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WORKING PAPER

**Progressive tendering of regional railway
services**

Juan Montero, Matthias Finger, Teodora Serafimova

European University Institute
Robert Schuman Centre for Advanced Studies
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Abstract

The European Union's Fourth Railway Package dating from 2016, introduces a number of substantive reforms with a view to revitalize the rail sector and boost its competitiveness vis-à-vis other modes of transport by completing the process of gradual market opening. Its so-called 'market pillar' establishes the general right for railway undertakings established in one Member State to operate all types of passenger services everywhere else in the EU, lays down rules aimed at improving impartiality in the governance of railway infrastructure and preventing discrimination, and introduces the principle of mandatory tendering for public service contracts in rail. These reforms are grounded in the premise that competition in rail passenger service markets would induce railway operators to become more responsive to customer needs, improve the quality of their services and their cost-effectiveness. Not least, competitive tendering of public service contracts would enable cost savings.

The introduction of these reforms and general principles, however, takes place against the backdrop of Member States and regions retaining a certain degree of discretion in shaping public service contracts. In other words, both have the basic right to decide which type of services is to be provided under public service obligations, whether such services are to be tendered out under a single contract or divided into several contracts, and whether these contracts should be tendered simultaneously or progressively over time, for instance.

In this report, we set out to identify the optimal solution(s) for tendering rail public service contracts, both in terms of contract volume and scheduling of the tenders, while suggesting possible accompanying measures to ensure an optimum outcome.

Keywords

Railways, Public Service Contracts, Progressive Tendering, Fourth Railway Package, Regulation

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List of acronyms

CMA	Competition and Markets Authority
EU	European Union
EUR	Euro
GBP	British pound sterling
IRG-Rail-	Independent Regulators' Group - Rail
KM	Kilometer
ORR	Office of Rail and Road
PRIME	Platform of Rail Infrastructure Managers in Europe
PSO	Public Service Obligation
ROSCO	Rolling Stock Operating Company
TRKM	Train-kilometer
UIC	International Union of Railways

1. Executive Summary

The European Union's Fourth Railway Package dating from 2016, introduces a number of substantive reforms with a view to revitalize the rail sector and boost its competitiveness vis-à-vis other modes of transport by completing the process of gradual market opening. Its so-called 'market pillar' establishes the general right for railway undertakings established in one Member State to operate all types of passenger services everywhere else in the EU, lays down rules aimed at improving impartiality in the governance of railway infrastructure and preventing discrimination, and introduces the principle of mandatory tendering for public service contracts in rail. These reforms are grounded in the premise that competition in rail passenger service markets would induce railway operators to become more responsive to customer needs, improve the quality of their services and their cost-effectiveness. Not least, competitive tendering of public service contracts would enable cost savings.

The introduction of these reforms and general principles, however, takes place against the backdrop of Member States and regions retaining a certain degree of discretion in shaping public service contracts. In other words, both have the basic right to decide which type of services is to be provided under public service obligations, whether such services are to be tendered out under a single contract or divided into several contracts, and whether these contracts should be tendered simultaneously or progressively over time, for instance.

In this report, we set out to identify the optimal solution(s) for tendering rail public service contracts, both in terms of contract volume and scheduling of the tenders, while suggesting possible accompanying measures to ensure an optimum outcome.

Clear consensus has emerged in economic literature that public transport authorities should divide services into a number of different contracts, as opposed to merging these into a single public service contract for their entire territory. When it comes to the recommended size of the contracts, we find that the optimum volume will lie somewhere in between a maximum volume in terms of train-km so as to reduce barriers to entry and foster competition on the one hand, and a minimum volume so as to ensure efficiency in terms of transaction costs and economies of scale, on the other hand. In other words, whereas larger contracts with higher requirements in terms of rolling stock and staff should be avoided as they risk diminishing competition and precluding newcomers from entering the market, caution should be exercised in reducing the size of public service contracts beyond a certain minimum threshold given the substantial transaction and administrative costs linked to individual tenders.

In a second part, our document explores the optimum timing for public service contracts. Here we support the recommendation made in the literature to space the allotted public service contracts progressively over time. In this way, a higher number of bidders can be attracted, including smaller companies, which might not be in the position to participate in many tenders at the same time due to their limited human resources and expertise. High participation in tendering is a key pre-condition to safeguarding effective competition and successful contractual outcomes.

A staggered approach also stands to benefit public authorities, which can devote more resources to each tender if it does not coincide in time with other tenders. This is particularly relevant for the public administrations in smaller regions, where human resources may be limited or in regions with no or little experience in market opening, where new skills need to be acquired. Furthermore, both public authorities and railway undertakings, be these newcomers or incumbents, can benefit from a learning curve to avoid repeating mistakes and reinforce best practices. In recognition of these benefits associated with a progressive tendering approach, Regulation 1370/2007 foresees the possibility of delaying tenders up to 5 years once the first tenders are launched.

