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Long-Distance Passenger Rail Services in Europe

Market Access Models and Implications for Germany

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**LONG-DISTANCE PASSENGER RAIL SERVICES IN EUROPE:
MARKET ACCESS MODELS AND IMPLICATIONS FOR GERMANY**

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ABSTRACT

This paper focuses on classifying market access for long-distance passenger rail services in Europe into three main models and discusses the advantages and disadvantages of each of these models. The “Tendered Concessions” model aims to introduce competition for the market by which operators are selected in a tendering procedure. The “Monopolistic Network Operator” model aims to sustain network effects by granting a concession to one operator. The “Open Market” model enhances operators’ entrepreneurship by providing opportunities to plan services based on open access to the network. We present the strengths and opportunities, risks and threats without favouring any one model. Classifying the many design options and their different impacts will help to structure the ongoing policy discussion. The paper also gives an overview of the organisation of long-distance passenger railway markets in selected European countries, and discusses the development of Germany’s long-distance rail passenger services in particular.

Keywords: Long-distance passenger rail transport, market access, open access, competitive tendering.

1. INTRODUCTION

The liberalization of European rail transport markets has been on the agenda of politicians, academics, and industry for the last 20 years. Whereas infrastructure aspects and freight transport were the primary focus, the regulation of passenger transport has largely been a secondary concern. Directive 91/440/EEC explicitly addressed the vertical disintegration of national railway incumbents, requiring at least accounting separation. The First Railway Package, effective after 2003, concentrated on improving the effectiveness of recent legislation. The Second Railway Package, effective after 2004, included, among other issues, safety and interoperability. The latest regulation, the Third Railway Package, contains Directive 2007/58/EC which aims at opening the market for international passenger rail services after 1st January 2010. Of importance for domestic travel, the Directive includes the possibility of passenger carriage within countries along international routes. Exceptions refer to the protection of routes served with public service contracts. Open access for domestic services is not mandatory, but is used to augment competitively tendered services (see Griffiths, 2009, for the British example). The key question in designing a model for market access is: should access to long-distance passenger rail markets be open, or via concessions, or possibly a mix? In this paper, we address this under-researched question.

The remainder of the paper is organised as follows: In Section 2 we give the necessary background on rail passenger transport in Europe. We consider the value chain, differentiate long-distance services from other services, and point to the issue of non-profitable interregional services.

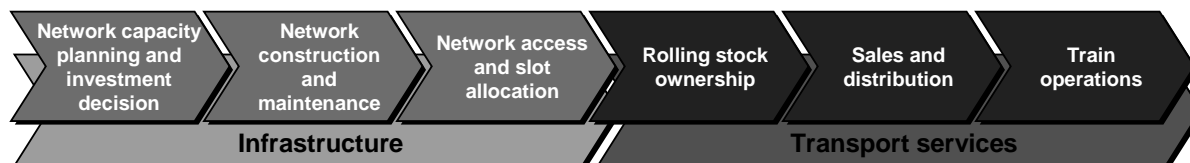
Furthermore we look at issues such as ownership of the infrastructure network and vertical separation, because of the interdependencies between the design of access to the infrastructure and the potential for competition for long-distance rail passenger services. Section 3 presents and analyses the different models of market access for long-distance rail passenger services using country examples. This includes a franchising model with a number of concessions as well as a single concession to a monopolistic network operator. An opposing model is the “Open Market” approach in which companies can introduce new services for any route for network slots they are awarded. Section 4 is dedicated to a more intensive case study of Germany, Europe’s largest market for rail services. It includes an analysis of the current situation and an outlook on future developments. Section 5 concludes.

2. SECTOR BACKGROUND

2.1. The value chain and axes of competition

Analysing the different forms of market access for long-distance rail passenger services cannot be conducted without considering the other steps of the value chain in the railway sector, which are displayed in Figure 1. The infrastructure is a non-contestable natural monopoly consisting of network capacity planning and the investment decision, network construction and maintenance, and network access management and slot allocation. Much network construction and maintenance can be outsourced to a competitive market for construction, maintenance and renewal activities. The provision of transport services includes rolling stock ownership, ticket sales and distribution, and train operations.

Figure 1. The value chain of the rail transport sector



Source: Author’s illustration.

A first point of contact between network activities and train operations is assignment of network access. In open access train operators must apply for network slots. Possible organisational forms for the responsible authority are integrating with the network operator or remaining a separate agency. Based on the allocation of network access, the next step is timetable preparation. It requires co-ordination with other rail services provided by the same operators or others.

Rolling stock is procured after the allocation of network access or a successful competitive tendering. The procurement process for new rolling stock is long-term, and markets for second-hand rolling stock hardly exist. Different technological requirements across countries and tracks make it difficult to resell stock. Rolling stock ownership represents a competitive market with significant entry

barriers. To mitigate such effects, the rolling stock can be owned by independent companies founded only for this purpose, or by authorities.

