Air Transport Logistics in European Union

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Abstract
Air transport is an inseparable part of a transport system, it is the youngest, yet the most dynamic and developing form of transport of people and goods. The paper analyses the number of commercial airports and air transport of passengers and goods in the member countries of the EU as well as in the EU 27. It evaluates logistics of air transport in the European Union and deals with basic aspects of insurance and legal norms in logistics, applicable in the member states of the European Union. Within the legislation, attention is focused primarily on transport logistics and aviation insurance, because it is necessary to minimize and anticipate risks in air transport.

Keywords: logistics, European union, aviation, transportation, insurance, legal norms

JEL Classification: K2, G22, R41

1. Introduction
Air transport is a part of transport system of the country, it plays a strategic role especially in the area of provision of transport services abroad and at the same time contributes to the social and economic development of the state. For several countries, air transport is a prerequisite for the entry of foreign capital into the economy. The level of its development represents the economic and social maturity of the state and can also be a measure of the living standards of the population.

It is the youngest type of transportation, it is not limited by geographical barriers and it is also it is also an ideal solution for shipments that must be delivered as soon as possible. It is therefore possible to deliver the goods very quickly by air to almost all countries of the world. On one hand, air transportation is very fast, but on the other hand it belongs among the most expensive ways of transport. Regarding speed, it is undoubtedly the fastest way to transport goods over long distances. Scheduled flights are suitable for regular shipments through European airports to / from around the world, and charter flights are used to transport goods that are to be delivered flexibly - independently of scheduled flights.

Air transport has expanded in recent decades. In the early days of aviation, it was probably not even expected to be one of the most widely used modes of transport in the world. More than any other mode of transportation (ocean or ground), air transport has benefited from advanced technological innovations, which have had a revolutionary effect on long-distance travel (Pei-Fen Kuo, Gede Brawiswa Putra, Faizal Azmi Setiawana, Tzai, Hung Wen, Chui-Sheng Chiu, Umroh Dian Sulistyah, 2022).
Air transportation is the youngest type of transportation. On one hand, air transportation is very fast, but on the other hand it belongs among the most expensive ways of transport. Especially thanks to its speed, it is a very dynamic and developing way of transport. Just like in the EU, in other countries of the world, in relation to air transport, its impact on the environment is addressed. As Sallan & Lordan (2020) state “Air transport industry has been under constant evolution and transformation since its inception in the beginning of the 20th century. Its present configuration is the result of a set of heterogeneous forces: technological, political, regulatory and geographical”.

What matters are mainly aviation emissions, aircraft noise and environmental pollution around airports. The share of aviation in global pollution and global warming is minimal. The use of new technologies within the manufacture of aircraft, leads to a reduction of the level of noise and emissions from aviation. Compared to other modes of transport, air transport pays considerable attention to environmental protection by: monitoring noise at and around airports, measuring air quality, introducing new methods of cleaning and de-icing aircraft, introducing new technologies for liquid and solid waste disposal, more efficient use of agricultural land around airports and son on. The efficient provision of air traffic control services helps to minimize emissions and reduce aircraft noise around airports.

Throughout the year 2020, COVID-19 has turned into a fully blown pandemic, which poses a global risk to our health and global economies. Domestic and international air passenger markets have seen an increase with the rapid growth of low-cost carriers and aggressive route expansion; however, the coronavirus disease COVID-19 pandemic, which began in 2020, caused a steep decline in air travel and airlines face an uncertain future in regaining passengers. (Myeonghyeon & Jeongwoong, 2021). COVID-19 caused enormous damage in aviation that a 59–62% decrease by year in terms of global air transport passengers might be expected according to International Civil Aviation Organization.

For a comparison, we are stating information from a research realized in China. Pei-Fen Kuo, Gede Brawiswa Putra, Faizal Azmi Setiawana, Tzai, Hung Wen, Chui-Sheng Chiu, Umroh Dian Sulistyah (2022) state: “The number of routes decreased by approximately 68.3% from 41 to 13 during the outbreak (see figure 1). In addition, the total passenger volume decreased by approximately 98.4% from 466,780 to 7,387”

![Figure 1. Medium-distance international flights originating from China (before and during COVID-19 pandemic)](source: (Pei-Fen Kuo, Gede Brawiswa Putra, Faizal Azmi Setiawana, Tzai, Hung Wen, Chui-Sheng Chiu, Umroh Dian Sulistyah, 2022))
1.1 Insurance in Air Transport Logistics

