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AIRPORTS AS A CATALYST FOR REGIONAL LABOR MARKET DEVELOPMENT AND EMPLOYMENT GROWTH IN THE OPINION OF THEIR STAKEHOLDERS

Abstract

Airports, by combining air transport with other modes of transport, fuel local and regional development. Airports are home to institutions and companies that offer employment to workers in various fields. They also attract investors and positively influence the image of the region, contributing to the establishment of companies and the development of tourism, which also leads to job creation. Taking these issues into account, surveys were carried out in 2021, 2022 and 2023 to determine how residents of municipalities, representatives of municipal authorities and airport representatives, perceive the impact of the airport on the socio-economic situation of the municipality in which they are located, including the labor market. Airports are seen as a catalyst for the development of the regional labour market and employment growth in the opinion of their stakeholders. The perception of the impact of the airport in the opinion of their stakeholders depended on the size of the airport, its location in the municipality, the nature of the municipality and the level of education of the municipalities residents participating in the survey. In the course of the research, data on the operation of airports, municipalities and strategic documents of municipalities were analyzed and survey research was carried out using questionnaire and interview techniques. The research focused on 10 airports located in Poland. A total of 1,200 surveys were conducted among residents of municipalities, 10 interviews with local government and port officials (2021-2022) and 7 interviews with airport officials (2023). To analyze the collected data and present the results, Statistica v.13.3 and R/RStudio software were used.

Keywords: *airport, commune, labor market, regional development, regional labor market, work satisfaction, airport stakeholders*

Environmental factors affecting the operation of the airport

Technological advances, improved travel conditions, improved safety indicators, the development of low-cost airlines and the provision of innovative passenger services (Kozuba et al., 2021; Airbus France, 2018; Air Transport Action Group, 2016) have made air transport, including in the European Union (EU), becoming a popular mode of transport, creating millions of jobs and generating billions of euros in impact (ACI Europe, 2024; European Commission, 2024). The deregulation of the air passenger transport market in the EU, which was carried out in the 1980s and 1990s, has had a significant

impact on the market. This led to stiffer competition among airline industry players, the development of new business models, and a transformation in the provision of labor, the level of employment and the required skills that aviation-related people should possess. The use of outsourcing has also increased, and employees have been forced to be more flexible and efficient in their work provision (European Commission, 2019). The use of atypical forms of employment has also become commonplace (European Parliament, 2015; European Union, 2016).

As one of the pillars of modern transportation, air transport provides employment for millions of people by offering positions to specialists in diverse fields. According to information presented in *Aviation Benefits Beyond Borders,* in 2018, in Europe, the number of people employed in air transport or sectors directly and indirectly related to airport operations was 13.5 million, and each full-time job directly related to air transport and tourism associated with airport operations generated additional full-time jobs in other industries (Air Transport Action Group, 2020). At the time (2018), according to IATA data, there were about one hundred and thirty-seven thousand people employed in air transport in Poland. This group included people working in aviation companies, taking jobs with aviation subcontractors. This group also includes jobs generated by the spending of people directly and indirectly employed in the aviation sector and in companies serving tourists using air transport (IATA, 2019).

Airports are an important component of air transport. In Europe, commercial routes are served by more than 500 airports (ACI Europe, 2024). Airports as complex systems (Schmitt et al., 2016; Wensveen, 2015), by combining air transport with other modes of transport and strengthening the transportation accessibility of the region and smaller territorial units (e.g., municipalities) within which they are located, create numerous jobs (Arora et. al., 2021). In 2018, the number of employees directly related to airport operations in the European Union was 553,000 (Air Transport Action Group, 2020).

Within the airport, there are various institutions and companies that provide certain services, both to travelers and the local community (Freathy et al., 1998). The services offered by airports are classified within two categories of markets: the aeronautical services market (aviation services market) and the commercial services market (non-aeronautical services market),

and this determines a wide and diverse range of customer groups. In a simplified scheme of the arrangement of relations prevailing in the aviation services market, the airline is at the center of it and, in relation to its activities, the other participants, including the airport, carry out ancillary activities (Wilczyńska-Strawa, 2022, pp. 29-45). Assuming the wide range of activities carried out by airports and the complex pattern of relationships of entities that make up the supply side of the service market, the group of airport customers should include passengers, ground personnel agents, commercial and service companies operating at the airport, government services, discharging passengers and visitors to the airport (who are not passengers), cargo shippers, freight forwarders, logistics companies, users of their own aircraft, entities that perform aviation services using aircraft (e.g. air cabs), sport aviation, ground transportation companies and travel agencies (Kaliński, 2008, pp. 159-177). Consequently, the structure of the airport workforce is diverse, and includes those associated with airlines (28%), ground handlers (14%), air traffic control employees (14%), food and beverage outlets (8%), retail and other terminal services (6%), airport security and passenger control workers (6%), aircraft maintenance, repair and overhaul workers (6%), customs and passport control workers (5%), ground/road transportation (5%) and others (7%) (ACI Europe, 2015).

