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Nordic Air Freight Market
Visions for Cargo Business Development from Airport
Management view-point
-Based on a case study of Swedish LFV Landvetter Airport
and their industry network

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Remarks

The authors would like to mention their specific interest in air cargo industry matters over longer time period; Satu has followed the air freight market development during the past few years, and prior to this she has a background of working in international B2B environment within product marketing for airline IT industry. Also Li Pengfei has focused on airline technology in his bachelor thesis within Logistics as major.

Gothenburg, Sweden, 31 May 2009

Satu Kettunen and Li Pengfei

ABSTRACT

Key words:

(Nordic) Air freight, Air cargo industry, Air freight Development, Aviation Industry, +services, Airport Management, Airport Development +business development, Airport Marketing, Airport systems, +market situation, +competition, +market forces, Competitive analysis, Strategy.

This Master's thesis combines knowledge of Logistics Management and Strategy with the subject of aviation B2B marketing, more specifically within the area of business development within Nordic Air freight.

.....

Severe financial crisis sweeping the world causes international trade to fall down sharper than expected in 2009. As taking care of goods physical movement, the transportation industry has been severely impacted and the air freight business with it. Adding into this equation changes by declining yield, violent oil price fluctuations and decreasing demand, followed by routing cut-offs and over-capacity of airlines, airports are directly influenced. Airline business changes cause fewer cargo volumes, resulting to less airport revenue.

At the same time airport management faces airport development requirements, operational challenges, pressure on airport costs and higher uncertainty with regard to future cargo volumes. All this pushes for a mental switch which is happening in the airline industry right now and the airport management recognizes that the competition toughens but that the turbulence also always creates strategic business development opportunities.

The research purpose is to recognize how the relevant airport stakeholders picture the future of air freight development, and to analyze whether their visions for the future are aligned. With step-by-step approach, the industry level analysis seeks to describe how the Nordic air freight industry looks like; and what are the characteristics of the market place in the light of global trade changes. The paper structures and analyzes these influences with focus on Airport Management. The second step was to acquire deeper understanding of the airport as a specific micro-environment, and LFV as a state-owned airport manager. A Case study was conducted on Gothenburg-Landvetter Airport (GOT) and within their industry network (stakeholders).

For interviews were there is empirical bias for Nordic, especially to Swedish data. To the certain extend, the results can be considered strongly indicative to all Nordic Airport Management business development units, and much of the discussion can be of interest to other similar European non-central hub airport

managers, and to those trading in the Nordic market place. LFV aims to use the outcome of the research as a supporting input for their future business development strategy.

Theoretical framework builds on the known industry influencers' reports, expert views, and on existing academic research. To continue to build up the research and to assess the strategic industry environment, theoretical tools such as the Porter 5-forces analysis and the Stakeholder model are applied. The identified stakeholders are the airlines, export/import industry, shippers, forwarders, integrators, other logistics providers and partners such as airport handling companies.

Literature and experts reviews indicate that airport operations management is a very specific micro-environment, directly connected and dependant on airline business performance, and airports worldwide are seeking ways to diversify the business opportunities. Forecasts in the beginning of 2009 show that the airline industry losses will still mount during 2009, but if the current oil price and 2009 expected lower oil prices will compensate the costs in 2009, capacity-related savings may just match the collapse in revenues.

Empirical findings of the Case Study also indicate that looking into the future, the depression economics may have not hit the air cargo business so hard after all - the first signs of careful positivity and trust for the future for the airline industry and for the total growth for air transport in the future can be recognized.

Further research results give deeper view to the future development of stakeholders' global market visions, the type of future Nordic air cargo, and other important structural changes of air cargo business actors possibly impacting cargo airport management and their future strategy.

At the company level the research results address LFV Cargo and stakeholder future relationships, provided LFV and airport services, competition, visions for multimodality, visions in changes in airline networks and in airport structures, in pricing and in future demand turbulences.

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Abbreviations

LFV	Luftfartsverket, 'The Group of Swedish Airports and Navigation Services'
ACI	Airport Council International
AL	Airline
AP	Airport
APOC	Airport Operation Centre
ATA	Air Transport Association
ATC	Airport Traffic Control
ATM	Airport Total Management
RTKs	Revenue Ton-Kilometres
CAA	Civil Aviation Authority (Sweden)
CAAC	Civil Aviation Administration of China
CASS	Cargo Accounts Settlement Systems (CASS)
CIS	Commonwealth of Independent States
FTKs	Freight Ton-Kilometres
GDP	Gross Domestic Product
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IGHC	IATA Grounding Handling Council
JIT	Just-In-Time
OEM	Original Equipment Manufacturer
OPEC	Organization of Petroleum Exporting Countries
PAX	Passenger, in aviation industry terminology
RFID	Radio Frequency Identification
SAA	Swedish Aviation Authority
SARS	Severe Acute Respiratory Syndrome
TIACA	The International Air Cargo Association
IATA Codes, Airports:	
AMS	Amsterdam Schiphol Airport, The Netherlands
ARN	Stockholm Arlanda Airport, Sweden

BRU	Brussels International Airport, Belgium
CDG	Paris Charles de Gaulle Airport, France
CPH	Copenhagen Airport, Danmark
FRA	Frankfurt International Airport, Germany
GOT	Gothenburg Landvetter Airport, Sweden
HEL	Helsinki-Vantaa Airport, Finland
HHN	Frankfurt Hahn Airport, Germany
LHR	London Heathrow Airport, United Kingdom
LUX	Luxemburg Findel Airport, Luxemburg
MAN	Manchester International Airport, United Kingdom
MUC	Munich Franz Josef Strauss International Airport, Germany
MPX	Milano Malpensa International Airport, Italy
SPL	Refers to Amsterdam Schiphol Airport, the Netherlands (nowadays uses IATA code AMS).

IATA codes, Airlines:

OZ	Asiana
BA	British Airways
EK	Emirates
AY	Finnair
LH	Lufthansa
SK	SAS

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1. Introduction

Chapter one sets the background of air cargo business for the reader by describing main influences for the air cargo and airport industry and assessing where the aviation industry stands today with their strategic direction. Research purpose and the structure of the thesis are presented, and the chapter ends with the clear description for the delimitations of the study.

Air transportation responds perfectly today's international logistics networks increasing 'JIT', 'build-to-order' and 'zero-stock' delivery requirements; the key competitive factor of air transport is the rapidity and the efficient, quality delivery over growing long-haul distances, compared to any other transportation means. Another key competitive factor of air freight is air transported goods value: the air cargo accounts about 5 % of the global transport volumes – however covering 35 % of total goods' value.

On the other hand, air cargo market right now is living in turbulence more than ever: mergers and acquisitions have been part of the Nordic air cargo carriers' and integrators' strategy over the past years; over-capacity of airlines and declining yield are constantly presenting more challenges (Appendix 3). Extreme fluctuation of oil prices was shaking the airline industry in 2007-2008; yes, the airline planners are accustomed to dealing with annual oil price fluctuation in the range of 10 dollars per barrel, but they are not accustomed to price changes of 60 dollars per barrel as occurred over the past year. The variability experienced 2008 in fuel costs far exceeded historical changes in any other significant component of the airline cost structure. According to Seabury, fuel price accounts for 40-60 % of an air cargo carrier costs.

In October 2008 the economic crisis hit hard everyone related to the industry - global air freight dropped -22 % in December 2008, and airports were the first ones impacted. Even during the progress of this study, a substantial deterioration in the economic conditions happened in air transport industry since IATA's (International Air Traffic Association) forecasts in December 2008; back then the economists were expecting world GDP to still grow by 0.9 % in 2009, but announced in February 2009 the decline of 1.9 % instead. This would mean the deepest recession since the 1930's.

Forecasts in the beginning of 2009 show that the airline industry losses will still mount during 2009 in Europe, Latin America the Middle East and Africa, but just very recently in March 09, there seems to be some light at the end of the tunnel: current improvement is concentrated in US, where capacity cuts are matching the demand slump. Also Asian airline losses turn out to be smaller due to lower losses on fuel hedges. If the current oil price and 2009 expected lower oil prices will compensate the costs in 2009, the fuel cost reductions and capacity-related savings

may just match the collapse in revenues. Also Asian airline losses may turn out to be smaller due to lower losses on fuel hedges. Seabury anticipates a return to double-digit growth in 2012 or 2013.

Geographical differences in the depth of impacts can be noticed. “It seems like in the Europe the influence on cargo traffic was somewhat lower up to the end of 2008, we saw no decline. But that does not mean that we were not hit at the first quarter 2009” stated Guy Tordjman, president European Cargo Services. Now IATA economists forecast cargo volumes in 2009 at -13 %, and passenger traffic in comparison -5,7 %. Together with declining yield this implies an unprecedented 12 % fall in revenues.

1.1 Air Cargo Industry Strategy

Re-structuring, re-organizing, cost-cutting and other efficiency measures of the business activities are hot topics of today’s air freight dependant business, in order to respond to economic challenge and at the same time, in tightening, globalizing competition. Many airlines ordered new models of planes just before economic downturn, and these heavy investments always mean pressure in long term revenue generation. Current freighter revenue streams are under scrutiny. Airline industry seems to have a common recipe: optimising by checking routing results and by better yield management.

Airports are directly impacted. They are also optimizing; lowering airport fees, cutting costs. In addition, the growth of market is being affected by other external influences such as environment concerns; ‘Going Green’-concepts, dependency on fluctuating fuel prices, tightening security requirements, e.g. task force driven by TIACA (World Air Cargo Association), and growing importance global networking and value-generating partnerships.

“Airports are holding carefully the hand of their existing clients and partners to overcome this turbulent period. Now it is the time when new strategies are formed to be ready to attract new businesses when the business picks up again. Companies are using this so called idle time by short-listing clients, and by cutting costs – some whispers are creating hype around Summer 10, when the business will experience a sudden peak again. Long haul transport will play essential role in profitability in the future. “(discussion with Ragnebrink, B., LFV, Jan 2009).

From the competitive view-point, the financial crisis has raised the entry-to-market barriers to potential newcomers while spurring the withdrawal from business of weak competitors. IATA is calling on the cargo supply chain to battle current cargo crisis by “improving security, delivering a better product and by boosting efficiency.” “After the shocking 22.6 percent decrease in December 2008, the cargo demand dropped a further 23.2 percent in January 2009”, says Giovanni Bisignani, IATA

Director General and CEO. As to battle this crisis, the receipt is to look for new opportunities that will build the future with more efficient industry, “focused on meeting customer needs. Customers want a good price and a great product, delivered via the supply chain with speed and reliability. To build a solid future for the (air) industry, a change is required.”

What comes to airports, they are the essential nodes of the air transport system, just like the sea ports are nodes in the sea transport system. The business of owning and managing airports, once considered a safe heaven, is challenging even the best managers today. On top of the steep drop expected in passengers, cargo volumes and revenue, several other trends are impacting airports: huge airport development and operational challenges, increased pressure on airport costs, and uncertainty to future (passenger and) cargo volumes demand. (Olivier Wyman Group, 2009).

Airports are directly dependent on and influenced by the Airline industry. How the airport managers anticipate and can manage these strategic risks will determine how successful and profitable their airports are in the coming years. Airport Management has to look into other revenue streams. Just like Lufthansa CEO was joking about airline industry **“2009 will be the year that turns boys into men”**.

Considering the decisions which may be made by airlines for possible network and capacity changes in the near future, it is to be noted that today the commercial portion of the passenger traffic is high, and therefore the importance of passenger traffic compared to freighters still weights heavier in decision making in passenger traffic driven airports. “I do think that every airport needs to evaluate what it can truly achieve, from where and why. We spend way too many resources unwisely and we ultimately must realize that we cannot be everything to everyone”, states '09 Chris Mangos, Director Marketing, Miami International Airport. Airports are left to wonder whether it is time for specializing. (Interview of Air Cargo World, March 2009).

1.2 Research Purpose

The main research purpose of this study was to recognize how the airport management and their key stakeholders picture the future development of air cargo, and analyze if their visions for the future are aligned. In order to do this, another pre-research was needed, as first the industry environment of the business had to be understood. Therefore, the research was divided into two main parts: First the industry level analysis aimed to explain how does the Nordic Air freight industry look like; what are the characteristics of the market place. The second step was to conduct a Case Study to acquire deeper understanding of the airport as a specific micro-environment, and LFV as a state-owned airport manager, acting as a service provider for airline carriers and for importing/exporting companies. The Case Study was conducted on LFV Gothenburg-Landvetter Airport (GOT) and within their industry network (stakeholders).

LFV aims to use the outcome of the research as a supporting input for their future business development strategy.

1.3 Structure of the Study

Chapter 1, introduction sets the background of the current global situation by introducing the air cargo business to the reader, describes driving forces and strongest influences in the airline and airport industry, and their common strategic direction. Also research purpose and the structure of the thesis are presented, and the chapter ends with a clear description for the delimitations of the study.

Chapter 2 goes deeper into collected material, such as well recognized industry influencers and consultants report outcomes. It gives further background information by providing examples of earlier global level crises impacting aviation, describes oil price fluctuation impacts, and introduces airlines as important nodes in global airline network.

Applied theoretical framework and key concepts are presented in Chapter 3, introducing B2B markets, Strategic environment thinking and theoretical tools of Porter 5-forces analysis and the Stakeholder model. Research methodology with clear research questions are described more in details in Chapter 4 including reflection on study reliability and validity.

Chapter 5 gives on overview of the current air cargo industry and its evolution in the Nordic area during the period of 2006-beginning of 2009. Chapter 6 goes deeper into

export goods flows by country carried as air cargo in the Nordic area. Chapter 7 describes airports and specifies the function of Airport Management and classification for airport hubs as an answer for deeper understanding of the airport as a specific micro-environment.

The organization of LFV and the Gothenburg Landvetter Airport (later on abbreviated by Landvetter's IATA-code GOT) are analyzed in Chapter 8, explaining the specifics of state ownership, their strategy and marketing messages, customer base, services, organizational structure and the airport logistics systems. Chapter 9 provides Nordic Cargo Airport industry analysis assessing the current strategic competitive environment and rivalry based on five forces industry analysis.

Chapter 10 provides short version of empirical interview results as the base of future visions analysis based on conducted case study on LFV Gothenburg-Landvetter Airport (GOT) and their industry network.

Finally, Chapter 11 discusses study highlights and draws final conclusions on how the airport management and the key shareholders vision the future development. These conclusions are provided in sections identified during the pre-study phase, to help reader to understand extracted strategic business areas.

1.4 Delimitations

This study focuses on air cargo on B2B (business-to-business) markets. Authors very clearly recognize the obvious connection of today's air cargo business with passenger transportation in terms of defining markets and in routing planning; also the importance of the passenger planes in terms of cargo capacity, especially dependency of belly cargo (also called pax-belly). A lot more studies around passenger than cargo traffic exists. Therefore, in order to keep the focus on cargo side of the business for this study, the pure airline passenger traffic and its influences to cargo are excluded from the scope. All kind of air freight including pure freighters and belly-cargo itself are included.

It is to be noted that at the company level for the empirical analysis of LFV, the unit of Air Navigation Services is out of scope for the research due to our focus on Airport Management and the business development of the LFV activity. Even though the two units (air navigation services and airport management) work closely together, their focus of main activities, ambitions and targets are separated.

At the empirical part of the study, it is very easy to slide into a situation of basing arguments and research on cost analysis, especially in this difficult financial period

which the industry was increasingly experiencing during the study. Visions and comments related to costs (fees) are included at the strategic level, however, the authors have avoided focusing on detailed cost analysis.

As for data collected in interviews, it is to be noted that interviews were focused on certain selected stakeholders, limiting out maybe some most obvious ones. In addition, interviews were conducted in the Nordic market area, so naturally there is empirical bias for Nordic, especially to Swedish data.

Finally, the authors would like to point out that though the study has solid academic grounds, it also seeks to produce information of business value to LFV and to the industry stakeholders. Included theory concepts are applied as necessary models, 'tools', in the study to help the reader to better structure and understand discussed industry and its players, who are named as the 'stakeholders'.

2. Empirical background

The second chapter gives deeper background based on well recognized industry influencers and consultant reports. The chapter also gives some examples of past aviation crises, describes oil price fluctuations' impacts to aviation, and introduces airlines as important nodes in the airline network.

2.1 Global economy impacts to airport industry

Aviation industry is familiar with the crises. Super-national organizations such as IATA, TIACA, ACI and aircraft manufacturers such as Airbus and Boeing frequently monitor the industry and produce industry wide reports. There are also some consulting companies such as Olivier Wyman, and Seabury who typically provide five-year forecasts for the international air cargo industry using information from specific trade lanes combined with worldwide forecasts looking at industry, fuel price and economics.

Olivier Wyman Aviation, Aerospace & Defence group focuses in airport management analysis, and identifies increased risks that the airport executives currently face. These are divided on revenue and cost side. The revenue pressures are caused by lower passenger and cargo demand, greater demand variability and airlines changes to networks and capacity. Cost pressures are caused mainly by mega-projects (such as creation of airport cities) with high investments and a project risk, airline and regulatory opposition to rate increases and yet to higher customer service expectations. Airport terminals are among the most expensive commercial construction in the world, often costing three to five times as much per square foot as other commercial construction. British Airways' new T5 at Heathrow, for example, costs over 18 300 dollars per square meter.

In addition to planned Airport City or Airport Business Centre -concepts, Olivier Wyman points out airport managers' emphasis on revenue diversification also from other non-aviation areas, such as by increasing advertising and by maximizing parking revenues. (see Appendix 7, Development of the Airport Business model).

From previous recessions, to 9/11 terrorist attacks and the outbreak of the SARS, aviation had to deal with bad news for a long time. But the crisis have also represented to the industry opportunity to re-think. Airline Cargo Management – magazine states in its March issue (Editors Note, 2009) for the future forecast; 'poor

with sunny intervals. While cutting-costs is now on everyone's agenda there is also a chance to make long-term strategic changes, which can only be good for the future'.

Before the strong economy recession touching the whole world, a few incidents in recent decades have influenced the development of air cargo industry. The most important are Asian financial crisis, 9.11 terrorist attacks, and skyrocketing oil prices. Each of them had an impact on different aspects of an air cargo industry. Looking back on these incidents can give a background and direction in assessing the current and future air cargo situation.

2.2 Examples of earlier aviation Crisis

1997 Asian Crisis

The Asian financial crisis of 1997-98 is now seen as one of the most significant economic events in recent world history. The crisis began in early July 1997, when the Thai currency baht was floated, and spread into a virulent contagion—leaping from Thailand to South Korea, Indonesia, the Philippines, and Malaysia. It led to severe currency depreciations and an economic recession that threatened to erase decades of economic progress for the affected East and Southeast Asian nations. (Bhumika M. 2007)

In 1997 and 1998 all major countries of Southern and Eastern Asia slowed their development pace. The main indicators of economy of these two years revealed the severe consequence of this event. The table here shows the GDP growth of selected Asian counties from 1996 to 2000. In 1997 and 1998, almost all Asian countries present in the table experienced numerous retrogress in GDP growth compared with the growth rates before the crisis. And the economy situations were still under the shadow crisis after the crisis.

Country	\$GDP p.c.	1996 (%)	1997 (%)	1998 (%)	1999 (%)	2000 (%)	Decline (%)
<i>Vietnam</i>	310	9.3	8.2	3.5-5.8	4-5	4-5	4.3-5.3
Indonesia	1,100	8.0	4.5	-13.7	0.5	4.3	3.7
Japan	38,000	5.0	1.4	-2.8	0.7	1.3	3.7
Malaysia	4,500	8.6	7.5	-7.5	4.9	6.3	2.3
Thailand	2,740	5.5	-1.3	-10.0	4.0	5.4	0.1
China	860	9.6	8.8	7.8	7.1	7.4	2.2
Korea	10,500	6.8	5.0	-5.8	10.2	7.6	+0.8
Bangladesh	360	5.4	5.9	5.6	5.2	6.2	+0.8

Note: GDP growth for 2000 is projected based on the April 15th *Economist* data, except for Bangladesh and Vietnam, which are from the IMF. Historical data are from the IMF. China's GDP growth is widely believed to be 2-3% below the official figures. Vietnam's recent official growth rates have been higher than independent estimates by the IMF and some multilateral banks. Thus, a range is given. The final column is growth in 1996 less in growth in 2000.

Figure 2.2.1: The GDP Growth in selected Asian countries around Asian crisis. Dr. Dapice, David O; Vietnam and Asia, Selective Recovery from the Asian Crisis? 2000)

Eastern and Southern Asian area is seen as the most important sourcing region of raw materials and semi-products. The financial crises ruined most of the local industries including many OEM factories, material and component suppliers. The bank systems cracked in Southern Asia, which cut down the fund flow to many companies and factories. Without monetary support, these companies seldom survived in this catastrophe. Therefore the export volume significantly declined in 1997 and 1998. For the import side, all local currencies in this region had suffered serious depreciation after the crisis started in Thailand. Usually the international trade uses USD or Euros as the payment currency. The previous prices of the import products became much higher for the customers in these Asian countries due to the depreciation of the local currencies. The only way they could choose at that time was to cancel the orders. Without orders, the import is coming from nowhere.

The trade is always linked with the transportation. Once the trade is shrinking, so is the transportation, especially for air cargo industry which just started its high-rate growth in developing Asia. Hong Kong, one of the Eastern Asian Tigers, being also the Asia's financial and trading center, recorded huge slide-down in both air cargo and trading volume during the crisis time.

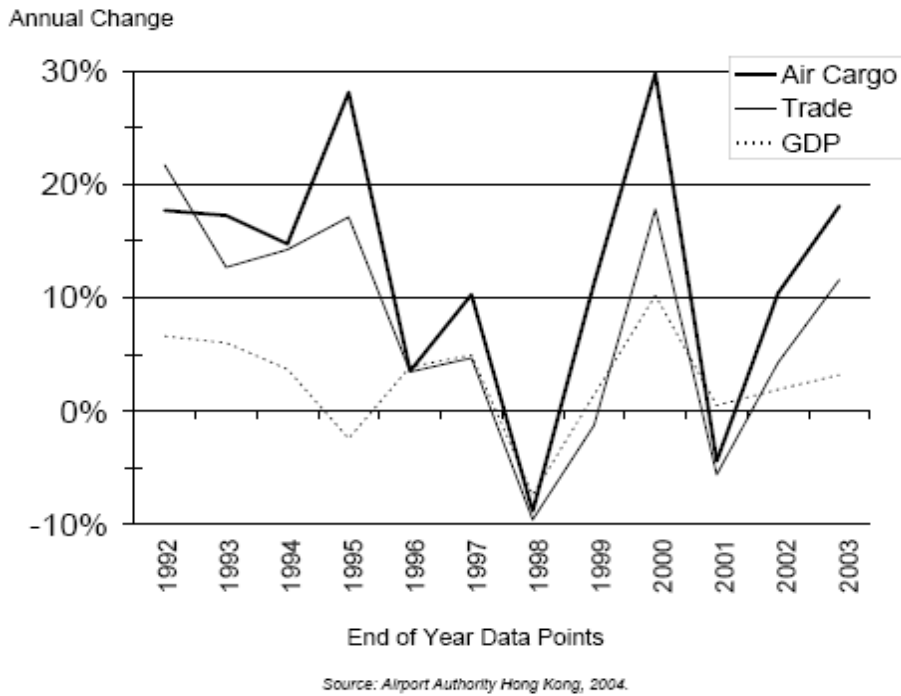


Figure 2.2.2: Annual Change of Air cargo in Hong Kong. (Kasarda, John D. and Green, Jonathan. Air Cargo: Engine for Economic Development, 2004)

However, viewing this crisis from the worldwide view, the main influence was limited in developing areas like Asia and Latin America. US and Europe relatively safely got through this crisis because first, the crisis did not occur in either of these continents, secondly their financial and currency systems are much more mature than ones in developing countries. Domestic consuming powers also benefited. Same situation happened in the air cargo industry. The historical data in Boeing Report supports the fact that the impacts on air freight in US and Europe were rather small.