Based on the allocation of network access and the availability of rolling stock, ticketing, sales, and marketing can be organised. Sales can be classified into off-board and on-board. In the case of longer travel times, on-board sales can be a reasonable option for passenger convenience and reduced transaction times. Further options are represented by a markup of on-board ticket prices, or the imposition of pre-booking for increased planning reliability. On the other hand, ticket vending machines throughout the countrywide network represent an essential facility which is generally too costly to duplicate. Moreover, a well-established and popular Internet platform for scheduling and sales is a competitive advantage. At issue, however, is how much these services should be centralised to provide fair, non-discriminatory access and to provide a united “face” to customers. The degree of state involvement in such a united face is another crucial point in the evaluation of the different models of market access.

The actual nucleus of the value chain is train operations. However, one should remember that around 50% of total costs are already predetermined by track and station access costs, energy costs, and marketing and sales costs (Monopolkommission, 2009, pp. 49 and 94; and Preston, 2008). Train operations can represent a state-granted monopoly or an open market. The quality and type of service are partly predetermined in competitively tendered services or can be freely chosen in any open access services. Quality and service of train operations are strongly related to the rolling stock and the tracks.

2.2. Differentiation between long-distance and regional services

The differentiation of long-distance and regional transport services is a crucial point in the setup of a model for market access for long-distance rail passenger services. Popular distinction criteria are represented by type of service, travel distance, and profitability.¹ Using type of service, all high-speed trains, intercity, eurocity and night trains are classified as long-distance, with the rest being urban, local, or regional.

Travel distance could classify all trips over a certain threshold, e.g. 50 km, as long-distance, depending on country characteristics. However, this would require complex data collection and the service classification could only be based on the majority of passengers.

A third possible distinction criterion is profitability. Urban, local, and regional services are usually characterised by some form of state provision, i.e. an enterprise in public ownership or public procurement. Through its nature as a public service obligation, the provider receives subsidies and can sell tickets at a price below cost recovery. To minimize these subsidies, countries such as Germany, Great Britain, the Netherlands, and Sweden use competitive tendering.² In principle, this procedure is also possible for long-distance services, and is another crucial point in determining how much the different forms of market organisation could allow improved integration of subsidy instruments.³ Further differentiation of long-distance services is possible through different services classes, on-board service, stop frequency, and so on.

2.3. Handling of non-profitable interregional services

Since there are no generally accepted distinction criteria between long-distance and regional services, there is a gap into which unprofitable interregional services fall. The handling of such services is especially interesting when looking at different models of market access. In this respect it is

important to consider public service contracts. Directive 2004/18/EC defines these as contracts between a service provider and a contracting authority. The term public service obligation is used for public service contracts that offer an auction for subsidies and award the winning company a monopoly to operate a specified route with subsidies for a specified period.

In countries where a concession for the entire long-distance network is given, presumably non-profitable sections are included. In Great Britain competitive tendering is applied to both profitable and not profitable services, resulting in a concession fee for the former and a subsidy for the latter. The Swedish national railway SJ decides whether or not a service is profitable. If the state-owned enterprise decides not to operate a service, competitive tendering is introduced. In Germany, where federal law obligates the state to provide regional transport services, there is no legal base for public assistance for long-distance services. Instead, regional authorities define parts of abandoned long-distance services as regional services which allows them to maintain service quality with public financial aid to the engaged operator. Italy uses public service contracts to ensure services that otherwise would not operate.

2.4. Infrastructure organisation

There are strong interdependencies between the design of market access for long-distance rail passenger services and the organisation of the infrastructure network.⁴ The key characteristics for Austria, France, Germany, Great Britain, Italy, the Netherlands, and Sweden are presented in Table 1.

Directive 91/440/EEC mandates a separation between train operators and the infrastructure manager. Although by now all EU member countries' railway markets have undergone such separation, there are different degrees. In Great Britain, the Netherlands and Sweden, there is full independence between infrastructure functions and long-distance passenger train operations. In Austria, Germany, and Italy, a holding structure exists which comprises both infrastructure and train operating functions. Both options are explicitly allowed following the Directive. France has a formal separation but, by means of contracts, important segments of the infrastructure maintenance are still the responsibility of the SNCF.

The rail networks in all considered countries are owned by the state. After the negative experiences in Great Britain during privatisation in the 1990s, no other country has privatised its tracks or stations. Although the organisational structure of the infrastructure management varies widely, this does not affect the general acceptance of public responsibility for the railway infrastructure.

