

The Economics of the ATM Regulation in EU. The impact of the Single European Sky.

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Abstract¹

"...by thinking and trying, it [regulation] can be made to make more of a difference-or, more importantly, a better difference." [14] Starting in April 2004 the European Commission (EC) with the Council and the European Parliament have been gradually introducing a set of regulations establishing the "Single European Sky" (SES) in EU. This has put the Air Navigation Services (or ATM) provision to a category of business for which the Member States (MS) had to implement a separation of the provision of service from its regulation and allow service provision to develop under specific rules [1]. To supervise the correct application of the new regulations the Member States had to establish National Supervisory Authorities (NSAs) [1]. Although one may argue that these type of regulatory tasks have been executed in the past by competent State's Authorities as part of their obligations to ICAO Convention and SARPS, in practice States had to establish new or enforce existing institutions and organizations to cope with the those new obligations [2]. This inevitably impacted the cost of regulation. The paper introduces a model for regulation of Air Navigation Services, inspired by the High Level Group Report (2007) to address the role and the multiple functions of the NSA. It has been observed that the SES regulations inevitably generate a cost but as the regulations allow different choices, states have followed a diversified path in recovering this cost. The paper stipulates and introduces principles regarding the fair handling and recovery of this cost. In addition other ways are proposed in an effort to rationalize the cost and minimize the impact on the market without compromising the effectiveness of the regulation in particular regarding safety and security. The case of "many NSAs" functioning in a FAB environment is also addressed.

Keywords

Optimized Regulation, Regulation Efficiency and Effectiveness, Economics of Regulation, Collaborative Environments, Air Navigation Services, Monopolies.

1 Introduction and definitions.

1.1 Principles and definitions adapted for the study.

For this study regulation is considered to be a set of interrelated functions following a complete cycle (see Fig. 1) deployed and exercised across at least three interacting levels (Fig. 2). The necessity for this set of regulative functions is being created by the inevitable human (economic) activities, in this case the provision of Air Navigation Services to airspace users.

¹ The paper expresses the personal views of the authors.

Based in a set of principles developed also by EU, the cost of regulation must be born by those who create the need for regulation through their activities and by those who receive the benefits (i.e. appropriate safety, security, unobstructed, non-discriminative access to service in performing business, etc.). In this sense the bearer of the regulative functions or the regulator in general has to be independent with adequate authority and power to exercise its duties. In addition these functions need to be deployed and exercised with the higher possible cost efficiency[3].

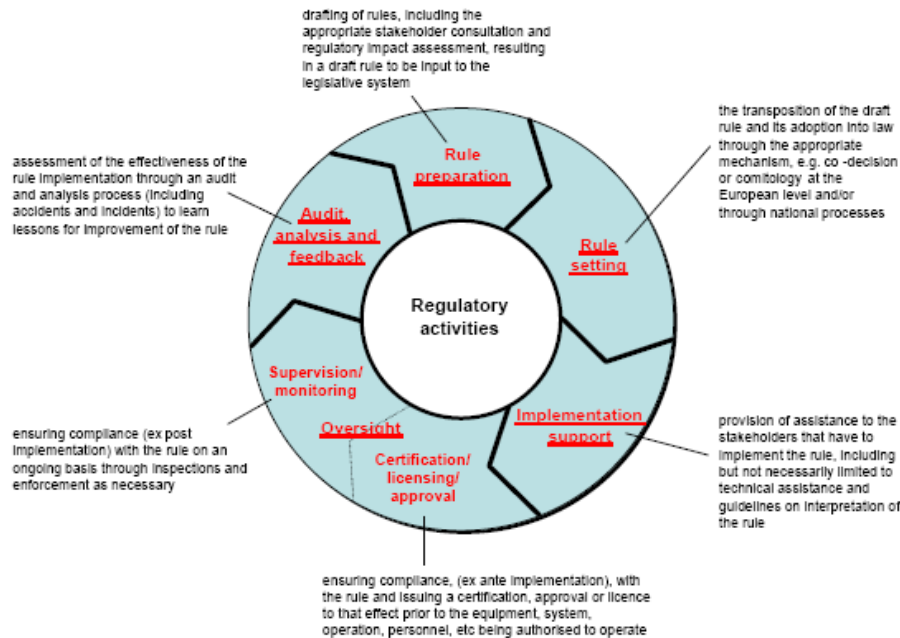


Fig. 1: Standard definitions and functions regarding aviation regulation from the High Level Group Report[5]. The complete cycle of regulation in aviation.

