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The importance of air cargo and air cargo security for economies, population and value chains

New international and national safety regulations for air freight are affecting the profitability of exporting and importing firms as well as companies involved in air freight. Adjustments to these regulations are creating a considerable burden on firms depending on air transportation and are resulting in changes in the air cargo industry itself. Many experts doubt the effectiveness of these regulations and point towards distortions in the flow of cargo because of different compliance standards, which may ultimately lead to job losses in countries with high regulatory compliance. Based on this discussion, this article highlights the social and economic importance of air freight, explains the operation of air freight supply chains and shows approaches that contribute to efficient air freight security from this perspective.

Why air cargo is important for domestic jobs and economic development – the case of Switzerland

The Chair of Logistics Management at the University of St. Gallen conducted a study in 2010 on air freight in Switzerland. The study is based on data from 217 shippers and logistics service providers in Switzerland, representing 9,25% of the total Swiss exports and 25% of the Swiss air freight exports by value². The study shows that air freight is an integral part of Swiss value chains. For 70% of the companies the handling of air freight at Swiss airports is a prerequisite for successful daily business. Air freight links Switzerland with international supply chains and secures access to foreign markets. This applies to both large corporations and regionally based small and medium-sized enterprises.

One-third of exports by value leaves Switzerland by air and one-sixth of all imports by value reaches Switzerland by air. A total of 61% of the senders and 44% of the recipients of air freight expect a substantial increase in their use of Swiss airports until 2030. A characteristic of air freight in Switzerland is that it is transported almost exclusively in the cargo holds of passenger aircraft. Most intercontinental flights to and from Switzerland would not operate above cost without the cargo's revenue contribution. The range of passenger flights at Swiss

airports thus depends directly on the cargo flown in and out of Switzerland. Swiss businesses estimate that the current high quality of air cargo in Switzerland secures over 200 000 highly-skilled jobs in industry, commerce and logistics.

The Swiss example shows that air freight contributes to strengthening the economy and saving jobs. Despite the study of individual specifics of the Swiss company and industry features, the importance of air freight can be transferred to economies with a comparable level of development: air freight is an integral part of many supply chains and as a link between regions it significantly contributes to the interconnectivity of firms and thus to economic growth. Therefore, interference with the operation of air freight supply chains directly affects the competitive situation of companies and indirectly the labor market of a country as well.

Particularities of air freight supply chains

Air freight enables the exchange of goods faster and more securely than any other mode of transportation. This applies particularly to transport over long distances, where the time difference from alternative sea or land transport, if existent, is the greatest. These time savings make air freight especially suitable for the transport of relatively light, time-sensitive and perishable goods such as food, process-critical goods such as medicine and spare parts, and valuable cargo, such as high-performance electronics and precious metals. Air freight shipments are daily business for many companies. However, the large number of interfaces and high time pressure often pose great challenges to the players involved³.

Basically, there are three business models in the air freight business: (a) the traditional model, (b) the integrator model and (c) the charter model⁴. Traditionally, in business model (a) air freight shipments are organized and transported by a series of logistics service providers. The key actors are the carriers that coordinate the air freight services and the airlines that are responsible for the provision of air freight capacity. In general, freight subsidiaries of airlines, for example Swiss World-Cargo, are responsible for the management of air freight on passenger aircrafts.⁵ Integrators such as DHL offer their custo-

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² Ehrenthal, Hofstetter & Stölzle (2010), p. 21.

³ Pompl (2007), p. 93.

⁴ Rieger & Ehrenthal (2010), p. 13.

⁵ Holloway (2008), p. 572.

mers the entire transport chain from collection to delivery and usually operate with their own all-cargo aircrafts. This business model (b) is more often found in major aviation hubs or appropriately equipped integrator sites, such as in Memphis (Tennessee, USA)⁶.

In business model (c), charter companies use cargo aircrafts for special transports, such as for very large and heavy items like trains, turbines or priority deliveries for natural disasters, such as tents, food and mobile hospitals. Special transports by air freight often cannot be replaced by other modes of transportation because of their urgency or lack of alternatives⁷.

Usually, the consignor of air freight authorizes a freight forwarder to organize the transport. The freight forwarder in turn has subcontracts with individual carriers, airport handlers and airlines⁸. The following figure shows the transport of an air freight consignment from consignor to consignee⁹.

unt for the safety of their country and naturally have a norm-setting and a control function. The breakdown of the players and levels of air freight security are shown in Figure 2 as an example.

Regulations on air safety and on air freight security in particular have been subject to major changes in recent years¹¹ and especially in connection with the foiled terror attacks through air freight in 2010. Regulatory change is usually a reaction to specific events that lead to the reassessment of risks. These changes are reflected in the duties, responsibilities and expenses within the air freight supply chain.

