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How to liberalise rail passenger services? Lessons from European experience

Classification codes: D47; L92; R48

Abstract:

This paper studies the experience of Europe's three most liberalised railways - Sweden, Germany and Britain - in opening-up rail passenger services to competition by means of competitive tendering, and seeks to draw lessons for countries that are just starting the process, such as France. It also comments on experience of competition in the market in these and other countries (this form of competition has been taken furthest in other countries - notably Italy and the Czech Republic, as well as on a single route in Austria). The paper fills an important gap in the literature - that has so far focused on econometric modelling of the impact of rail reforms - by considering how competition can best be introduced in practice. This investigation is important and timely given the requirements of EU legislation (4th Railway Package) which will require competition to be introduced into passenger rail services (by 2020 for commercial services, and 2023 for public transport contracts) across the whole of the EU. It finds evidence that competitive tendering has helped increase demand for and reduce subsidies to the rail passenger sector, but that there are many decisions that have to be taken as to how it is to be implemented. Short gross cost contracts may work well for regional services where the tendering authority takes the lead in planning and marketing such services. If services where ticket revenue recovers a larger share of costs – "more commercial services" – are to be tendered, long net cost contracts may make more sense. An alternative is to leave them operated by the incumbent but with

open access for competitors to enter the market. Two particular issues face countries starting on the liberalisation process. Firstly, if existing rolling stock is owned by the incumbent rather than the franchising authority or an independent company; that remains a major barrier to entry. The second is the position of existing staff. If new operators are required to take them on at existing wages and conditions; that is a barrier to improved efficiency, but for new operators to recruit their own staff may also be problematic, particularly where the pace of change is fast.

1. Introduction

Since the 1990s successive EU legislation has sought to open rail markets to competition with the aim of improving service quality, reducing costs and in turn the need for government subsidy, and increasing rail mode share. Freight markets were opened up first, followed by international passenger services. The implementation of the 4th railway package will require domestic passenger markets to be opened up to competitive entry in all EU member states by 2020 (for commercial services) and 2023 (for public transport contracts), although in both cases provision is made for exceptions. Though a small number of countries have introduced significant competition in passenger rail already, most have not. This latest of the EU's legislative impulses therefore has the potential to radically transform the way in which EU passenger rail services are provided, their cost and quality and in turn usage.

Whilst there is an extensive econometric-based literature on the impact of rail reforms, including passenger competition on rail costs, and to a lesser extent, demand (for a review,

see Mizutani et. al., 2015, van de Velde et al, 2012) this evidence says little about precisely how to open up passenger competition for countries starting out on the reform process (to meet the requirements of the 4th Railway Package). Specifically, the econometric-based literature sheds light on the impact of reforms at a high level – that is, vertical separation, horizontal separation, and passenger and freight competition – on rail costs and demand. However, the limited number of cases where passenger competition has been introduced means that they can say nothing about how best to implement competition into the provision of rail passenger services.

There are broadly two ways in which entry into provision of rail passenger services may be permitted. The first is by means of competitive tendering for public service contracts. The second is by open access for the operation of commercial services. This paper starts by examining European experience to date, relying mainly on evidence from Britain, Sweden, Germany, the countries which have taken the liberalisation of rail passenger markets furthest (IBM, 2011). Most experience to date of competition in the rail passenger market from these countries is competition for the market rather than competition in the market. Britain, Sweden and Germany display a wide range of approaches to competitive tendering in terms of variables such as gross or net cost contracts, contract size and length, responsibility for setting fares and service levels and provision of assets such as rolling stock.

We also comment on experience of competition in the market, which has been taken further in other countries, notably Italy and the Czech Republic, as well as on a single route in Austria. From this evidence, the paper seeks to draw lessons for countries that are still at the beginning of the liberalisation process for passenger services (and will have to comply with

the 4th railway package in the coming years). We focus on one such country, France, one of the EU's most significant rail markets.

This paper thus fills an important gap in the literature by focusing on what can be learnt from past reforms on how best to introduce competition into passenger rail services, and how to apply these lessons to countries starting out on the reform process as now required by the 4th Railway Package. . The remainder of the paper is structured as follows. Section 2 briefly describes the background to European rail passenger liberalisation. The literature review and methodology is set out in Section 3. Section 4 presents evidence on the impact of rail liberalisation and lessons for countries starting on liberalisation are discussed in Section 5. Section 6 concludes.

2. Background

The history of European rail liberalisation is usually traced back to Directive 91/440, which first started the process of separating (at least in terms of finances) infrastructure from operations and opening access for new entrants. However, the early measures to open access only concerned freight. It was not until 2010 that a measure of market opening occurred for international passenger traffic. Only under the 4th railway package will the domestic market be opened, in 2020 in terms of open access for commercial services and in 2023 in terms of competitive tendering for public transport contracts. It will remain possible to restrict entry if it disturbs the financial equilibrium of public service contracts, and to continue the direct award of contracts if this can be justified to an appropriate authority (usually the regulator).

However, some countries opened markets to entry long before that. In Sweden, competitive tendering was introduced for subsidised services in 1990. In Britain, virtually all passenger services were subjected to competitive tendering over the period 1994-7. In Germany, states were given the power to competitively tender contracts for regional services from 1994, and there has been a trend towards competitive tendering in that country. For a full review of the experience of these countries see Nash et al (2016). Whilst there has been some competitive tendering of passenger services in other countries, including the Netherlands, Denmark and Portugal, in no other country has it taken place on a large scale. So it is primarily to these countries that the rest of Europe will look for lessons as they move to introduce competitive tendering.

All three countries have at least some commercial open access operation, but this is on a limited scale. The countries that have taken open access competition furthest are Italy, where an entrant provides frequent services in competition with the state-owned operator on the high-speed network, and the Czech Republic, where there are two entrants providing frequent open access competition on the busiest domestic routes as well as on international routes to neighbouring countries. Austria also has frequent open access competition on a single route.

Although under the new legislation (4th Railway Package) there is still the possibility of awarding direct contracts if this can be justified to an appropriate independent authority such as the rail regulator, pressure for reform in some countries means that the introduction of competitive tendering is likely in the near future. This is particularly true of one of the most important rail transport markets in Europe, that of France. Thus, France is taken as our example in considering the future expansion of rail liberalisation.

3. Literature Review and Methodology

There has been extensive econometric work on European rail reforms to identify the impacts on costs, and a more limited sample of such studies examining the impact on demand. Within this literature, the impact of vertical and horizontal separation has been extensively studied. In respect of the former there is mixed evidence with some studies finding that vertical separation increases costs, others showing reductions (see for example van de Velde et al (2012) and Mizutani et al (2015) for recent reviews). Mizutani and Uranishi (2013) and Mizutani et. al. (2015) emphasised the important role that might be played by traffic density in this debate. They find that vertical separation may increase costs for intensely used railways, whilst acting to reduce costs for less busy railways. The increased co-ordination challenges and transaction costs in a separated railway that is close to capacity are stated as the explanation for this finding.