2 Literature research

Although there is enough material regarding the cost efficiency and performance[8] of the provision of the Air Navigation Service (ANS), there is very little for research looking to the efficiency of the specific activities in regulating ANS and its economics. In our research we found references [6], [14] and [15], very useful and important although not particularly focusing on the specific subject of ANS regulation. The theoretical proof regarding the naturally monopolistic character of the Air Traffic Services argued in [13], helped to understand better the need and function of the ANS regulation. Regarding the economic regulation of ANS the “Study on the implementation rules of economic regulation within the framework of the implementation of the Single European Sky” of the Regulatory Policy Institute[9] provides a number of analysed alternatives, which nevertheless were not entirely adopted by the respective regulation[10].

3 A model for regulating ANS. Why the NSA is also a regulator.

As part of the study, a model for ANS regulation was developed inspired by the Report of the High Level Group for the future of aviation regulation[5]. The Report aimed as well to recommend measures to improve regulation efficiency[3]. The model is described in the following sections. We have identified three major elements (dimensions) involved in the regulation business:

- The regulatory Functions and their interrelation and interaction including of course the individuals involved in exercising regulation;
- The Domains of Regulation (i.e. what regulation covers) and
- The Addressees or recipients of regulation actions/activities and their results.

The details of this structured approach follow:

Regulatory Functions and their levels:

To start with the design of the model the main regulatory functions in different levels is given below:

Rule preparation: i.e. preparing regulatory material by an organisation that has the technical (legal) competences/skills to do so and that follows adequate procedures to ensure all necessary inputs and consultations were received and applied from and by those that will be affected by the regulation; ensure an appropriate level of transparency and stakeholder involvement and achieve an appropriate spread of response from relevant stakeholders.

Rule setting: i.e. the promulgation of rules prepared by the previous function above, and other binding requirements in a context that allows for proper application and enforcement of these rules as well as for legal and political accountability for any choice/decision/verdict that can be made.

Implementation support, i.e. assisting organisations and individuals in charge of the application of regulatory requirements such as support to monitoring, to application, to certification etc.

Certification/licensing/operational approval: i.e. the initial verification of the application of regulatory requirements to individuals, organisations, equipment and procedures or groups of these so as to authorise *ex ante* the conduct of specific activities and provision of services;

Monitoring/oversight/inspection: i.e. the *ex post* assessment of continuing compliance with regulatory requirements, the identification and definition of corrective action and enforcement when, where and as needed;

Enforcement: i.e. the exercise of formal powers to ensure compliance with regulatory requirements including the imposition of dissuasive and proportionate sanctions; and finally

Who receives the regulation or who are they the regulation addressees for the case of Air Navigation Services:

- Air Navigation Service Providers of all type (i.e. ATS, CNS, AIS and MET);
- Recognised organisations;
- Notified bodies;
- The staff of all these organisations and more.

The military aviation is not the subject of the exercise of regulatory functions as described above. However, it is highly beneficial and therefore desirable to associate the military closely so as to achieve an integrated approach where and as possible. Involvement of military can take place through specific national military organisations, through their association with civil bodies or through their participation in civil bodies. This inevitably generates an additional hidden cost.

Domains of regulation or what is/has to be regulated

Regulation to addressees is applied and exercised to achieve specific results and goals e.g. to maintain and improve safety levels for the public or to increase the financial efficiency of a monopolistic service provision without deteriorating the quality of the service. We call these areas *domains* of regulation. It is important to identify and register them for the case of ANS:

- Safety;
- Security;
- Quality of service;
- Protection of the environment;
- Fairness to access the service and
- Economic regulation or cost efficiency.

