

1. Rail economics and regulation

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Even though some form of railway regulation already existed in the United States, starting with the Interstate Commission the US Congress established in 1887, economic railway regulation is basically a European creation of the past 20 years. Such economic regulation became necessary as a result of the European Commission's decision in the early 1990s to de-regulate and (in parallel) to re-regulate the European railway sector. Rail de-regulation and re-regulation are part of a broader initiative of the European Commission's aim for a single European market, also in infrastructure (Finger, 2011; Finger and Laperrouza, 2011). The main reasons that are generally given for railway de-regulation pertain to the poor performance of the European rail sector and its loss of modal share vis-à-vis the road (cars and trucks) (Nash, 2013). The key features of European railway de-regulation, which have already been addressed elsewhere (Laperrouza, 2011), are (1) the separation (to a certain extent) of the rail infrastructure from transport companies using this very infrastructure; (2) competition among the transport companies on this infrastructure (called competition for markets in open access such as freight since 2007, or competition for the market for regional or national services franchised through public service obligation contracts); (3) technical standardisation, which makes this type of competition possible due to low technical entry barriers; and (4) regulation and sector-specific railway regulators, which are generally regarded as being crucial to making such a partially liberalized European railway market happen. As such, these key features follow the European Commission's 'general toolkit' for creating single European markets in the different infrastructures.

This chapter focuses on the specific role that regulation and regulators play – and are supposed to play – in the shaping of the European railway sector (past) or industry (future). We do this by considering the economic dimensions of railway de- and re-regulation, as opposed to the technical and safety dimensions, which are dealt with elsewhere in this volume (see Chapter 12). This is also because railway regulation, at least in the way it was originally conceived, is basically supposed to be economic regulation;

however, as we will see at the end of this chapter, the boundaries between economic, social and technical railway regulation are becoming increasingly blurred as railway de-regulation and re-regulation unfold.

This chapter is divided into three distinct sections. The first section presents the European Commission's (EC) history and programme of railway de-regulation and re-regulation, especially with regard to economic regulation. In the second section, we look at the underlying railway economics from the perspective of the main three types of rail market players that have emerged as a result of the EC's de-/re-regulation initiatives; namely, infrastructure managers, train operating companies and station managers. The third section discusses the challenges for railway regulation, and European railway regulatory policy more generally, that result from the newly emerging and increasingly fragmented European railway industry structure.

1.1 RAILWAY DE-REGULATION AND RE-REGULATION, EUROPEAN-STYLE

Prior to the initiatives of the EC to de-regulate rail, two member States – Sweden and the UK – had already made significant progress in this regard. Sweden was actually the first country to reform its railway market and probably has the most liberalized railway industry in Europe today. In fact, the first step, which is Sweden's separation of the state railways into infrastructure managers and railway operators, dates back to 1988. As of October 2010, services were offered on open access grounds, even if they overlapped with services funded under PSOs (for a complete overview, see Finger and Rosa, 2012). In his doctoral thesis, Alexandersson (2010) argued that the Swedish reform was actually more 'accidental' than deliberate, and that the railways are a fortunate outcome rather than a deliberate policy. Similarly, the case of the UK is not an example of rail de-regulation either. Rather, it is a systematic exercise – thanks to the 1993 Railway Act – of fragmentation (into approximately 100 different companies) and privatization with the parallel creation of a strong regulator (the Office of the Rail Regulator (ORR)) to make this fragmented system work (Yvrande-Billon and Ménard, 2005).

In this sense, the efforts of the EC constitute the first systematic initiative, at least on a European scale, to create a single European railway market; or, as it became called in 2001, the Single European Railway Area. There is general agreement that railway de-regulation in Europe started in 1991 with *Directive 91/440/EEC*. This is a rather programmatic directive that must be placed into the context of a series of White Papers. Directive

91/440 defined the main dimensions of European rail liberalization that have not changed since. It is ‘the most important Community measure to improve the competitiveness of rail’ (EC/COM (1998) 202, p. 2) and consists of four axes, namely: (1) the ‘autonomization’ of railways from the State, both in financial and managerial terms; (2) the separation of transport services and infrastructure management, at least at the accounting level; (3) the obligation of member states ‘to reduce railway debt to a level that does not impede sound financial management’; and (4) the ‘establishment of access rights to railway infrastructure for railway undertakings established in the European Community.’ Directive 91/440 was followed by a 1996 White Paper entitled ‘A strategy for revitalizing the Community’s railways’ (EC/COM (1996) 421). Later White Papers were made broader and pertained to transport more generally; in particular, the 2001 White Paper on ‘European transport policy for 2010: time to decide’ (EC/COM (2001) 370) and the 2011 White Paper entitled ‘Roadmap to a single transport area’ (EC/COM (2011) 144).

