

# Evaluating the efficiency of market liberalisation in the field of air navigation support services

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**Abstract**—This paper evaluates what will be the possible implications for airlines and employees at air navigation service providers if air navigation support services get liberalised as proposed by Single European Sky 2+.

*Ancillary air navigation service; air navigation support services; Single European Sky (SES)*

## I. INTRODUCTION

In two days of June 2013 more than 5000 flights were cancelled. The reason was a strike of air traffic controllers mainly in France against the measures of the European Commission (EC) addressing air congestion in Europe. The initiative of the European Union called Single European Sky (SES) aims to increase the efficiency and sustainability of the European airspace by (among other measures) introducing liberalisation on the market of air navigation services.

Nowadays, air navigation services (ANS) in Europe are provided by mostly state owned companies such as Deutsche Flugsicherung in Germany and Direction des Services de la navigation aérienne in France with some of the activities being managed centrally by EUROCONTROL. In order to decrease the costs for ANS and to make them more customer-oriented the EC suggested unbundling of the support services such as meteorological, communication, navigation, surveillance and aeronautical information services from the core air navigation services. This measure is part of the updated second package of SES (SES2+) adopted by the EC in the middle of 2013.

The so called ancillary air navigation services amount for around 27% of the total costs for ANS. An example from the Swedish air navigation service provider that has outsourced the maintenance of its support services, and benchmarking with other industries like railway transport showed that separation may lead to 20% decrease in the cost of support services or savings in the amount of nearly 450 million euro per year [1].

## II. POSSIBLE SCENARIOS

There are basically three scenarios how the separation can be accomplished. The support services can be outsourced to external providers by using public tenders. This case is referred to as structural separation. It implies that it will not be

possible anymore for the same organisation to provide both core and support services. This option is also the one most preferred by the EC as it boosts utmost efficiency and innovation.

The second option is to make support services functionally independent from the core services, so their costs are more transparent to the stakeholders. According to this scenario core and support services should be split into different business units each of them being financially independent (both in terms of reporting and charges) [1].

Recently there was another proposal from EUROCONTROL that offers outsourcing to external providers to be managed centrally, so economies of scale can be applied. Their suggestion does not offer one solutions for all support services but leaves some room for adjustments. So, it is possible to manage the procurement of external support services on different levels. While for some services it might make sense to be managed centrally for all air navigation service providers (ANSPs), other might be managed on ANSP level as before [2]. However, although the EC is interested in this solution, it was not explicitly mentioned in their document on impact assessment of policies.

These measures caused disapproval among air traffic controllers in Europe. The employees of the ANSPs are afraid that liberalisation of the market will lead to job cuts, decrease in the quality of service and respectively will raise some safety concerns.

However, while job losses may occur, it is unlikely that the quality of support services will suffer. In this paper it is considered to be constant. Let us assume that the quality of these services will worsen in case we decrease their price considerably. This might have negative impact on flight safety. But both airlines and passengers will be ready to pay more for support services as they value human life more than money. According to the general equilibrium theory there is a price for which equilibrium between the demand for ancillary ANS and their supply exists. This price corresponds to a level of safety below which all agents agree not to go. So, we can assume that all parties are interested to maintain quality constant.

The governments of Germany and France also expressed some negative opinions about the SES2+ package as being not necessary at this stage. This puts into question the implementation of the SES2+ package as it cannot come into force before it is approved by the European Parliament and the

Member States. If the proposal get accepted, it is likely to come into effect by the late 2014.

In this situation where national ANSPs and many governments are willing to retain the status quo in order to prevent unemployment, and airlines are demanding lower rates for air navigation services, so they can be competitive on the global markets, it is hard to find the right balance.

