

***Beyond the quiet life of a natural monopoly:
Regulatory challenges ahead for Europe's
rail sector***

Policy paper

Yves Crozet, Chris Nash, John Preston

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About the authors

Prof. Yves Crozet is professor of economics at Lyon University (*Institute of Political Studies*) and member of the *Laboratoire d'Economie des Transports* (LET), which he headed from 1997 to 2007. In 2008, he became the head of the newly created *Energy, Environment and Transport Observatory* set up by the French government to assess the carbon content of different transport modes. He is also chairing the transport policy group of the French research and innovation programme in ground transport (PREDIT). Since 2010, he is also the Secretary General of the World Conference of the Transport Research Society.

Prof. Chris Nash is research professor at Leeds University. In recent years he has been a visiting professor at many universities throughout the world. Prof. Nash has also acted as an advisor to several public institutions, including the European Commission, the European Union committee of the House of Lords, the Transport committee of the House of Commons and the Railways Group of the European Conference of Ministers of Transport. He is also a member of the editorial board of many distinguished academic journals in transport economics, such as the *Journal of Transport Policy and Economics*, the *International Journal of Transport Economics* and the *International Journal of Green Economics*.

Prof. John Preston is the head of the Civil, Maritime and Environmental Engineering and Science Academic Unit of Southampton University. He was previously Director of Southampton's Transportation Research Group and Head of the School of Civil Engineering and the Environment. His research interests in transport cover demand and cost modelling, regulatory studies and land-use and environment interactions. His initial work concentrated on rail, but subsequent work has covered all major modes of transport. He is a member of the World Conference on Transport Research's (WCTR) Scientific Committee, the co-chair of the WCTR Rail Special Interest Group, a committee member of the International Association of Rail Operations Research (IAROR) and of the International Conference on Competition and Ownership in Land Passenger Transport.

It seems not at all unlikely that people in monopolistic positions will often be people with sharply rising subjective costs; if this is so, they are likely to exploit their advantage much more by not bothering to get very near the position of maximum profit, than by straining themselves to get very close to it. The best of all monopoly profits is a quiet life.

John R. Hicks

Annual Survey of Economic Theory: The Theory of Monopoly
Econometrica, January 1935, page 8.

Introduction

The best of all monopoly profits is a quiet life! Hicks' statement perfectly describes the state of affairs in the railway sector in many European countries after the Second World War. In order to boost rail transport, the deregulation of European rail services was initiated in 1991. This led to profound reforms in a sector which had long been characterized by the existence of vertically integrated monopolies. As in other network industries, the need arose to switch from a quasi-administrative system to a market-based approach. By vertically separating monolithic national railways, and by reducing the influence of the State, the European Commission's aim was to change the organization of the railway system and its internal operating rules which had generated a high degree of inertia more or less everywhere in Europe. Competition therefore became a key policy objective; but how can competition be best implemented in the setting of national, integrated monopolies?

The approach chosen by the European directives, namely vertically separating integrated monopolies surprised many. One major problem that needed to be addressed was that European rail networks were mostly national in scope and lacked economic incentive schemes to promote efficiency. International services were run by cooperation between national companies and were mostly of poor quality, particularly with regard to freight.

As will be shown in Section 1 of this paper, vertical separation of Infrastructure Managers (IM) and Rail Operators (RO) is a first attempt to increase overall efficiency in the rail sector. In Section 2, lessons will be drawn from the opening to competition. Due to the importance of barriers to entry and market power, regulation of the rail sector has also become a key issue which will be addressed in Section 3. Policy recommendations are formulated in Section 4.

