



THE IMPACT OF THE COVID-19 PANDEMIC ON THE ECONOMIC PERFORMANCE OF EUROPEAN AIR NAVIGATION PROVIDERS

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Abstract

The main objective of paper, is to evaluate the effects of the Covid-19 pandemic on the economic results of European air navigation service providers. The paper provides a set of information; the impact of the pandemic on air traffic in Europe, funding and forms of financial assistance to air navigation service providers in Europe. The findings are based on the synthesis of the knowledge from the research. Two analyses are carried out to achieve the goal. The first analysis focuses on selected financial and economic indicators for all 37 air navigation service providers and concentrates on the pre covid period. Due to the limited data availability, second analysis looks at the three selected European air navigation service providers and compares the financial analysis indicators for 2019, i.e. the year before the outbreak of the pandemic. It also includes 2020, 2021, while the Covid outbreak persisted in Europe. The findings of the paper confirm the stable development of financial and economic indicators in the pre-recession period and also the deteriorating situation during the Covid period. In the conclusion, recommendations are proposed to help to identify more comprehensively the impact of crises such as the Covid-19 crisis on the financial situation of air navigation service providers in order to create a more resilient funding system.

Keywords

air navigation service providers, air navigation services, COVID-19, economic performance, financial analysis

1. INTRODUCTION

The Covid-19 pandemic, which erupted in Europe in early 2020, has hit the aviation sector much harder than other sectors. This impact was mainly due to a decrease in air traffic due to the introduction of government travel restrictions. The decline in traffic is also linked to the decline in air navigation services provided, leading to gate-to-gate revenue, which is the primary component of funding for European air navigation service providers.

Given the timeliness, the article looks at the impact of the Covid-19 crisis on the economic performance of European ANS providers, given that this pandemic still persists and that the aviation industry, and therefore the air navigation service provider, was not prepared for the crisis. The main information bases of the research were data from the ACE Benchmarking Report as well as data from the annual reports of individual European ANS providers, which quantified the effects of the Covid-19 pandemic on selected financial and economic indicators and selected indicators of financial European air navigation service providers.

There are many studies and expert studies that look at the impact of the Covid-19 pandemic articles on European air navigation service providers. However, the articles focus mainly on the demand for transport services, the financial assistance that individual ANS providers have received, but are not focused on research by ANS providers as financial-economic entities. None of the articles analyzed used the same research to determine the impact of the Covid-19 pandemic on the economic performance of European air navigation service providers as used in this article.

2. LITERATURE REVIEW

The individual expert articles cover in particular the operational and, to a lesser extent, the financial and economic impact of Covid-19 on air navigation service providers in Europe. Although more than two years have passed since the outbreak of the pandemic in Europe, the question of the impact of the pandemic on this aviation sector is not fully answered. Therefore, more and more experts and institutions are commenting on this topic in order to assess the real impact of the pandemic on this aviation sector.

The decrease in air traffic in individual airspace caused a decrease in revenues from route and terminal charges and thus affected the economic area of providing air navigation services. In 2020, air traffic in Europe fell by 55% compared to 2019, representing a loss of € 4.9 billion [1]. In 2021, there was a 44% drop in operations, so the loss was € 3.7 billion. Just as there was a decrease in traffic in the airspace, there was also a decrease in traffic in the area control centers. The busiest area control center in European airspace was the control center in the upper airspace of Karlsruhe UAC in Germany, with a decrease in traffic of 44% compared to 2019 [2]. Jobs and wages have been reduced due to cost reductions. The staff who remained in office were properly cared for and created an environment in which they did not tolerate or feel the consequences of the pandemic [3]. On the other hand, the positive news was that the high level of delays in European airspace, due to insufficient capacity in 2019 from April to 2020 due to pandemic reductions, has almost disappeared [4]. The articles focused on the issue of economics only in the impact of the Covid-19 pandemic on revenues, which have seen a significant decline, and on the forms of state aid provided to them. Last but not least, the articles focused on the issue of future funding for the sector, where GATCO and DATCA

suggested two options for future funding, public tax funding or hybrid funding, where air navigation service providers would finance the state at 50% and the remaining 50 as a percentage of airspace users [5].