About the unique of aviation insurance business written (Bassel F El-Kasaby, Scott E Tarry, Karisa K Vlasek. 2003). Authors state “the aviation insurance is a unique field from a business, legal, and regulatory standpoint. Issues such as risk management, contracts, and liability raise particular challenges within this highly specialized market. The aviation insurance market is unique. For one thing, the market relies on a relatively small pool of aircraft in terms of risk distribution. Additionally, the market must be able to absorb potentially staggering losses. In order to operate under these conditions, insurance companies engage in elaborate reinsurance mechanisms. In the US, underwriters reinsure each other in order to expand their capacity to absorb catastrophic losses as well as their ability to assume larger risks. Insurance companies also try to insure high risk ventures on the global market to further spread their losses”.

Two important features distinguish a contract of insurance from other contracts, namely, insurable interest and the duty of disclosure. As state:

- **Insurable Interest** – A contract of insurance is distinguished from a wager by the requirement that the insured have an insurable interest in the subject matter of the insurance. This means that the insured should benefit from the subject matter's continued existence or suffer damage by its loss or destruction.

- **Duty of Disclosure** – Insurance policies are contracts done in the utmost good faith. Because the insured knows information about the risk being insured, he or she must act in the utmost good faith in making disclosures to the insurer either directly or through a broker. This disclosure enables the insurer to assess the risk properly, to decide whether or not to accept it, and, if so, to determine at what premium and on what terms”.

Very important is the duty. About the **duty of good faith** written (Bassel F El-Kasaby, Scott E Tarry, Karisa K Vlasek. 2003). Author/s state “this duty applies equally to insurer and insured, but the emphasis may vary from country to country. In the United Kingdom it seems that the duty is considered more frequently in relation to the actions of the insured, while in the United States it would seem that the duty is usually viewed in connection with the actions of insurers”.

The **duty of utmost good faith** requires an insured to make full disclosure of all "material facts" within the insured's knowledge. The duty also extends to the disclosure of facts which the insured could have ascertained by reasonable inquiry. A material fact is one which would influence the judgment of a reasonable insurer in deciding whether to accept the risk, and if so, for what premium. If the insurer receives information from an insured, either directly or through a broker, which should put a prudent insurer on inquiry, but the insurer fails to make such inquiry and accepts the insurance, the insurer will be unable to rely on the insured's nondisclosure (Bassel F El-Kasaby, Scott E Tarry, Karisa K Vlasek. 2003).

The **duty to disclose** material facts ceases when the insurance contract has been concluded but is revived when the contract is renewed. The policy wording may also impose a duty on the insured to inform the insurers of any material change in the nature of the risk during the policy period (Rod D. Margo. 1996).

The most common forms of insurance in aviation are hull, passenger, third party liability, war and airport or fixed base operator (FBO) insurance. Other types of insurance cover are repossession, residual value and products liability.

(Rod D. Margo. 1996) state „Notwithstanding the facts that certain types of insurance have become more or less standard, the contractual nature of insurance policies make them very flexible instruments. Parties may deviate substantially from standard insurance provisions to suit their particular needs. This is constrained, however, by insurers’ need to minimize and
predict aggregate risks. Aviation insurance markets tend to be very unpredictable compared to most insurance markets”.

1.2 Law in Air Transport Logistics

Airspace is a common resource for all categories of users that needs to be used flexibly by all of them, ensuring fairness and transparency whilst taking into account security and defence needs of Member States and their commitments within international organisations. Efficient airspace management is fundamental to increasing the capacity of the air traffic services system, to providing the optimum response to various user requirements and to achieving the most flexible use of airspace. The activities of Eurocontrol confirm that the route network and airspace structure cannot realistically be developed in isolation, as each individual Member State is an integral element of European Air Traffic Management Network (EATMN), both inside and outside the Community. A European upper flight information region (EUIR) encompassing the upper airspace under the responsibility of the Member States within the scope of this Regulation should facilitate common planning and aeronautical information publication in order to overcome regional bottlenecks. (REGULATION (EC) No 551/2004 of the European Parliament and of the Council of 10 March 2004 on the organisation and use of the airspace in the single European sky)

Podľa REGULATION (EC) No 785/2004 of the European Parliament and of the Council on insurance requirements for air carriers and aircraft operators “Air carriers and aircraft operators shall be insured regards their aviation-specific liability in respect of passengers, baggage, cargo and third parties. Air carriers and aircraft operators shall ensure that insurance cover exists for each and every flight, regardless of whether the aircraft operated is at their disposal through ownership or any form of lease agreement, or through joint or franchise operations, code-sharing or any other agreement of the same nature”.

