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European aviation transportation during the COVID-19 crisis

Europejski transport lotniczy podczas kryzysu COVID-19

Abstract: This article examines the effects of uncertainty shocks such as the one posed by the current COVID-19 pandemic on global airline transport with a particular focus on the European region, including Poland. The rationale behind the topic choice is that air transport, mainly passenger one, belongs to those economic sectors that are most affected by the global pandemic due to lockdowns of economies, travel restrictions set up by countries around the world, and people reluctance or fear to travel. As the pandemic situation is still changing, the previous assessments of the COVID-19 impacts available in literature require continuous updating. In this respect, using the most up-to-date data, the current paper contributes to a growing body of knowledge by focusing on such aspects as changes in air traffic volume, passenger and cargo, the financial condition of air transport providers, and this industry employment. The article is of a descriptive character. It is based on the scientific and popular literature, and publicly available Eurostat and Statista statistics as well as aviation industry-specific sources (ICAO, Eurocontrol, IATA, ATAG). The research adopts the methodological approach proper for a positive economics. The results indicate that not the entire aviation sector was negatively affected by COVID-19, as freight and private non-commercial aviation transport increased sharply during the pandemic.

Key words: airlines, passenger traffic, air cargo, pandemic crisis, financial performance, employment, Europe, Poland

Synopsis. Niniejszy artykuł analizuje skutki szoków niepewności, takich jak ten wywołany pandemią COVID-19 na globalny transport lotniczy, ze szczególnym uwzględnieniem regionu europejskiego, w tym Polski. Uzasadnieniem wyboru tematu jest przynależność transportu lotniczego, głównie pasażerskiego, do tych sektorów gospodarki, które najbardziej utraciły w wyniku globalnej pandemii ze względu na blokady gospodarek, ograniczenia w podróżowaniu nałożone przez kraje na całym świecie i obawy czy niechęć ludzi do podróżowania. Ponieważ sytuacja pandemiczna wciąż się zmienia, wcześniejsze oceny skutków COVID-19 dostępne w literaturze naukowej i popularnej wymagają ciągłej aktualizacji. W tym zakresie wykorzystując najbardziej aktualne dane, niniejszy artykuł przyczynia się do poszerzania wiedzy, skupiając się na takich aspektach, jak zmiany w natężeniu ruchu lotniczego, pasażerskiego i towarowego, kondycja finansowa przewoźników lotniczych, a także zatrudnienie w branży. Artykuł ma charakter przeglądowy. Opiera się na literaturze naukowej i popularnej oraz publicznie dostępnych danych wtórnych (Eurostat i Statista), a także na źródłach specyficznych dla branży lotniczej (ICAO, Eurocontrol, IATA, ATAG). W badaniu przyjęto podejście metodologiczne właściwe dla ekonomii pozytywnej. Wyniki wskazują, że COVID-19 nie wpłynął negatywnie na cały sektor lotniczy, ponieważ transport towarowy i prywatne przewozy pasażerskie gwałtownie wzrosły podczas pandemii.

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Słowa kluczowe: linie lotnicze, ruch pasażerski, cargo, kryzys pandemiczny, wyniki finansowe, zatrudnienie, Europa, Polska

JEL codes: L93, M21, R41

Introduction

Within the framework of the theory of exogenous economic growth, the natural crises such as disease pandemics are external shocks that deteriorate business activities and reduce the potential for economic growth. The peculiarity of the COVID-19 crisis is that it has spread rapidly throughout the world. In addition, the current pandemic has shaken individual economies on both the supply and demand sides. The crisis generally affects every business sector; however, the scale and direction of this impact differ depending on its specificity.

When it comes to air transportation, in the pre-COVID-19 years, it performed quite well. It belonged to the most dynamically developing economic sectors with the annual growth in global air traffic passenger demand reaching about 7–8% in 2015–2018, and 4% in 2019 [Statista 2021a]. In 2019, the number of scheduled passengers boarded by the global airline industry amounted to over 4.2 billion people and doubled since 2005 [Statista 2021b].

It changed radically in the COVID-19 period. Government restrictions to stem SARS-Cov-2 spreading have led to border closures, lockdowns and a dramatic downturn for domestic and international human mobility which disrupted commercial activities and caused general shrink of national economies thus affecting transportation networks that include sea, air, rail, and road transport. On supply side, the pandemic has halted the domestic and international supply chain, on demand-side, it decreased domestic and international demand for transport, especially passenger one.

The aviation sector has faced many disruptions throughout history, e.g., the oil embargo, airline deregulation, terrorist attacks and the great recession [Ito and Lee 2005, Luft 2006, Pearce 2012, Davies 2016] but none has been as rapid and severe as the one caused by current pandemic. While previous crises have slowed down the growth of the aviation industry, none of them led to a complete halt to operations. For example, in 2002, after the terrorist attacks in the United States, air traffic in Europe fell by 2%. The financial crisis of 2009 translated into a decrease of 6.6%. The eruption of the Icelandic volcano Eyjafjallajökull in April 2010 resulted in the cancellation of 111 thousand flights [ECA 2021].

According to a recent Fitch's special report, the COVID-19 pandemic has resulted in the worst event-driven crisis in modern aviation history, materially negatively affecting the financial and credit metrics of airlines, aircraft lessors and airports, and the performance of aircraft and engine asset-backed securities [Fitch Ratings 2021].