The second step towards the liberalization of the European railway sector was taken in 2001 in the form of several directives. The European Commission itself sometimes refers to this step as the first Railway Package, and sometimes as the second. We will refer to it as the *1st Railway Package*, as Directive 91/440 currently seems to be the accepted terminology. Directive 2001/12/EC amends Directive 91/440/EEC (the 1st Package) and defines the access rights for international freight services between railway undertakings and infrastructure managers, thereby setting the stage for the liberalization of freight (to be effective in 2007). This directive also mandates accounting separation for passengers and freight operations, as it mandates the separation of transport operations from capacity allocation, and defines infrastructure charging and licensing. Directive 2001/13/EC defines the licensing regime of railway undertakings and Directive 2001/14/EC sets forth the conditions for allocating railway infrastructure capacity, charges for the use of railway infrastructure, and safety certification. Directive 2001/16/EC addresses Technical Specifications for Interoperability (TSIs), a condition for fair competition to take place. Most importantly in the context of this chapter, this 1st Railway Package mandates the creation of regulatory bodies, so-called National (Railway) Regulatory Authorities (NRAs), in every member state. Their task is to ensure fair and non-discriminatory access to the rail network and services. The legal basis for their creation and their initial competencies are defined in Article 10.7 of Directive 2001/12/EC and in Articles 30 and 31 of Directive 2001/14/EC.

Based on the 2001 Transport White Paper (EC/COM (2001) 370), the European Commission launched a so-called *2nd Railway Package* in 2003,

which was subsequently adopted in 2004. The package consists of three directives and a regulation (Directives 2004/49-50-51/EC; Regulation (EC) 881/2004), pertaining mainly to matters of safety and interoperability on both the conventional and high-speed rail systems. Directive 2004/49/EC is especially relevant for the different national regulatory authorities, as it amends Directive 2001/14/EC in matters of railway infrastructure capacity allocation as well as in matters of infrastructure charging, thereby extending their remit and their powers somewhat. However, when it comes to the development of European railway regulation, this second package marks a milestone in that it creates – by way of Regulation 881/2004 – the European Railway Agency as technical and safety regulator (as opposed to economic regulation by which the NRAs are tasked). Indeed, the 2nd Package mainly identifies incompatible technical and safety regulations as an impediment to the creation of a single European railway area (ERA), and its mandate is to align technical regulations and harmonize safety standards.

The *3rd Railway Package* (2007) is also grounded in the 2001 Transport White Paper and builds on the 2nd Package. It is generally said to consist of two directives (2007/58-59/EC) and two regulations (1370/2007 and 1371/2007). Its main hallmark is the opening up of the international passenger services market, including ‘cabotage’ (that is, the right to take on and offload passengers on the domestic portions of the international journey), as of 2010. Other important features of this 3rd Package are the introduction of rail passenger rights and the harmonization of licenses for train drivers. In terms of regulation, the latter is relevant for ERA, which, as part of its technical harmonization mandate, is now charged with train drivers’ licensing. Directive 2007/58 is relevant for the national regulatory authorities, as it extends open access – and therefore the remit of the NRAs – to international passenger trains and national passenger cabotage, which can actually be restricted if it endangers the so-called PSO (Public Services Obligation) equilibrium. Regulation 1371/2007 on passengers’ rights does not specify which will be the responsible regulatory body. Member states are simply tasked with setting up enforcement bodies that are independent (from the TOCs) at a national level, which may or may not be the NRA. The most interesting regulation is Regulation 1370/2007, also called the Public Services Obligation or PSO Regulation. Building on both the 2001 Transport White Paper and the 2004 White Paper on Services of General Economic Interest (COM(2004)374), Regulation 1370 regulates national passenger transport that is in the general economic interest and cannot be operated on a commercial basis, including buses and trains. Its main feature is the introduction of tendering procedures for such PSO contracts no later than 2019. However, it is not the NRAs

that are charged with such tendering. Instead, member states must set up so-called ‘Competent Authorities’, which can either be national or regional (sub-national), to fulfill this task.

In 2012 the European Commission launched an exercise of simplification and consolidation, called *The Recast* of the 1st Railway Package by which the various existing directives and subsequent amendments were combined into a single document that also took into account observed shortcomings as result of industry evolution (2012/34/EU). In the eyes of the EC, the main shortcomings pertained to the lack of competition on the European rail network; inadequate regulatory oversight, mainly due to a lack of independence and powers of the NRAs; and the low levels of investment in the European rail infrastructure. The Recast is particularly relevant when it comes to economic regulation and regulators. On the competition side in particular, the Recast calls for more detailed network statements (annual documents that define the available infrastructure and the conditions of its use) and establishes more explicit rules about possible conflicts of interest and discriminatory practices, both of which must be supervised by the NRAs. In terms of investment, long-term infrastructure investment plans and better infrastructure charging rules are required, both of which will have to be supervised by the NRAs. Most importantly for our topic, the Recast aims to strengthen regulatory oversight, first by extending the remit of the NRAs not only to the above but also to ‘rail-related services’. Second, the powers of the regulators are to be considerably strengthened with sanctioning mechanisms and investigative powers.

