

Economic Aspects of Air Navigation Services Providers

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Introduction

Air traffic control is an assumption of air traffic existence in the worldwide measure. It is also the phenomenon which significantly influences its safety and effectiveness. Constant efforts to minimize the flight delays in the airspace while maintaining the high levels of safety and services reliability are the stimulus of all Air navigation services providers.

Methodology of the air traffic services provision is the discipline, which is solved by the number of the international rules and recommendations. Experts from companies providing such services are members of working teams of the ICAO and Eurocontrol international organisations. Quality professional methodological work creates the preconditions for the success of the air traffic services as a whole.

In general, the economics of such enterprises is similar to the economics of common enterprises, but there are also some peculiarities.

1 Basic status and economic aspects of the air navigational services providers

Main task of the Air navigation services providers is to ensure the safety environment for air traffic according to regulations of relevant ICAO documents. In practice, it means to provide a variety of different services to users of specified airspace and airports in the territory of given state. It is important to pay attention to international status of the air transport in accordance to international regulations while maintaining the maximum level of safety by use of financially and capacitive efficient means.

Air navigation services providers are usually organised according to political state borders. Air traffic services may be provided only by one ANS provider due to the character of the provided services. Due to the fact, that there are also air forces operating in national airspaces, there must be ensured maximal coordination between military and civil air traffic control.

Significant volume of air traffic (especially in Europe) is carried on international routes (airways) where aircrafts are flying through the airspaces of at

least two different states. Aircrafts flying at longer distances (for example from northern Europe to southern Europe) are usually flying through airspaces of several states such as aircrafts flying at long haul flights. That is the reason, why it is so important to negotiate clear rules and high level of coordination of air traffic services among individual states. Growing volume of air traffic increases demands on capacity of individual air traffic services what leads to occurrence of local capacity problems and delays. However these problems become international on international routes, because the capacity of the routes is as high as the capacity of the weakest part of the whole route. Providing of the Air Traffic Services (ATS) is in accordance with terms of the Convention on International Civil Aviation (Chicago convention) under the responsibility of individual states, whose governments delegated the provision of ATS to specialized Air navigation services providers (ANSP). ATS are provided in designated areas and at designated airports. Airspace is divided into so-called Flight Information Regions (FIR). FIR is determined within national borders with regards to the territorial size or other criteria (for example operational or political). There is only one FIR in Slovakia and Czech Republic (Bratislava, Praha), eight FIRs in Germany and two FIRs in Switzerland (due to the political reasons). There are so-called controlled areas within the FIR, which contain airways for controlled flight and also Terminal Control Areas (TCA) in the vicinity of controlled airports. Controlled areas are defined geographically, as well as by height.

2 Economic aspects of activities performed by air navigation services and their history

Basic rules and historical context of the economic status of ANS providers result from different development of the organisation and ownership in the field of aviation. In this thesis, due to practical reasons, I am concern about the questions of air traffic control from European view that means, when airlines pay precisely determined charges for these services. Its amount depends of expenses level of ANSP, traffic volume, distance of the flown route and aircrafts weight. An alternative method of payment of these services is used in the USA, where the air traffic services are paid of special tax on aviation fuel. At the time of the DMCL creation, provision of air traffic services was very different from the way it is nowadays. The DMCL deals with the airport and other similar charges in its original text in Article 15. Airport and navigation infrastructure were included into the aviation infrastructure and from economic point of view, this infrastructure was viewed in the same way. In Europe, air traffic control services were not charged until 1960. The creation of the Eurocontrol organisation formed the basis of a new approach to financing of the European air traffic control services development. Airports were gradually functionally separated from other aviation infrastructure, particularly from air traffic services provision. In the terms of air traffic services provision, the en-route control services has been again separated from terminal

control service from economical point of view. This evolution is reflected in ICAO document “Policies on Charges for Airports and Air Navigation Services”, published under the designation Doc 9082/7. It describes other rules that must be mandatory observed by ANS providers – the gradualism rule, cost refinement rule and the rule of reasonable profit, transparency rule and the rule of consultation with services users. In the terms of historical circumstances of air traffic services creation, it is important, that it was a responsibility of the state to provide Air traffic services. ANS providers were created as a part of the state administration, from which it was later separated in Europe. This trend accelerated particularly in the '90's, when majority of ANS providers was organizationally separated. Separation of the state administrations gives them wider opportunities to respond to demands of customers.