The air transport sector as a whole, experiencing a sharp contraction in economic activity, revenues, and profits is commonly classified by researchers as an economic loser from the pandemic [Abay et al. 2020, Sokol and Pataccini 2020, Zawojska 2021].

Airline companies are directly exposed to the virus and suffer negative effects from the drop in travel demand. As it is well known, following the COVID-19 outbreak, states imposed strict measures, such as travel restrictions for passengers and transport personnel, as well as flight bans, to help contain the pandemic. This made air transport arguably the most affected sector of the economy, with thousands of aircraft stranded around the globe.

Given world passenger traffic, it was 49% lower in 2021 vs. 2019 and 60% lower in 2020 vs. 2019. In 2021, compared to 2019, there was an overall reduction of the seats offered by airlines by 40%, of passengers by 2,2 billion persons, and a loss of gross passenger operating revenues of airlines estimated at approximately USD 324 billion [ICAO 2021]. The post-COVID number of scheduled passengers boarded by worldwide airline industry fell to 1.81 and 2.28 billion in 2020 and 2021, respectively. In response to the new situation, within commercial air transport, there has been a shift from activities that involve higher exposure to the virus (passenger transport) to safer substitutes such as cargo transport.

The commercial supply chain of the aviation industry in Europe is not focused on the European market as European planes are sold to international customers and European suppliers can be found, for example, in the supply chains of Boeing and Airbus. European players generated combined revenue of USD 146 bn in 2019 [del Camp et al. 2021].

The worldwide literature on the multifaceted impacts of the COVID-19 is very huge. Several recent contributions have investigated the consequences of COVID-19 on aviation industry and air transportation in different dimensions, either at the global level [Iacus et al. 2020, Sun et al. 2020, 2021, Dube et al. 2021, Gudmundsson et al. 2021], European level [Albers and Rundshagen 2020, Budd et al. 2020, Iacus et al. 2020, Nižetić 2020, Cifuentes-Faura and Faura-Martínez 2021, Kökény et al. 2021] or country level [Janczuk and Czapski 2020, Li 2020, Florido-Benítez 2021, Wasowska et al. 2021, Wolle 2021].

Another works have examined the impact of air transportation on the risk of the COVID-19 outbreak and the spread of disease [Craig et al. 2020, Daon et al. 2020, Nakamura and Managi 2020, Nikolaou and Dimitriou 2020].

It should be emphasized that the purpose of this study is not a comprehensive review of the literature published so far. This article collects and analyses the latest data on air transport traffic, both passenger and freight, the financial results of and employment in the airline industry, concentrating on the European region, including Poland, to show the impact of the COVID-19 pandemic on these dimensions reflecting the economic prosperity of the sector.

Our study, therefore, adds value to the growing body of knowledge on COVID-19 and its repercussions regarding different aspects of the European air transportation industry as well as contributes to the academic discussion on this topic.

Aim and methodology

The research aims to identify the changes in aircraft, passenger and cargo movements, as well as the aviation industry's financial performance and employment, during the COVID-19 crisis, in the European region.

The rationale for the theme choice is that air transport in general, and passenger transport in particular, is one of the economic sectors most affected by the pandemic. As the pandemic situation is still changing, the previous assessments of the COVID-19 impacts available in scientific and other literature require continuous updating. In this respect, using the most up-to-date data, the current paper contributes to a growing body of knowledge.

The nature of our study is descriptive and not prescriptive. It follows a positive economics' paradigm which in principle is independent of any normative judgments or value-based approach to the subject. It deals with what has been, is, or will be, rather than what ought to be. Empirical evidence or assumptions about facts have normative implications as

expressed in statements about what is good or desirable and what is not. The normative (advocacy-oriented) approach, however, is out of the scope of this paper and dedicated to another contribution.

Using a variety of industrial historical time series, we analyze quantitatively how the pandemic affected the European and domestic airline sectors, also referring to a global perspective. To capture changes, the data covers the pre-pandemic periods and during pandemic development. The applied statistical methods include the analysis of time series data based on tabular presentations and constructed graphs good suited for identifying patterns in the data. Additionally, dynamics measures (time indices and rates of growth) were employed.

The research is based on the review of the relevant scientific and popular literature, and publicly available secondary data drown from Eurostat and Statista, specific sources associated with the airline industry (the International Civil Aviation Organization – ICAO, the European Organization for the Safety of Air Navigation – Eurocontrol, the International Air Transport Association – IATA, the Civil Aviation Authority of Poland, and Air Transport Action Group - ATAG) as well as the International Finance Corporation – IFC.