3. RESEARCH GOAL AND METHODOLOGY

The research applied in this article is divided into two parts and, since the covid period has affected European ANS providers, especially in terms of revenue generation, it quantifies the effects of the Covid-19 pandemic on selected financial and economic indicators of European ANS providers.

The first part of the research is devoted to the pre-covid period and its aim is to characterize the structure and dynamics of selected financial and economic indicators of European air navigation service providers. The data of selected financial indicators of European air navigation service providers for the implementation of the first part of the research come from the reports ACE Benchmarking Reports 2019, 2018, 2017, 2016 and all 37 European air navigation service providers are included in this part. It is important to note that these reports, published annually by Eurocontrol, focus mainly on cost-effectiveness as a key benchmarking indicator in terms of ATM/CNS costs and do not address the issue of financial indicators in a comprehensive way.

The second part of the research consists of performing a financial analysis of selected European air navigation service providers according to Zalai et al. [6]. As not all European air navigation service providers have published annual reports dating back to 2021, 2020 and 2019, only three European air navigation service providers were included in this financial analysis. These three European ANS providers include the Norwegian ANS provider Avinor, the British ANS providers NATS provider and the Swiss ANS provider Skyguide.

4. RESEARCH RESULTS

4.1. Before the covid period

The pre-covid period was analyzed on the basis of selected financial and economic indicators, the data of which come from the ACE Benchmarking Report and from which the article generates indicators of structure, growth rate and calculated values of average, median and standard deviation comprehensively for European air navigation service providers. The individual European ANS providers were grouped in this analysis. The breakdown of groups A, B, C, D and E is taken from Commission Implementing Decision (EU) 2019/903 [7]. The breakdown of Non-SES 1 and Non-SES 2 does not come from Commission Implementing Regulation (EU) 2019/903, but was created by merging these groups, with which the ACE Benchmarking Report works.

The values of the mean, median and standard deviation did not change significantly for the analyzed four-year period before the outbreak of the Covid-19 pandemic for all analyzed financial and economic indicators. This fact confirms the stable development of the individual indicators analyzed in the pre-covid period for European ANS providers as a whole.

In terms of structure indicators, we focused mainly on the share of gate-to-gate revenues, which are formed by revenues from

route and terminal charges to total revenues from the provision of air navigation services due to the fact that the decrease in air traffic during the pandemic decreased this financial-economic indicator the financial situation of European ANS providers was significantly affected. We focused on other selected indicators of the pre-covid period.

Based on the data, we found that route fee revenues total approximately 80 percent or more of total gate-to-gate revenues, and the remaining percentages account for up to 100 percent of terminal revenues. Revenues from gate-to-gate account for more than 80% of total revenues from ANS provision for most ANS providers. The exceptions are the Norwegian provider ANS Avinor for the whole period (49.74% in 2016; 50.03% in 2019) and the Swiss provider ANS Skyguide for the whole period (66.75% in 2016, 68.63% in 2019). The Estonian provider ANS EANS and the Ukrainian provider ANS UKSATSE with the highest value of 100% for all four years analyzed and the Bulgarian provider ANS BULATSA and the Moldovan provider ANS MOLDATSA with the highest value of 100% of the share of gate-to-gate ANS revenues in the total ANS provision for 2019, 2018 and 2017. The results of this structure indicator show that gate-to-gate ANS revenues, which are made up of line and terminal revenues, are key to financing European ANS providers. Based on Table 1, we can see that for groups A, C, D and group Non-SES 1, Non-SES 2, the values of this structure indicator are very homogeneous and reach more than 80%, in group B the exception is mentioned Avinor and in Group E Swiss provider ANS Skyguide.