2.1 Monopolistic status of ANS providers and their economic regulation

ANS providers have a monopolistic status in the segment of the airspace served by them so they have to be the subjects of the regulation. This regulation takes place at the national and international level, as well as in the other areas of the aviation. ANS provider acquired its monopoly position due to two factors. The first factor is exclusive access to resources. The resource is the airspace of the state, in which the ANS provider operates. The second factor is the state license. ANS providers have to be licensed to operate. The licensing process is governed by the rules of EU. The Civil Aviation Authority of the Slovak Republic (LÚSR) is the license publisher in the Slovak Republic. The natural economical motive of every company is to maximize profits. It is usually easier to achieve maximization of the profit in the conditions of the monopoly, because there are no competitive pressures or they are much smaller than in the market economy situation. ANS provider opposes only to the level of competition, which corresponds to the customers (airlines) choice of the better alternative. Choice of the alternative is easier in the case of small state surrounded by similar states with different prices for air traffic services. In the Europe, these conditions are limited only to the number of the geographical locations. The choice of the alternative is also limited by fuel price, because it is usually associated with the extension of the route distance. The actual choice of the ANS provider is rather theoretical for the intra-European airlines in the European area, due to the central assignment of specific airways by CFMU. The long haul lines have more opportunities to optimize the routes, because they have more options to choose the specific routes.

2.2 Economic regulation principles of the natural monopoly in aviation

Economic regulator is the necessity in the conditions of monopoly and minimal competition. There is no regulator with executive power in the EU or in the global measure. The regulatory process is rather directed in the way of the

recommendations (recommended practices) ICAO, prices and productivity comparison (Eurocontrol), lobbying, negative/positive publicity of the expensive/cheap providers (IATA, AEA and other carriers association) and political pressure. That is the reason, why the individual states are responsible for the executive economical regulation. Problem of this solution is that in many cases, the state regulation authorities often lack the sufficient experiences in the field of air transport economy, so the regulation may be only limited to the simple comparison of price levels applied in the other states. In the Czech Republic, the role of the economical regulator is divided to the Ministry of Transport (compliance of international agreements under the Law of civil aviation) and the Civil Aviation Authority (financial status of the ANS provider in compliance with EC Regulation no. 550/2004). The similar situation is in the Slovak Republic. In the regulation of the national ATS, the national regulator should evaluate at least the following:

- ***compliance of users non-discrimination rule***
 - a) application of the same charges for the domestic and international flights
 - b) application of the same charges for domestic and foreign airlines
 - c) reduction of the cost basis, associated with the government, military and other types of flights, which are excluded from charges payment
- ***appropriate cost coverage***
 - a) to include only costs associated with the services provided to the airlines
 - b) to achieve economical and operational efficiency / productivity in the specific activities (eg output per employee), investment policy etc. in the cases, when the airlines use only part of the specific services (such as meteorological services, search and rescue service), it is necessary to ensure, that these costs are correctly allocated to the specific users groups (cost allocation)
- ***achieving reasonable profit***
 - a) the reasonable profit should be comparable to the level of the profit achieved in the other fields of air transport – it can contain costs of capital obtaining (interest) The present value of the capital income is in the range of 2,5 % (Italy) to 16 % (Moldavia) rather in the relation to the conditions of the local capital markets than the status of the air transport
 - b) application of the refund mechanism for users reaching the higher then the reasonable profit (over-under recovery principle)
- ***compliance of other ICAO recommendations***
 - a) the existence of an effective consultation process with the users (IATA)
 - b) presentation of the transparent information about financial and operational results
 - c) compliance of gradualism rule in the necessary charges increase.

Considering, that the number of terms contained in the ICAO principles (see Doc. 9082/7 – reasonable profit or costs allocation) is not clearly defined, the level of principles compliance in the terms of consultation process between the providers

and users of this monopolistic services in the air transport is the subject of permanent discusses. Approach to the economic regulation of ANS providers is in many ways similar to the economic regulation of the airports, which also greatly benefit from the status of the natural monopoly.

