The role of ticket retailing in railway regulation

Roger Pyddoke\textsuperscript{a,}\textsuperscript{*}

\textsuperscript{a} VTI, Swedish National Road and Transport Research Institute, Sweden

\textsuperscript{*} VTI, Box 55685, S-102 15 Stockholm, Sweden, +46 (0)8 55 57 70 30, roger.pyddoke@vti.se

Keywords: Railway, Regulation, Pricing, Ticket retailing, Booking.

ABSTRACT

European railway regulation proceeds on the assumption that increased competition among railway operating companies will yield lower prices and better services for passengers. At the same time legislators are aware that insufficient provision of information on the supply of services and time consuming procedures for through ticket reservations may erect a substantial obstacle and reduce the demand for services. This paper compares how the regulatory regimes in Sweden, Great Britain and Germany handle the provision of through ticketing and how the different approaches have been justified. The analysis proceeds from official policy documents and examines law texts and the policies of organisations in charge of providing tickets to passengers. The main findings are that not only do the regulations of ticket provision have different forms in these three countries; they also differ on how important a common neutral system for ticketing is professed to be for a well-functioning market. Therefore the emphasis on a common and neutral system for ticket provision is also very different in the three countries. Great Britain has a compulsory system for neutral provision of tickets, Germany has a system provided by the incumbent and Sweden has a formally neutral system which is owned and organised primarily by the incumbent with voluntary association for entrants. The degree to which common ticketing has been justified also varies. So far we have found no more elaborate analyses on the welfare consequences of operating common ticketing systems or the lack of such systems.
1. Introduction

An underlying idea for the European Union’s railway policy [COM (96) 421] is to be an on-going process towards better functioning railway markets. As a legislative process this however proceeds in steps. Each step represents a political compromise where an overarching vision formulated by the European Commission meets the objectives of the member states. After the implementation at EU level these consecutive legislative initiatives are to be implemented in the member states.

The key features in the EU policy [COM (96) 421] are separation of infrastructure and transport operations and open access for freight and international services. In the policy [COM (96) 421] it is stated that “market forces should be introduced into domestic passenger transport” (p. 3) but that this should be done in consideration of “network benefits”. And although the commission states that “open access may be the best solution” to improve long distance passenger services (p. 16) it also makes the reservation that an “exclusive concession” may be more promising or that market forces could be introduced by a tendering process.

The EU legislation in many cases leaves quite a bit of room for individual member states to govern their own development. This is also the case for the railway legislation. Individual countries are supposed to proceed to implement a minimum of the required substantive reforms in the direction pointed out by the EU policy or go even further. This is illustrated by three different regulatory models suggested by Nash (2008). In the first, Swedish, model the distinguishing features are organisationally separate infrastructure managers and transport operators. The Swedish legislators initially choose to continue with a national monopoly for long distance passenger transport. The key feature of the second, German, model is that it retains infrastructure and train operations in the same holding company. This model, it is argued, retains the benefits of an integrated railway, whilst permitting competition through the open access conditions. The German model has however been challenged by the European Commission in the EU-court on account of the degree of independence of the infrastructure manager, the organisations incentives to reduce costs and the regulatory body’s insufficient powers. Germany’s government on its side is convinced that it fully complies with the European legislation. The third, French, model finally is characterized by a separate infrastructure manager, which in turn subcontracts most of its activity to the major operator.

The latest reforms in Sweden signifies a departure from the above “Swedish model” as the former legal monopoly for long distance passenger transport is dismantled and replaced by open access rules. The desire of the Swedish government to launch a more competitive market is however fraught with some hesitation as the government points out that the legislation may have to be further strengthened on a number of points (Alexandersson et.al. 2011). The degree to which the legislator mandates cooperation in a common booking system is such a question.

The central observation in Alexandersson et.al. (2011) is that the European legislation and the reformed Swedish legislation may not be sufficient to make competition work. This is particularly so for the supply of rolling stock and the provision of through ticketing.

The purpose of this paper is to present and examine the stated objectives for ticketing policies, their official justifications in Sweden, Britain and Germany. Furthermore some
arguments presented by stakeholders will be presented. These official justifications will in turn be compared to economic analyses of ticket pricing as well as policy recommendations based in economic theory.