The number of jobs at an airport is correlated with the number of passengers checked in at the airport, per year. When the traffic value is up to one million people, 1,000 additional passengers generate 1.2 jobs. When this level is 1-10 million passengers, 1,000 passengers generate 0.95 new jobs. In the situation of ports serving more than 10 million people in a year, 1,000 additional passengers contribute to forming 0.85 jobs. Job creation also depends on airlines, as passengers of low-cost airlines, generate 20% fewer direct jobs than passengers of other carriers (ACI Europe, 2015). The data presented are related to the size of the airport and the segments of passengers using its services. The data presented behind *The impact of an airport* (ACI Europe, 2015) shows the existence of economies of scale, where the employment generated by 1,000 additional passengers for a small airport is greater than for a large airport. At the same time, connecting passengers and those using low-cost airlines have a smaller impact on the amount of direct employment at an airport, which can be linked, in the case of connecting passengers, for example,

to the abandonment of car parking at the airport, and in the case of those using low-cost airlines, for example, to a reduction in support services such as in-flight catering, which consequently reduces the need for employment at the airlines themselves. New jobs are also being created, as a result of growing cargo traffic and the increasing number of tons of cargo handled from/to the airport. Staffing solutions also depend on other factors, such as the airline's business model and the type of flight operations carried out. Airports also attract investors and contribute to the development of companies, which also create jobs (Piotrowska-Trybull, Kozuba, Sirko, 2023, pp.167-188).

Airports offer a diverse range of employment opportunities for both highly skilled people and those with less recognized skills. Working at an airport is demanding and stressful (Hmeidan, 2022). Salary levels do not compensate for the workload and responsibilities placed on employees. The average annual salary of directly employed workers at the airport (€40,400) far exceeds that of indirect (€29,500) and induced (€27,400) employment – (ACI Europe, 2015). Employee health problems due to stress and work overload remain a key employment challenge. The potential for greater use of remote work in the context of the required physical presence of employees to perform maintenance tasks remains limited (Hmeidan, 2022).

Airports, like other organizations with an open character, are susceptible to transformations in their environment. Particularly in a crisis situation, the external environment of an organization influences and determines the strategy of activities of entities in the aviation services market (Wilczyńska-Strawa, 2022, pp. 29-45). This was particularly evident during the Covid 19 pandemic, when, revising their previous ways of operating, airports applied solutions that had not been used before, including those relating to the staff employed.

The labor market is a place of a peculiar game, between employers looking for suitable people, who offer certain wages and working conditions, and job seekers offering their experience, knowledge, skills, motivation. The peculiarity of this market is due to the uniqueness of the labor force. Other factors that can and do affect the workforce at airports, as in other organizations, include: 1) rapidly developing technologies 2) automation of processes 3) increasing use of robots 4) demographic changes and the presence of representatives of different generations in the labor market (Dilmegani, 2024;

Armstrong, Shah, 2023; Meister 2022. These elements impinge on the conditions under which work is performed (Bobillier Chaumon, 2021; Coron Gilbert, 2020), on the increase in demands on employees and their behavior (World Economic Forum, 2023; Moritz, 2020).

Organization of the research

The research was carried out in three stages (stage 1 – 2021, stage 2 – 2022, stage 3 – 2023), when airports, after a dramatic decline in 2020 in the number of passengers carried, were slowly returning to the state of 2019. The aim of the research was to determine how residents of municipalities, municipal officials and airport representatives, perceive the impact of the airport on the socio-economic situation of the municipality in which they are located, including the labor market. When embarking on the study, it was assumed that the size of the airport, its location within the municipality and the nature of the municipality affect the level of satisfaction of residents and local authorities, with its presence, including due to its impact on the situation in the local labor market. The research process began with an analysis of the literature on the subject and reports on the situation in air transport.

In each of the research stages aiming at a broader view of the situation in which, in 2019-2023, airports find themselves, the data posted on: Civil Aviation Authority (CAV) website (https://www.ulc.gov.pl/pl/), Polish Air Navigation Services Agency (PANSA) website (https://www.pansa.pl/), International Airports Council (ACI) website (https://www.aci-europe.org), airport websites, and studied International Air Transport Association (IATA) reports found at https://www.iata.org/en/publications/economics/ and aviation industry studies.