In addition to the above, the following domains were considered as well in the realm of regulatory functions:

- Achieve seamless operation of complex systems through **interoperability** requirements and coordinating functions;
- Work towards a better organisation and “perfection” of the market;
- Enforce and apply international coordination and cooperation;
- Regulate as part of the fairness to access the allocation of scarce resources (airspace capacity),
- Consult Stakeholder and verify if service providers apply consultation;
- Secure the sustainability and continuity of service (applying a multiplicity of measures including economic oversight to finances).

In the context of the above the difference between domains and addressees should be understood as one to all mapping situation e.g. the regulation of ANS competent staff and their licensing aims to secure safety, security, quality, etc. and all the items in the domains of regulation. Fig. 2 provides a schematic illustration of the three-dimensional model of ANS regulation develop by this study. The model enables and support checking for completeness and for estimating effort necessary to perform the regulation functions adequately and with cost efficiency.

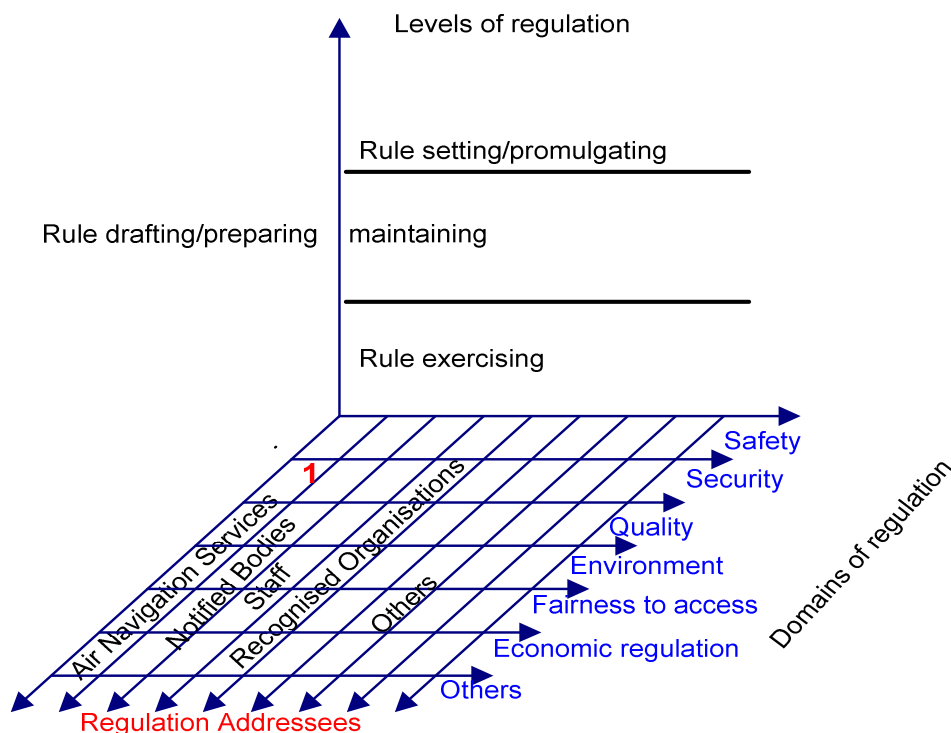


Fig. 2: The three dimensional model of ANS regulation. Not all elements are shown. As an example square numbered 1, shows the case of exercising regulation to ANS for security purposes.

In the context of the model described above we argue that the NSA although called basically Supervisory Authority is in reality also a full regulator since their activities cover all three levels of regulatory functions described in the model. Indeed NSAs are obliged to issue directives (safety for example) even on the spot of activity as to order corrective action to be accomplished in given time when deviations are observed (e.g. during an oversight, audit or inspection)².

The NSA is also charged and entitled to impose dissuasive and proportionate sanctions, for example removing the licence of non-complying ATCOs without degrading safety and/or capacity, taking similar measures technical staff involved in safety related tasks, etc.