The central justification offered for the most interventional policies for passenger railway market pricing are that they are intended to ensure the creation or preservation of network benefits. This argument in turn rests on a number of mechanisms generating mutual possible externalities that may, or may not, be captured by a several competing transport operators. One such mechanism is that a monopoly selling two complementary products sold as a package will want to charge a lower price and reap a larger profit than in the case when the two products are sold separately. This mechanism has been known by economists since the 19th century (Cournot 1838). The policies therefore aim at facilitating passengers search for combinations of tickets and to provide incentives for operators to facilitate the provision of through tickets.

Even though the issue of network benefits is a central issue for railway pricing policy we have found no academic papers explicitly applying the network pricing theory to railway pricing. The discussion of railway policy is mostly in policy papers.

The paper is organised as follows. A second section presents a positive theory of pricing in oligopolies providing complementary goods and partial substitutes, and discusses the applicability to railway passenger transport. It is noted that good data to assess the potential benefit is lacking. The third section describes the policy perspectives relevant for ticket retailing in the European Union, Sweden, Great Britain and Germany. A fourth section summarizes and concludes.

2. Possible economic justification for regulating railway pricing

The main argument for mandating cooperation in computer systems for the sale of tickets appears to be the idea that without such cooperation operators will have weaker incentives to provide discounts for combinations and consumers will lose travel opportunities and operators revenue. The underlying idea being that a significant share of railway trips are associated with either change of trains or change between trains and other regional or local public transport. Unfortunately data on change of train cannot be obtained from the Swedish national travel survey as changes of train are not recorded (Tomth 2011). A partial analysis presented by Wieweg (2004) looks closer at the traffic between Sweden’s two next largest cities and Stockholm and finds a share of trips involving change of trains may lie in the range 30 to 50 per cent of all long distant railway trips. A corresponding assessment by the British regulator ORR (1995) was “that a conservative estimate of through ticketing accounted for more than a quarter of total fare revenue” (p. 7). The basic idea is that with a proliferation of railway operators, passengers will find it harder to find connecting transport and to reserve and buy a ticket for the whole journey. The reason being that independent operators will find it costly to coordinate their time tables to other operators, thereby unintentionally decreasing positive network externalities in the railway system.

1 “Railway trips involving change of trains constitutes a relatively large share of the trips in long distant railway travel on the most used lines in Sweden (the Southern and Western lines), and is between 30 and 50 percent, while a typical share in regional railway transport is assessed to be 15 percent.”
A further problem may be that the price of combined tickets may rise significantly compared to when a single operator offers all the train trips in a journey. The relevant theory of pricing is the theory of pricing in networks. A basic comparison is between which prices a monopolist or a benevolent planner would charge for the services in the network. These prices may in turn be compared to the prices charged by several profit maximising firms each serving a part of the network. In such a system the prices of combined tickets may become significantly higher than they would be in a single seller regime (double (or multiple) marginalisation) (Economides, N. and Salop, S.C. (1992)). Consequently the demand and consumer benefits for such journeys will decrease for this reason also.

If, on the other hand, the anticipated height of hurdles for acquiring through tickets is exaggerated, the justification for mandating a centralised system or cooperation in ticket sales is weaker. In air transport regulation the cooperation for ticket sales has not received this kind of emphasis.

A further assumption could be that the incentives for profit maximising sellers to cooperate will be weaker than the socially optimal. The sources of this market failure can be both transaction costs associated with creating cooperation and information asymmetries concerning the different parties potential costs and benefits from cooperation. The common information system will also be a public good with the corresponding incentives to shirk from the costs.

Following in the footsteps of Cournot (1838), where consumers are interested in buying products that have no other use than together with the other products, Nalebuff (2000) extends the classical two product case to any number of products. For this case demand is represented by:

$$q = A - b \ast (p_1 + p_2 + p_3 + ... + p_n)$$

For the case where two components always are used in pairs this is compared to the outcome in markets where duopolists either independently sell the two components or coordinate and sell two components as a bundle. The result is that the firms coordinating not only will charge lower prices, but they will also earn higher profits, than when they act independently.

The two firm case illustrates the general result. If two firms coordinate their prices, then in a Cournot-Nash equilibrium, the optimal joint price is lower and the profit higher than without coordination. The higher profits may not be surprising but the lower price may be so. Nalebuff goes on to state that the scale of the advantage in terms of profits of firms bundling products in this way is remarkably large (p. 325).

