



Air Cargo Logistics Study Switzerland 2020

Facts – Requirements – Trends

A study by the Institute of Supply Chain Management

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Lucerne
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***“Science-based,
practice-driven”***

Air Cargo Logistics Study Switzerland 2020

1. Research design

2. Air cargo market & trends
3. Customer perspective
4. Digitalisation
5. Climate & environmental protection
6. Regulatory framework
7. COVID-19: Air cargo in times of crisis
8. International supply chains in the context of the crisis

Megatrends across sectors have an impact on Swiss air cargo logistics facing complex challenges



Comprehensive market study to assess the performance profile of Swiss air cargo logistics in an international comparison in the light of challenges and development trends



Desk Research

- Kick-off workshops at the Swiss airports to identify relevant **key issues**
- Development of a **study inventory** to identify current **literature sources** and **secondary statistical data**



Empirical part: January until June 2020

Data collection

- Qualitative, semi-structures **expert interviews** among air cargo logistics stakeholders, particularly taking into account the current situation at the three national airports of Zurich, Basel and Geneva
- **Online-Survey** among Swiss freight forwarders ($N=45$)
- Case Studies
- **COVID-19 Update** in May/June 2020

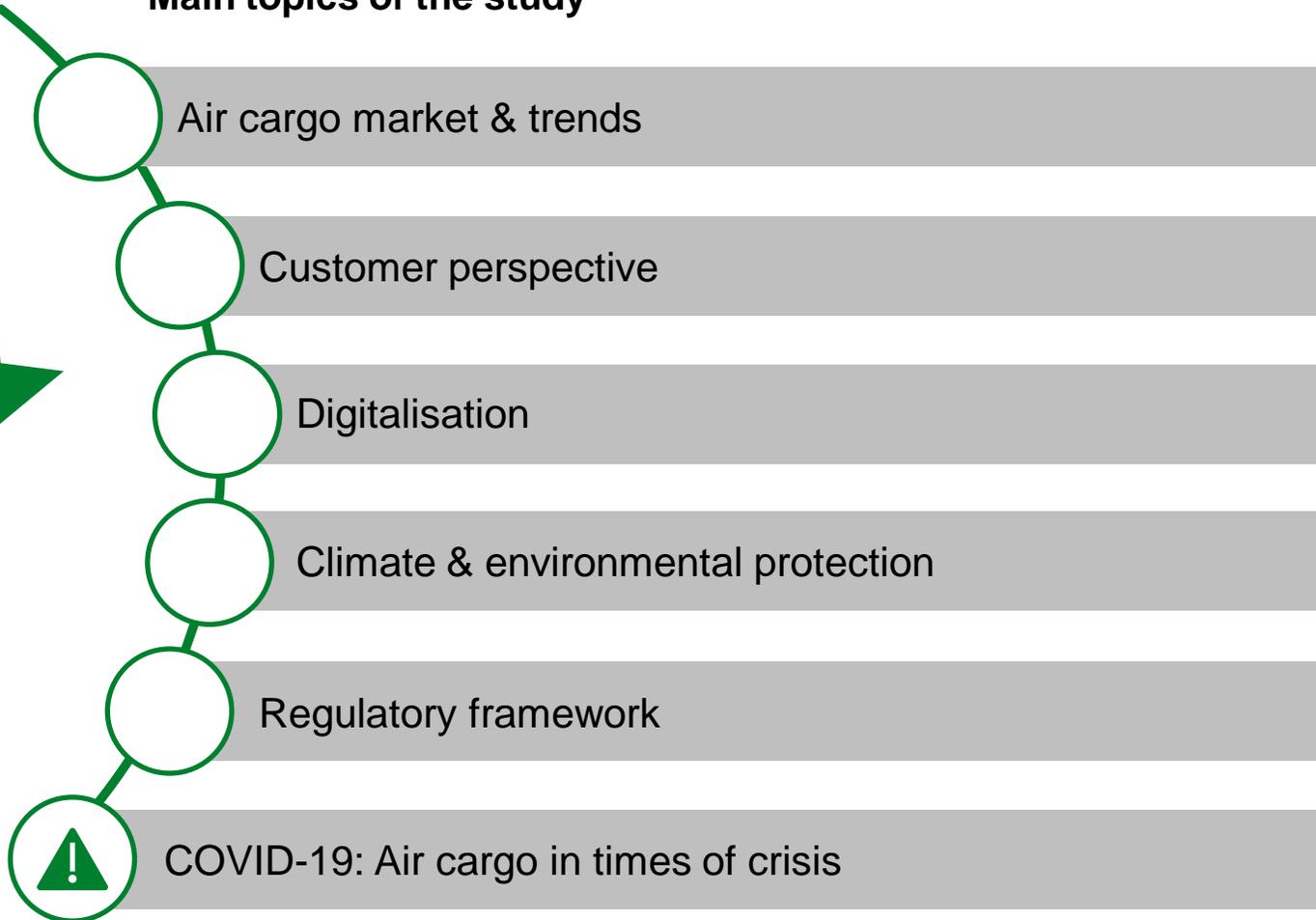
Analysis

- Quantitative and evaluation of the results of the **online survey**
- **Qualitative content analysis of expert interviews and interpretation**
- **Data processing** of secondary statistical data
- **Cross validation** of the results of the expert interviews

The study **combines desk research** with a **qualitative and quantitative empirical survey** to achieve the study objectives

How does the Swiss air cargo logistics meet the challenges and trends in an international comparison?