To the surprise of some, the European Commission proposed a *4th Railway Package* only one year after the Recast. This package contains three main elements pertaining to railway governance: opening up the national passenger transport market, interoperability, and safety. At the time of publishing this chapter, the European Council has not yet adopted the 4th Railway Package. Whereas the interoperability and safety pillars of the Package, including the reorganization and strengthening of the role of ERA, are not controversial, the other two pillars are. It is still not entirely clear how the opening of the national passenger transport market will co-exist with the compulsory tendering of public service obligations. In any case, this last step of railway market opening will again extend the remit of the NRAs. However, it is in matters of railway governance – the most controversial part of the 4th Railway Package – where the powers of the NRAs will again be significantly increased. Indeed, the 4th Railway Package will now (in contradiction to EU rail regulatory policy since 1991) allow for existing (holding) structures; that is, having infrastructure managers and train operating companies within the same firm. However, this comes at the price of strengthening the regulators tasked with also

overseeing the independence of decision making (between IMs and TOCs), the absence of cross-subsidies (from IMs to TOCs), the independence of the IT system, as well as the cooling-off periods of staff (when moving between IMs and TOCs).

As a result of these various legislative packages, the European railway sector has now been considerably restructured, with many member states unbundling their national monopolies and others creating holding companies. As we will see in section 1.3 of this chapter, national regulatory authorities have been created in every member state that has a railway system. Overall, the railway sector has become more fragmented. Even more important is the fundamental shift that has been operating, basically in two areas – the funding and strategic behaviour of the involved actors – both of which pertain to the financial and economic fundamentals of the European railway sector:

- As a result of European railway reform, government funding can no longer be relied upon to prop up a country's railway industry. Funding must follow state aid rules and is closely structured by the various directives and regulations. National subsidies must be clearly earmarked and can only be used for the railway infrastructure as well as for PSO contracts. There is some leeway when it comes to access charges (a topic discussed in detail in Chapter 14 of this book). In this context, one must also mention that member states have been forced to tighten their fiscal budgets, mainly as a result of the economic crisis.
- Train operating companies and also even infrastructure managers are now forced to think commercially and thus strategically. For example, they can now generate returns on capital investments and the associated risks through new financing options. They can also obtain financing and risk guarantees for infrastructure construction projects, as they can be allocated a given passenger service for a guaranteed length of time (such as a PSO contract). They can also lobby for favourable track usage fees and receive advantageous tax treatments for passenger and freight operations. Overall, however, there is no limitation to the strategic behaviour of the various operators, as we will see in the next section.

As a result of European railway reform, it is basically the relationship between the operators (infrastructure managers, TOCs) themselves, as well as between the operators and the governments that has changed. In between, regulators (so-called NRAs) have emerged, whose role is to bring some order to these various strategic relationships among the involved

actors to guarantee the continued functioning of the national railway system. But how does this hold up against the economic reality of the main industry players?

1.2 EUROPEAN RAILWAY INDUSTRY PLAYERS' PERSPECTIVES

So far, we have seen how the EU has restructured the European railway sector by opening up the national railway infrastructures to train operating companies, first in the freight market (2007), then in the international passenger transport market (including cabotage; 2010), and now probably also in the national passenger transport market. This transformation is accompanied by major efforts in technical harmonization, particularly when it comes to interoperability. We have also seen that such restructuring is accompanied by both technical and economic regulation, which actually becomes a condition for this single European railway area to even function. Therefore, it is fair to say that the liberalized (to an extent) European railway industry is a highly regulated industry and will remain so for a long time.

In this section, we will now examine how the main three types of emerging European railway industry players – namely the railway infrastructure managers, the train operating companies (freight and passengers) and the railway station managers – are likely to behave in this de-regulated and re-regulated industry (Messulam, 2008). It is particularly important to understand their underlying economics (see Waters, 2007) and respective business models in order to assess, in section 1.3, the challenges to economic railway regulation.

1.2.1 Railway Infrastructure Managers

Railway infrastructure managers are either the owners of railway infrastructure or companies that have been awarded concession contracts. They are responsible for the safety and maintenance of railway installations, as well as for making any necessary renovation and capacity expansion investments. Most importantly, they are responsible for making their infrastructures available to the different train operating companies. In all EU countries, infrastructure managers have been set up as national monopolies, with most of them being publicly owned. There are, however, a few exceptions:

- Some German railway lines are managed by railway infrastructure managers that are independent of DB Netz, which is part of Deutsche Bahn holding.
- Eurotunnel is both the infrastructure manager for the channel tunnel (opened to freight and passengers train companies) and the train operator for the Le Shuttle service.
- The Perpignan-Figueras tunnel concession (between France and Spain) has been held since 2009 by TP Ferro, a private concession holder, which works as an infrastructure manager.
- More recently, under France's latest round of railway public-private partnerships (PPPs), Lisea (the company that won the PPP contract for the LGV Sud Europe Atlantique high-speed rail line) will serve as the infrastructure manager and Eiffage Rail Express (the company that won the PPP contract for the LGV Bretagne Pays de Loire high-speed rail line) will perform infrastructure maintenance and renovation work, while France's national railway infrastructure company, Réseau Ferré de France (RFF), will manage the capacity allocation/access charge interfaces with the railway operators.