Results and discussion

Air traffic

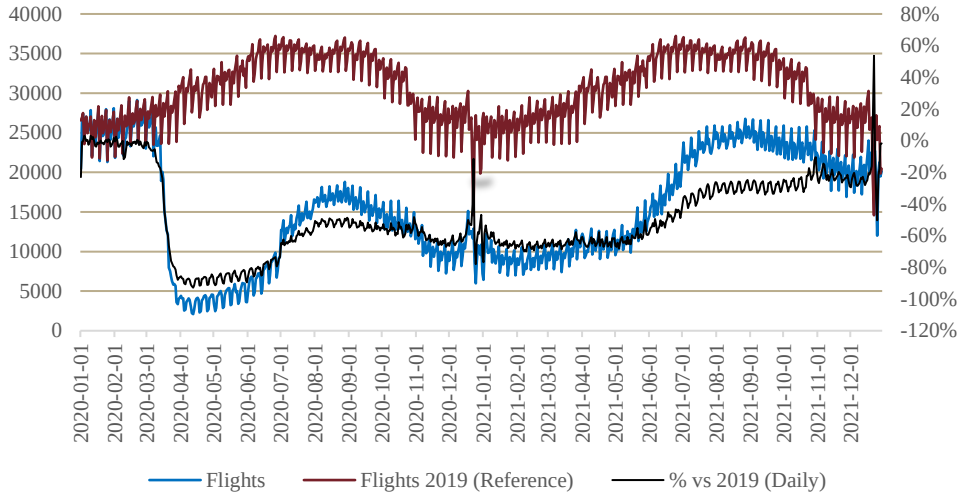
On March 16, 2020, the European Commission adopted Guidelines on border management measures to protect health and ensure the availability of goods and essential services. They underline the principle that all EU internal borders should remain open to freight and that supply chains for essential goods such as food, including livestock, medical equipment, personal protective equipment, and substances of human origin, should be guaranteed. According to the Commission, it is in everyone's interest that, in these extraordinary times, the free movement of goods continues to be free [European Commission 2020a].

To prevent the spread of the pandemic, countries around the world have taken a number of restrictive measures since the beginning of 2020. The air transport industry has suffered a blow due to these constraints but the latest European flight data shows signs of recovery (Figure 1).

As a result of the COVID-19 pandemic, the number of flights in Europe decreased by 55% in 2020 and resulted in 6.1 million fewer flights against the 2019 level. For comparison, in the USA, air traffic decreased by 33.5%, which corresponds to 5.3 million fewer flights. The higher reduction in the European region appears to be linked to the differences in air market composition and various coronavirus-related measures implemented by the European states. On both Atlantic sides, domestic traffic was less affected than international traffic.

As flight restrictions were mainly imposed on long-distant international flights, the impact of the COVID-19 pandemic on these flights was much stronger than on domestic flights [Sun et al. 2020].

The share of domestic traffic in the USA (85.6%) is much higher than in Europe (28.4%)[1] which contributed to a smaller reduction in all US traffic. The relatively high proportion of international traffic both within and to and from Europe, as well as the various COVID-19 quarantine and testing procedures appear to have contributed to lower levels of traffic in Europe [European Commission 2021a].



Notes: The comparison with 2019 is made using the closest similar days: i.e. Friday 01/01/2021 is compared to Friday 04/01/2019. Traffic = total IFR flights (including international arrivals, departures, domestics but excluding overflights.

Figure 1. Daily traffic variation in European countries

Rysunek 1. Dzienna zmiana ruchu w krajach europejskich

Source: own elaboration based on Eurocontrol data [Eurocontrol 2021a].

Flight variation depicted in Figure 1 can be explained by many different factors including COVID-19 and overall economic downturn caused by pandemic, as well as the failure of airlines, disruptions in Air Navigation Service Provider (ANSP) that gives the service of managing the aircraft in flight or on the manoeuvering area, airports' disruptions, and traffic variation in the reference year of 2019.

The latest data show that in December 2021, traffic demand at the European level varied on average between 30% and 40% of the traffic levels for the respective days and months of 2019 [Bucuroiu and Vincent 2021]. Most, if not all, air traffic service (ATS) centers in Europe still applied some specific measures related to COVID-19. According to the Eurocontrol, the most likely traffic forecast estimates that annual air traffic in 2022 will be 89% of 2019 levels [European Commission 2021b].

In the case of Poland, the largest reduction in daily flights (by 80–90%), compared to the reference period of 2019, took place between April and June of 2020. In the EU region,

[1] Unlike Europe, in the US, there is no good alternative to air transportation when it comes to traveling from the East Coast to the West.

the peak was reached in April when the number of flights fell by more than 89% [Nižetić 2020].

Respectively, in some weeks of 2021, they have down 70% against 2019 (Figure 2). From March 1, 2020, Poland has lost around 400,000 flights.