The foiled attacks using parcel bombs at the end of October 2010 are a recent example. Packets with explosives sent from Yemen were addressed to a facility in Chicago (USA). They were handled at the airport Cologne/Bonn (Germany) and forwarded to Nottingham (England). There, the packets were iden-

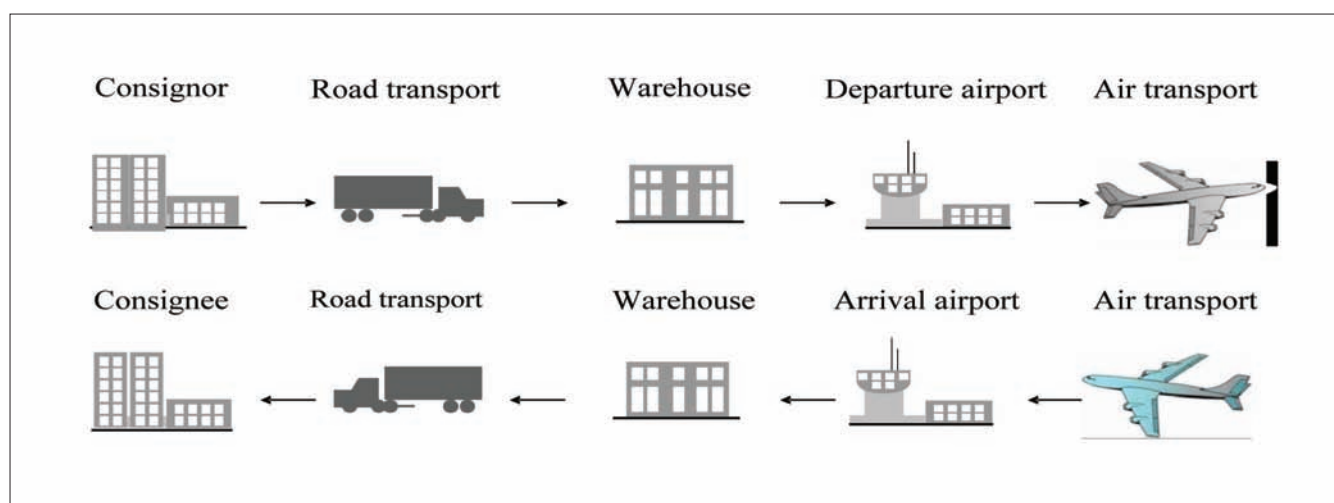


Figure 1. Transport of air freight from consignor to consignee.

A special feature of air freight is its heterogeneity regarding its respective needs: some air freight, such as medicine and spare parts, needs to arrive at its destination the next day; other air freight, e. g., fresh flowers, may not exceed a certain temperature and not all items can be transported or stored next to each other. This also increases the complexity of air freight supply chains¹⁰.

Why air freight security is a concern for shippers, logistics service providers and governments alike

For all the players in air freight security is essential. The shippers and receiving parties depend on reliable collection, transport and delivery in order to be able to service their customers and survive in the market. Logistics service providers and infrastructure providers are responsible for the safety of their employees during transportation and are responsible for the integrity of the goods flown. Governments have to acco-

untified based on information from Saudi security authorities and rendered harmless. The attempted attacks in 2010 showed that cargo aircrafts can equally become the targets of terrorists, like passenger aircrafts: also, in this way, important goods flows are interrupted, security costs increase and insecurity is spread in the population.

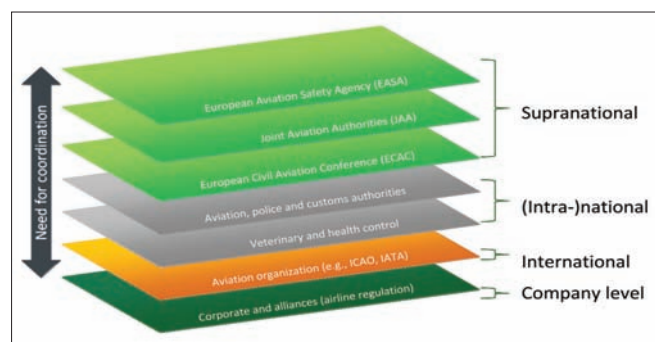


Figure 2. Regulative bodies in air freight security.

⁶ Wells & Wensween (2007), p. 98.

⁷ Doganis (2005), p. 213.

⁸ Doganis (2010), p. 21.

⁹ Stölzle, Hofstetter & Wessely (2009), p. 142.

¹⁰ Ehrenthal, Hofstetter & Stölzle (2010), p. 31.

¹¹ Giemulla (2008), p. 32.