An important element of the ongoing research was a survey, which was initiated in 2021. Using as a sampling frame, the list of airports published in Civil Aviation Authority studies, five airports were drawn: Rzeszów-Jasionka, Katowice-Pyrzowice, Kraków-Balice, Szczecin-Goleniów, and Lublin. In the next step, the municipalities in which the drawn airports are located were identified. These included rural municipalities (Trzebownisko – Rzeszów-Jasionka port,

Ożarowice – Katowice-Pyrzowice port, Zabierzów – Kraków-Balice port), urban-rural municipality (Goleniów – Szczecin-Goleniów port) and urban municipality (Świdnik – Lublin port). In the next step, after the preparation of research tools (survey questionnaire and interview questionnaire), in the first quarter of 2021, surveys were carried out among residents and interviews were conducted with representatives of municipal governments. In each municipality, taking into account gender and age, 120 people were drawn (a total of 600 people). One employee of the authorities of each municipality was interviewed. Surveys with residents of municipalities, representatives of local authorities and ports were carried out using structured questionnaires, which were prepared by members of the research team. The survey was conducted using the Computer Assisted Telephone Interview (CATI) method. The interviews were recorded. After their transcription, a separate text file was prepared from each interview. These files were used to analyze the text they contained. The assessment of the socio-economic situation in the municipalities was made on the basis of data from the Central Statistical Office (CSO) and analysis of information contained in the municipalities' development strategies, reports on their condition and local revitalization programs (the analyzed documents are listed in the bibliography).

In the second stage, as in the first stage, in addition to the analysis of socio-economic indicators and information contained in the strategies and reports on the state of the surveyed municipalities and on the websites of the airports and the organizations mentioned in the first stage, a survey was carried out (first quarter of 2022) in the urban municipalities (Gdańsk, Bydgoszcz, Łódź, Poznań, Wrocław) within the borders of which the airports are located: Gdańsk L. Wałęsa, Bydgoszcz, Łódz, Poznań-Lawica, Wrocław-Strachowice. The participants were 600 residents of the municipalities, drawn similarly to the first stage, as well as four representatives of the municipal authorities and one representative of the airport. The participation of the latter was due to the fact that attempts to contact a representative of the local government in Gdańsk failed and it was not possible to complete an interview with him. The authorities of the airport, which is located on the territory of the municipality of Gdańsk, responded positively to such a request.

The final stage of the research, in addition to the analysis of data posted on the CAV, IATA, ACI and airport websites, was devoted to conducting interviews with representatives of airports (July-August 2023), which are located in the municipalities where, in the first and second stages, the survey research was carried out. Requests to participate in the survey were addressed to all airports, unfortunately, representatives of three of them (Bydgoszcz, Łódź, Rzeszów-Jasionka), despite the arrangements made, ultimately did not participate.

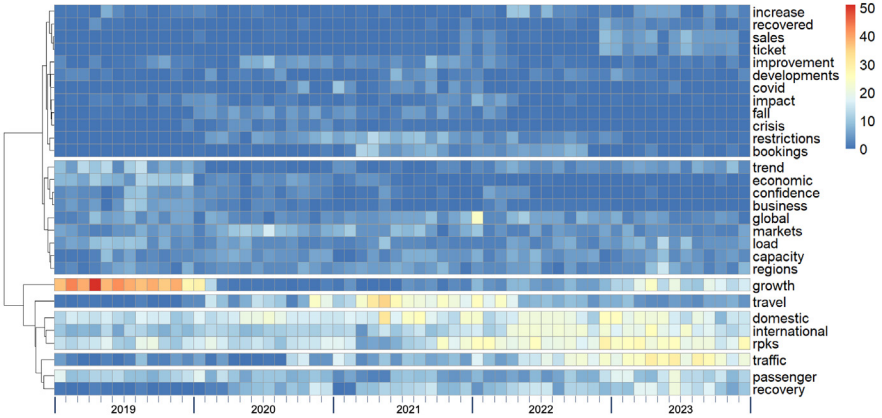
The airports of interest in the subsequent stages of the study differed by the number of flight operations and the number of passengers checked in. Based on this data and using cluster analysis (Euclidean distance, Ward's method), four groups of airports were identified by size (group 1: Krakow-Balice, group 2: Gdańsk L. Wałęsa, Katowice-Pyrzowice, group 3: Poznań-Ławica, Wrocław-Strachowice, group 4: Rzeszów-Jasionka, Szczecin-Goleniów, Bydgoszcz, Lublin, Łódź). Ports were also differentiated by their distance from major cities. The first group included ports located within the borders of Gdańsk, Bydgoszcz, Poznań, Łódź, Wrocław. In this group, the average distance of the airport to the center is 7.2 km. The second was formed by ports located near Szczecin, Lublin, Rzeszów, Kraków, Katowice. In this group, the average distance of the airport to the center of these cities is 22.8 km. These variables (the size of the airport and its location) were taken into account when analyzing respondents' answers.