Main topics of the study



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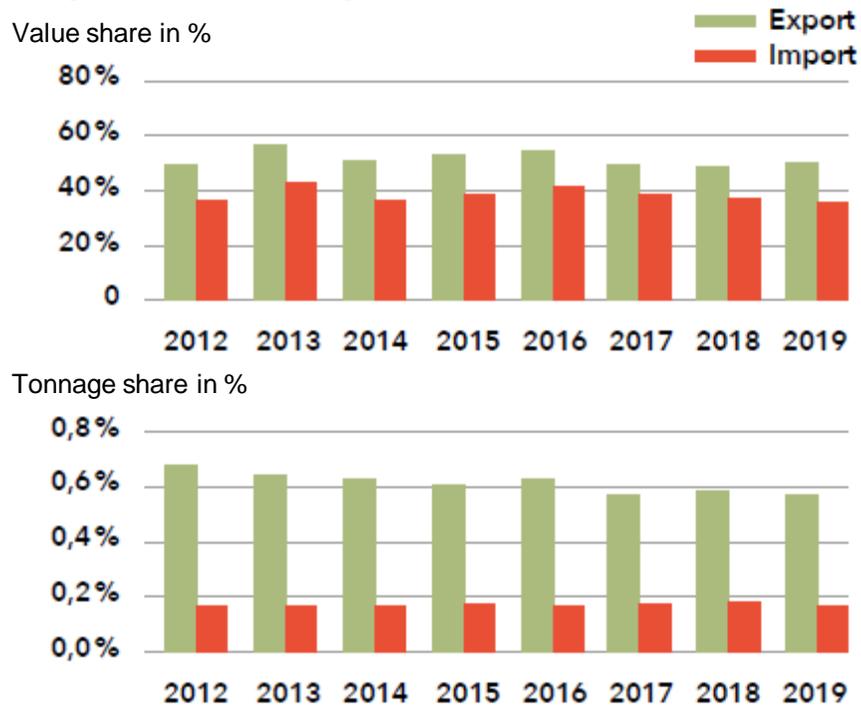
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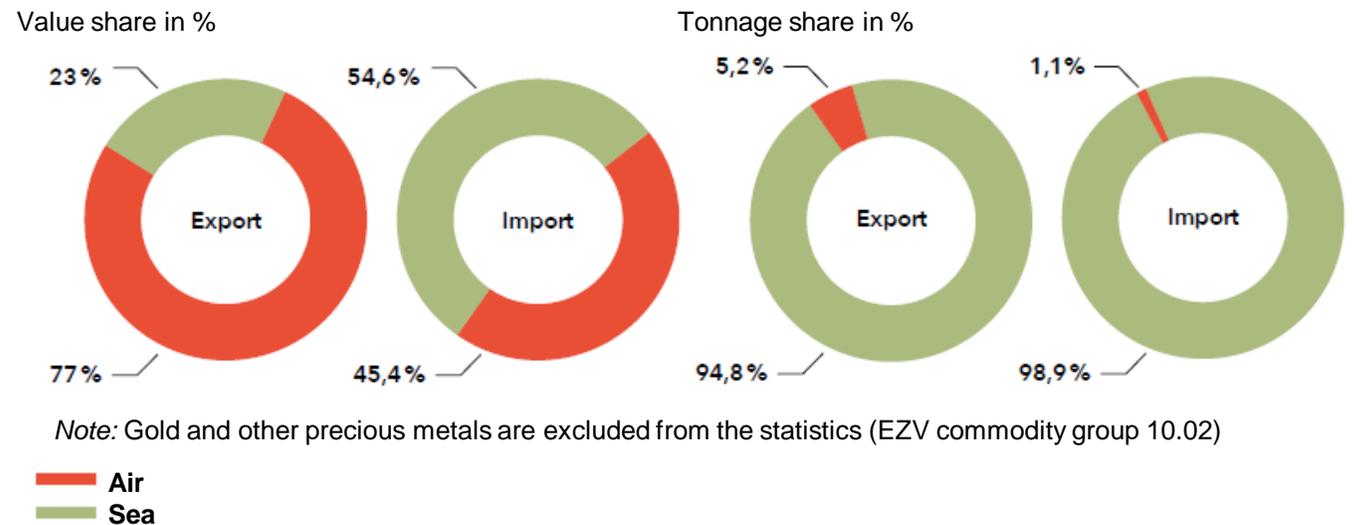
8. International supply chains in the context of the crisis

In 2019, goods worth CHF 157 billion were exported from Switzerland by air cargo, 50% of total exports from Switzerland

Development of the value and tonnage share of air cargo in Swiss foreign trade



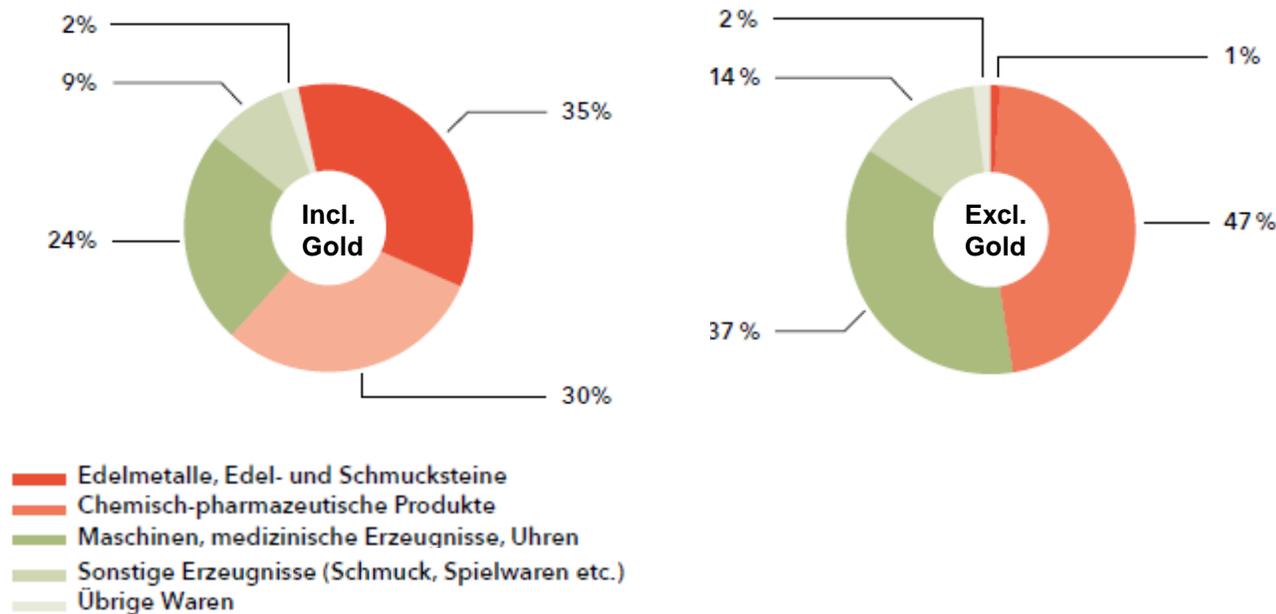
Value and tonnage shares in intercontinental transport by mode in 2019 (excluding gold)