### III. LESSONS LEARNED FROM OTHER INDUSTRIES

The problem of introducing market liberalisation is not new. While in some industries it proved to be extremely useful (electricity generation and distribution), there are also not that successful examples (railway transport). In his paper “Lessons learned from electricity market liberalization” Joskow (2008) gives an overview over the liberalisation of the electricity market trying to answer the question why liberalisation is so difficult and opposed by the stakeholders. He gives some insights that hold true also for the market for ANS services. Joskow points out that in general liberalisation leads to cost optimisation and service quality improvement which does not always mean lower prices. There are countries where electricity prices were artificially kept low by the regulator contrary to the market conditions. He also highlights market power as a possible problem which can occur due to insufficient number of competitors, vertical integrations and points out as an example the California electricity crisis in 2000 and 2001. Misuse of market power is an issue that has been raised also by critics of the liberalisation of ancillary ANS. Many of them are afraid that once the market is liberalised the know-how of providing support services will be concentrated in a small number of companies. In the case of liberalisation of the electricity market where important elements such as prices and service quality are still regulated, the role of the regulator is not less important than the one of the private entities producing and distributing electricity. The regulator has a crucial role in preventing deterioration of the service quality due to cost reduction measures undertaken by network operators [3]. In the case of ANS provision it is questionable who will take over this control function – the national aviation authorities or the respective ANSP.

There are a lot of similarities between ANS provision and railway transport. For example both of them do not allow “infrastructure competition” [4]. Having redundant air traffic control towers as well as railway tracks is counterproductive. Unlike other network industries the costs for unbundling of railway operators and infrastructure providers are difficult to be estimated and can actually exceed the one encountered in other industries [4]. So, it is worth it to carefully examine the costs for outsourcing support services. The size of the market and the barriers to market entry should be taken into consideration as they proved to be crucial for the railway transport. Depending on them competition in the railway transport may not be always economically beneficial [4].

### IV. THE MODEL

This paper refers to rational choice theory. According to this theory individuals try to maximize their profit and to minimize their costs. When we apply rational choice theory on the market for ancillary ANS we can easily see the different implications for the various stakeholders. Air traffic

controllers would like to maximize their profit by increasing their wages and retaining the number of jobs. Airlines on the other hand would like to receive these services at the lowest possible price in order to achieve the main goal of each private enterprise – maximize their profit. Passengers would like to buy flight tickets at the lowest possible price, so they will be also in favour of cheaper ANS. Taking these preferences into account, is it possible to decrease the price for support services without affecting the number of people employed?

One of the options is that ANSPs optimize their costs and thus offer the same service at a lower price. But we have to keep in mind that state owned companies have little incentives to optimise their costs. This situation can be explained with the principal – agent problem. Wages of public servants usually do not depend on performance, so they do not have monetary incentives to optimize their work. ANSPs are not forced to increase their profit but rather to contribute to the society as a whole by offering good service at a fair price. So, maintaining the existing level of employment and wages and at the same time decreasing the price for support services may lead to decrease of profit for ANSPs. An outcome that is not beneficial for the overall welfare and only shifts losses from airlines and passengers to the state owned ANSPs.

Another option is the unbundling of support services which can happen in three different ways (as described above). Although the liberalisation of support services foreseen in the first and third scenarios can be perceived as a trade-off between cost reduction and employment rates, it still might bring improvement to the current situation.

In order to evaluate market liberalisation two concepts for economic efficiency are used – Pareto efficiency and Kaldor-Hicks efficiency. According to Pareto we have an improvement of certain situation if someone is made better off without making someone else worse off. Kaldor and Hicks develop further this concept by saying that improvement may exist also when someone is made worse off but the agent made better off can provide sufficient compensation to the harmed party. This paper will try to answer the question if Pareto/Kaldor-Hicks improvement of the current situation is possible by evaluating four different cases: maintaining the status quo, functional separation, structural separation and centralisation of support services.

In order to give an overview on the four different scenarios a graphical model is suggested. The model is calibrated with data for 2011.