Regardless of their legal structures, railway infrastructure managers provide a critical service to any operator wishing to use their tracks. TOCs have no choice but to work with them, which puts infrastructure managers in a monopoly position. Consequently, the decisions of IMs have immediate and far-reaching effects on the business models – and even the survival – of the other industry players. Consequently, they are heavily regulated.

1.2.1.1 The infrastructure managers' business model

The income for railway IMs comes from the sale of track slots to railway operators and from government funding earmarked for operations, new construction projects, capacity expansions and performance upgrades. The relative proportion of each – access charges and subsidies – varies by country. Basically, as explained in Chapter 14 of this book, the level of track access charges determines the level of subsidies. Occasionally, infrastructure managers are able to obtain government grants to offset financial losses, as is the case in France, or these can be subsidized for new investments, as is the case in Germany.

Inversely, railway IMs' expenses include operating costs (such as rail traffic controllers and control centres), maintenance, depreciation and renovation works (such as tracks, signalling systems, power systems and traffic flow software). Consequently, IMs must make major investments in extremely long-term projects, ranging from 30 years for a rail line to over a century for a bridge or a tunnel. This gives them responsibility for network

longevity, beyond temporary fluctuations in traffic. Therefore, it is not surprising that, at least in Europe, most of the rail infrastructures belong to the public sector, as private investors are unwilling or unable to take on the large-scale and long-range capital risk involved (as recent experience with Eurotunnel demonstrates only too well).

So how do railway infrastructure managers maximize income? A first source of income is the charges levied on the traffic. To recall, track access charges are generally set by national policy makers (along EU regulations) and, in rare cases, by the NRAs. Consequently, IMs are incentivized to lobby for increased track access fees, especially by charging higher fees on routes that have heavy traffic or are lucrative for rail operators, as is the case with high-speed train lines in France, for example. A second way to maximize income is to cut operating costs. For example, isolated maintenance work can be merged into larger-scale contracts, while operations can be streamlined by consolidating control centres and using centralized, automated control systems. The payoff is higher workforce productivity, more efficient use of equipment and substantial reductions in expenditures that are relatively unaffected by the amount of traffic. In this context, one should also mention that IMs can quite easily delay maintenance works as well as infrastructure development, thereby cutting costs, at least in the short run. A third option involves building specific infrastructures that generate long-term income on lines that are highly profitable and can be expected to remain so. This is true of some high-speed lines in France, as well as the Betuwe Line in the Netherlands. A fourth and final way to maximize income is to discontinue line sections that have insufficient traffic or would require costly overhauls in order to continue operating.

Overall, and in order to ensure the economic balance of their entire network, railway infrastructure managers offset income and expenses between the various lines in the national network and between different types of traffic. In other words, they cross-subsidize between more and less profitable lines and different train operations. In France, for example, income from high-speed lines more than covers their total cost; in the case of freight, on the other hand, even the marginal costs of using the tracks exceed the income from freight access charges.

1.2.1.2 Implications for economic regulation of infrastructure managers

Infrastructure managers are monopolies and are therefore the most regulated operators in the industry. Such regulation needs to take place in the following four areas: infrastructure pricing, network structure maintenance and development, network access, and safety.

Infrastructure pricing is generally set by policy makers and/or regulators and has both micro- and macro-economic dimensions; in micro-economic

terms, regulation must provide a legal and economic framework for generating line accounts that approximate ‘actual cost’. Such a framework establishes a sound basis – shared with rail operators and the relevant transport organizing authorities – for addressing issues such as the long-term future and profitability of rail transport compared with other modes, particularly road transport. In macro-economic terms, regulation must be designed to give railway infrastructure managers the highest possible return on assets, while ensuring that value added is divided fairly between them and the railway operators. Likewise, income and expense offsets between geographic areas and types of trains should be calculated carefully, since this will directly affect how competition plays out among operators. Chapter 14 of this book discusses the issue of regulated infrastructure pricing in detail.

Network structure issues are numerous and regulators (and sometimes policy makers) are involved in most of them. This is the case, for example, when IMs want to close down lines or sell them to other railway infrastructure managers, as is the case in Germany and as is being considered in Scotland. Regulators are often also involved when it comes to developing and upgrading installations. In addition, regulators may set medium- and long-term priorities for expansions of capacity (by requesting so-called network development plans) that do not necessarily match up with railway infrastructure managers’ short- or medium-term cash-flow needs. Managers may understandably be tempted to avoid specific investments in capacity and to focus instead on raising fees on the busiest rail lines. However, even this kind of regulation may not be sufficient to address the medium-range needs. At a time of sharply rising urban and suburban traffic and modal shift, it will be up to national (and European) transport policies to plan for and finance the necessary infrastructures. In this respect, the UK has proven exemplary: after considerable trial and error, the UK’s Office of Rail Regulation (ORR) has now emerged as a well-informed arbiter and champion of a long-range outlook for Britain’s rail sector.