, Most studies find that horizontal separation of freight and passenger operations has a strong cost-reducing effect. Evidence on the impact of competition is more mixed and has been hampered by lack of good data – in many cases the competition variables have been created as dummies based on whether competition is allowed (rather than actually exists). Even where the impact of actual competition has been modelled, this has tended to be implemented via simple dummy variables (competition exists or not).

Mizutani et. al. (2015) and Smith et. al. (2018) attempt to introduce measures that reflect the degree of entry. Even so, a combination of problems with characterising the degree of entry and obtaining good data, and perhaps because of the relatively small number of examples of market entry in passenger rail, the literature to date is rather inconclusive.

Mizutani et. al. (2015) did not find conclusive evidence of cost-reducing impacts of competition (passenger or freight). On the other hand, Smith et. al. (2018) found that passenger competition reduces costs – and more widely, that paper emphasises how strong regulation, combined with vertical separation, should be a powerful means of improving the efficiency of production in less densely trafficked European railways. In part this effect would be expected to come through the promotion of competition. Van de Velde et. al. (2012) also studied the impact of reforms on rail market share, but found no evidence of an impact.

While previous studies permit a conclusion on whether market opening has been successful in reducing costs and increasing traffic, they do not shed light on the question of how to open the passenger market. To the extent that there has been variation in the way competitive tendering has taken place within individual countries, either because different franchising authorities have taken different approaches or because policy has changed over time, it may be possible to do 'within country' econometric studies, and some such studies will be utilised in this paper.

However, data limitations make even such studies difficult. Only in Britain is each franchise established as a separate company with published accounts giving details of costs and revenues. In Germany and Sweden, the only data readily available is the level of franchise payments made to the operator and given that there is a mix of gross and net cost contracts even that is not comparable across all franchises. Moreover, franchises are let by regional authorities with responsibilities for both bus and rail transport. Since travel passes may be valid for both modes, the revenue of the rail operations is not easily measured.

Thus, the methodology of this paper is more qualitative than econometric. We examine the experience of the countries listed above and arguments as to what has worked well and what not, making use of what data we have been able to assemble on what has happened to costs and traffic. This is done bearing in mind the problem that, as with all studies of this nature, we have no reliable way of establishing the counterfactual.

Although there are many reviews of individual countries, this sort of comparison has not been attempted before, except for a previous paper by three of the current authors (Nash et al, 2013). This paper may be seen as an update and extension of this previous work, with more consideration being given to how to apply the lessons to newly liberalising countries such as France.

4. Impact of reforms

4.1 Growth of traffic

Table 1 shows that all four countries have had substantial growth in rail passenger traffic since 1995, but that the growth has been strongest and most continuous in the two countries with the largest level of new entry to the passenger market, Britain and Sweden. Of course there is no suggestion that the reforms were the sole or even most important determinant of this growth: growth of cities, suburbanisation and road congestion may be other major causes. In Britain, there is evidence that a substantial part of the major growth since liberalisation has been due to exogenous factors; whilst trends in service frequency

and fares have also been significant causes of growth these have to a considerable extent been directly prescribed by government, so it is unclear how far these should be attributed to the franchising process. (Wardman 2006; Preston and Robbins, 2013). In Sweden, Germany and more recently France, growth in the regional market has been stronger than at the national level, and this has been associated with the transfer of responsibility for franchising regional services to the region (although in France the regions, in charge of regional rail services since 2002, are currently still required to franchise services to the monopoly rail passenger operator SNCF; however a new law means that competition will be opened for regional services in the coming years). In earlier years, growth in passenger traffic in France was largely associated with development of high speed rail, but growth in this, and indeed in all sectors other than the Paris area, has largely ceased since 2008.

Table 1: Trends in total rail passenger traffic (in bill. Pass-km)

	Rail Passenger km 1995-2013				
	1995	2005	2013	2013/2005	2013/1995
France	55.1	77.5	90.1	1.16	1.63
- Long-distance	40.2	52.1	63.1	1,21	1,57
- Regional	14.9	25.4	27.0	1,06	1,81
Germany	71	76.8	89.6	1.16	1.25
- Long-distance	36.3	33.7	36.8	1.09	1.01
- Regional	34.7	43.1	52.8	1.22	1.52
Sweden	6.8	8.9	11.8	1.34	1.75
- Long-distance	4.6	5.2	6.1	1.17	1.33
- Regional	2.2	3.7	5.7	1.54	2.59
UK	30.3	44.6	62	1.39	2.05
- Long-distance	10.5	14.7	20.8	1.41	1.98
- Regional	19.8	29.9	41.2	1.38	2.08
Note: Northern Ireland railways remain government owned and vertically integrated. However, they are a very small part of the UK total rail operations.					

Source: EU Transport in Figures. 2015. Note that this quotes data for the whole of the UK, but Northern Ireland is such a small share of rail passenger traffic in the UK that these figures may be taken as representing what has happened in Great Britain.

Thus it may be concluded that competition, and in particular franchising, has played a role in driving growth in rail demand in Britain, Germany and Sweden, but that other factors are at play, given the growth of demand in France (no competition) and the importance of other factors in the other countries.