Insurance in respect of liability for passengers, baggage and cargo:

- For liability in respect of passengers, the minimum insurance cover shall be 250 000 SDRs per passenger.
- For liability in respect of baggage, the minimum insurance cover shall be 1 000 SDRs per passenger in commercial operations.
- For liability in respect of cargo, the minimum insurance cover shall be 17 SDRs per kilogram in commercial operations.

2. Data and Methods

The main source of information on the number of commercial airports, the number of transported persons and goods was Eurostat. The data analysed in the paper are shown in tables and graphs for better clarity. Data for EU Member States as well as EU-27 were analysed. In some cases, e.g. in the graph 1 we stated data for the countries which do not belong to the EU, for example Turkey. Norway.

The main source of information about legal norms was the portal of the European Commission EUR-Lex. It is offers access to EU law, case law by the Court of Justice of the European Union and other public EU documents as well as the authentic electronic Official Journal of the EU.

Source of information about air transport was the Act no. 143/1998 L. i. on civil aviation (aviation law) as amended and source of requirements for insurance in air transport was Regulation of the European Parliament and Council (ES) no. 785/2004 from April 21, 2004 on requirements for insurance of insurance of air carriers and aircraft operators.
3. Results and Discussion

The main task and commercial activity of airports is to ensure the handling of aircraft, from landing to take-off, and of passengers and cargo, so as to enable air carriers to provide air transport services. For this purpose, airports offer a number of facilities and services related to the operation of aircraft and the processing of passengers and cargo, the cost of which they generally recover through airport charges (Directive 2009/12/EC of the European Parliament and of the Council of 11 March 2009 on airport charges).

In the graph 1 we can see that the highest number of commercial airports from the EU-27 is in France, namely 43 in 2020. More than 30 airports can be found in Italy and Spain. On the contrary, only one commercial airport is in five countries (Estonia, Latvia, Luxembourg, Malta and Slovenia). There are two airports in Cyprus, Hungary and in Slovakia.

From the graph 1 it is clear that the number of airports have increased in France and Romania since 2010 (3 airports). The opposite can be recorded in Germany, a decrease by 3. For instance, we can state the data for Turkey in graph 1. In this country there has been an increase in the number of commercial airports over the last 10 years to 17, which may be a result of increased interest in tourism in the country.

Graph 1. Number of commercial airports (year 2010 – blue colour, year 2020 – red colour)

The table 1 shows the yearly number of passengers carried in Europe broken down by country. Passengers carried are all passengers on a particular flight counted once only and not repeatedly on each individual stage of that flight.

From the table 1, two basic facts are evident. On one hand, from 2012 to 2019, the number of air passengers in all EU Member States increased. On the other hand, we have recorded a decrease of air passengers in 2020. Compared to the previous year 2019, it is a decrease of more than 70%. In 2020, almost as many passengers were carried across the EU as in Spain in 2019. The most significant fall (more than 80%) can be seen in the countries with the lowest number of air passengers throughout the year, like Slovakia, Slovenia, as well as Croatia. Interestingly, the relatively smallest decline, despite it being more than 65%, cannot be seen in the countries with the largest passenger numbers per year, but in countries with an average to small passenger numbers, such as Norway, Luxembourg, Bulgaria, Greece.

The clear reason for this sharp decline in air passengers is the measures taken in connection with COVID-19. As Myeonghyeon & Jeongwoong, (2021) state „The air transport industry provides global connections between trade, tourism, and investment, and it is profoundly affected by external
factors, such as the spread of infectious diseases, exchange rates, and oil prices". Xiaoqian, Sebastian, Changhong, Anming (2021) add „the larger airports are those which often experience the hardest impact of COVID-19, given an extraordinary reduction in the number of global passengers”.