Moreover, the ORR is also an example in matters of regulating *network access*, as it has produced a document setting out the general conditions for network access and a structured, detailed, down-to-earth regulatory corpus governing contracts between the railway infrastructure managers and the rail operators, as well as the rules for competition among operators. Overall, however, network access is also a closely regulated area, in which infrastructure managers and train operators must sign so-called (long-term) framework agreements and infrastructure managers must publish annual network statements outlining the conditions for access to their infrastructures.

Because they have oversight of signalling and other safety installations, and because they draw up the operating rules followed by all rail operators, railway infrastructure managers play a pivotal role in ensuring *network safety*. The decisions they make in this area have a major impact, often requiring railway operators to upgrade their equipment, adjust staffing and recast their training programmes. In addition, the new European Technical Specification for Interoperability (TSIs) introduced by the ERA, particularly ERTMS (the European Rail Traffic Management System) for signalling, highlights the need for railway infrastructure managers and railway operators to coordinate the timing and focus of their investments. Unilateral moves by a railway infrastructure manager are likely to saddle operators with high upgrading costs (for example, €500,000 to make an existing locomotive ERTMS-compatible, compared to the cost of a new locomotive of between €2.5 and €3 million); these costs cannot be passed on to end users in the short term. Thus, there is also a tendency to look at safety and interoperability regulation, which is traditionally the remit of ERA and the national safety regulators, from an economic (regulatory) point of view.

1.2.2 Railway Operators

In both freight and passenger transport, railway operators (also called train operating companies or TOCs) are the only actors in direct contact with customers, which means they play a pivotal role in the transport sector. Therefore, the prosperity of the rail sector depends, to a large extent, on their profitability, that is, their added value. How that value is divided up between the TOCs and the IMs in the form of access charges is the primary determining factor behind the industry's health and overall economics. This means that it is just as essential to regulate relations between operators and the rest of the industry as it is to regulate competition among railway operators. In short, railway operators – rail transport companies – combine their own inputs (such as rolling stock, crews, sales networks, logistics facilities) with inputs purchased from other industry players (such as access to corridors, logistics facilities and passenger interchange hubs) to deliver a non-storable service whose value varies according to the day and the time of day.

1.2.2.1 The TOCs' business model

Revenues are generated by the TOCs from two different sources: customers and subsidies. In the case of passenger transport, customers are high-speed train passengers (if available), long-distance passengers and commuters. Subsidies can be quite substantial, but Regulation 1370/2007 (see above)

has forced them to take the form of PSO contracts; in other words, they are earmarked. In the case of freight, customers are generally chargers and subsidies hardly exist anymore. Railway operators are responsible for filling up trains and bear the risk of not succeeding. Their profit margins depend on how efficiently they combine the various inputs and how intensively they make use of them, such as by minimizing idle periods for trains and crews. A number of these inputs are completely beyond their control (such as corridors and stations) and are available to them on the same terms as to their competitors. This may apply to a lesser degree to other inputs, such as rolling stock and train terminal facilities, but these are still inelastic and can weigh heavily on operators' balance sheets.

This leaves five requirements for gaining competitive advantage: (1) railway operators need access to 'good' track slots (that is, slots that offer rapid service to popular destinations) and the ability to provide a level of service appropriate to solvent demand; (2) they must also obtain the most efficient rolling stock for the lowest possible price; (3) they must leverage their inputs effectively, achieving maximum workforce productivity and maximum use of rolling stock; (4) they must maximize income by filling up trains with dynamic pricing policies, including yield management on high-speed trains and attractive fees on container trains; (5) finally, they need government funding to maintain service on lines considered essential for public service reasons, which would otherwise be unprofitable.

Two key elements of the TOCs' business model – track access charges and rolling stock – require particular attention here. Track access charges are regulated and will be discussed below. Rolling stock, on the other hand, is not regulated but must be addressed briefly here. To recall, rolling stock is generally a railway operator's largest recurring expense item (20–30 per cent of its fixed costs). It is an extremely long-lived tangible asset (30–40 years on average) with varying liquidity. This compels railway operators to manage the risk of a mismatch between such assets and market demand.

There are two main categories of rolling stock: vehicles providing motive power (for example, locomotives and self-propelled units) and unpowered cars. Because their technical specifications are dictated entirely by the infrastructure they operate on, such vehicles are hard to sell, replace or redeploy; this is unlike airplanes, trucks and cars, and even ships. For example, electrically powered locomotives cannot be redeployed on other lines with different voltage. Transforming them to different signalling systems can be expensive and take up several financial quarters. Loading gauges and platform heights vary from country to country and in some countries from region to region. Finally, special safety standards may apply to key infrastructure points (fire prevention in tunnels, for example). One possible solution is to transfer that risk by selling rolling stock to a

ROSCO, or rolling stock company, which then leases it back to the railway operator over a period for which the operator expects to have reasonable market visibility. However, the British experience highlights the limitations to this approach (see Chapter 9 in this book). Railway operators need high recurring profits to offset the risk of purchasing or operating their rolling stock, whether they own it or lease it from a ROSCO. Also, technical configurations adopted by railway infrastructure managers (such as signalling systems, speed and acceleration rates calculated for a given route) are vital to railway operators, since they can render assets with substantial residual value obsolete virtually overnight, with no opportunities for selling them to other operators. Overall, this underscores the need for industry-wide regulation to protect railway operators against the risk that infrastructure configuration decisions made with no prior discussion will render their rolling stock obsolete.