Finally, yet importantly, the design and implementation of public service contracts needs to be guided by a systemic approach. Railways present economies of scale, scope and density, as well as network effects, which can be reduced by means of small size contracts. Guaranteeing a

minimum volume of contracts can allow for economies of scale to be exploited while simultaneously reinforcing competition in tendering and supporting a positive learning curve. The mere imposition of a theoretically optimal contract size, however, is not advisable, as the combination of services within a package needs to consider the underlying geographical specificities of the region so as to optimize economies of density. Even if contracts ensure economies of density by aggregating services in a specific area, discontinuity is unavoidable. In networked systems such as transportation, which have been fragmented into different sub-systems (tender lots), it is common to impose regulatory obligations on railway undertakings to cooperate in line with a set of rules so as to create and safeguard network effects.

2. Tendering of Rail Public Service Contracts

2.1. The Fourth Railway Package

The Fourth Railway Package, adopted by the European Union in 2016, imposed upon Member States the introduction of competition in the provision of domestic railway passenger services. Previous packages had decided the liberalization of freight services and international passenger services. The process would be completed with the reform of domestic passenger services, which would take different forms and even timelines based on whether passenger services are commercial services or services under Public Service Obligations (PSO).

For commercial services, mostly long-distance services including high-speed services, the option was to open the market to newcomers to compete face-to-face with incumbents. Newcomers would be allowed access to the rail infrastructure, and they would be in the position provide the same services previously monopolized by incumbents in each Member State. This so-called “open access competition” (or competition in the market) was scheduled for December 2019. Competition in the market is today a reality in countries such as Italy, Austria, Sweden, Czechia, and is emerging in some routes in Germany, France, Poland, and Spain.

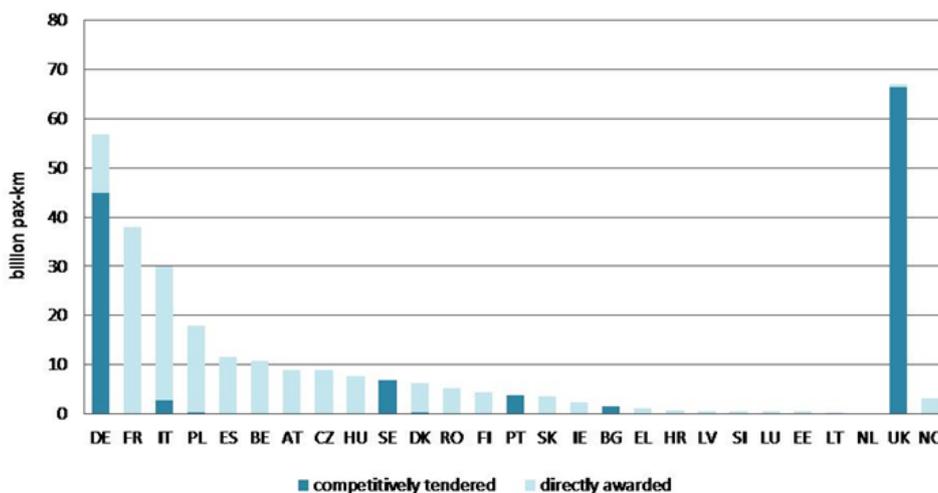
For services under Public Service Obligations, mostly suburban and regional services, the option was to introduce competition for the market in the form of tenders for the assignment of public service contracts. Competition takes place during the tender, not during the provision of the service, which is provided under exclusive rights by a single railway undertaking, i.e., the one that has won the tender. In the academic literature, the terms “franchising” and “competition for the tracks” are also popular expressions for this model, which was originally conceived in the United Kingdom in the early 1990s and is well established in countries such as Germany and Sweden. Extension to the entire EU is scheduled for 2023, even if transitory regimes and derogations remain possible.

Public service contracts were already a reality in the EU before the adoption of the Fourth Package. They are the instrument used by public transport authorities to impose requirements in order to ensure public passenger transport services in the general interest that an operator, if it were considering its own commercial interests, would not assume or would not assume to the same extent or under the same conditions without compensation. Public service contracts also establish the principle of calculating the financial compensation for the provision of the services that fall under public service obligations.

However, in the past and in most Member States, public service contracts were directly awarded by the public transport authorities to the historic railway undertaking. No tenders were organized. Newcomers had no chance to enter the market and to have public service contracts awarded.

The main exceptions were the UK, Germany (MONTADA 1999) and Sweden (ALEXANDERSSON & HULTEN 2007). More limited experiences can be identified in Portugal, Italy, Bulgaria, Poland, Denmark, and Czechia.

Figure 1. Number of PSO Contracts Competitively Tendered and Directly Awarded by Country (Billion pax-km, 2018)¹



The main novelty in the Fourth Railway Package is the principle that public service contracts should be awarded based on a competitive tendering procedure. Article 5 of Regulation 1370/2007 states that the procedure adopted for competitive tendering shall be open to all operators, shall be fair and shall observe the principles of transparency and non-discrimination.

Member States, including regions, when competent, have the freedom to shape public service contracts. They have the basic power to decide which services should be provided under public service obligations. Furthermore, they can decide whether such services should be tendered under a single public service contract for the entire territory of the region or be divided into several contracts; they can also decide on the basis of which principles the services should be divided into different contracts. Finally, they can decide the schedule for the tendering of the contracts and determine whether all the contracts should be tendered at the same time or progressively along a schedule.