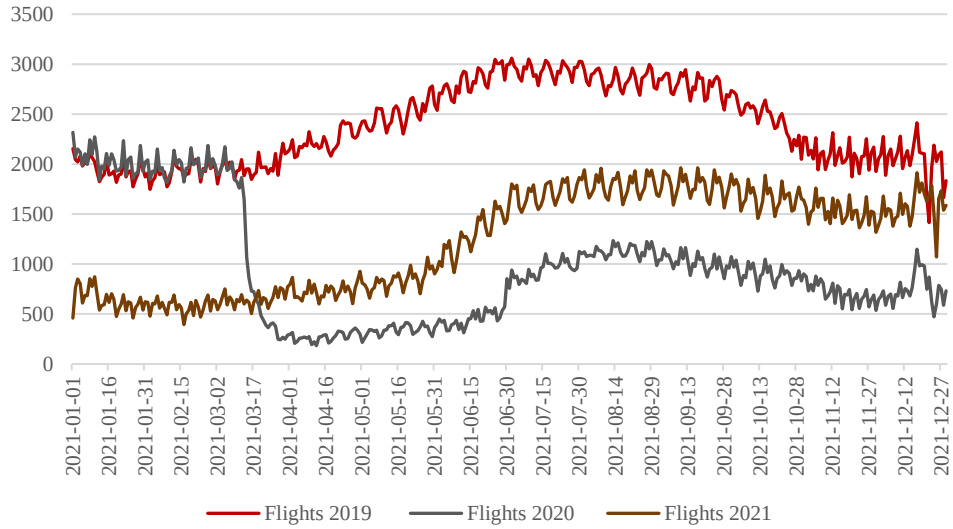


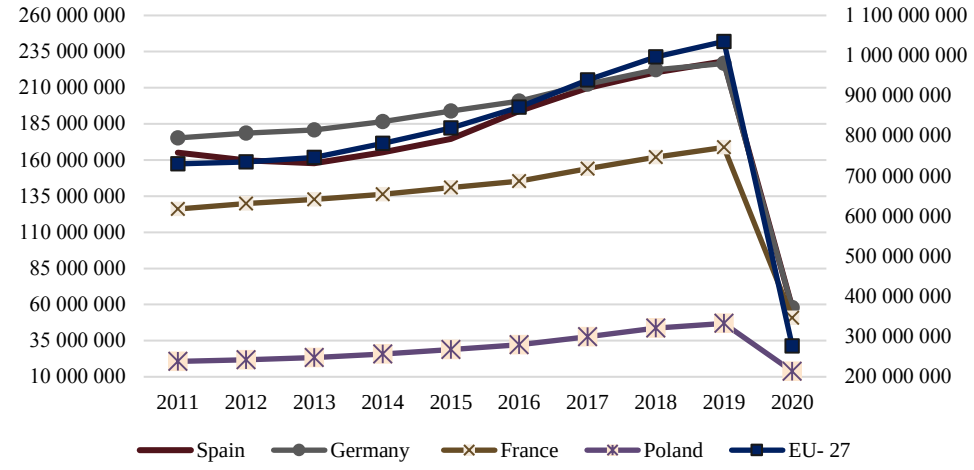
Figure 2. Daily traffic variation in Warsaw ATS, Poland, 2019–2021
Rysunek 2. Dzienna zmiana ruchu w Warszawie, Polska, 2019–2021
Source: own elaboration based on Eurocontrol data [Eurocontrol 2021a].

Only 65% of the capacity will be available at Warsaw Chopin Airport until March 26, 2022. The main limitation is the passenger terminal with reduced capacity due to social distancing. The capacity of the runway (RWY) will be maintained at the same level [Bucuroiu and Vincent 2021].

Passenger transport

Figure 3 shows the annual number of transported passengers (arrivals and departures) in the entire EU (the United Kingdom excluded), as well as in Poland and the three countries with the highest passenger traffic in 2019. The data includes all passengers on a given flight (with one flight number) counted only once and not repeatedly on each stage of that flight. These are all revenue and non-revenue passengers whose journey begins or ends at the reporting airport and transfer passengers joining or leaving a flight at the reporting airport. Direct transit passengers are excluded.

In the EU-27, the number of passengers traveling by air dropped from 1,035.2 million in 2019 to 276.7 million in 2020 due to the coronavirus pandemic. As borders are opening up in most European and other parts of the world and travel bans are relaxed, airlines are moving closer to their pre-pandemic flight schedules. However, Omicron threatens to disrupt passenger traffic in 2022 timetables.



Notes: Right axis denotes the EU-27.
Figure 3. Air transport of passengers by country, 2016–2020
Rysunek 3. Transport lotniczy pasażerów według krajów, 2016–2020
Source: own elaboration based on Eurostat [Eurostat 2021].

The highest drop in passengers between 2019 and 2020 (by 80%) was evident in small countries (Slovenia, Slovakia, Cyprus, and Montenegro), while the lowest one but still high (by two-thirds) in Norway and Luxembourg (Figure 4). In Poland, this decline was at 70%.

According to the data of Poland's Civil Aviation Authority, in the 2020 second quarter, the population of passengers on domestic and international flights, both regular and charter ones, at Polish airports was 99% lower compared to the second quarter of 2019. This sharp drop was due to suspending, in March 2020, all regular flights to and from Poland as well as domestic flights [Wasowska et al. 2021]. Passenger traffic at Poland's national airline, PLL LOT, plunged by over 70% in 2020 to 3.1 million people (in 2019 – 10.5 million), and the number of charter flights – by 73% [PAP 2021].

The results of the prediction analysis conducted by Gudmundsson et al. [2021] show that European temporary recovery of passenger demand to pre-COVID-19 levels will take on average 2.7 years starting from 2020 (by late–2022). In the pessimistic scenario, Europe may need as much as six years to regain air travel passengers. Airlines have been upbeat about a rebound in passenger transport demand, particularly after governments lifted travel restrictions, but countries can limit travel again as new coronavirus variants are detected.

According to Wolle [2021], the main driver of a slow recovery in passenger air travel is the combination of travel restrictions and a lack of international cooperation, which leads to a fragmented market situation in Europe and affects consumer confidence.

The question is whether the entire aviation sector was hit during the COVID-19. What, if any, segment of passenger travel surged during the pandemic? The answer is as follows: one particular niche – private aviation. While data on private non-commercial flights is very limited, the media suggests that the demand for private jets and air travel is booming during the current pandemic.