- The low tonnage volume and the high value per kilo illustrate that **air transport is used selectively for specific categories of goods**
- At an average of CHF 1,413 per kilo, air cargo has a particularly **high value of goods** compared with other modes of transport.
- In **intercontinental trade**, air cargo is indispensable for many companies being the **fastest long-haul transport mode** (export share of air cargo >80% by value)

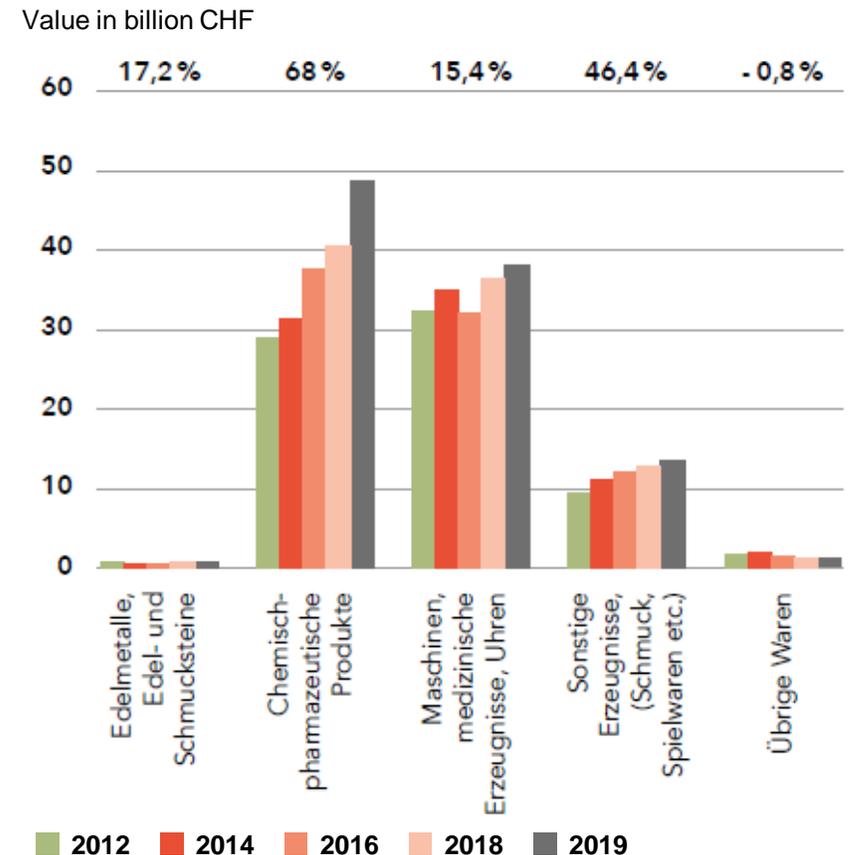
Chemical pharmaceutical products are the most important category of goods in Swiss air cargo exports

Air cargo exports from Switzerland 2019 by category of goods



- Air cargo has a strong **traffic affinity** especially for **high-value, time-critical and perishable goods**. In the export sector, primarily pharmaceutical products, machinery, watches and other high-value products of Swiss industry are transported by air
- From 2012 to 2019, the **value of chemical pharmaceutical products** - the most important category of goods in exports - has **increased by 68%** to almost CHF 48 billion in 2019

Value and tonnage shares in intercontinental transport by mode in 2019 (excluding gold)



Note: Gold and other precious metals are excluded from the statistics (EZV commodity group 10.02)

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86% of all Swiss forwarders handle most of their air cargo shipments via Swiss airports - Air cargo relevant airports are also located abroad

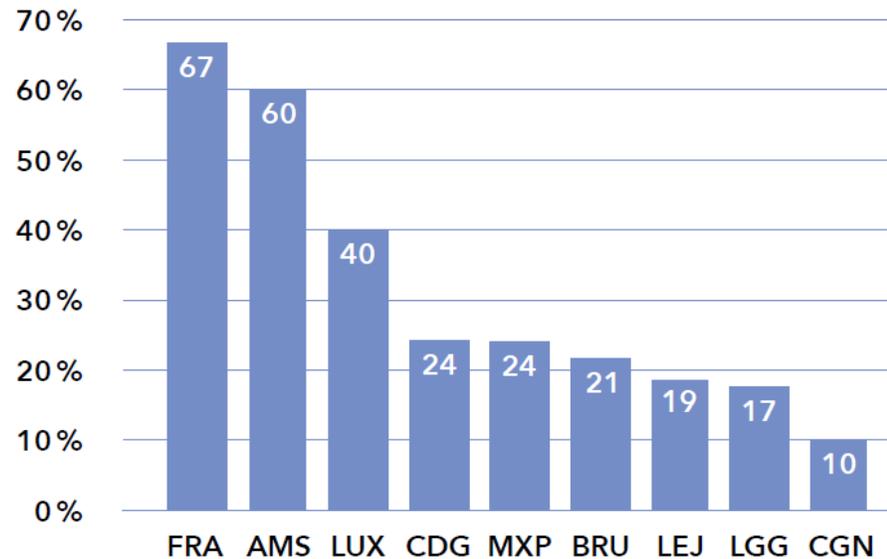
In a survey of Swiss freight forwarders (N=45), **24 criteria** were evaluated in terms of their **relevance to the choice of airport** for handling air cargo shipments:

Die TOP 10-Kriterien



1. Zuverlässigkeit der Akteure der Luftfrachtkette (Qualität)
2. Effizienz der Abfertigungsprozesse
3. Abwicklungsgeschwindigkeit bei Handling Agenten für Exportsendungen
4. Sicherheitsstandards für Luftfrachtsendungen
5. Verfügbarkeit von Standard-Umschlagkapazitäten am Flughafen
6. Frequenz der Abflüge
7. Planungssicherheit durch regelmässige Flugverbindungen
8. Planungssicherheit durch einen vorangekündigten Flugplan
9. Schnelle Verfügbarkeit von Importsendungen
10. Erreichbarkeit des Flughafens über das Strassennetz

Airports regularly used by Swiss forwarders in the European region for handling air cargo shipments (in %)



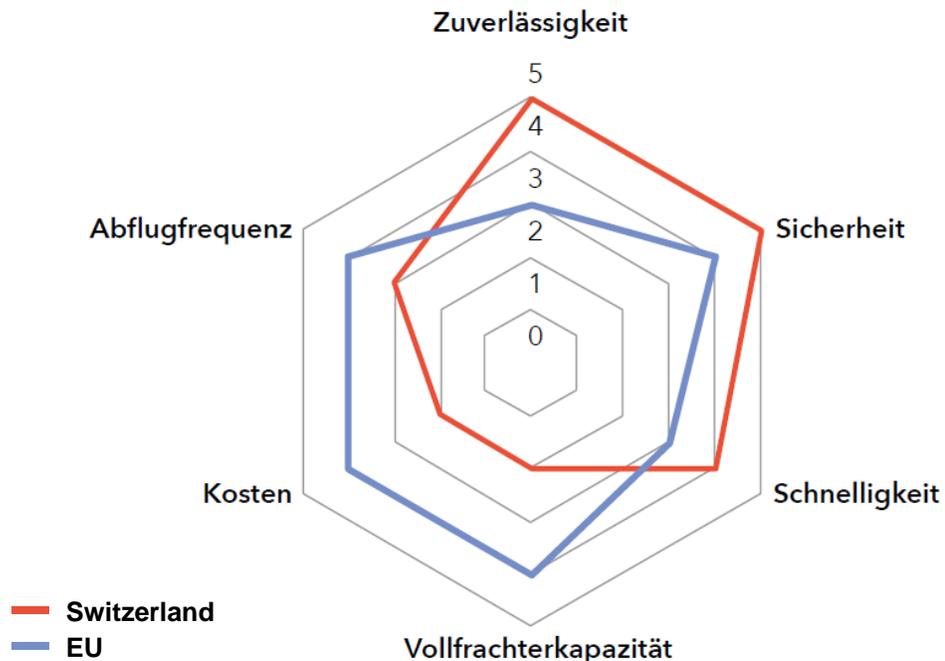
Most important cargo airports in the European region for Swiss forwarders:

Frankfurt
Amsterdam
Luxembourg

- **Survey result:** When choosing an airport, **speed, safety & reliability** are the main criteria. Freight forwarders aim to offer their customers **high-quality and firmly plannable transit time** throughout the entire transport. The **reduction of disruptive factors along the logistics chain** is a high priority.
- Numerous large **European airports** can be reached **by truck** from Switzerland in **just a few hours**, so that freight forwarders can rely on an easily accessible airport network in Europe as an alternative to Swiss airports. Air cargo **relevant airports are therefore also located outside Switzerland.**
- If the 30% RFS share is combined with estimates by industry experts that around 20-30% of Swiss air cargo passes through Swiss airports and flows directly abroad (EXW), it can be assumed that **more than half of Swiss air cargo is handled via European airports.**

By international comparison, Swiss air cargo logistics stands out for its reliability, speed and high security standards

Relative positioning of Swiss airports in comparison to their European neighbours based on selected criteria



Zurich, Basel & Geneva
Focus on the national airports



Reliability

Two thirds of the freight forwarders rate the reliability of the players in the air cargo chain at Zurich Airport as rather better or much better. Basel also scores above average.

Security standards

The security standards for air cargo shipments at the three national airports are rated similarly well - better than at European airports in the surrounding area

Speed

The processing speed of handling agents is highly relevant for both export and import. More than 75% of forwarders consider the three Swiss national airports to be at least equivalent to other European airports