1. Analysing and improving the performance of IM

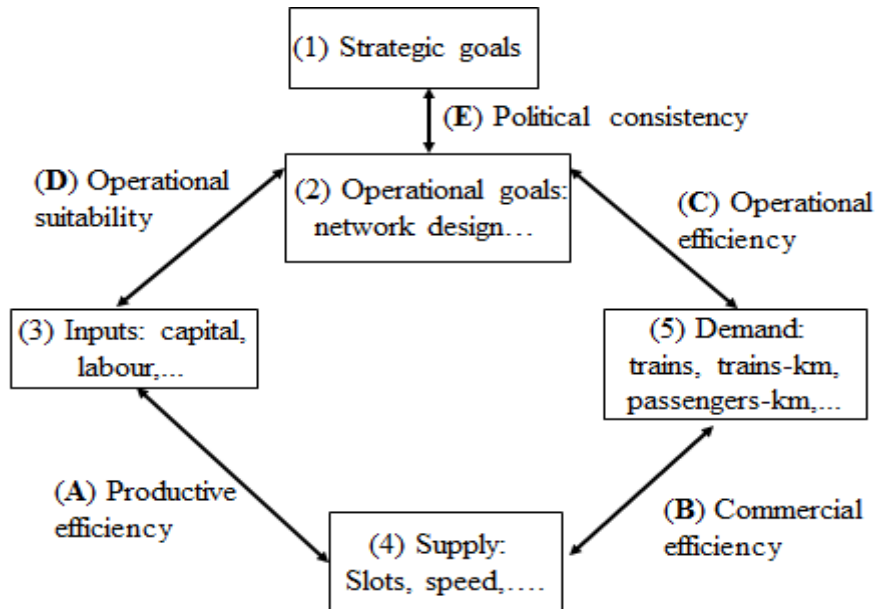
The IM is a natural monopoly (Berg and Tschirhart, 1988), whose role has been defined by successive railway directives. Two main ideas underpin this concept of a monopoly under control:

- The first is that the railway sector must be open to competition wherever this is possible. Establishing the limits of the IM is therefore a matter of defining which activities are potentially competitive and, as such, should not be the preserve of the IM;
- The second focuses on what happens within the IM's sphere of competence. As a natural monopoly, the IM must be monitored, and regulation is required in order for it to improve its performance and efficiency.

As competition and regulation issues are dealt with in the next sections, we will focus here on efficiency and performance issues. In order to develop the necessary evaluation tools, some key indicators are identified, which could be included in an incentive regime. These indicators are identified by breaking down the IM's tasks, and by singling out for each task which set of indicators is optimal to measure the IM's performance. As can be seen in Figure 1 hereunder, the tasks of the IM relate to its goals at different levels, of which we shall consider the five most important ones.

- Most infrastructure managers receive much of their funding from the state. While independent from the state and responding also to market signals, IM's are responsible for implementing state policies in terms of the quality and capability of the infrastructure they supply. The IM's strategic goals (1) therefore reflect major public policies: how should the network be extended? What is the network renewal policy? What types of investments should be made and for what types of services? ;

Figure 1: From the strategic framework to indicators of the IM's performance



- These strategic goals are then expressed as operational goals (2) which are the concrete operational translation of the strategic choices made. This is where decisions are made as to where investments should be made and what forms they should take;
- The IM's job is then to mobilize the necessary inputs (3) required to achieving its operational goals. This is the IM's core role. Its activities in the areas of procurement, recruitment, sub-contracting, etc. are set accordingly;
- The concrete offering (4) proposed by the IM to the railway companies will allow for the assessment of the IM's efficiency. Overall, this can be measured by the number of slot-kilometres, its evolution over time and of course, the quality of the offering as measured by a variety of indicators (permitted speeds and weights, quality of slots, regularity, availability, etc.);

Bundling versus unbundling

At least three models of railways architecture have developed in Europe:

- The first is the holding company model, such as in Germany, Austria and Italy. A holding company has separate subsidiaries responsible for freight operations, passenger operations and infrastructure. According to the legal requirements, there is open access for freight and international passenger services on the system. Moreover, in some countries, domestic passenger operations are also open to competition, mainly through competitive tendering for the franchise to run regional services.
- By contrast, other countries, such as Sweden and the United Kingdom, have gone for complete separation of infrastructure from operations. In Sweden, the government still owns the largest passenger and freight railway undertakings, whereas in Britain it owns virtually none (except Directly Operated Railways - DOR).
- The third model is a hybrid system, as it is the case in France. There is a separate infrastructure manager which has a clear set of responsibilities. In France, according to EU legislation on essential functions, this includes planning and investment as well as charging and allocation of capacity. However, another set of responsibilities are subcontracted to the incumbent. In France, these include infrastructure maintenance and operations.

The obvious attraction of full vertical separation is that it removes the incentive for the infrastructure manager to favour its own sister train operating companies, and even the suspicion that it might do so. Discrimination is therefore less likely. Nevertheless, even in a vertically separated system, there may be a tendency for the infrastructure manager to favour large operators over small ones, particularly when the large operator is also, as it is the case for the infrastructure manager, state-owned. But full separation also creates important issues as to how to give all parties in the industry incentives to behave in a way which maximizes the whole industry's efficiency rather than simply serving their own interests. This is particularly true for the infrastructure manager, a natural monopoly that has to be subject to particularly strong regulation in fully separated systems in order to ensure that the interests of the final customer (passenger or freight forwarder) are taken into account.

