
The Air Freight Market During the Pandemic

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Abstract:

Purpose: In the paper some analyses of air cargo transport during the Covid-19 pandemic in 2020 in selected European countries were presented. The main goal of this paper is to try to assess, based on the analysis of the correlation between the scale of crises in the cargo and passenger air transport market, whether passenger planes have partially taken over the cargo market.

Design/Methodology/Approach: The percentage share of air cargo transport in the European market in 2018 and the volume of cargo transport per capita in these countries for 2019 were examined. In the research the linear correlation coefficient to analyze the correlation between the scale of crises in both markets (passenger and cargo) was applied.

Findings: Freight transport has been affected by the crisis, albeit to a lesser extent. However, it is a myth that freight transport, also in crisis, could save airlines, which may be indicated by the lack of correlation between the scale of the crisis on both freight and passenger markets across European countries.

Practical Implications: It is important to properly assess the size and types of aircraft available and the logistics around them, as well as the balances of cargo and passenger flights. This will enable the transition to gradual and reactionary changes in the transport of cargo and passengers depending on the prevailing market situation in the industry.

Originality/Value: The paper can be used for advanced analyzes enabling policy makers to prepare the right actions for the aviation industry.

Keywords: Air transport, cargo transport, the Covid-19 pandemic, risk management.

JEL classification: L91, L93, R40.

Paper Type: Research article.

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1. Introduction

In recent years the aviation sector has been characterized by a steady growth, both in passenger transport (an increasing demand for tourism), but also in freight transport worldwide. As one of the key development sectors, it influenced the social development and economic growth of countries, creating jobs in the entire value chain of the sector (Dube and Nhamo, 2020). The crisis caused by the Covid-19 pandemic made destabilization and one of the biggest slumps in this market in history, incomparable to the crisis of 2008, or the decline in passenger transport caused by the attacks in 2001. The aviation industry has already experienced various crises and shocks, even in 2009 there was the A/H1N1 pandemic, but its scale was nothing like the actions taken in the case of Covid-19. There is a possibility that the pandemic could change the pattern of world trade, affecting globalization and trade relations. Certainly, some economies will lose this game, but there will also be the winners.

Air freight services have not been imposed such severe restrictions as in the case of passenger transport, thus the carriers did not have to suspend their activities. Moreover, there was a need to quickly transport medical equipment, security measures and other necessary materials to fight the pandemic, and the use of air transport was essential then. Unfortunately, the crisis did not spare air cargo transport.

The subject of the impact of the pandemic on the aviation industry is raised by scientists. However, most of the research is carried out on passenger air transport, and less frequently on freight, especially when it comes to European coverage. The paper aims to fill this gap, and can also be used for advanced analyzes enabling policy makers to prepare the right actions for the aviation industry. The main goal of this paper is to try to assess, based on the analysis of the correlation between the scale of crises in the cargo and passenger air transport market, whether passenger planes have partially taken over the cargo market. The literature on the subject indicated that one of the solutions adopted in the air transport market in such a deep crisis could be the use of passenger planes for cargo transport, replacing passenger transport with a greater number of cargo flights. The prospect of developing air transport has great potential due to the development of the e-commerce market. In addition, the free space in airplanes, due to the need to comply with the limitations of social distance rules, could be used for additional cargo (Sun *et al.*, 2021).

2. Literature Review

Air transport is a very important branch of transport in the world economy. It is a relevant driving force for the development of the country. This is one of the fastest, most expensive but on the other hand, the most effective types of transport (Kuczek, 2015).

Freight air transport is viewed through the prism of passenger flights over long distances. The air cargo sector is characterized by wide development opportunities in the future, however, appropriate knowledge and experience in management are necessary. The majority of cargo air transport is carried out with the use of liners, a much smaller part by specialized freighters. Air cargo can typically consist of air, post and express shipments. Shipments differ in size (e.g., air shipments are usually larger and heavier, express ones are often consolidated into packages defined in terms of weight and dimensions, while postal ones include documents and letters) (Boeing, 2012; Janić, 2019).