For effective risk management of industrial assets, therefore, it is essential that rail operators are able to count on medium-term stability through a framework agreement defining their competitive environment. Unless this is in place, opening the market up to competition will not, on its own, be enough to attract new capital into the rail industry.

1.2.2.2 Regulation

TOCs are not directly regulated by the NRAs, but their relationships with infrastructure managers and station managers are. They are regulated by safety regulators and by ERA for their rolling stock, as well as for train drivers. TOCs may also be regulated by competition regulatory authorities. However, they are chiefly concerned with the regulated access to slots and even more so with the regulated track access charges. For example, track access charges can represent up to 25–30 per cent of the total costs for long-distance passenger-transport operators in some countries. Also, the method used to calculate prices has a decisive impact. For a track slot that is profitable regardless of its payload capacity, the rail operator will seek to maximize the number of passengers per train, even going so far as to purchase options that are more expensive but have higher capacity. Thus, a railway operator with greater capacity gains a relative advantage. By contrast, if a track slot's value is contingent on payload capacity, the train operator may be tempted to increase the number of trains while making each train smaller, thereby contributing to infrastructure saturation.

1.2.3 Train Station Managers

Train station managers are responsible for managing passenger stations, especially interchange stations or hubs for accessing urban and suburban

transit lines. They must ensure equal treatment of all railway operators and relay information to passengers as well as to people accompanying or waiting for them; in other words, there must be non-discriminatory access to all services they offer. Their status can vary from country to country and even from station to station. A station manager may be part of the railway infrastructure manager with responsibility for the rail infrastructure used by that station. It may also be part of a railway operator providing service to that station, as is the case in the UK, or a standalone business like DB Station in Germany or Grandi Stazioni in Italy. Whatever the form of organization, managing stations is a capital-intensive business that is highly sensitive to (local) tax variations. In densely urbanized areas, such investments often prove costly, and the need to comply with strict zoning and other rules can make project completion a long, slow process. Such projects are closely related to those of the relevant railway infrastructure manager.

1.2.3.1 Business model

Train station managers earn income in the form of fees similar to airport landing fees. At the request of railway operators, they may also provide additional services at government-regulated fees, ranging from on-board catering and food logistics services to baggage handling and vending-machine management. A further possible source of income is the rental of space in stations to retailers. The main expenses of train station managers are cleaning, security, information and display systems, bus and underground interconnection services, bicycle facilities and property tax.

1.2.3.2 A new field for regulation

The main area of regulation for station managers pertains to non-discriminatory access. Indeed, station managers must ensure equal treatment for all railway operators to their infrastructures, such as information display, signage, connecting service management and many other services. A series of lawsuits brought by Arriva and Veolia/Connex against DB Station for distorting competition in favour of DB Fernverkehr and DB Regio serve as reminders of how sensitive these issues can be. Under the Recast (2012), many of these potentially discriminatory practices can be or are now regulated. However, many other practices require regulatory attention. For example, when a transit hub in an urban area expands, how can the added value be divided between the station manager, the railway infrastructure manager and even the railway operators that bring in most of the additional customers? The Japanese have dodged this touchy issue by getting industry players to form integrated conglomerates, as is the case for the Greater Tokyo Area mass transit system.

1.2.4 Conclusion

Let us briefly crystalize how the main operators' business models are affected by railway regulation. As we have seen, the business models of both the IMs and TOCs are heavily influenced by the level and mode of calculation of the track access charges. While track access charges are entirely regulated, they are not always set by the regulator but are generally rooted in regulatory policy decisions and are, in fact, as argued in Chapter 14 of this book, an economic policy rather than a purely economic issue.

In addition, TOCs are strongly affected by the type of available slots on tracks and in stations. Access to slots and rail-related services is a typical regulatory issue, with NRAs in charge of preventing discrimination. But looking at access to slots simply in terms of (non-) discrimination – which NRAs currently do – may actually miss the point. Indeed, both because train operations remain heavily subsidized (in the case of PSOs) and because of intermodal competition and related public policy objectives, looking at slots from a purely competitive perspective may, as we have argued in this section, produce negative welfare effects and either lead to higher subsidies than necessary and/or to undesirable modal shifts towards the road. In other words, even though slot allocation (and corresponding regulatory policy) must be done in a non-discriminatory way, it must also be embedded within larger public policy objectives.

The same can also be said of technical specifications and safety standards, which again affect the business models of all the TOCs. Even if technical and safety standards must be applied in a non-discriminatory manner to all the TOCs, different TOCs will be affected differently, which can again lead to unanticipated and undesirable welfare consequences.