Table 1. Characterisation of European long-distance passenger rail transport markets

	Austria	France	Germany	Great Britain	Italy	Netherlands	Sweden
Degree of infrastructure - transport services separation	Holding integration	Partial separation	Holding integration	Full separation	Holding integration	Full separation	Full separation
Network ownership	Public	Public	Public	Public (after private intermezzo)	Public	Public	Public
Market dominance and operator ownership	100% ÖBB Personen-verkehr (state-owned), entries between Vienna and Salzburg announced by Westbahn (hourly service) and Fair Train (every 3 hours)	100% SNCF (state-owned)	99% DB – Fernverkehr (state-owned)	Oligopoly of private train operating companies (apart from temporary re-nationalisations) (Merkert, 2009)	100% Trenitalia (state-owned), considerable entries announced by NTV (Rome-Milan) and DB in co-operation with ÖBB (Munich-Verona)	NS (state-owned) and NS-KLM joint-venture HSA (90% state-owned) together 100%	SJ (state-owned) dominating, some smaller railway undertakings present

Concessions	No	No	No	Competitive tendering for regionally delimited areas and long-distance connections, franchised under National Rail	No	Two concessions granted to NS until 2015, and to HSA until 2024	Concessions only on routes where SJ refuses to operate commercially
Open access	Yes	No	Yes	Yes, if not primarily abstractive	Yes	No	Only for night trains, change announced for 2009/2010
Degree of market opening	Access for all operators given	None	Access for all operators given	Access for all operators through competitive tendering	Access for international groupings given	None	Purely commercial day services reserved by law to SJ, change announced for 2009/2010
	Austria	France	Germany	Great Britain	Italy	Netherlands	Sweden

Source: Own illustration according to Alexandersson (2009), Alexandersson and Hultén (2009), Alexandersson *et al.* (2009), company websites, Holvald (2009), and Monopolkommission (2009, p. 56).

2.5. Organisation of long-distance services in selected European countries

The long-distance passenger rail market in most countries is still dominated by the state-owned incumbent which used to be (and in many countries still is) the only operator. The prominent exception is Great Britain, where there are several train operating companies (TOCs) active on long-distance routes. Most routes are tendered by the UK Department for Transport and operated as franchises. These companies operate under their own brands, but offer a common Internet platform *National Rail* through the Association of Train Operating Companies (ATOC). Open access operators are presented on the *National Rail* website as well. Specific tickets are valid on trains by different operators. Apart from temporary re-nationalisations (Merkert, 2009a), there is no publicly owned British TOC, but some TOCs are partially owned by foreign, state-owned enterprises, e.g., the German DB Regio owns part of Wrexham & Shropshire, and French Keolis owns shares in several British TOCs (Nash and Smith, 2007, and Alexandersson, 2009).

There is more than one long-distance train operator in Sweden, Germany, and the Netherlands. In Sweden, SJ operates profitable services on its own account. On routes which SJ refuses to serve, the state organises competitive tendering to find the most economic operator. As a consequence there are several active train operators, although SJ offers the majority of services. Except for winning tendering and introducing night services, train operators other than SJ are so far not allowed to participate in the market, but a change to more open access was announced for 2009-2010 (Alexandersson and Hultén, 2009).

In Germany there is open access to the entire rail network, but Deutsche Bahn subsidiary DB Fernverkehr AG holds a 99% share in long-distance rail passenger transport. However, the incumbent is not the only active operator. After a few unsuccessful attempts, there are currently three enterprises which together comprise less than 1% of the long-distance market (Holzhey *et al.*, 2009, p. 99).

In the Netherlands long-distance rail services are split into two concessions operated by HSA and the national Dutch railway NS. In other European countries, only the state-owned incumbent serves the whole long-distance network. In some countries such as France the exclusivity is due to protective legislation which guarantees exclusive rights to the traditional railway undertaking.

Directive 91/440/EEC mandates an opening for “international groupings”. The term describes any association of two or more railway undertakings from different EU member countries for the purpose of providing international transport services. In countries with exclusivity rights of the incumbent, this means that only international services may be operated. The right to form international groupings is not limited to public train operators, and theoretically one international grouping could operate in all EU member countries, as long as each service is at least transnational.

Austria and Italy grant rail access to all operators. While no significant market entries have been observed, market entries in both countries have been announced by private operators for the near future.⁵

3. MODELS OF MARKET ACCESS

3.1. “Tendered Concessions” model

We define our first model for market access as the “Tendered Concessions” model, featuring Great Britain as the prominent, contiguous example. In this model the network of operations is structured into a reasonable number of sub-networks based on a demarcation along regions or traffic flows and tracks. There is competition for the market for each sub-network in terms of competitive tendering. The tendering authority typically has extensive design and decision responsibilities. It determines the level of supply as obligation in the tender documents. This includes routes, frequency of service, capacity, operation times, and (minimum) requirements of service quality. The aim of the competitive tender is to find the operator which best fulfills a list of criteria, with price often being the most important or single criterion. Quality aspects can represent an additional decision criterion with weights assigned to price and further aspects. In the case of profitable lines, the goal is to find the operator which pays the maximum concession fee to the state. Track access charges are regularly predetermined by the national track access charging scheme. One can generally differentiate between three kinds of contracts:

- Under a management contract, the operational as well as the revenue risks are borne by the authority.
- Under a gross-cost contract, the service operator bears the operational risk. This means a high degree of tariff regulation by the authority and relatively low incentives for the service provider to attract as many passengers as possible.
- Under a net-cost contract, the provider acts as the most entrepreneurial, and bears the risk on both the cost and revenue sides. The predefined contractual agreement between the authority and the operator has the advantage that performance control through a system of indicators can be established and pressure is applied through penalties on subsidies or payments.