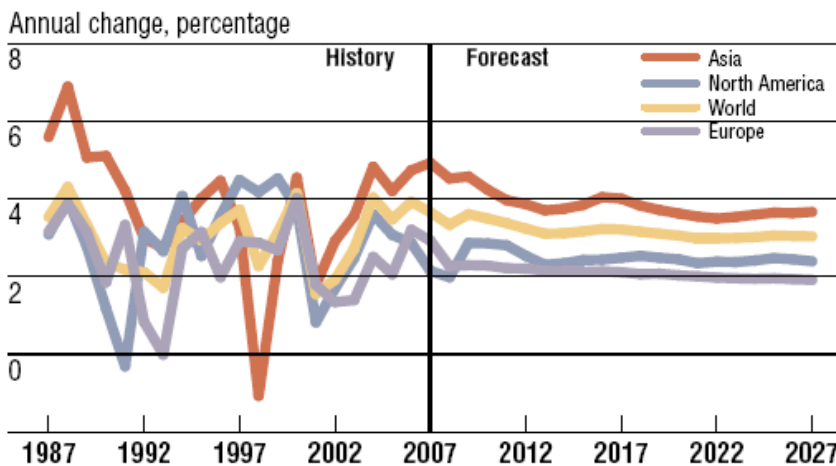


Figure 2.2.3: Annual change of Air Cargo, World Wide view (Boeing Report 2008-2027 - forecast given in 2007).

Terrorist Attacks 9.11

On 11th of September 2001, two civilian passenger aircrafts were hijacked by terrorists and they crashed the World Trade Center standing in the central business district of New York. At the same time, a small passenger jet struck the Pentagon the headquarters of the US Department of Defense. Later in that day, another passenger plane was controlled by terrorists and finally prang in Pennsylvania. Thousands of people lost their lives in this aforethought terrorist attack, but the more serious consequence was that it significantly affected the world's political and economical development.

Air transport industry stagnated at the valley which it has never been after the 1980's oil crisis since the attack occurred in air transport field and it revealed security problems existing in the industry. Many passengers choose other transport modes when they travel or have business trips. As the biggest air transport market, the numbers, the nine largest U.S. air carriers had operating expenses of \$26.7 billion in the third quarter of 2001 (80 percent of which had transpired prior to September 11) as compared to operating revenues of only \$21.5 billion, thus producing an operating loss of \$5.2 billion. The General Accounting Office now estimates that U.S. airlines will lose between \$6.5 billion and \$10.5 billion as a result of the terrorist attacks, an estimate that may prove to be too low. (Source: Laurence T. Phillips, A. Crisis of Security and Economics. 2001)

Air cargo includes belly cargo and pure freighter cargo. Reduction in passengers served by air definitely leads to the cut-down in belly cargo volume. On the other hand, due to the serious security problems in the aviation industry, such as increase in security processes, many shippers shift to alternative transport modes such as sea for long haul, and to road.

The figure shows that there are two evident valleys in the history part of air cargo annual growth. The second one indicates how serious the 9.11 negatively affect the air cargo industry. Compared with the first valley caused by Asian Financial Crisis, Europe and North America market also suffered significant damage which was even more than Asia. This means the shock wave spread by 9.11 had swept the whole world.

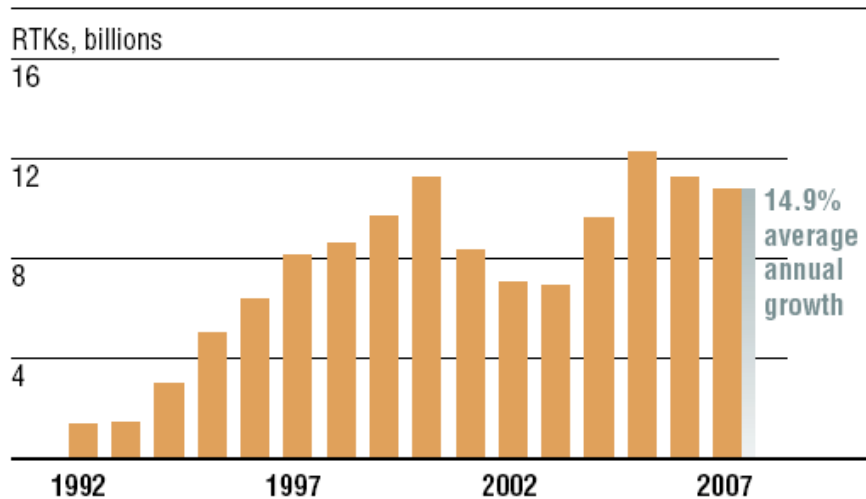


Figure 2.2.4: World Air Cargo Growth in RTKs (Boeing World Air Cargo Forecast 2008-2009, published 2007, p. 4)

From the volumes point of view, 9.11’s catastrophic after effect is much worse than the one of Asian Financial Crisis. From 1997 to 1998, the volume slightly increased by less than 0.5 billion RTKs. As the compared period, from 2000 to 2003, no more increase happened in terms of volume. The total cargo transported by air dropped from approximate 11.5 billion RTKs to less than 7.5 billion RTKs which is even lower than the level of 1997 when the Asian Financial Crisis started.

However this incident brought some positive influences into the whole air transport industry. The most important one is that the security issue has been focalized and all the actors involved with air transport mode immediately improved their safety and security standards after 9.11. At same time, the demand for air transport is still existing and increasing soon after 9.11, so that the both volume and growth rate of air cargo jumped to the normal level by 2003.

2.3 Oil price fluctuations impacts

On 11th July, 2008, US light sweet crude rose to highs of \$147.27, before dipping back to \$145.08. In London, Brent crude climbed to \$147.02, before settling at \$144.49. Market experts put the increase down to concerns about OPEC member Iran's recent missile tests, concerns about global supplies and the weak dollar. (BBC Financial New, 2009)

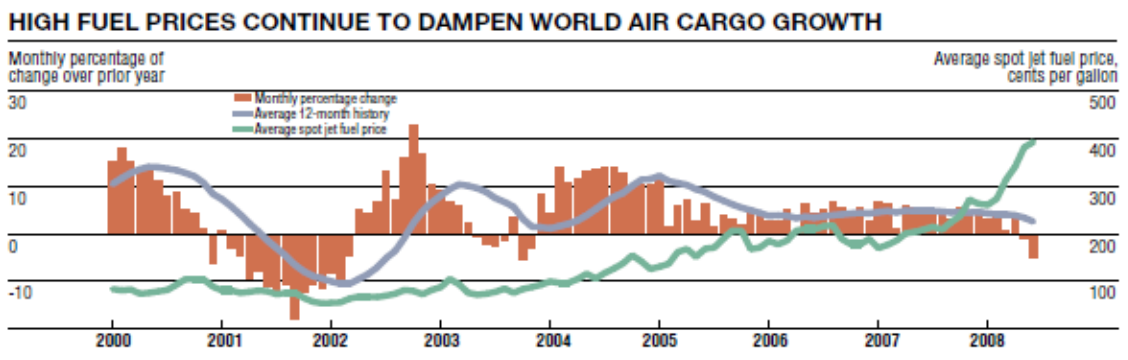


Figure: 2.3.1: Fuel price influence to Air Cargo (Boeing Air Cargo Forecast 2008-2009. 2007, p. 1.)

No doubt increasing oil prices are likely to dampen global trade. By value, 35 percent of goods traded internationally are transported as air cargo; cargo traffic is a leading indicator of any economic slowdown. The air cargo industry, where the fuel accounts for 20-30% of the operational costs (40-60% of total costs according to Seabury), is poised to be the prime casualty of the new era of expensive oil. (Source: The oil prices and its impact on air cargo industry) Therefore, the crude oil market development strongly influences the air cargo market in terms of transport cost, revenue and cargo types. For example, the average values of air cargos import to and export from USA has been increasing since 2005 when the growth of oil price started to accelerate.

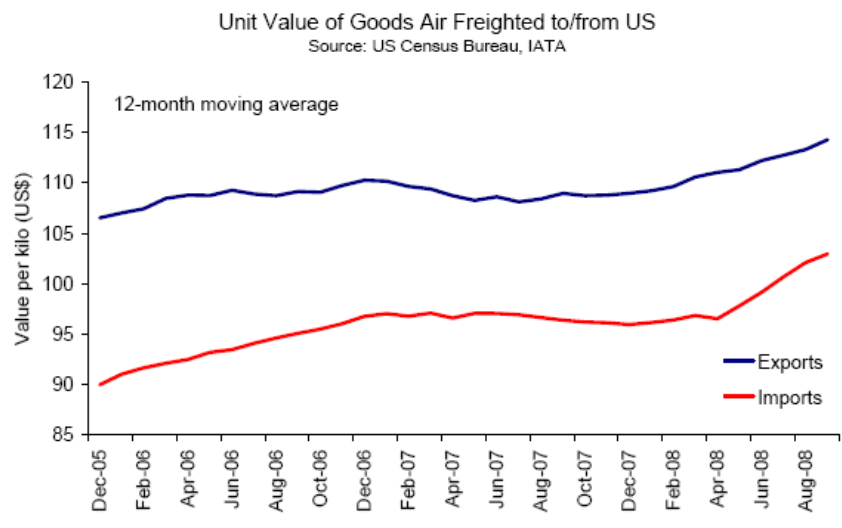


Figure 2.3.2: Unit Value of Goods air freightied to/from US (IATA Cargo Chart Book Quarter 4, 2008)

The oil price fell sharply after it kicked its record high in July 2008 and now back down to the level prevailing in 2005 and 2006. IATA forecasts the 2009 Brent oil price will average \$60 per barrel, for a total annual industry bill of \$142bn. This is \$32bn lower than in 2008 when oil averaged \$100 per barrel. Despite some relief on the price of oil, 2009 would represent the worst revenue environment for the aviation sector in 50 years and the industry could expect losses of \$2.5bn over the full year. (Source: IATA Market Forecast 2009)

Based on the historical record, the raising of oil price is a continuant pattern since 2002. Therefore today's low prices will be a temporal result of crisis, and they will keep a growing but unpredictable trend in future. According to Seabury, the oil prices will continue to put much pressure on the industry. The forecast made by Seabury says that the oil price will rise to \$106 per barrel in 2012 from \$75 in 2009. For every dollar increase in the price of oil, aviation industry costs go up by \$1.6 billion. Although the huge fluctuating oil prices from 2008 to the early 2009 have not structurally changed the air cargo industry, it is still hard to say that the relatively weak players will remain unchanged by the unpredictable oil prices in the future. (Seabury's Air Cargo Forecast, 2008)

Besides economic crisis and oil price, public health incidents such as SARS in 2003, avian flu and most recently H1N1A Flue had influenced or is influencing the air transport industry as well. However due to the carrier of these infectious diseases is human being, the impacts are mainly limited in the passenger side. The decline in air freight side is relatively small. Figure 2.2.3 indicates this smaller impact by a insignificant down-turn at 2003.

WORLD AIR FREIGHT TRAFFIC, RTKS

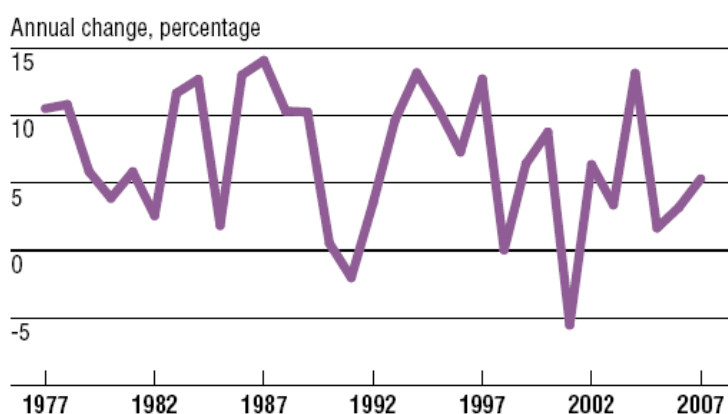


Figure 2.3.3: Annual Change of World Air freight Traffic (Boeing World Air cargo Report 2008-2009, published in 2007.)

2.4 Airports are important nodes in Airline Network

Airport is the node in the node-line network of air transport and plays an essential and important role in the air transport industry. Airport provides the entire infrastructures needed to enable passengers and freight to transfer from surface modes to air modes of transport and to allow airlines to take off and land. (Graham,A. 2008.) At airports, passengers and cargos are gathered and dispatched to different destinations, and from logistics point of view the airport is the spot where the transfer of two basic logistics functions, storage and transport realize. Except the services of air traffic control, passenger transferring and freight handling, airport also offers a wide range of commercial facilities like shops, hotels, restaurants, and business facilities.

Time is the most crucial issue in air transport industry, always connected with the quality of transportation. For air transport mode, short delivery time is the biggest competitive advantage. How to maximize the use of this advantage is the top task of air transportation service providers. There are five time elements in transportation according to Woxenius, J:

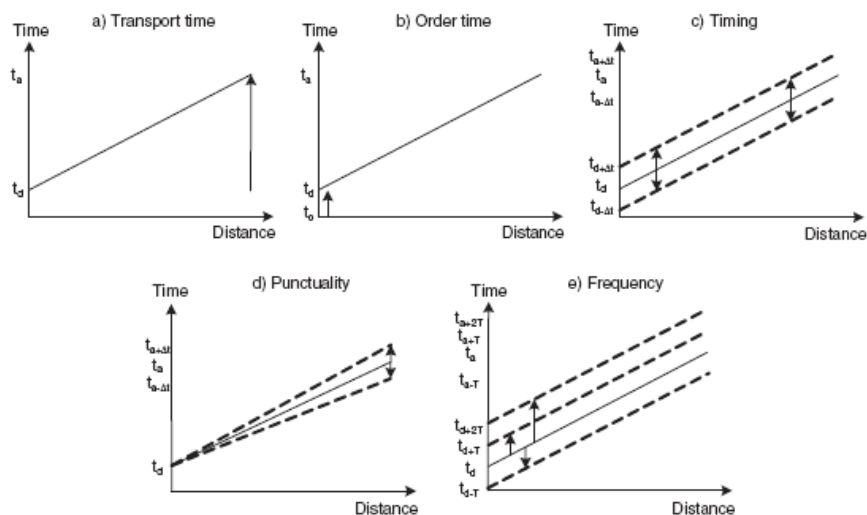


FIGURE 2. PRINCIPLES FOR THE TIME ELEMENTS.

Legend: t_0 = time of order, t_d = time of departure, t_a = time of arrival are points of time; the elements relate to duration.

Figure 2.4.1: Principles for the Time Elements, source: Woxenius, J; Temporal Elements in the Spatial Extension of Production Networks

Among five time elements, timing, punctuality and frequency are all highly dependent on the airport management. The arrival and departure time of planes are involved with timing and punctuality. Many airports are suffering traffic congestion due to capacity limits or poor management, which definitely will counteract the speed competence provided by air transport. The frequency of airline calls decides the availability of transportation service. High frequency with various destinations will appeal more customers to use air transport. Therefore airport and airport management play very important role in maintain the speed and availability of air transport service which, in turn, affect the quality of air transport service.

From the region point of view, the airport has become a main driver of regional economic growth. Is there any airport available has been seen as a critical criterion to evaluate the competence and investment attractiveness of one region. According to Hugh Doyle, Director of Unisys’ freight program “A region without an effective air freight infrastructure will be competitively constrained in a rapidly evolving global marketplace. Well-planned airports and related infrastructure are not a luxury; they are fundamental to the economic success of any region”. (Schwartz Beth, 2000) Mr. Bengt Wennerberg from the Business Region Gothenburg (BRG), emphasizes the importance of Gothenburg Landvetter airport as “one of the industry factor of Gothenburg area.” (Source: interview with Wennerberg). Besides the contribution on the local economy in terms of transport, airports also can bring greater wealth, and provide substantial employment opportunities. (Graham,A., 2008)

Globally the airport industry is dominated by North America and Europe in terms of passenger numbers and North America and Asia Pacific in terms of cargo tones carried, according to the data from Airport Council International (ACI).

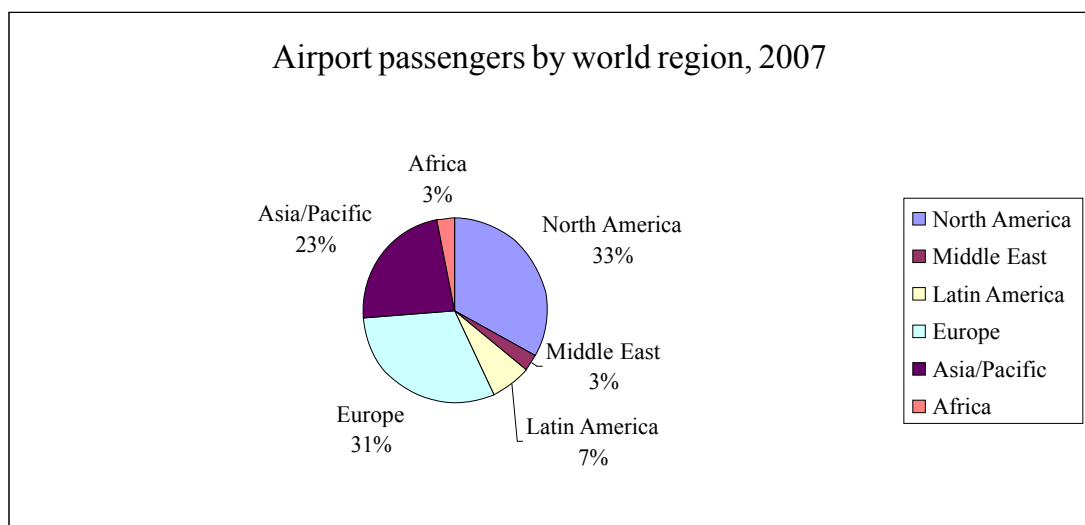


Figure 2.4.2: Airport Passenger by World Region (Source: ACI)

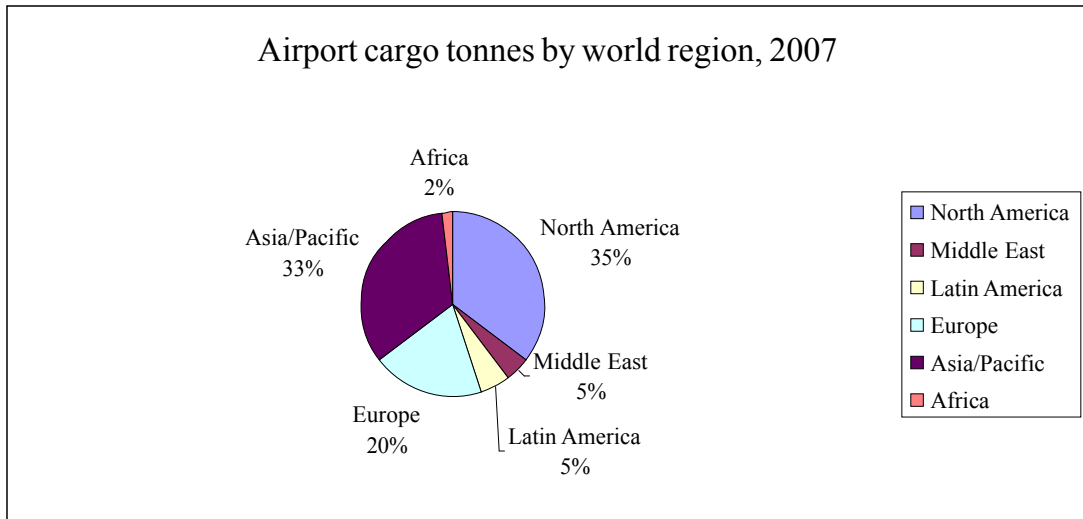


Figure 2.4.3: Airport Cargo by World Regions (Source: ACI)

The importance of these regions is reflected in the individual traffic figures of airports ranking in terms of passenger and cargo tons.

Table 2.4.1: Top 10 Airports by Passengers 2007 (Source: ACI)

► Top 10 airports by passengers 2007

Rank	City	Code	Total Passengers	% Change
1	ATLANTA GA	ATL	89 379 287	5.3
2	CHICAGO IL	ORD	76 177 855	(0.1)
3	LONDON	LHR	68 068 304	0.8
4	TOKYO	HND	66 823 414	1.1
5	LOS ANGELES CA	LAX	61 896 075	1.4
6	PARIS	CDG	59 922 177	5.4
7	DALLAS/FORT WORTH TX	DFW	59 786 476	(0.7)
8	FRANKFURT	FRA	54 161 856	2.6
9	BEIJING	PEK	53 583 664	10.1
10	MADRID	MAD	52 122 702	13.9

Table 2.4.2: Top 10 Airports by Cargo Tons 2007 (Source: ACI)

► Top 10 airports by cargo tonnes 2007

Rank	City	Code	Total Cargo (metric tonnes)	% Change
1	MEMPHIS TN	MEM	3 840 491	4.0
2	HONG KONG	HKG	3 773 964	4.5
3	ANCHORAGE AK*	ANC	2 825 511	0.6
4	SHANGHAI	PVG	2 559 310	18.0
5	INCHEON	ICN	2 555 580	9.4
6	PARIS	CDG	2 297 896	7.9
7	TOKYO	NRT	2 254 421	(1.2)
8	FRANKFURT	FRA	2 127 646	8.4
9	LOUISVILLE KY	SDF	2 078 947	4.8
10	MIAMI FL	MIA	1 922 985	5.1

2.5 Air cargo Aircraft types

There are several factors that will dictate the aircraft type that is the most appropriate for the planned trip and transport: the number of passengers travelling (in case of belly hold cargo), the size, type, nature and amount of cargo that will be carried, special routing and destination requirements, personal aircraft or manufacturer preferences, and the budget parameters will all factor into the type of aircraft that is needed. Some examples of aircraft models used in air freight carrying from LFV GOT Airport can be found in the Appendix 9.