The aviation industry is one of the economic sectors most affected by the pandemic (Suau-Sanchez *et al.*, 2020). The International Air Transport Association (IATA) determines the total losses of global airlines at USD 118 billion in 2020 (IATA, 2020). The effects of the restrictions (as one of the most important factors affecting the condition of air transport) in connection with the Covid-19 pandemic are enormous, which is also indicated by the number of passengers handled in relation to 2019 (passengers who could not or did not want to fly in fear of contagion, or the inability to return or other restrictions). The crisis that affected air transport related to the Covid-19 pandemic showed the problems that characterized the global air transport system, including low profit margins of the sector (Gössling and Higham, 2020; IATA, 2019) or the infamous impact of transport on environmental pollution and climate change (Fahey and Lee, 2016). Commitment to reduce emissions and develop alternative fuel sources may provide long-term solutions that increase environmental sustainability (Bartle, Rebecca, and Leuenberger, 2021). It should be taken into account that in the long term the benefits of environmental sustainability resulting from reducing air pollution may not disappear, for example, in the event of an improvement in the epidemiological situation and a return to the number of flights at the same level as before the pandemic.

It should be emphasized that the aviation sector was one of the reasons for the spread of the disease, with a local epidemic it caused a global pandemic (Budd *et al.*, 2009; Browne *et al.*, 2016; Yang *et al.*, 2020). The effects of the pandemic may be severe on the global economy in the future, hence the need to analyze the currently functioning transport systems, and also to think about them politically in order to reduce the existing economic weaknesses. In order to maintain sustainability benefits, some approach must be planned and adopted. It should be based on pre-crisis and post-crisis data.

3. Methodological Approach

The subject of the analyzes is air freight transport of European countries for the period 2019 and 2020, and the impact of the Covid-19 pandemic on the industry as a factor posing a threat to the sector analyzed. The differentiation of the position of European countries with regard to the air freight industry was presented. The

analysis covered European countries on the basis of data contained in Eurostat, reports and websites related to air transport.

In the paper the percentage changes in freight and passenger transport between 2019 and 2020 were determined, and the correlation between them was examined using the linear correlation coefficient. The results are shown by means of a scatterplot. Some of the analyzes were illustrated by choropleth maps, which made it possible to assess the spatial distribution of changes in the aviation market resulting from the crisis in 2020.

4. Conducting Research and Results

4.1 The Level of Cargo Transportation by Air Transport

Air transport is sensitive to changes, and the impact of the COVID-19 pandemic on the functioning of supply chains is obvious. Problems resulting from the restrictions implemented, hampering the operation of the market, the need to meet the set standards, regulations and safety requirements that must be met by goods, are decisive criteria as for high costs as a result of compliance with the restrictions applied. Despite the closure of the airspace, and further restrictions on the freedom of goods during the pandemic, many new transport orders were created (especially for medical equipment, vaccines and other medicaments). Moving cargo by air can be an additional source of revenue for airlines.

Table 1 shows the percentage share of air cargo transport in total cargo transport for European countries in 2018. The highest percentage of air cargo transport was recorded for Germany (26.1%), around 14% for England and France. The table also shows the volume of air freight transport (expressed in thousands of tonnes) in 2018-2020. 8 of the 31 European countries analyzed account for 80% of air cargo transport in Europe. Polish cargo transport has so far developed relatively quickly, but according to IATA, it accounts for only about 1 percent of the European market (Derewienko, 2019). Figure 1 shows the volume of freight transport per capita in selected European countries for 2019. The transport per capita rate ranges from 154.3% in Iceland to 2.3% in Romania.