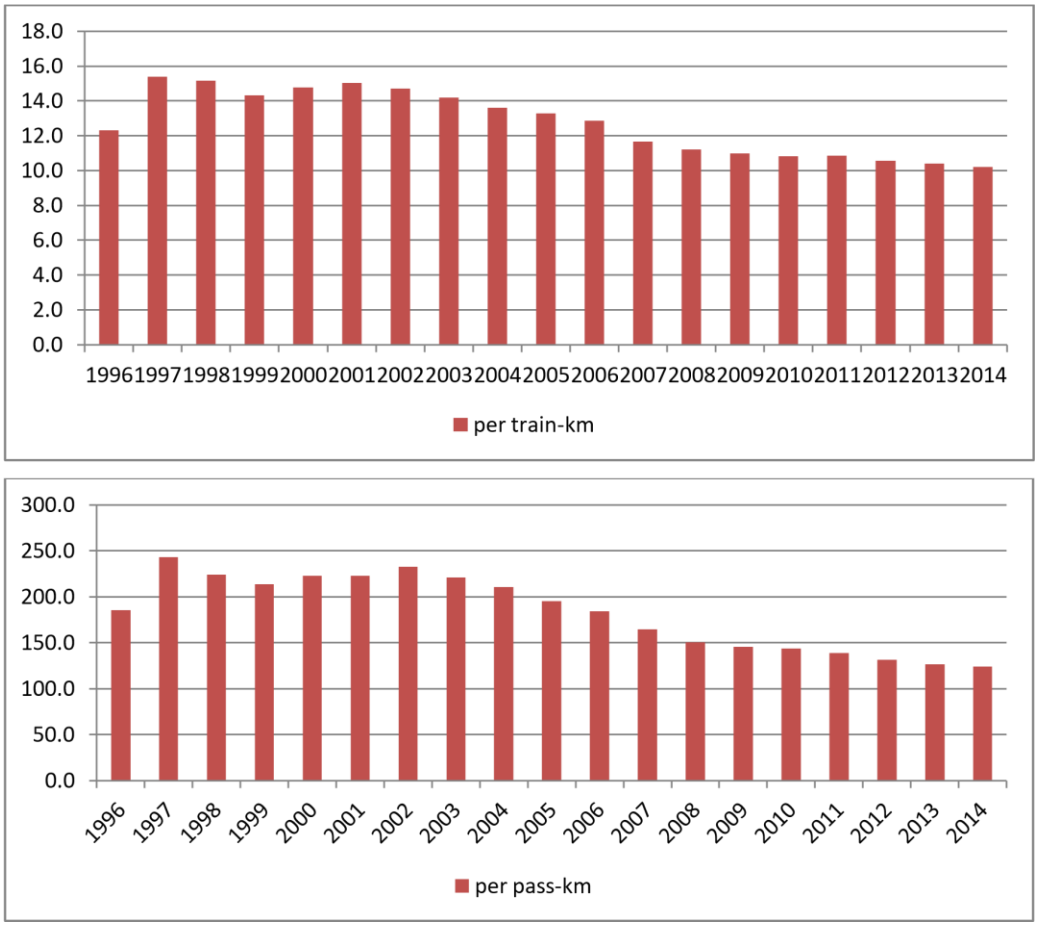
4.2 Subsidies

In Germany, only regional services are subsidised. There has been a reduction in subsidies per passenger train kilometre and more strongly per passenger kilometre since responsibility was allocated to the states, with the freedom to adopt competitive tendering, in 1996 (Fig 1). Infrastructure charges are designed to recover the total cost of the infrastructure, excluding renewals which are paid for by a separate government grant. The regional subsidies therefore in effect cover (at least part of) payments for the use of infrastructure.

There is no comparable data on subsidies for Sweden, but according to Nash, Nilsson and Link (2013) overall support per passenger km (including support to the infrastructure manager) remained roughly constant in Sweden over the period 1997-2007, whereas in Britain it rose substantially in this period. Earlier work on Sweden concluded that competition had reduced costs, more than offsetting the cost increase caused by vertical separation, although that work did not distinguish between the impact in the passenger and freight markets (Jensen and Stelling, 2007). There is also some evidence that the first two rounds of competitive tendering for regional services reduced subsidies, and the third round sustained that reduction (Alexandersson & Hulten, 2007).

In Britain, the rise in subsidies is mainly due to increased support to the infrastructure manager but more surprisingly given the introduction of comprehensive competitive tendering, there has been a 25% increase in cost per train km (Table 2). The increase in cost per vehicle kilometre is however somewhat lower, and the rapid growth in traffic means that cost per passenger kilometre has fallen substantially. Indeed, support per train kilometre in Britain in 2015 is lower than at the start of the franchising process (Table 3), though it rose substantially in the interim.

Fig 1: German subsidies for regional rail per transport unit (in Euro per train-km and Euro per thsd. pass-km) at 2010 prices



Source: Heike Link own database

Table 2: Train Operating Company Real Unit Cost Changes (1998-2015) in Britain

	Per train-km	Per vehicle-km*
Staff	+44%	+34%
Rolling stock lease payments	-20%	-26%
Other	+46%	+35%
Total	+25%	+16%
(excluding payments to Network Rail)		

Source for cost data: ATOC (2013) and ORR (2015)

Note: actual vehicle-km data were sourced from ORR and Network Rail for the years 1998 to 2010. From 2010 to 2015 vehicle-km are estimated on the assumption that average train length continues to increase at the same rate as over the 1998 to 2010 period.

In France, where there has been no competition, the growth of regional rail traffic from 2002 to 2017 is much lower (27% more train-km) than the large increase in public subsidies of around 70% (see Fig 3 below). These figures does not include the direct payment (almost 2 billion euros per year) of the state to the infrastructure manager for the special track access charges of regional trains.

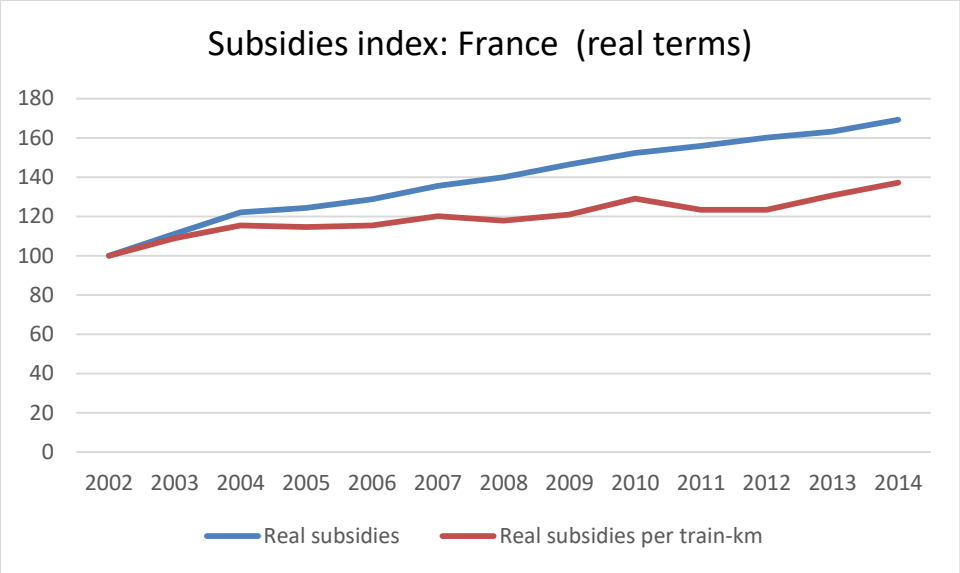
Table 3. Government support for rail passenger services in Britain (excluding investment in enhancements).

£m, 2015 prices	Net payments to / from train operating companies	Support to Network Rail for Operations, Maintenance and Renewal*	Total Government Support (excluding enhancements)	Total support per train-km (£)
1996/97	3,447	0	3,447	9.05
1997/98	2,863	0	2,863	7.27
1998/99	2,396	0	2,396	5.79
1999/00	2,039	0	2,039	4.78
2000/01	1,686	0	1,686	4.05
2001/02	1,521	3,631	5,152	12.06
2002/03	1,767	4,490	6,256	14.39
2003/04	2,455	5,431	7,885	17.70
2004/05	1,706	4,494	6,200	13.96
2005/06	1,580	4,044	5,624	12.37
2006/07	2,213	3,151	5,364	11.79
2007/08	1,725	2,953	4,678	10.21
2008/09	669	4,084	4,753	10.14
2009/10	873	3,136	4,009	8.23
2010/11	167	2,626	2,793	5.64
2011/12	88	2,621	2,710	5.36
2012/13	-265	2,743	2,479	4.90
2013/14	143	3,341	3,485	6.88
2014/15	-679	3,320	2,641	5.15

** This is Network Rail operations, maintenance and renewal costs less income from track access charges and property income. It is zero for the first few years as during this period the infrastructure was run by a private company, Railtrack*