For the study of IATA reports and interview files, a text analysis was applied using R/RStudio and libraries: readtext, tm, tidyverse, quanteda, pheatmap, ggplot2 and ggExtra, as well as solutions presented in studies (Bruce et. al, 2020; Jockers, Thalken, 2020; Freeman et al, 2019; Wickham et al, 2018; Silge et al, 2017; Kwartler, 2017; Friendly et al, 2016). Survey data and data obtained from CAV, PANSA, CSO websites were analyzed using Statistica v.13.3 and R/RStudio software (libraries: likert, tidyverse, rpart, rpart.plot, rattle). In verifying statistical hypotheses, a standard level of significance was adopted ($\alpha = 0.05$).

Airport employment in a turbulent environment

The impact of the impact of the pandemic on the condition of air transport was presented in reports by the International Civil Aviation Organization (ICAO), International Air Transport Association, Airports Council International, in studies prepared by government institutions of individual countries and other organizations. Analyzing IATA's monthly reports, from the period 2019-2023 (Figure 1), it was found that the problems specific to the transportation industry, in addition to the statistics included in them, are reflected in the vocabulary used in them. Of the words that occurred with greater or lesser frequency in the reports, Figure 1 illustrates selected ones that relate in a specific way to the operation of airports or refer to phenomena in their surroundings. Of the words that occurred with greater or lesser frequency in the reports, Figure 1 illustrates selected ones that relate in a specific way to the operation of airports or refer to phenomena in their surroundings. The color of each cell is proportional to its position on the color scale, which indicates the frequency of the word in the report. The selected words form groups, which were identified, as a result of cluster analysis (Ward's method, Euclidean distance). While at the beginning of the characterized period, the reports often showed the word growth, less often the words *trend, economic* referring to the development and good condition of the industry, in 2020-2021 words related to restrictions, pandemic, collapse, crisis appeared. In the background, they were associated with employee layoffs, financial losses in the aviation industry, threats to the continued operation of airports. The impact of the Covid-19 pandemic on the number of flight operations carried out, the number of passengers checked in and the amount of cargo (Cargo) transported at the airports presented in the article is presented in the studies (Piotrowska-Trybull, Kozuba, Sirko, 2023, pp.167-188; Sirko, 2022, pp.121-135).

Figure 1. *Occurrence of selected words, in IATA monthly reports, 2019-2023*



Source: own study based on IATA reports.

The recovery of the aviation market in 2021 was reflected in the terms used *(travel, domestic, rpks).* The year 2022 and 2023 will see a slow return to the level of flight operations performed and the number of passengers carried in 2019, in domestic and international traffic, reflected in the vocabulary *(sales, ticket, traffic, passenger, domestic, international, rpks).* Also evident is the increasing share of words referring to growth and trend formation. Occurring more frequently in 2019, the words *business, economic, confidence,* in 2023 were not yet so numerous in the reports. In view of the impact of the Covid-19 pandemic, this may be due to the specific use of particular words, e.g., the word *confidence,* where the level of public confidence was taken into account in scenarios of air transport returning to its 2019 condition. The change in traveler behavior, especially attitudes and preferences, depends on the sense of confidence within the organization, the execution of air travel, and is identified on the basis of distinct passenger segments (Budd T., Suau-Sanchez P., Halpern N., Mwesiumo D., Bråthen S., 2021). According to the results of the 2022 Inmarsat survey, 8 out of 10 passengers felt reassured when deciding on air transportation, which was expressed in the increase of air operations. At the same time, passenger expectations have changed, some trends have accelerated and deepened, e.g., in view of the change in work patterns, a new

group of passengers has emerged – a *hybrid* combining the behavior of the business passenger and the traditional leisure passenger, the most important element of passenger comfort on board an aircraft is access to Wi-Fi, a seamless, combined experience of service *on the ground* and *in the air* passengers is expected, in addition, expectations of speed of service, information updates and add-on offerings have increased (International Maritime Satellite, 2022).

The reduction and temporary halt in air traffic caused by the Covid-19 pandemic resulted in the loss of experienced personnel due to layoffs, forced long-term leaves, incentives for early retirement, employees' own decisions dictated by the *great resignation – great resignation* phenomenon (International Labour Organization, 2023). A gap in professional expertise was created and shortages of unique skills emerged, the formation of which requires professional and long-term training and practice. Personnel shortages were seen at all levels of the aviation value chain – from ground handling personnel to airline staff to air traffic controllers. In 2020, using airline operations as an example, it was estimated that during the uncertainty of the Covid-19 pandemic, total employment would fall by between 7 and 13%, with traditional airline employees and unskilled workers feeling the brunt (Sobieralski, 2020). In September 2021, Air Transport Action Group reported that the Covid-19 pandemic resulted in 2.3 million job losses (a 21% reduction from pre-pandemic levels) (Air Transport Action Group, 2021). In Europe, at the end of the third quarter of 2021, number of jobs in air transport was by more than one fifth lower compared to the pre-pandemic period (Zawojska, Siudek, 2021, pp. 83-100). According to Eurostat, in the first quarter of 2022, there were 325600 people employed in aviation in the EU. This was the lowest figure in 14 years (Eurostat, 2022).

