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Konstantinos MALAGAS[1], Athanasios PALAMARAS[2], Ayse KUCUK YILMAZ[3], Nikitas NIKITAKOS[4]

PROBLEMS, CHALLENGES, AND POTENTIALS OF THE GREEK AIR CARGO INDUSTRY

Summary. Air cargo significantly contributes to trade, bridging the gap between production and consumption in a timely and reliable manner. The specific industry is a complex system, participating many players and requiring many documents and actions. Greece's economic growth is highly dependent on the exportation and import of goods. The current study intends to analyse the Greek air cargo industry, implementing a more holistic approach, identifying the main problems and challenges, and making useful recommendations. In-depth focus group discussion with the participation of twelve (12) experts (n=12) and observation applied to collect the required information. The main findings present the high level of bureaucracy, the lack of cooperation between the partners and the use of technology that caused significant problems in the industry's performance, while some

[1]Department of Shipping Trade and Transport, University of the Aegean, Korai 2A Street, 82132 Chios, Greece. Email: kmalagas@aegean.gr. ORCID: https://orcid.org/0000-0002-9532-7289
[2] Department of Shipping Trade and Transport, University of the Aegean, Korai 2A Street, 82132 Chios, Greece. Email: apalam2@gmail.com. ORCID: https://orcid.org/0009-0007-3375-6655
[3] Faculty of Aeronautics and Astronautics, Aviation Management, Eskisehir Technical University (ESTU), 2 Eylul Campus, 26555, Tepebaşı, Eskisehir, Turkiye. Email: akucukyilmaz@eskisehir.edu.tr. ORCID: https://orcid.org/0000-0001-5240-1023
[4]Department of Shipping Trade and Transport, University of the Aegean, Korai 2A Street, 82132 Chios, Greece. Email: nnik@aegean.gr. ORCID: https://orcid.org/0000-0003-0808-0247

effective interventions were proposed. The study provides useful insights to the related practitioners, policy-makers and academicians.

Keywords: Greek air cargo industry, Greek freight, Greek aviation, focus group

1. INTRODUCTION

Air cargo is a trade facilitator, contributing to global economic development and creating millions of jobs. Air cargo transports over US $6 trillion worth of goods, accounting for approximately 35% of world trade by value [1]. These figures underline that air cargo is an important investment area and contains opportunities for countries, as it is the only transportation option for certain high-value products.

Air cargo transportation presents significant benefits compared to the sea and road competition, such as the speed and the no-impact by external events (weather conditions, high traffic in ports). Air transportation provides a convenient mode of movement for specific products types such as emergency (spare parts, particular documents), high value (gold, work of arts) and perishable products (medicines, fresh food and vegetables, flowers); all these have a concise life and need fast transport times [2]. The main characteristics of the air cargo supply chain are the participation of several stakeholders and documents that add value and complexity to transported goods. All air cargo intermediaries should cooperate and coordinate to effectively and efficiently transport goods from the origin point to the delivery's end. The two key air cargo supply chain players are airlines and freight forwarders. The former must adapt and respond to the challenges in the relevant global competitive environment [3], as well as regional and local. Furthermore, forwarders are primarily focused on the decisions issues related to capacity booking, supply strategies for airlines, container loading, integration and consolidation strategy, and truck routing and scheduling [4] Therefore, air cargo performance is a function of different combinations of factors and variables. Consequently, studies that focus on these intermediaries and the required processes identify possible problems and suggest solutions are beneficial.

Greece has a great production of fruits and vegetables and industrial products, and a unique geographical position requires efficient air cargo transportation. However, the industry has yet to grow, and research on the Greek air cargo industry problems is highly welcomed. At the international level, air cargo transportation is an over-researched area, and more recent studies are focused on operational processes, systems descriptions, and industry development [4]. On the other side, there needs to be more studies focused on the Greek air cargo industry, and the current research tries to bridge this gap. Thus, the present study examined an interesting subject, a holistic analysis of the Greek air cargo industry and useful insights are expected.

