

[irina.lapenkova@eui.eu](mailto:irina.lapenkova@eui.eu)

**Ozan Barış Süt**, Designer:

[ozanbarissut@gmail.com](mailto:ozanbarissut@gmail.com)

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