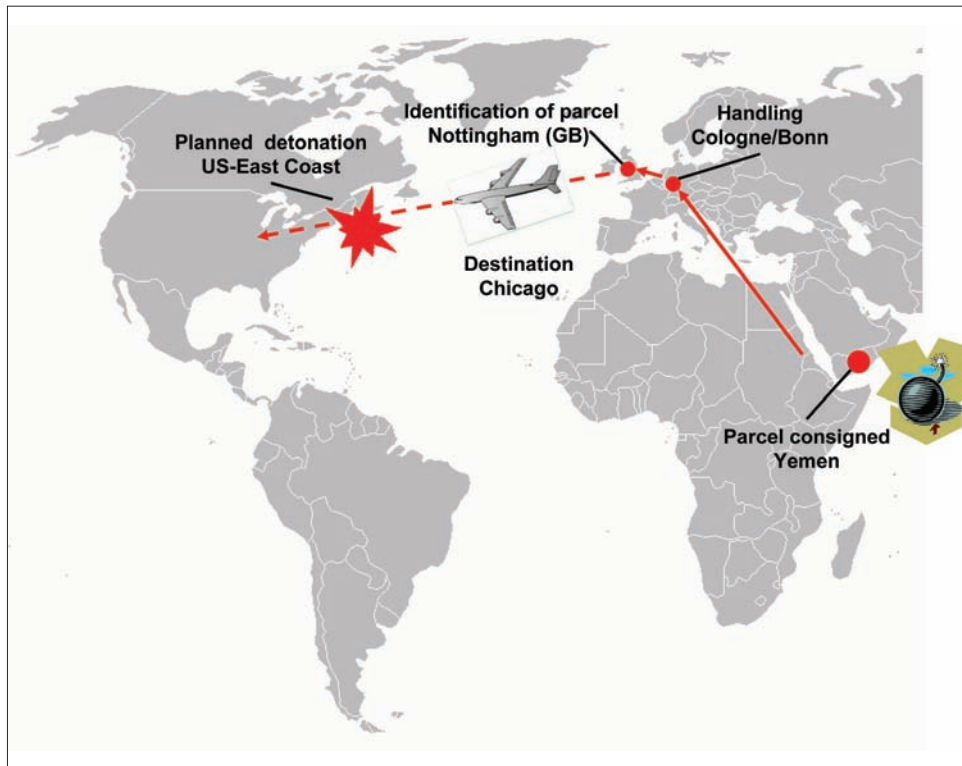


Figure 3. Attempted attacks in 2010.

However, air freight security extends far beyond protection from terrorist threats. Air freight security regulations also include the handling of hazardous materials on passenger and cargo flights. Such substances are only risky in larger quantities on board or if stored or handled improperly. Other potential risks for the security of air freight supply chains range from theft up to hijackings. The provisions for air freight security aim to reduce these risks. For example, the integrity of the freight throughout the air freight supply chain always needs to be ensured. This means, first, that only authorized persons have access to the freight and unauthorized access is hindered. Second, there are increasing efforts to maintain a constant flow of information that allows the control of the freight on its way from the sender to the receiver and the prevention of loading on board the plane in the case of a security risk. Time requirements, engineering measures, certification, audits and staff training play a role in air freight security regulations that is equally important as IT systems and security technologies (e. g., for the detection of explosives).

The extent of the impact and the circulation of the costs associated with air freight security within European air freight supply chains is so far unknown. Similarly, the impact of air freight security measures on the international flow of goods has not been studied sufficiently. Both make it difficult to design and implement objectively and purposefully efficient air freight security regulations. To improve air freight security, it is therefore necessary to identify how air freight security regulations influence transportation chains and as a consequence the competitiveness of countries or regions, what economic impact uncoordinated security requirements have, what minimum standards should be in force worldwide, what costs air freight security regulations cause along air freight supply chains and who should bear these costs.

The road ahead must be one of international togetherness and practical solutions for business

Air freight contributes significantly to the competitiveness of a country. While fast delivery is essential for goods such as medicine and spare parts, it also means substantial time savings in the delivery of other products such as machinery. Regulations for air freight security must account for the demands of air freight, especially speed and reliability. Security procedures for air freight should be run quickly and smoothly so that the goods reach their destinations speedily and safely. Delays can cause problems with the supply of consumer goods to the general public; losses in production due to missing parts for shippers will hurt employment.

Efficient air freight security regulations must take into account the characteristics of air freight supply chains and must

be coordinated with national and international bodies, both governmental and private. Governments need to liaise with each other to establish a unified, practical regulatory framework with mutually recognized practices. Business leaders must become a great deal more effective at coordinating their requirements among each other and conveying their needs to governments. Researchers may help the process by establishing models to pre-assess the economic and social impacts of emergent air cargo security regulations.

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