Source: Government support to the rail industry - Table 1.6, ORR Portal

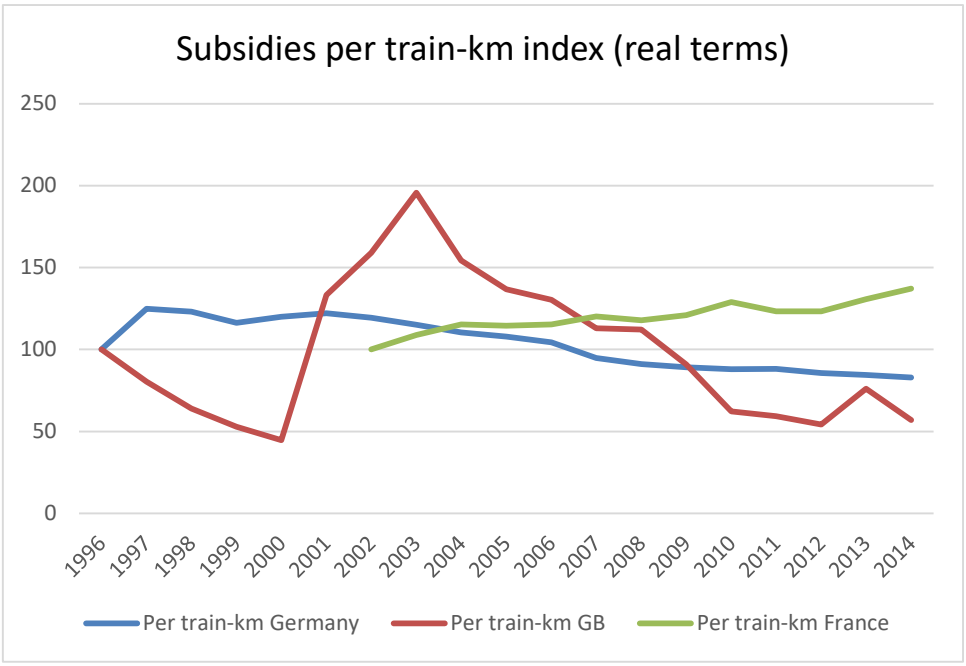
Fig 2: Public contribution to regional rail traffic in France

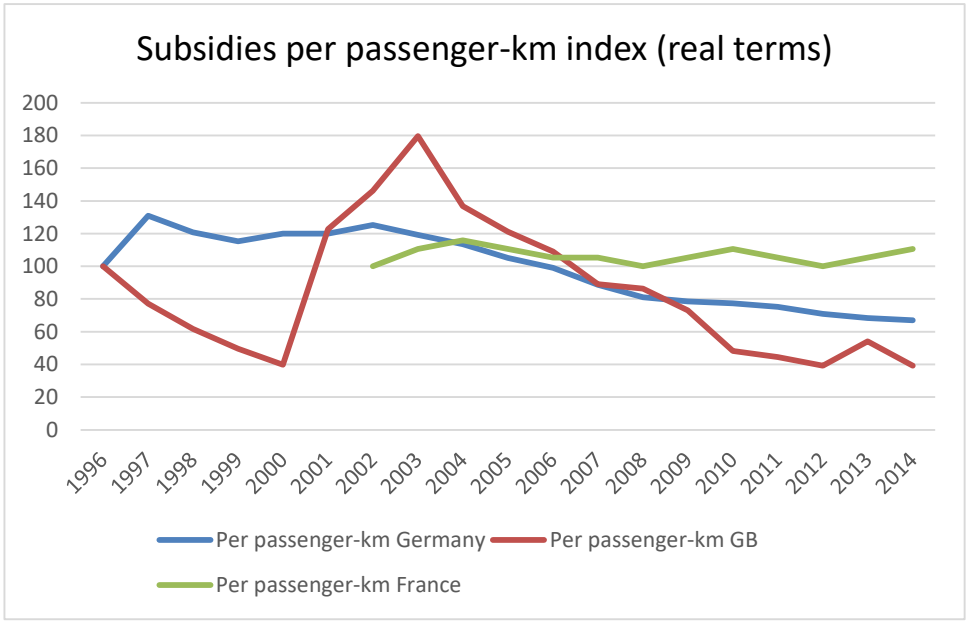


Source: Ministry of Transport (France)- Comptes transport de la nation

Fig 3 below summarises the above data on subsidies per passenger and train km for ease of comparison. It may be concluded that liberalisation of rail passenger services has been relatively successful in that it has been accompanied by growth in the rail passenger market and that two countries (Germany and Britain) have achieved this without requiring additional government subsidies; in Britain there was however a sharp rise in the interim, before subsidies started to fall back (see Fig 3). It should also be noted that in Britain unit costs of train operations has risen very substantially. The reduction of subsidies has only been achieved because of even sharper revenue growth. By contrast, the rail system in France has seen a strong growth in subsidies per train km in the regional market.

Fig 3: Comparison of subsidy trends by country





Notes: index =100 for Germany and Great Britain (GB) in 1996. For France the index starts at 100 in 2002.

Source: based on Figures 1 and 2 and Table 3

5. How best to franchise rail passenger services?

The experience of the three countries in which rail passenger franchising has gone furthest raises several issues which need to be considered by a country such as France which is still at the start of the liberalisation process. These issues will be considered in turn.

5.1 Franchising authority

In both Sweden and Germany, as well as in France, franchising of regional services is undertaken by regional authorities with responsibility for all modes of transport. In all three countries, regional services have seen considerable expansion under these arrangements. That is also true of Britain, where regional services have generally been franchised by central government. However, even in Britain there is a trend to devolution. Services in Scotland, Wales, London and on Merseyside are being devolved, whilst management of the Northern franchise is shared with Transport for the North, a body representing 29 local authorities in the area. Britain has no regional authorities as such, but the latter pattern is seen as a model for further devolution of responsibility for regional services.

One would expect regional government to be more aware of needs and better able to coordinate rail services with other modes of transport and land use, so it is expected that regional government will be better placed to fulfil the function of franchising of regional services than national. On the other hand, in all cases this process has been accompanied by budgetary transfers from national to regional governments to cover the costs. In addition, there may still be a need for a centralised centre of expertise and experience on franchising for franchising authorities to learn from experience. At the least, there should be a minimum

requirement to submit significant information about subsidy, patronage, supply and form of contract, so that all franchising authorities can learn from the experience of others.

5.2 Gross cost versus net cost contracts

With net cost contracts, the franchisee is incentivised to attract more revenue, and thus may be given some or all of the responsibility for planning and marketing services. If gross cost contracts are used, the responsibility for fares, service levels, quality of service and marketing lie with the franchising authority. In most cases, this is achieved by allocating responsibility for franchising to a body which itself undertakes these functions and has responsibility for other public transport and possibly for roads and land use planning as well.

The only clear econometric evidence on the choice between the two for rail services of which we are aware is in Link (2016), who finds evidence that in Germany, gross cost contracts are more successful in reducing subsidies than are net. It has also been argued in Britain that gross cost contracts would focus the attention of franchisees on the need to reduce costs.