3. Theoretical framework

Chapter 3 describes important theoretical concepts and models behind the study. The chapter shortly reminds the concept of B2B Business Development, describes the Strategic Environment thinking, explains 5-forces analysis principals and the Stakeholder model, which were used as tools for Strategic analysis in this study.

This thesis combines the science of Logistics Management and Strategy with the subject of aviation B2B (Business-to-Business) marketing, and more specifically within the area of Business Development and Strategic Vision development.

Theoretical framework of this thesis is based on two parts: First part starts by building on the collected empirical material: known industry influencers' reports, expert views, and on existing academic research. Second part is the research based on Case Study generating further new information. Theoretical tools such as the Porter 5-forces analysis for assessing the strategic industry environment, and the Stakeholder model for the Group LFV GOT stakeholders are applied.

3.1 Business development in B2B

The study is based on business-to-business (B2B) relationships. B2B describes commerce transactions between businesses, such as between a manufacturer and a wholesaler, or between a wholesaler and a retailer. Contrasting terms are e.g. business-to-consumer (B2C). Defined by Kotler (2003, p.216-2170), the *business market* consists of all the organizations that acquire goods and services used in the production of other products or services that are sold, rented or supplied to others. Contrary to consumer markets, business markets have typically fewer and larger buyers, close supplier-customer relationship, geographically concentrated buyers, professional purchasing and the demand is derived, inelastic and volatile.

In fact, the volume of B2B transactions is much higher than the volume of B2C transactions. The primary reason for this is that in a typical supply chain there will be many B2B transactions involving subcomponent or raw materials, and only one B2C transaction, specifically sale of the finished product to the end customer. For example, an automobile manufacturer makes several B2B transactions such as buying tires, glass for windshields, and rubber hoses for its vehicles. The final transaction, a finished vehicle sold to the consumer, is a single B2C transaction.

The term "business-to-business" was originally coined to describe the electronic communications between businesses or enterprises in order to distinguish it from the communications businesses and consumers. It eventually came to be used in marketing as well, initially describing only industrial or capital goods marketing. Today it is widely used to describe all products and services used by enterprises. Many professional institutions and the trade publications focus much more on B2C than B2B. This can be considered as a strange development as most sales and marketing people actually do work in B2B. The specialist area of business development comprises a number of techniques and responsibilities which aim at gaining new customers and at penetrating existing markets. Techniques used typically include:

- assessment of marketing opportunities and target markets
- intelligence gathering on customers and competitors
- generating leads for possible sales
- advising on, drafting and enforcing sales policies and processes
- follow-up sales activity
- formal proposal or presentation management and writing
- business model design

Business development involves evaluating a business and then realizing its full potential, in implementation stage using such tools such as marketing, information management and customer relations.

3.2 Strategic Environment & 5-forces Industry Analysis

Strategic Environment

Assessing strategic management, we first need to look into the environment the company is acting in. According to Oxford Handbook of Strategy, the external environment that the company is concerned with comprises of the whole set of relevant strategic conditions surrounding the firm – this can be termed the *strategic environment*. Strategic management is concerned with, amongst other things, how firms relate to each other, whether by competing, cooperating or just by coexisting. Consequently, the most relevant distinction to be drawn amongst potential subsets of the strategic environment surrounding the firm is between those factors and conditions which affect all related firms – what can be called the overall or *common strategic environment* and the somewhat narrower range of factors and conditions which primarily comprise the industries the firm competes in and which we might call the competitive environment. At the lowest level, we have the business unit

environment which comprises the immediate competitive surroundings of the firm comprising those firms with which it competes for customers and added value. In this study, these strategic environment layers are defined as follows:

- a. Competitive environment is composed of the transport industry, generated by the global economy and trade
- b. Industry Environment here is composed of the Nordic Air Cargo.
- c. Business Unit Level is the activity of Airport Management.
- d. The Case firm representing the Airport Management is this study is LFV and their Gothenburg-Landvetter Airport (GOT).



Illustration 3.2.1: Definition and visualisation of the Structure of Strategic Environment of LFV and GOT Airport.

The strategic environment model is adapted and developed by authors based on the model of Oxford Handbook of Strategy 2003. For the original model, see Appendix 8.

Layer a., Competitive environment, the transport industry generated by global trade, is covered in chapters 1 & 2 of this study as an introduction and background.

Layer b., Industry environment, is based on Porter's 5-forces analysis model. According to Porter, there are five key forces which determine industry attractiveness. In addition to maybe most obvious competitive rivalry occurring within the industry, these forces divide into those which provide more competition: to entrants and substitutes, and those which in essence portray the dynamics of the supply chain for the industry: suppliers and buyers. The following Cargo Airport industry analysis is based upon this framework, and aims to assess the current industry rivalry from airport management view-point. Future industry rivalry scenarios are then presented in Future Visions – analysis part.

Layer c., Business Unit Level covers the activity of an airport and its management, and these are touched upon in the chapter 7 of this study.

Layer d., The Case firm representing the Airport Management in this study is LFV with their Gothenburg-Landvetter Airport (GOT).

The idea of presenting the strategic environment as layers in this study is that the approach of the study follows the same structure as these layers, throughout entire study, starting from A. and ending to D.

Porter's 5-Forces Industry Analysis

"The essence of formulating competitive strategy is relating company to its environment" (Porter, 1980).

According to Porter, and the Oxford Handbook of Strategy (p.245-250), by analysing the five forces confronting an industry, a firm should be able to *position* itself so as to defend itself against them, *influence* them so as to improve its position, and *anticipate change* in them so as to obtain a better position before rivals do. (See visualisation of The Porter Five Forces in Appendix x).

Industry Rivalry: Competitive rivalry within an industry (here between the service providers) on the market place can be affected by a number of factors. Important characteristics here are the market structure: is the industry concentrated or there are many providers, are there economies of scale that would lead to consolidation (cost structure). Moreover, for existing competitors important issues are market growth prospects, the existing capacity, product/service differences, and switching costs.

Buyer power: In theory, buyer power can be described by following characteristics: bargaining leverage, buyer volume, price sensitivity, buyer concentration vs. industry, substitute available, pricing policy, and business customers vs. private customers. Therefore this force looks at the customer relationships, trying to characterize the

customers, how continuous are customer relations and how service prices are being formulated.

Supplier Power: The theory denotes that power of suppliers depends on: concentration of suppliers, branding, and profitability of suppliers, role of quality and service and switching costs. Similarly to the previous force, this force looks on the relationships but on the Supplier side.

New Entrants: In the theory, following characteristics have been brought up to describe the threat of new market entrants: absolute cost advantages, access to inputs, government policy, economies of scale, capital requirements, brand identity, switching costs, access to distribution. This force tries to evaluate the risks concerned with new competitors entering the market, by looking into how market is regulated and what other market entry barriers exist to protect from new competition.

Substitutes: The threat of substitute products or in our present case the service, depends on: quality, buyer's willingness to substitute, the relative price and performance of substitutes, the costs of switching to substitutes. Substitute products and services are similar to the ones offered by competitors, meaning they fulfill the same needs of customers, however the product/ service itself is different. The competition from substitutes can in some cases have important influence on the competition in-between the competitors.

3.3 Stakeholders

In order to analyse the lowest layer, the business unit level (see Illustration 3.2.1: Visualisation of The Structure of Strategic Environment of LFV and GOT Airport), a Case study is conducted. The research comparison is based on development of the relations of two companies or corporations working together in B2B environment; it builds on the concept of Network of organizations (see for example Harrison, Van Hoek, Remko: Logistics Management and Strategy, p.9) and further grounds on the model for stakeholder theory at the Business Unit level in our study. Business markets are addressed as networks within the domain of industrial marketing (see for example Ford, David; Understanding Business Markets). ‘Network’ describes a complex structure, where organizations can be cross-linked. In its simple form, this can be illustrated as follows:

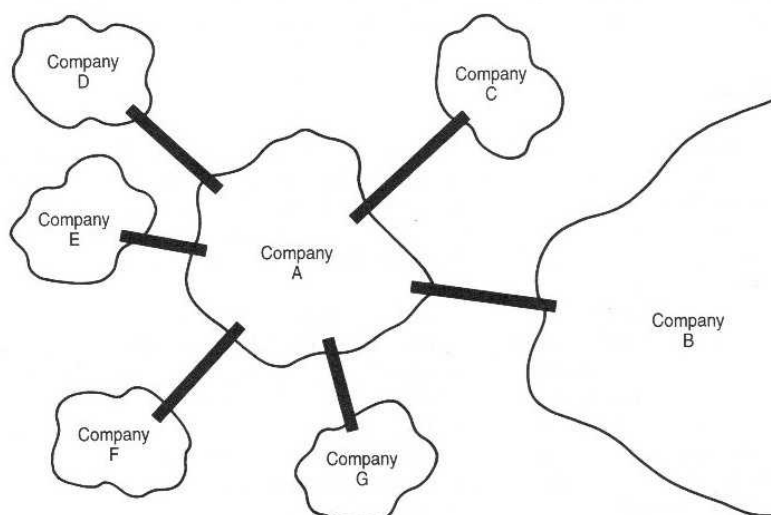


Illustration 3.2.2: Business Markets as a Network (Ford, David: Understanding Business Markets. p.165)

In this study, stakeholders are illustrated as a network. A stakeholder is any person or organization, who can be positively or negatively impacted by, or cause an impact on the actions of a company. Types of stakeholders can for example be categorized as follows:

- Primary stakeholders: are those ultimately affected, either positively or negatively by corporation's actions.
- Secondary stakeholders: are the ‘intermediaries’, that is, persons or organizations who are indirectly affected by corporation's actions.
- Key stakeholders: (who can also belong to the first two groups) have significant influence or importance in corporation.

The stakeholder theory is a theory of organizational management and business ethics that addresses morals and values in managing an organization. It was originally detailed by Freeman R. Edward in the book *Strategic Management: A Stakeholder Approach*. It identifies and models the groups which are stakeholders of a corporation, and both describes and recommends methods by which management can give due regard to the interests of those groups. In short, it attempts to address the "Principle of Who or What Really Counts".

Stakeholders are individuals and groups with a multitude of interests, expectations and demands as to what business should provide to the society. Stakeholder is simply an individual who possesses a stake. Business stakeholders are typically the owners (shareholders in a corporation) but can be also for example government, employees, clients or other influencers or influences. Stakeholder model has become as a frequently used tool e.g. in the field of project management.

In this study the Stakeholder model, based on understanding business markets as a network, was used to identify and categorize the parties for the research interviews.

4. Methodology

Chapter 4 explains the methodology used in this study, with clear presentation of detailed steps seeking to answer to the main research question: How the Airport Stakeholders see the future development? Chapter also introduces the process of qualitative interviews and the questions used and processed for the Case Study of LFV and their stakeholders. Chapter concludes by reflecting why the study is considered as valid.

As the study initiates from real life business problem of LFV, the thesis is an applied business research. It follows the Research Process methodology consisting of the following main steps: Problem formulation, Problem Analysis, Data Collection, Analysis and Interpretation (*Jensen A, 2008*)

The study follows the process of analytic induction and qualitative research methods in order to acquire a deeper understanding of the current very specific and the future situation in the Nordic freight markets, and more empirically focusing in the Case Study on those impacting the Swedish LFV Airport Management and Operations.

Authors would like to mention that even though the research topic initiates from the real and current business challenges of LFV, the researchers have used the freedom of research in order to be unbiased in empirical material collection and in order to create a good and trust-based dialogue during the interviews, as well as to produce unbiased analysis from the wider global perspective.

LFV aims to use the outcome of the research as a supporting input in forming process for their future strategic vision alignments.

4.1 Research Questions

The main research question is:

- 0) How the Airport stakeholders see the future development?** Are their visions for the future aligned? (aligned with the strategic view of LFV, aligned with each other and aligned with the collected industry experts views)

In other words, the research aims to give a flash view to the future development visions by selected stakeholders. The bottom-line fear is: is there future for the air cargo in the Nordic area, and how does that look like? Also LFV as an Airport Manager wants to be correctly positioned in terms of what the Shippers/Manufacturing companies/Forwarders/Integrators are looking for. How can LFV be better placed in the future competitively through their strategic alignments, in respect with the other airports as well as other transport modes?

In order to be able to answer to the main research question, pre-research and sub-questions were established in steps-by-step approach:

- 1) First: Industry level analysis seeks to answer to the question of: **How does the Nordic air freight industry look like; what are the characteristics of market place and how is the competitive environment?** (from Airport Management view-point, based on Porter's 5-forces model)
- 2) Secondly: **Why is Airport an important, specific micro-environment? What is the role of LFV as a specific type of industry provider, acting as an Airport Manager?** And therefore as a service provider for Airline carriers and manufacturing companies. (NOTE: LFV authority for Air Navigation Services is out of scope for this study)
- 3) Thirdly: **Who are LFV's partners and clients to be included, and what is their view of the future development?** (based on Stakeholder model, note - limited, selected stakeholders are included in the case study).

4.2 Qualitative Interviews

Interviews used for this research were qualitative in nature, including both unstructured (explorative) and semi-structured interviews. (see e.g. Bell, E, Business Research Methods, Oxford University Press 2007, p. 472 - 508).

Drafting and coming up with a correct structure and rich yet precise questions was a process in itself, and this process was composed of three main steps:

First round of interviews were conducted at LFV premises at Gothenburg Landvetter Airport (GOT) during the period of January-March 2009. These were exploratory interviews in character with the aim of extracting as much rich data as possible. These batches of discussions and interviews were conducted with LFV Cargo Business Development Director Björn Ragnebrink, Route Development Manager Johan Andersson, Landvetter CFO Brett Weihart and LFV Cargo Business Developer Sara Wedin. We warmly thank them all for their excellent help and cooperation during the entire research process.

Second batch of interviews were conducted during March 2009 with external industry experts, in more semi-structured format. The goal here was to help to formulate and refine the research problem to further define the research questions for the study. At the same time in parallel, the intensive and further scanning of industry news and daily industry updates was ongoing.

These items were then translated into main subject categories, and furthermore into questions for the third round of interviews which was planned for identified and selected stakeholders.

Based on the two first rounds of discussions, interviews and industry information and notifications, information was extracted into two main categories; the first part of the interview was focused on the overall air cargo business development direction. The second part of the questions was more LFV and Gothenburg-Landvetter Airport impact -specific. Following key areas emerged, and the questions were organized accordingly in these categories:

1) **Global Market Visions**, focused on geographical market areas, purpose was to find out directions for routing development initiation by Airport Management.

2) **Air Freight Import and Export Development** with goal of visions on market movements, enablers & possibilities for business diversification, and equipment. Also at the 3rd stage of interviews it was noticed that visibility on Cargo carried on passenger aircraft versus with pure freighters would be of interest to focus on, so it was added.

3) **Possibly changing structures of Air cargo Business Actors**: Have roles changed compared to the past years? Will the roles change further in the future? The aim here was to find out if there is going to be similar structure in air freight business in the future; if not, then how is it going to be different? How will these changes influence the Airport Management? Opinions of potential privatization of GOT airport were analysed within this question.

4) **Relationship and cooperation with LFV** and/or GOT-Landvetter Airport.

5) **Airport Services** (*To be noted that in terms of analyzing LFV services and client relationships (here points 4 and 5), we learned during the process that there is another, dedicated study being conducted by an industry consultant at the same time as we write this study. Therefore this study will just mention, but not aim to focus on these areas.*)

6) **Competition visions** in the Nordic Area.

7) Possibilities with **Multimodality**.

8) Visions for **Future Airport Networks**. Also opinions of potential of GOT to become the real Cargo Hub in the Northern Europe were analysed within this question.

9) **Visions on Airport Structure** and opinions about Airport Business City – concept, and Cargo Handling Centre.

10) **Airport pricing**, with focus on LFV pricing structures and possible influencing factors in the future.

11) **Ideas for Airport Risk Management:** As the demand for air cargo is highly depend on a few manufacturing industry, any changes in these industries will make the demand vary significantly. This question area aimed to collect open ideas about how the airport could better manage to reduce the risk caused by uncertainties in air cargo transportation (in order to keep on offering competitive service)?

Third set of interviews were conducted in April-May 2009 and can be described to be the core of the research part of this paper. These interviews were addressing stakeholders (identified later in Stakeholder figure on page x). Also these interviews were conducted in semi-structured format yet based on the interview guide. All conducted interviews were recorded and transcribed into notes.

4.3 Triangulation

The approach of triangulation was largely used in this study to enable maximum possible reach and coverage within the project time limits. Triangulation term refers to an approach that uses multiple methods of investigation and sources of data (see e.g. *Bell, Bryman, p. 412*). Multiple sources were used to collect base material; such as industry influencers' and expert reports, published industry interviews, academic researches, industry magazines, internet sources, newsletters, publications and published discussions within industry players.

Second important basis for the empirical research was the conducted LFV-case study and related interviews. Research interviews provided more background data than just for specifically addressed questions, and this valuable information was also filtered and used in the study analysis and conclusions.

4.4 Validity and Reliability

The research is valid when the theory and empirical parts have a fit. In other words, it measures if the study concerns that phenomenon that it was intended to concern. The validity of the study improves if all the concepts are carefully designed. Naturally, in the qualitative study, validity is always a question of interpretation. However, there are several techniques to ensure the maximum validity.

This study was carefully designed based on valid and recognized studies published by industry experts. After this, the process was continued by using the industry journals and newsletters, and by various published discussions and interviews of industry experts. For this part of the study the empirical data can be considered very valid in the global scale.

What comes to second part of the empirical data, the case study of LFV/GOT and the interviews with their industry network, using then the 5-forces industry analysis and stakeholder model for analyzing results: direct results of these interviews are valid for the organization of LFV, though by some parts specific to GOT airport. It is to be noted that the data collected in interviews is valid to the specific selected stakeholders. Therefore the results can be considered as valid and representative for those covered stakeholder groups. Interviews were conducted in the Nordic market area, so naturally there is empirical bias for Nordic, especially to Swedish data. To the certain extend, the results can be considered strongly indicative to all Nordic Airport Management business development units, and much of the discussion can be of interest to other similar European non-central hub airport management, and to those trading in the Nordic market place.

Empirical research material is based in a Case Study research initiated by LFV, grounding on the material gained in the interviews with significant industry players and stakeholders. Naturally there is an empirical bias towards the Swedish (LFV/GOT) data, as the interviews and case study were conducted mostly in Sweden, but seeing the global aspect of the air freight business in general, much of this discussion can be of interest to any other non-central-hub Cargo Airport management in Europe, as for generic direction on the business situation on the Nordic Air cargo area.

Reliability means that when researching the same phenomenon twice, the result remains the same. This is naturally always an area of concern when using qualitative interview methods. In the case of our interviews, the interviewees did not know the detailed questions in advance. One could wonder if the outcome would be more reliable if the interviewees did know the questions in advance and therefore could have prepared their answers. However, we believe that as the study of assessing the future visions and strategies, the data that can be collected without preparation possibly brings up the most important and unexpected, company specific ideas.

Also, in order to ensure maximum reliability, interviews were as much as possible aimed to be conducted in similar settings, face-to-face meetings instead of via telephone. However, due to tight schedules of some of our interviewees, additional flexibility in timing for the interviews was required and some interviewees were geographically located further away. For this reason some of the interviews were finally obliged to be conducted by phone.

Questions asked during these interviews were based on the method of analysis meaning that they were asked from interviewees following the same introduction, categories and questionnaire structure in order to collect as much opinions on same issues and same subject categories as defined in advance, also enabling and facilitating the comparison analysis of the interview outcome.

Interviews were aimed to key persons who were required to have a covering view and decision power over the company's (air) freight business. In general, this meant meeting with Logistics or Air Freight responsible manager or with the director level person with close visibility on company strategy. Please find the complete list of interviewees listed at the end of the study, Appendix x.

Even though the research topic initiates from the real and current business challenges of LFV, the researchers used the freedom of research in order to be unbiased in empirical material collection and in order to create a good and trust based dialogue during the interviews, and to produce unbiased analysis.

5. Industry overview – Air cargo industry Nordic

Chapter 5 specifies the classification of air cargo services and gives an insight for the business directions and changes of the existing Nordic air cargo industry during the period of 2006-beginning of 2009.

The organization of LFV and the Gothenburg Landvetter Airport (later on abbreviated by Landvetter's IATA-code GOT) are analyzed in Chapter 8, explaining the specifics of state ownership, their strategy and marketing messages, customer base, services, organizational structure and the airport logistics systems. Chapter 9 provides Nordic Cargo Airport industry analysis assessing the current strategic competitive environment and rivalry based on five forces industry analysis.

Chapter 10 provides short version of empirical interview results as the base of future visions analysis based on conducted case study on LFV Gothenburg-Landvetter Airport (GOT) and their industry network.

Finally, Chapter 11 discusses study highlights and draws final conclusions on how the airport management and the key shareholders vision the future development. These conclusions are provided in sections identified during the pre-study phase, to help reader to understand extracted strategic business areas.

5.1 Classification of Air cargo Services

According to Air Transport Association (ATA), Air cargo includes commercial freight shipments transported in the belly hold on passenger planes (later in this paper referred as belly-pax) or on freighter aircraft (also called 'pure freighters' in domestic and international service).

The Airline Cargo Market is more often referred to as the traditional air cargo chain that consists of several consecutive participants who collectively are responsible for the transportation of goods by air. The 'integrated express market' exists for some thirty years now and consists of a small number of suppliers who offer fast door-to-door service model transport of mostly documents and parcels. These suppliers carry out all activities themselves, in some cases including air transport.

Definitions of air cargo and air freight vary depending on the source. In general, definitions are as follows: Air cargo: Any property (freight, mail, or express) carried or to be carried in an aircraft, other than carry-on, checked or excess baggage, or property carried, which is incidental to the carriage of the passengers (e.g. in flight

meals) or cargo (e.g. empty containers), (Boeing reference guide 2003). In this thesis the term ‘air cargo’ refers to the transportation of goods by air on a commercial basis.

Air freight: The term is often used interchangeable with ‘air cargo’. However, to be precise, term air freight generally refers to larger / heavy consignments, while the term air cargo also cover mail and express. (Zondag, W. 2006)

Apart from integrators, there are five kinds of airlines in the cargo business all over the world, which are pax-belly, combination, dedicated cargo, charter and ad-hoc (Andersson, N. 2000)

- **Pax-belly** offers cargo and passengers mixed service, where the available capacity after passenger related cargo is loaded will be used for cargo transport. Examples are most traditional passenger carrier airlines, such as Finnair, SAS or Lufthansa.
- **Dedicated or pure cargo (Freighter planes):** these are airlines that supply cargo service only and they offer scheduled services, examples are Cargo Lux, Asiana.
- **Combination Carriers:** these are airlines that offer pax-belly and dedicated services.
- **Charter operators (Charterers)** are flights may purchase the whole capacity of the aircraft, for shipment to utilize the entire capacity or buy the service for emergency shipments of any size. **Ad-hoc operators** are for special requirements of transport such as big shipment.