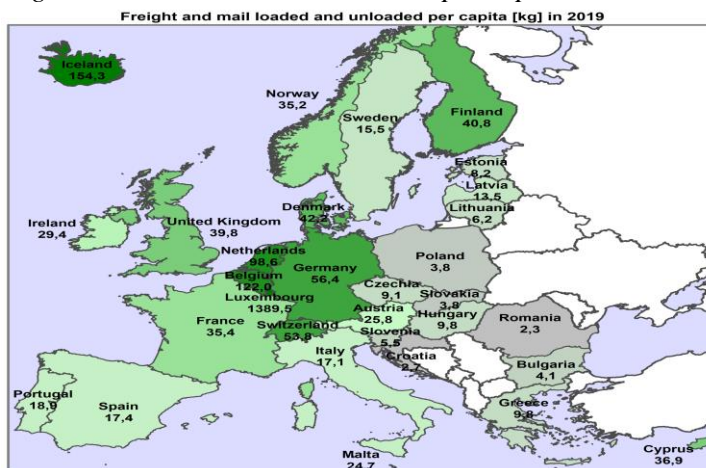
Table 1. *Percentage share of air freight in the European freight transport in 2018*

Country	Percentage share in 2018	2018	2019	2020
Germany	26.1	4 843	4 685	4 498
The United Kingdom	14.8	2 749	2 650	1 683
France	13.0	2 408	2 377	2 140
The Netherlands	9.9	1 840	1 704	1 591
Belgium	7.6	1 416	1 398	1 585
Italy	5.7	1 066	1 022	724
Luxembourg	4.8	895	853	905
Spain	4.3	807	816	600
Switzerland	2.7	493	460	273

Denmark	1.3	242	245	182
Austria	1.3	238	228	165
Finland	1.1	197	225	147
Norway	0.9	175	187	176
Portugal	0.9	173	194	133
Sweden	0.9	159	48	134
Ireland	0.8	156	144	125
Poland	0.7	135	143	110
Hungary	0.5	101	96	89
Greece	0.5	97	105	73
Czechia	0.5	91	97	71
Iceland	0.3	57	55	49
Romania	0.2	45	44	39
Cyprus	0.2	32	32	24
Bulgaria	0.2	29	29	26
Latvia	0.1	25	26	19
Slovakia	0.1	25	21	25
Malta	0.1	18	12	13
Lithuania	0.1	17	17	20
Slovenia	0.1	12	11	11
Croatia	0.1	12	11	8
Estonia	0.1	11	11	9
Total	100	18563	17947	15615

Source: Own compilation, Eurostat (The volume of freight transport for United Kingdom was determined on the basis of data from January to October 2020 (no data for the fourth quarter) presented according to Eurostat).

Figure 1. Freight and mail loaded and unloaded per capita in 2019



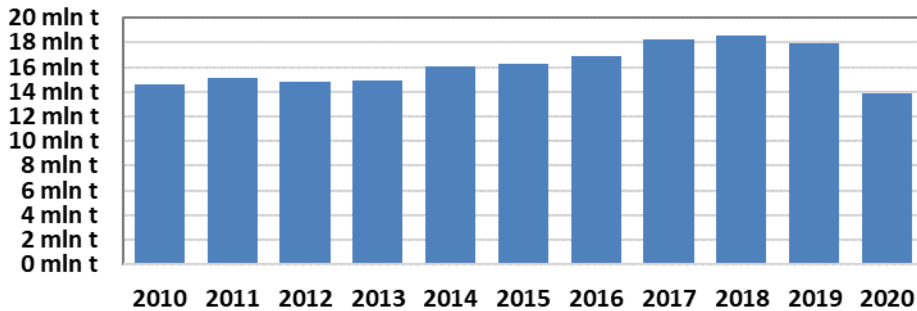
Source: Own compilation, Eurostat.

There is a clear dominance of the Benelux countries, as well as: Germany, Switzerland or Iceland (in this case, it should be taken into account that it is an island country). Taking into account the spatial location, the countries of Eastern Europe in terms of the index analyzed do not present the best, in a sense, we can speak of their backwardness as the low rate of freight transport per capita proves the economy of relatively low technological advancement.