The scope of this report is to identify, according to economic literature, the optimal solution(s) for tendering the rail public service contracts, both in terms of contract volume and scheduling of the tenders (progressive tendering), while identifying possible parallel measures in order to ensure optimum results. The analysis of the experiences in the United Kingdom, Germany and Sweden are of particular interest.

2.2 Tendering Railway Services in the United Kingdom

The most mature experience in terms of tendering of rail contracts can be identified in the United Kingdom. The process of the railway sector reform was initiated in 1993 with the adoption of the Railways Act. The Department for Transport (DfT) originally designed 25 non-homogeneous bundles of long distance, regional and commuter services (later down to 17). The bundles, under the name of “franchises”, included all existing passenger services on the land. The bundles included cost-covering and non-cost-covering services. Such bundles were put up for tender for the first time between 1995 and 1997.

Winning bidders were decided purely on a cost basis: those who offered to receive the lowest subsidy, or pay the highest premium, would be awarded the service. The leading objective of this liberalization strategy was to reduce costs and the need for public subsidies. The system allows the winner of a tender to extract monopoly rents on the most profitable routes, and to cross-subsidize

¹ Regulation (EC) No 1370/2007 of the European Parliament and of the Council of 23 October 2007 on public passenger transport services by rail and by road and repealing Council Regulations (EEC) Nos 1191/69 and 1107/70, as amended by Regulation (EU) 2016/2338 of the European Parliament and of the Council of 14 December 2016.

with these rents non-cost covering services included in the bundle. It is complex to determine whether ticket fares have increased or decreased since the reform of the sector in 1993. On the one hand, around one third of the passenger revenue is under “price cap” regulation (CMA 2016, p. 49). This is mostly the case for commuting journeys. Prices can only be modified a percentage above or below the Retail Price Index, as determined in the contract between the DfT and the franchisee. These fares have remained mostly stable, evolving in parallel to inflation. On the other hand, around two thirds of the revenue is unregulated. Franchisees have substantially increased fares at peak time on high volume routes (even tripling fares over 20 years), but they have aggressively reduced fares in off-peak times, tickets bought in advance, etc. Overall, fares were increased in the first decade after liberalization, until 2010 (MCNULTY 2011, p. 19), while over the last years fares present a tendency to be reduced. The average fare per passenger journey decreased by 5% between 2010 and 2014.

Certainly, the model was successful when it comes to the objective of reducing public contributions to the provision of rail services, as the burden is passed on to passengers. Public subsidies came to nil before COVID-19 (not taking into account subsidies for the infrastructure manager), as profitable long-distance services cross-subsidized non-profitable services. But there are signs the model was not very successful in curbing costs; some of the reasons are said to be the large size of the franchises (MCNULTY 2011) and the wrong incentives. Indeed, cost reductions cannot be exploited by the franchisee during the short duration of the contract, so they are merely passed on to the next franchisee.

The model is under review at the moment. The experience shows that tenders are complex to organize, and serious pitfalls have been identified over the years, such as franchises abandoning the service before the term expiration. Transaction costs have skyrocketed as fees charged by consultants have reached very high levels. But the ultimate reason for abandoning the model has been the limitations of passing operating risks to franchisees. The new model under consideration will rather be based on franchisees operating services on behalf of public transport authorities, under a cost-plus model. Thus, the transport authority will determine the services and will take the operating risks (WILLIAMS-SHAPPS 2021).

2.3 Tendering Railway Services in Germany and Sweden

Other European countries have experimented with tenders in railways limited to Public Service Contracts, as foreseen in the Fourth Package. The more interesting experiences have been the German and the Swedish ones, as a result of which, we seek to extract some relevant lessons from these countries.

Sweden has a long history of tendering public service contracts in railways, starting in 1988. Tenders are organized by the 22 regional transport authorities, as well as by the national authority for national services. In Germany, the Länder assumed the power to manage PSO services in 1996, and tenders became the most common form of assigning public service contracts. A large number of contracts has been put for tender over the years in both countries, providing a valuable experience about the challenges posed by railway tenders, the results that can be expected, and particularly, how tenders have evolved over the years, as contracts are put for tender again in new rounds when the first contracts expire.

Firstly, it has been identified that, as tenders were introduced, the duration of public service contracts was extended. If directly awarded contracts had an average duration of 8 years, contracts awarded through a tender have an average duration of 10 years, both in Germany and Sweden. It has been identified that the longer the contracts, the more competitors the tender attracts (HUNOLD & WOLF 2009).

Secondly, in the German case, an evolution in terms of risk sharing has been identified. At the initial stage of tendering, net contracts were preferred by public transport authorities: railway undertakings

would be taking the ridership risk, that is, the risk of passenger volumes going up or down. However, over time, public transport authorities started to assume such risk (gross contracting). The reasons seem to be that railway undertakings have limited tools to manage ridership in PSO services, as they have little room to modify prices (usually under the control of the public transport authorities). The same evolution is happening in the UK, where a majority of rail services were under no price regulation, so railway undertakings could fully exploit pricing strategies to increase ridership and optimize revenue, but this approach is under reconsideration. Furthermore, it has been identified that gross-contracting allows railway undertakings to compete more vigorously, as uncertainty is reduced (LINK & MERKERT 2011).