One issue is whether there is an appropriate body to take on the planning and marketing role if it does not rest with the operator. In Sweden, Germany and indeed in much of Europe, there are regional authorities with responsibility for transport which can and do take this responsibility. This is also the case for London, in the form of Transport for London. But elsewhere in Britain it is necessary to create authorities specifically for this purpose, as is the case in Transport for the North.

The main case of a gross cost contract being used without there being such a body is the current Thameslink franchise in London. The reason for using a gross cost contact in this case was that the services were being severely disrupted by a major investment programme on the completion of which service patterns would be greatly changed. Although the outcome in terms of service quality in this case has been widely criticised (House of Commons, 2017), it is not obvious that the problems have been triggered by contract format.

It is doubtful whether gross cost contracts are appropriate for more commercial long distance services, where planning and marketing would need to be done by central government (or a specifically created agency) and where marketing includes detailed issues of on board services and yield management techniques which are likely to be better allocated to a commercial operator..

To the extent that the regional authorities in France can take on the marketing role, then they might be advised to use gross cost contracts. Net cost contracts may, however, be useful for subsidised long-distance services, which remain the responsibility of central government (see section 5.10).

5.3 Size of franchises

Whilst there is reason to expect that there are some economies of scale in franchises in terms of depots, staff and rolling stock fleets, there is econometric evidence that the largest franchises in both Britain (Wheat and Smith, 2015) and Germany (Link, 2016) are too large. Presumably the issue is one of management control, and it has been suggested that franchises that cover large geographical areas or diverse types of service are particularly problematic (House of Commons, 2017). On the other hand, franchisees can adopt a

decentralised management structure to ensure that all areas and service types get appropriate management attention (for instance in the case of Northern in Britain). But even so, to the extent that smaller franchises reduce barriers to entry and thus increase levels of competition, one would expect them to be advantageous.

There is also strong econometric evidence of economies of density. Splitting the services on a particular route between operators will therefore raise costs. This effect seems to be less strong when services are diverse and use different types of rolling stock (Wheat and Smith, 2015). It should be noted that the implications for franchise structure are complex because diseconomies of scale may imply more and smaller franchises. This would, on the other hand, almost certainly create more franchise overlaps and thus lead to cost rises potentially because of loss of economies of density.

But franchise size is not solely a question of costs. There are arguments that when all services in an area are operated by a single company, timetables and marketing can be better coordinated and use of rolling stock optimised. For instance, one of the arguments for creating a very large operator in Britain in the form of Great Western Railway was to be able to use main line stock to help deal with the commuter peak, both by reallocating rolling stock between services and by altering stopping patterns to make use of any spare capacity in main line services. Of course, these arguments are less important where the franchising authority has tight control of timetables, fares, marketing and rolling stock.

5.4 Length of franchises

All countries examined have a wide variety of franchise length, overall this ranges from 2 to 25 years. In Britain the variation comes about because of changes in policy by central government; in the other countries it is more a case of having a variety of franchising bodies facing varying circumstances.

Again, Link (2016) provides the only clear econometric evidence of the impact of franchise length on costs; finding longer contracts to be more cost effective, and concluding that this is because they are better aligned with the life of rolling stock. Of course this advantage would not be present if the franchising authority provided the rolling stock, as in Sweden.

There are arguments both ways on the impact of franchise length on costs and efficiency. On the one hand, short franchises reduce risk for the operator thus encouraging competitive bids. Frequent refranchising will also keep up the competitive pressure and avoid the need for complex arrangements to deal with changing services in response to changing conditions.

On the other hand, longer franchises save costs and disruption of frequent franchise competitions. In addition, they encourage a longer-term approach to the provision of services, not just in terms of investment in physical assets where that is the responsibility of train operating companies, but also in terms of planning, marketing and changes in working practices. The more these activities are the responsibility of franchising authorities rather than operators, the less the need for long franchises.

5.5 Ownership of rolling stock.

There are at least three possible approaches in terms of ownership of rolling stock. Firstly, rolling stock may be owned by the operators. Secondly it may be leased to the operator by a public-sector body. Thirdly it may be leased from a private leasing company or manufacturer.

Where rolling stock is owned by the operators, it clearly forms a barrier to entry, as existing rolling stock will all be controlled by the incumbent operator(s). As noted above, this is a particular problem with short franchises, where it will be risky for entrants to buy rolling stock themselves. This is the existing situation in France and for much of the rolling stock in Germany.

Where rolling stock is owned by the franchising authority, this barrier to entry is overcome and the authority is in a good position to take a long term view of requirements. This has been the case in Sweden since the start of franchising when the existing rolling stock was placed in the hands of a leasing company owned jointly by the franchising authorities, and is a growing trend in Germany.

Where rolling stock is in the hands of a private leasing company or of the manufacturer, then (as noted above) there may be a problem if contracts are short, as leasing companies are likely to add a heavy risk premium to leasing charges, particularly for specialised rolling stock. Also, it is likely to lead to a relatively short-term view of choice of rolling stock by the train operator, with an emphasis on fast entry into service and immediate reliability rather than life cycle costs, performance and innovation (Nash et al, 2014).In Britain, when franchising was introduced, rolling stock was placed in the hands of commercial rolling stock leasing companies (ROSCOs) from which winners of franchises could lease rolling stock. Of course,

they are not required to do so; they may purchase it themselves or lease it from the manufacturer as part of a package including responsibility for maintenance. This is a developing trend, under contracts whereby the owner of the rolling stock is paid based on availability rather than simply elapsed time.

In Britain, it is legally possible for the government to guarantee that the rolling stock will continue to be paid for by successive franchisees. The disadvantage of this practice is that it ties the hands of succeeding franchisees and weakens further the incentives on train operating companies and ROSCOs to achieve the best deal in terms of life cycle costs. This provision was much used during the large-scale replacements of the early 2000s but the government has generally avoided it since.

In some cases of major rolling stock procurement, such as the rolling stock for the Crossrail and Thameslink investments in London and for inter-city services, a public body has itself led the procurement. In the first two cases, that was almost inevitable, as the rolling stock had to be procured before the franchises had been awarded, but the third case has been more controversial. The argument behind the decision was that there would be economies in procuring a common fleet for all inter city services, and the fleet could be optimised in terms of life cycle costs. This has indeed been a guiding principle in all the publicly led procurements, alongside optimising system costs, allowing for impacts on infrastructure costs as opposed to the more short-term considerations of the train operating companies. But it has been argued that the train operators themselves could have secured more favourable deals with less innovation (NAO, 2014).

The latest development in Britain, following the Brown report on franchising (Brown, 2013) is the introduction of a specific weighting for quality in the bidding process. Much of the points allocated for quality is determined by rolling stock plans, and this has led recent franchise winners to propose major investment in new rolling stock. Indeed, in two large London suburban franchises, all rolling stock is to be replaced, including some that will still be almost new. Of course, new rolling stock may be attractive to users, but such large levels of rolling stock investment may lead to a surplus of rolling stock for the first time since franchising began, and a consequent rethink of the risk premia they charge in leases by the ROSCOs.