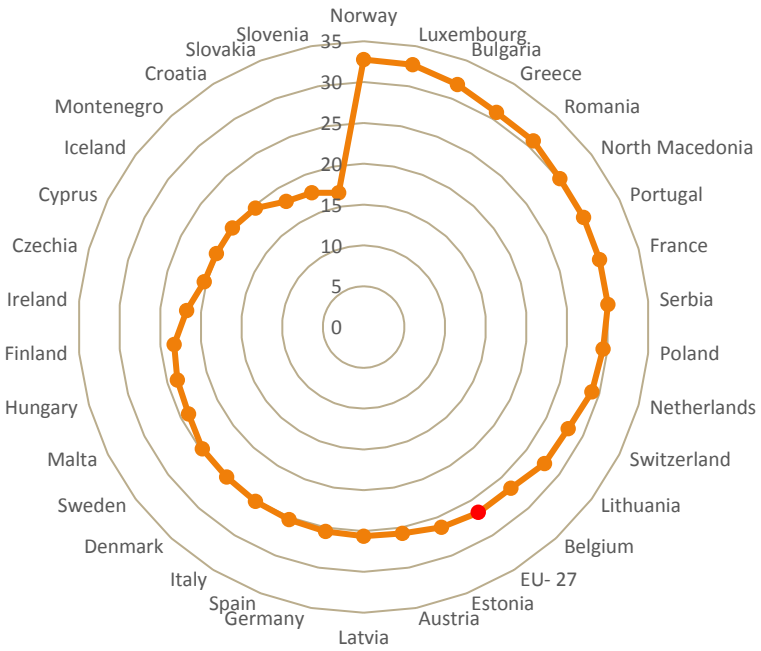


Figure 4. The 2020 air transport passengers as a percentage of 2019 relevant passengers by country
Rysunek 4. Pasażerowie w transporcie lotniczym w 2020 r. jako odsetek tych pasażerów w 2019 roku według krajów
Source: own elaboration based on Eurostat [Eurostat 2021]

The private Jet Market which grapples with a rise in demand for travel around the individual countries and the world during the pandemic as more wealthy people opt to avoid airport lines and crowded commercial flights [Sullivan 2021]. For instance, record demand for private travel is beyond the capacity of the NetJets, the second-largest air carrier in the world by the number of planes, as well as flyExclusive. Likewise, according to Christopher Marich, co-founder of MySky, the market for private aircraft is in a position where it has never been before as demand significantly outweighs supply [Stupples 2021].

The McKinsey & Company 2020 report states that before COVID-19, there were about 100 thousand regular private jet fliers in the USA, out of some 1.5 million people who could afford to charter the aircraft. After the economy shutdowns, there were many more people who could afford to fly private [Dalphonse 2021].

GlobeAir, the leading private jet charter company in Europe offering on-demand charter flights, announced a volume boost of 20% for entry-level private jet charters in 2021 as more and more affluent flyers have started to use them for essential travels [GlobeAir 2021].

The study also identified cargo air transport as the sector that benefited from the pandemic.

Freight transport

The role of air transport in freight is less clear-cut as airplanes are an expensive means of transport in terms of tonne-kilometres and only competitive over longer distances, and relatively light, high-value or perishable commodities. Air cargo accounts for approximately 35% of world trade by value.

Over the past ten years, low freight rates and the unprofitability of the cargo business have led many airlines to abandon or shrink their dedicated cargo freighter fleets. However, during the COVID-19 pandemic, cargo has become a lifeline for the aviation industry. Half of the air cargo is normally carried on passenger planes, but many of them were grounded during the pandemic. In response, some airlines have switched passenger aircraft to carrying only cargo.

In Europe, all cargo flights in normal years typically account for 3–4% of all European flights. During the pandemic, their share was even as high as 25% (Figure 4). On June 2021, all-cargo flights were above 2019 levels. This, cargo traffic was not significantly affected by COVID-19, and was even increased due to the transport of vaccinations and medical equipment in the fight against the disease.

Regarding air freight in Europe, it shows a shorter predicted time of recovery (on average 2.2 years) compared to air passengers' forecasts [Gudmundsson et al. 2021].

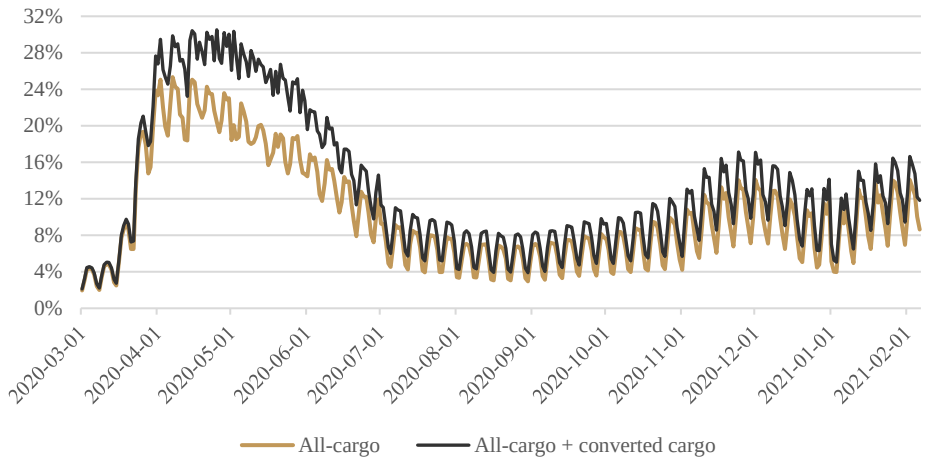


Figure 4. Cargo shares of all European flights
Rysunek 4. Udział lotów przewożących ładunki w lotach europejskich ogółem
Source: own elaboration based on [Eurocontrol 2021b].