A charter airline, also sometimes referred to as **air taxi**, operates aircraft outside normal schedules, by a hiring arrangement with a particular customer. Most scheduled airline companies also operate charter flights but are not considered or classified as such.

An example from the Nordic region is the Finnish national carrier, Finnair (IATA code AY); Finnair’s Cargo operations are dependent on passenger traffic, as Finnair does not have dedicated cargo planes, e.g. pure freighters any longer. Most of all AY cargo is carried in passenger aircraft’s hold together with luggage, and therefore it is always so called ‘rest-capacity’. In addition to this, Finnair cargo has leased some cargo capacity from Cargo Lux.

Difference to pure freighter planes is the amount of belly-cargo that can be uplifted is dependent on number of passengers, the amount of baggage and the amount of fuel. Other procedural differences also exist; belly-cargo has a different routing and booking behavior – for example cargo goes always one way and it is not so flight or route sensitive as passengers are. Cargo booking behavior is also more erratic

compared to passengers' early reservation according to *Slanger & Kapteijns 2003, (81)*.

5.2 Nordic Market definition and characteristics

For the purposes of this study, investigated markets include Nordic Air cargo and Freight markets. By this we mean cargo transportation originating or destined from/to and within the Scandinavia (Sweden, Norway, Denmark) and including Finland, yet another Nordic geographical market area. Market leader in this area in terms of belly transport volumes is Scandinavian Airlines, SAS Cargo, followed by Finnair cargo Company. Island is in principal also included into this category but has not had significant cargo traffic so far, and is not included in CASS statistics.

International Airline Transport Association, IATA, has established CASS system for Air cargo Carriers enabling the remittance and settlement of Air waybills between Freight forwarders and Airlines in CASS Nordic (Denmark, Finland, Norway and Sweden). CASS listing can be considered as covering list of Airline carriers operating on the main Nordic market area (Appendix 5).

Despite the small size of their populations, the Nordic countries are industrially advanced. Since their domestic markets are limited, they have built up extensive foreign trade to underpin their economic growth. Foreign trade currently accounts for close on 60 per cent of the total GNP of the Nordic countries. The Nordic countries are each other's largest single trading partners. Around 25 per cent of what each country produces is sold to other Nordic countries. Industrial enterprises in the Nordic countries supply each other and often form consortia together for major projects in foreign countries. (*www.nordicfreight.org*). Western Europe as a whole accounts for 60—70 per cent of Nordic foreign trade. This was actually not changed by the referendum in which Norway decided to remain outside the EU. Norway continues to have ties with the EU through the EEA Agreement.

Compared with the rest of Europe, the Nordic countries have extensive long-haul goods transportation. In round figures, the transport sector accounts altogether for 4 per cent of GNP, 7 per cent of investment and 5 per cent of employment in the Nordic countries. The levelling off of goods transportation in recent years has its natural explanation in technical and economical developments. There has been a gradual increase in the degree of processing in industry. Manufacturing is increasingly economising on materials, while at the same time the value of goods is rising, most markedly in the electronics industry. The relative importance of products of low added value is declining. (*www.nordicfreight.org*).

An interesting fact is that the Nordic Air cargo volumes peaked in 1999, but after that even if big successful manufacturing businesses such as Ericsson and Nokia continued to grow, the product units were no longer produced in the Nordic area - the manufacturing industry in these countries is gradually sliding away to lower-cost production areas, such as to Asia, China. As a consequence, the future Nordic intra-economy can be expected to transform further as service-based.

Secondly, even if the aggregated transport and the transport value grows – the goods transported are getting smaller in size. This is so called miniaturization of electronics, phones, TV sets, and computer related components. Phenomenon is also nowadays known as “gadget integration”; a good example of this is today’s sophisticated mobile phone models, that also include a calculator, camera and computer – all gadgets in one device, and there is no longer need to transport many separate devices. Miniaturization/gadget integration has an impact in airport revenue, as today the air cargo is charged according to cargo weight.

5.3 Nordic Air Cargo Business

Industry and commerce to an increasingly greater degree understand to view logistics as a vital part of production chain: Transport, forwarding, storage and distribution, together called logistics, account for about 30 per cent of the value of production. Steadily rising added-value and increasing goods values demand a higher and higher quality of transport. The factor of time is becoming more important and the demands of freight customers for rapid and accurate transport information are increasing. This is especially true for industrially and technologically highly developed, high-service-level Nordic markets.

The implementation of the internal market, the enlargement of the European Union and the changes in Eastern Europe will lead to increased economic activity and, as a result, a substantial increase in goods transportation in Europe, believes Nordic logistics providers and freight forwarders (NSF). It is yet to be seen how much of this will be translated into business of air cargo transport.

Concerning the air transport, not so long ago the conventional wisdom in Europe was that the big central cargo hubs on the continent - Frankfurt, Amsterdam, Paris, Brussels and maybe Luxembourg - would see the most cargo growth. By most standards, peripheral European markets such as Scandinavia or Nordic area were best served by truck feeder services. Throughout the 1990s Stockholm saw more of their air cargo trucked to central Europe than flown on direct long haul flights.

5.4 Business growth of 2006-mid 2008

For Nordic airports, the trucking of goods to central European hubs to be loaded for further long-haul transport obviously means missed business opportunity problems as goods transit without coming through the Nordic cargo airport. In recent history, there was a noticeable change in trucking the goods from the Nordic area towards the central-European hub airports, and in 2006 the focus started promisingly to shift to Scandinavia. New freighter services were established including three-times-weekly 747-400 service to Copenhagen launched by Air China in September 2006, and a three-times-a-week MD-11 freighter from China Cargo Airlines in December 2008.

Meanwhile, in August 2006, Stockholm Arlanda airport in Sweden got twice-weekly 747-400-freighter service from Korean Air cargo on the routing Seoul-Wien-Stockholm, and similar service from Hong Kong-based Cathay Pacific in September, and yet twice-weekly 747-400 freighter flights from Korean Air in December 2008. To cap it all, Jade Cargo International, the joint venture between Lufthansa Cargo and Shenzhen Airlines, started twice-weekly service to the Swedish capital in March with 747-400 extended-range freighters. *Note:* Later on February 2009 JADE closed operations at Arlanda because of the generic decrease of cargo volumes due to the global economic crisis. (Discussion with B. Ragnebrink, LFV, followed by press release of Air Cargo News).

Influence area for these jumbo-jet actors on Stockholm's Arlanda is the whole Scandinavian area. The outbound cargo to Asia from Arlanda is mostly composed of telecom- and medical devices and the import flow to Stockholm is mostly textile, car parts and home electronics. (www.flygtorget.se)

Press Release from Arlanda Airport in September 2007 stated that more and more cargo was being flown non-stop from Stockholm to its final destination. As a consequence, the proportion of cargo first being hauled to some other hub in Europe before being loaded on an aircraft was decreasing. This was also seen reducing environmental impacts.

"If you fly from Amsterdam or Frankfurt to China on a great circle route, you almost fly over Stockholm, and 50 percent of our cargo was trucked south. So why not stop here and pick up the cargo at source?" said then B. Ragnebrink, Director of Business Development, LFV. (Convay, Peter: Driven to the edge.)

Having stated this, it shall be mentioned that even prior to financial crises hitting the world economy in 2008, there was already signs of too many carriers in the Scandinavian market; for example Cargo Lux year 2008 scrapped its weekly

Gothenburg 747-400 freighter to New York, citing overcapacity. Lufthansa withdrew its twice-weekly MD-11 freighter from Gothenburg to Nagoya, Japan, although it still flies three times a week to Osaka via the airport of Gothenburg Landvetter.

Lars Korup, Head of Cargo for Copenhagen airport, has stated that Stockholm has overdone it on the freighter front, and that the services will not be sustainable. Not surprisingly, he said, "Copenhagen is a better long-term bet for Asian freighter operators wishing to serve Scandinavian". What this statement well mirrors is that the competition for the limited cargo volumes in the Nordic market is tuff, and is not getting easier.

5.5 Depression period volumes of 2009

From the beginning 2009, air cargo volumes have been falling steeply in the Nordic area, and pretty much everywhere globally. February 2009 was the eighth consecutive month of decline in IATA cargo volumes, and over-all, the global IATA cargo volumes dropped 23.2 percent, y-o-y, after falling 22.6 percent in December, 2008.

Asia Pacific carriers, representing 43 percent of the market, led the cargo decline with a 28.1 percent fall. This was followed closely by the other major market players: European carriers, down 23.0 percent, and North American carriers, down 19.3 percent. All markets were down, even Middle East that dropped 6.1 percent, y-o-y, and still performed the best compared to other markets.

In March 2009 it became apparent that the decline in air freight has been stronger than forecasted in December 08. According to IATA Financial Report, March 2009, Cargo volumes in 2009 were now expected at -13 %, and passenger traffic -5,7 %. Airlines are reducing capacity and grounding planes. Economists forecast world GDP to shrink by 1.9% in 2009, which would mean the deepest recession since the 1930s.

Some of the latest airline industry forecasts are telling that 2010 looks earliest for recovery in the air freight industry, and it is likely to delay to 2011 for strong rebound. However, after that the industry seems pretty positive about returning back to the 2007-beginning 2008 levels rather rapidly.

The only significant positive growth in the Nordic area is seen in the Finnair's North Atlantic traffic where volumes grew by nine percent to 707 tonnes in February 09, and by 4.7 tonnes in January-February 09, to 1,031 tonnes, reflecting an increase in the frequency of flights to USA from Helsinki, Finland.

After a pause, Korean Air cargo's Boeing 747-400 freighter resumed its weekly service from Frankfurt via Luleå Kallax Airport in Northern Sweden to Seoul in March 24, 2009. First flight was actually on January 20, 2009, continuing till February 20, 2009, as a charter operation, after which flights were suspended pending the granting of traffic rights to pass through Russian and Chinese airspace.

-We had 60-65 tonnes of Norwegian seafood on the latest flight and we are confident that the Norwegian seafood market will live up to promises, says Lasse Wangen, DHL Danzas Quality Cargo.

-What will be crucial to the sustained success of the service will, however, be the realisation of the many promises and commitments by exporters of air cargo in Norway, Sweden, Finland and even Denmark. There has been much oral support to the project prior to the launch, but we still lack to see this translate into concrete bookings and firm agreements.

Shipments of Norwegian salmon are important, but to secure the profitability of the scheduled freighter service other cargo shipments are needed, says Mr Wangen. (newstodate.aero, March 26, 2009 – subscription required).

6. Nordic Air Cargo flows

Chapter 6 goes deeper into freight flows carried as air cargo in the Nordic area. The chapter presents volumes and gives highlights per country. The chapter wraps up by pointing out the clear aviation markets in Nordic area.

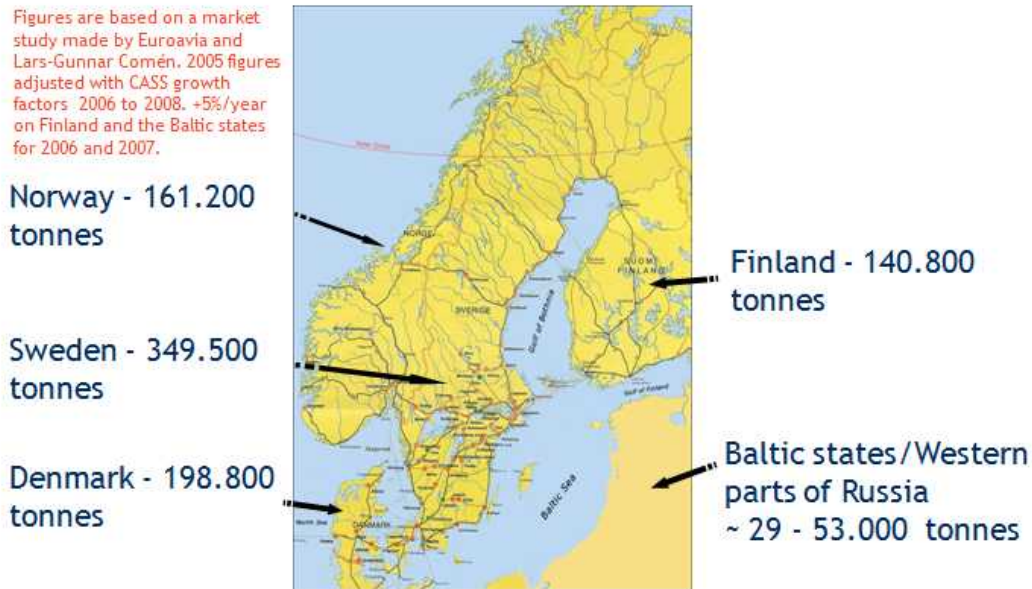


Illustration 6.1: Air cargo volumes in Nordic Region (Euravia study 2008).

Earlier mentioned IATA's CASS statistics have a limitation of recording outbound flows only. Comparing air freight volumes in the Nordic Markets in 2008 the volumes were the following (2007 figures placed in brackets for comparison):

Sweden 349 500 (375 000) tons, Denmark 198 800 (208 000) tons, Norway 161 200 (175 000) tons and Finland 140 800 (146 000) tons. This means that the total air freight of Nordic area according to this study is 850 300 tons (versus 904 000 tons in 2007).

According to Ragnebrink, in order to get a very rough estimation of total export and import volumes in the Nordic area, given CASS figures could be multiplied the total by two, as the Nordic air freight is rather well in balance.

As a comparison from the nearby region following figures can be extracted: Baltic States and Western parts of Russia 32 – 58 000 tons, which seems rather low. Note: These figures are based on a market study made by Euroavia, LG Comén. 2005 figures are adjusted with CASS growth factors for 2006 to 2007. +5%/year on Finland and the Baltic states for 2006 and 2007.

6.1 Sweden

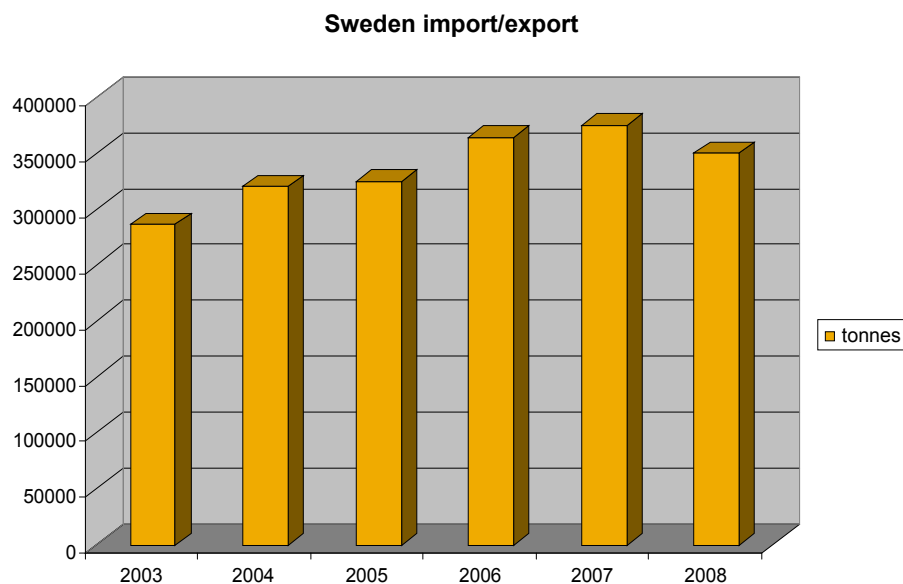


Figure 6.1.1: Sweden Import/Export

(Source: Euravia, L-G Comén. Added the CASS growth numbers of +12% for 2006 and 3% 2007).

According to LFV, the first half year in 2008 was pretty strong. In the summer the market started to stagnate, and it fell heavily October- December 2008 due to the global crisis. All in all the CASS export volume fell with -6,8% for the full year 2008.

According to *newstodate.aero*, in 2008, the 16 Swedish airports, including Stockholm Arlanda, Gothenburg Landvetter and Malmo Sturup Airport, all managed by LFV, “noted a decrease by only 0.6 percent in their total combined cargo volumes at 388,544 tonnes”.

6.2 Denmark

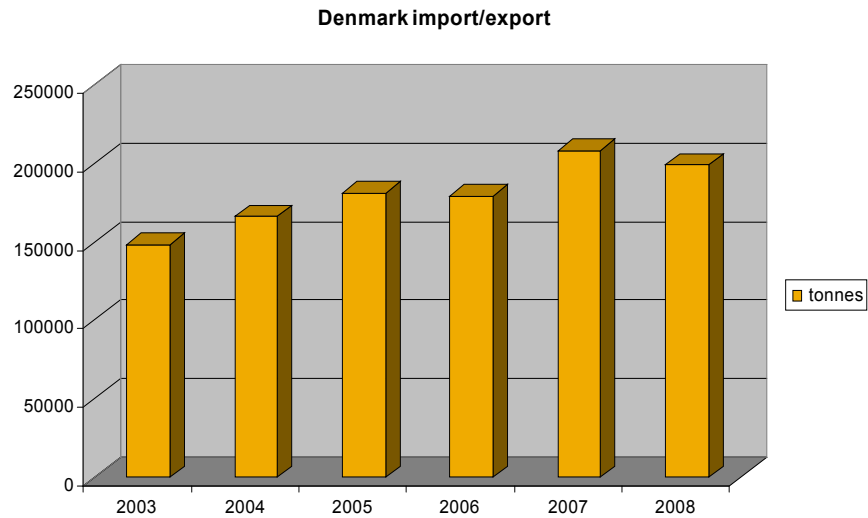


Figure 6.1.2: Denmark Import/Export

(Source: Euravia, L-G Comén. Added the CASS growth numbers of +12% for 2006 and 3% 2007).

Highlights:

- ✓ SAS Cargo, with its hub in Copenhagen (CPH), drives the CPH volumes
- ✓ Figures includes significant numbers of Swedish/Norwegian shipments. Local Denmark market fairly small. Note that 2008 70% of the CPH tonnage was transfer cargo.
- ✓ The Market is estimated to grow, longterm, with +4,6% the coming years according to a market study (Airline study April 2008)

6.3 Norway

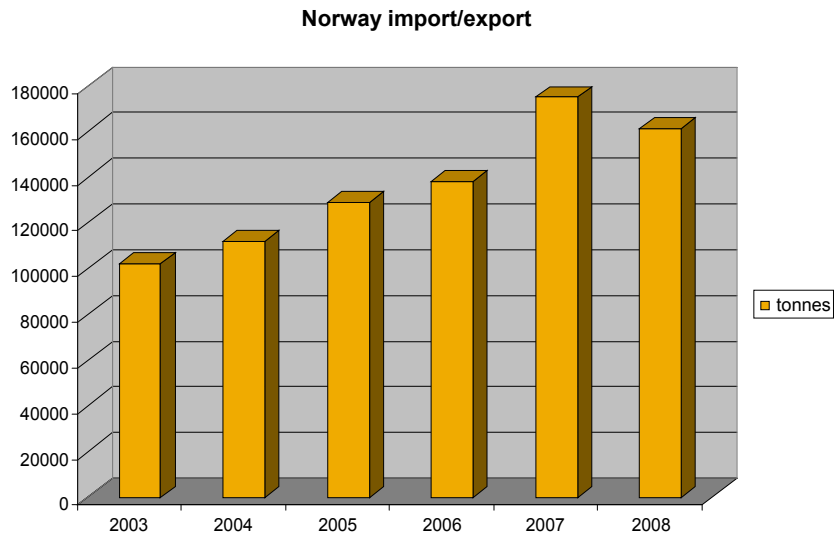


Figure 6.1.3: Norway Import/Export

(Source: Euravia, L-G Comén. Added the CASS growth numbers of +12% for 2006 and 3% 2007).

Highlights:

- ✓ The Market is estimated to grow, longterm, with +4,1% the coming years according to a market study Airline study April 2008)
- ✓ China is the largest export market with roughly 26% of the total CASS volume.
- ✓ Japan has historically been the largest salmon market, but it has been overtaken 2007 by China
- ✓ Salmon is the dominating export commodity

6.4 Finland

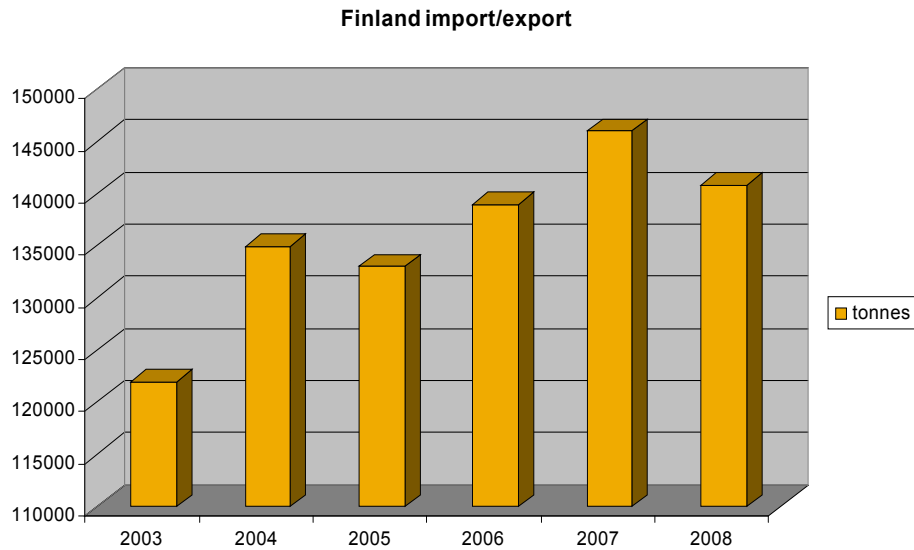


Figure 6.1.4: Finland Import/Export

(Source: Euravia, L-G Comén. Added the CASS growth numbers of +12% for 2006 and 3% 2007).

Highlights:

- ✓ The Market is estimated to grow, longterm, with +5,2% the coming years according to a market study (Airline study April 2008)
- ✓ China and North America are by far the largest export regions out of Finland with a share of 29% and 22% respectively.
- ✓ Nokia and telecommunication equipment is the dominating export commodity

6.5 Evolution per country: 2007/08

As the year 2009 recent months' cargo performance has not been very typical to the industry, the following provides a flash-review to past years' competitive market situation, as per statistics that are accessible.