Extended focus group discussion with the participation of experts (n=12) was applied to collect the required information. The study's participants were purposely selected members from the cargo community, and all have rich expertise and knowledge in transport logistics. In addition, observation of workplaces was also implemented to instant monitor the industry's problems. This mixed method approach helped the researcher better understand the manifestation of concerns under study from the views of people who lived the experiences and know the industry well; The outputs led to balanced and useful conclusions.

The main findings show the high level of bureaucracy, the need for more adoption of advanced technologies, and coordination and cooperation between the industry stakeholders, and these generate significant obstacles to the further growth of the Greek air cargo industry. Based on these issues, valuable solutions were proposed to manage them.

We should not forget that when modeling transport organization, ecological aspects should be taken into account [5].

Useful conclusions emerged from the current study, which can form a basis for solving industry problems. Also, the research provides useful knowledge for those involved in the industry, both professionally and academically, and those who draw up specific related policies (policymakers). The current paper significantly contributes to the specific field as there are only few and old related studies.

The current study is organised as follows. The next part provides relevant literature, followed by the Greek air cargo industry presentation. Then the used methodology and the study's findings are followed. Finally, the discussion of the results, conclusion, main limitations and suggestions for future research are presented.

2. LITERATURE REVIEW

In this part of the study, the main issues of the relevant literature are briefly presented. The air cargo industry plays a leading role in international commerce and economy, and its main advantages compared to the other transport modes are the speed, reliability, and the ability of aircraft to accept containers with a cold room (ideal for food, vegetables and medical items). The seasonal nature of the transported products impacts the industry's revenues and profits [6]. Sea transport dominates in cargo transportation, while road and rail transport compete with air for small and medium-sized items; while air cargo tariffs are based on units of weight and sea transport on shipment volume [7]. Air transport carries around 1% of the volume of world trade shipments, representing over 35% of the world trade value; goods transported by air are very high-value commodities, often perishable or time-sensitive [8]. The annual world air cargo volume change is highly associated with world GDP [9].

The centre of gravity for the industry has shifted to the Asia/Pacific region, and one-third of a million tonnes, and about 50% of the world cargo (measured in tonne-kilometres) either transported from to or within this region, with significant imbalances in direction [8]. Air cargo's positive contribution to managing crises is indisputable [10]. In the COVID-19 crisis, from the aviation industry, only cargo airlines and freight forwarders enjoyed increased demand [11]. The main causes for the increased volumes of air cargo are the high global trade growth, the considerable demand for quick delivery and firms' trend to keep the lowest inventory level through frequent replenishments [12]. Furthermore, the rapid growth of e-commerce [8] and the use of widebody aircraft like B777, B747-8 and A340, which are more economical and could carry large volumes of cargo in their bellies [5], have changed the air cargo industry.

Air shipments are heterogeneous, ranging from envelopes to heavy and bulky loads weighing several tonnes, and fresh vegetables and fruits, requiring different approaches and fares [2]. Instead of looking at individual products, many authors prefer to segment intercontinental trade based on the carriers' motivation and urgency for delivery [7, 13]. In air cargo transportation, four main product types are transported in increasing order and are related to the price sensitivity: 1. Emergency transportation 2. High-value cargo, 3. Shipment of perishable products, 4. Non-perishable freight [7]. Moreover, the high level of differentiation goes hand in hand with high returns [14], while demand for specialty products grows faster than demand for general cargo.

Like the passengers' air transportation, air cargo profitability depends on the interaction of the same three variables: unit cost, revenue or unit yields and load factors, and the key elements are time, cost, product nature and market characteristics [15].

Two types of airlines operate in the industry, integrated express carriers and those that combine passenger and cargo transportation, carrying express packages and mail in the belly space of passenger aircraft and also operate dedicated freight aircraft [16]. There are many reasons producers prefer air cargo flights: 1) the passenger transport does not serve the most important commercial cargo routes; 2) passenger itineraries often do not correspond to sender's time requirements; 3) cargo that is shipped on a pallet cannot be transported by a passenger aircraft; 4) the passenger planes cannot handle hazardous materials, and 5) the range of payloads for passenger planes may limit carriage cargo, which reduces the probability that the cargo will reach its destination on time [17]. In addition, considering passenger traffic and freight ratio, the following four groups of airports are operated: a) full passengers' airport, b) freight interest airport, c) freight specialist airport, and d) mixed passenger and freight airport [18].