In Poland, according to the data of the Polish Civil Aviation Authority, in the first three quarters of 2021 around 94.7 million tonnes of goods were shipped by air, i.e. 32.5% more than in the corresponding period of 2020 (Table 1). Comparing the latest available data (third quarter of 2021) with those at the beginning of the pandemic reveals that Polish airports increased the turnover of serviced cargo by approximately 28%. In Poland, a vast majority

of air cargo traffic was handled in Warsaw (Chopin Airport) and Katowice (74.2 and 17.1% in 2021).

Table 1. The volume of freight on board reported by Polish airports, 2020–2021 (tonnes)
Tabela 1. Wolumen frachtu na pokładzie zgłaszany przez polskie porty lotnicze, 2020–2021 (tony)

Airport	2021	2020	2021/20 (%)	2021	2020	2021/20 (%)	2021	2020	2021/20 (%)	3rd Q 2021/1st Q 2020 (%)
	1st Quarter			3rd Quarter			three Quarters			
Total, of which	27 291	28 361	–3.8	36 265	23 185	56,4	94 670	71 426	32.5	27.9
Warsaw Chopin Airport	20 176	22 251	–9.3	26 510	16 482	60,8	70 221	53 123	32.2	19.1
Katowice - Pyrzowice*	4 594	4 232	8.5	6 808	4 871	39,8	16 205	12 953	25.1	60.9
Gdansk Lech Walesa Airport	2 095	1 641	27.7	2 269	1 680	35.0	6 629	4 677	41.7	38.3
Rzeszów - Jasionka	43	174	–75.5	219	57	285.7	346	241	43.4	25.7
Poznań - Ławica	8	17	–51.7	9	9	–4.8	28	84	–67.0	–50.5
Wrocław - Strachowice	375	36	945.4	436	85	411.6	1 227	233	426.5	1 114.8

Notes: * cargo values of Katowice - Pyrzowice airport covers also transit data; Total volume includes other airports, such as Szczecin – Goleniów, Bydgoszcz – Szwederowo, Port Lotniczy Lublin, Radom – Sadków, Warszawa – Modlin, Łódź – Lublinek, Kraków – Balice, Olsztyn – Mazury, and Zielona Góra – Babimost.

Source: own elaboration based on: [Civil Aviation Authority of Poland 2021].

Those businesses that relied on belly-hold space on passenger planes for transporting goods are likely to continue to use dedicated air cargo services until passenger routes, especially transatlantic ones, return to pre-pandemic levels.

Airlines financial performance

This section covers the airline share price response to the COVID-19 outbreak and the financial results of the aviation sector.

The stock market provides a unique view of the expected future of the economic sector and its companies. That is because the value of a firm derives from all discounted future expected cash flows. No previous infectious disease outbreak has impacted the stock market as strongly as the COVID-19 pandemic. Shares plummeted and market volatility skyrocketed around the world [Baker et al. 2020, Engelhardt et al. 2021]. Non-pharmaceutical interventions of the governments (restrictions on internal movement, international travel controls, workplace closings, etc.) aimed at curbing the pandemic increased the volatility in international stock markets [Zaremba et al. 2020].

The collected data shows that the advent of the pandemic caused a significant drop in airline equities. The global airline share price index during COVID-19 was well below pre-pandemic levels, also for much of 2021, due to uncertainty about outbreaks and their impact on the air transport's recovery and concerns about the impact of rising jet fuel prices on operating costs of airlines. In 2021, regional indices of airlines were down by 25–30% as to December 2019. The global airline index has risen by just 1.8% since the beginning of 2021, while the broader stock market index FTSE has increased by 15.2%. Among the regions, European airlines have the worst-performing stock prices on average (Table 2).

Table 2. Airline share prices
Tabela 2. Ceny akcji linii lotniczych

Indices	October 29th, 2021 (Jan 2014 = 100)	Change (%)	
		vs. December 2019	vs. start of 2021
World airlines	96.1	–28.9	1.8
European airlines	79.4	–29.8	–6.8
Asia Pacific airlines	82.5	–25.0	6.5
North American airlines	118.2	–29.6	2.9
FTSE All-World	190.1	31.4	15.2

Notes: the FTSE – Financial Times Stock Exchange index is very widely used in Europe, it comprises large and mid-sized company stocks in developed and emerging markets.

Source: own elaboration based on: [IATA 2021].

The share price decline has an adverse impact both on shareholders and the capital value of the airline industry.

Airlines have particularly high capital or fixed costs as a proportion of the total costs, so contraction of the activities sharply reducing operating revenues creates a potential risk for large losses or even bankruptcy. A similar is for airports. According to the report of the International Finance Corporation [IFC 2020], capital costs of airports, which provide services to airlines, make up on average 35% of total costs and mainly comprise depreciation (ca 65%) and interest payments (ca 32%). Potential airline bankruptcies pose a serious threat to airports, particularly to those that serve as hubs for struggling airlines. Airlines typically contribute the most significant share of airport earnings.