TABLE 1 SHARE OF GATE-TO-GATE ANS REVENUE IN TOTAL REVENUE FROM ANS PROVISION [SOURCE: 10,11,12,13,14]

ANSPs				
	2019	2018	2017	2016
Albcontrol	99,89	99,73	99,86	99,83
ANS CR	98,61	98,68	98,34	98,11
ANS Finland	85,27	85,23	84,80	97,94
ARMATS	99,96	99,97	99,98	99,95
Austro Control	97,77	97,90	98,96	98,74
Avinor	50,03	51,56	51,48	49,74
BULATSA	100,00	100,00	100,00	99,61
Croatia Control	93,05	90,95	90,27	92,68
DCAC Cyprus	88,77	89,18	89,29	88,06
DFS	84,24	90,89	91,76	92,77
DHMI	99,51	99,53	99,30	99,16
DSNA	94,15	93,82	93,85	95,74
EANS	100,00	100,00	100,00	100,00
ENAIRE	83,93	84,66	78,65	81,02
ENAV	95,12	94,52	94,83	93,93
HCAA	99,03	99,09	98,58	98,11
HungaroControl	96,66	97,28	95,61	95,41
IAA	99,11	99,10	98,82	98,76
LFV	92,79	93,63	93,67	93,12
LGS	98,01	98,19	97,27	97,88
LPS	96,82	96,64	95,46	95,02
LVNL	91,82	93,68	94,70	95,18
MATS	88,06	82,81	88,38	90,00
M-NAV	99,94	99,94	99,88	99,86
MOLDATSA	100,00	100,00	100,00	89,31
NATS	83,26	83,12	81,17	78,84
NAV Portugal	99,04	99,38	99,12	97,58
NAVAIR	90,25	90,12	92,51	93,70
Oro navigacija	95,22	97,66	98,20	96,82
PANSA	98,51	98,20	98,56	98,12
ROMATSA	97,07	97,87	95,61	95,35
Sakaeronavigatsia	96,70	94,60	90,93	88,90
skeyes	81,82	83,68	84,42	83,58
Skyguide	68,63	68,94	67,00	66,75
Slovenia Control	94,67	95,34	95,08	94,23
SMATSA	89,76	91,36	84,93	86,43
UKSATSE	100,00	100,00	100,00	100,00

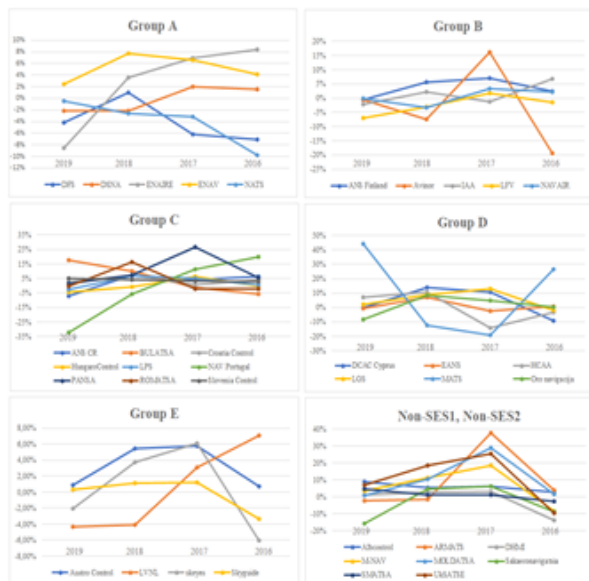
(Group A is marked in yellow, group B in blue, group C in green, group D in orange, group E in red and group Non-SES1, Non-SES 2 in gray).

Based on other analyzed structure indicators, we found the following facts in the research:

- For most European ANS providers, ATM/CNS provision costs account for more than 85% of the ANS provider's total gate-to-gate costs.
- The average percentage value of the share of air traffic controllers in the total number of employees was 31,88% in 2016, 32,04% in 2017, 31,39% in 2018 and 31 % in 2019.
- The share of the sum of the net book value of fixed assets in operation and the net book value of fixed assets under construction in total assets was in only a few cases higher than 70%.
- The share of the sum of long-term and short-term liabilities in total liabilities represented variable values ranging from three to one hundred percent.