Air cargo transportation is a complex process. Several involved operators carry the load along the chain with various responsibilities, including aircraft operators, forwarders, postal carriers, agents, shippers, consignees, carriers, and ground handlers. Most (29%) of the cargo revenue goes to airlines, while the rest is directed to middlemen [7]. The cargo can be transported between many connecting flights before reaching the final destination, subject to various procedures and documentation requirements in accordance with legal and commercial frameworks. Therefore, everyone involved in these complex procedures is responsible for ensuring cargo safety and operating within the law's framework [19].

In addition, air cargo operation is more complex than passenger transportation because the former includes more players, more sophisticated processes, a combination of weight and volume, varied priority functions, integration and consolidation strategies, and mainly an indirect network [4]. A high level of coordination to achieve fast delivery is required [20], while miscoordination and faults within the supply chain result in significant losses compared to the other transportation types [21].

Information dissemination and management are important for efficient air cargo operation. The implementation of fully integrated information technology (IT) systems, RFID (radio frequency identification) and a cargo tracking system (GPS technology) allow the fast data process regarding the supply chain operation and manage the flow of information faster than the natural flow of cargo. These positively contribute to air cargo's increased visibility throughout the supply chain and cargo transportation performance [22].

In addition, emphasis on the customer’s needs is important. Thus, air cargo management should focus on customers responsiveness, mainly in terms of security and immediate satisfaction of their requirements and empathy, leading to higher performance. In contrast, implementing an informative platform to provide real-time cargo movement data is highly required [23].

The cargo airlines network is important; developing a hub-and-spoke system can revive medium and large-size airports that limit passenger demand in their catchment area to become strong regional hubs [18]. Furthermore, the selection of aircraft type, fleet planning and sector features should be considered in the hub selection process, particularly when this requires major investment and incurs significant operational costs [24]. The surface transport links are essential, and in particular, road transport can efficiently feed intracontinental short- and medium-haul routes providing delivery and pick-up services through airline trucking (road feeder services) and ‘truck flights’ of airway billed consignments between two airports [25]. The ‘transport capacity’ related to airport connectivity, followed by ‘airport operations and facilities capacity’ and ‘regional economic growth’, are the main drivers of competitiveness of cargo transportation at hub airports. In contrast, European airports are more competitive in terms of ‘financial performance’ than other regional airports [26]. The efficient operation of air

cargo terminals is important, including decision problems related to workforce planning and scheduling, cargo processing, truck arrival and unloading management, which are all interdependent actions [27]. The human resources, handling process and cut-off time (to achieve high punctuality) are the most significant for air cargo terminal operational performance (in particular in the Covid-19 era) [28]. Thus, the efficient operation of landside part operations of air cargo terminals is essential, focusing on shipment-consolidation policies based on the economic shipment weight policy [29]. Warehouse design is necessary for air cargo operation, and using the proper decision support system can achieve low cost, high operational performance, increased customer received quality and high marketing effectiveness [30]. In addition, airside and landside activities and physical and documentary handling run simultaneously, making the air cargo handling process more complex and well-coordinated; special emphasis should be placed on safety and environmental issues [31]. Vasantha (2019) [32] studied the cargo operations, problems and challenges at the Chennai International Airport in India and identified the main issues of bureaucratic procedures in customer clearance, congestion at airport cargo terminals, unskilled employees, inefficient use of the aircraft belly capacity, lack of forecasting of airline cargo capacity and space allocation. He also identified a lack of the relevant knowledge to handle dangerous and hazardous goods.