The Covid-19 pandemic escalated problems related to the recruitment, training and retention of airport workers. During the period of its occurrence, a twofold impact of the threat to the airport employment ecosystem was identified, i.e., the health risk arising in the air transport sector from the possibility of employees performing job duties contracting the virus, and the economic risk associated with the instability of the air transport industry's operation under changed conditions (S. Tuchen, M. Nazemi, S. M. Ghelfi-Waechter, E. Kim, F. Hofer , C-F. Chen, M. Arora, S. Santema, L. Blessing, 2023).

The airport as a development factor and employer in municipal documents

In development strategies and reports on the state of municipalities where ports are located-their presence is treated as:

- an important element of the city's transportation system (Report on the State of the City of Bydgoszcz for 2021, p. 239), also as an asset in the context of co-creating with other types of transport infrastructure a transportation hub for passenger and cargo traffic. The existing network of air connections is considered a weakness (*Bydgoszcz* 2030. *Development Strategy*, p. 9), which is gradually improving. As highlighted in the report, improving accessibility is a condition for strengthening the role of Bydgoszcz and increasing the competitiveness of the functional metropolitan area (*Report on the State of the City of Bydgoszcz for 2019*, pp. 47, 50),
- a condition for good internal connectivity with other parts of the country and abroad (Szmytkowska, 2021). The airport, together with the seaport, are treated as important elements of exogenous potential, also poles of economic growth, which attract and where companies with a manufacturing and logistics profile concentrate (Szmytkowska, 2021, p. 107, *Gdańsk 2030 Plus City Development Strategy*, p. 65). The development and quality of transport and logistics infrastructure is treated as a source of Gdańsk's competitive advantage,
- element that increases transport accessibility and at the same time provides an impetus for the development of other types of railroad infrastructure (*Report on the State of the Municipality of Ożarowice 2020*, 2021, p. 5). Its presence causes inconvenience for residents (noise) and causes restrictions on the use of land around the port for investment (*Report on the State of the Municipality of Ożarowice 2020*, 2021, p. 51),
- a factor affecting transportation in the municipality, responsible for the intensification of car traffic and increased flow of passengers and port employees, as well as airport noise and inconvenience to residents caused by investments in the Kraków-Balice port. At the same time, the municipality's development strategy emphasizes that the presence of the

port is conducive to the location of investments (*Development Strategy of the Zabierzów Municipality until 2030*, 2021, p. 28). The municipality's transportation accessibility, which is based on saturation with transport infrastructure, is considered a strength, while noise and housing and investment constraints as a consequence of the port's location are considered a weakness,

- a factor that facilitates domestic and foreign connections (*State of the City of Świdnik Report for 2022*, p. 7), increasing transportation accessibility through a developing and diversified infrastructure. In addition, creating opportunities for increased capital inflow to the region and the creation of new jobs,
- a factor increasing transportation accessibility along with developed road infrastructure (*State of the City Report*, 2021, pp. 5-6),
- a factor conditioning the communication accessibility of Poznań, in addition to the railroad wheeled infrastructure, which is conducive to dynamic development (*Report on the State of the City of Poznań for 2020*, p. 216). The development strategy marks a prioritya strong metropolisconditioned, among other things, by support for the expansion of the network of rail, road and air connections, which will allow to intensify national and international links (*Development Strategy of the City of Poznań 2020+*, p. 29),
- a strength of the municipalityan element that strengthens its economic potential (*Development Strategy of Trzebownisko Municipality for 20*22-2030, pp. 40, 47),
- transportation hub (*Report on the State of the Goleniów Municipality in 2019*, 2020, p. 6), providing good conditions for communication accessibility (rail, road, air) and conducive to attracting entrepreneurs to the municipality, who locate in the Goleniów industrial park (*Development Strategy of the Goleniów Municipality for 2014-2023*, p. 22),
- *a window on the world* (*Report on the State of the Municipality 2019*, 2020, pp. 13-14). Military and civilian air operations to save people's health and lives are handled at the Wroclaw port (*Report on the State of the Municipality 2022*, 2023, p. 212).