4.2 The Impact of the Pandemic on the Level of Air Cargo Transport

Due to the pandemic some passenger transport, and hence the freight transport of some cargo carried by airplanes were “grounded”, which resulted in the reduced transport capacity. The question arises: what changes and adaptations of some passenger planes to the needs of cargo transportation in the passenger space did it make, and what was the condition of the rest of the air transport market during the pandemic? The transport of health goods in large quantities by air cargo during the pandemic has certainly increased. The second figure shows the volume of annual cargo transport by air and mail in 2010-2020. In 2020, there was a clear decrease in the transport operations analyzed due to the pandemic.

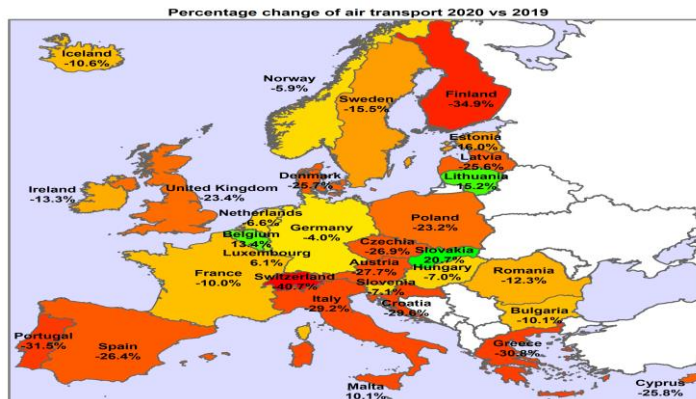
Figure 2. Freight and mail loaded and unloaded in thousand tonnes in the years 2010-2020 (Europe)



Source: Own compilation, Eurostat.

In 2019, air cargo transport amounted to around 18,000 tonnes, a 4% decrease compared to the previous year and almost a double increase in ten years (71%, 2009-2019). Figure 3 shows the percentage change in air cargo transport in 2020 compared to 2019.

Figure 3. Percentage change in air freight transport between 2019 and 2020



Source: Own compilation, Eurostat.

Almost all European countries under the analysis saw a decline in air cargo transport. Only in the case of Slovakia, Lithuania, Luxembourg and Belgium, an increase in freight transport was recorded in that period, by 20.7%, 15.2%, 6.1% and 13.4%, respectively. In the analysis of the percentage change in air freight transport, the countries of southern Europe perform the worst: Switzerland (a decrease in transport by 40%), Portugal (-31.5%), Greece (-30.8%) and Italy (29.2%).

The decrease in transport results mainly from the decline in the volume of flights of passenger planes as a large part of the cargo is carried on board. According to estimates, before the pandemic, the belly cargo, i.e. the cargo transported by scheduled passenger planes accounted for approximately 54% of the cargo capacity of global air transport. As a result of grounding and largely eliminating the belly cargo, it was down 53.1% for the full 2020 (IATA, 2020a). For the international air transport market, this resulted in a decrease in the available cargo capacity by 24.1%. Even the increased exploitation of the global freight fleet could not compensate for these losses (Ofiakowski, 2021).

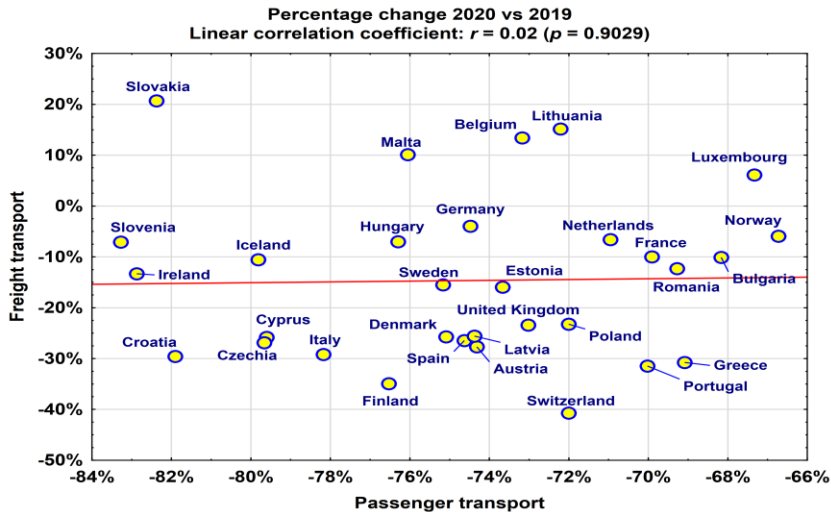
4.3 The Crisis in the Passenger Transport Market versus the Crisis in the Freight Transport Market