Thirdly, tenders resulted in a significant reduction in prices for the provision of PSO services when compared with previously directly awarded contracts. In Germany, the reduction in the first round of tenders was calculated to be of 26% (MOFAIR 2009). It is important to note divergences based on the type of service: From 15% for Regional Bahn services to 47% for Regional Express services. However, cost reductions diminished in the second round of tenders, as railway undertakings grew more experienced (LINK & MERKERT 2011). Similar results have been described for Sweden, where unrealistic bids were identified in the first round of bids (NILSON J.-E. 2016).

Fourthly, both in Sweden and Germany, as costs were reduced, regional transport authorities increased services in terms of train-km, which resulted in an increase in ridership.

These are all valuable lessons for Member States implementing the Fourth Railway Package.

3. The Optimum Volume for Public Service Contracts

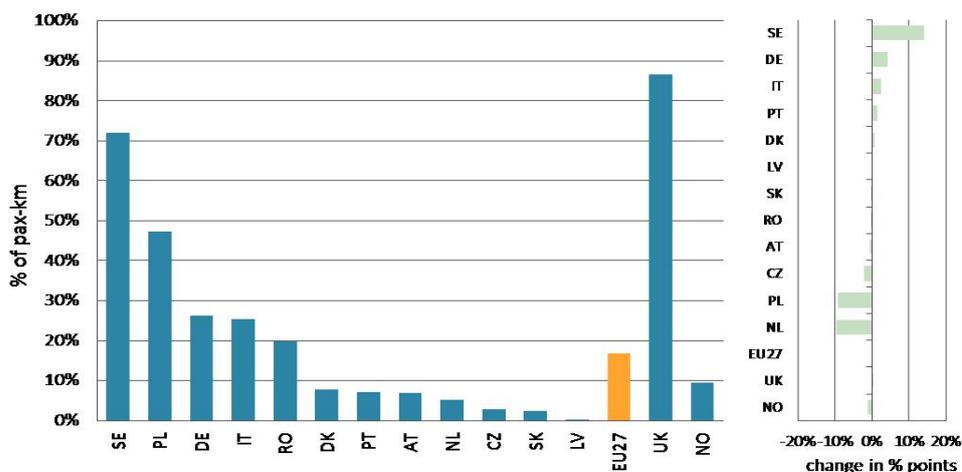
In this section, we will analyze how economic literature recommends designing public service contracts in terms of contract volume. The optimum will lie somewhere in between a maximum volume in terms of train-km so as to reduce barriers to entry and foster competition, on the one hand, and a minimum volume so as to ensure efficiency in terms of transaction costs and economies of scale, on the other hand.

3.1 Public Service Contracts Should be Allotted

Academic literature had identified early on that market contestability diminishes as the size of public service contracts increases. In other words, the larger the contract, the more relevant the barriers to entry. More resources such as rolling stock and staff are needed, which in turn, entails higher risks. In other words, the size of the public service contracts affects the possibilities of newcomers to win the tenders.

For example, the analysis of 77 tenders for public service contracts in Germany showed that the larger the network size (measured in kilometres) the more likely the incumbent DB Regio is to win. While the average length of networks won by DB Regio was 171 KM, for the other undertakings it was 124 KM (LALIVE & SCHMUTZIER 2008). Even if a large segment of the PSO is open for tender in Germany, the newcomers' market share is below 25% (MONOPOLKOMMISSION 2009), as shown in Figure 2

Figure 2. Competitors' market share in the PSO passenger market per country (% of pax-km in 2018)²



This has led to a consensus in economic literature that public transport authorities should not aim at one single public service contract in their territory, but should rather divide the services into a number of different contracts. It is a widely shared position that “il est quasi certain que l’optimum collectif consiste dans un premier temps à allotir des marchés régionaux” (LEVEQUE 2007, p. 154). Such a principle has even been imposed by a Court in Germany (Judgment by the Court of tenders in Madgeburg in 2022, in BRENCK & PETER 2007, p. 145).

3.2 But Efficiency Requires a Minimum Size for Contracts

There are limits to the allotment of public service contracts. The higher the number of tenders and contracts, the higher the transactions costs. Furthermore, there are operative constraints in the size of operation to make them efficient.

On the one hand, transaction costs are generated not only by each tender, but by the management of each contract during its duration, both to the public authorities organizing them and to the companies submitting the offers. Such transaction costs can be substantial.

Tenders generate transaction costs, particularly the first round of tenders when both public transport authorities and railway undertakings have limited experience. These transaction costs can reach substantial levels. For example, in the UK, it was estimated that each bidder spent an average of GBP 10 million per tender (NASH ET AL. 2016).³ While costs in continental Europe can be expected to be lower, the higher the number of contracts put up for tender, the higher the transaction costs in the system.