For European airlines, the sudden suspension of travel caused serious liquidity and efficiency problems. One of their obligations between March and May 2020 was a refund passengers for purchased but unused tickets, the amount being estimated by IATA and Airlines for Europe (EU-27 and UK) at EUR 9.2 billion [ECA 2021].

Results for the second quarter of 2021 show that airlines' financial losses have declined at an aggregate level compared to the same period of the previous year. Some aviation carriers (e.g., in North and Latin America) reported their first profitable quarter since the crisis began. In a sample of 27 airlines, industry-wide EBIT margin improved to –2%, while in Europe to 1%. Despite persistent losses, European carriers have experienced a solid recovery thanks to increasing intra-European traffic.

According to IATA data, the passenger revenues of airlines presented in Table 3 went down by 34% in the third quarter of 2021 compared with the pre-crisis Q3 2019. Cargo revenues rose by 65% over the same period amidst robust cargo demand. Total airline revenues declined by about 29%.

Many airlines had to borrow huge sums of money to stay afloat and took on considerable debt to maintain liquidity through the pandemic. Using state aid, credit lines, and bond issues, the word industry amassed over USD 180 bn in debt in 2020 [Bouwer et al. 2021]. As debt levels continue to rise, paying it back is more difficult due to deteriorating credit ratings and higher financing costs, that need to be recoupled, thus airfare prices are likely to rise.

Table 3. Airline financial results
Tabela 3. Wyniki finansowe linii lotniczych

Number of air-lines	Regions	3rd quarter 2020		3rd quarter 2021	
		EBIT margin (%)	net post-tax profit (USD million)	EBIT margin (%)	net post-tax profit (USD million)
10	North America	–94	–11840	1	2683
6	Asia-Pacific	–31	–1544	–23	–1558
6	Europe	–57	–4810	1	–142
3	Latin America	–76	–260	14	10
2	Other	–86	–75	20	49
27	Total	–68	–18529	–2	1042

Notes: EBIT margin = operating earnings before interest and taxes/revenues

Source: own elaboration based on: [IATA 2021].

In 2021, the prices of flying cargo around the world reached record levels; they nearly doubled over three months on key air freight routes linking manufacturing hubs in China with Europe and the USA, leaving the industry struggling to find sufficient aircraft to meet demand.

The LOT Polish Airlines (PLL LOT) suffered a huge loss (EUR 227 million; PLN 1.04 billion) in 2020 due to the coronavirus pandemic – a sharp contrast to its profit (EUR 15 million; PLN 68.9 million) in 2019 [PAP 2021]. Operating loss (EBIT) of PLN 734 million in 2020 was the highest since 2005 [Statista 2021c].

The pandemic diversely affected services' sales in individual segments of the LOT's activity. Throughout 2020, domestic sales and exports in the passenger segment amounted to over PLN 2.3 billion compared with PLN 6.7 billion in 2019 (reduction by 65%). In the cargo segment, 2020 sales revenues came to over PLN 775 million while PLN 327 million in 2019 (growth by 137%). In 2020, the LOT achieved additional revenues on aircraft leasing (ca PLN 6 million) not present in 2019. Consequently, in 2020, the net sale of products, goods, and services exceeded PLN 3.5 billion compared to almost PLN 7.4 billion in the previous year, meaning their fall by 53% [Dybiński 2021].

The European Commission has approved two Polish measures, for a total of about EUR 650 million (ca PLN 2.9 billion) to support the LOT due to the coronavirus outbreak and inability to carry out the company's core business. The aid consists of a EUR 400 million (PLN 1.8 billion) subsidized loan, and a capital injection of around EUR 250 million (PLN 1.1 billion) through the subscription of newly issued shares taken up by state [European Commission 2020b]. In 2020, about 10 months after the outbreak of the pandemic in Europe, the carrier received PLN 2.9 bn of the aid of which PLN 1.8 bn was a loan from the Polish Development Fund, and PLN 1.1 bn was recapitalized by the Polish State Treasury. It turned out, however, that this support was not enough, especially considering that, according to the latest forecasts, the LOT will return to the 2019 level of air traffic at the earliest in 2025.

In response to reduced demand for transport services and financial turmoil, airlines have had to reduce overall operating costs, including staff costs. The staff-oriented measures to diminish costs typically cover reductions in job numbers by permanent or temporary layoffs, a temporary leave (furloughing schemes), accelerated retirements, or voluntary redundancies.

European Air Navigation Service Providers (ANSPs) carried out also other actions to reduce staff costs such as reduced working hours, the suspension of bonuses and overtime, promotion postponement and associated salary increases, recruitment freezing, and temporary salary reductions.

Since the COVID-19 crisis affected the airlines' credit rates, and they needed immediate financial support, multiple governments in Europe extended loans or guarantee loans in different forms to the airline industry or specific airlines through state-owned banks or state-owned development banks.

Air transport employment

While the pandemic-caused financial damage to the industry is evident to all, one sometimes misses the costs to air transport workforce.

Under normal, pre-COVID circumstances, 11.3 million direct jobs were within the aviation sector around the globe including 2.7 million in Europe; at airlines, airports, civil aerospace manufacturers, and air traffic management [Airports Council International 2020].