Table 1. Air transport of passengers by country (yearly data)

| TIME     | 2012      | 2017      | 2018      | 2019      | 2020      |
|----------|-----------|-----------|-----------|-----------|-----------|
| EU - 27 countries | 734 860 381 | 938 854 476 | 996 295 411 | 1 035 185 440 | 276 754 355 |
| 1        | Spain     | 159 771 261 | 209 824 089 | 220 611 429 | 228 262 372 | 57 797 305 |
| 2        | Germany   | 178 591 103 | 212 389 343 | 222 422 361 | 226 764 086 | 57 795 978 |
| 3        | France    | 129 764 462 | 154 096 485 | 161 991 179 | 168 726 788 | 50 724 011 |
| 4        | Italy     | 116 029 388 | 144 306 325 | 153 352 444 | 160 667 939 | 40 405 355 |
| 5        | Netherlands | 55 680 209 | 76 240 304 | 79 644 163 | 81 192 507 | 23 594 783 |
| 6        | Greece    | 32 082 336 | 50 170 728 | 54 258 826 | 56 088 527 | 17 341 192 |
| 7        | Portugal  | 28 186 254 | 47 673 057 | 51 018 598 | 55 007 894 | 16 548 993 |
| 8        | Switzerland | 43 236 086 | 53 564 943 | 56 139 549 | 57 194 328 | 16 006 811 |
| 9        | Poland    | 21 800 765 | 37 684 668 | 43 764 548 | 46 942 771 | 13 825 504 |
| 21       | Croatia   | 5 422 632  | 8 843 053  | 9 731 294  | 10 623 239 | 1 919 100 |
| 22       | Lithuania | 3 166 628  | 5 246 101  | 6 254 178  | 6 504 685  | 1 804 500 |
| 23       | Malta     | 3 650 347  | 6 007 731  | 6 805 817  | 7 318 357  | 1 752 445 |
| 24       | Luxembourg | 1 893 991  | 3 554 730  | 3 988 804  | 4 365 569  | 1 426 310 |
| 25       | Estonia   | 2 202 427  | 2 635 145  | 2 995 528  | 3 258 003  | 857 837 |
| 26       | Slovakia  | 1 563 197  | 2 402 651  | 2 794 094  | 2 839 787  | 500 604 |
| 27       | Slovenia  | 1 167 877  | 1 682 133  | 1 810 567  | 1 719 039  | 287 787 |

Source: Eurostat

If we look at the current information on the percentage year-on-year change in the number of commercial flights in the selected EU countries (see graph 2.), namely first two countries of the table 1., i.e. Spain and Germany, together with the last two countries of the table 1., i.e. Slovakia and Slovenia, we can see, that the most significant change is in Slovenia. The rest of the selected countries have a very similar trend.

Graph 2. Commercial flights by reporting country (% change compared with same period in 2019)

Source: Eurostat

It is clear that with the summer season of 2021, the number of flights increased compared to January of the same year, yet it is significantly lower than in 2019. After the end of the summer season 2021, we see a slight decline. We can see it in all countries, most notably in Slovakia, even in January 2022. This decline is probably caused by reintroduction of measures due to the new Omicron variant of COVID-19. The number of commercial flights in EU countries can be expected to increase again with the approaching summer season of 2022, but it is unlikely that it will reach the numbers of 2019.
The table 2. shows the yearly volume of goods transported in Europe (in tonnes), broken down by country. The data covers the total volume of freight and mail loaded/unloaded.

In comparison with the table 1., which shows the number of air passengers per year, in the table 2. we can see, that the amount of goods transported per year did not have such a deep drop. The number of transported goods in the EU countries decreased by only about 10% between 2019 and 2020. Even in countries such as Luxembourg, Belgium, but also the Slovak Republic, Lithuania and Malta, the number of goods transported by air has increased over the year. In Slovakia this increase was most significant out of all the EU countries (more than 20%). The biggest drop (more than 30%) in transport of goods by air transport was recorded in countries like Finland, Portugal and Greece.

The logical conclusion is that COVID-19 measures have generally had a small impact on the carriage of goods by air in EU Member States. Still, for example The International Air Transport Association (2021) in connection with the transport of dangerous goods, states „The COVID-19 pandemic has significantly disrupted the way the air transportation of dangerous goods is taking place”.