Transactions costs are also generated along the duration of the contract. Public transport authorities have to design control instruments (IT tools, statistics, etc.) to ensure conditions imposed upon railway undertakings are respected, and to devote resources to implement such controls, impose penalties when necessary, commit resources to secure proper interfaces to sustain regular communications with the undertakings, respond to unexpected circumstances, etc. The higher the number of public service contracts to be managed, the higher the transactions costs.

On the other hand, efficiency considerations recommend not to reduce the size of the public

2 Figure 2 shows that the most interesting experiences are in the United Kingdom. Germany and Sweden. The reference to Poland is misleading, as rather than competition for the market, they have different subsidiaries of the incumbent providing services. Though Italy had an interesting initial experience with PSO tendering it was suspended early on after a small number of regions ran a tender.
 3 Such a high cost should not be expected in other European countries. It is a UK specificity, and it is mainly driven by the high prices of consultants in charge of evaluating risk, the key point in this kind of tenders.

service contracts beyond a certain minimum threshold. Railways present economies of scale, scope and density, as well as network effects, which could be reduced by small size contracts.

Railways, as most network industries, present economies of scale. Efficiency requires to distribute common costs (management, planning, ticketing, etc.) across a volume of services in order for these not to increase too much. The larger the volume of an operation, the lower the impact of such common costs on the cost per train-km. For this reason, there are objective limitations to the allotment of public service contracts. The exploitation of economies of scale requires a minimum volume to be ensured for each contract.

However, economic literature leads us to conclude that economies of scale are not as relevant as traditionally considered, while economies of density tend to receive more attention. Traditionally, it was considered that railway undertakings required a very large size in their operations to be efficient. But the role of economies of scale has been questioned in studies in the United States (CAVES et al. 1985 and IVALDI & McCULLOUGH 2001) as well as in the United Kingdom (SMITH & WHEAT 2012 and RASMUSSEN et al. 2015). On the contrary, these studies identified that, after a minimum scale, economies of density are more relevant. Efficiency is derived from concentrating activity in a given geographic area rather than by growing large operations across multiple areas.

Both for the relevance of transaction costs and for the relevance of economies of scale and density, when newcomers are consulted about the optimum size of railway public service contracts, they systematically alert that a minimum size is required to ensure efficiency.

For example, when the tendering of a second license for the operation of high-speed services in Spain was considered, back in 2013, newcomers opposed the allotment of the contract and the segment of licenses for individual corridors (Madrid-Valencia was the corridor to be tendered). They claimed that the volume of train-km would be too small to sustain a viable operation. A larger operation would be necessary for viable competitors to enter the market (MONTERO et al. 2016).

In France, when potential newcomers were consulted about the size of public service contracts, they insisted a minimum volume should be ensured (Régions de France 2017, p. 8).

As a consequence, even if economic literature recommends allotting public service contracts, it also alerts about the risk of dividing existing services across an excessive number of contracts, which would diminish the efficiency of the system. The optimum in terms of contract volume and number of contracts has to be identified.

3.3 The Optimum

The challenge is to optimize the size of public service contracts put up for tender. The contracts should be large enough so as to ensure efficiencies (in particular economies of scale and density) and keep transaction costs under control by limiting the number of contracts, but keeping the contracts of a limited volume not to erect barriers to entry and diminish competition.

As a reference, it is of interest to identify the size of the public service contracts in the EU pioneer countries in 2017. The average contract size in terms of train-km in Germany was 3.5M and in Sweden 5.8M (PERENNES 2020). In both countries, tenders were organized by regional public transport authorities. On the contrary, in the UK, where tenders were organized at a national level, yet covering all rail services, thus including also very profitable long-distance services, the average contract size was 28M. However, this important size has also been identified as one of the potential reasons for inefficiencies in the system, particularly a difficulty to curb costs (MACNULTY 2011).

Another interesting reference can be identified in the EU legislation itself. When the Commission proposed to amend Regulation (EC) 1370/2007 for the Fourth Package,⁴ it included a provision

⁴ European Commission, proposal for a Regulation of the European Parliament and of the Council amending Regulation (EC) No 1370/2007 concerning the opening of the market for domestic passenger transport services by rail, COM(2013) 28 final.

limiting the size of public service contracts. Public service contracts could not include more than one third of the total national passenger volume under public contract, or 10 million train-km (whatever the largest).⁵

The rationale for this limitation was that “[a] maximum annual volume of a public service contract for passenger transport by rail needs to be set to facilitate competition for such contracts while allowing competent authorities some flexibility to optimize the volume according to economic and operational considerations” (recital 7). This provision was, however, not included in the final text of Regulation (EU) 2016/2338 amending Regulation (EC) No 1370/2007.

At the same time, Regulation (EC) No 1370/2007 defines a minimum floor, under which tendering is not required, which is set at 500,000 KM (600,000 KM for small or medium-size enterprises). Below this minimum, tendering is considered not to be efficient in terms of transaction costs.

Art. 5(4): “Unless prohibited by national law, the competent authority may decide to award public service contracts directly: [...] (b) where they concern the annual provision of [...] less than 500 000 kilometres.

In the case of a public service contract directly awarded to a small or medium-sized enterprise operating not more than 23 road vehicles, those thresholds may be increased to either an average annual value estimated at less than EUR 2 000 000 or to an annual provision of less than 600 000 kilometres of public passenger transport services.”