This model was recently extended in a paper by Armstrong (2010). Armstrong’s objective was to extend the existing body of results to a case where products are partial substitutes, in the sense that a consumer values a bundle less than its components separately. Starting from a situation where linear prices are offered. From this starting point, an integrated monopolist is compared to separate monopolies. In a second step the analysis is limited to a case where the demands for the two goods are symmetric and when valuations are additive and products are supplied by separate sellers. Here two cases are analysed, first a case when there is disutility of joint consumption and second a case where a proportion of the buyers can consume only a single item, while the other consumers have additive valuations.
For the first case a monopolist also wishes to bundle, but the optimal bundle discount is smaller than when valuations are additive, and separate sellers will wish to offer joint-purchase discounts. For the second case an integrated firm the optimal bundle discount is the same as for the case with all consumers having additive valuations. In this case, however, separate sellers would, optimally, like to charge a premium when a customer has purchased the rival product.

Comparing the two models and the results of Nalebuff we note that he models the markets for the separate products as duopolies while Armstrong models them as monopolies. Nevertheless both these approaches imply some market power. Given this difference the models represent differing cases in the sense of complementarity vs. substitutability. In both these cases of markets with a potential for bundling prices the models point in a direction that an integrated monopolist is likely to charge lower prices than separate sellers with some market power.

Comparing these models to the railways we have already noted that a proportion of the tickets involve more than one trip. We may therefore conjecture that an integrated firm in the railway sector is likely to charge lower prices for through tickets than separate sellers of trips.

Furthermore it is likely that the more frequent the number of combination trips are, the larger integrated monopolists discount will be. Therefore it would be valuable to have data on the degree to which trips involve changes of train. This is crucial to assess the degree to which railway tickets are complements in the sense of to the extent of Cournot’s and Nalebuff’s models or substitutes in sense of sub-additive valuations of Armstrong’s model. In the case of railways we know that some tickets are bought as combinations of train trips to form one through ticket, but a large part of the sold tickets are only one trip without change of trains. For passengers purchasing tickets sold as trips without change of train the willingness to pay for connecting trains is less than the advertised price.

The fact that integrated firms will charge lower prices and sell more trips may have implications for regulation. If the regulation aims at increasing the number of competitors in a simplistic fashion this may have counterproductive results if the beneficial effects of competition does not outweigh the loss of discounts given by the integrated monopolist. A complete regulatory program therefore would involve some strategic notions on how to preserve or even improve the network benefits by regulation of both prices and the principles for settling payments for combinations of tickets.

3. The policy perspective: the European Union, Sweden, Great Britain and Germany

In an overview of passenger rail reforms in Europe the fundamental aim for rail reforms in Europe is interpreted to be to “improve the efficiency and competitiveness of the European rail system” (Nash 2008 p. 61). Nash, however, also points out that “the introduction of competition has only been one of a number of objectives of the Commission and not necessarily an objective at all of all member states” (p. 61). Consequently there is no EU requirement to open the passenger market to competition through open access or through competitive franchising. Furthermore the EU regulation is silent on the issue of through ticketing as this is not necessarily an issue of open common markets.
Comparing the development of European railway regulation to European telecommunication regulation it can be noted that telecom regulation initially proceeded from differing national legislations to unified community legislation in 2002. This new framework introduced a comprehensive system of criteria for identifying submarkets with significant market power and a set of instruments adapted to identified regulatory needs. The major difference compared to the railway legislation is the open ended system for identifying market power and the corresponding regulatory obligations.

The obligations that are possible to impose under the railway legislation are limited to rail infrastructure. To the extent that assets like maintenance workshops, rolling stock and ticketing infrastructure gives market power this does not qualify as reasons to impose obligations under the European Union legislation. In one or more of the national legislations considered in this paper all these sources of market power have been at one time or another been considered as grounds for imposing regulation.

3.1 Sweden

Previous reforms in Sweden have delivered the institutional changes referred to above as the Swedish model. These reforms have been surrounded by several qualifications concerning the natural monopoly properties of railway. The general idea being that both the supply of infrastructure and transport services where associated with economies of scale and scope as well as network externalities.

In the Government Bill on the liberalisation of the provision of railway passenger transport (2008/09:176 p. 12) the Swedish government states that it desires a faster, more dynamic development and more efficient resource use. Furthermore that “increased competition will contribute to the development of a supply of railway services that will better suit the demands of passengers”. It is mainly the long distance (more than 100 kilometres) trips that are considered as attractive for market operators. Therefore this reform aims at opening the former market to entry from private enterprise. But later the shorter distance regional and local lines, which are heavily subsidized through a system of franchising, were also opened to competition (government bill 2009/10: 200). This is, however, less likely to yield any substantial entry. An assumption underlying this new regulation is that liberalising the entry of train operating companies and exposing the existing companies to competition will improve the economic welfare properties of the whole system.