- The offering also depends on demand (5), as measured by the number of trains or train-kilometres, or alternatively the number of passengers or passenger-kilometres. Therefore, the IM does not fully control its performance, since the latter is directly linked to the decisions made by RO about train services and rolling stock.

Figure 1 illustrates the interdependence between the IM and its environment. In order to assess an IM's performance, it is necessary to identify indicators that distinguish between those aspects of performance that depend entirely on the IM and those where performance is a shared responsibility. On that basis, five sets of indicators (labelled from A to E on Figure 1) can be identified for assessing the IM's performance. They will provide us with an initial set of performance indicators that are intended to track performance over time, or over a cross section of countries. Either way, but particularly in the latter case, it is necessary to allow for factors outside the control of the infrastructure manager – in the former case whether traffic growth is on peaky commuter services, inter city services or little used rural services; in the latter, geography and the mix of services is even more important. That is why such indicators should always be completed with an econometric model. These indicators cover:

- Productive efficiency (**A**) is the only one that depends entirely on the IM. This is measured by the costs of production, maintenance, replacement and development. In general, productive efficiency relates to the productivity of the IM (productivity of labour, capital, etc.).
- Commercial efficiency (**B**) obviously depends on the IM, but also on the IM's interactions with ROs. The latter make operational decisions based on track access charges, as well as on the quality of the slots, their effective availability, etc. This gives us another possible set of indicators which compare the level of access charges with the level of traffic, the slots that are offered and those that are requested or used, etc. Obviously

the level of infrastructure charges depends on the degree to which the state funds infrastructure directly, so this must also be taken into account.

In the upper part of Figure 1, the IM's actions cannot be evaluated without considering its institutional and political environment. This explains why the operational efficiency (C) and operational suitability (D) are highly dependent on the goals that are set for the IM. A nation or region may decide to modernize or build railway infrastructure which only attracts very disappointing levels of traffic. This is not due to the poor performance of the IM but rather to a poor political decision (E) which will lead to poor operational efficiency with respect to unattainable goals.

For example, poor operational efficiency (e.g. a low number of train-kilometres per track-kilometres) could be due to requirements to have a comprehensive network despite low population densities. This would then lead to high level of inputs for the intermediate (train-kilometres) or final (traffic-kilometres) output. This situation would reflect poor operational suitability. It would also lead to low productive efficiency (high inputs per train path) and low commercial efficiency (low traffic per train path).

Consequently, evaluating the performance of the IM also involves examining its operational goals; the evaluation cannot only involve the IM's performance! Similarly, the regulator's job is to enforce the regulations imposed by public authorities but also to assess whether the objectives set by the latter are being met efficiently. But regulation also has to address the competition issue.

2. Off track competition, the best option to deal with barriers to entry?

Rail competition, where it occurs, is likely to be limited in nature. Market demand is often too thin to support a large number of operators, whilst there may be some economies of scale and density that limit the optimum number of firms in rail markets (see, for example, Smith and Wheat, 2009). The relevant industry structure is therefore oligopoly competition. In addition there will be some market segments, e.g. medium distance passenger routes with road congestion, where intermodal competition proves ineffective.

The recent McNulty review undertaken in the United Kingdom for the Department for Transport and the Office of Rail Regulation provides some useful data on market shares in key European markets (see Table 1 hereunder). These have been supplemented by data from the 2011 Liberalisation Index (IBM, 2011).

Table 1: Market Share of Dominant Operator (for 2008/9)

	Passenger Dominant Operator	Freight Dominant Operator	Liberalisation Index
France	100%	85%	612
Germany	80%	75%*	842
Great Britain	26%	51%	865
Netherlands	86%	66%	815
Sweden	82% (71%)	61% (85%)	872

Source: Civity, 2011, except * which is based on DB (2012). Shares based on train-kilometres, except for Sweden, based on passenger-kilometres or tonne-kilometres (figures in parentheses for Sweden are based on revenue) and figures for freight in the Netherlands based on track access charges.