Confirmation of the increase in the frequency of the use of words indicating improvements at airports was also found in reports on the state of municipalities. In them, one can find information about the gradual recovery of air passenger traffic in 2022 (Gdańsk, Wroclaw, Poznań, Szczecin-Goleniów, Łódź, Bydgoszcz) and the launch of new connections and cooperation with new carriers (*Report on the State of the City of Bydgoszcz for 2022*, *Report on the State of the City of Gdańsk for 2022, Report on the State of the Municipality of Goleniów for 2022*, *Report on the State of the City of Poznań for 2021*). In the context of airport development, the reports presented references to planned and ongoing investments in airport infrastructure, such as: preparing documentation for the implementation of an investment at the Port of Bydgoszcz – the construction of a photovoltaic farm in 2021 (*Report on the State of the City of Bydgoszcz for 2021*), investing in the reconstruction of the terminal and changes in the payment processing system, modernization of the parking lot (*Report on the State of the City of Bydgoszcz for 2020*), construction of a new passenger terminal at the Port of Gdańsk (Szmytkowska, 2021), applying for funding to improve service conditions at the Katowice-Pyrzowice airport by connecting the areas adjacent to the Pyrzowice airport to the A1 highway (*Report on the State of the Municipality of Ożarowice for 2022*), implementation investments of a device visibility management system in the network, a cyber threat reporting system, and modernization of the cargo terminal premises at the Port of Poznań in 2021 (*Report on the State of the City of Poznań for 2021*), investments in the expansion and modernization of the airport, including the implementation of the ISO 27001 and ISO 2230 Information Security and Business Continuity System, adaptation of the IT infrastructure to the requirements in the area of cyber security at the Port of Wrocław (*Report on the State of the Municipality for 2022*, 2023).

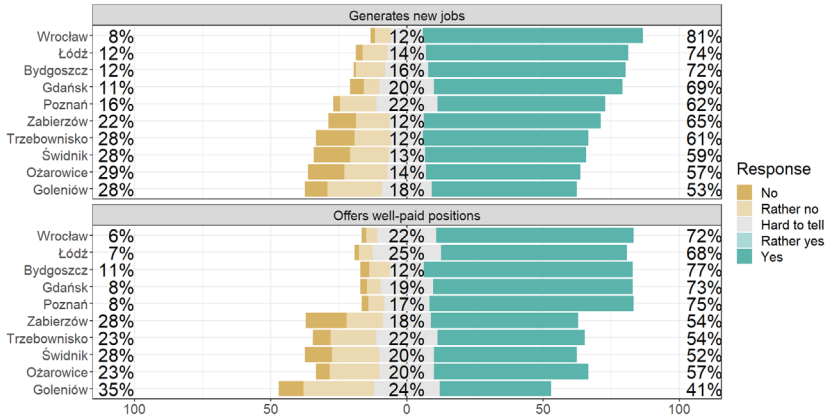
The impact of the airport on the local labor market situation – in light of the results of a survey study

Airports are complex systems that affect their surroundings in certain ways. The benefits associated with the presence of an airport in a municipality (e.g., creates jobs, fuels development, attracts investors) and the consequences associated with it (e.g., generates noise, adversely affects flora and fauna) mean that the presence of an airport does not necessarily have to be perceived unequivocally (Piotrowska-Trybull, Kozuba, Sirko, 2023, pp.167-188). This is reflected in the responses of the respondents, because next to a large group (72.0%) of people satisfied with the fact that they live in the municipality where the airport is located, others (18.3%) had a different opinion in this regard or did not take a clear position (9.7%) – a statistically significant relationship at $p = 0.0000$. Benefit from the presence of the airport was perceived by 83.5% of respondents from municipalities where the airport is located within city limits and 60.5% from municipalities where it is far from a large city (statistically significant relationship at $p = 0.0000$). A statistically significant relationship (at = 0.0000) was also found when analyzing respondents' answers taking into account the variable port size (the highest percentage – 80.3% – of those satisfied with the presence of the port was recorded in the third group).

The location of the port in their municipality was viewed critically by 9.6% of respondents from urban municipalities, 29.9% from rural municipalities and 35.8% from urban-rural municipalities, 11.2% of respondents with a university education, 22.4% with a high school education, 20.6% with a vocational education and 15.6% with a primary education.

One of the advantages of the airport's presence in a municipality is that it offers employment for its residents. While this was perceived by respondents from every municipality (Figure 2), the greatest number of indications were noted in urban municipalities: Wroclaw, Lodz, Bydgoszcz, Gdańsk and Poznań – (statistically significant relationships at $p = 0.0000$). This may be due to the fact that there are more people in large agglomerations who, in light of the variation in the structure of the port workforce presented in the study (ACI Europe, 2015), are likely to work at the airport.

Figure 2. *Respondents' opinions on the impact of an airport on the local labor market*



Source: Own study.

The positive impact of the airport on the local labor market was perceived by a similar percentage of participating men and women (64.7% and 66.0%, respectively). Respondents' opinions in this regard were differentiated by the education they had. As it increased, the percentage of indications increased (primary 60.5%, vocational 61.3%, secondary 64.4%, higher 71.4%) indicating that respondents perceived that jobs were being created at the airport (statistically significant relationship at $p = 0.0104$), and that they were well paid (primary 59.6%, vocational 61.3%, secondary 58.9%, higher 69.6%).

Respondents' responses regarding the impact of the airport on the local labor market were also differentiated by the airport size variable (statistically significant relationship at $p = 0.0000$). In the opinion of 73.5% of respondents living in municipalities where there are airports in Group 3 and 65.0% from municipalities with airports included in Group 2, airports located in their area offer well-paid positions. In the other groups, the percentage was lower (group 1 – 54.2%, group 4 – 58.5%).