According to Newstodate.aero, in 2007, the four capital airports in the Nordic region handled a total of 813,589 tonnes of air cargo. Outbound in Nordic according to study of Comen, (EurAvia '08) totals to 850 300 tons. In terms of size of cargo handling airports in Nordic area, the Copenhagen airport in Denmark is still currently the

biggest but also Stockholm Arlanda is booming; Arlanda took the lead 2008 in volumes.

The beginning of 2008 IATA export cargo performance in the Nordic markets showed some differences in growth figures, with the Danish market emerging as the front-runner and taking the lead. Topping the list was Copenhagen Airport in Denmark, who handled 395,506 tonnes but recorded the region's lowest growth at 4.1 percent, y-o-y. Second was Stockholm Arlanda, Sweden, with 169,458 tonnes, generating the region's highest growth rate at 18.6 percent, y-o-y. Third was Helsinki Vantaa, Finland, with 151,314 tonnes, raising 4.3 percent, y-o-y. Finally Oslo Gardermoen, Norway, with 97,311 tonnes of air cargo, was up 7.9 percent, y-o-y. (15.05.2008, newstodate.aero – subscription required)

Looking into a comparison period, the Danish market that grew by 15.8 percent in 2007 continued a significant growth trend, increasing 10-11 percent, y-o-y, in volumes during January-March, 2008. The Norwegian market grew by 27.4 percent in 2007, but shrank 3-5 percent, y-o-y, during year 2008 Q1. The Swedish market changed little in 2007, growing only by 2.8 percent in volumes, and decreased two percent, y-o-y, in volumes during year 2008 first quarter. The Finnish market was not fully reported by IATA during the full year 2007, but according to IATA data, declined by some two percent, y-o-y, during year 2008 first quarter. (IATA and 13.05.2008, newstodate.aero).

The Scandinavian main home-base carrier, SAS had tough times during 2007. "The air cargo industry is experiencing some big changes these years with consolidation among the customers and over capacity on key markets. SAS Cargo is going through a transition process in order to adapt to these changes. This has affected the result for 2007, which is not at a satisfactory level" said President and CEO of SAS Cargo Group A/S, Kenneth Marx. "Looking back at the positive development SAS Cargo experienced in the years up to 2007, last year was a challenging year for the company.

The new market situation resulted in a changed strategy for SAS Cargo and the company made a number of structural changes in order to adjust to the changed market conditions.

6.6 Clear aviation markets

The players in the Nordic air-freight market are the (traditional) airlines carrying cargo in the belly of the air craft, and pure dedicated freighter airlines, the integrated express companies (also increasingly called as the integrators) and other freight forwarders, which may be either large-scale forwarders with separate flying

operations, or specialized air forwarders. According to this definition, about 4 000 employees in 200 companies work in the Nordic air freight sector.

Most of the Nordic outbound volumes are composed of the international and intercontinental (long-haul) traffic. The value of goods is on average about one-hundred times larger than the average goods value for surface goods. The predominant category of goods consists of engineering and high-technology products. Another large group is perishables, which includes large amounts of fresh salmon originating from Norway, being flown from fish farmers in the North of Norway to the markets in the Far East. As the destination for fish and sea food, the Japanese markets recently surpassed by the Chinese markets. Within the Nordic countries a lot of mail and newspapers go by air.

Within the belly cargo, besides the Scandinavian Airlines, SAS, and Finnish national airlines Finnair, (AY), the one which is most involved and successful in all the Nordic countries is German Lufthansa LH. Dutch (KLM –who has merged with Air France (AF), and in a process of merging with Martin Air), and British Airways (BA) are also prominent in air freight sector.

Air-freight forwarders or integrators, including large international express companies (such as DHL) work mainly in their own sectors of the relatively clearly defined air-freight market. The integrated companies are to a large extent constrained by their standardized production systems, whereas the forwarders work more flexibly and are market-driven. It is not uncommon for air forwarders to offer their "own" express products, which have, in fact, been purchased from an integrated operator with whom the forwarder has a cooperation agreement.

Based on our conducted interviews, fifty percent of the Nordic air freight is currently still believed to be trucked via hubs on the European continent which are then linked to international routes. The latest development lead to the situation that Nordic-European freight is no longer send by air, but almost all Nordic-European cargo is transported by trucks, some also by rail.

Positive development of transferring the traffic to direct flight deliveries directly from the Nordic airports and mostly from Sweden started promisingly 2006 forwards, but reverted again due to economic downturn in 2008-2009 according to Nordic Cargo industry news, and statements in conducted interviews.

7. Airport and Airport Management

Looking in to an airport as a specific micro-environment, Chapter 7 describes airport major facilities, specifies the function of airport management, and presents global classification for airport hubs.

7.1 Airport Major Facilities

Airport is a very specific kind of functional unit and a micro-environment; it is like a spider web of services one supporting another. An Airport does not live by itself – it is a service provider for airlines and for goods importers and exporters. An airport also has noticeable amount of money invested in the infrastructure including runways, buildings, terminals and IT-systems.

Airport Air Side structures include: runway, taxiway, apron, holding area, air traffic control tower, nav aids, lighting systems, support facilities: rescue and firefighting services, aircraft maintenance, fuel pumping systems, security fences and control gates. Airport terminal structures include: passenger terminal and apron, cargo terminal and apron.

Airport Land Side structures include: access roads, long-term and short-term parking, rail and public transportation access and fuel farm. Support facilities include: airport maintenance base, flight kitchens, sewage treatment and pumping stations, electrical subsystem, hotel and business areas, and industrial uses. (Civil Aviation Department Hong Kong, 2008)

7.2 Airport Management

The public ownership of an airport, either on public or national level used to be the norm. However, the way how the owners choose to operate or manage the airport today can vary quite significantly and is developing into a serious business management activity. “Business of owning and managing the Airport, once considered the safe heaven, today is challenging even the best managers” (Olivier Wyman Group. 2008).

Airport management key activities today are overall Steering of Airport activity and contracts, Strategic planning, Routing development and Airline relationship management and Business Development, and the Air Traffic Control. Naturally

airport management tasks vary in different individual airports due to the environmental, social, political and economical differences. However, basic functions of airport management and operations are almost the same among airports, which typically include following aspects:

- Determine initial, and monitor ongoing air service trends on a local, regional, and national basis
- Develop and implement air service development activities to attract a new air carriers or to expand existing services
- Maintain a safe environment for aircrafts and for airport users
- As airport security coordinator, maintain and negotiate all airport security measures implemented or directed by the European Union.
- Participate, supervise, and facilitate discussions on short and long term airport planning issues and projects
- Administration and enforcement of airport area tenant leases and agreements
- Actively solicit new tenants and the expansion of existing tenants
- Work with citizens concerned with noise
- Operating and Capital budget development and oversight
- Ongoing facility safety inspections
- Seek new approaches to revenue growth and funding sources, and revise lease agreements to improve revenues to the airport enterprise fund.
- Establish and maintain working relationships with the aviation related organizations and associations, labor unions, local airports, local government and local businesses (Chico Municipal Airport, 2003).

7.3 Hub Airport Classification

The technical changes in aircraft manufacturing area have greatly improved the performance of airplanes in terms of range and capacity. At the same time, after

entering into the Information Era, more and more high-value, high-tech but short product-life-cycle electronic products were developed, which increased the demand of international air freight service. On the other hand, due to cheaper and cheaper air tickets, the volume of air passengers grew exponentially. Air travel has become the first choice of long haul international trip. Consequently, the hub-spoke system is applied when the airlines design their networks.

After 1990s, the air transport was developing with fantastic annual growth, and the international hub airports more than act as the traffic hub or community infrastructure. Their function, as an economic engine, extends to boost economic development. Furthermore, the role and function as the economic engine become more and more outstanding along with the development of society, economy and scientific technology. According to their role and function, hub airports are divided into four categories: (Peiying Li, 2007)

- **International hubs** mainly provide connection services with international airlines.
- **International/Domestic gate hubs** mainly provide connection services between domestic and international airlines.
- **Domestic inland hubs** mainly provide connection services of domestic transfer flights.
- **Regional hubs** mainly provide connection services between domestic trunk and branch flights.

Hubs derived from hub-and-spoke system of Europe and the US. It gained great success due to its high operational efficiency, and developed globally with the trend of deregulation and “Open Sky”-policy.

After 20-years of development, hubs began to face new environment and meet new reform, including the rise of free economic movement, the development of low-cost airlines, the innovation of aircraft manufacture technology, and the change of customers’ demand. All the factors have interacted and eventually driven the new trend of international hubs development.

8. LFV – “Group Swedish Airports”

The organization of LFV and the Gothenburg Landvetter Airport, abbreviated by Landvetter’s IATA-code GOT, are analyzed in Chapter 8, explaining the specifics of state ownership, LFV strategy and marketing messages, customer base, services, organizational structure and the airport logistics systems.

The LFV Group consists of the Swedish state owned enterprise LFV (abbreviation of the Swedish word Luftfartsverket) and its subsidiaries and associate companies. LFV currently owns and operates 16 airports in Sweden. In March 2009, 6 airports were announced to be sold in the near future. LFV is at the present time also responsible for Air Navigation services in Sweden. LFV (Luftfartsverket) today officially is called in English as “LFV Group Swedish Airports and Air Navigation Services”. LFV has 4 000 employees and the turnover is roughly 600 million SEK.

“The Swedish government’s designation after much dispute of 10 airports as being of strategic importance, due to receive continued state support, has left another six airports in the cold.

The six airports are Angelholm, Jonkoping, Karlstad, Sundsvall, Ornskoldsvik and Skellefteaa, and talks will now start to decide on their future ownership situations. The “non-strategic” airports may seek a future as owned by either communes or private investors.

In the case of Jonkoping the future has already been decided upon as Jonkoping commune and LFV have agreed to pass airport ownership to the commune by or even before December 1, 2009.

-We are very enthusiastic about the future that will allow us to compete fully even with LFV airports, says Hazze Sandstrom, Jonkoping Airport Manager.

-We are already in talks with several carriers and will further boost our marketing efforts to attract both low-cost, regular and cargo traffic.

-We benefit from being right in the middle of southern Sweden with no immediate close competitors, and this will prove a valuable asset in our efforts, says Mr Sandstrom.” Mars 23, 2009 (newstodat.aero- subscription required):

LFV is also being steadily separated from the aviation author functions, and in 2008 LFV underwent a drastic change swapping its official name from ‘Luftfartsverket’ to LFV. Along this change LFV is steadily moving from the previously state owned-image towards the direction of stronger stressed, clearer defined business perspectives. Some signs of these are e.g. ongoing cost cutting and benchmark – programs within the organization.

However, LFV is still a state-owned organization, albeit this industry structure can possibly be questioned in the future; same remarks point to the direction that the structure may yet be expected to further transform, for example with regards to cooperation with Air Navigation Services and Airport Management business. State ownership gives very specific characteristics such as return to state - requirement (8 %), tight legal regulations and specific generic responsibility for ‘the common benefit for the industry’.

One of the continuing controversies in an organization is whether activities should be grouped close to top management, or dispersed throughout the divisions of the larger firms (or global organization) (See e.g. Ballou, Ronal. H, Business Logistics/Supply Chain Management p. 705). One current problem that LFV Cargo also seems to face is a so-called “Profiling difficulty”, an organizational positioning item leading to some marketing issues: What actually is the identity of the new LFV? Characteristics of traditional, state-owned LFV are being weighted against the newborn LFV with its new strategic marketing concepts such as the ‘Swedish Cargo Direct’.

Airport privatization is a well posed question, but the current status of LFV is to continue being a state owned corporation. In fact, this is not uncommon in the Nordic countries, some examples are state owned Nordic Sea Ports and spiritshops, e.g. System Bolaget (in Sweden), and ALKO (in Finland).

8.1 Recent history as a part of the Civil Aviation Authority

From the 1 of January 2005, the CAA’s, Civil Aviation Authority’s two governmental related branches, Air transport inspection and Air transport and society, were separated from the organization. These two branches now make up a completely new governmental agency called the Swedish Aviation Authority (SAA). This agency is in charge of licenses and training procedures, leaving the remaining CAA with the business related tasks. (www.lfv.se)

The Swedish Civil Aviation Authority operates under the supervision of the Swedish government. The organization was formed in January 2005 and the authority’s main focus is on regulation and inspections within Swedish aviation. In addition to this, they supervise, analyze and develop the civil aviation sector as well as provide expertise in issues including physical planning, the environment, emergency planning and contingency planning.

As the world becomes more globally integrated, and air transport is an international mode of transport in character, rules and regulation are in many cases subject to international rules and agreements. Due to this, a majority of rules that affect Swedish

civil aviation has its origin in international agreements. As an outcome of this, the Swedish Aviation Authority acts both on a national level as well as on the international level. In terms of national level, their focus is to enforce these rules and regulations that have been agreed upon on an international level. On the international level, the aviation authority is trying to have an influence on new rules and regulations, making sure these are in the best interest for the Swedish aviation and air transport industry.

The SAA authority is situated in Norrköping, Sweden along with regional branches around the country. Currently, the authority has 230 staff members, who work with various issues regarding air transports. (www.luftfartsstyrelsen.se) First of January 2009 'Luftfartstyrelsen' SAA became part of a new state organization called Transportstyrelsen, grouping all the other transport mode administrations and it is located in Norrköping.

8.2 Specifics of State Ownership

The state of Sweden gives directives to LFV: LFV shall contribute to the Transport Policy objectives for air travel in an economically efficient and profitable manner by operating cost efficient, safe and well managed airports and air navigation services.

An airport, as well as all other governmentally owned business activities has overall goals that are composed of more than revenues and economical results. The goals for the Swedish transport industry can be found in the Swedish Transport Policy. These goals are not quantified, but it provides a foundation for other laws such as taxes, environmental fees etc. Besides the Transport Policy there are goals that are more or less common for all governmental owned activities, they can be divided into:

- Accessibility, e.g. the airport should be there even if it would not be economically justified. To serve the community and the local industries.
- Influencing citizen behavior, e.g. environmental fees on domestic airline tickets or car fuel will increase the will to travel by train instead, as the train is seen as more environmentally friendly.
- Attract people or/and companies to a region. For example by building an airport in a less populated area that has started to grow moderately in order to increase the will for a specific company to go on with investments and development in that area. To provide an infrastructure that is not beneficial in itself but provides opportunities for companies in the region to prosper.

- Get access to resources, governmental support, to make investments or to cover other extraordinary costs. (Stensson, S. 2002)

An Example from China

Civil Aviation Administration of China (CAAC) is an integrated organization who governs the Chinese aviation industry. As a government owned profitable organization, CAAC currently has more than 350,000 employees including 12,840 certificated pilots. CAAC owns 24 airlines in China and 982 of all models of aircrafts among which 937 are passenger crafts and 45 are cargo crafts in service. Additionally CAAC controls five higher educational schools and two R&D Institutes who own 140 teaching and experimental airplanes. All 147 Chinese civil airports (excluding airports in Hong Kong, Macao and Taiwan) are under control of CAAC. Beijing Capital Airport, Shanghai Pudong Airport and Guangzhou Baiyun Airport are all ranked in the world top 50 airports in terms of passenger volume in 2007. (www.caac.gov.cn)

8.3 LFV Marketing Strategy and Messages

‘LFV mission is to generate added value for our customers and promote air travel by operating cost effective, safe and well managed airports and air navigation services. Our vision is that our customers shall single out LFV’s airports and air navigation services as a good example when it comes to cost effectiveness, safety and functionality.’

The overall LFV Group’s described strategy, ‘challenges’ do not specify strategy for LFV Cargo development. According to Annual Report 2008, The LFV Group’s main aims are:

- To develop best customer value in the Nordic Region
- Introduce cost advantages within en-route through international cooperation
- Maintain sufficient air traffic controller resources
- Fulfil our environmental strategy
- Strengthen leadership within the LFV Group

LFV Cargo has established a long term marketing strategy programme labelled ‘Swedish Cargo Direct’. Swedish Cargo Direct is described as ‘a function within The LFV Group that can help you (as the customer) to understand and establish yourself on the Swedish air cargo market.’

Marketing services include providing statistics, sharing market knowledge, finding customers and suppliers and helping with airport related issues. The Swedish Cargo

Direct is presented as a ‘One-Stop-Shop’, covering all most important Swedish airports under the same umbrella brand, when the airline client wants to fly on an airport in Sweden.

A Smarter Access to Scandinavia



The key marketing messages of Swedish Cargo Direct are looking the markets from the global perspective, promoting aspects such as:

- Smarter Access to Scandinavia
- “Free to expand” (to Northern Europe)”
- Access to high-tech region

8.4 Customers and Service

LFV Cargo main target are airlines. Other clients are shippers and importing and exporting companies, integrators and other forwarders. During the past year 2008, LFV Air charter service became more and more intercontinental, with new services to destination Asia. According to Ragnebrink, LFV Cargo gained many new contracts, before the economic crises, including Cathay Pacific, with home base Hong Kong, China Airlines (to Stockholm-Arlanda) and Korean Airlines (routing to Luleå).

According to LFV Annual Report, during 2008 LFV carried out extensive efforts to ensure that these new carriers are given the opportunity to generate the highest possible cargo volume at the airport. One sign that the new carriers are making a long-term investment is that during the year, both Cathay Pacific and Korean Air Cargo chose to establish their own offices at the airport. In 2008 Stockholm-Arlanda was ranked as one of the best air cargo airports in Europe by the respected trade publication *Air Cargo World* (see Appendix 6).

Biggest shippers, exporting clients in GOT-Landvetter area are manufacturing companies such as SKF, Ericsson and Volvo. Biggest importing companies are garment and textile companies such as KappAhl, Ellos, Lindex, H&M and Gina Tricot.

8.4.1 Routing development from GOT Landvetter

In terms of weekly intercontinental wide-body operations, GOT Landvetter Airport is one of the leading airports in Scandinavia. Weekly operations are flown by Lufthansa, twice a week to Asia by Asiana. The carrier Emirates is expected to increase frequency to three times a week (LFV, Weihart and Andersson). Destinations served are Dubai, Hong Kong, New York and Osaka. Charter planes operate occasionally for special freight, in general with 747 aircraft.

8.4.2 Ground Handling Agents

DHL and TNT Express have their own activity localized at the Landvetter Airport and they also take care of their own ground handling. Handling company Spirit takes care of the freight for the following carriers: Air Finland, Austrian Airlines, Britannia, City Airlines, Emirates, Finnair, Iran Air, KLM, Lufthansa, Malev, My Travel Airlines, Novair, Polar, SAS Cargo, Swiss World Cargo, Singapore Airlines, SN Brussels Airlines and Wideroe. Japan Airlines' ground handling is taken care by another company called 'Godshantering Landvetter AB' (GLA, which also acts as a

warehouse facility). Spirit is a member of the IGHC (IATA Ground Handling Council).

According to statistics, out of the total amount of air freight which is handled at the GOT-Landvetter Airport yearly, about 94 % is handled via Spirit and GLA and the remaining 6 % via the integrators TNT and DHL Express. This means that the biggest goods flow goes via Spirit and GLA. (Wedin ,S. Rapport 2006).

8.4.3 Forwarders

There are many forwarders acting at the GOT-Landvetter Airport. Both clients and carriers have often contact with various forwarders – though 80-20-rule also here is true, meaning that some few forwarders are responsible for the biggest volumes. On Landvetter these are TNT Freight Management and DHL Global Forwarding (Wedin,S, Rapport 2006). These two are the biggest and dominating forwarders. Amongst other significant forwarders UPS Supply Chain Solutions and Schenker can be mentioned.

8.4.3 Forwarders' Distributors – Trucking Companies

Distribution means delivery of goods to the business customer, and this includes many players. In comparison with goods weight, the biggest actors are the 'Flygbilar' and 'Idealtransporter' and 'GLA'. Interesting though, that in comparison with the *number* of deliveries TNT express and DHL express have more shipments. There is also remarkable number of transport between the actors within the airport.

8.5 LFV Cargo Services

Main LFV services besides the Air Navigation Services are the Airport Management and Operations, and Routing development. Within the concept of Swedish Cargo Direct, LFV recognizes that they have valuable industry knowledge and broad contact network within the Swedish air cargo Market. Services targeted to airlines include statistics, market knowledge, helping to find target clients, helping with airport related issues and finding appropriate suppliers in the region (business facilitation).

Other LFV promoted airport services include: Briefing, Aircraft maintenance by FLS Aerospace and SAS; Aircraft fuelling by Gothenburg Fueling Company; and Catering by Gate Gourmet , Klarago AB and Top Flight.

Terminal agents are employed by the airlines to help them with baggage handling, check-in, boarding and more. The following 'pure terminal handling agents' operate

at Göteborg-Landvetter Airport (As these are related to passenger transport, they are left out of the scope for this study) : Menzes, GSL and Nordic Aero, main services including the Arrival service, Passenger service and Traffic office.

In general, **quality service requirements from clients** have increased and becoming more defined. World Air Cargo monitors annually the service performance and classification of airlines and airports (see Appendix 3: Results of World's Air cargo Excellence Survey (Appendix 6).

One recently conducted study in Finland was based on Finnair Case (Matikainen, S, 2008). It interviews three biggest AY air freight clients (forwarders), who are all international, with destinations to Far East, North America, Far East, Singapore, Bangkok, Hong Kong, and to main China. In this study it was found out that the forwarding companies consider themselves as partners to the airline. Also, according to this study, the forwarding customers value most: 1) general reliability, 2) fluent terminal processes and 3) electronic communication.

8.6 LfV Organizational structure

The LfV Group organisation 1 January 2009

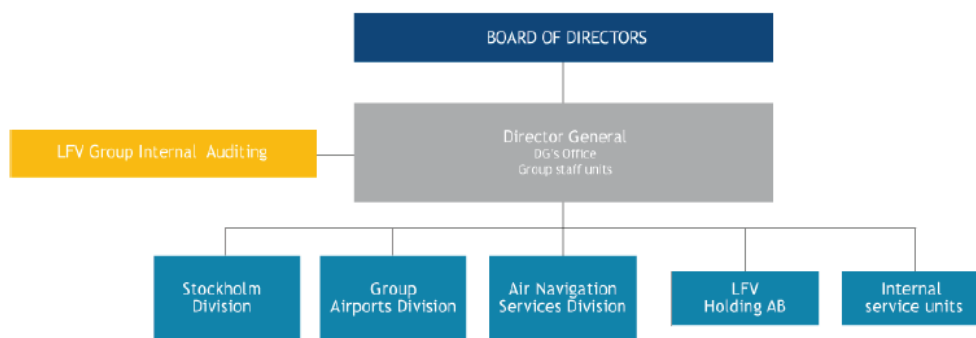


Illustration 8.6.1: LfV organizational structure. (LfV Annual Report 2008).