The contribution of international aviation organisations to facilitating cargo shipments is important. IATA (International Air Transport Association) through e-freight/eAWB (e-Air Waybill) (introduced on 1st January 2019) involves all the participants in the cargo supply chain and facilitates its digitalisation reducing paperwork through electronic messages and high data quality [33]. ICAO (International Civil Aviation Organization) is focused on safety issues through Annex 6 (Operation of Aircraft - Part I – International Commercial Air Transport – Aeroplanes) and on dangerous goods safety through Annex 18 (Safe Transport of Dangerous Goods by Air) and the relevant Docs (Doc 9824, Doc 9481, Doc 10102, Doc 10147) [34]. EASA (European Air Safety Agency) published specific guidelines facilitating cargo transportation in passengers' aircraft compartments (in particular in COVID-19 era when the urgent cargo transportation demand was high) [35]. Finally, the WCO (World Customs Organization) [36] and UPU (Universal Postal Union) [37] support the benefits of their participants and facilitate cargo and mail transportation.

In this complex and competitive environment, the Greek air cargo industry has several problems to overcome, survive and grow.

3. THE GREEK AIR CARGO INDUSTRY

Greece supports and guides air cargo demand, especially with its geographical location, rich cultural features, natural wealth, developed with high potential tourism sector, and product diversity. Some countries present specific characteristics that flourish cargo operations compared to the rest, such as the geographical location, production values, strong aviation industry, and significant logistics to become a hub [38]. In addition, the rapid expansion of air transport passengers' traffic, the new developments in airports infrastructures and the implementation of some initiatives like the recent cooperation between the Athens International Airport (AIA) and the port of Piraeus – the so-called "Seanairgy Project" – contribute to the development of Greece as a major regional logistics hub that links Europe with the Middle East, Africa, and East Mediterranean.

The Country has 45 airports, 15 of which are international, 26 are domestic, and 4 are municipal. The key players in the Greek aviation market that invest in the new infrastructures are the AIA, the new Heraklion Airport (expected to complete in 2027), and the infrastructure developments in 14 regional airports by Fraport [39]. The latest advancements include more emphasis on air cargo services.

Approximately 105,398 tonnes of air freight were carried through Greek airports in 2019, while in 2008, this figure amounted to 112,225 tonnes. In the previous years, the country's financial crisis had negatively impacted the cargo figures, while 2015 marked the first year that an increase in freight volumes was observed. Concerning the type of air freight traffic, international loads have by far the largest share in the total quantities of goods transported through the Greek airports, in the range of 90%. Europe is the main cargo market for Greece. Intra–EU air traffic was Greece's most important component of air freight transportation up to 2017; however, percentages are split between intra- and extra-EU in the past two years, with extra-EU traffic surpassing intra-EU for the first time in 2018. On the other hand, within the same reference period (2008-2019), there was a remarkable shift in the split of air freight that arrived in the Greek airports compared to the cargo that departed from them. From only 40% in 2008, the share of air freight that departed from the Greek airports − in international or national flights − reached the value of 51% in 2015 and 57% in 2019, showing considerable growth in the significance of the outbound air freight [40].

More than 88.3% of air freight in 2019 passed through the AIA. The following table 1 shows the cargo and mail figures for the 2019-2022 period. The two key findings are: a) the outbound outperform inbound cargo traffic and b) the high numbers in transit traffic.

Tab. 1
Athens International Airport (AIA) cargo and mail traffic for 2019-2022

	Cargo			**Mail**	
Years	Inbound	Outbound	Transit	Inbound	Outbound
2019	37.699.416	48.091.124	3.734.828	3.734.828	3.926.725
2020	33.139.960	38.166.188	8.341.677	1.969.445	2.507.770
2021	40.919.227	51.626.902	9.687.607	2.016.135	2.344.623
2022	36.587.392	60.754.984	5.941.312	1.659.935	2.551.170

Total		**Total**	**Proportion**	
Inbound	Outbound	(Inbound+ outbound+ transit)	Inbound	Outbound
41.434.244	52.017.849	97.186.921	44,3%	55,7%
35.109.405	40.673.958	84.125.040	46,3%	53,7%
42.935.362	53.971.525	106.594.494	44,3%	55,7%
38.247.327	63.306.154	107.494.793	37,7%	62,3%

Remarks: Transfer: freight transported via Athens to another destination in Greece or abroad
Mail refers to Hellenic Post (ELTA) shipments | Express (courier) weight is included in the Freight
Transfer/Transit is included both in inbound and outbound freight.
Source: Athens International Airport (AIA), Facts & Figures, Cargo Traffic [40].