Jobs can also be created by investors for whom the airport is a magnet, the presence of which provides a comparative advantage in the form of higher transportation accessibility of the place relative to competing locations. Such an opinion was expressed by 65.1% of respondents with primary education,

65.3% with vocational education, 66.7% with secondary education and 77.5% with higher education (statistically significant relationship at p = 0.0044), mainly coming from urban municipalities (77.9% of respondents from these municipalities). Among respondents from rural municipalities, there were 57.3% such respondents, and 53.3% among those residing in urban-rural municipalities (statistically significant relationship at p = 0.0000). The presence of investors and their role in the labor market was perceived by 68.3% of female and 70.3% of male respondents. The most frequent respondents were between the ages of 18 and 44 (85.6% of those in this age range). Differentiation, was also found by analyzing respondents' answers through the prism of the port size variable (statistically significant relationship at p = 0.0005). The highest percentage of responses indicating the role of the port as a magnet for investors was found among respondents living in municipalities with ports in group 3 (75.0%) and ports included in group 2 (73.7%), Jobs are also created by companies that are established in the municipalities as a result of the favorable situation created by the presence of the airport. Such a relationship was pointed out by 69.7% of respondents with primary education, 59.7% with vocational education, 64.6% with secondary education and 77.2% with higher education (statistically significant relationship at p = 0.0000). They included residents of urban (73.6% of respondents in this group), rural (59.6%) and urban-rural (55.0%) municipalities – a statistically significant relationship at p = 0.0000.

By examining the text files resulting from the transcription of interviews with municipalities and airport representatives, words were identified that occurred in their statements (appeared in the corpus at least five times and were present in a minimum of ten out of seventeen interviews). Among the others were the words *airport* and *work*. Taking into account how numerous these words were in each interview and using cluster analysis (Euclidean distance, Ward's method), four groups A, B, C, D of similar utterances were identified.

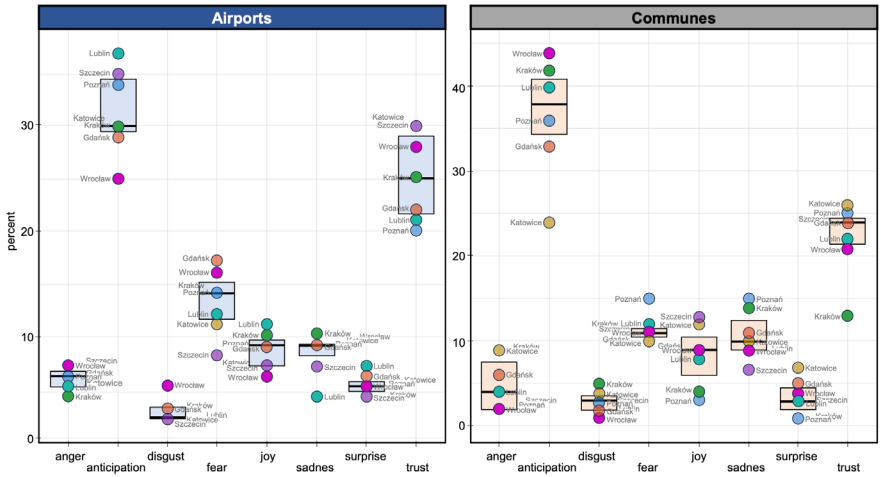
What is characteristic is that the statements given by representatives of airports, with some exceptions (2023_Goleniów, 2023_Poznań), form separate, not fully homogeneous groups (B, C). It can also be seen that some interviews given by representatives of municipalities and representatives of airports located in their areas were similar in terms of the number of words airport and work uttered during them (2021_Goleniów and 2023_Goleniów – group A,

2021_Zabierzów, 2023_Kraków – group B). One group (C) also included interviews from 2022 and 2023 by representatives of the L. Wałęsa Port in Gdańsk.

Similarities and differences between the statements made by representatives of municipalities and those made by representatives of airports located in their areas were seen by analyzing emotions that were identifiable through the use of sentiment analysis (an issue discussed, for example, in the work of Silge et al., 2017; Kwartler, 2017). The distribution of emotions in these groups is shown using a box-and-whisker plot (Figure 3). Generally speaking, their distribution is similar, especially in the groups: *anger, disgust fear, joy, sadness and surprise.* However, it can be noted that in the group of municipal representatives, the percentage of emotions related to expectation was higher than among airport representatives. The above may have been related to the expectation of benefits in the form of an increased influx of investment and development of economic activity, indirectly also an improvement in the labor market situation, due to expenditures on the development of transportation infrastructure that increases the accessibility of the municipality and the region, and the preparation of economic activity zones. On the other hand, in the group of representatives of airports, a higher percentage, compared to representatives of municipalities, was the emotion of trust, the basis of which may be the increase in customer interest in air travel, manifested in the number of air operations and income from this activity, which has been growing year after year since the pandemic.