LfV Cargo is a minor part of the organization, belonging to Group Airports Division. The Cargo organization has been struggling with structural changes, and it is still living at the moment. One question is the regional versus centralized structure: According to people working with LfV Cargo, visibility to airline clients suffers from

time to time due to region versus central management issues, as the structure is not clear. LFV organization currently has no management and marketing responsables focusing purely on cargo business development.

8.7 Gothenburg-Landvetter (GOT) Airport-Logistics systems

Gothenburg Landvetter Airport is not big in size in European size, but it is the second largest airport in Sweden. It is located about 30 km outside of Gothenburg city. Every year, the airport serves more than 4 million passengers. The catchment area, which is the area from where people are to choose Landvetter as their primary airport, reaches about 250 kilometres in each direction. Within this area live about two million people.

Gothenburg Landvetter is exceptionally well suited for air cargo operations because of its ideal, central location in Scandinavia and because it is a regional, non-congested airport with no slot restrictions and with adequate runway length for long haul, wide body operations. The location of the airport offer very good surface access with only some 4-6 hours road transport from Scandinavian Capital regions (Logistic Hub Scandinavia, p.4).

Some key figures of GOT:

Latitude/ Longitude: 57°39'46"N / 12°16'47"E

Length of Runway: 3300m

Altitude of Runway: 154m

Width of Runway: 45m

Available Parking Places: 7300 vehicles

Access to Public Transport: the airport bus operates a regular service to the Nils Ericson Terminals (main bus and train station Gothenburg) and the city centre of Gothenburg. The airport is near the main national road 40, near exit 77. (Airport codes UK)

The general layout of Landvetter Airport and the layout of the buildings and the logistics structures setup which are part of Gothenburg-Landvetter Airport, are illustrated in Appendix 11, (source: LFV GOT Airport, Andersson J.). Details of the numbered facilities are:

- 1: Runway
- 2: Taxiway
- 3: Airport Apron
- 4: Passenger Terminal, International Part
- 5: Passenger Terminal, Domestic Part and Airport Administration Offices
- 6: Cargo Terminal
- 7: Hangar

- 8: TNT and DHL cargo Terminal
- 9: Custom Immigration
- 10: Maintenance Building
- 11: Hotel
- 12: Environmental Station
- 13: Heating Center
- 14: Parking Place
- 15: Multi-storey Garage

According to LFV Annual Report 2008, during the year, construction began on another cargo terminal at Stockholm-Arlanda. The terminal will be leased by the Dutch-based logistics company A.S.P., which will fly an additional 25,000 tons of cargo from the new terminal. The airport's initiative also has a positive environmental aspect, since it is flying out cargo that would otherwise have been hauled by lorry to airports on the European Continent and that would then have flown back over Sweden on its way to Asia.

At Göteborg Landvetter Airport the express and mail company TNT inaugurated new terminal during 2008. In Jönköping, TNT meanwhile established an air hub for express cargo that will be transported onward to Sweden, Norway, Denmark and Finland.

According to some whispers, in 2013 there are plans for Landvetter to open its train connection with Gothenburg city and other cities. This new connection would increase the airport's catchment area, which would indirectly have a positive impact on the number of passengers at Landvetter airport. In addition, this new connection would also decrease the time it takes to reach the airport. If we compare to the new train connection at Stockholm-Arlanda airport, the outcome is that the train has decreased the time it takes to reach the airport by around 10 minutes. This fact increases the aviations competitiveness with other modes of transport. Even if we can only speculate about what the outcome will be at Gothenburg-Landvetter airport, it is likely that at least the number of passengers will increase when the train connection is established. Whether this would enable cargo transport by rail, is yet to be seen.

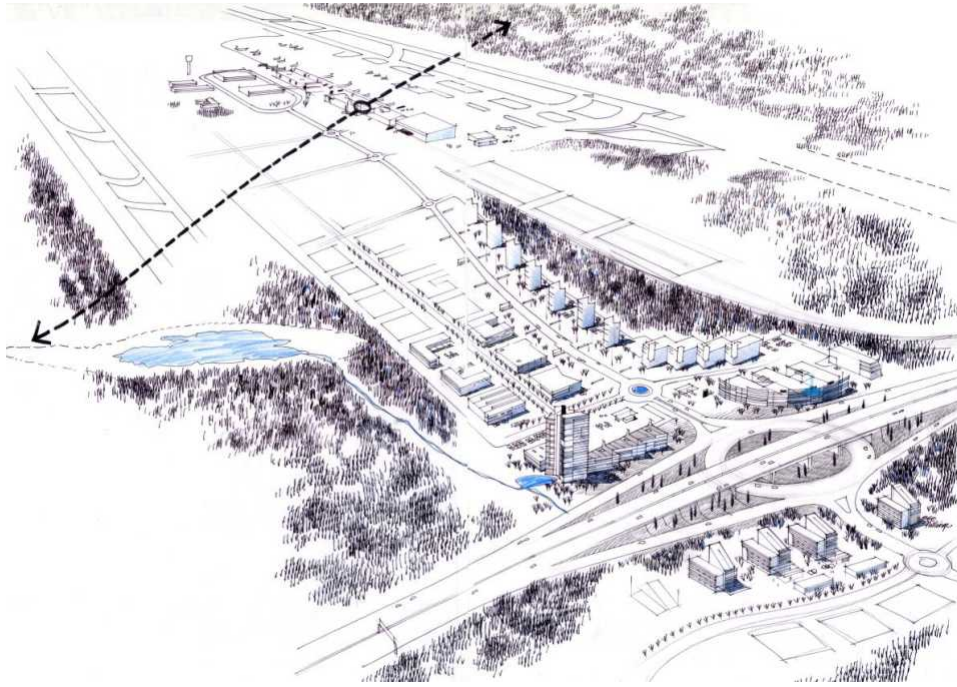


Illustration 8.7.1: Drafted Vision of GOT Landvetter Airport City –concept (Source: LFV GOT Airport, Andersson, J. 2009).

9. Nordic Cargo Airport Analysis

Chapter 9 provides first Nordic Cargo Airport industry level analysis assessing the current strategic competitive environment based on Porter 5-forces industry analysis. Secondly, the chapter addresses identification of Stakeholders at the company level.

According to Porter, there are five key forces which determine industry attractiveness. In addition to maybe most obvious competitive rivalry occurring within the industry, these forces divide into those which provide more competition: to entrants and substitutes, and those which in essence portray the dynamics of the supply chain for the industry: suppliers and buyers (The Oxford Handbook of Strategy, 2003). The following Cargo Airport industry analysis is based upon this framework, and aims to assess the current industry rivalry. The future industry rivalry scenarios are presented in Analysis and Conclusions of the study.

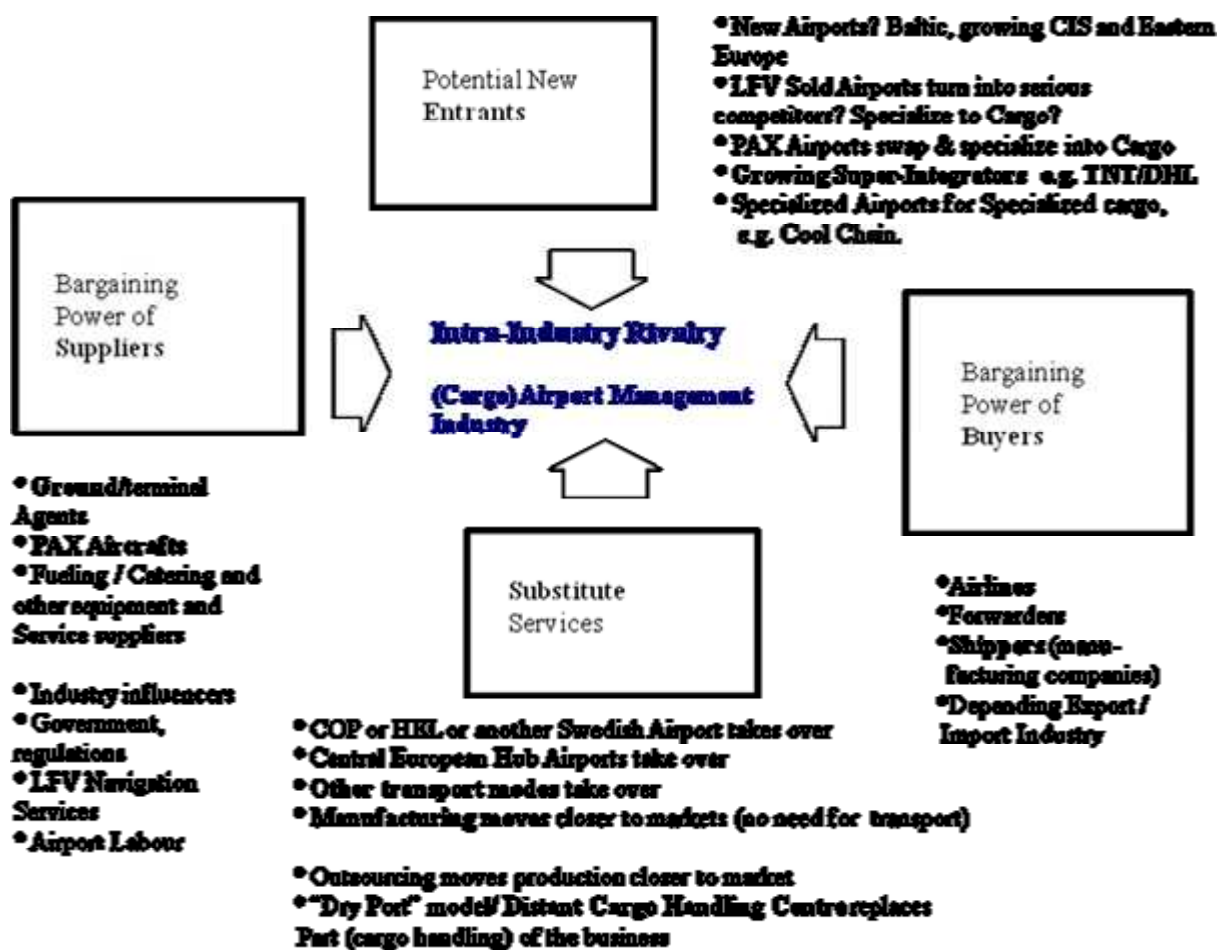


Illustration 9.1.1: Five Forces Analysis. (Authors' work).

9.1. Five forces Industry Analysis

9.1.1 Rivalry

Previous Nordic Air Freight –specific chapters of this study are dedicated in investigating the industry rivalry within the Nordic area in depth. Market structure in the air carriers as well as in the airport management is very concentrated. In a summary, from Airport Management perspective, the Nordic capital Airports (Copenhagen, Helsinki-Vantaa and other Swedish Airports such as Stockholm Arlanda and Malmö), main integrators’ own terminals, and other transport modes can be currently identified as the main rivalry for GOT Airport.

Air freight forwarding, dealing with the Airlines, is pretty well in the hands of few powerful integrators or forwarders some of them owning own fleet and steering their own transport operations. Attractiveness of Economies of Scale has over the past years caused many mergers and acquisitions between these players and might yet attract few of the integrators to merge into “Super integrators”. Expected industry rivalry in the future will be further addressed in the Vision Analysis and Conclusions – part of the study.

9.1.2 Buyer power

Air freight Business and Cargo airports are dependent on B2B trade. Airline using Airport services pays various fees to the airport. In air freight, long term negotiations (long sales cycles) are common before securing the Airline routing to a specific Airport. Long, established client relationships have been very typical in the airline industry in general over the past decade – once the airport gains a routing via negotiated airline, it can be considered rather established. However, in the Nordic market the during the few past years there has been examples of Airports’ rapidly establishing routings, as also few examples of Airlines leaving the Airport due to too limited Air freight volumes in the market – e.g. Japan Air and Lux Air pulled out their operations shortly after starting from Sweden 2007. In the Airport Industry, the frame of charges is based on regulations, and e.g. in case of LFV the regulatory and harmonizing influence in pricing by the state ownership cannot be disregarded.

The Nordic air cargo market is dominated by few, large shippers (supplier chain/manufacturing/ buyer) accounts that are thus crucial to the failure or success of any airline carrier. These clients provide volumes. Finland has Nokia and Sweden has the mobile phones of Ericsson, the automotive industry spare parts of Volvo and Saab, and all the Nordic area exports seafood, mainly salmon. Imports are also relying on few, large clients importing electronics, textile, perishables and seasonal products.

“Some 70-80 % is from the same clients, but they are not necessarily those clients who bring the profits. Profits can come from the rest 20-30% of clients.” Comment some of our forwarder sources. In the Nordic market there are a few but important customers that provide the airlines with the needed volumes, therefore these buyers have a lot of negation power towards Air freight Forwarders. They produce a large portion of the cargo volume that the airline transports, without them there is a significant drop of cargo

Fuel price dependency and the over capacity situation puts a significant price pressure among these active players. The price is believed to be an important part of the competition. This gives the advantage to the forwarders, for example when negotiating for long term contracts. Most of the cargo (approximately 95%) goes through forwarders, very little is goes directly to the air carrier (Hellermann, 2006). The forwarder is the one who is closest to the customers and in many cases the one who actually decides who the carrier will be. From this perspective the forwarder can be seen as the main buyer for the Air Transport, giving them the favorable negotiation power towards Airlines.

9.1.3 Supplier power

There are very few Suppliers on the Ground handling side (at GOT airport Spirit Air cargo Handling and GSL), and at the same time the main clients, airlines are very dependent on Airport terminal handling and ground handling agents for their vital cargo loading and unloading processes and related services. Spirit was part of Scandinavian national carrier SAS Cargo until February 2008, when SAS announced the sale of Spirit. In this sense, as the Ground handling services are undergoing changes, these services are possibly being impacted. This has importance not to be ignored, as Cargo Airport is heavily dependent on their smooth and professional operations. Professional Ground Handling would be rather difficult to replace rapidly with a new one in case needed. However, at the same time, Airport has the control over the distribution of the slot times for the Airlines, so in this sense their businesses go hand in hand and the power can be currently be considered to be in balance. However, sensitivity to timely ground handling service is to be closely monitored.

Pax traffic and aircraft here is put into category of suppliers, as the belly cargo today from the view-point of the Airport is considered as an ‘add-on’ service for passenger transport facility. However, the due to importance in terms of covering routing offer for cargo services, the influence power of this ‘supplier’ can be considered remarkable. “There is a substantial aircraft belly-hold capacity in the market, and like in Norway there is a significant market in Finland for express products where

parameters are fast and high quality service”, says Mr. Wichmann, Lufthansa Cargo Scandinavian Manager. (Source: 13.05.2008 newstodate.aero – subscription required).

Government supplies the framework legally speaking. Airports have to comply with government and other industry influencers such as IATA, TIACA and EU regulations. State owned Airports in the Nordic Countries are totally dependent on these regulations.

Aviation industry in general is very labor driven, and the most tangible part of functioning Cargo Airport is service provided by its staff. E.g. Scandinavian national carrier SAS had some problems a couple of years back and the staff was striking as they were not satisfied with the working hours and the lunch breaks (SvD, 2008-05-15). The strike lead to series of cancelled and delayed flights, and therefore impacted the whole Airport performance. More recent similar example can be found at the Sea Terminal of Gothenburg harbor where the staff has been striking for the similar reasons. In democratic Nordic countries the staff possesses some bargaining power that cannot be ignored.

9.1.4 New entrants

Airport business traditionally is known to be regulated, and presents heavy entry barriers for new and potential market entrants. In addition, the cost of Airport is huge - Cargo Airport infrastructure and equipment requires capital and heavy investments, and the maintenance requires very long term planning. Heavy investments also work as a very effective entry barrier.

Other barriers would be required industry know-how and high technology dependency. However, in the very recent times some new and renovated or rebuild airports in the Baltic area, CIS countries and in the rest of the Eastern Europe can rapidly become a strong threat to existing Nordic Cargo Airports such as GOT, as they do have considerable cost advantages.

An example from the Eastern European area; by June 2009, work will start on development of Poland’s Wroclaw Copernicus Airport. This project will be supported by EU funds and the full project is to be completed by September 2011.

On the other hand, Russia and CIS market is also known for something less desirable; in March 09 newstodate.aero announced that in 2008 Russian and CIS airlines held the unpleasant world record of having the world’s worst air security. This kind of reputation certainly can impact the image and the attractiveness of the airports in this region.

The most likely threat in form of a new competition is though coming from industry related players, who can possibly grow or expand into Airport Management business direction. Many integrators already run large parts of the airports on their own, via their own dedicated terminals. In GOT Airport, TNT just last year completed their dedicated Air cargo terminal, and similar projects are on-going in Stockholm Arlanda and in Malmö. As new “specialized, no frills” cargo carriers start to pop-up on the markets, maybe the similar phenomenon can happen on the Cargo market side as what happened in the Passenger Airline side few years back with “low-cost – no-frills” airlines such as EasyJet and companies alike, founding their respective, new, lower cost Airport network.

Some new specialized, 'low-cost' Cargo carriers are popping up now into the markets also on Cargo side - for example: Case Jet8 with concepts such as 'Global Cool Chain'. Jet8 started shipping frozen and refrigerated sample products from food and hygienic laboratories, including sample product for the analysis of components and chemical compositions. (www.jet8cargo.com)

9.1.5 Substitutes

The most obvious potential substitutes for the LFV Airports are the other main competing airports in the Nordic Copenhagen (CGH) in Denmark, and maybe Helsinki-Vantaa (HEL) Airport in Finland (though this airport currently is not thriving for more freighters, but focuses mostly on belly cargo). From GOT 'Sandbox' model perspective also Stockholm Arlanda Airport and the Malmö can be seen as potential substitutes, in case the Airlines would decide to change their cargo routings over to these airports instead.

This kind of substituting could happen by closer relationship, better service, better offer etc. In some cases there is a possible fear that the some Central European Airport hubs will take over by attracting e.g. with more volumes, but based on our research, the Nordic forwarders and shippers are not believing into this option as the congestion and difficulty to get suitable time-slots in the hubs is becoming a problem in the most popular hubs already.

Other modes of transport can substitute the need for Air transport – many shippers are currently planning to move their shipments to sea, especially in the current market situation due to price and no need for so fast lead times. The rail transport is optimal over mid-long distances and has the support from environmental view-point, so this is certainly something to consider as potential raising substitute.

One clear trend with professional manufacturing companies and further developing supply chains practices is that the manufacturing is moving closer to new markets. In this case there is no need for transport at all, or it can be provided by local providers over the short distances, which means that airports are not involved any longer.

It is typical that the borderline between complementing service versus competitors can be blurry – “As in other markets we also see a tendency here (in the Nordic markets) for express shipments to slide into the standard cargo segment, while parts of the former standard cargo segment are moving into ocean transport”, said Mr. Wichmann (13.05.2008 Newstodate.aero – subscription required). One potential scenario extracted in the interviews is that the current integrators/forwarders can consider a distant cargo handling centre (see also the Dry Port -concept, e.g. Woxenius, J.), which can potentially substitute at least the cargo handling part of the Airport operations.

However the key factor to point out here is that the threat of substituting service for LFV or GOT airport does clearly exist, as based on research interviews buyer’s are easily willing to substitute as soon as one of the above mentioned benefit or value-adding criteria appears.

9.2 The Stakeholder Analysis

After Industry layer analysis, we look into micro-level of Airport Management environment. Following the principal of the Stakeholder model, the authors categorized various LFV connected players, from the GOT airport view-point, into several groups as illustrated in following picture:

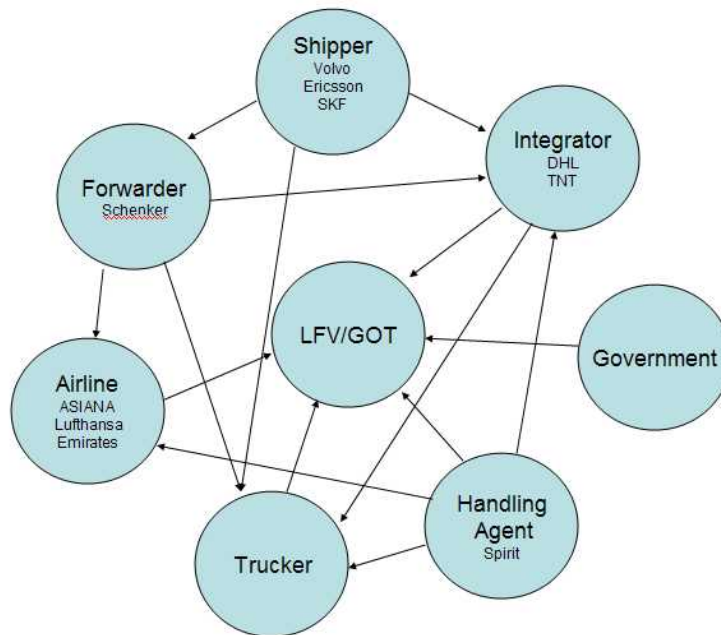


Illustration 9.2.1: Stakeholder Model, LFV. (Authors work).

However, there are a great number of researches and reports discussing the relations and business between airports and airlines, as this is the most obvious network relationship link. In this research we wanted to focus on those ones less associated and researched within airport studies, and to focus on those who LFV finds to have least complete visibility upon. Therefore this study is sampling within other selected stakeholders, namely: Forwarder/Integrator, Handling Agent and Shipper, excluding e.g. the Airlines.

Amongst the shippers (importers and exporters), study is covering exporter interviews. Also the interviewees are mainly from rather large companies. It should be pointed out that the textile industry who is one the most important customer of air cargo has not been included this time. However garment manufacturer and the smaller sized companies especially the forwarding companies also increasingly influence the air cargo market, which would be an area to be further explored.

10. Future Visions - Interview Analysis

Chapter 10 provides short version of empirical interview results as the base for future visions analysis. It is a result from conducted case study on LFV Gothenburg-Landvetter Airport (GOT) and their industry network.

10.1 Global Cargo Market Visions

Intra-stakeholder Analysis – Shipper:

Shipper A

- Asia is a very important market with rapid growth;
- North America is a traditionally important and mature market;
- CIS, especially Russia has a lot of potential to develop;
- Africa is a growing continent as a market;

The volume from Asia including sub-Indian continent to Europe and US is much larger than the opposite way;

Shipper B

- In future there will be more production units located in Asia;
- There are opportunities for logistics in CIS market; but also a challenge as well, such as political and market environments;

China, India, Malaysia will grow bigger in future;

The production is moving from East Europe to Asia;

Shipper C

- Huge supplies exists in NA;
- There too many operation al problems in Ukraine;
- Have factories located in Russia, so there might be suppliers from Russia in future;

The shippers tend to have a shared vision on the future cargo market from the geographic stand point. Asia will attract yet more business, which will lead to a promising future of cargo market development over there. North America seems to be a mature and stable market for all shippers. CIS market has large potential but as well challenges to be overcome in order to harness the potential. Besides these three regions, one shipper pointed out the growth of African markets.