The main types of air cargo handled at the AIA are ship spare parts, pharmaceuticals, fresh fish, foods, perishables, electronics/machinery/parts, jewellery, high-tech products, aluminium, special cargo (live animals, dangerous goods, radioactive materials, etc.), and new premium products, such as bioproducts. Moreover, since 2003, AIA has established an efficient communication platform: the Airport Cargo Community Committee (ACCC), to strengthen and enhance the communication and cooperation among all members of the air cargo community [41].

According to an expert (President of the National Council for Logistics), Greece climbed to 19th place worldwide compared to 42nd in 2018 in the World Bank's Logistics Performance Index (LPI stands at 3.7 in 2023 versus 3.2 in 2018), and this is attributed to the following: a) 13% of customs infrastructure and procedures, b) 17% in the simplification of general procedures in the logistics market, c) 15% in infrastructure modernisation, d) 24% in digitisation investments, e) 23% in boosting the credibility of the public sector, and f) 6% in strengthening Greek extroversion. In addition, the privatisation of the two major ports, Piraeus and Thessaloniki, positively contributed to freight transportation. On the other hand, the country’s railway infrastructure and modern commercial centres/industry areas lag, while the institutional framework also needs improvements. Finally, establishing a pure cargo airport in Volos, Central Greece, focusing on international markets, is proposed [42]. Furthermore, Thessaloniki offers significant advantages, and the cooperation and integration of port-airport services are important and should become a vital hub in North Greece for air cargo transportation. At the same time, particular emphasis on Balkan countries should be given and to examine the possibility to exploit other distant markets beyond EU, such as South American markets [43].

Finally, IATA pointed out that Greece lags behind the European average score in terms of overall Cargo Facilitation, which is related to customs and border processes, and the use of e-Air Waybill (eAWB), which is still low in Greece, is recommended that greatly improves the flow of goods across borders [44]. The above shows the good prospects of the Greek air cargo industry, although there are significant problems that should partially be solved, and these consist of the objective of the current study.

4. METHODOLOGY

Qualitative research can lead researchers to gain insights into real-world problems [45]. In particular, the qualitative research method asks open-ended questions whose replies are not easily represented by numbers such as 'how' and 'why' [46].

Focus group discussion and observation were applied to collect the required data. Focus group discussion is a technique where a researcher assembles a group of individuals related to the examined subject to discuss it, aiming to draw useful study information from the complex personal experiences, beliefs, perceptions and attitudes of the participants through a moderated interaction [47]. The moderator (the second author of the current paper) had an important role to well-organize the focus group discussion. Detailed analysis of the focus group discussions and observations was applied to generate useful outcomes according to the study objective.

The focus group meeting occurred in the AIA Cargo Department training office in January 2023. In addition, the visit and observation with employees at AIA Cargo Department warehouses was beneficial.

Consequently, based on the secondary data, focus group discussion and observation, useful information was collected, satisfying the study's needs, and triangulation was achieved, which is essential for the study's quality.

Table 2 presents the study's participants, who were purposefully selected from various related fields, which is also significant for the study's quality.

Tab. 2

The study's participants

Respondents Number	Respondents Professions
1	Professor in Business School
2	Professor in Transport School
3	Manager at Athens Airport
4	Customs Officer
5	Cargo Director
6	Airline Executive
7	Aviation Researcher
8	CFO in an International Transport Cargo company
9	Head in an Intergrator company
10	Manager in a Freight Forwarder company
11	Researcher in Supply Chain
12	IT manager

The focus group discussion and observation provided useful information satisfying the study's objectives.

5. THE STUDY'S FINDINGS

The outcomes of the focus group discussion and observation are presented below.