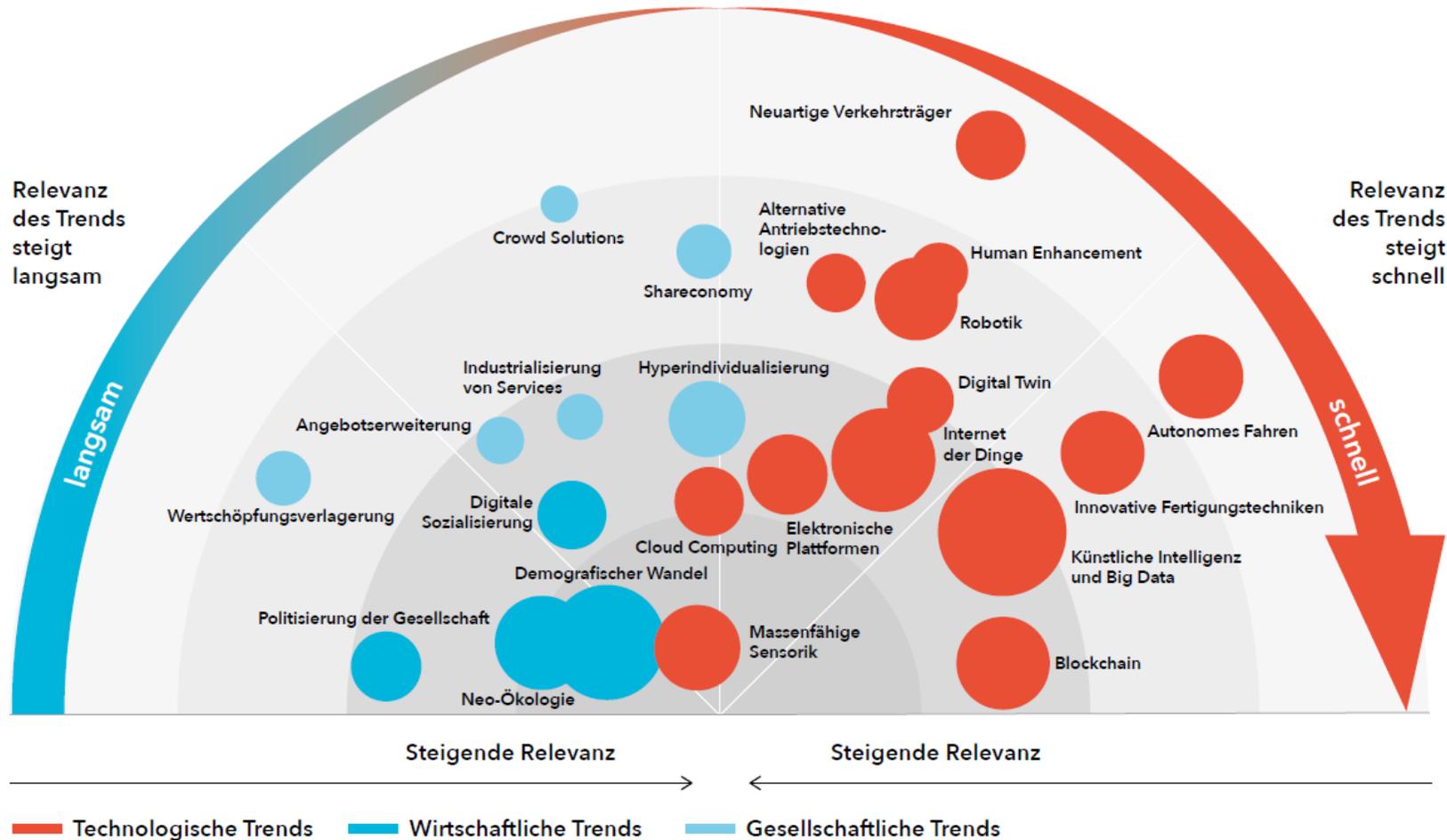
- Due to the high-quality products in the Swiss air cargo sector, an appropriate **infrastructure for special goods such as valuable, temperature-controlled and perishable goods** is a **key success factor** for Switzerland as an air cargo location
- The biggest **challenge** is the **high cost level in Switzerland**, especially for labour-intensive process steps. The **competitiveness** of Swiss air cargo logistics in relation to other European airports suffers as a result. In order to compensate for the disadvantage of high costs, Switzerland can **differentiate itself from other European countries**, particularly **in terms of quality**.

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In particular, technological trends have the potential to cause major changes in air cargo logistics within a relatively short time only

Trend Radar: Trends in Logistics and Supply Chain Management*



Use cases

Artificial Intelligence
Optimisation of ground processes using predictive analyses from historical data?

Integrated platforms
Data transparency across actors thanks to real-time, seamless communication?

Long-term effects
3D-Print
Shifting flows of goods to the local level through application in production?

*Source: Mathauer, Hofmann & Stölzle (2019).
 Zukunftsstudie Logistikmarkt Schweiz

Manual, paper-based processes entail considerable additional administrative work and limit efficiency and data quality

The introduction of the **electronic air waybill (e-AWB)** in 2010 is considered the central lever of the IATA e-freight initiative to make the **physical transport of documents superfluous** and thus enable the **end-to-end digital air cargo process**.

e-AWB quota at Swiss airports (Data for 03/2020)

| Flughafen | Basel | Genf | Zürich |
|-------------|-------|-------|--------|
| e-AWB-Quote | 73,4% | 67,9% | 55,8% |

- Far **more shipments are accompanied by paper** than the IATA figures suggest, as physical documents often accompany the shipments in parallel.
- **Process perspective:** shipment information follows the physical shipment, which means that **process interfaces** between actors **cannot be coordinated at an earlier stage**.

Potential for improvement in shipment processing from the perspective of industry experts



Information flow

From the shipper's point of view, the flow of information among actors of the air cargo chain must be faster especially in case of incidents: Real-time based information transfer is desired



Data quality

Fully digitized processes and overcoming of bilateral exchange of documents (end-to-end transparency)

IATA ONE Record addresses the current challenges and aims to achieve the following goals for the air freight process:

1. Permanent **availability, timeliness** and **transparency** of data
2. Creation of an **integrated network of platforms** based on a **common messaging standard**
3. Close **cooperation with authorities**

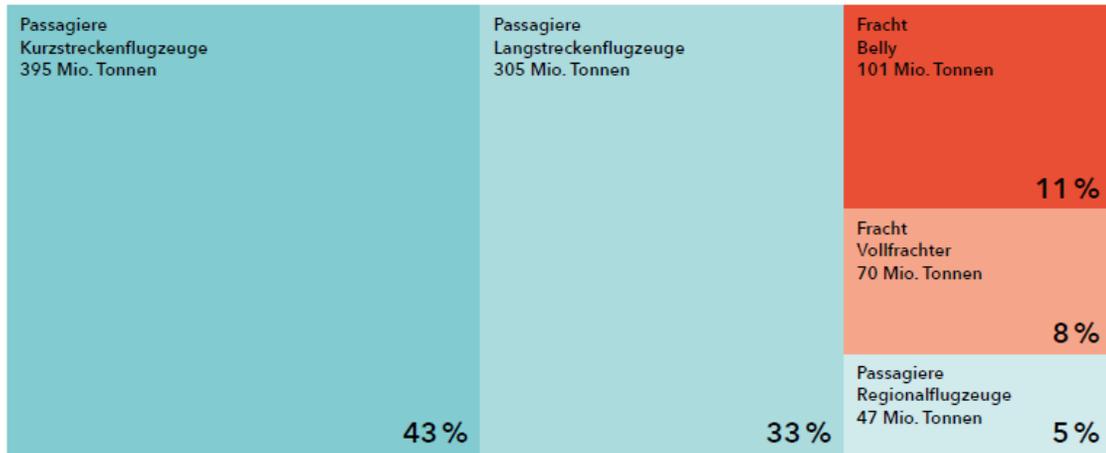


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CO₂ emissions dominate the debate on climate protection in the aviation industry

Distribution of global CO₂ emissions from aviation by type of use and aircraft in 2018