Table 2. Air transport of goods by country (yearly data, tonne)

| TIME | 2012  | 2017       | 2018       | 2019       | 2020       |
|------|-------|------------|------------|------------|------------|
| EU - 27 countries | 11 212 453 | 13 954 124,4 | 14 243 667 | 13 743 488,6 | 12 426 326,7 |
| 1    | Germany | 4 218 208  | 4 773 359 | 4 842 716 | 4 684 553 | 4 497 805,1 |
| 2    | France  | 1 753 085  | 2 450 326 | 2 407 878 | 2 371 614 | 1 938 349 |
| 3    | Netherlands | 1 563 500 | 1 865 106 | 1 840 419 | 1 703 556 | 1 591 388,6 |
| 4    | Belgium | 963 615   | 1 251 173 | 1 416 428 | 1 397 513 | 1 584 640 |
| 5    | Luxembourg | 615 286   | 892 660   | 895 004   | 853 030   | 905 397 |
| 6    | Italy   | 790 493   | 1 077 874 | 1 066 221 | 1 021 941 | 776 205 |
| 7    | Spain   | 593 523   | 742 443   | 806 518   | 815 612,4 | 599 930,3 |
| 8    | Denmark | 166 283   | 235 937   | 242 068   | 244 997   | 181 967 |
| 9    | Norway  | 78 420    | 169 295   | 174 840   | 187 379   | 176 298 |
| 10   | Slovakia | 20 893    | 27 188    | 24 565    | 20 525    | 24 772,1 |
| 11   | Cyprus  | 27 581    | 30 880    | 32 186    | 32 360    | 24 006,6 |
| 12   | Lithuania | 14 342 | 15 064    | 16 779    | 17 211    | 19 819,8 |
| 13   | Latvia  | 31 460    | 21 204    | 24 628    | 25 866    | 19 246,8 |
| 14   | Malta   | 16 493    | 16 194    | 17 677    | 12 210    | 13 444,2 |
| 15   | Slovenia | 7 572    | 12 025    | 12 337    | 11 358    | 10 552,6 |
| 16   | Estonia | 23 760    | 11 233    | 11 475    | 10 866    | 9 131,7 |
| 17   | Croatia | 6 961     | 9 510     | 11 934    | 10 846    | 7 638 |

Source: Eurostat

Portal of the European Commission states „Cargo deliveries by air remain crucial for Europe. The European Commission issued guidance on 26 March 2020 for the continued support of air cargo operations. The measures include:

- inviting Member States to grant temporary traffic rights for additional cargo operations from outside the EU, if restrictions would normally apply
- temporarily removing night curfews and/or slot restrictions at airports for essential air cargo operations
- enabling the use of passenger aircraft for cargo-only operations if necessary exempting aircrew flying the aircraft from travel restrictions if they do not show symptoms of COVID-19”.
For a comparison we are stating graph 3. Number of flights cancelled by airlines in the USA from 2000 to 2020.

Graph 3. Number of cancellations by major U.S. air carriers from 2000 to 2021 (in 1000s)

Source: Statista 2022

In the bar graph 3 we can see that from 2000 there were most of the flights cancelled in 2020 (281,03 thousand of flights) and in 2001 (231,2 thousand of flights). We can conclude that the reason for such a steep number of flights cancelled in 2020 were measures connected with COVID-19 pandemic and in 2001 there were issues from 9/11.

4. Conclusion

Air transport is characterized by some characteristics that determine its position in the state transport system. Air transport must fulfill its tasks and must therefore be fast, safe, high-quality and economical. Due to the number of factors that affect air transport, it is necessary to eliminate the risks arising from this mode of transport. We use various forms of insurance to eliminate risks.

The most common forms of insurance in aviation are Hull, Passenger, Third party liability, War and Airport or fixed base operator (FBO) insurance. Other types of insurance cover Repossession, Residual value and Products liability.

Aviation insurance is a unique field from a business, legal, and regulatory standpoint. Issues such as risk management, contracts, and liability raise particular challenges within this highly specialized market. The market relies on a relatively small pool of aircraft in terms of risk distribution. Additionally, the market must be able to absorb potentially staggering losses.

Insurance is primarily designed to protect the insured against loss or damage caused by unforeseen or unexpected future events. Since insurers intend to cover events of a contingent nature, they will not insure against future events which are certain to occur. Neither will insurance cover loss or damage deliberately caused by the insured.

Two important features distinguish a contract of insurance from other contracts, namely, insurable interest and the duty of disclosure. Lloyds of London is perhaps the most venerable aviation insurance establishment in the world.

In the aviation insurance market, the behavior of market participants does not always respond to market conditions.
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