Forwarder/Integrator:

FWD 1

- China will back soon, and Far East will grow in future;
- The textile goods earlier manufactured and transported from Thailand, now are moving to Vietnam, Cambodia. Also seasonal goods will grow;

NA will remain important, accounts for about 25-30 % of business;

Africa has huge potential;

Air freight volume will get back to 'normal level' (75 % of volumes) within ½ year - 3 years;

China will come back soon, Far East will grow;

FWD 2 Within EUROPE - Lots of volumes have moved to land modes.

US-EUROPE markets will soon stabilize to normal level;

Russia huge potential but a question mark;

Asia, especially China will grow fast;

FWD 3 BRICS countries will have large potential in air freight;

Not so much growth in Europe except for some special goods;

More freighters will be needed by shippers following the industry growth.

The answers from forwarder/integrator group are quite aligned with the ones from the shippers. Far East especially China will come back soon from the recession. North America will remain to play a large role in future due to its largest market share. Opportunity and threat go hand by hand in CIS market. Two companies also mentioned about the potential of Africa. Beside the geographical view, this group also provided some opinions from the angle of transport mode development.

Handling agent put the main concern on the air freight operational side. The security and route planning were referred. Asia once again has been considered as the most important market in future.

Inter-stakeholder analysis:

Shipper	Asia will be the leading market in future.
	CIS has potential and challenges.
	North America will keep stable.
	Africa is the new emerging market.

Forwarder/Integrator	Asia will be the leading market in future.
	CIS has potential and challenges.
	North America and Europe will keep stable.
	Africa is the new emerging market.

Handling agent	Asia will be the future focus.
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Routes changing and security issues will become concerns.

LFV	Rather recently (before economic down turn) contracted various Asian carriers to develop lanes from Sweden to Asian market. Current Strategy is to keep these existing clients, and to focus to increase their frequency. Continue the Swedish Cargo Direct program. Interested in opening new routes to North America.
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10.2 Freight Import and Export Development

Intra-stakeholder Analysis – Shipper:

For the main question, the specific type of cargo exported and imported naturally varies among shippers due to their different products. Cargo type will not change significantly is the consensus of shippers. Trade remaining mostly in balance is another common view of shippers. Only one shipper gave us an affirmative answer for the portion of pure freighters used. The other two used very vague answers, and the shippers do not seem to know the ratio, as they pay per contract and then the responsibility for operational arrangement is transferred to forwarder.

Forwarder/Integrator:

FWD 1	Future: more flow cargo will be trucked than before, high value goods, seasonal goods, for example from Vietnam
	Export: electronic and mobile equipments, network and high-tech electronic products, medical supplies, specialized machinery and sea food;
FWD 2	Future: electronic goods will play more important role, the average value of goods will increase, rush delivery will increase; Trade balance will be the same
FWD 3	The high-tech and electronic products will still dominate the cargo structure; Future: there will be no big changes in cargo types

Forwarder/Integrator provided more broad view of the structure of air freight. High value goods and perishable goods are dominating the air freight. And this situation will stay stable in future. The ratio between belly cargo and freighter in general is 50% to 50%, but the reliability of the answers feels questionable. The balance seems to point slightly more towards belly cargo but there are big regional variations, as from Finland even 90% can be belly cargo. Handling agent tells that 90-95% is

transported by freighters from Gothenburg, but in other Scandinavian airports the ratio should be more 50%-50%. Export currently is composed of: electronic equipment, mobile phone and medical equipment, Import: textile. In the future: almost same products but different models, for example changing from traditional TV to LCD TV. Handling agent gave an answer with the point that is that textile is the main product imported to Nordic region. Another highlight is the same product type, but changing models (cargo miniaturization-trend).

Inter-stakeholder Analysis:

Shipper	<p>High value products will dominate the air freight industry.</p> <p>There will no significant change in cargo types.</p> <p>Trade in balance.</p>
Forwarder/Integrator	<p>High value products will dominate the air freight industry.</p> <p>There will no significant change in cargo types.</p> <p>Emergency delivery will increase.</p>
Handling agent	<p>High value products will dominate the air freight industry.</p> <p>There will no significant change in cargo types except the specific model changes due to development.</p>
LFV	<p>High tech products and salmon are main exports. Electronics and textile main imports.</p> <p>No big changes in terms of cargo inbound and outbound types are seen.</p> <p>Impact to Airport: Bigger freighters are coming, such as 747-8 and A380 and more efficient, less polluting aircraft models.</p> <p>Much bigger Freighters on the Nordic markets are not possible without expanding the current runway infrastructure.</p>

10.3 Changing Structures of Air cargo Business Actors

Intra-stakeholder analysis – Shipper:

Main question

Shipper A	<p>Increasing consolidation will happen in the forwarding industry;</p> <p>The big forwarders like the ones used by us will not have big changes;</p>
Shipper B	<p>Lots of acquisitions has happened and situation is quite stable now;</p>

Three parties negotiation is possible in future;

Airport will not have any role changes;

No direct connection with airline;

Shipper C Forwarder's role is important, since if something goes wrong, it is under the responsibility of forwarder;

Forwarders have had different setups; forwarder's earlier setup cannot be compared with now. Requirements from our clients are growing all the time. We have dedicated customer service from forwarders and excellent setup today (especially in NA);

Sub-question

Shipper A It will be no difference to our business.

Maybe better performance will be provided by a private owned company;

Shipper B No really impacts on us.

But airport business might be safer to be state owned;

Shipper C No impact as long as the lead time is guaranteed;

All shippers recognized forwarder/integrator as an important player in the air freight industry, and most of them forecasted that there will be some small acquisitions and mergers in future within forwarder/integrator. However, for the general view of future industry, all shippers considered the both the structure and the situation will be stable. Details about airport changes were rarely mentioned in the interview. When it comes to the impact of airport privatization, no shipper thought it would greatly influence their businesses.

Forwarder/Integrator:

Main question

Airlines are capacity provider;

FWD 1 Forwarders' roles are moving more towards industrial expert and consultant in future. They will be closer to the client instead of being just pure transport providers;

There is a new generation of logistics expert within the manufacturers;

Less freight handling at the airport;

Roles will pretty much same;

FWD 2 Airlines tried to go directly to the shipper but failed, therefore they will focus on their core business in future;

Forwarder need to provide better and more diversified service to the clients. Few more mergers

might be happen on few bigger ones. Maybe it is time for specialization;

Airlines and forwarders/integrators will become fewer and bigger with wider networks;

Smaller but agile players will survive in the niche markets;

FWD3 So far many airport operations are done together with airport and forwarder, but in the future a forwarder/or group of forwarder will have their own warehouses and services;

The forwarders/integrators will develop their own preferred carrier agreements with Airlines.

Sub-question

FWD 1 N/A

Example from other country is that the airports are strongly focusing on specialized operations such as terminal and ground handling;

FWD 2 Do not really see the possibility of the airport becoming private;

At least big air port should be run by state (security and neutrality aspects)

FWD3 In long term, the privatization will bring more dynamics and better commercial attitude;

In the forwarder/integrator group, the answers are broader. The airline, shipper, forwarder and airport were all referred. Their common attitude to airlines is that they should keep on focusing on the role as the capacity provider instead of entering into forwarding area. Shippers will have higher requirements on the service in the future. The airport privatization issue seems not interest the forwarder/integrator either. Only one company provided positive answer about the airport privatization.

Handling agent:

Main question

Agent 1 Forwarders will have their own terminals and warehouses;
Final price provided by forwarders might not be cheaper;

Sub-question

Agent 1 One possible change might be that the private company will increase some service fees to earn more profit, which will lead to reduction of our business;
Otherwise, there will be no special influences on our business;

Handling agent cares about the operations side, which is indicated by their facility concerned answer. The privatization again failed to appeal too much attention.

Inter-stakeholder analysis:

Shipper	Forwarder/Integrator industry will continue small acquisitions and mergers.
Forwarder/Integrator	Airlines will focus on their core business which is as the capacity providers. Better services are required to provide to customers by forwarders/integrators.
Handling agent	Forwarder/Integrator will have own facilities at the airport.
LFV	Airlines consolidation will continue with mergers & acquisitions. Pure Freighter Airlines will have more market share because of more SPEED & AGILITY compared with mixed airlines. Integrators will still grow since they have the networks, direct contacts with customers, and good IT systems, e-trade is coming. Integrators are with 10-15 times better yield (than the others). Impact to Airports: have to become more 'business driven', and more global.

The impacts of potential airport privatization

Shipper	No direct influence.
Forwarder/Integrator	No direct influence
Handling agent	No big influence.
LFV	LFV will still be state owned. Though privatization has been launched on 6 airports.

10.4 LFV Specific

10.4.1 LFV Cargo and Client Relationships

Intra-stakeholder analysis – Shipper:

Shipper A	No direct relation with LFV;
Shipper B	Relationship with GOT is quite good. GOT is a small but efficient airport, and there is no positive or negative news from LFV; Not so much direct contact with LFV, work more with forwarders;

Shipper C Do not have any relationship with airport, only deal with integrators.

All shippers pointed out that they do not really have direct connection with airport and LFV, which might be interpreted as they lack of knowledge about airport and LFV.

Forwarder/Integrator:

FWD 1	LFV now has more attention on the air freight, they have to be more aggressive in marketing to attract more airlines;
FWD 2	Not really work with airports, and more with airlines; Stockholm is a really hand gateway because of a lot of freighter connections.
FWD 3	No relationship with LFV; they are an authority...they do what they have to do, what comes down to administration. They follow rules and regulations.

The forwarder/integrator also showed their limited understanding of airport or LFV.

Handling agent:

Agent 1	Relationship with LFV is quite good; LFV wants to have more handling agents in order to provide better service through competition.
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The handling agent is the only one who has direct relations with airport and LFV, and the relationship between them is described quite good.

Inter-stakeholder analysis:

Shipper	No direct relationship with LFV.
Forwarder/Integrator	Not really works with airports but more with airlines.
Handling agent	Relation is good and helps LFV provide better service.
LFV	The relationships are very good with its main customer: airlines. Due to the problem that there is no focus on cargo business, the relationships with other industry players would need to be developed.

10.4.2 LFV Services

The authors would like to note that in terms of analyzing the LFV services, another dedicated study being conducted by industry consultant as we write this thesis paper. Therefore this area has intentionally been kept short and indications are further addressed in conclusions.

Due to both shipper and forwarder/integrator do not really have direct contact with airport and LFV.

Handling agent:

Agent 1 Most frequent contact with LFV happens on the border inspection posts; The procedures there need to be improved;

Even though the handling agent has direct contact, but it yet seems quite limited.

Inter-stakeholder analysis:

Shipper	N/A
Forwarder/Integrator	N/A
Handling agent	Border inspection procedures need to be improved.
LFV	LFV Arlanda just won the 'Best Air cargo in Europe 2009' award (Air cargo World – magazine). GOT is certainly as good, but they have a bit more visibility problem (in the markets).

10.4.3 Competition in the Nordic area

Intra-stakeholder analysis - Shipper:

Shipper A	Due to the significant price difference, more cargo volume will shift to sea, but air transport still take a significant part of total cargo volume;
	We (the shipper) decide the airport option;
Shipper B	We are not going to any other Nordic airports as we have our own dedicated networks and production unit in Gothenburg;
	Another option could be truck our cargo to central Europe hubs;
	We decide to which airport we want our cargo;
Shipper C	We can only use GOT today. But if the freighter could land on City Airport we will use it as well;

Shippers are more interested in the competition between air and other transport modes than the airport competition. The probable answer has been collected from this question as well, which is that the Shipper makes the decision on which airport their

cargo uses. Especially for GOT, the shipper has no other choice if they decide to load their cargo on plane in Gothenburg.

Forwarder/Integrator:

FWD 1 Stockholm has very good connections to Norway, Finland and Baltic;
Copenhagen is too close to the Frankfurt.

FWD 2 We simply go to the airport who can provide the services we need;
We have a feeling that Stockholm has better connections than others in Nordic area.
We always follow the airlines.
We don't want to use Paris which takes minimum 3 days to get goods from there.

FWD 3 Stockholm and Copenhagen has accustomed to attract international freighters and many international companies are around them;
GOT will be more possible to be a truck hub between them;

The forwarder/integrator, oppositely, put more focus on the airport competition. Stockholm got higher evaluation than Gothenburg. Another threat is from Copenhagen airport.

Handling agent:

Agent 1 N/A

No specific answer has been collected from handling agent.

Inter-stakeholder analysis:

	Make the decisions on which airport are going to use.
Shipper	GOT is currently the best option. More air transport will shift to sea.
Forwarder/Integrator	Stockholm is maybe better than GOT.
Handling agent	N/A
LFV	Copenhagen is the biggest competitor. Intra-airport competition between the Swedish Airports (GOT-Arlanda-Malmö) still appears strong.

10.4.5 Visions on Multimodality

Intra-stakeholder analysis – Shipper:

	Multimodal transport will increase in future;
Shipper A	Rail freight will increase but not replacing any other modes; Air-truck and air-sea are working pretty well.
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Shipper B	Multimodal is being used today and it will increase in future; Sea-air mode is used from Asia to Europe and Air-sea is used other way around; Rail does not have flexibility, but for inland transport part is replacing truck by rail in Europe.
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Shipper C	Air-sea is a compromised solution in order to meet the optimal point of lead time and tied-capital; Problem with train is that you cannot get the cargo if they are stuck in somewhere; Multimodality is the future possibility. For example Agility has a huge hub in Dubai with a lot of sea-air; Within Europe all freight are using truck.

Multimodal transport has been perceived as going to be increased in future due to the more demand for lower cost. Air-Sea will be most promising one among all possible combinations; air-truck is quite mature. But the air-rail failed to get high expectation since the inflexibility.

Forwarder/Integrator:

	Working all the time with multimodal business models;
FWD 1	Developing a program with air-rail from China to Europe via Russia; Looking into the possibility of using air freight to cheaper places in Middle East because of large demands from shippers for air-sea.
<hr/>	
FWD 2	Multimodal are encouraged due to environmental and cost view; Trans-Siberian rail has huge potential; We already use sea-air from Far East to Dubai and fly to Gothenburg and trucked to Helsinki. Sea-air is increasing.
<hr/>	
FWD 3	Sea-air connection is only a compromised product between price and lead time provided by forwarders/integrators; Trans-Siberian rail will be another option from Asia to Europe besides sea, air and sea-air combination;

The forwarder/integrator has been working with multimodal transport concept for many years. Air-Sea combination received a lot of concerns from this group as it did from shipper. However different opinion on air-rail has been found in this group. The air-rail became an alternative option for forwarder/integrator to transport cargo between Asia and Europe via Russia.

Handling agent:

It is cheaper to use multimodal;

Agent 1 The problem of air-rail and air-sea is the inefficient loading tools and devices. For example ULD (Unit Loading Device) used by air is currently not suitable to rail and sea;

Handling agent gave their focus on operation side once again. The incompatibility of ULD between air and rail, sea was seen as the biggest obstacles of multimodal transport related with air.

Inter-stakeholder analysis:

	Multimodal transport will increase in future.
Shipper	Sea-air combination has been greatly developed recently. Rail has too many problems to connect with air.
Forwarder/Integrator	Multimodal is encouraged due to environmental and cost view. Sea-air combination has been greatly developed recently. Develop the potential of air-rail system.
Handling agent	Cheap to use multimodal. ULD incompatibility exists in the air-sea and air-rail combinations.
LFV	Not seen as a strong potential growth or development option by LFV, seen as “too difficult and pricy” to develop. The past shift from air to sea has gone unnoticed by air freight. It seems though that right now shippers are trying to find OPTIMAL TRANSPORT SOLUTION.

10.4.6 Airline networks

Airbus in its Report 2008 forecasts that in the future, the traffic will be concentrated between the biggest cities in the world. These so called hub cities are global business centers that are getting even bigger and dynamic. Freight distribution in the world is a complex system based on hubs and good’s flow consolidation. According to LFV

business plan for 2007-2010 the air freight industry goes towards relatively few but larger international players will dominate the market.

Intra-stakeholder analysis – Shipper:

Shipper A	No specific opinion
Shipper B	N/A
Shipper C	It's a shame that a lot direct lines disappeared from here; Otherwise we do not really care about the hubs, which are supposed to be forwarders' issue;

Shippers did not offer any opinion on this question, which might be because the forwarder arranges transport for them.

Forwarder/Integrator:

	GOT is unlikely to be the air freight hub in the Nordic area.
FWD 1	GOT lacks of frequency of airlines; The whole cargo part has big possibility to disappear from GOT;
FWD 2	GOT has a perfect geographical location and it works well. The big freight operations in GOT are not as good as other cargo handling. GOT should attract more freighter carriers , type Martin Air and Cargo Lux.
FWD 3	In five years there will be no big changes; In long view the specialization between passenger and cargo handling in airports will continue; GOT is not believed to be a cargo hub in Nordic area;

The opinions on the cargo business in GOT are not clear enough. Two out of three answers are more reluctant for the possibility of being the cargo hub in Nordic area for GOT still needs more research.

Handling agent:

	GOT has a perfect geographical location in North Europe;
Agent 1	The advantages here are: first, big freighter can land; second, traffic is not congested; third, ramp handling service is more available (no queues due to pax aircraft priority)

Handling agent gave some operational advantages in GOT to support the possibility.

Inter-stakeholder analysis:

Shipper	No specific opinion.
Forwarder/Integrator	GOT has good geographical location. Not really possible to become the cargo hub in Nordic area. GOT should attract more airlines if they could.
Handling agent	GOT has good geographical location. GOT has several advantages compared with other Nordic hub airports.
LFV	LFV believes in PAX and Freight AP specialization. GOT is positioned as the Main Transport Node in Northern Europe though GOT is enjoying the support of local business region development.

10.4.7 Airport Structures

Mega projects require huge infrastructure investments: Airport terminals are among the most expensive form of commercial constructions in the world, often costing three to five times as much per square foot as other commercial construction. (Olivier Wyman. 2008).

Intra-stakeholder analysis – Shipper:

Shipper A	It depends on how you define the business park. If it is offices for the air industry players, it is a good idea.
Shipper B	N/A
	It is hard to understand why airport needs a business centre.
Shipper C	Most of the forwarders are actually currently moving away from the airport; Office space is probably expensive in the business centre.

Not all shippers agreed with the plan of Business Park in GOT. The division of opinions among shippers is quite big, which can reflect that the concept of “Cargo Park” can be understood many different ways (based on different images).

Forwarder/Integrator:

FWD 1	It is a good initiative; Business centre should be more than a cargo park;
FWD 2	It is a good idea; As the airport is usually far away from the city centre, it is important that the integrator terminals are located at the airport;

FWD 3 The Business Park should focus on the air cargo services, like warehouses and distribution centers;
 Consider the market capacity and profitability before investment;

The forwarder/integrator group provided a shared understanding on the Business Park. More than this, they pointed out the cargo handling facilities should be included in the Business Park.

Handling agent:

Agent 1 Business centre at the airport would generate more business;
 GOT would need parking places, hotels, restaurants and cinemas.

Instead of answers from operation view, the handling agent suggests that there should be more service business in the Business Park.

Inter-stakeholder analysis:

Shipper	Not all shippers think that the business park is a good plan.
Forwarder/Integrator	Good initiative, but requires good capacity analysis. Business centre should be more than just a cargo park.
Handling agent	Business centre could generate more business.
LFV	Process has been kicked-off and is open for listening specific needs.

10.4.8 Airport Charges and fees

Industry widely air carriers are said to protest against too high airport fees. Airports were not built to easily accommodate a high level of variability, and the traditional approach of raising airline fees as volumes decrease in not likely to work in the new environment. (Olivier Wyman Group. 2008).

The interview question of airport fees was initially targeted for the airlines. Due to exclusion of interviews of airlines in our research focus, this question was skipped from the specific view-point of LFV and GOT airport fees. Pricing in general was covered in discussions, and it is addressed in the Conclusions part of the study.

However, according to LFV, the fees charged by LFV are same as (or even lower) than other airports in Europe. As a quick response to the down turn in air transport

industry caused by the latest financial crisis, LFV announced lowered fees in the beginning of 2009.

***Flash - Case Finnair:** Cargo revenue represents a good quarter of total revenue of Finnair’s Asian traffic, and cargo is considered as an essential element of Finnair’s growth strategy for Asian traffic. It is interesting to note that Finnair cargo group’s result was one of Finnair Group’s strongest. (Finnair Group Annual Report 2008).*

10.4.9 Risk Management – demand turbulences

Intra-stakeholder analysis – Shipper:

Shipper A	<p>LFV should have a strong control on their cost, and keep the break-even level as low as possible. Work more and more with variable costs;</p> <p>Be more focus on the business side, and keep the service quality;</p>
Shipper B	<p>Provide good service to make sure that airlines can keep their timetables in order to reduce delay;</p> <p>It is very important that GOT stays here and keeps growing;</p>
Shipper C	<p>They need carefully listen to their customers’ needs. We hope that GOT is prepared when our business picks up;</p> <p>Airport should be dynamic to be prepared to offer more flights and air routes when needed</p>

The suggestions from shippers included cost control, better service and being dynamic. All the suggestions are related with the shippers’ business: cost control meaning reduction cost in transport fees; better service can decrease the delay and shorten the lead time; the dynamic requirement is based on their own demand.

Forwarder/Integrator:

FWD 1	<p>Airport should less depend on only PAX or Cargo;</p> <p>Business diversification is needed;</p>
FWD 2	<p>N/A</p> <p>Consistent and outstanding service level;</p> <p>Be adaptable to the environment with flexible rates ;</p>
FWD 3	<p>Strengthen the branding;</p> <p>Be lean during bad times;</p> <p>Put same effort on cargo business as GOT has done on passenger side</p>

The information gotten from forwarder/integrator is more general. Reducing the dependency purely on passenger or purely on cargo can be acquired from business

diversification. However how to diversify the airport business has not been mentioned. Beside diversification, be adaptable and lean also has been mentioned in the interviews.

Handling agent:

	Diversification;
Agent 1	Develop truck handling system. Get the railway close to the airport, and look into the potential of combination of transport systems;

Two suggestions come from handling agent, which are diversification and attention on combination of different transport systems.

Inter-stakeholder analysis:

	Cost control.
Shipper	Provide good service in order to reduce delay. Be well prepared for the demand.
<hr/>	
Forwarder/Integrator	Diversification and reduce the dependence only on passengers or only on cargo.
<hr/>	
	Diversification.
Handling agent	Develop combinations of different transport modes. Be lean and adaptable with flexible rates;
<hr/>	
	Currently: Lowering fees, holding hand of existing clients. Re-thinking the Strategy.
LFV	Attract more volume from neighbour countries and be the largest Cargo market in Nordic area. Work more with the airlines who have the good destination portfolio. Need to understand the market and values that can be sustained in longer run, which means establish and support routings that meet the market needs.