In short, we consider that for regional services there are big advantages in rolling stock being owned and leased by the franchising authority itself. In France, regional rolling stock has been largely financed by the regions and unless ownership of this rolling stock is transferred to them rather than remaining with SNCF this will pose a big barrier to the effective introduction of franchising.

5.6 Incentives for quality of service

Particularly with gross cost contracts, it is necessary to include in the franchise agreement incentives for quality of service, generally based on a set of key performance indicators. These may be linked directly to financial incentives, to procedures which may lead to premature termination of the contract if benchmark standards are not achieved, or both. In addition, gross cost contracts may offer the franchisee a small revenue share as an incentive for providing appropriate service quality.

There is little published material on performance incentives in Sweden. In Germany, most contracts include some types of incentive mechanisms, at least penalty schemes for services below agreed levels are common. Most PTAs have meanwhile established quality reporting schemes for contract monitoring. This information is, however, usually not publicly available at all or only as aggregate numbers. In Britain, there has been a general shift away from financial incentives, which were seen as requiring a lot of data and of limited effectiveness, to administrative procedures under which a failing franchisee has to provide a remedial plan, under threat that if the plan does not achieve the required improvement in performance, the contract will be terminated early. The Schedule 8 performance regime – under which Network Rail and operators compensate each other for the long-term revenue loss resulting from delays – remains in place, though is smaller in financial terms than in the early days of franchising, when it covered not just losses to the train operator but also social costs of poor performance. New means of compensating passengers for delays (making it easier to claim) are also being introduced.

As noted above, there is now an explicit weighting attached to quality in the award of franchises in Britain, but there are fears that it is currently leading to too much emphasis on rolling stock replacement.

5.7 Incentives for reduction in costs

It is generally assumed that franchising will give adequate incentives for cost reduction, particularly in the case of gross cost contracts, and that it is more in the area of quality of service that there are worries. However, it has been seen that in Britain, franchising has not

succeeded in reducing costs. A key reason for that may relate to the length of franchise and the treatment of staff at franchise renewal (see section 5.8).

To address the failure to reduce costs, the McNulty report (2011) suggested the incorporation of incentives to reduce costs directly into the franchise agreements, with targets set for reduction in cost per unit of output however defined. This has not to date been done in any of the case study countries. Recent British franchises have however included a requirement that on designated parts of the network, driver-only operation of trains should be facilitated by transferring control of the doors from the guard to the driver. This proviso for cost reduction has led to an ongoing labour dispute which is particularly difficult to resolve. Since the hands of the franchisees are tied by the franchise agreement, the dispute is really more with the government than with the train operating company, although it is the train operating company that has to try to resolve it.

5.8 Treatment of existing staff

When franchising began in Sweden and Germany, and if an entrant won a franchise, it was free to recruit its own staff at whatever wages and conditions it could achieve. Existing staff were generally free to remain with the incumbent who would redeploy them elsewhere on the system, although they might choose to transfer to the entrant. This approach was possible because new franchises were generally small, and because the process of franchising was a gradual one. Moreover, Transfer of Undertakings protection of employment legislation was deemed not to apply as what happened was a marginal reduction in the business of one company rather than its transfer.

At the restructuring of the state owned German company in 1994, the state had taken responsibility for paying for non-commercial terms and conditions applying to the existing staff because of many of them enjoying the privileges of civil servants, making it easier for the incumbent to compete. Furthermore, a recently adopted revision of the German Competition Law contains a set of rules that a new operator shall take over staff from the previous one and given the shortage in rail staff most operators have a strong interest in doing so.

In Britain, all services were franchised within the space of three years in the form of 25 large franchises, so it was clear that this approach would not work. Instead 25 free standing companies were set up and all train operating company staff placed in one of these. Whoever won the franchise took control of this company for the duration of the franchise. It consequently took over the staff, but Transfer of Undertakings Protection of Employment legislation required that it took the staff on at existing terms and conditions, although it could then try to negotiate changes. This is one reason why franchising may have been less effective at reducing costs in Britain than elsewhere, although it is difficult to see any choice if franchising was to be introduced on the scale and at the speed proposed. From a TOC management perspective, given relatively short franchises, the damaging revenue implications of prolonged industrial action resulting from exerting pressure on staff wages and practices may not be worthwhile, particularly given that any gains through a reduced cost structure become available to new bidders at re-franchising in any case.

Treatment of staff will clearly be a major issue in any new introduction of franchising, as in France. If it is aimed at a fast and widespread introduction, then the direct transfer of staff will be necessary. Some sort of arrangement could be introduced, such as that in Germany,

in which the state underwrites non-commercial terms and conditions for existing staff. New staff can be employed on commercial arrangements so that the costs declines as existing staff retire or leave. But undoubtedly negotiating such an arrangement will be difficult with attendant risk of industrial disputes.

5.9 Vertical integration

In Europe, there is a legal requirement for infrastructure and train operations to be separated at least in terms of management and finances. A holding company structure whereby both are subsidiaries of the same company is still permitted and remains the case in Germany and France. Vertical separation may in any case be desirable inasmuch as economies of scale may be greater in infrastructure than in train operating companies, and the need to take over infrastructure as well as operations may deter entry. Moreover, any sensible structure of franchises is likely to involve some degree of overlap of services, with different franchisees running over the same tracks.

On the other hand, there is evidence that vertical separation may increase costs. Van de Velde et al (2012) and Mizutani et al (2015) found this to be the case for denser networks, and McNulty (2011) considered the resulting misalignment of incentives from vertical separation to be a significant cause of cost increases in Britain.

One solution, particularly where franchises are relatively self-contained, would be to let vertically integrated franchises, whereby the franchisee becomes responsible for the infrastructure as well as the operations for the duration of the franchise. Such franchises have been used for passenger services in Australia (Stone, 2010) and for freight in South America (Thompson and Kohon, 2013), although in both cases issues arose concerning the

long-term state of the infrastructure. An alternative, now being tried in Britain, is alliances between the franchisee and the infrastructure company, which may go as far as merging staff and sharing changes in costs and revenues. However, strict regulatory oversight of arrangements for track access by freight and other passenger operators is obviously needed. Currently there is a lack of clear evidence as to whether alliances have worked, which invites further research.

6. How to introduce competition into commercial services

As noted above, for commercial services there are two alternative ways of introducing competition into the market for commercial services. The first is through franchising but the second is by open access for entrants to compete in the market.

In Sweden and Germany, commercial services are provided on the basis of competition in the market rather than for the market. Whilst most services are still provided by the incumbent, there is open access for entrants to provide whatever commercial services they wish. Competition in Sweden has now become intense on the most profitable route, between Stockholm and Gothenburg, with three operators involved, (Vigren 2017) shows that the incumbent's prices decreased by almost 13 percent and that the price level of the competitor is well below the average price that was offered in the pre-entry period. The reduced prices are a short-run equilibrium, or an ongoing process, implying that prices might adjust further in the long-run. Few other routes offer the same potential for profitable operation.

In Germany, competition is much more limited, perhaps because of the much higher track access charges prevailing in Germany than in Sweden. Furthermore, Germany has seen the abolition of some long distance commercial services from DB which have been replaced by regional subsidised services and generated higher revenues to DB.