However, as the quantity of services is mostly predetermined by state authorities, entrepreneurship is generally on a low level and the influence on costs and market development can be restricted. In the case of Britain, only the management changes when a franchise is awarded to a new operator (Smith *et al.*, 2009). While this introduces some employment certainty for existing personnel, it also establishes bargaining power and information advantages over the new management. The procedure additionally reduces the possibilities to influence costs and processes, and has direct effects on franchise bids. Hence, it is doubtful whether the sole exchange of top management is suitable for producing substantial changes in the service provision. This in turn is related to franchise duration, since increased durations lead to possibilities for better innovation for the new management. Obviously, the franchise duration must be aligned to the rolling stock life-cycle with replacement and refurbishment dates. The importance of franchise duration may also be dependent on rolling stock ownership. The British model introduced rolling stock companies (ROSCOs) as providers of the rolling stock. Such an additional level in the value creation removes a barrier to market entry, because the service provider is no longer concerned about the financing of rolling stock. In contrast, it is doubtful whether this supports rolling stock innovation (Yvrande-Billon and Ménard, 2005) and even more important, it introduces new transaction costs (Merkert, 2009b).

The “Tendered Concessions” model exhibits further transaction costs in the coordination of many players, particularly when there are network overlaps or connection points. Hence this model has high disadvantages in comparison with a single network operator when the network effects are high. On the other hand, a star-like (radial) network structure such as in Great Britain facilitates a franchise demarcation along regions or traffic flows and tracks. This is emphasized even more with a station structure, i.e. London, where different routes serve different stations without long-distance service interchanges. The “Tendered Concessions” model, possibly with common concessions for both long-distance and regional rail, improves the timetable coordination between different services. It can even remove any artificial distinction between long-distance and regional rail services. Under the model the allocation of subsidies to rail services operators or the concession payments to the authority can be carried out fairly and transparently. For example, government can decide to pay subsidies only to regional rail services which may be considered as public service obligations, but there is no general need to classify a service into long-distance or regional.

Furthermore, the “Tendered Concessions” model allows the state to compensate subsidies for non-profitable lines through the collection of concession fees on profitable lines. Hence, the state can balance expenses and revenues. We note, however, that there may be some additional costs for the authorities that manage competitive tendering. In this model, profitability and losses are bounded and state-regulated. This originates primarily in the design of auctions and reverse auctions where interested companies compete to win the franchise, and potentially articulate similar bids restricting the margin a priori. Moreover, cap and collar regimes such as in Great Britain limit the risks and chances (Kain, 2007, and Preston, 2008). The British Department for Transport will skim 80% of the revenues lying above the 106%-level of the train operating company’s original forecast.⁶ Hence, through a system of risk-sharing the rail operator’s profit is limited. This conclusion only holds for a sufficiently high number of bidders that contribute to a market outcome with an efficient production of services, a bid that corresponds to average production costs plus an opportunity cost of capital that is normal in the market and a quality of services that is at least as good as before. Consequently, in the absence of corruption and collusion competitive tendering with a sufficiently high number of bidders will represent a competition substitute.⁷ Unfortunately the substitute is frequently threatened by a decreasing number of bidders after an initial phase of tenderings (see e.g., Augustin and Walter, 2009, for an example from the German bus market).

A critical issue in the “Tendered Concessions” model is that the state and its authorities define the level of service concerning routes, frequency, quality, etc. This leaves room for political influence, e.g., routes or cities served because of localised political ambitions.

An extension of the “Tendered Concessions” model is possible through open access services proposed by private companies without any subsidy requests. Such services can provide direct connections without the need for transfers. Since these services also compete with franchised services, the regulation authority must decide whether they are not primarily abstractive from the franchisees’ revenues (Griffiths, 2009). This procedure requires an intelligent institutional design to secure a fair and efficient decision process and furthermore introduces additional transaction costs. In Britain, open access services approved by the Office of Rail Regulation (ORR) have gained a share in passenger revenues of only 0.6% (ORR, 2009). A simulation of the different market entry strategies by Preston *et al.* (1999) shows that on-track competition in Great Britain usually reduces welfare resulting from increased consumer benefits, but greater profit reductions for operators. With the Directive 2007/58/EC coming into effect on January 1, 2010, open access will certainly play a more important role in continental Europe, but it is doubtful whether the directive will affect countries in island positions such as Great Britain. The only track connection to continental Europe is the Eurotunnel, and London is the first major stop so that cabotage does not play a large role in Great Britain.

3.2. Network concession for a monopolistic operator

A single network concession for a monopolistic operator under a performance-based contract represents a different type of concession. Such a concession appears to be relatively suitable when substantial network effects with many interconnection points and crosslines may be opposed to a split in concession areas. A very dense network can, for example, be found in the Netherlands with frequent timetable intervals similar to suburban transit systems. A monopolistic network concession can have the effect that it prohibits market entry of competitors and can be used to strengthen the position of a monopolistic public company. In the absence of competition, incentives for a public monopolistic network operator for efficient performance will be quite low. Hence, the challenge in this case is to design an institutional setting which facilitates efficiency-oriented governance of the monopolistic public company.