5.1. Focus group discussion

All the participants agreed for the industry's great prospects in Greece, the required further cooperation and coordination of the cargo industry stakeholders and the linkage of cargo airlines with the other transport modes. Academics (respondents no 1, 2, 7 and 11) highlighted excessive bureaucracy in the industry. As a solution, they proposed the immediate digitisation of documents and procedures. In contrast, the executives of the transport companies (respondents no 3, 5, 9 and 10) stressed the major lack of infrastructure at regional airports, while the planned operation of the new airport in Kasteli, Crete, as a hub for the Middle and Far East will be important for the Greek air cargo industry. This will boost fresh vegetables and fruits and transit cargo traffic.

In addition, academicians and a managing director of a cargo company (respondents no 1, 2, and 5) pointed out that the wide implementation of e-AWB will assist the industry, facilitating cargo transportation, and all stakeholders will gain essential information about the shipment movement. A Professor in Transport Studies (respondent 2) suggested the adoption of advanced technologies on the airport side, such as introducing new delivery autonomous vehicles that use more sustainable and environmentally friendly fuels and advanced forms of packaging (intelligent packaging); while new modern warehouses should be established in the big regional airports (Heraklion, Corfu, Chios).

AIA official (respondent no 3) emphasised the benefits of the close cooperation of all involved stakeholders (airlines, forwarders, customs, Ministry of Rural Development), which takes place under the umbrella of the ACCC; while similar services should be established in other regional airports.

A Customs Officer (respondent no 4) pointed out the high level of paperwork for a simple parcel customs clearance and the need for more staff at regional airports to have a 24-hour operation. The great advantage of AIA is the operation at a very close distance of the public services (customs, veterinary clinic, customs offices) and the warehouses of the cargo companies, as these mean faster turnaround times.

A managing director of a cargo company (respondent no 5) mentioned the high level of protectionism in the Greek air cargo industry that limits the establishment of new infrastructures, mainly at regional airports. Thus, he argued that Greek airports apart from AIA do not have sufficient facilities to support the freight transport. Another issue is the lack of interest of the two largest airlines in Greece (Aegean Airlines/Olympic Air & Sky Express) to transport goods, strengthening the export trade of Greek products, especially fresh agricultural products high demanded in European countries.

An executive of a Greek airline (respondent no 6) commented on the need for Greek cargo airlines to enter more aggressively into the industry due to the intense competition by sea transport and the high operating costs of such a business. He also proposed the enforcement of intermodal transport of high-tech goods by train from the port of Piraeus to AIA and their transhipment on aircraft bound for Europe.

An aviation researcher (respondent no 7) highlighted the industry's great flexibility during the pandemic as it took on the titanic task of transporting COVID-19 vaccines using refrigerated containers across the globe by converting passenger aircraft into cargo and the optimal use of resources. He mentioned the lack of employees' awareness about international organisations' regulations and instructions, particularly those related to dangerous goods transportation.

The head of the financial department of an international transport company (respondent no 8) explained that the highest transport cost is fuel, which remains one of the most expensive in Europe. At the same time, the airport fees of state-owned airports such as Heraklion Airport are low.

The head of an integrator company (respondent no 9) pointed out the difficulties they face with the new security protocols and the implementation of the corresponding information systems. There is a different application of them from country to country in the EU (with Greece having made minimal progress), they are complex and require many working hours for their operation, and the transporters burden the costs.

An executive at a freight forwarder company (respondent no 10) identified the difficulties in implementing the Import Control System 2 (ICS2), which also operates in Greece, and there are no clear instructions for its use. He also pointed out that there is no mutual recognition by EU countries of PLACI (Preloading Advance Cargo Information)[5] marks for products entering from third countries, thus increasing the waiting times of warehouse goods.

A researcher on the supply chain subject (respondent no 11) described the industry's current state as there is still a drop in demand from the consumer side (due to high inflation, high-interest rates, high-energy costs and concern about the security of jobs). However, the demand is expected to increase in the second half of 2023 and 2024.

A transport executive, head of the IT department (respondent no 12), argued that we should apply the best available technologies in air transport. The digitisation of the industry is finally here, and the Greek transport companies must adopt them if they want to remain competitive.