Competition in the market is most extensive in Italy (Bergantino et al, 2015) and the Czech Republic (Tomes et al, 2016), where entrants provide frequent services over main long distance routes. In both cases, the result has been reductions in fares and improvements in service levels. Whilst initially entrants lost money, it now appears that in each country the main entrant is profitable. What is not known is the impact on the finances of the incumbent and how this is paid for.

In Britain, to date, commercial services have generally been franchised alongside subsidised services, and open access entry limited to services deemed 'not primarily abstractive' from commercial services. Net cost contracts have been used. If a franchising approach is adopted for commercial services, this makes more sense than a gross-cost contract approach. Mechanisms to avoid overly optimistic bidding may however be required and finding an approach that works well has proved elusive in Britain.

Initially, all British franchises were subsidised although there may have been commercial services within them. Increasingly, however, franchises are now becoming profitable, and indeed the surpluses from profitable franchises more than pay for the subsidies on non-commercial ones at existing levels of track access charges. In practice, entry has been limited to services linking smaller cities to London, where there is no regular through service as part of any franchise. Even these services may compete with franchised services between some

towns and London. The Competition and Markets Authority (2016) has however recommended an extension of open access rights, which might ultimately result in commercial services being provided entirely by competition in the market and their removal from franchising as in the rest of Europe.

In favour of the franchising approach is the fact that it permits services to be planned on an integrated basis, to optimise timetables and capacity utilisation whilst fully exploiting economies of scale and density. However, on track competition has led to lower fares and improved services, and in some cases these have continued for a number of years. It may also be that open access competition overcomes some of the tendency for 'short termism' on behalf of franchisees on matters such as revising working practices to reduce costs and procurement of new rolling stock referred to above.

In every case except Britain, entrants are competing with existing public sector monopolies. In Britain entrants are competing with private operators who have already won a franchising competition. Yet there is some evidence that even in Britain, entrants have lower costs because of lower wages and more flexible working arrangements (Rasmussen et. al., 2015). It is not clear however whether this could survive a major growth in open access competitors. Would entrants be able to attract the staff they need and would they legally be obliged to honour existing wages and conditions if they were taking over services directly from franchises?

A particular problem with competition in the market is the question of what to do about track access charges. If the government is willing to pay the fixed costs of the infrastructure so that track access charges may be based on marginal cost – which is the situation in

Sweden – then competition may be possible. But if it wishes operators to make a substantial contribution to the fixed costs of the system then franchising has a big attraction. Under this strategy, bidders may bid in terms of the premium they are willing to pay and contribute to the fixed costs in that way, whilst being charged only marginal costs for the services they run. In effect this is the approach in Britain, as the fixed charges toward track access costs that franchisees pay simply serves as a diversion of part of the premium they would otherwise be willing to pay. With on-track competition, it is necessary to recoup these fixed costs by a mark-up on track access charges. If the aim is to recover all the costs in the form of charges, as is broadly the case in Germany and France, this may lead to very high mark ups, which discourage the provision of frequent services and make new entry difficult, in turn limiting the scope of on track competition as a way of forcing efficiency on the incumbent. Charges may need to be highly differentiated by traffic segment in order to avoid deterring expansion of services and new entry.

In France, competition in the market for long distance rail services could come about in two ways. The first is direct entry into services on high speed lines as in Italy. However, there is a shortage of capacity on the most profitable high speed lines (especially Paris-Lyons) and track access charges on high speed lines are high. The second is by operating slower low cost services on conventional main lines with much lower track access charges. However, the incumbent is already seeking to forestall such entry by operating low cost high density services without refreshment facilities on the high speed lines. Thus we consider the scope for competition in the market in France to be very limited.

7 Conclusions

This paper studies the experience of Europe's three most liberalised railways - Sweden, Germany and Britain - in opening-up rail passenger services to competition by competitive tendering, and also considers the wider experience in terms of competition in the market for commercial services. It seeks to draw lessons for countries that are just starting the process, such as France. The paper supplements the econometric literature that has studied the high level impact of competition on rail costs and to a limited extent demand, by considering how competition can best be introduced in practice. This is based on experience to date and its potential application to countries whose markets are currently closed to new entrants. The econometric method does not readily permit analysis of precisely how best to implement reforms at the detailed level. The paper is timely given the requirements of EU legislation (4th Railway Package) which will require competition to be introduced into passenger rail services (by 2020 for commercial services, and 2023 for public transport contracts).

In all three liberalised countries there has been rapid growth in demand for regional services. In Germany both costs and subsidy per train km has fallen while there is no recent evidence on these counts for Sweden, although earlier evidence suggests that costs and subsidies fell. In France, with no competition, subsidies have risen substantially (e.g. Alexandersson & Hulten, 2007). In Britain train operating unit costs have actually risen, although this has been more than offset by increased revenue. This suggests that a policy of franchising regional services in France (and more widely other EU states) by means of competitive tendering may improve on current performance. Where regional authorities are able to take charge of

marketing and service development there is evidence that gross cost contracts may be appropriate and if these authorities also procure rolling stock these may be relatively short. Where the train operator is in charge of marketing, development and procurement of rolling stock, longer franchises are required.

In the same way as many other inquiries into the consequences of competitive procurement and comparisons of different ways to implement this practice, this paper suffers from absent, incomplete and inconsistent data. Compared to its peers, the British centralised model for introducing competition has resulted in a reasonably comprehensive – while not exhaustive – set of data that has facilitated analyses that have not been feasible elsewhere. The decentralisation of responsibilities for procurement of commercially unviable railway services has much to commend it, in that it places the responsibility closer to those that benefit from and pay for the services. The delegation of authority does however not eliminate the need for experts or indeed for the general public to understand the consequences of the practices used by different regions. Moreover, each PTA is typically responsible to the elected representatives in the different regions, and typically have poor incentives to collect and indeed to publish data about the activities that may be embarrassing.

This observation makes it necessary for legislators and indeed for the European Union to mandate the delivery of a well-specified set of data to some central body for compilation and public availability. This would remove a veil of uncertainty about the costs and revenues of non-commercial public transport and add to the understanding and benchmarking of practices. This is so since all relevant information is or can readily be made to be part of the contracting process between the PTA and the franchisee.

Given that France has already transferred responsibility for rail passenger franchising to the regions, it would make sense for them to play a major role in planning and marketing these services alongside bus services. In these circumstances, relatively short, gross cost contracts may be a sensible approach. Short franchises have an advantage particularly at the start of the process in that if they do not work well there is an early opportunity to change approach. However, crucial to the success of this policy will be the transfer of the relevant rolling stock to the ownership of the regions as opposed to SNCF.

Liberalisation of long distance services is more complex. Although the evidence to date is that this may reduce fares and improve services compared with a state owned monopoly, it is not clear who bears the costs in terms of any reduction in profitability of the state owned operator, or that the results are optimal in terms of integrated timetables and use of scarce capacity. In France, open access on a commercial basis may be introduced, but given the shortage of capacity on the most profitable route (Paris-Lyon), the high level of track access charges, and the fact that the incumbent has already introduced low cost services on the high speed network, it is not clear that much competition would take place. Entry may be encouraged by auctioning scarce slots in the way suggested by Nilsson (2002).