In the Netherlands, a 10-year concession contract was directly awarded to the Dutch railway undertaking NS in 2005 (Van de Velde *et al.*, 2009). The contract is part of a major railway reform in which infrastructure management is defined as a government responsibility, and passenger transport is targeted as a non-subsidized commercial activity. Non-profitable regional lines were separated from the NS network and tendered (Alexandersson, 2009). The concession contract is monitored by performance indicators, and NS must propose improvement values. The importance of such performance indicators has to be highlighted in case of the permanence of a monopolistic network. Difficulties can arise when trying to identify a reasonable benchmark company. This is necessary when improvements are not only compared to a firm's own base level, but also to best practices. As monopolistic operator, an international comparison has to be made (see, e.g., Coelli and Perelman, 2000), but this is difficult because of different operating environments, different purchasing powers, and so on.

The early results of the Dutch concession contract are that investment activities intensified, and performance in terms of customer satisfaction and punctuality improved. From 2009 on, NS should pay for the concession. In fact, the concession for NS is complemented by a second concession for train operations on the high-speed railway link (HSL-South) between Amsterdam, Schiphol Airport, Den Haag, Rotterdam, and Brussels. This concession was granted in a competitive tendering to High Speed Alliance, a joint-venture of NS and AirFrance-KLM, for the period from 2009 to 2024 (NS, 2009, pp. 101, 120).

Open access has not been planned as an option in domestic services, although Directive 2007/58/EC naturally makes this possible for international services. This raises the issue of sustainability of the NS monopoly. Facing these seemingly contradictory approaches in national and European regulation, we note that the Netherlands have always been critical to opening up the national market because of the country's assertion that a single company with exclusive rights is more capable of efficiently serving such a densely used network.

3.3. "Open Market" model

The "Open Market" model is based on the concept of competition in the market. All European countries that have introduced open access as the primary market entrance possibility, such as Germany, Italy, and Austria, still face the existence of a single monopolistic network operator, although some market entries have now been announced for the near future.

The “Open Market” model assumes that competition in the market, or at least the threat of competition, results in a creative product offering, technological innovation, and downward pressure on costs and prices. In theory, it emphasizes the entrepreneurship of operators, because they plan and determine routes, frequency, quality, and are assumed to operate as profit-takers. Hence, political influence in state-owned companies could be a critical aspect. Full profit orientation can lead to a cutback of service offerings in rural and remote areas, because it may emerge that they are unprofitable to operate. Nonetheless, if it is desirable to operate these services, the state faces a conflict between its open access orientation and the necessity to subsidize. A suitable solution to determine the minimum level of subsidies is competitive tendering, but this is not part of the “Open Market” model. However, non-profitable lines may be separated from the open market. This provokes strategic behavior: companies could shut low-profit or loss-generating interregional routes under the certainty that they will be publicly procured. They do not have to fear any negative network effects in terms of connections to profitable lines.

Given that local and regional services are likely to remain public service obligations, the “Open Market” model for long-distance services requires a reasonable differentiation between these two types of services. However, such a differentiation is not straightforward. Possible distinction criteria were given in Subsection 2.2, but all are either difficult to measure or give providers room for strategic behavior.

On the one hand, indirect subsidization is also possible via reduced track charges. On the other hand, the state could potentially gain track access charges that are cost recovering. In either case, it is not possible for the state to compensate subsidies through concession fees, in contrast to the “Tendered Concessions” model. For very efficient and well-positioned firms, it is possible to gain high profits, which may once again attract entrepreneurs and creative product offerings.

Reducing service offerings in rural and remote areas also represents opportunities for competitors. These lines offer a market niche with limited capital requirements in comparison to a major high-speed trunk route, and the risk of direct competition with the incumbent, or even predatory behavior, is low.

The discussion about cutbacks in rural and remote areas initiates a controversy in how far the “Open Market” model should be augmented with obligations for operators to serve regions, to provide special rates for low-income customers, to provide interconnections with other means of transport, etc. These obligations are all part of the larger question about how to accomplish welfare enhancements in the “Open Market” model. More generally, the profit orientation in this model can lead to an increase in ticket prices in comparison to the politically influenced ticket prices of state-owned European incumbents.

The “Open Market” model closely relates to another institutional aspect of European railway organisation: the separation of infrastructure and operations. There is a long-standing discussion on the advantages and disadvantages of vertical integration vs. unbundling. Empirical results have confirmed the presence of economies of scope between a network and train operations for a majority of European railways (Growitsch and Wetzel, 2009). However, it is doubtful if vertical integration is necessary to exploit these economies of scope. Hirschhausen *et al.* (2004) found that only a few critical transaction processes that demand a hierarchical organisation are existent.