In the analysis of growth rate indicators, as with the structure indicators, we focused mainly on gate-to-gate ANS revenues.

Graph 1 describes the growth rate of gate-to-gate ANS revenues of individual European ANS providers. Most European ANS providers have had a similar growth rate of this revenue indicator. The highest value was for the provider ANS MATS, where the growth rate in 2019 was over 40%. The lowest growth rate of 0.07% was with the Cypriot ANS provider DCAC Cyprus in 2019. European ANS providers in Group A and Group E had the lowest values of this indicator (Group A: -9.76% in 2016 for UKSATSE, 8.39% in 2016 for ENAIRE, Group E: -6.08% in 2016 for Skeyes, 6.15% in 2017 also for Skeyes). The highest value of the gate-to-gate ANS revenue growth rate indicator was 63.6% for the ANS MATS provider from group D (44.34% in 2019; -19.26% in 2017).



GRAPH 1 RATE GROWTH OF GATE-TO-GATE ANS REVENUES OF EUROPEAN ANS PROVIDERS BROKEN DOWN BY GROUP [SOURCE: OWN PROCESSING BASED ON DATA FROM ACE AND 2015 BENCHMARKING REPORTS 2019, 2018, 2017, 2016, 2015]

Despite various developments in the years analyzed, selected financial and economic indicators of growth rates and structures confirm the relative stability of the air navigation services sector before the Covid-19 pandemic. This is also justified by the focus of ACE Benchmarking Reports on cost-effectiveness as a major problem for the economy of European air navigation service providers, not the sources of funding and capital structure of these ANS providers.

4.2. Covid-19 period

The data needed to calculate the financial analysis indicators, which are the debt ratio and the profitability indicators, come from the consolidated financial statements and the consolidated balance sheets of the selected ANS providers. For Avinor and NATS, the individual data are provided for the whole group and not only for the ANS provider itself, as is the case for Skyguide.

4.2.1. Debt ratio

For the Norwegian provider ANS, the total indebtedness of assets in 2019 reached 65.403%. In 2020, when the Covid-19 pandemic broke out, the value of this debt ratio increased by 8,037 percentage points and thus exceeded 70%, which represents the company's high debt. In 2021, this value did not change significantly compared to 2020, but there was a decrease of 0.284 percentage points.

For the UK provider ANS NATS, it is important to note that the fiscal year ends on the last day of March. The mass disruption of flights in the United Kingdom took place as early as March 2020. This means that the impact of the Covid-19 pandemic on this ANS provider can only be comprehensively assessed in the annual report from 2021. rising character. Compared to 2019, growth of 4,59 percentage points was recorded in 2020. In 2021, the growth of this debt ratio was higher than in the previous year. The value of total asset indebtedness rose by 8,873 percentage points in 2021. All three values were higher than the recommended values, which represents a higher indebtedness of this provider.

The total indebtedness of assets with the Swiss provider ANS in 2019 was 52,594%. In 2020, this value fell by 0,239 percentage points, but in 2021 it rose by as much as 14,293 percentage points. None of the values during the analyzed three-year period exceeded the value of 70%, which represents the limit value of this indebtedness indicator in terms of recommended values.

TABLE 2 VALUES OF THE DEBT INDICATOR OF ANS AVINOR, NATS AND SKYGUIDE PROVIDERS [SOURCE: DATA OF ANNUAL REPORTS OF ANS AVINOR, NATS AND SKYGUIDE PROVIDERS FOR 2021, 2020 AND 2019]

		Avinor	NATS	Skyguide
Debt ratio	2021	73,156 %	70,508 %	66,648 %
	2020	73,440 %	61,635 %	52,355 %
	2019	65,403 %	57,045 %	52,594 %