Better adaption to the demands of passengers will require passengers to find information on timetables and interchange possibilities. Therefore the creation of coordinated information to passengers is considered fundamental, but it is also desirable for passengers to be able to book and buy tickets for trips involving more than one operator. For this purpose the new Swedish law (SFS 2009:694) requires operators to provide information on their supply of departures to a centralised information system. The need to help the customer is however not given a welfare economic justification, neither in the bill nor in the preceding commission document.

The obligations for public transport operators was somewhat further articulated in a later Government Bill (2009/10:200 p. 86) where it was stated that it primarily is the responsibility
of the operators to develop standards for common pay systems. The Swedish government, however, intends to follow this development to see if legislation will be necessary.

In the directives to the commission (SOU 2008:92 p. 322) preceding the government bill (2008/09:176) the government stated that a coordinated system for information on travel possibilities and booking was necessary to improve the competitiveness of railway services. It is therefore in consequence with the directives that the commissioner suggested such a system without looking closer at the justifications for it.

In a memorandum from the Swedish Public Transport Association (2010) it is stated that a common pay system should be the objective. The memorandum also states that, in the short term, small improvements in interoperability among the different public transport authorities' pay systems should be aimed for.

The commission (SOU 2008:92) also proposed that the government should initiate the formation of a new organisation for cooperation between railway passenger transport operators for the ownership of common information and booking systems. It was suggested that this organisation should be open for all new operators to enter. But at the same time, the commissioner, stated that participation in the organisation should be voluntary. The proposal also involved the new organisation taking over the ownership of the current system for bookings and settlements of payments to operators.

The voluntariness of participation in the new organisation opens for the logical possibility that no operator participates. The commissioner stated that it was justified to reduce the dominance of SJ AB (p. 190). He therefore suggested that it should be investigated if there is a need to mandate operators with dominating market positions to participate and contribute to common system. The commissioner however makes the assessment that the system will be attractive to most operators, and that they therefore will want to participate voluntarily (p 189). This may turn out to be hopeful only, if a significant number of operators prefer not to participate. So far most new operators participate in the existing booking system owned by the incumbent. If the initiation of a coordinated system is economically justified and many of the new operators choose not to participate, this raises the question if some obligation to participate may also be justified.

The idea of neutral system for information, booking and settlement is presented without analysis of the potential consequences in terms of ticket sales or transaction costs. A welfare economic justification could involve the argument that an obligation for all operators to be part of a common booking system would represent the optimal way to produce and present information on all travel possibilities in the railway system and that fragmentation of booking would lead to less travel possibilities being perceived and used by customers. On the other hand, the construction, management and development of a common system will inevitably involve costs that will have to be shared among the partners. Therefore it is not evident that the economies of such a system will imply a cost advantage to all individual operators. A condition for such a system to be of advantage is therefore that the further travel possibilities gained by customers will lead to more sales and that such an increase in sales will more than compensate for the costs. As it stands today the Swedish regulatory model for competition for passenger railway services lacks measures to regulate prices and revenue settlements to ensure a maximum of network benefits.
3.2 Great Britain

The British regulation was enacted with the Railway Act in 1993 and is classified as a case of the Swedish model (Nash 2008). This is because the regulator clearly separated infrastructure management from train operations.

The British government however went further, its central tool to improve efficiency and competitiveness being the system of rail franchising. This implies that the government tendered all long distance services, and consequently most such services are provided by franchised rail operators. Recently this system is eased up and the British system also considers occasional services within the franchised area.

From the start it was perceived as a cornerstone of the British policy that customers should be able to reap the full benefits of the system and consequently that through tickets should be conveniently provided. Therefore it was required of the operators by the regulator to offer combined tickets including the services from other operators if a passenger demanded a trip that extended beyond the limits of the franchise of the first operator. This regulatory requirement on operators to retail other operator’s tickets has made a centrally administrated train ticket retail service superfluous.

The present policy formulation in the form of the white paper CM 7176 - Delivering a sustainable railway (Department for Transport 2007) does not point out changes in the formal structure of the regulation of the access to infrastructure owned by the infrastructure or rolling stock companies. Neither does the policy point to new legislation concerning ticketing.