In practice, supporters, particularly labour unions in Germany, have pointed out the benefits of internal labour markets in the case of vertical integration.⁸ In contrast, there is a strong discrimination potential against competitors. This potential is especially relevant for the “Open Market” model in long-distance passenger rail transport with the importance of network effects, but is less relevant

where network effects are insignificant and the transport is less sensible to the particular time slot for network access, e.g., for block train traffic in freight transport. It is also less relevant for tendered services, because the track allocation takes place on an upstream level. An independent network operator will try to maximize network utilisation and enforce the development of bottlenecks, while a vertically integrated railway company will try to maximize the firm's entire profits. If unbundling is politically not enforceable, then the minimum requirement for a functioning market is to implement an effective access regulation.

The discussion concerning non-discriminatory network access is related to two more aspects. First, transparency with respect to free capacities is necessary. This could easily be implemented with an Internet-based information system (Monopolkommission, 2009). Second, the "Open Market" model also requires careful consideration of the long-term planning reliability for network access. Once procured, rolling stock may be difficult to resell, and the deployment on other tracks may be impossible due to different technological requirements. Hence, as investment in rolling stock is specific and secondary markets are almost non-existent, it is important to have ensured slots on tracks for a sufficiently long period to recover the investment, e.g., for a minimum of 10 years.

Network access is not the only monopolistic bottleneck in the "Open Market" model. Alexandersson and Hultén (2009) emphasize the need for an independent booking and ticketing system. An independent authority may also be desirable for timetable planning. Finally, in comparison to other sectors, such centralised institutions and state intervention tend to limit the "free-ness" of this market.

Critical to all market access models, network effects can play a very important role in long-distance passenger rail transportation. In the "Open Market" model, additional offerings selected by cherry-picking can lead to service terminations of the incumbent because of revenue abstraction, to a reduction of network effects, or to increased network congestion. Following this, the beneficial former network effects such as interconnection possibilities, integrated vehicle scheduling, and cost advantages can be harmed or even destroyed.⁹ Thus, the "Open Market" model can present disadvantages for consumers and can lead to inefficiencies from a welfare economic perspective.

On the other hand network effects may be so beneficial to the incumbent that on-track competition never develops. Another negative impact on potential competition results from scarcity of network capacities. In consequence, the network operator might have strong market power. This will be especially problematic for consumers as well as from a welfare economic perspective in the case of a monopolistic network operator which is privatised and aims at maximizing profits.

An additional possibility of the incumbent to foreclose competition is implementation of strategic behavior against potential newcomers, e.g., the incumbent can invest in rolling stock only for the purpose of deterrence. In general, strategic behavior of the different players can be expected and will cause net-costs from a welfare economic point of view.

We note that due to intermodal competition effects the controversy about the extent of intramodal competition in the railway market may be of little significance. The most important competitors are motorised individual transport (MIT), air transport, and express coaches. However, these means of transport sometimes address different target groups, and we note that they partially serve different sub-segments of travelling. MIT is attractive because of its flexibility but may be inadequate for long trips and a lesser alternative for business travellers and the socially deprived.

Friederiszick *et al.* (2009) find a high competition intensity between low-cost airlines and Deutsche Bahn (DB). Holding the view that there is very low potential for on-track competition for

long-distance passenger rail services, Friederiszick *et al.* (2009) conclude that international railway alliances such as Railteam are no threat to competition. With respect to intermodal competition, the results of Friederiszick *et al.* (2009) are not generalisable, because air service plays no role in many routes that are less than 300 km, or that are point-to-point connections between cities with no substantial air connections. This in particular holds for a decentralised urban settlement structure such as Germany (in contrast to France with its star-like travel flows to Paris). Friederiszick *et al.* (2009), whose research has been financed by DB, have been criticised for their sample selection, e.g., Monopolkommission (2009, p. 78) particularly questions their short observation period (January 2006 until October 2007) with less emphasis on winter months.

Express coach services can be an alternative for young people, seniors, low-income earners, and others who are not as sensitive to travel times. It is questionable how much of a competitive threat express coach services represent to railways, or if they merely induce new traffic and entice passengers away from motorised individual transport (Walter *et al.*, 2009). One option is the provision of non-profitable interregional lines with economical express coach services.

4. CASE STUDY: GERMANY

Germany's railway market is the largest in Europe, and a prominent example of an "Open Market" model for access to the long-distance network. However, the market that has developed so far is characterised by niche competition rather than open market features.

A major reorganisation of German railways was conducted in 1994 with the *Bahnreform*. The first stage of this railway reform consisted of three basic principles. The first was to reorganise the formerly West German railway *Bundesbahn* and the East German railway *Reichsbahn* into a new, primarily state-owned, corporation. The second concerned the delegation of responsibility for regional railway services to the federal states. The third, and most important for studying market access models, was to introduce non-discriminatory market access for private companies. Germany was hence at the forefront for providing open access to the long-distance passenger rail transport market.