4 The economics and finances of the ANS regulation

The financing of ANS regulation does not currently add considerably to the overall cost of ANS provision in EU. The last official survey on the issue was conducted late 2006, released early 2007 for the purpose of supporting the EC report to the European Parliament three years after the publishing of the SES Regulation (i.e. April 2007). The SESFARR Report[2] addressed the issue by asking States to report effort spent in implementing SES and their respective planned budget for 2008. By extrapolating linearly the data of the SESFARR[2] survey, we estimated to total budget for NSAs to be approx. 2,5m€ per state by the end of 2008, which with the necessary adaptations provide a sum of approximately 75m€ yearly for all SES participating States. Given that the total cost of ANS in Europe that year was ~7,5b€³, it was found that the cost of the ANS regulation adds only ~1% to the total actual cost of the service.

However inequalities and disharmonies in handling locally this cost may cause considerable distortions in given specific areas. More importantly the appropriate regulation of ANS depends also on the right economics and finances of the regulators. ANS regulators fit to purpose can help achieving quicker and cheaper the necessary benefits in particular on performance. Concerning the sources of financing the NSAs, the SESFARR survey found that the majority of them are financed by the route charges while a few remain clearly under state budget. It was observed that the latter has a negative effect on the staffing and functioning of the respective NSA in particular in Central and South-eastern Europe where the wages of the civil service are particularly low. The situation creates large difference regarding attractiveness for skilful experts between the Service Provider and the NSA; in other words NSAs have tremendous difficulties to recruit the appropriate staff to performing their duties. The SESFARR study also revealed that often an NSA is an integral part of a (larger) Civil Aviation Authority (CAA). This provides a number of advantages regarding cost efficiency (see Fig. 3 for a theoretical business model based on this approach). However there are cases where the accounting system is unable to provide separate accounts for the NSA from the rest of the CAA. In these cases (about 13 in 2007) it was impossible to estimate the budget for the NSA and consequently the cost for regulating the Air Navigation Services. Often the whole budget of the CAA is entirely financed by the revenues of the en-route charges. To alleviate this issue the ASATC Programme (2003-2007)⁴ with its Work Package 6 developed Business Plans for five CAAs in the Western Balkans which foresee that respective activities of the CAA are financed by the corresponding recipients of the regulation functions (i.e. Airport, Airlines, Maintenance Organisation, Pilot Schools etc. were to be charged for the cost necessary for their regulation.

² Art. 8 of Reg. 2096/2005

³ Excluding flight inefficiencies

⁴ http://www.eurocontrol.int/asatc/public/standard_page/Work_Package_6.html

5 Cost efficient regulation in ATM

In this section we examine phenomena and approaches that are conducive to reducing cost and improving efficiency and effectiveness in ANS regulation. As already mentioned a major issue is how NSAs/CAAs are organised and structured i.e. if they have settled to an organisational functioning scheme that is optimised regarding efficiency and effectiveness. Fig. 3 (from [11]) provides one generic example of organising NSAs as part of larger CAA organisations. However experience has shown that there is no one solution for everybody. Size of business plays an important role in choosing organisational schemes.

While a regulator has to have a hierarchical structure, the quest for efficiency in small countries favours projectized matrix schemes. In this case staff from other part of the CAA (e.g. legal experts, economists, technical inspectors, etc.) may support temporarily the NSA in significant tasks for example carrying initial certifications, ascertaining initial interoperability for large systems or their important upgrades, etc. The Commission started promoting the cooperation of NSAs via a specific platform. The idea has been already introduced and explored[4].