The policy does however point to some changes in the provision of tickets that are conceived to facilitate the purchase of tickets. For the fares the “system will be simplified, so passengers have greater confidence that they are being sold the right ticket for them. Smartcards will be able to be used in all major cities, and inter-city fares will be purchasable on mobile phones. This will cut queues at ticket offices and free staff to assist passengers and enhance their sense of security.” (Department for Transport 2007, p. 10)

In 2008 the Office of Rail Regulations ORR policy document “Promoting safety and value in Britain’s railways: our strategy for 2009-14” (2008) sets out the ORR’s interpretation of the objectives set out in British and European law. The objective relevant to ticketing is to promote continuous improvement in the value the railways offer to users and funders, including meeting the needs of passengers and of freight users, and the wider needs of society and the economy.

The main instrument for regulating supply, ticket prices and retailing are the franchising agreements. In earlier policies and analyses the ORR considered ticket retailing to be a critically important issue for the users of the railway industry (1995 p. 1). The regulator took as a point of departure that the network benefits from the railway services should be maintained. These network benefits were described as “interconnecting services” “using the services of more than one operator” and the possibility to do so “through the purchase of a “through ticket”’. The regulator claimed that a conservative estimate of through ticketing accounted for more than a quarter of total fare revenue (p 7). The regulator concluded that the ticketing requirements should assist in promoting the use of the network (p. 11).
The main requirements on ticketing and pricing that imposed on the train operating companies by the franchises are that train operators must offer and accept inter available and through tickets and that certain fare levels are regulated. Regulated fares are for example season tickets and standard singles and returns for shorter journeys and off peak saver fares for long.

In some cases regulated fares for through tickets are less costly than separate tickets but not in all cases. Wärnfeldt (2008a) reports that requirements imply information on at least one alternative for a through ticket, although in most cases this implies prices for each operator/segment. It is therefore not transparent how systematic considerations of network benefits by way of requirements for discounts for combined tickets and revenue settlement rules are built into the requirements.

In 2003 a consultation on fares policy was presented (Strategic Rail Authority 2003). The report concluded that the cap on regulated fares was to be changed by 1% less than the Retail Price Index (RPI-1%) each year. This was considered unsustainable by industry stakeholders. This was changed by a decision that the annual increase in regulated fares will be changed from RPI-1% to RPI+1% from January 2004 and three years on. From that point in time, all regulated fares were supposed to be regulated by means of fares baskets intended reduce the administrative burden on operators.

Concerning commuter fares the consultation document explained that fares regulation is only justified where it is necessary to prevent or correct ‘market failure’. This mainly applied to two situations in the rail industry:

• where operators possess market power;

• where there are significant external costs not fully reflected in the cost of production or the price, such as reductions in congestion, pollution, energy consumption or accidents, relative to other forms of transport.

For long-distance fares the need for fares regulation was not considered necessary as alternatives generally exist and are used in the form of travel by car, coach or air.

In 2009 a new web based ticketing system was introduced. This system appears to be common to all operators. On the web-site of the Association of Train Operating Companies (ATOC) the ticketing agreement is explained as follows: "Those selling rail tickets and rail products generally (e.g. like joint rail / event tickets) need the same information about price, availability, conditions and the like. The Rail Settlement Plan (“RSP”) team at ATOC manages all the above processes and thereby ensure that retailing by TOCs and others is effective and consistent, that the contract between the passenger and the carrier(s) is robust and that all the revenue generated ends up in the correct place. The systems underpinning RSP activities are exceptionally complex which is not surprising given the range of products on offer and the multitude of outlets and channels involved in selling those products. “Settlement” activities relate not only to the relationship between the TOCs themselves but also with third parties linked to the TOC businesses, such as Transport for London, Eurostar and travel agents (including web-based agents like the Trainline)."
This elaborate scheme for handling information and booking clearly indicates that British regulators did not trust market forces to provide such services in the absence of the mandatory system.

3.2 Germany

Following an early EU directive [dir. 91/440 EG] – an early predecessor to the first railway package – Germany adopted a new railway law in 1994. Among other initiatives this new law brought open access to the railway infrastructure (Nash 2008 p. 64), a partial separation of transport and infrastructure and the decentralisation of the responsibility to provide regional transport to the states (Bundesländer).

There are no official documents in Germany directly corresponding to the Swedish and British government bills and white papers. On the federal ministry’s home page the European transport policy is presented and the government states that the policy objective is that the passenger railway market should be completely opened to competition.