There are numerous studies which have tried to identify, specifically for France, the optimum volume of public service contracts in terms train-km. As a reference, an average volume between 1M and 3M train-km is recommended in different reports (LEVEQUE 2008 and ABRAHAM 2011). In terms of number of contracts per region, it has been stated that “il semble cohérent de proposer aux régions d’allotir leur réseau en 3 ou 10 sous-réseaux, en fonction de leur taille” (LEVEQUE 2007, p. 156). In an institutional survey among potential newcomers, an absolute minimum of 1.5M train-km has been identified, with the optimum being set between 3M and 5M train-km (Régions de France 2017, p. 8).

We share the conclusion in PERENNES 2020, recommending starting with a volume between 1.5M and 3M train-km per contract during the first period of liberalization, and eventually increasing to larger contract sizes between 3M and 5M train-km as the market matures. Such an evolution is coherent with our conclusion to space the tenders along time, that is, not to tender all contracts at the same time.

4. The Optimum Timing for Public Service Contracts

In this section, we will discuss the recommendation made in the literature to space the allotted public service contracts progressively over time. In this way, more bidders will be attracted, as railway undertakings (both newcomers and the incumbent) might not be in the position to participate in many tenders at the same time. Similarly, public authorities can devote more resources to each tender if it does not coincide in time with other tenders. Furthermore, both public authorities and companies alike can benefit from a learning curve to avoid repeating mistakes.

If a public authority decides to divide rail services into different contracts, it is widely advised to put them for tender gradually and progressively over time. In the previous section, it has been recommended to divide services under PSO into optimally sized contracts, with each contract requiring a specific tender procedure. Public authorities have the prerogative to define the schedule for the tenders. While it is legally possible to organize all the tenders at the same time, the widely shared agreement is that the best option is to separate the tenders in time and define a progressive schedule for the tenders.

⁵ Art. 2a(6)(b): “the maximum annual volume of a public service contract in terms of train-km shall be the higher volume of either 10 million train-km or one third of the total national public rail passenger transport volume under public service contracts”.

4.1 Right Distribution of Resources

Tenders require substantial resources both from public transport authorities and from bidders. It is widely understood that the progressive tendering of the allotted contracts along time allows all players to better use their resources.

Public authorities benefit from progressive tendering, as they can focus their resources on a single tender procedure. Rail tenders indeed demand substantial resources from the public authorities. Authorities have to define the minimum requirements in terms of services, quality of service, incentives, penalties, guarantees, etc. with a high degree of precision. The human resources in public administrations that can be devoted to such tenders, particularly in smaller regions, are always limited. The staggered organization of the tenders in a region facilitates the successive use of the available human resources, both in house and external consultants.

Railway undertakings, both newcomers and incumbents, also benefit from progressively tendering. Newcomers have a limited bandwidth in terms of resources to work in parallel on a high number of tenders. As such, tenders are complex and require sophisticated technical, economic and legal expertise. While some of the expertise (economic, legal) might be more widely available, sector-specific knowledge is limited and tends to be concentrated in the incumbent. Just in terms of manpower, newcomers might not have a sufficient number of employees to work on a high number of tenders at the same time. Even when relying on consultants (which are also scarce), the cost might be substantial, as already demonstrated in the example of the UK.

Even the incumbent might face difficulties if different regions launch tenders at the same time. This is particularly the case as public transport authorities require detailed data from the incumbent in order to make it available to all bidders and thereby safeguard a level playing field. The incumbent does not have specific teams to be devoted to the generation of the data in the format required by each transport authority. For good quality data to be generated on time for each tender, the necessary time has to be made available. Concentrating tenders in time is an obstacle to sharing data for a level playing field in tenders.

For these reasons, staggered tendering increases participation in tender procedures, and stimulates competition. It is well-known that for tenders to be successful, a minimum number of bidders are being required, so as to have effective competition. The higher the number of bidders, the more competition, the better the contractual outcomes. Designing a staggered schedule for the tender procedures in a given region, and even coordinating the schedules across regions in order to avoid duplications in tendering dates, will increase participation and competition, and therefore result in better contractual outcomes.

4.2 Benefiting from a Learning Curve

Progressive tendering has another beneficial effect, as it allows all players to benefit from a learning curve, limiting damages in case of mistakes and increasing the quality of tenders, contracts and overall results.

Tendering public service contracts is a complex exercise. Service concession contracts and tenders are among the most complex activities in public administrations (DE LA ROSA 2020). A successful contract requires to ascertain the risk involved in the provision of the service while designing the right incentives so as to guarantee the quality of service. When experience in the tendering of a service is limited or non-existent, the complexity increases. When the service is sophisticated and requires the coordination of a multifaceted system, as it is the case of railways, complexity is at a maximum.