The first scenario describes the current situation (CURS). Out of the 37 ANSPs that are currently included in the analysis, 34 are fully state owned, 22 of them have outsourced their meteorological services to separate organizations and 15 of them provide these services internally [5]. The other support services are also provided internally. In 2011, there were 57968 people employed in ANS [5]. Although it is required from the ANSPs to provide the exact number of employees per service [6], it has to be noted that it is not unusual that one employee provides both core and support services. So, the exact number of people employed in ancillary services can be only estimated. According to IATA the airlines’ profit in Europe for 2011 amounted to 400 million euro [7].

The second case represents functional separation (FUNS). In this case it is expected that the number of people employed will increase as additional management layer will be added. It is assumed that there will be at least one additional person hired on average per ANSP. Consequently the employment costs will increase. In order to estimate this increase average employment costs per person are calculated. For 2011 there were 57968 employed in air navigation services, the total employment costs were 4,9 milliard euro [5], so the average employment costs per employee were 84 536,61 euro per year. If functional separation would have taken place in 2011, the employment cost would have increased by nearly 3,2 million euro. In 2011 all ANSPs (except the one in UK) applied the full cost-recovery method [8] which would have led to airlines as main airspace user recovering this increase from their profit.

Similar logic is applied when estimating the possible impact of structural separation (STRS). The EC has calculated that structural separation will cause cutting 300 jobs per year which will result in cost savings to the amount of 450 million euro per year [1]. In the model it is assumed that these savings will directly contribute to the profit of airlines in Europe.

Regarding the centralised services approach (CENS) it is estimated that savings between 150 and 200 million euro per year can be achieved [9]. In the model the lower value is taken into consideration. The agency claims that the introduction of the centralised services concept will not lead to any job losses [2]. However, as the employment costs represent the biggest share of support services costs (ca. 70%), it is not possible to have such a huge decrease in these costs without affecting its major contributor. If we assume that 70% of these savings are due to employment cost reductions, this would mean that 105 million euro have to be saved by layoff or salary reduction. Dividing this figure by the average employment cost per employee, show us that in total some 1242 jobs have to be cut. The lifecycle of such a technology is around 10 years [9], so spreading the job cuts over the years will result in approximately 124 job terminations per year. This result is comparable to the findings of the EC that in the case of structural separation 450 million euro savings correspond to 300 job cuts per [1]. A simple equation shows that one third of the savings can be achieved by terminating 100 employees. In the model it is assumed that in order to achieve savings in the amount of 150 million euro at least 100 jobs per year have to be cut.

None of the three scenarios (FUNS, STRS and CENS) represents Pareto improvement as in all cases either the airlines' profit or the number of people employed in the national ANSPs will decrease. Therefore the Kaldor-Hicks criterion is applied.

In the FUNS scenario, it is possible to compensate the airlines only if the ANSPs lower the costs for support services despite the increased employment costs. In the graphical model this situation is indicated with the abbreviation FUNS\*. As already discussed above such behaviour will harm the

national ANSPs and consequently cannot be perceived as a Kaldor-Hicks improvement.

In the STRS case, airlines can compensate the employees who have lost their job by paying the annual employment costs for them. If this scenario had been introduced (marked as STRS\* on Fig. 1), airlines would have made 420 million euro more profit. The STRS\* is clearly a Kaldor-Hicks improvement.

In the case of CENS, this kind of compensation is also possible (labelled as CENS\* on Fig. 1). However, airlines would have made nearly 140 million euro more profit. The CENS\* scenario also fulfils the Kaldor-Hicks criterion.