In this section, we have demonstrated that viable business models in the rail sector are not achievable (and therefore private capital flow would dry up) without addressing two main policy issues: first, it is important to define and then to monitor the fair application of rules for sharing the added value created by the rail industry as a whole among infrastructure managers, railway operators and train station managers. Failure to do so will not incentivize the involved actors to actually develop the rail sector and thereby contribute to modal shift. This issue is not currently being addressed, either by railway regulation or by railway regulatory policy (where it belongs). Second, it is important to ensure that each player's role is economically viable, and hence the profitability of the sector as a whole is high enough to attract the capital necessary to develop the rail industry. A key aim here is to ensure a fair balance between natural monopolies and competing railway operators. This issue speaks, in particular, to the stability of the regulatory framework and especially to the role and

independence of the regulator, which must ultimately ensure such stability (for example, against short-term political intervention in terms of funding and investment).

In short, European-style railway de-regulation has created antagonistic interests between all the actors involved: infrastructure managers against train operating companies, train operating companies against each other, station managers against everybody else, etc. Regulators are there to arbitrate these different antagonistic interests, but only to the extent that they are legally empowered to do, as we will see in the next section.

1.3 EUROPEAN RAILWAY REGULATION AND REGULATORS

In this section, we will first briefly recall the evolution of European railway regulation (this was already done to a large extent in section 1.1) and then present the evolution of the European railway regulators. Before doing that, however, let us summarize the above in order to set the stage for the broad role of railway regulation and regulators.

1.3.1 Setting the Stage

In section 1.2 above, we outlined the business models of the three newly emerging actors in the European railway sector at a national level, as well as their implications for regulation and regulators. However, it is important at this point to introduce a distinction leading to two different situations and subsequent scenarios for regulators. The first situation is one where the national railway system is still somewhat integrated; that is, where the incumbent railway company still operates under a holding model. In Europe, this is particularly the case in Germany, France, Italy, Austria and Switzerland. In such cases, the railway regulator is basically in conflict with the incumbent and its main role is to support new entrants in case they feel discriminated against. The public policy objectives of the overall railway sector are either still more or less delegated to the incumbent or negotiated directly between the ministry (railway administration) and the incumbent. In this case, the regulator is actually more of a ‘nuisance’ to the overall functioning of the still somewhat integrated railway system.

The second situation is one in which the national railway sector has been unbundled; the UK is currently the most extreme case of railway fragmentation. Other member states are at various stages of this unbundling/fragmentation process, with Sweden and Belgium probably being the most and least ‘advanced’, respectively. In this case, the railway regulator must

inevitably play a much more active role that goes far beyond discrimination, basically arbitrating the interests of the fragmented actors in the national railway sector to ensure the functioning of the national railway system. This not only leads to the regulator having a much more powerful role, but also a somewhat changed role. On the one hand, the regulator now plays the role of an overall national ‘railway system manager’ (despite having no operational skills and attributes). On the other hand, and because the national railway system is primarily a public policy issue, the national railway regulator becomes a partner of the national policy makers or, worse, takes over some roles of policy making; this can already be observed in the UK case of the ORR.

In any case, the overall trend is clearly moving towards the second situation, mainly because the European Commission is pushing in this direction, as we will see in the following sub-section.

1.3.2 The Evolution of EU Railway Regulation

In section 1.1, we saw how the European railway regulatory framework has unfolded step by step; that is, from Directive 440/1991 to the three Railway Packages (2001, 2004 and 2007), to the Remit (2012), and now to the currently discussed Package No. 4. In the eyes of the European Commission, economic regulation of the European railway sector by way of independent national regulatory authorities plays a central role in the creation of a Single European Railway Area. But regulatory policy is a two-fold policy issue. On the one hand, there is the substantive regulatory policy defining what regulation is about and what remit regulators have; on the other hand, there is the institutional regulatory policy defining the powers of the regulators.

In matters of substantive regulatory policy, the various EU directives and regulations have gradually extended the remit of the national regulatory authorities. From overseeing discrimination in freight (as of 2007), this task has been extended to international passenger transport including cabotage (as of 2010) as well as to rail-related services (as of 2012) and is planned to be extended to national passenger transport (as in the final adoption of the 4th Railway Package). In all these types of rail transport, the regulator must ensure that infrastructure (or station) users are not discriminated against in terms of slot attribution or in terms of access charging. In particular, the Recast (2012) defines additional functions, specifically when it comes to observing the so-called ‘economic equilibrium’ of PSO contracts, as well as in matters of overseeing framework agreements and network statements. The 4th Railway Package will also further extend the regulators’ remit to control the so-called ‘Chinese

Walls' of integrated railway undertakings, as well as to control tendering procedures. While these are the main tasks of a national railway regulator, there are several other, less clearly defined tasks, such as monitoring the railway market. Also, countries can attribute further tasks to their respective NRAs, as is notably the case with the UK and Germany. In Germany, for example, technical and safety regulations fall within the remit of the sector-specific regulator (Bundesnetzagentur), as do consumer complaints in the case of the UK.