The table shows that in four of the five countries sampled there is a strong market leader both for freight and passengers. The leading operator is much less dominant in Great Britain than any of the other four countries in both the passenger and freight markets. This is in part due to the deliberate breaking up of British Rail into a number of separate freight and passenger companies followed by complete privatisation. It may also reflect the role of comprehensive franchising in the

passenger market rather than open access and/or limited competitive tendering. This is also reflected in the Herfindahl Index of market concentration, which is equal to 0.64 for the German passenger market but to only 0.16 for Great Britain. The Liberalisation Index indicates that France is the least liberalised market and Sweden the most liberalised. In the latter case, this reflects recent reforms.

Our overall findings on the impact of barriers to entry on different market segments are summarised in Table 2 hereunder.

We find that, while they are growing, open access passenger rail services are still largely limited to niches, such as peripheral services that have been neglected by the incumbent, even in those countries in which wider open access is permitted. This may be so because there is a range of barriers to entry that prevent more widespread head-on competition (Griffiths 2009, Van de Velde 2009).

But barriers to entry are not necessarily exacerbated when the incumbent operator is not fully separated from the infrastructure (see EVES-rail report, 2012). Tangible barriers, relating primarily to physical assets, such as track and rolling stock, can be dealt with by regulations to ensure access to essential facilities. Dealing with intangible barriers related to incumbent size and experience may be more difficult, and this becomes particularly pressing where these barriers are exploited strategically. As open access entry tends to be small scale, entrants may be particularly vulnerable to takeovers from incumbent operators; to date such acquisitions have not been blocked by anti-trust authorities.

High infrastructure charges may be a particular barrier to entry in high speed markets (Crozet and Chassagne 2012), although rolling stock access can also be problematic. Whilst open access freight operations are challenged by tangible and intangibles barriers, reaction periods can be longer, since a significant share of traffic is carried on long term contracts. Consequently, there is more competition, although monopolisation through takeovers remains a risk.

Table 2: Barriers to Entry and Competition: Summary of Findings

Barrier		Open Access Passenger	Open Access Freight	Franchising	Competitive Tendering
Tangible	Infrastructure	•	•		
	Rolling Stock	•	•		•
	Depots	•	•		•
	Terminals	•	•		
	Retail	•			
	Ticketing	•			
Intangible - Strategic	Size	•			
	Reputation	•			
Intangible – Innocent	Experience	•	•	•	•
	Brand Loyalty	•	•		
	Capital	•	•	•	
Reaction Period		Short	Medium	Long	Medium
Extent of Competition		Limited	Moderate	High	High

• Denotes potential presence of a barrier.

For both international passenger and freight services, lack of interoperability remains a barrier (Preston 2008, 2009). A distinction has to be made between competitive tendering (where the operator provides the rolling stock for relatively short and small scale contracts, as has regularly been the case in Sweden) and franchising (where the rolling stock is typically provided by a third party for relatively longer and larger scale contracts, as in Britain). In the former, rolling stock and depots can be important barriers; in the latter access to capital may be an issue, either given high bidding costs, and/or in cases where the winning bidder bears the revenue risk.

Overall, open access passenger services may be particularly problematic and are likely to be only a niche activity, although the major entry by *Nuovo Trasporto Viaggiatori* (NVT) in Italy in April 2012 is likely to be an important test case in this

respect, whilst there are also interesting developments in Austria and the Czech Republic.

The fourth package proposals for the harmonisation of regulation and for framework conditions concerning the independence of infrastructure managers and access to stations and facilities and provisions on ticketing may help eradicate some of the problems. However, the recent recast of the first railway package considerably strengthened the rules in these fields. It might therefore be worth waiting for member states to transpose the recast into their national legislation and to appreciate its impact, before mandating new obligations through the Fourth Package.

Where infrastructure authorities are seeking to cover fixed costs, high access charges are likely to limit the scope for profitable open access entry in passenger markets. Therefore, franchising or tendering (Nash 2010, Nash and Smith 2006) may be a more effective way of introducing widespread competition for passenger services, but it is not problem-free (e.g. the limited role of the private sector in service definition in tendering and strategic bidding behaviour in franchising (Thompson 2006)). Open access freight services may be less problematic, but still face substantive barriers, particularly with regard to international services. However, all competitive models may be threatened by mergers and acquisitions and the creation of monopolies, although this can be dealt with by the competition authorities.