» The 19% share of air cargo in global aviation emissions corresponds to about 0.5% of total CO₂ emissions

Air cargo shipment compared to sea freight

| | Luftfracht | Seefracht |
|------------------|---|---|
| Route | St. Gallen-Hongkong (via Flughafen Zürich) | Zürich-Hongkong (via Hamburger Hafen) |
| Vorlauf | St. Gallen-Zürich 62 km per LKW: 40 Tonner, Auslastung 80 % 0,32 kg CO ₂ e (TTW) | St. Gallen-Hamburg 683 km per LKW: 40 Tonner, Auslastung 80 % 3,52 kg CO ₂ e (TTW) |
| Hauptlauf | Zürich-Hongkong (als Belly-Fracht) 9280 km 566,90 kg CO ₂ e (TTW) | Hamburg-Hongkong (Schiff) 18456 km: CCWG-Daten, Auslastung 74 % 6,00 kg CO ₂ e (TTW) |
| Total | 567,22 kg CO ₂ e (TTW) | 9,52 kg CO ₂ e (TTW) |

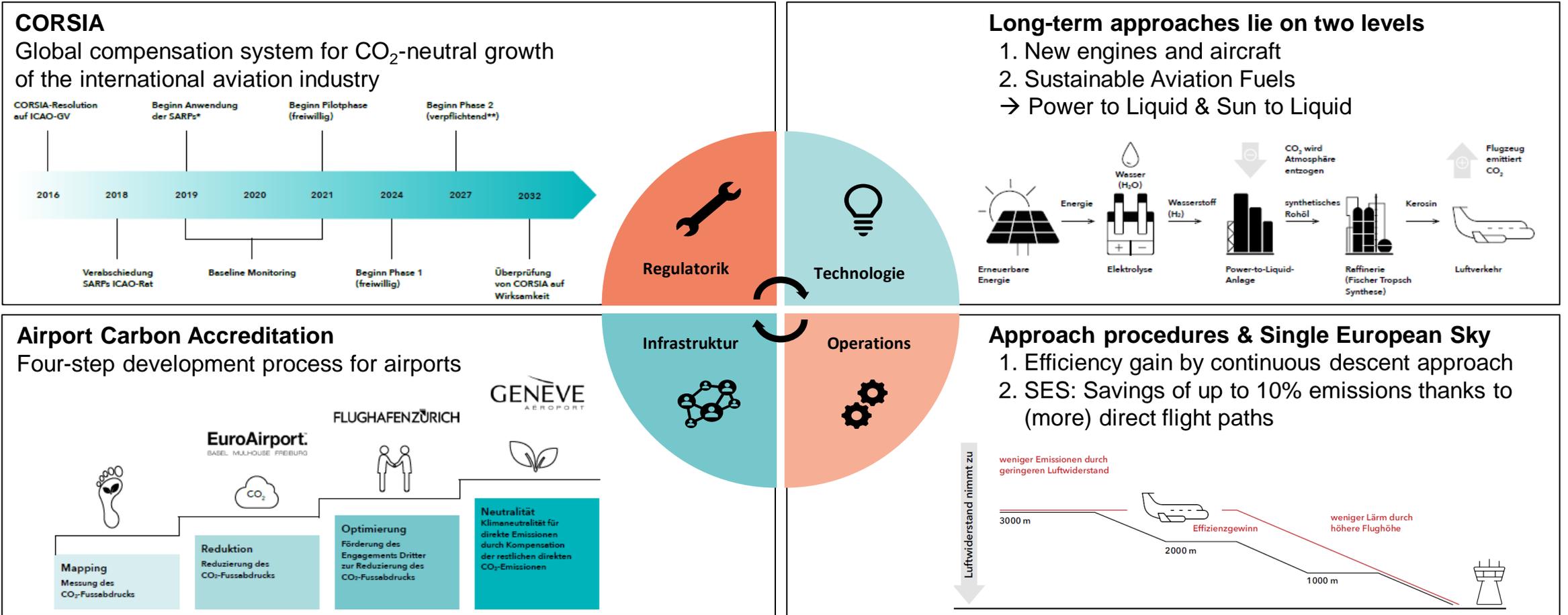
» In a **direct comparison of modes of transport**, the use of air cargo can hardly ever be justified for purely ecological reasons

» The isolated view of transport does not adequately reflect the **life cycle assessment** of a product.

Effective environmental protection requires a **holistic view of product life cycles and emissions**

- **Product lifecycles:** Due to its mode-specific advantage of **fast transport over long distances**, air cargo enables the **use of climatic differences**, which improves the life cycle assessment compared to "local" European production - despite transport via air
- **Emissions:** Even though CO₂ has the strongest climate impact of all air traffic emissions, it is important to ensure that all air traffic emissions are considered when implementing climate protection instruments and that incentives for climate protection through regulatory influences are correctly set

IATA's climate protection strategy is based on four pillars



The **biggest lever for climate protection** - from a long-term perspective - lies in the area of **technological improvements**

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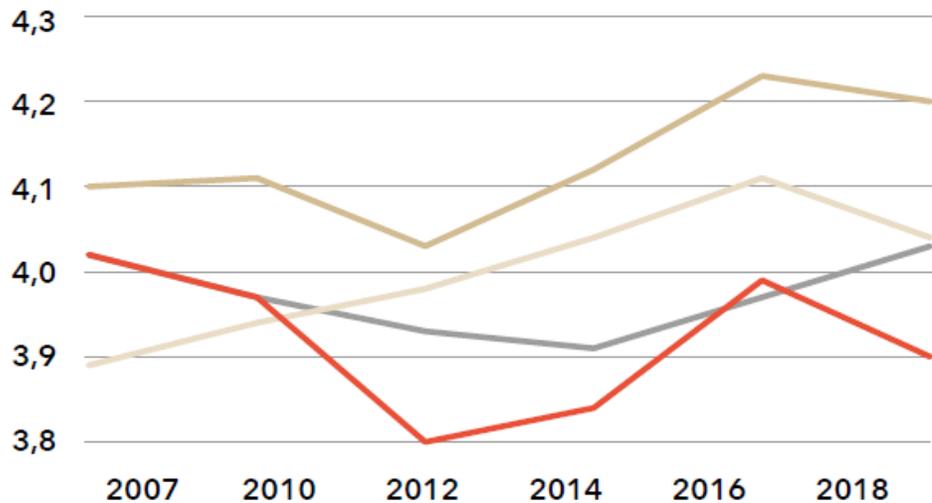
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Aviation hubs face international competition between locations, which has intensified in recent years