To date there has been no substantial on-track competition. Holzhey *et al.* (2009) count 9 attempts to enter the market in 15 years of liberalization, all of which are small-scale and consist of at most 2 pairs of trains per day. Five of these services ceased after operating for a very short time. The remaining services have in common the ability to serve routes that were previously operated by some kind of Deutsche Bahn train, in particular the so-called InterRegio lines. These were abolished beginning in 1999 because of profitability problems (Link, 2004). The underlying concept of the InterRegio (and also of its competitive successors) was to connect the many medium-sized towns and vacation areas with metropolitan areas. The services stopped frequently (thus were slower than InterCity or high-speed trains) and were also cheaper. The more utilised lines were reorganised into InterCity lines, while the rolling stock partly remained the same and prices were increased.

Another condition for the start of the few commercial services was the introduction of competitive tendering for regional rail services. The four services have used rolling stock from their regional operations and two, Harz-Berlin-Express (Veolia) and Vogtland-Express (Arriva), represent an extension of lines operated under a public service obligation. The InterConnex Leipzig-Berlin-

Rostock (Veolia) was equipped with long-distance rolling stock after the first four years of operation. It is also the only service directly competing with DB long-distance offerings. All of these services can be distinguished from DB offerings by their longer travel times and lower prices (Séguret, 2009).

An exception is the night train between Berlin and Malmö in Sweden. Unlike the other services mentioned which are provided by subsidiaries of international integrated private transport companies, Berlin Night Express is operated jointly by Georg Verkehrsorganisation and SJ.

Interestingly, the four current long-distance offerings by DB's competitors are connections to Berlin through the eastern part of Germany. Two reasons for the existence of these routes may be the East German settlement structure which has only three larger agglomeration areas (Berlin, Dresden, and Leipzig) and the low percentage of business travellers which make them unattractive for DB. A third reason may be the price sensitivity in regions with lower per capita incomes.

The low level of competition intensity can be attributed to four factors. The first is DB's vertically integrated structure with discrimination potential and information advantages, in particular through information exchange between long-distance operations and the network. The DB infrastructure subsidiaries directly control 35% of total costs for long-distance service operations, such as access charges, traction power, etc. (Holzhey *et al.*, 2009, p. 102). This cost issue is particularly relevant, since the sector is said to yield only low profit margins. However, this could also be related to the incumbents' business models. Low-cost airlines, for example, have been able to earn high profits from a similar market situation in aviation.

The second factor is network access. Congestion is already a problem in Germany, and it has been attenuated due to the present financial crisis and resultant decline in freight transport. The focus of past network investments has been on new high-speed lines, e.g., Frankfurt-Cologne or Munich-Nuremberg-Erfurt-Berlin, whereas main junctions, e.g., in Frankfurt and Cologne, are congested, intersections exhibit obstacles (Vieregg, 2004), long-distance, freight and regional traffic are forced to share congested track sections, and many lines are speed-restricted because of poor track. Moreover, transparency concerning free capacity could be improved. Holzhey *et al.* (2009, p. 115) have proposed a visualised network capacity timetable that is open to all interested companies. The instrument of framework contracts could be improved through more flexibility, longer lead times, and the prioritisation against other awarding criteria (Monopolkommission, 2009, pp. 7, 61).

The third factor is the expansion strategy of local authorities that have begun to procure interregional services. Good examples are the so-called regional services on the Elsterwerda-Berlin-Stralsund route with a line length of over 400 km and the service between Munich and Nuremberg that serves the new high-speed line between Ingolstadt and Nuremberg with former long-distance rolling stock¹⁰. Although these services may constitute travel improvements, they also signal that there is no need for private initiatives for commercial lines, and they complicate the discovery of appropriate connections (Monopolkommission, 2009, p. 58).

The fourth factor is the impact of today's financial crisis that has made it more difficult to finance rolling stock investments. However, two recent announcements of market entry may represent a new strategy. In October 2009, the private newcomer locomore rail announced plans to operate three daily trains from Hamburg to Cologne after August 2010, meaning that it has already successfully applied for track capacity. Comfort and travel time should be comparable to DB InterCity services, and tickets should be cheaper¹¹. locomore is supported by the US investment firm Railroad Development Corporation. A potential strategy to reach competitive travel times and to save access costs may be to stop at alternative stations instead of running into bottlenecks and loops such as the main stations of Dortmund and Bremen.

A less advanced, but potentially more dangerous competitor for DB is Keolis, which is backed by SNCF, Axa Private Equity, and a Canadian pension fund. Also in October 2009, it announced services between Strasbourg, Frankfurt and Hamburg, and Strasbourg, Frankfurt, Berlin, and Hamburg comparable to DB InterCity services. Keolis has not yet received a confirmation for track access. This decision will be made by the network subsidiary of DB by April 2010, so that services could start at the earliest in December 2010.

As a starting station, Strasbourg offers Keolis the possibility to use existing French maintenance facilities and to span a real international network of train connections. However, possible market distortions follow from the (partial) state ownership of both Keolis and DB which compete with private operators.