3. Towards “à la carte” regulation?

The main duty of a regulator in the rail sector is to ensure that competing operators have non-discriminatory access. Although this requires regulatory supervision, it is easier to achieve in a vertically separated system than in an integrated one. But a second duty of regulators is to ensure efficiency in the development and use of the rail system, in particular through the regulation of the IM. This is actually made more difficult by vertical separation, and careful consideration is therefore required in the design of incentives to achieve that efficiency goal. In that regard, the recent EVES-Rail report underlines that there is no evidence showing that full vertical separation between IM and ROs is better than partial separation but that provisions should be made to ensure that the IM and RO are demonstrably independent. The EVS-Rail report also notes that there are major shortcomings in incentive schemes and track access charges regimes with regard to incentivising efficiency.

Regulation needs to be adapted to the institutional setting which is applicable. “Tell me what your institutional framework is and I will tell you how to design optimal regulation!” But even if regulation develops “à la carte”, or maybe because of it, regulators should be strong and independent from transport ministries.

At least three different approaches are being experienced in practice (IBM, 2006):

- Some countries, such as the United Kingdom, have a specific rail regulator, with wide ranging powers and responsibilities. In the United Kingdom these include overseeing not just charges and capacity allocation but also whether the infrastructure manager meets the reasonable needs of its customers in terms of capacity and quality of service. The ORR remit also includes conducting a periodic review of the IM’s financial needs, and through benchmarking, determining the degree to which the IM can reduce those needs by increased efficiency. The British regulator is independent, although

it must consider guidance provided by the Department for Transport, and must, in particular, pay attention to the financial implications of its decisions on the Budget. It has substantial powers to demand data when these are necessary to fulfil its role. In Britain the regulator is also responsible for regulating safety, whereas in many countries this is a separate body. It also shares responsibility with the Competition Commission for examining competition issues in the rail sector; again this is often the responsibility of a separate body elsewhere in Europe.

- In other countries, such as Germany and the Netherlands, regulation of the rail sector has been entrusted to a sector regulator, responsible for energy and telecommunications as well.
- In a third group of countries, the regulator is located within the Transport ministry. Many countries, including France and Italy, initially adopted the latter model, in which the regulator was largely advising the government. They are, however, gradually moving away from it to adopt a more independent structure. France has set up its independent rail regulator in 2010.

The arguments in favour or against a rail specific regulator (versus a more general regulator) are not straightforward. A rail specific regulator may be too inward-looking and not sufficiently open to ideas from elsewhere and therefore, ultimately more subject to regulatory capture. A regulator with a broader remit may be more able to transfer experiences from one sector to another. The rail industry is, however, quite different from other regulated industries. So is in particular the level of interaction between railway undertakings and infrastructure managers. Running trains involves having a precise path through junctions and stations, calling at them at the correct times, and using rolling stock which imposes differential wear and tear on the infrastructure according to its characteristics. Coordinating this may be a demanding task, requiring specialist knowledge, naturally not available to regulators

from other sectors. It also requires a level of day-to-day contacts between the infrastructure manager and all railway undertakings (and in particular the larger ones) that may not correspond to what is the pattern in other industries. This may raise fears of discrimination against smaller operators.

In a vertically integrated company, it may be assumed that senior management has the objective of optimizing the performance of the company. Even if individual divisions have their own budgets and targets, senior management will intervene if disputes and/or conflicts arise between them. A holding company may provide a similar role, although this varies with the degree to which the holding company intervenes in the decisions of its subsidiaries. With open access, there will be at least some operators who will not be part of the IM's group. In the case of complete separation, none will be. The regulator must then make sure that appropriate incentives for systems optimization are in place. This includes incentives for cost minimization, appropriate quality of service, efficient use of infrastructure and investment. The IM is therefore continuously challenged, mainly through the performance regime and the monitoring of track access charges.

In this process, the role of government is crucial. By funding infrastructure, it can ensure that the necessary investment takes place, while allowing charges for its use to be based on the short term marginal social cost. By subsidising services, it can ensure that social benefits over and above the revenue earned by train operators are taken into account.