Airlines, air navigation service providers, and airports directly hired nearly 4.5 million people, the civil aerospace sector, which manufactures aircraft systems, frames, and engines – 1.3 million, and 5.5 million people worked in other on-airport positions [Air Transport Action Group 2020].

Due to the severe downturn in air traffic caused by COVID-19, a large number of jobs both in air transport and the wider economy relying on aviation were at risk. It was predicted that globally up to 4.8 million aviation jobs could be lost by early 2021, a 43% reduction compared to pre-COVID levels, in Europe respectively by 1.2 million persons or 44% [Air Transport Action Group 2020]. Iacus et al. [2020] have projected worldwide jobs loss in the aviation industry (direct and indirect) up to 30 million units in the whole of 2020.

Updated data on June 2021 indicates that the reduction in worldwide aviation jobs is lower, by 2.3 million persons or 21% compared with the pre-COVID levels, of which by 340 thousand (–10%) at airlines; 30 thousand (–5%) at airport operators, 1.7 million (–29%) other on-airport, and 300 thousand (–24%) in civil aerospace [Air Transport Action Group 2021]. In Europe, there were 587 thousand fewer aviation jobs, meaning 22% less than before the pandemic.

In a survey of aviation workers conducted by the European Transport Workers' Federation (ETF) it was estimated that 58.5% of airport-based workers were out of work, around 23% of the European airport-based workforce has been laid off while 35.5% of the European airport-based workforce were on furlough [Coates 2021, EFT 2021].

Aviation (in particular, airlines, airport operators, air navigation service providers, and civil aerospace categories) typically have a relatively high proportion of highly skilled professions that require ongoing certification. These include flight and cabin crews, engineers, dispatchers, and airport operations personnel. Re-hiring and retraining for these job positions can take time and money. Ground handling job losses during a pandemic will have long-term

consequences for the industry in a long time since the sector may not be able to respond to a rapidly increasing demand due to the lack of available, skilled and trained staff.

In April 2021, the European Commission proposed EUR 3.7 million from the European Globalization Adjustment Fund (EGF) to help close to 1,500 former workers of the aviation services company Swissport Belgium, who lost their jobs due to the impact of the COVID-19 crisis on air transport activities. Swissport Belgium, one of the two ground handlers at Brussels Airport, responsible for 60% of handling at Zaventem airport, was declared bankrupt in June 2020, three months after the activities at the airport stopped, and its 1,468 workers lost their employment [Johnston 2020]. This financing is intended to help these people find new jobs through further education or training, or to support them in starting their own business [European Commission 2021c].

Conclusions

1. This article examines the impact of large exogenous shocks, like natural crises such as the COVID-19 pandemic, on European air transportation. Our research contributes to prior literature on COVID-19 consequences for the aviation industry.
2. Given the huge public health impact of the novel coronavirus, the economic and financial effects considered in this article may appear to be secondary. However, the economic impact will potentially be of first-order importance in various domains of the European economy, including commercial air transportation sector. The numerous restrictions imposed on human mobility and economic activities, including air transport, have severely hit the sector and might to have serious long-term consequences for the global and European aviation industry.
3. Our exploratory analysis shows that the ongoing pandemic has an unprecedented severe effect on European airline transport, both positive and negative depending on the type of transport:
    - The COVID-19 gradually affected air transport mobility in the EU where a peak was reached in April 2020, when the number of flights in the region fell by more than 89%.
    - In 2020, there were 277 million passengers carried in the EU, 73.3% less than in 2019. Despite a slight recovery from the worst downtime of COVID-19, air traffic and passenger numbers remained lower in 2021 than in 2019. Merely air cargo has recovered above 2019 levels and is expected to be solid in 2022 with the support of strong global trade. Similarly, private aviation passenger travel surged during the COVID-19.
    - In times of economic downturns, such as the current health-related crisis, the aviation sector experiences a significant drop in revenues, mainly due to fewer flying passengers, and therefore generates financial losses. Airlines in Europe suffered unusually large operating losses and negative net post-tax profits due to the pandemic. They took on considerable debt to maintain liquidity during a pandemic and it will probably take several years to pay off.
    - Due to the severe downturn in air traffic caused by COVID-19, a large number of jobs in air transport were at risk. In Europe, at the end of the third quarter of 2021, their number was by more than one fifth lower compared to the pre-pandemic period.

4. The scale and duration of the global COVID-19 crisis are unprecedented, so there is still much uncertainty about the shape and form of recovery, including the aviation sector recovery, in the years to come. According to some projections, air traffic will not return to 2019 levels before 2024. In the European region, the time of recovery of passenger demand to pre-COVID-19 levels was optimistically predicted on average at 2.7 years, while air freight at 2.2 years, starting from 2020. However, the rise of new virus variants and new government restrictions can slow down the whole sector's recovery.
5. A major problem since the beginning of the crisis has been the survivability of the air transportation industry in the face of a sudden lack of demand for passenger travel, airlines' limited financial resilience, and forced staff reduction. Leaving the industry alone to grapple would be detrimental not only to the industry itself but also to air transport safety as well as the health and safety of aviation workers. Additionally, it would harm the entire European and global economy. The sector requires substantial public support from governments but the response has been different among countries and regions. Further research could delve into government support and its effects on the airline sector and market.

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