The German railway law (Allgemeine Eisenbahngesetz 1994) focuses on the access to the rail infrastructure and the allocation of time table slots. And although there have been disputes about the access to facilities such as cleaning and provision of information, and that the entrants have won these disputes, this has not encouraged further entry (Nash 2008 p 64).

The access to infrastructure is also main task of the German rail regulator (Bundesnetzagentur). The law also assigns role to the advisory commission on competition issues (Monopolkommission) to give observations on the development of competition and advice on policies to improve it. Our interpretation is that the German legislator’s objectives are expressed directly through the legislation itself. The Monopolkommission does not appear to perceive maintenance services as barrier to entry but points to that that the acquisition of rolling stock may be a barrier to entry (Monopolkommission 2009 p. 13).

In 2008 there was no neutral provision of through tickets and Deutsche Bahn (DB) was the de facto single seller of through tickets (Wärnfeldt 2008b). DB Passenger Transport has agreements with most other operators to sell their tickets and settle the payments. According to Bundesnetzagentur it is therefore possible to acquire through tickets where more than one operator is involved. Consequently there was no competitively neutral source for ticketing information.

The fact that both timetable information and a general booking service is provided by the largest operator DB, may suggest that the German regulation does not perceive a neutral provision of information and tickets as a central issue to regulatory policy. The Monopolkommission, however, argues that a fragmented retailing of tickets may be perceived as an obstacle by customers (Monopolkommission 2009, p. 49). This is also the

---

2 This section has benefited greatly from a parallel paper in this project Hylén (2011).

position of the German travellers’ organisation, which is of the opinion that the possibility to obtain information on combined trips and to book through tickets is essential to establish competition.

DB also decides the price of a through ticket and the share of the total price received by other operators. The revenue for such a ticket goes to DB who in turn settles the payments with other involved operators. According to the Swedish commission (SOU 2008:92); some of the rival operators to DB have complained that the settlements are done many months after the trip has taken place (p. 184). DB has a unique position and can set the price and conditions for this retailing. Wärnfeldt (2008b p. 6) also states that franchisees for regional transport are obliged to sell through tickets.

This assessment is confirmed by the Monopolkommission which argues that the dominant position of Deutsche Bahn allows it to limit the possibilities for its smaller competitors to formulate tariff and other sales conditions (p. 50). The commission therefore suggests that legislators should consider regulating the obligation to cooperate on through ticketing. What will come out of this is still unclear.

The dominant position of the Deutsche Bahn may, however, preserve network benefits as it may be in the interest of DB to continue to use or implement a pricing formula that captures those.

3.4 Comparison

Let us now compare the three countries with respect to the policies to encourage on the track competition and initiatives to further ticketing systems that are intended to capture network benefits.

In 2007 Great Britain, Germany and Sweden were ranked as having the three most liberalised rail legislations in EU (Kirchner 2007). Of the three following countries in the ranking: Netherlands, Austria and Denmark, Austria has opened for on the track competition, but the other two have not. Of these countries Sweden, Germany and Austria appear to be the only countries where legislators claim to want on track competition for long distance passenger railway services. Sweden also opens for on the track competition for regional services. The Swedish government also perceives ticketing to be an important factor to increase the efficiency of introducing of on track competition. In contrast Britain has moved more cautiously in the direction of on the track competition and is committed to franchising of both long and short distance train passenger trains. Britain’s system with rail franchises does not allow general open access, but now opens for limited on the track competition where this is judged to create further economic welfare compared to the supply provided by the franchisees.

In Great Britain access to the rail infrastructure is less of an issue as the franchises give access to the parts of the rail infrastructure system needed for the franchises. The access to the rail infrastructure provided by the infrastructure manager includes access to maintenance facilities.

In the Swedish legislative system (the preceding commission and the government bill) three further critical issues have been identified (Alexandersson et.al. 2011). These are the competiveness of the maintenance facilities market, the market for rolling stock and the
degree to which current ticketing systems may constitute a barrier to entry or an obstacle for the realisation of network benefits. In Sweden these issues have so far only been identified and not tackled by any new legislative measures.

The British legislation and regulation has handled most of these issues already at the conception of the regulatory reform. Rolling stock companies and maintenance workshops were separated from train operations and infrastructure. In a recent investigation the British Competition commission (2009) assessed the competition in the market for rolling stock leases not to be working fully but the market for maintenance services to be working (p. 12).