Airports are places where various organizations that provide certain services operate. On the territory of the airports presented in the article there are stores, restaurants operate, services are provided, and there are parking lots at the airports providing parking space. Analyzing the information on the websites of airports (accessed 02.02.2024), it was found that the largest number of points where passengers can use certain services was at the ports of Krakow and Wroclaw. It was also checked what job offers were on the ports' websites. Most were in Wroclaw (8 offers), three each in Lublin and Rzeszów, two each in Poznań and Gdańsk, one each in Szczecin and Katowice. The ports were looking for security personnel, ground handlers, passenger attendants, cleaning staff, and a public procurement specialist.

Figure 3. *Distribution of emotions in interviews of representatives of municipalities and airports located in their areas*



Source: Own study.

Conclusions

Air transport, while playing an important role in the movement of people and goods, is susceptible to the impact of disruptions of a natural, economic or other nature. It is characterized by seasonal fluctuations in demand. These fluctuations lead to under – or over-utilization of resources held by carriers and airports. The link between air transport and other modes of transport is airports, which to a greater or lesser extent affect the local environment, including the labor market situation. There are various companies operating at airports, which makes the structure of the airport workforce diverse. The state of employment at the airport is derived from the number of passengers checked in during the year or the number of cargo type operations carried out. Airports, by attracting investors, new economic activities, contribute to the creation or development of local companies. They also make the region in which they are located more recognizable, which also affects the development of tourism.

Consequently, the presence of airports contributes to the creation of jobs in air transport-related sectors.

Until 2019, the main problems in the operation of the aviation services market, in view of the projected growth in demand for aviation services, were, in addition to the depletion of infrastructure capacity and equipment, staff shortages. Conditions of employment and provision of labor, is one of the reasons for the shortage of workers at the airport. The Covid-19 pandemic escalated the problems of recruiting, training and retaining airport employees. In the case of air transport, where there is a high degree of specialization and the education and training process is sometimes lengthy and costly (e.g., flight attendants, controllers), staffing problems can result in operational disruptions. The potential loss of personnel, during a temporary halt and curtailment of aviation sector operations, can lead to a very long period of rebuilding teams of employees.

Airports, like other modern organizations, operate in a dynamic environment, which is characterized by competitiveness, volatility, which in a greater or lesser way affects the tasks carried out in them. Airport operations can be significantly curtailed or brought to a halt as a result of black swan events (an issue discussed in Taleb's article, 2020). As a result, the airport's human resource management problems escalate, mainly centered around recruitment, training and retention processes. The key problem becomes the adjustment of the number of employees (downsizing, upsizing) to the number of operations carried out in the short term, which consequently underscores the importance of the need to build resilience in air transport, including in the management of the sector's human resources.

The importance of the airport for the municipalities in which they are located is confirmed in their strategic documents. It is emphasized that airports are a strength of the municipality, their presence increases the transport accessibility of the municipality, the region, and this in turn contributes to greater investor interest in locating activities near them. Entrepreneurs locate operations in cities (Gdańsk, Wrocław, Poznań, Łódź) or in specially created for this purpose – economic activity zones (Ożarowice, Zabierzów, Trzebownisko), industrial parks (Goleniów, Świdnik) to discount the benefits of a convenient location and the opportunity to develop business relationships on a national and international scale based on services and products. Consequently, this leads to job creation.

In the surveyed municipalities where there is an airport, participating residents of the municipalities were mostly satisfied with its presence. Perceptions of the airport's impact on the labor market were differentiated by the nature of the municipality, the size of the airport and its location, and the respondents' education. Satisfaction among residents of urban municipalities was higher than among residents of rural and urban-rural municipalities. In the case of the former, access to a diversified labor market, the opportunity to live and work in a large city, and the availability of various modes of transportation, including air transport, promote satisfaction with its location in the city. The port's location in a metropolitan municipality, closer to the city center, increases this employer's accessibility to those associated with the aviation industry. The concentration in large cities of a larger number of professionals with university degrees who can take up jobs at the airport means that this group of people recorded the greatest support for the airport's presence. In the case of municipalities, neighboring large cities, the airport was a source of jobs partly in companies located at the airport, but also in companies providing services around the airport. Among those surveyed, the highest probability that a person was satisfied with the presence of the airport occurred when he or she believed that the airport attracted investors.

Statements by representatives of municipalities and airports also varied. They were characterized by lexical diversity and level of emotion. In the group of municipal representatives, the percentage of emotions related to expectation was higher than among airport representatives, while in the group of airport representatives, there was a higher percentage, relative to municipal representatives, of emotions related to trust. A clear differentiation of emotions relating to expectations, was found in municipalities where the airport is located near a major city.

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