4.2.2. Profitability indicators

For the Norwegian ANS provider, the return on total assets reached a negative value of -0.019 during the three-year period

in 2020. The negative value of this profitability indicator indicates the worst situation of the provider in the three-year analysis period. In 2019 and 2021, the values of this indicator were positive. The highest value of this indicator was achieved by the provider in 2019, and thus this year it brought 2 øre net profit to the provider of each Norwegian kroner of total assets. Even in 2021, this indicator brought the provider a profit, but 0.14 øre less than in 2019. The value of the return on equity of the Norwegian provider ANS in 2019 was 0.046. In 2020, this dropped to a negative value of -0.055, and in 2021 the value of this indicator returned to positive values. The negative value of this profitability indicator indicates that in 2020 the ANS provider made a loss of 5.5 øre net profit. In 2019, Avinor achieved a profit of 4.6 øre per crown of net profit, and in 2021 it was a profit 3 øre lower than in 2019.

For the British provider ANS NATS, the value of return on total assets was positive in two years, in 2019 and in 2020. In 2021, this value was negative. In 2019, the provider made a loss of 5.4 pence of net profit for each pound of total assets, and in 2020 it was 4.3 pence less than in the previous year. The value of return on equity decreased from 2019 to 2021 by 0.189. Already in 2020, the value of this profitability indicator reached negative numbers, when in 2020 it reported a loss of 0.1 pence of net profit for every pound of equity and in 2021 this loss was higher by 8.2 pence than in the previous year. The best return on equity was in 2019, when one pound of equity was produced by 10.6 pence of net profit.

Both profitability indicators of the Swiss LAS provider reach negative values throughout the three-year analysis period. In the case of return on total assets, this means that the Swiss ANS provider did not make any net profit on the company's total assets. However, the values of this profitability indicator increased in 2021 compared to the previous year, namely by 0.041. The value of return on equity decreased by 0.628 from 2019 to 2021, when it reached even greater negative values. These negative values tell us that for every single franc of equity, the Swiss ANS provider made a loss in all three periods analyzed. In 2019, this loss was 1.4 rapen net profit, in 2020 53.7 rapen net profit and in 2021 64.2 rapen net profit. Based on data from the annual report of the Swiss provider ANS from 2018, we found that in this year the values of both profitability indicators did not reach negative values, because the values of profit before tax and profit after tax were positive.

TABLE 3 VALUES OF CALCULATIONS OF ANS AVINOR, NATS AND SKYGUIDE RENTABILITY INDICATORS [SOURCE: DATA OF ANNUAL REPORTS OF ANS AVINOR, NATS AND SKYGUIDE PROVIDERS FOR 2021, 2020 AND 2019]

		Avinor	NATS	Skyguide
Return on Assets	2021	0,006	-0,018	-0,214
	2020	- 0,019	0,011	-0,255
	2019	0,020	0,054	-0,006
Return on Equity	2021	0,016	-0,083	-0,642
	2020	- 0,055	-0,001	-0,537
	2019	0,046	0,106	-0,014

5. CONCLUSION

The aim of this article was to analyze the financial situation of European air navigation service providers in the run-up to the Covid-19 pandemic in Europe and the outbreak and persistence of the pandemic and to identify the impact of selected

pandemics on the economic performance of European ANS providers.

Although many experts and organizations are working on the impact of the Covid-19 pandemic on ANS providers, this article uses a different methodology to determine the impact of the Covid-19 pandemic on the economic performance of European ANS providers. Two parts of the research were conducted in the article. The first part, a four-year pre-peace analysis, included all 37 European providers and the data for this research come from the ACE Benchmarking Report. Due to the unavailability of the necessary data, only three European ANS providers were included in the second part of the research, the covid period analysis. The data for this analysis come from the available annual reports for 2021, 2020 and 2019.

In the analysis of the pre-covid period, the values of selected financial and economic indicators did not change significantly, which indicates the stability of this period. Through an analysis of the pre-covid period, we found that gate-to-gate revenues, which are made up of line and terminal revenues, account for the largest share of total ANS revenues from European providers. As travel restrictions introduced in response to the outbreak of the pandemic have led to a decline in air traffic and thus a drop in gate-to-gate revenues, a change in the financing model of European ANS providers will be needed to make it easier for ANS providers to manage crises such as crisis associated with the outbreak of the Covid-19 pandemic.