The German legislation and regulation following closely the demands raised by European legislation focused on the access to infrastructure. The Monopolkommission (2009) does not recognize maintenance facilities to be a barrier to entry but mentions that rolling stock may be one.

Concerning ticketing, only the British legislator and regulator appear to be broadly satisfied with its institutional and legislative arrangement for retailing, which was tackled early with an obligatory common system. The British regulation is the only one of these three countries to mandate symmetrical cooperation between all operators to retail tickets with the intention of facilitating customers' purchase of through tickets. The regulation of the franchises also involves regulatory constraints on the fares. Germany mandates cooperation for a common system which is provided and dominated by the incumbent operator. Sweden has a formally neutral system which is owned and organised primarily by the incumbent with voluntary association for entrants. In the latter countries, analysts commissioned by the government (the Monopolkommission and the railway legislation committee), point to potential deficiencies in their respective countries legislation. The German Monopolkommission clearly finds the current legislation inadequate to generate efficiency in the market for tickets, and the Swedish government bill argues that the government will follow the development closely and if necessary mandate a system for ticket booking.

Interestingly there is little empirical analysis illuminating the extent to which the order of magnitude for the network benefits may motivate a public intervention in the market. We have for example no data on the ratio of tickets sold via internet and through other retailing channels we have at present. Similarly we know little about the costs for entrants to sell tickets with modern web-based technology. Such technology may also reduce the costs for operators to cooperate for sales of through tickets. In the airline business web-based retailing has proved to be an important factor for both for the total sales of air travel and for the sales of tickets and combined tickets.

4. Summary and conclusions

The central conclusions from the theoretical part are the conjectures that an integrated firm in the railway sector is likely to charge lower prices for through tickets than separate sellers of trips, and that it is likely that the more frequent the number of combination trips are, the larger the integrated monopolists discount and hence the total welfare generated from railway travel will be.
The observations from the policy analysis of the three countries are first that the national regulatory models concerning ticketing are quite different. The British regulator early on decided that an obligation for train operating companies to cooperate in a common, competitively neutral, booking system. The German legislation also mentions obligations to give information on ticket prices, but an overarching ticketing and booking facility is provided by the incumbent operator only. In Sweden finally there is an obligation to provide timetable information and a formally neutral system, albeit owned by the incumbent, with the possibility for entrants to become participants.

In Great Britain the regulator has seen a need to improve the ticketing system and its fundamental justification to serve customers better than individual train operators would, is not questioned. In Germany the railway legislation does not open for the railway regulatory authority to do much about ticket prices. The railway law, however, does appoint the Monopolkommission to watch over competition. The commission acknowledges ticketing as an impediment to competition, as the conditions for through ticketing may be dictated by the incumbent. The paradox that proliferation of ticket sellers would risk the incentives to provide through tickets to an efficient degree is not emphasised here.

These observations point forward to upcoming regulatory needs for countries proceeding with the intention to establish on the track competition. It appears that both the European and the national legislation in Germany and Sweden may be insufficient to provide stable institutions for the efficient combination and pricing of tickets. The conjecture emerging in this paper is that individual competing operators or even bilateral cooperation will not price combined tickets efficiently. Therefore a system for voluntary combination of individually decided pricing decisions may not be sufficient to accomplish efficient pricing.

The need for coordinated action on pricing is ultimately also an empirical question. In order to assess the potential for through ticketing better data on prices and the relative frequency of through tickets demanded would be useful.

**Acknowledgements**

I have benefited from valuable suggestions from Chris Nash on the British regulation and from Bertil Hylén on the German regulation. Staffan Hultén and the participants in a workshop at VTI in the spring of 2011 also provided stimulating suggestions.
References


Commission White Paper, 1996, A strategy for revitalising the Community's railways, [COM (96) 421 final]

Competition commission, 2009, Rolling Stock Leasing market investigation.


Department for Transport, 2007, Delivering a sustainable railway, white paper CM 7176.


Hylén, B., 2011, Railway regulation in Germany, working paper, Swedish National Road and Transport Research Institute.


SOU 2008:92, Konkurrens på spåret (The official report series for the government commissions in Sweden)

Strategic Rail Authority, 2003, Fares Review Conclusions 2003 – Britain’s Railway, properly delivered.

Tomth, J.-E., 2011, personal communication with the former developer of the Swedish national travel survey.