World Bank's Logistics Performance Index compares the logistics framework conditions in individual countries



- Deutschland
 - Belgien
 - Japan
 - Schweiz
- Subareas of the LPI:**
- Infrastructure
 - Customs clearance
 - Price competitiveness
 - Punctuality
 - Tracking and tracing
 - Quality of logistics services

Key challenges for the Swiss air cargo at the regulatory level



Operating hours at the airports

By international standards, restrictive operating hours at airports limit the accessibility of Switzerland in cargo traffic.



Accessibility by road

The ban on night and weekend driving for trucks restricts the accessibility of the airports by road. Airports in Europe's surrounding area can be reached more flexibly in terms of time, also thanks to special permits.

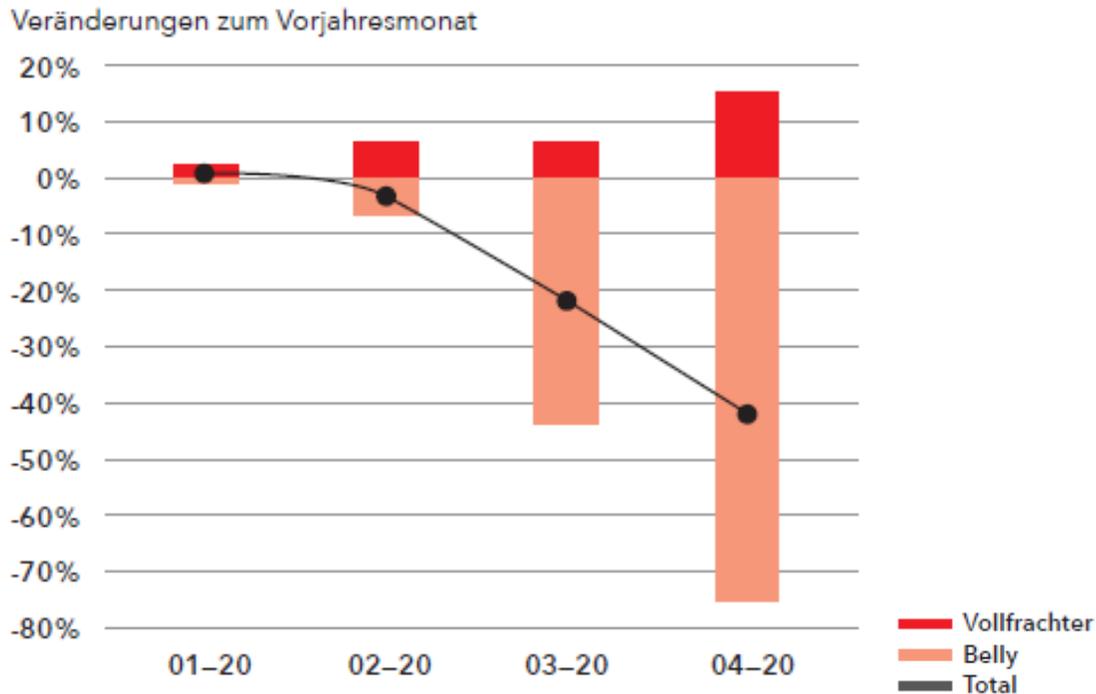
- In the light of the increased international competition between business locations, the air cargo industry in Switzerland **depends on internationally competitive conditions**
- At a high level, the **trend** in the Logistics Performance Index **is downwards compared with the top group**
- The **logistical framework conditions** for the air cargo industry have **deteriorated in recent years in international comparison.**

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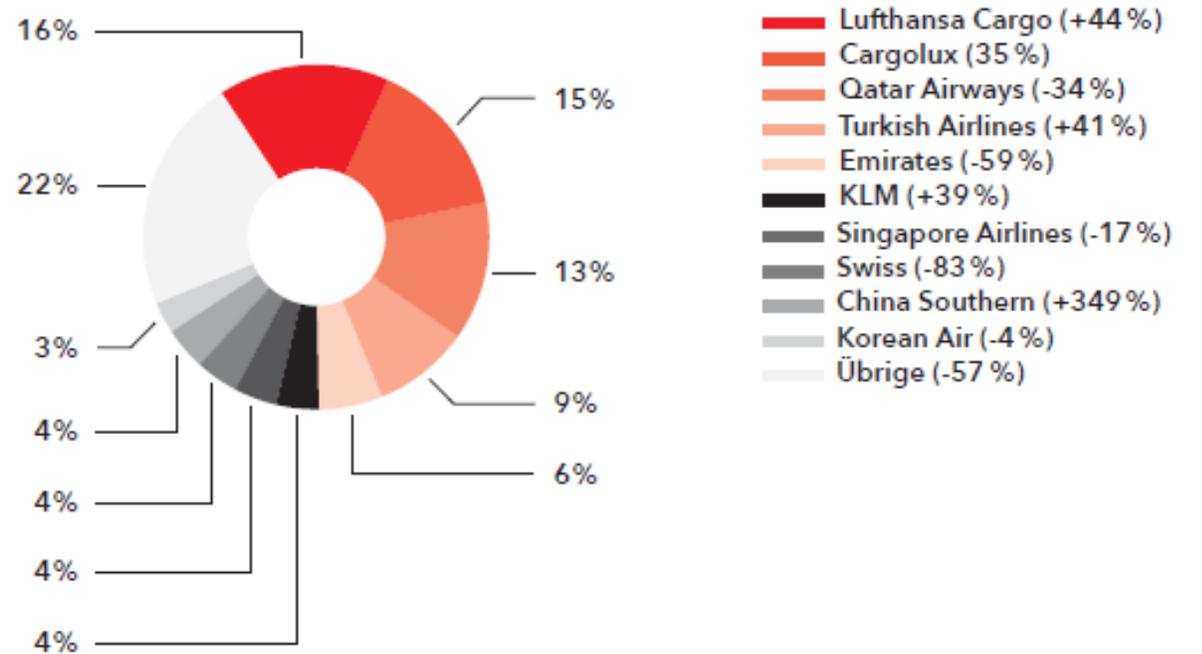
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Declining belly capacities on the air cargo market lead to a shift in market shares among airlines in Switzerland