During the analysis of the covid period, a change in selected indicators of the financial analysis was visible. The calculation of the indebtedness indicator showed a higher indebtedness of the company during the Covid-19 pandemic. The values of the profitability indicators were very diverse, which points to the different impact of the Covid-19 pandemic on selected European ANS providers. Both analyzed profitability indicators showed negative values in the covid period and thus reached a loss for the provider. Profitability manifested itself in these profitability indicators in the pre-ancillary year, but in the year when the pandemic broke out, a certain degree of loss was observed in these profitability indicators. For Skyguide, profitability was recorded in 2018, and a loss rate was reported throughout the period analyzed. The Norwegian provider ANS Avinor showed positive values for both profitability indicators in 2021, which can be assessed as an improving situation.

The mentioned processes of commercialization and corporatization could also be reflected in the consolidated financial statements. All three ANS providers Avinor, NATS and Skyguide have liberalized terminal air navigation services, which affects the economies of these providers not only in terms of cost but also in terms of revenue.

Given that the ACE Benchmarking report focuses only on the cost of ANS providers, which is undoubtedly a financial indicator, this report ignores the revenue aspect of the economy, which has become more significant due to the change in the unit rate method from the full cost method to the fixed method. costs and revenue shortfalls from the provision of ANS due to the Covid-19 pandemic. To comprehensively assess the impact of crises, in our case the impact of the Covid-19 pandemic on the economic performance of European ANS providers, it would be necessary to produce reports that have the same or at least similar accounting standards and without data restrictions and specifically address the financial health of

providers. ANS in the regulated part of the industry, not their whole group. This is likely to be accompanied in the future by a structural reform in the provision of ANS, which may contribute to transparency in the reporting of accounting information (SES2 + recast 2020).

It is important to note that individual airspace blocks are being phased out due to non-fulfillment of their purpose, despite the many successes they have achieved through the cooperation of individual ANS providers within a functional block. The outbreak of the Covid-19 pandemic, which caused a sharp drop in air traffic, has shown that a single European or not resilient enough, as the provision of services is difficult to adapt to transport developments. In September 2020, the European Commission drafted a recast of the 2013 European Parliament and Council Regulation on the implementation of the Single European Sky services from line services. Thus, the decision whether to purchase individual CNS, AIS, ADS, MET and terminal services on a commercial basis will be up to the provider itself. If it decides to purchase through a tender, the performance plans that are developed for the reference period in the key performance areas and key performance indicators will not apply to this. It follows that the ANS provider can decide whether to go through the market mechanism or be pushed by transnational regulation. Airports will also decide for themselves from whom to purchase terminal services through the market mechanism. As a result of these changes, new market entrants will emerge and therefore the provision of ANS should be conditional on compliance with the defined requirements in this Regulation regarding financial soundness, liability and insurance coverage. For this purpose, a proposal is made for the issuance of an economic certificate, which will be issued by individual national supervisory authorities. Article 8 of that recast, which is renumbered Article 6, contains the following wording: 'In addition to the certificates they must hold in accordance with Article 41 of Regulation (EU) 2018/1139, air navigation service providers shall also hold an economic certificate. This economic certificate shall be issued on application, provided that the applicant has demonstrated sufficient financial soundness and has obtained adequate liability and insurance coverage'[8]. The wording of this article supports the basic idea and conclusions of this article that ANS providers should be seen as financial entities and that the future development of ANS providers in Europe will require a structural reform that separates the provision of core services from organizational and accounting services. support services, as well as the organizational and accounting separation of the provision of terminal services from the core services. . The proposed structural reform does not envisage the creation of a transnational fund to finance the provision of ANS, which appears to be an alternative to structural reform. It is also possible to set up such a fund, which could financially rehabilitate the system in the event of major crises and which would be a support instrument for financing such crises.

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