Experience shows that tendering rail services is challenging, and serious mistakes have been made in various jurisdictions. The UK provides some striking, even embarrassing examples of failures in tendering processes. In the early 2000's, authorities had to repeatedly renegotiate the financial

conditions and increase subsidies in order to avoid contractors walking away from the contracts (NASH ET AL. 2006). But this did not always prevent defaults: Sea Containers defaulted in 2006 and National Express in 2009 (BROWN 2013). When, in 2012, risk distribution and guarantees were modified in order to avoid walk-aways, one of the main tender procedures had to be cancelled before assignment because the Department for Transport made mistakes when calculating the guarantees. As a result, the ability of such a reputable authority was called into question (LAIDLAW 2012).

Also in Sweden, despite years of experience, recent failures have led to the early termination of a contract: an 8+2 year-long PSO contract was terminated in 2022 just after 16 months of operations because the maintenance costs of the rolling stock owned by the Public Transport Authority were much higher than originally anticipated by the contractor, SJ (Öresundståg service).

From a dynamic perspective, both public authorities and railway undertakings can benefit from staggered tendering in order to exploit the learning curve. If contracts are progressively tendered, public authorities can learn from the experience in the first tenders and improve the tendering conditions in successive tenders: previous mistakes can be avoided and best practices can be reinforced.

Bidders can also benefit from a learning curve. It is by now well-known that during the first round of tenders (for instance in the UK between 1995 and 1997), bidders have a tendency to over-bid, as they tend to be overly optimistic when it comes to the evolution of passenger volumes and therefore to their revenue. The more optimistic the bidder is, the better its offer in terms of compensation (subsidy reduction) and, as a consequence, the higher the chances to win the tender. However, over-optimism often turns into the “winner’s curse”. In the UK, as the economic situation worsened after 2001, and the fare box was lower than expected, some franchisees found themselves in financial difficulties and some of them simply abandoned the franchises (FINGER & MONTERO 2017). As tenders are staggered, all players, but in particular winners, can early on identify if they over-bided, and rectify in subsequent tenders. Damage is limited to the smaller, first contracts.

4.3 A Stable Dynamic Market for Future Rounds

Besides the first round of tenders, it is important to take into consideration how tenders will be organized in future rounds. It seems preferable to have tenders at regular intervals, keeping the market open at all times, rather than having few windows of opportunity for market entry, when all contracts are tendered at the same time, and having the market closed for the rest of the time.

Rail contracts tend to be long in duration (on average around 8 years). If all contracts are tendered together, or fall within a very short period of time, no further entry will be possible for a long period of time. The market will be frozen. Undertakings kept out of the market in a specific round of tenders will not be able to retain their management teams on place with no business prospect for 8 years. In other words, each round becomes an existential threat for them.

On the contrary, if contracts are staggered along time, there are continuous windows of opportunity for newcomers to enter the market. Stable teams can be maintained for working on tenders on an almost continuous basis. The market is more stable. For instance, in a region with 4 contracts each with an 8-year duration, one tender could be organized every 2 years, so that there are regular tenders in the market.

4.4 Progressive Tenders

For these reasons, 80% of the respondents in the European Commission consultation for the adoption of the Fourth Railways package supported “[...] transitional periods for gradually putting all public service contracts out to tender”.

As a matter of fact, Regulation EC 1370/2007 provides an exception to the obligation to tender

contracts before 2023. Public Transport Authorities are allowed to directly award contracts for up to 5 years when a number of competitive tendering procedures are already being run, thus positively affecting the number and quality of bids:

“3a. Unless prohibited by national law, as regards public service contracts for public passenger transport services by rail awarded on the basis of a competitive tendering procedure, the competent authority may decide to temporarily award new contracts directly where the competent authority considers that the direct award is justified by exceptional circumstances. Such exceptional circumstances shall include situations where:

— there are a number of competitive tendering procedures that are already being run by the competent authority or other competent authorities which could affect the number and quality of bids likely to be received if the contract is the subject of a competitive tendering procedure” (Article 5).

It is precisely for this reason that Regulation 1370/2007 defines specific obligations in case of direct awards, namely a maximum duration of 5 years, the impossibility to renew such contracts without tendering after this period, as well as the need for the competent authority to justify its decision to the European Commission:

“The competent authority shall issue a substantiated decision and shall inform the Commission thereof without undue delay.

The duration of contracts awarded pursuant to this paragraph shall be proportionate to the exceptional circumstance concerned and in any case shall not exceed 5 years. [...]

The subsequent contract that concerns the same public service obligations shall not be awarded on the basis of this provision.” (Article 5).

In conclusion, considering that it is widely accepted that progressive tendering benefits both Public Transport Authorities and railway undertakings (both newcomers and incumbents), Regulation 1370/2007 allows to delay tenders for up to 5 years once the first tenders are initiated. Tenders can be gradually paced over such a period. This is particularly relevant in the first round of tenders, as all the parties can benefit from a learning curve and mistakes in the first tender can be avoided in successive tenders. Furthermore, this approach creates a more balanced market, where new opportunities to enter the market are periodically offered, and not only during short windows of opportunity every 8 or 10 years.

5. The Relevance of the Systemic View

In this section, we will analyze how fragmenting tendering into different public service contracts can have an impact on efficiency, and how specific regulatory measures which combine the benefits of competition for more than one contract per region can aid the full exploitation of economies of scale and network effects.