National regulatory authorities were officially set up in 2001 by Directives 2001/12/EC (article 10.7) and 2001/14/EC (articles 30 and 31). Since then, national regulatory railway authorities have been set up in every single member state, as well as in Switzerland and Norway along the EU model (see Finger and Rosa, 2012; Finger, 2014). The European Commission has regularly expressed concerns about the independence, staffing and resources of these authorities, all of which still vary widely across the member states due to strong national path dependencies (see European Transport Regulation Observer, 2013). In the Recast (2012), the Commission paid particular attention to the regulators; while it acknowledged some progress, it was mainly concerned about the regulators' independence (which needed strengthening) and powers (which needed clarification), especially when it came to rail ex-officio interventions, sanctions and information requests. In the 4th Railway Package, the European Commission has sought to further enhance the NRAs' independence, powers and resources (Kaufmann, 2013).

In the Recast (2012), the European Commission is also particularly concerned about coordination and harmonization among the different national regulators. However, collaboration among regulators dates back to 2010, when the regulatory bodies of the UK, the Netherlands, Austria, Switzerland and Germany launched a corresponding initiative, the so-called Independent Regulators' Group – Rail (IRG-Rail). Yet, with the Recast, the Commission launched its own European Network of Rail Regulatory Bodies (ENRRB), this time with the Commission as a member (and without Switzerland, which is not part of the EU) and with Commission support. Its purpose is to cooperate on market monitoring and investigation, especially on cross-border matters, such as the newly established freight corridors.

1.3.3 Conclusion

The clear trend from the above presentation is that that NRAs are constantly extending their remits and powers and are actively supported in this endeavour by the European Commission. In addition, and since 2012,

the NRAs have also been encouraged and supported to work with the Commission, not only in order to align their ways of working, but also to become more aligned with the approach and goals of the Commission. Such strengthening of the NRAs, as well as their coordination by the ENRRB, is of course fully coherent with the various rail liberalization policies, as outlined in section 1.1 of this chapter. Indeed, a liberalized (that is, fragmented) rail sector, with the main actors now behaving strategically, if not commercially, requires a strong regulatory framework and especially strong, well-coordinated and fully aligned (with the Commission) regulators. This is, by the way, similar to other European network industries, such as electricity, air transport and telecommunications.

CONCLUSION

In conclusion, we will highlight three concerns that all somewhat relativize this otherwise well thought-through and coherent approach of the European Commission to rail de-regulation and re-regulation. These considerations pertain to the systemic nature of railways, as well as to some of the economic fundamentals of rail, both in terms of patronage and intermodal competition.

Railways are systemic in nature and rail ultimately operates as an integrated socio-technical system. While market elements can be introduced to make the overall system more efficient and perform better, there are some critical system-relevant functions – particularly interoperability, capacity management and overall system management (such as in the case of timetables) – that need to be performed so that the system as a whole can work (Crettenand and Finger, 2014). Historically, such critical system-relevant functions were performed by the historical vertically integrated railway operator. As this incumbent is unbundled, competition is being introduced and competing operators are emerging. These critical system-relevant functions then fall by the wayside, given that they are not commercially lucrative and cannot be attributed to one of the actors since all actors now behave strategically. Almost by default, the independent regulator emerges as the only actor that can take on these critical system-relevant functions, or at least the coordination and supervision of these functions (such as slot allocation). Time will tell whether the regulator can actually play this overall system-coordinating role or whether we are perhaps placing too much faith in the regulator and its abilities.

The second concern pertains to the economic observation and fact that the main rail business actually lies in mass transit. That is where most of the passengers are and where most of the money can potentially be generated.

This means that the relevant unit of a railway system is not the nation state, and even less so the European Union. This also leads to the fact that when operators start to behave commercially and strategically, they will automatically prioritize railway activities that are different to those prioritized by their national governments and by the European Commission. Therefore, it is questionable whether the objective of the creation of a Single European Railway Area can actually withstand the economic reality of the essential local rail business.

The third concern is equally economic in nature. It is obvious that the main competitors of a railway operator are not other railway operators, but rather cars, trucks, low-cost airlines and, more recently, long-distance bus operators. These are the operators that ultimately threaten the business model of the railway sector as a whole (except perhaps for mass transit). Regardless of what regulatory framework is put in place to guarantee non-discrimination and competition, and no matter how independent and well-coordinated the regulators, the fact is that the main problem – that is, the lack of profitability or even economic viability of rail – remains. Without clear public policies to support rail financially, railways will decline, no matter how well they are regulated. Regulation only comes into play once it has been decided where exactly – in the infrastructure or in transport, as well as for which category of transport – subsidies are given, so as to guarantee non-discrimination among the recipients of the subsidies.

In this sense, while it is good to focus on railway regulation, it is even better to focus on policies that do not discriminate in favour of rail against other transport modes.

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