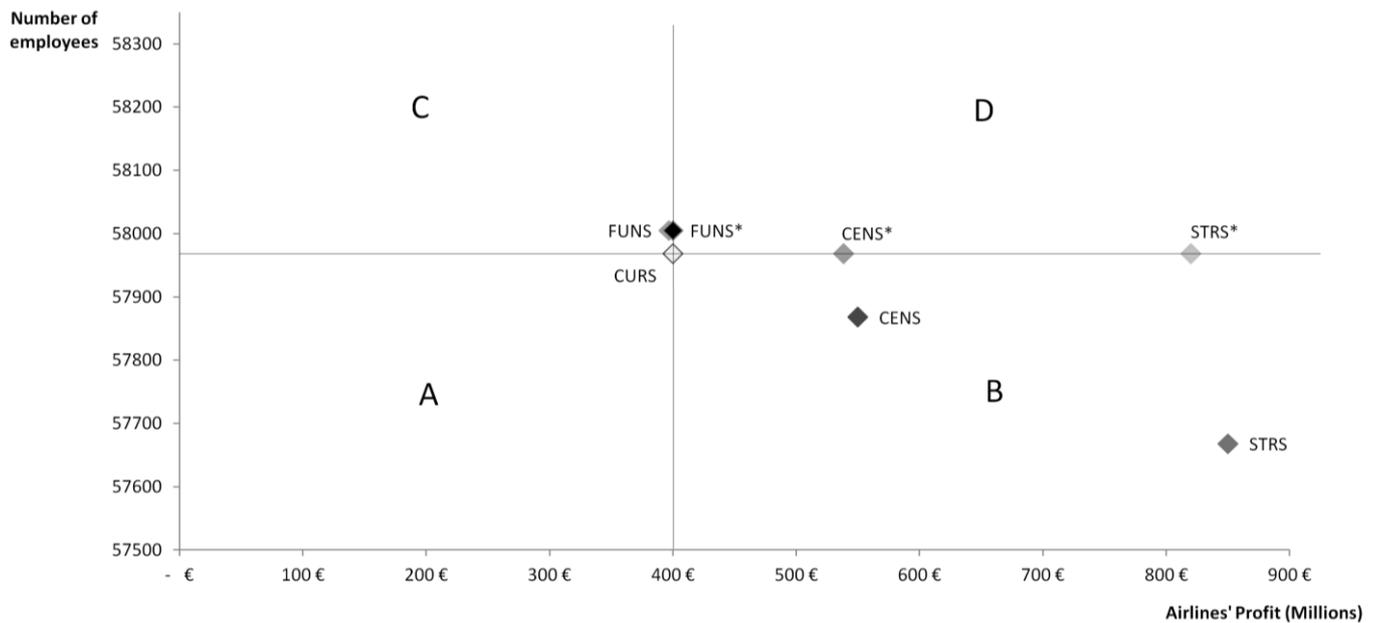


Figure 1. Graphical model of possible scenarios for the liberalisation of air navigation support services

On the graphical model above we can see that without applying the compensation adjustment none of the scenarios can result in a Pareto improvement. Once the Kaldor-Hicks criterion is applied, the FUNS, STRS and CENS scenarios move from quadrant B and C to quadrant D (FUNS\*, STRS\* and CENS\*). However, not all points in quadrant D represent a Kaldor-Hicks improvement. Both STRS\* and CENS\* result in improvement for airlines and offset the damages for ANSPs' employees. The FUNS\* scenario brings improvement to ANSPs' employees but it cannot be considered as efficiency improvement because by offsetting airlines it makes ANSPs worse off.

### V. CONCLUSION

In conclusion, both structural separation and centralised services provision offer opportunity for efficiency improvement. Implementing structural separation can lead to benefits in the amount of 420 million euro covering also the unavoidable job reductions. The centralised services provision concept brings smaller benefits but also requires less job cuts. Regardless of the option chosen both ways of liberalising the ANS market will make support services more efficient and thus airlines in Europe will be more profitable and competitive.

In this paper two major factors were studied – number of people employed at ANSPs and airlines' profit. However, there are many other factors affecting the liberalisation of support services that need further research. For example, implementing one of the two concepts mentioned above requires certain resources and generates costs that are often overlooked. Opening the market for ANS services to private providers may not automatically create the desired competition; possible barriers to entry into the market and misuse of power have to be carefully examined. The provision of ANS services is safety critical; the quality of service of external providers has to be rigorously monitored while

keeping the administrative burden to its minimum. Many of these issues are not new and benchmarking with other industries can help solve them.

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