We have analyzed so far the advantages of limiting the volume of the rail contracts, of tendering several contracts within a region and of tendering such contracts gradually over time. As long as minimum volumes are guaranteed, economies of scale can be exhausted, while simultaneously benefiting competition in tendering as well as fostering a positive learning curve.

However, specific measures are necessary in order to ensure that other efficiencies are not negatively affected by the allotment of the contracts. Beyond economies of scale, railways present economies of density, economies of scope, as well as network effects. In order to fully exploit all these efficiencies, the allotment of the contracts must take into consideration certain elements and must be complemented by some regulatory measures.

5.1 Economies of Density and Scope

Economies of density being relevant, the mere volume of the contract cannot be the only criteria for designing the tenders. In order not to reduce economies of density, complementarities in services have to be identified and continuity has to be ensured.

On the one hand, complementarities exist within a geographic scope as defined in a public service contract. Rail services along a route or a corridor, around a hub station or when encompassing a single geographical area do display complementarities which do not exist if services are scattered around a territory. As a consequence, the combination of services within a package has to be done carefully, after considering the specific geographical circumstances within a region, so as to optimize economies of density. The mere imposition of a theoretically optimal contract size independently of the underlying geographical circumstances of the region is not recommended.

On the other hand, complementarities exist with service facilities. A substantial portion of the costs of a railway undertaking are related to rolling stock storage, cleaning and maintenance. Service facilities providing such services can be owned by the railway undertaking winning the bid, by the public transport authority or by a third party. Independently of the model, defining service packages around the existing service facilities (stations, storage facilities, maintenance facilities, etc.) increases economies of density. Pairing public service contracts with the operation of some of these facilities has been an option in some countries; for example, small stations for PSO services in Spain are operated by RENFE, not by the Infrastructure Manager (ADIF).

Economies of scope are also relevant, as different demands can be met by a single provider. For example, the same service can satisfy both suburban and regional demands. However, it is important to take into consideration that different demands often require different rolling stock (e.g., more seats for longer services, different speeds, etc.). Economic literature confirms that operating different types of rolling stock increases the franchisee's operating costs, an increase that might not be counterbalanced by economies of scale.

5.2 Network Effects

Network effects are, finally, of utmost relevance in transportation systems. Even if contracts ensure economies of density by aggregating services in a specific area, discontinuity is unavoidable. As the territory of a region is divided into different contracts, it will be common to have connecting services provided by different railway undertakings, and even to break some previous lines into services provided by different undertakings.

It is common in networked systems, which have been fragmented into different sub-systems (tender lots) to impose regulatory obligations so as to create and guarantee network effects. This means that railway undertakings are obliged to cooperate according to specific rules.

For instance, railway undertakings can be forced to sell tickets not only for their own services, but also for services across the entire region, and even across regions. Similarly, railway undertakings may be forced to sell through-tickets, that is, tickets that involve services provided by different railway undertakings so as to ensure a seamless connection between point A and point B. Service is guaranteed and in case of a missing connection, service continuity remains ensured. For example, through-ticketing was introduced in the United Kingdom, as national services were divided into more than 20 franchises back in the early 1990s. Clear rules (and ex-post regulatory intervention) became necessary in order to ensure the undertaking responsible for the delay would take the costs.

5. Conclusion

Tendering of rail public service contracts, as mandated in the Fourth Railway Package, requires public transport authorities to take decisions so as to maximize the beneficial effects of competition, while limiting negative impacts on efficiency.

Economic literature is very consistent in recommending the division of rail services under PSO in a country or a region into a number of public service contracts. The larger the volume of services in a given public service contract, the higher the barriers to entry for newcomers, thus reducing contestability because of the limited number of participants in the tender. Such reduction in competition does not only increase the chances of the incumbent winning the tender, but also results in higher prices and, more broadly, worse conditions for public transport authorities and passengers.

However, there are minimum thresholds in terms of volume of rail services in a contract if efficiency is not to be negatively affected. Economies of scale require a minimum volume in terms of train-km. Inversely, transaction costs resulting from each tender recommend keeping the number of contracts limited within each region.

Our conclusion is to start with contracts of a volume between 1.5M and 3M train-km during the first round of tenders, and to eventually increase the volume to larger contracts between 3M and 5M train-km as the market matures. This is based on the liberalization experience in other countries, as well as on economic literature.

Furthermore, literature also recommends not to put all the contracts up for tender at the same time, but to define a staggered schedule along a five-year period. Tendering requires substantial resources for both the public transport authorities and the railway undertakings. Available resources may be limited if all tenders are organized at the same time, thus reducing quality in the tendering documents and even participation, particularly by newcomers.

At the same line, progressive tendering allows both public transport authorities and railway undertakings to benefit from a learning curve. The complexity of these contracts should not be underestimated, as shown by mistakes made in other jurisdictions with decades-long experience. Railway undertakings benefit from a learning curve as well: lacking experience and information, companies tend to over-bid, leaving them trapped in the so-called winner's curse.

Finally, a systemic view should always be applied when designing the lots to be tendered, so as to optimize economies of density, economies of scope, as well as to maximize network effects.

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