The alternative way of introducing competition for such services is to franchise them. If such services were to be franchised, it may be that long net cost contracts would be the most appropriate approach. Careful thought would then need to be given to how the franchises would be structured in terms of size and geographical coverage. This would also relate to regional services and to providing appropriate incentives in the relationship with the infrastructure manager given that any existing benefits of co-ordination within the holding company model may be lost.

For a country such as France first introducing competition in the rail passenger market on a large scale, the issues of how to handle rolling stock and existing staff are the biggest barriers. Currently SNCF owns all rolling stock, even that paid for by the regions. This would need to be transferred to the regions if this barrier to entry is to be eliminated. In the case of staff, if they do not transfer to the new operator it may have difficulties recruiting staff, and the incumbent will find it difficult to manage the resulting staff surplus. But if they do transfer, should it be on the existing uncompetitive wages and conditions (see Crozet, 2016), and if not, who should pay any required compensation? Of the countries that have already introduced franchising, only Britain has required a direct transfer of staff. It may be that an arrangement such as that introduced at the time of the restructuring of the rail sector in Germany, whereby the state takes on responsibility for the non-competitive terms and conditions of existing staff, whilst new staff are hired on market conditions, would be the best way forward. But this is a highly controversial area, and major industrial disputes seem difficult to avoid.

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References

Alexandersson, G and Hulten, S (2007) Competitive Tendering of Regional and Interregional Rail Services in Sweden in Competitive Tendering of Rail Services, CEMT/ECMT, OECD, 2007

ARAFER, Le marché français du transport de voyageurs, 2017, p. 65; http://www.arafer.fr/le-ferroviaire/les-indicateurs-du-transport-ferroviaire/indicateurs-du-transport-de-voyageurs/

ATOC (2013) Growth and prosperity How franchising helped transform the railway into a British success story. London: ATOC.

BERGANTINO, A. S., CAPOZZA, C., & CAPURSO, M. (2015). The impact of open access on intra-and inter-modal rail competition. A national level analysis in Italy. *Transport Policy*, *39*, 77-86.

Brown, R (2013) The Brown Review of the Rail Franchising Programme. London: Department for Transport.

Competition and Markets Authority (2016) Competition in rail passenger services in Great Britain. London: Competition and Markets Authority.

Crozet, Y. (2016), Introducing competition in the European rail sector - Insights for a holistic regulatory assessment, International Transport Forum Discussion Paper, prepared for Prepared for the Roundtable on Assessing the impacts of regulatory changes in the transport sector, 6-7 October 2016, Stockholm

House of Commons Transport Committee (2017) Rail franchising. Ninth Report of Session 2016–17. London.

IBM (2011). Rail Liberalisation Index. http://www.assorail.fr/wp-content/uploads/2015/08/Rail_Liberalisation_Index_2011.pdf

Link, H. (2016): A Two-stage Efficiency Analysis of Rail Passenger Franchising in Germany. *Journal of Transport Economics and Policy*, 50, 1, 76-92.

McNulty, Sir R. (2011), 'Realising the Potential of GB Rail: Final Independent Report of the Rail Value for Money Study', London: Department for Transport and Office of Rail Regulation.

Nash, C A, Nilsson JE and Link H (2013) Comparing Three Models for Introduction of Competition into Railways. *Journal of Transport Economics and Policy*, Volume 47, Part 2, May 2013, pp. 191–06.

National Audit Office (NAO) (2014) Procuring New Trains. London: National Audit Office.

Mizutani, F., and S. Uranishi (2013): 'Does Vertical Separation Reduce Cost? An Empirical Analysis of the Rail Industry in European and East Asian OECD Countries', Journal of Regulatory Economics, 43, 31-59.

Mizutani, F, Smith, A.S.J., Nash, C.A. and Uranishi, S (2015), Comparing the Costs of Vertical Separation, Integration, and Intermediate Organisational Structures in European and East Asian Railways *Journal of Transport Economics*

and Policy, Volume 49, Number 3, July 2015, pp. 496-515.

Nash, C.A., Smith, A., Goodall, R., Kudla, N. and Merkert, R. (2014) Economic Incentives for Innovation: A comparative study of the Rail and Aviation Industries. Institute for Transport Studies, University of Leeds.

Nash C.A., Crozet, Y, Link, H, Nilsson, J.E. and Smith A.S.J. (2016) Liberalisation of rail passenger services. Brussels: CERRE.

Nilsson, J-E. (2002). Towards a welfare enhancing process to manage railway infrastructure access. Transportation Research Part A: Policy and Practice 36 (5), 419-436

ORR (2015) Great Britain Rail Industry Financial

Information 2011-12 to 2014/15, London: Office of Rail and Road

Preston, J .M and Robbins, D (2013) Evaluating the long term impacts of transport policy: The case of passenger rail privatisation. *Research in Transportation Economics,* 39(1), March 2013, Pages 14–20.

Rasmussen, T., Wheat, P.E. and Smith, A.S.J. (2015), 'Do open access train operators exhibit inherent cost benefits compared to their franchised counterparts?, *ITEA Annual Conference.*

Smith, A.S.J., Benedetto, V. and Nash C.A. (2018), The Impact of Economic

Regulation on the Efficiency of European Railway Systems, Journal of Transport Economics and Policy, 52, pp.113-136.

Stone, J. (2010). Turning over a new franchise: assessing the current health of public transport management in Melbourne. Paper delivered at the 33rd Australasian Transport Research Forum Conference held in Canberra, on 29 September - 1 October, 2010.

https://www.researchgate.net/publication/254609651_Turning_over_a_new_franchise_Assessing_the_current_health_of_public_transport_management_in_Melbourne [accessed Dec 28 2018].

Thompson, L S and Kohon, J C (2013) Developments in rail organization in the Americas, 1990 to present and future directions. Journal of Rail Transport Planning and Management, Volume 2, Issue 3 Pages 51–62

TOMEŠ, Z., KVIZDA, M., JANDOVÁ, M., & REDERER, V. (2016). Open access passenger rail competition in the Czech Republic. *Transport Policy*, 47, 203-211

van de Velde, D., M. Lijesen, F. Mizutani, C. Nash, A. Smith, S. Uranishi, F. Zschoche (2012) EVES-rail. 'Economic effects of vertical separation in the railway sector', Brussels: Community of European Railways.

Vigren, A. (2017). Competition in Swedish passenger railway: Entry in an open access market and its effect on prices. Economics of Transportation, Volumes 11–12, September–December 2017, Pages 49-59

Wardman, M. (2006), 'Demand for rail travel and the effects of external factors', *Transportation Research E*, **42** (3), 129-1.

Wheat PE; Smith ASJ (2015) Do the usual results of railway returns to scale and density hold in the case of heterogeneity in outputs: A hedonic cost function approach, Journal of Transport Economics and Policy, 49, pp.35-47.