But as noted earlier, a clear incentive scheme for the infrastructure manager and the train operating companies to work together to optimize the system is still missing in separated systems. Much of the cost of this rests with the government. Solutions such as alliances may assist in ensuring that all parties have an incentive to play their part in achieving the optimal functioning of the system. The example of the South West Alliance in Britain is an important development, as it has allowed aligning incentives without requiring full vertical integration. But such alliances can only work

when a single operator runs the majority of the trains on a specific route. When a single undertaking operates a major share of the national market, the holding company model can achieve a similar alignment of incentives, provided that the holding company itself ensures in an assertive way that its infrastructure and operating subsidiaries do pursue the efficiency of the system as a whole, rather than their own separate financial goals. Ultimately, it will be up to the government to ensure efficient investment and operations, either through the negotiation of a multi-annual contract or through regulatory supervision. The role of benchmarking studies is crucial in this process.

4. Recommendations

The European Commission will publish in the very near future its proposals for the fourth railway package. Emphasis will be put, among others, on open access competition for domestic passenger services. It should also provide for mandatory competitive tendering for public sector contracts, the harmonisation of regulation and framework conditions regarding the independence of infrastructure managers and access to stations and facilities. The forthcoming fourth railway package will therefore challenge the five main stakeholders shaping the rail sector: the government, the IM, ROs, regulators and end-users.

- Even if it might sound surprising, the most important stakeholder in the rail sector is the government (both central and local). Public authorities provide resources for infrastructure and services, and as such, they play an important part in defining networks and services. They need the tools enabling them to verify whether the substantial allocation of public money provided to the rail sector has a real counterpart in terms of social benefits. National and regional governments must therefore closely assess how overall productivity within the rail sector develops over time. National and regional figures also have to be benchmarked against similar ones in other countries or regions. It is crucial to consider what strategic goals should be assigned to the system. In a period characterized by stringent budgetary constraints, public authorities must determine the optimal size of the network and of the rail services that run on it. To fulfil their mission, public authorities need adequate information, coming from the IM, the RO and the regulator.
- Vertical separation (in different shapes) constitutes one of the cornerstones of European railway reform. An overly close relationship between the Infrastructure Manager and the dominant Rail Operator can be an intangible barrier that the dominant Rail Operator can exploit strategically. That barrier

is unlikely to occur with full vertical separation, but full separation has its own problems. Provisions can be made to prevent this intangible barrier from occurring in a holding company model but an independent regulator is needed to ensure this is so.

In spite of, or rather because of the large diversity of institutional settings within which ROs and IMs operate, the latter's independence must be guaranteed in particular regarding essential functions (i.e. track access and charging). This does not necessarily have to be delivered by full vertical separation. However, whatever the selected institutional design, the IM's costs, the changes in its productivity and the quality of its services must be clearly identified.

Commercial efficiency must also be assessed. This involves comparing track access charges and their variations according to rail traffic together with public contributions towards infrastructure costs. A well designed track access charging system can lead to more appropriate incentives for train operators regarding the design of timetables and the use of rolling stock. It can also provide appropriate incentives to the infrastructure manager regarding punctuality and the efficient planning of maintenance and renewals. The quality of the IM's interaction with the ROs is, in this regard, fundamental. What is needed, are clear incentives for the infrastructure manager and the train operating companies to work together to optimize the rail system.

- Rail market competition, on track or off track, can enhance welfare because most former state owned monopolists are not efficient. Therefore, competition may be a powerful tool to promote cost efficiency and reduce the incumbents' inefficiency. Competition may also pave the way for increased dynamic efficiency. Competition can promote innovation, particularly with respect to product differentiation. Innovation in pricing is

also important; it is stimulated by technological developments in delivery channels such as the internet, smart cards and mobile telephony.

Franchising, in particular for passenger services, is clearly a learning process for both the public authorities and the ROs. This process has to be repeated regularly because competition, reached at a specific moment in time, may then be threatened by subsequent mergers and acquisitions.

- In addition to measures aiming at increased vertical separation and open access for new entrants, the first railway package of 2001 required the establishment of a rail regulator, independent from the IM and the ROs. Because of a competition objective, the main task of the regulator was already seen at the time as ensuring non-discrimination on the part of the IM when allocating capacity or charging for its use. To achieve that objective, the independence of the regulator must be guaranteed. Leaving or setting up regulators within transport ministries raises fears that it would not be independent regarding decisions affecting the infrastructure manager or the dominant train operator, which are both usually owned by the State. Regulators located within ministries typically also have fewer powers and more limited resources. Their functions have largely been limited to considering discrimination complaints rather than completing a broader task regarding the achievement of competition and efficiency. Since fair competition and organisational efficiency will become the new buzzwords of the railways sector, and following similar developments in the other network industries, regulation must, more than ever, be at the core of the railway system.

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