Entwicklung der global verfügbaren Frachttonnenkilometern bei Airlines im Vergleich zum Vorjahr



Marktanteile einzelner Airlines am Tonnageaufkommen der Schweizer Luftfrachtexporte im April 2020



- The **high short-term dependence** on available **belly capacities** on passenger aircraft became apparent during the crisis as a **vulnerable factor in air cargo logistics**.
- Individual airlines were able to increase their market share in Switzerland, whereby the loss of direct flight connections from and to Switzerland led to an increase in RFS to European airports with higher (full-freighter) capacities, such as Frankfurt and Luxembourg

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Measures to combat the corona crisis cause lasting damage to the economy

Pandemic measures as a risk to the supply chain

- Restrictions due to political measures are regarded as triggers for supply chain disruptions
 - Travel warnings and entry restrictions
 - Border Controls
 - State-ordered closures
- Long-term economic and social damage not yet measurable

Corona measures put Swiss economy under pressure

- Slump in world trade and demand for Swiss products
- Staatssekretariat für Wirtschaft (SECO) is expecting:
 - Production slump approx. 25% in 2020
 - GDP - 7% in 2020
 - unemployment rate from 2.3% (2019) to up to 4.5% (2020)



- Political measures as triggers for extensive economic downturn
- Logistics sector (especially airfreight/export) particularly affected by weakening world and domestic trade
- Supply and production problems due to the breakdown of supply chains and politically induced plant closures at home and abroad

Example LEM Holding: electrical components manufacturer from Switzerland

The company:  LEM

- Manufacture of components for measuring current and voltage with headquarters in Freiburg (CH)
- > 1,200 employees - listed on the stock exchange (Swiss Exchange)

Problem:

- Production stop due to broken supply chains
- Components from Asia cannot be delivered as planned
- Shortage of air freight capacity and price explosion

Economic impact

- Sales decrease by 10.1 % (CHF 74.3 million) in Q2-20
- EBIT falls by more than 20 percentage points by CHF 13.3 million in Q2



- Sharply reduced air freight capacity (lack of belly capacity) makes transport prices more expensive - Travel restrictions lead to lack of capacity in passenger aircraft
- Core components for manufacturing the products are not available, regional procurement can only be implemented in the long term
- Objective: To reduce dependency on suppliers from the Far East in the future

Logistics companies are also affected by the political measures

Example Kühne + Nagel: Lack of transport capacity slows down growth in air freight

The company:

- Global logistics and freight transport company based in the canton of Schwyz
- Second largest air freight forwarder in the world (2018; by transport volume in tons), no own aircraft fleet to date

Problem:

- Collapse of world trade due to political measures in connection with Corona (land and sea transport)
- Lack of capacity in passenger aircraft (belly freight)

Economic impact

- First significant decline in orders in 7 years
- Comparatively high-priced charter of aircraft necessary to maintain delivery capability



- Rising demand for air freight with simultaneous decline in air freight capacity
- K+N's air freight division depends on airline capacity - loss of belly capacity significantly increases costs for K+N as an air freight forwarder (without its own aircraft fleet)

Example Schindler Aufzüge AG: Recession due to political measures on Covid-19 causes exports to collapse

The company:

- Construction and maintenance of elevators and escalators based in the canton of Lucerne; > 58,000 employees

Problem:

- Declining demand worldwide, especially in North America and the Far East
- Temporary factory closures due to the lockdown and idle construction sites in various countries

Economic impact

- Sales decline by 8.7 % to CHF 4.96 billion in the first half of 2020 compared to the previous year
- EBIT falls by more than 29 percentage points in the first half of 2020
- Reduction of more than 2000 jobs planned in Switzerland alone



- Combination of a decline in demand and factory closures, each caused by political measures around Corona
- Supply bottlenecks were prevented by regional supplier network, core components are supplied by air freight

How can the resilience of supply chains be strengthened and logistics capacities redimensioned if demand continues to decline?

Avoid breaking off supply chains in the future

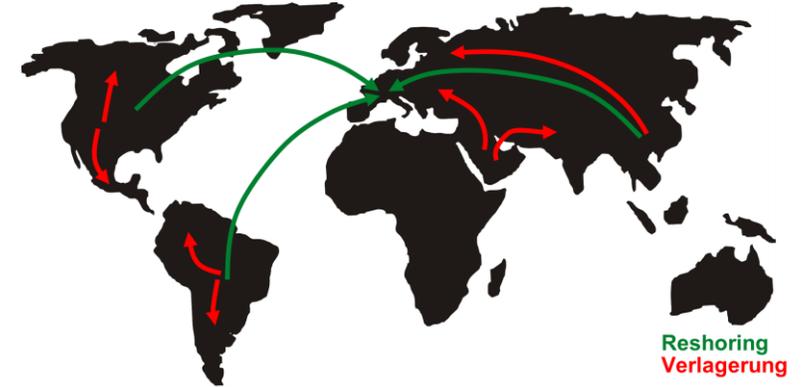
- Which risks are inherent in which supply chains?
- How can dependencies on suppliers be reduced?
- Should a redesign of supply chains be considered?

More robust supply chains through...

- Increasing transparency in the supply chains?
- Strengthening selected supplier relationships?
- Reshoring and relocation of value creation?

Global economic recession and continuing slump in demand

- Counteract the overcapacity by reducing capacity (closure/flooding)?
- Utilise existing capacities even better?
- Respond to price pressure by reducing costs?



- How can logistic process chains be stabilized and kept efficient despite the continuing slump in demand?

Contact information



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