5.2. Observation

A visit was made to two small parcels (mail) warehouses at AIA, one was private, and the other was state-owned. The first one was fully automated, and the free parcels and subjects were separated automatically with a laser that read the bar code. The problem, however, was with the understaffing of the customs service, resulting in many products accumulating in the warehouse for inspection, waiting for customs clearance. In the second one, most operations were done by hand, such as opening packages for examination by a three-member committee. At the same time, the delays were very long and resulted in the traders' complaints.

6. DISCUSSION AND CONCLUSIONS

Greece's key strategic location at the crossroads of Europe, Asia, and Africa makes it an ideal transit hub for air cargo. In addition, the country's proximity to major shipping routes and well-connected airports offers opportunities for the efficient transport of goods from and to various regions and the country. The specific nature of Greek production and exporting activity and certain domestic perishable goods can significantly benefit from air cargo transportation

[5] PLACI marks: ensure air cargo supply chain security by providing risk related information for carried cargo prior to the aircraft's loading at thef least point of departure.

independently of their lower value ratio [43]. In addition, Greece, like many countries, experienced significant growth in e-commerce, further accelerated by the pandemic. These prove that the country's air cargo industry has great potential to grow further and establish a robust supply chain. Therefore, particular emphasis should be taken to studying the obstacles that limit the growth of the Greek air cargo industry, which is the current study's objective.

The high level of bureaucracy generates critical problems in the air cargo supply chain, and the wide implementation of new technologies in every part of transportation will significantly assist the industry. Towards this target, e-AWB is important to facilitate transport and provide essential information to the industry stakeholders. Establishing technology-advanced warehouses in regional hubs (Heraklion, Thessaloniki, Chios) will improve the situation. In addition, introducing more automation in landside and airside tasks and processes, such as autonomous vehicles and robotics, is also significant.

The closer cooperation of all industry stakeholders is imperative at a central level and locally, as applied at AIA. A healthy and effective communication and relationship between stakeholders will seize opportunities, minimise threats and combat difficulties in the air cargo industry. Opportunities to increase earnings and market share can be captured by establishing a strong stakeholder structure, communicating with stakeholders, and developing cooperation areas. State-owned services should adopt more flexible practices and employ more staff to better respond to the industry's increased needs.

Airports' privatisation and foreign infrastructure investments boost cargo traffic [32]. The new Heraklion Airport (planned to open in 2027) and the renovations of 14 regional airports are expected to contribute to air cargo industry growth and create a favourable environment for air cargo operators to expand their operations. The country's regional airports, particularly those with significant production and a higher population base (Heraklion, Thessaloniki, Chios), require infrastructural developments similar to AIA to successfully increase capacity and improve cargo handling facilities to efficiently and effectively respond to local production demand.

The two big Greek airlines (Aegean Airlines/Olympic Air and Sky Express) are focused on passenger transportation but, in cooperation with the country's two main ground handlers (Swissport/Sky Serv and Goldair Handling), could examine to emphasise more on cargo traffic. Moreover, the better linkage of transportation modes with airports should be examined.

Air cargo supply chain employees should be regularly trained and aware of new trends and international organisations' regulations (from ICAO, IATA, EASA, WCO, UPU) to provide high quality services. The provision of training for dangerous goods handling is important as there is significant direct and transit traffic for these services.

Conclusively, the adoption of new technologies, the closer cooperation of all air cargo stakeholders, the establishment of new infrastructures in main regional airports, the provision of sufficient training to employees, and the better linkage of the other transportation means with airports are the main challenges for the Greek air cargo industry. The central government should positively contribute to these targets, as all stakeholders can reap significant benefits, including the Greek economy and society.

The current research presents a holistic picture of the administrative and operational framework of the Greek air cargo industry. Through this, all the participants and policymakers acquire useful insights to address deficiencies in the system and promote the industry's growth.

7. LIMITATIONS OF THE CURRENT STUDY AND SUGGESTIONS FOR FURTHER RESEARCH

More in-depth studies on the Greek air cargo industry are required to identify more problems and suggest solutions. The implementation of detailed quantitative and qualitative analyses with the involvement of more participants from all the industry's stakeholders is strongly recommended.

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