Closing borders and introducing restrictions, as well as flight bans contributed to the fact that 2020 was the most difficult time for all civil aviation. It should be emphasized that the 2020 summary for cargo transport looks much better than for passenger transport in all the countries analyzed. In the period from January to December in 2020 to 2019, cargo transport on boards of all aircraft decreased by an average of 15% for the European countries. In the case of passenger transport, in the same period there was a decrease in transport by as much as 75%. Thus, when comparing the measures of the crisis (percentage changes in transport in 2020 compared to 2019) in the freight and passenger transport market, presented in Figure 4, a much larger scale of the collapse is observed in the latter (in passenger transport).

In all the countries analyzed, the level of passenger transport decreased at least threefold, and in some almost sixfold. Freight traffic did not fall by more than a half in any country. It is interesting that there was no correlation between the scale of crises in both markets - the above chart is almost a model example of the lack of dependence (the correlation coefficient confirms this visual observation: $r = 0.02$).

In Slovakia, the crisis in passenger transport was one of the largest among the countries analyzed, while the volume of transported goods increased by 20% in 2020. On the other hand, in Croatia, with a similar scale of decline in passenger transport, a nearly 30% decrease was also recorded in the freight transport market. It seems that the crises in both markets were caused by other factors - decisions of state authorities regarding restrictions and the specificity of the economy of the given countries.

Figure 4. A comparison of changes in the freight and passenger transport market between 2019 and 2020



Source: Own compilation, Eurostat

In 2020, a marked decrease in the level of transport demand was noticeable. In 2021, globally, one can talk about eliminating the problem with the pandemic and its impact on the demand in the air freight sector, while in an in-depth analysis the level of this demand in terms of regional (continental) is highly diversified. World volumes for the first quarter of 2021 behave comparable to those of 2019. With an in-depth analysis by May 2021 by regions (parts of the world), Europe (-8%) or the Middle East and South Asia (-20%) are below 2019 levels in terms of air transport, while Central and South America (5%) and North America are characterized by an increase in a given relation over time. However, the year-on-year changes in revenues in USD seem to be of the key importance. A clear increase to 2019 is observed for all regions, but Asia and the Pacific countries have outclassed the rest of the world (125% versus 57% revenue growth for Europe - the second position in the ranking, or the Middle East and South Asia with an increase of 45% - third position in the classification) (website: <https://worldacd.com/trends>).

5. Conclusions

The results from March 2021 on air cargo transport show that the pandemic still has an impact on limiting the movement of people by air transport, while the transport of goods is catching up quickly. The restrictions introduced cause a decline in a social activity, and this must translate into a decline in demand in many markets. It is also noticeable in a decline in air cargo. Freight transport has been affected by the crisis, albeit to a lesser extent. However, it is a myth that freight transport, also in crisis, could save airlines, which may be indicated by the lack of correlation between the scale of the crisis on both freight and passenger markets across European countries.

The unexpected Covid-19 crisis brings with it the need to draw the appropriate conclusions, especially those directed towards goals related to sustainable development. Any infrastructural changes must protect human welfare and the environment, while pursuing its economic goal, while maintaining the efficiency and effectiveness of the air transport system. It is important to properly assess the size and types of aircraft available and the logistics around them, as well as the balances of cargo and passenger flights. This will enable the transition to gradual and reactionary changes in the transport of cargo and passengers depending on the prevailing market situation in the industry.

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