2.3 General framework of the accounting and financial evaluation of the air traffic services economy

As mentioned above, economical aspect of ANS provider's evaluation is one of the most decisive. It is advised to proceed in accordance with the general principles of economic evaluation of the company as a whole to achieve an objective picture regarding analysis of the assets, costs and revenues, cash flow. It is necessary to relate to the objectively valid statements such as balance sheet, income statement, and statement of cash flows in all presented examples. These can be found in the annual reports, which are public companies and corporations required to publish. In the terms of departmental membership of the company, we cannot bypass also the evaluation of structure of the services provided by them, which are available in the form of the kind indicators such as the number of over-flights, arrivals, departures and so on. Since those presented performances are a source of income, it is appropriate to evaluate these indicators in the terms of financial indicators. Economic performance monitoring is the top priority of the ICAO, which developed the tracking algorithm of the airlines costs due to the achievement of uniformity.

The biggest benefit of this chart is the distribution of tracking of the economy at three levels i.e., starting with general financial statements (level 1), via tracking through the centres (level 2) to the level of realisation of the operational processes (level 3 – the lowest).

3 Economic regulations and determination of prices for air traffic control services

Prices for the air traffic services are determined on a purely cost basis (cost-relationship). As previously stated, a number of rules and customs is applied in their creation, presentations, regulations and changes. Most of them are formalized in the documents of ICAO, EUROCONTROL or EU. The main principles of the cost basis determination of the both types of air traffic services are described in ICAO document „Policies on Charges for Airports and Air Navigation Services" - Doc. 9082/7 and also in the EC Regulation no. 1794/2006. Clear rules defining the form and the structure of the cost basis determination are included in the document of the Eurocontrol „Principles for Establishing Cost Base for Route Facility Charges and the Calculation of the Unit Rates", which is mandatory for all member states of this organisation. This document is exclusively aimed on the en-route services. Eurocontrol organizes multilateral consultative process. Users can ask there for the

applied principles used in the cost basis calculation and for the additional explanation. In the case of permanent doubt or belief that cost basis is set too high, bilateral consultative process is following. The main organisation which represents the airlines in this aspect is IATA. The single format is applied for the cost basis; unfortunately there is no defined content of the specific items. Neither mentioned EC Regulation defined the definitions of en-route, approach and aerodrome control services. That is the reason, why some aspects such as approach control service is attributed to the one of the cost basis in the different ways in the different countries.

3.1 Cost basis and the principles of the price determination for the services of ANSP

ANSP cost basis for the calculation of en-route and approach services presents the sum of all costs, invested into these services in a calendar year. As mentioned in the previous chapter, a major problem in the cost basis calculation is the question of the allocation of the specific cost shares (cost allocation) to the specified service in the cases, when specific costs cover the services for the different users. Another issue is the optimization of the individual cost items. In accordance with Eurocontrol, a very important rule so called over-under recovery principle is applied for the calculations of the cost basis in the specified calendar year. This principle means, that for lower/higher than expected sales in the year $N - 2$ (for example: year 2011 included under/over recovery for the year of 2009) this difference is added or subtracted for the cost base calculation for the planned (next) year. It limits mainly the problem between the providers and the users, which could arise due to the differences in the assumption of increase/decrease of traffic and increase/decrease of the specified operations cost. Logically, there remains the problem of different opinions on absolute amount of the operational and investment cost. The cost basis consists of the national air traffic services costs, Eurocontrol costs (in the case of the en-route services), over/under recovery of previous years and the profit range. In the terms of the ANS providers, the cost of services is calculated as a division of so called cost basis (cost base) and the total number of performance units (traffic units), expected in the next period, which is the next calendar year. ANS provider covers its costs associated with the services by this way and also ensures a reasonable profit. Price is calculated separately for each type of the service i.e., en-route, approach and aerodrome control service, which are corresponding costs assigned to. Each of the prices is charged separately, has a different performance unit and so far also the different authorization procedures. Performance units are the basic elements of the calculation of the price, charged to the airlines for air traffic services. For the en-route service, the performance unit is so called over-flight unit (service unit). It is the square extraction of the maximum take-off weight divided by fifty. The amount of the charges depends on the maximum take-off weight (MTOW) and the length of the flight:

For example to the 1st of the March 2013, the over-flight rate is 60, 92 € for SR, 45, 80 € for CR, 36, 20 € for the Poland, 41, 0 € for the Hungary and 96, 95 for the Switzerland. As an example, charges for the air traffic services for the flight from Barcelona - Copenhagen are € 1,571.15 for the Airbus A320 (77 tons – factor 1, 24).