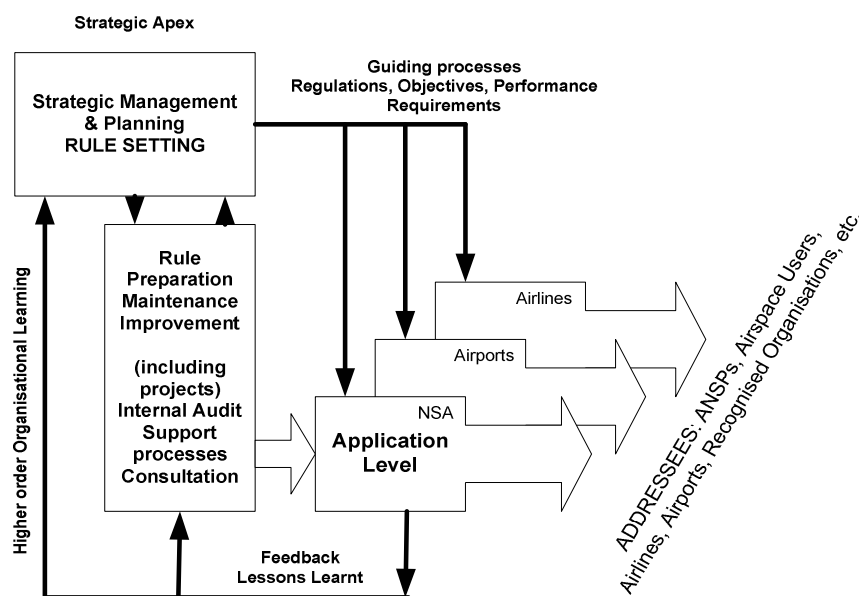


Fig. 3: A business model for an integrated efficient regulation of aviation business[11]. The regulation of ANS (NSA) appears at the application level since the other important levels are shared with other departments (regulation of airports, airlines, etc.), thus creating efficiencies and economies of scale.

It offers considerable advantages and requires only administrative and procedural inter-State measures. In essence collaborating NSAs do not have to develop and maintain all the necessary expertise and effort required formally for their functions. They may focus on their already best and get what is missing from other collaborative NSA while themselves offer equally their respective contributions. The idea can be easily promoted and implemented within FABs[7].

The importance for the Regulators (NSAs) to have as the Service Provider⁵, appropriate business plans if possible with a 3-5 years horizon, has been already addressed. To secure the proper implementation and follow-up of the plan, competent State authorities may apply external audits to the finances of their NSAs. The measure will complement and add to the value and effect of the foreseen Peer Reviews[1].

⁵ See requirements of Reg. 2096/2005

Recently organisational developments regarding the organisational transformation of ANSPs to become similar to each other or to the considered best among them, through the mechanism of organisational isomorphism were observed [12]. They may be promoting better regulation first by standardising further the work of the NSAs and secondly by extending isomorphism to the NSAs themselves as collaborative organisations complementing each other within a FAB[4].

6 Conclusions and future work

6.1 Conclusions

We studied the economics of the ANS regulation by first developing and describing a three-dimensional model for ANS regulation. The model may as well address other areas of aviation regulation. In our study we found that currently the cost of ANS regulation is approx. 1% of the total cost of the regulated serviced and has no observable trends to increase.

On the contrary methods and mechanism are in place to alleviate the issue of scarce resources of NSAs and preserve the acquired relative efficiency. The Commission promotes a platform for NSA cooperation while incentives exist for NSA to develop and maintain their business plans to control and secure their budgets.

Overall the important conclusion is that while the economic impact of the new regulation was found to be negligible (approx. 1% of the total cost of business) the benefits already achieved by having harmonised effective regulation with widespread common best practices in EU outpaces the cost.

6.2 Perspectives of further work

The economics of regulation in difference to the economic regulation do not usually attract particular interest in studying and research. Nevertheless our strong believe is that as the Regulators looks carefully and correctly after finances and the economics of the provision of the service themselves and their competent state authorities should take of the economics of the regulation. Healthy economics and proper financing make regulators more efficient and effective. In his important work Kahn[14] thinks that what is needed is: a) to make [II, p. 112] "... regulation more intelligent and more effective in those circumstances in which competition is simply infeasible;" and b) to find [p. xxxvii] "... the best possible mix of inevitably imperfect regulation and inevitably imperfect competition." Accordingly, economic analysis should, and must, play an important role in accomplishing these objectives. Modelling and promoting models represents also a good practice.

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