These announcements both incorporate a new strategy for market entry compared to the previously introduced peripheral services of Veolia and others. Both potential entrants would serve trunk routes that are characterised by competitive average speeds without the imperative use of expensive high-speed vehicles.¹² Competition in the high-speed segment up to 300 km/h may also be limited by the close international cooperation and joint ventures in this segment, such as Railteam, Thalys, etc.

However, it is important to bear in mind that the market organisation and the regulatory setup are by no means finalised. The coalition agreement of the new German government further assumes a vertically integrated DB under a holding company, in order to facilitate a common job market.¹³ The transport and logistics subsidiaries will be privatised as soon as capital markets recover. However, shifting the profits from the network to the holding will not be permitted, and the infrastructure will get a more independent management. Dual mandates with the same manager holding positions in both the holding and the network subsidiary will not be permitted. Further objectives of the railway policies mentioned in the coalition agreement are: a stronger regulator; harmonization of the rules on a European level; and the examination of a highly synchronised countrywide timetable with infrastructure investments in specific bottlenecks (Deutschland-Takt). The issues remaining are the extent to which a partially privatised monopolist can exercise market power to raise prices and to abandon services in rural areas, and how the potential on-track competition can serve to mitigate such effects.

The suggestions from DB competitors (Holzhey *et al.*, 2009, p. 113) aim to completely change the organisation of Germany's long-distance passenger rail market. One option may be the introduction of concessions for all routes and marketing of all services under a common brand. Another option is to focus on concessions for interregional lines to establish a second long-distance network alternative to the expensive high-speed segment. A third option is the systematic support of long-distance services by track access charges where peripheric routes are subsidized through higher charges on high-demand routes. A careful evaluation is necessary to determine the ability of these options to resolve critical long-distance passenger rail market concerns. It must however be clear that the introduction of concessions would renounce the "Open Market" model practiced in Germany so far.

The coalition agreement also includes liberalization of express coach services in Germany. Until now, these services have been heavily restricted to single connections, mainly to and from Berlin (Walter *et al.*, 2009). Express coach services could fill the gap left by abandoning trains on less-frequented routes with bus units that are smaller than trains. On the other hand, market entry is also likely to focus on trunk routes with great passenger potential and interest in low prices.

5. CONCLUSION

This paper has classified the models for market access in European long-distance passenger rail transport into the “Tendered Concessions” model, the “Monopolistic Network Operator” model and the “Open Market” model. Noting that each European country will pursue its own approach aligned to regional circumstances, nonetheless our classification can help to structure the ongoing discussion. We have presented the models’ strengths, opportunities, risks, and threats without favoring any one model. There are very different design options which have very different impacts. Empirical experience with the “Tendered Concessions” model in Great Britain has progressed the most, while open access experience is still in its infancy.

Open access appears to be the preferred regulation for international services, as manifested through Directive 2007/58/EC. With this directive, cabotage is possible, but only when the routes served under public service obligations are not distorted. It remains unclear whether open access for international services may distort tendered concessions in domestic markets, hence, if these two contradictory regulations coincide. This may be a smaller problem for geographically or technologically isolated rail markets, e.g., Great Britain, but could be a larger problem for networks highly integrated in a central European country like the Netherlands.

NOTES

1. These distinction criteria are all used in the German market.
2. Regulation (EC) No. 1370/2007, coming into effect on 3 December 2009, strives to stimulate competition in passenger transport markets and specifies competitive tendering as the standard award procedure. However, rail services are excluded from this rule, and direct awards with tenures of up to 10 years are possible (15 years when competitive tendering is used).
3. Subsidies can accompany institutional problems, such as the need for funding through tax collection. We do not further consider such aspects.
4. We define long-distance services as any rail services that are not classified as urban, suburban or regional services in Directive 91/440/EEC.
5. See Monopolkommission, 2009, p. 56, and www.oepnvwettbewerb.de/index.php?option=com_content&task=view&id=1872&Itemid=27.
6. The cap and collar regimes are controversial because they can provoke strategic behaviour in the estimation of revenues and costs (Preston, 2008).
7. With a high number of bidders, an efficient market outcome is more or less guaranteed. With a low number of bidders, competitive pressure can be still high enough to lead to an efficient market outcome, but this is more uncertain.
8. This argument has enjoyed renewed attention in the current financial crisis, because the cargo subsidiary of Deutsche Bahn experienced a sharp recession, with a subsequent decline in the need for personnel.
9. Service terminations because of revenue abstraction do not necessarily lead to welfare decreases. However, this is likely to lead to decreased network effects which, in turn, imply welfare disadvantages.
10. In contrast to the ICE high-speed service on this line the additional train offers more stops with the accompanied increased travel time.
11. <http://www.abendblatt.de/wirtschaft/article1253055/Hamburg-Berlin-SNCF-fordert-Bahn-heraus.html>, retrieved November 2, 2009.
12. The use of high-speed vehicles represents the third major market entrance strategy.
13. www.fdp-bundespartei.de/files/363/091024-koalitionsvertrag-cducsu-fdp.pdf, p. 29 f.

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