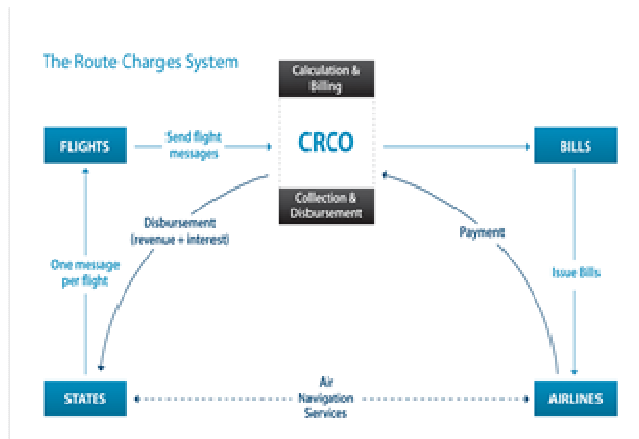


Figure 1 En-route charging system

Between the users themselves and between the users and the ANS providers, a fierce debate are kept, whether this calculation system is in accordance to the rule of the price relationship to the actual costs. Operators of larger aircraft types advocate the philosophy, that an important factor is the time spent in the airspace of specified ANSP rather than the weight and that the jet aircrafts with higher MTOW are usually faster, and the time spent in the system is lower, so they should pay the lower prices for the services. Operators of smaller aircrafts and usually also ANSP are of the opinion that the operation of all aircraft sizes and the function of the whole site of air transport by smaller aircrafts have to be ensured also outside of the main airport. The reality is, that in the case of weight criteria refusal, the charges would increase for smaller aircrafts.

The amount of the charges for en-route services in the individual member states formally approves bills and collects the Eurocontrol in accordance to multilateral convention on en-route charges, which is approved by the majority of the European states. For service users, this means one invoice per month in one currency. Price for the approach or aerodrome control service is collected by the air navigation services providers, either on their own or in accordance to special bilateral agreement by Eurocontrol. Performance units for approach and aerodrome control services exist in several variants.

3.2 Productivity and performance of ANS providers

Due to the monopolistic status of ANSP and their ability to put all of their costs into the cost basis and then to get them paid, the question of optimization of their productivity and the performance is of vital importance. In the absence of the market economy environment, it is necessary to use the mechanisms of the continuous optimization of the internal processes within every ANSP and simultaneously to compare the productivity and costs of the specific ANSP. Like in the other economical comparisons, the main problem is the question of the comparison criteria selection and the ability to consider the differences in the operation conditions and economic operation of these companies. The product of the ANS providers is narrowly focused and relatively homogenous. We could logically expect that their performance will be very similar. This is not so in the practice, so the performance benchmarking is a requirement that is respected not only by ANS providers but also by the users (airlines) and recently by EC.

The comparison of financial and economic efficiency and the setting of the goal is one of the main benefits for the European system as a whole and for ANS providers themselves.

An ANS provider has fairly limited possibilities, how to influence the financial cost effectiveness in the specified year and that is the reason of high proportion of the fixed costs. Suggestibility of the costs is possible in the longer term, which is specified by the validity of collective agreements and the period of assets depreciation (buildings and technological devices). The influencing of trends of the main cost components is important and perhaps the only mean of the financial and economic efficiency management of the ANS providers. However, these trends have to be known and estimated. The main approach consists in strong, transparent, independent evaluation and benchmarking of performances and setting of the goals of the individual ANSP.

Conclusion

ANS providers must consider their economic decisions, because they are the subjects of economical regulations. The quality and the price of the services is the determining factor of selecting the ANSP by the airlines nowadays. ANS providers are able to achieve this by the two factors. On the one hand, it is by way of reducing company total costs to avoid raising prices for provided services, and on the other hand, it is the investment into the improving the quality of services. These might be contradictory measures, but they are closely related and they form basis of success and further development of these companies. It is never easy to achieve the stated results and needs more time. Therefore, constant monitoring individual indicators and the trends of development are required on the part e ANSP so as to be capable of taking towards improvements and efficiency of the operations. However some factors are still difficult to influence, for example geographical location or the

company, which depend on the length of the period of operation in the field of air traffic services provision.

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Summary

Planned growth of air traffic requires the air traffic control to adjust its structural, economic and technological basis according to new trends in this field. Air navigation services providers will present important and attractive element in the structure of national economies due to dynamics of the process associated with constant growth of air traffic. We describe the economic system of Air navigation services providers, fees determination system and regulatory measures in this report.

Keywords:

air navigation services, economic aspects, air traffic, regulation

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