10.5 IT plays important role in Airport world

In the research interviews, airport technology development and e-Freight project “Cargo 2000” driven by IATA were mentioned. The Nordic countries are currently very involved in piloting the project. The main meaning of the system is that air bills

and other freight transport documentation will be handled in electronic format instead of today's widely used paper documents.

In the future integrated, Total Airport Management (TAM) system concept is a prerequisite for a modern, performance-based airport. These future concepts aim at an integrated airport management, where all major aircraft operator, airport, aerodrome Air Traffic Control (ATC) and ground handling processes are conducted using a single data set. This is embodied in an Airport Operations Centre (APOC) where operators constantly communicate and co-ordinate, develop and maintain dynamically joint plans and execute those in their respective area of responsibility. The Eurocontrol medium-term Airport Operational Concept constitutes a visionary description of airport operations for the medium-term timeframe (deployable from 2012 onwards). (Jane's Airport review, Feb 2009, p. 24)

Airport security-, detector and screening technology development is speeding up due to regulations following the 9/11 attacks; Los Angeles International Airport (LAWA) announced in early February 2009 that it is hosting the first independent cargo screening facility (ICFS) and e.g. Los Angeles International Airport (LAX) took part in certified Cargo Screening Program. (Jane's Airport Review, April 2009, p. 27).

RFID (Radio Frequency Identification) technology development is increasingly of interest, as working RFID system with lower costs compared to today would be able to revolutionize cargo 'Track & Trace' principals in the future.

11. Research highlights & Conclusions

The Conclusions Chapter summarizes and discusses the most interesting findings of the study, corresponding to defined research purpose: What are the airport management's and their stakeholder's visions for the air freight industry development? are these visions aligned? The conclusions are provided in titled sections to help reader to understand extracted strategic business areas.

11.1 Wrap-up of Nordic Air Freight Market visions

Due to continuing economic downhill, the Nordic air industry and the depending cargo airports are struggling with cost pressure and unclear cargo demand forecast. Latest good news are slowly raising general hope for relatively faster recovery than earlier was expected based on November 08 – February 08 figures, and lower oil prices which might actually even out dropped revenues by the end of the year 09. Full recovery will certainly take some time, but our interviewee's estimate that air freight business is back to 75 % of the activity in half a year-2 years from now, and they give a rather homogenous estimate of 2-4 years before the manufacturing companies will catch up with the normal manufacturing, with sales and with their entire supply chain operations again.

Nordic Air freight Markets are characterised by increasing competition with limited air freight volumes, dominated to a certain extent by a few strong players. Competition has also changed on the playfield: shippers have now in-house “*a new generation of Logistics specialists who focus in cost cutting*”– the industry is tougher and it is time for bigger strategy changes and more specified and targeted relationship building between Airports and their key Stakeholders.

11.2 Flash view on Future Global Markets from/to Nordic

Views on industry recovery and future markets show to be strongly aligned; Asia will pick up rather fast, lead by China. For the export markets, Far East, India Taiwan Malaysia, Thailand, Vietnam, and Cambodia will play role. Also Japan and Korea are believed to be more significant for air freight in the future.

Intra-European transport from and to Nordic area, has moved to land transport and uses mostly trucking, and is believed to stay that way. The future of air transport is believed to be in long-haul flights, which does not come as a surprise. North America

will still play important role (25-30 %) of transport, however its relative importance will decrease, and Far East will surpass in few coming years.

CIS, Russia and Africa will be the new potential markets, but require yet more work. These markets surely can bring along new competitive strengths for air transport, such as additional security, or accessibility benefits on the markets where the security and market instability can be a big threat, or lack of infrastructure development does not allow the penetration of other modes of transport. An example of security issues are the sea pirates causing severe issues to sea transport in African surrounding waters.

11.3 Type of future Air Cargo

In the future, air freight portion of the aggregated transport (total mass) is believed to be decreasing, however, the total transport volumes will increase. This means that as the 'overall cake' increases, air freight volumes will also increase. However, Air transport will become further specialized, and even further focused on emergency deliveries. When the economic downhill will ease up, the shippers believe in a sudden demand peak in air ad-hoc deliveries, and hope that the airlines and airports will be prepared to respond to this demand fast, with smooth operations.

Unlike many other geographical trade areas globally, the Nordic area has so far not suffered about serious trade imbalances. However, some reflections point to direction that in the future, import will likely grow over the volumes of export, as the manufacturing is being shifted to lower-cost areas such as Asia.

Interviews did not bring up any revolutionarily new types of goods for the future, although more frequency in items of special transportation such as live animals for international competitions, or seasonal exotic flowers from Brazil and Africa were mentioned. The fast developing electronics will play the major role also in over 5 years term, and everyone seems to believe that the increasing VALUE of the (rush) goods will be the key in the future.

11.4 Future Airport Relationships

New forms and focus for cooperation is needed: During the past years, airports have started to recognize that they need to tighten the cooperation with the airlines. LFV and GOT airport have demonstrated this increasingly, but maybe this is just one of the first steps. In the end, it is important to point out who is the one taking the final decision on transport mode (and airport) selections? According to our research this is very clear: it is the Shipper who takes the key decision (not the Forwarder). This happens hand -in hand with the Shipper's Forwarding Partner, who in the future plays

more roles as a decision influencer and as the expert consultant. More and frequent two-way communication, lobbying and structured and focused promotion by the airports and LFV towards the shippers (and forwarder as influencers) is needed.

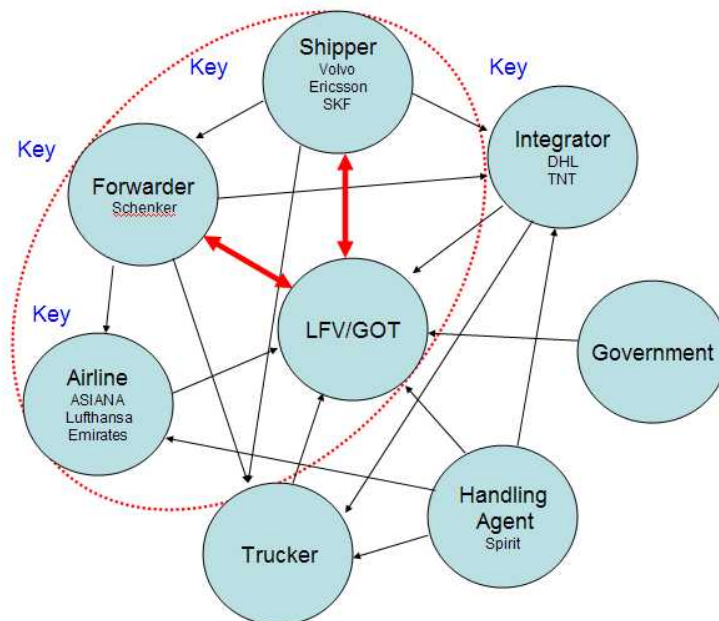


Illustration 11.1: Identified and needed network relationship links within stakeholders. (Authors work)

Shippers do not actually want to work directly (alone) with the Airlines, and the air forwarders are evaluated to be very professional, experienced and efficient with specialized targeted services to shippers such as 24/7 Help Desk and specific industry knowledge. Air Forwarding agents are valued by the Shippers. Many expressed that the industry setup as it was before in the past years cannot be even compared with the system and knowledge in place today, as it has developed and changed so hugely. A new trend, however is believed to be *3-party negotiations*, where the Shipper is more *involved* in negotiations with the Airline in order to gain more visibility in logistics process. Maybe the future can even be that of *4-party communications*, where the Airport establishes direct communication channel to the Shipper? (see the red circle in Illustration above).

LFV is suffering of non-clear business image: We find it interesting that Shippers and even Forwarders really are not so aware of the role of LFV. ‘Luftfartsvärket’ is mostly recognized from Navigation and ‘governmental’ context. Neutrality and a distant respect for the LFV image can be extracted, and the state ownership “authority-equals-stability” -image could certainly be turned as an advantage in marketing Sweden Cargo Direct campaigns even in global scale.

11.4 Price and Promotion

Interviewees did not put as much importance on pricing as could have been expected – air transport surely is experienced as expensive but it is not reflected as a surprise, but rather as a self-clarity. Slightly surprising is the fact that currently lowered air prices have NOT encouraged anyone to use more air transport – the reason for this is that the other transport modes have decreased prices remarkably more and as warehouses are full, currently there is no lead-time requirement which normally is the key competitive factor for air transport. One could ask whether competing with price make sense in this case? Maybe strategic airport marketing efforts should focus and stress other recognized strengths instead: reliability, proven smooth operation and industry experience, which were all brought up by interviewees. How about Active Green Cooperation - program with Shippers and/or Airlines to show lower CO2 and other emission figures? Maybe airports could actively promote green airport activities, such as bio-fuel supply at airports in the future, to help Airlines and Shippers to reduce their corporate emission reduction targets.

Air Cargo Management publication was stating that currently there is empathy towards struggling companies –“empathy rarely offered to the high profile fuel-burning aviation industry”. Through the interviews, it became apparent that the industry is indeed recognizing and sympathizing with the fact that the airlines have suffered about the economic crises. In addition, forwarders expect transport prices to increase in 2009, including air transport price. Shippers/manufacturers strongly expect that the ‘low’ air transport price is only temporary, and increase in prices is expected.

11.5 Belly vs. Freighters

Based on interviews, belly cargo charges by the airlines and by the airports are not fully clear, but it does appear to be more profitable than freighters. Belly is considered to be an ‘add-on’ to passenger traffic; today landing fee and taking-off fee charged by airport to airlines are calculated according to the maximum taking-off weight of the aircraft. Therefore airline can load as much cargo as possible into the belly hold with the hope of increased profit because the fees charged by the airport are compensated by the passenger tickets. Operating freighter service has to pay the same weight-based fees, but without the advantage of passengers.

It seems that airlines now focusing in their core businesses, have separated the belly cargo into its own business unit (e.g. the Nordic national carriers, AY and SAS). It is interesting to note, that even during the experienced turbulences, the cargo carried in

pax-planes has proved to be more profitable than the passenger traffic itself. According to our study, forwarders ship min. 50 % of their air freight in belly cargo rather than in freighters, and in some cases this can be even 90 %. Then again, shippers do not know how their cargo travels – they pay the same price to forwarder whether the cargo is traveling in the belly of the plane, or in pure freighter. Though with the increasing economic and environmental requirements, Shippers are becoming increasingly interested in knowing exactly in which physical aircraft and arrangement their cargo is being transported, as only this way they have full control e.g. over the emission monitoring. We suggest the assessment of belly vs. pure freighters as an area of interest for further research.

11.6 Airport Service

Due to economic downturn, even if airlines are experiencing over-capacity, from shipper view-point there are less flights, less capacity and certainly less frequency as airlines ground aircrafts from operation. Consequently airlines service is not considered as good as it was before, both by the shippers and by the forwarders. Otherwise in general, the attitude towards LFV/GOT airport and its ground handling services appear rather neutral.

11.7 Multimodal opportunities

Air transport shift to sea transport has been in the talks over the past years, but apparently is now more accurate than ever before. In addition, there will be more increase in combined Sea+Air transport (also called as “Airway bill over the Seas” – concept), e.g. by Sea to hub in Abu Dhabi and then by air transport to different dealers in Asian region. In some trade lanes the transport mode selection can be the opposite (first leg by sea, and the import from mid-East hub by air to Nordic region). Forwarders expect a huge increase in this area for air shipments in the near future, and the carriers are required to develop this business more. Benefit is that mixing the sea and air, the lead time is much better (i.e. 40 days take 20 days) compared with Sea shipment, and yet it is less expensive than total air shipment. In addition, this way Shippers’ logistics planners’ can proof having taken actions of moving away from pure air freight, which has a strong image of being expensive.

Another combination of Air+Rail was recognized and mentioned by shippers and forwarders. Shippers do not warm-up for rail-option due to its inflexibility and inaccessibility to cargo in case of accidents. Forwarders, then again, do consider this combination: they perceive air-rail having a huge potential in terms of lead-time, cost and environment savings, especially for transporting between Asia and Europe via

Russia. Several larger integrators have launched their own researches and pioneering trials on the possibility of the air-rail solution. Although the shippers are currently against air-rail combination, forwarders believe in break-through once this option will prove to offer sufficiently benefits.

Finally, in case of Gothenburg region, the obvious cooperative opportunities created by the proximity of the biggest Nordic harbor, the Port of Gothenburg, should not be ignored (suggestion for further research).

11.8 Future Airline Networks

According to this research, there is a huge tendency for bigger, consolidated flows to main hubs such as Amsterdam, Frankfurt, Paris and Brussels. Within Europe trucks nowadays have pretty much replaced the air transport – forwarders call this as the ‘Gateway Setup’; goods flows are driven to hubs for consolidation. Some veterans in the industry tell that the strategy of centralizing to hubs and then again, decentralizing appears to come in repetitive cycles of about 7 years.

At the same time, there is more ‘flown’ cargo trucked from Sweden to Central Europe than ever before, and there are hopes that the cargo flow in the future would be reversed; then the cargo would be trucked from Central Europe for consolidation in the Nordic hub(s) such as GOT instead. This means that there would be opposite traffic by trucks (or by train – or by sea in case of Gothenburg) from the Central Europe destined to Nordic for consolidation to further destinations instead.

11.9 Environmental aspects cannot be ignored

Increasing number of companies is becoming aware of the importance of a sustainable development and airline industry is under the review in relation to environmental issues. In our study, environmental issues were purposefully not in the scope. This is not to say that the environmental concerns would be something to be ignored, but rather due to set research boundaries (many other studies are focusing into the growing area of environmental aspects recently). However, during the research we came to realize that Corporate Social Responsibility -programs and emission targets are more important to many Shippers than expected. Everyone interviewed addressed this subject. Having pointed out this, it should be added that the environmental issues also seem to have become a powerful promotional marketing tool, and may not have yet reached the true importance within the operational logistics people. Either case, environmental aspects are with no doubt one of the key elements in this industry and increasingly so in the future – every single interviewee mentioned and stressed the environmental aspects despite our deliberate attempts not to focus on this area in the

study. LFV won the ‘Green Price with SAS 2008, but this does not seem to be used for promotional purposes very strongly.

The role of supra-national governments and global roof organizations¹ such as EU, IATA and TIACA are not to be disregarded in terms of support, cooperation and especially with legal requirements such as safety rules and the growing green trend, which we call as the “Environmental Promotion²”.

11.10 Other concluding remarks

It is not vital for all companies to be truly international – but if any, then air cargo industry is a *truly* global industry, and it is globalizing ever further to serve more different, distant and complex networks. Here the covering, rapid and flexible airline network with its reliable and truly ‘internationalized’ airport hubs create the common competitive playfield. ‘Business-as-usual’ and the ‘Sandbox model’³ do not work in this business any longer. Dynamism, strategic risk-taking capability and out-of-the-(sand) box -thinking by the airport management is required right NOW. Just like Lufthansa CEO was joking about airline industry “*2009 will be a year that turns boys into men*”.

In general global industry experts believe that the airport management has to decrease dependency on airline industry and this will determine how successful and profitable their airports will be in the coming years. One possibility is to build an Airport City or Airport Business Park following global trend and example of some big airports, but the study results do not encourage for this in case of GOT Airport. Majority of interviewees think that GOT is not likely to attract lot more passengers wanting to

¹ Kyoto protocol is the base for emission limits and is monitored via EU regulations. Pursuant to Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community, as amended by Directive 2008/101/EC², aviation activities of aircraft operators that operate flights arriving at and departing from Community aerodromes are included in the scheme for greenhouse gas emission allowance trading within the Community as of 1 January 2012. (For more information, EU Commission Notice: <http://www.tiaca.org/images/tiaca/PDF/IndustryAffairs/OJ%2020021109%20ETS%20Assignmt.pdf>)

² ‘Environmental Promotion’ is term created by the authors meaning that the environmental issues seem to have become a powerful promotional marketing tool, and may not have yet reached the true environmental concern and importance within the operational logistics people.

³ ‘Sandbox model’ is a term created by the authors, which means looking into global business, but focusing on the Nordic perspective, rather than looking into a specific Nordic business from the global perspective. A sandbox as a playground for children symbolizes a certain naivness of being limited within restricted and defined borderlines.

spend their time at the airport. However, the response and support from interviewees in principal for the development around and at the airport is positive. Maybe another possibility could be to strengthen the airport in cargo operations, to work in close cooperation with shippers and their forwarders, to invest in the required infrastructure and to provide them the efficient cargo handling facilities for competitive price, right by the airport instead of letting these partners to move out from the airport area.

”What will count in the future, is more economical uplift of cargo” - there is a belief within the interviews that there is going to be less freight handling at the airports in the future – shippers, forwarders and the ground transportation are in a search of cheaper labour, cheaper land, and cheaper security (ref. Dry Port concept, see e.g. by Woxenius, J.). In general, the airport area and office space located at the Airport of LFV/GOT are expressed by the interviewees to have an expensive image.

As for the future aircraft, it is believed that due to current volume requirements for increasing the profitability in pure freighters, there will be new plane models coming (possibly in 2-3 years) with more efficiency. *“Surely globally there might be bigger freighters but perhaps also (in these type of Nordic markets) there will be smaller freighters serving these markets with more frequency”*. Has anyone thought about completely new kind of semi-airplanes which can carry more cargo than a traditional belly aircraft, yet providing capacity to carry some passengers as an extension of passenger service to exotic destinations?

Following some benchmarking from the industry, active cooperation with leading airline manufacturers, and then public promotion of it could be established, to demonstrate dynamism and out-of-the-box thinking in order to actively seek for better air plane models, or better adjusted combi-transport devises (e.g. for Air+Rail, Air+Sea); and more effective load units for the future to better answer to shipper’s requirements and being perfectly suited to GOT Airport traffic -> See an example of Finnair in cooperation with Airbus: Futuristic views on Aircraft in the future, labeled ‘Departure 2093’ – Visions of future flying. (www.departure2093.com).

For us the authors, this study has certainly been very interesting, educative and additionally challenging as the air freight industry business has lived through its yet biggest turbulence during these 7-8 months of our past intensive research time. Now approaching the end of this project, we can fully relate to following statement:

‘We have completely changed our budgets and forecasts in last week’ said one major cargo handler when *Airline Cargo Management* was interviewing the leaders

throughout the industry telling their predictions for the year 2009. ***“And it may change again next week”***.

Towards the end of our research process, Airline Cargo Management –magazine (March 2009) published an interesting article based on the review of the Strategy shift at currently leading European Cargo Airport (in terms of freighters), Amsterdam’s Schipol (AMS). What makes this interesting is that the conclusions of the report are amazingly similar as to what our study has found. *“Shippers generate cargo, not airlines or forwarders”* said Mr. Enno Osinga, senior vice president cargo at AMS.

...“Well connected layout and no congestion. Aim is to create an environment in which manufacturers and shippers are happy to create a base and make the region a multi-modal logistics hub”. “AMS is no longer focused on marketing to individual airlines – it is attempting to attract the source of cargo, and carry it by air, or sea, or rail. There is no competition between the modes; it’s about making the whole region attractive”. Also the importance of the multi-modal development, and the cooperation between the AMS airport and the largest European sea port, Rotterdam were stressed. *“I don’t understand why more airports and seaports don’t work together”*, stated Osinga.

12. Suggestions for Future Research

LFV Organizational Challenges and Marketing Structures

LFV Cargo's current centralized or non-centralized marketing for three main airports, Stockholm-Arlanda, Gothenburg-Landvetter and Malmö, is causing unclearness amongst the LFV organization itself, but also towards the clients as there is no clear image. Direct Cargo Concept – has been launched, and it seems to have all potential to succeed, but it needs much more promotion, starting from inside of the LFV organization. One possibility would be to conduct a research with assessing pros and cons by comparing the centralized to non-centralized organizations of marketing, and/or by benchmarking international corporations who frequently face this problem within even larger, globally spread organizations.

Analysis of Belly versus Freighter Cargo

According to this study, the ratio between belly cargo and freighter cargo in Nordic market is quite balanced, which means the demand for both type of air cargo services is close to same (50-50%). Possible specialization as a passenger or a cargo airport can provide a good opportunity to further focus on either belly cargo or pure freighter cargo handling operations. As for LFV case, Stockholm-Arlanda Airport is the largest hub in Sweden in terms of passenger volumes. Therefore the belly cargo there is higher than at any other Swedish airport. On the other hand, Gothenburg-Landvetter Airport has much less passenger volume, and the ratio between freighter and belly in Landvetter is 90% to 10%. To improve the usability of the infrastructure and the use of resources is a tough but crucial task to LFV as the common manager of Swedish Airports. How to better adjust and control this so called co-petitive⁴ situation among the LFV airports? Is the current business model for belly cargo charging still accurate?

From historical record, the airport management is more focusing on the passenger side. The major hub-airports of world are suffering of the congestion problem. And the freighter heading to these hubs has to wait longer time to get the handling service, as the passenger plane has the priority to first access the service provided by airport. This can severely undermine the time advantage of air cargo transport. Arlanda as the major gateway of passengers going in and out of Sweden has the similar situation. Landvetter is much less congested due to less passenger volumes. If Arlanda could

⁴ Co-petitive means in cooperation, yet in competition.

more concentrate on belly cargo service, while Landvetter puts more effort on freighter cargo service, the infrastructures and resources in both airports could be more optimally used. This does not mean that Arlanda should only handle belly cargo and no freighters at all, or that all freighters should go to Landvetter. Both airports can still attract new freighter or passenger lines when possible. The point is establishing the Swedish airport networks with Arlanda as passenger and belly cargo oriented, and Landvetter as freighter oriented airport hub, to provide better service by specialization and to maintain competence.

Further study on more effective multimodal cooperation

Multimodality will be an irreversible trend for the future development of transport. The air freight industry has to follow this trend and at the same time grasp the opportunity created by multimodality to get further self-development. From this study it became apparent that the sea-air combination will keep growing in the near future; the air-rail combination has received much more attention than before from forwarders due to its recognized future potential. From the policy point of view, according to EU Transport White Book, short sea and rail have been recognized as the two transport sectors that need to be revitalised. As a transport node within other transport modes, the airport should stronger pay attention to the importance of multimodality.

Gothenburg has a strategic, central location in the Nordic (and the larger Northern European) region; Port of Gothenburg is the largest one in Scandinavia peninsula in terms of cargo through-put. Aiming to improve the cargo handling efficiency and decrease the environmental impacts, the concept of dry ports has been introduced within the Port of Gothenburg. So far several dry ports with direct rail connection with the port have been established surrounding the Port in Gothenburg region.

The Dry Port -concept and the existing rail connected distant ports in Gothenburg provide many future possibilities and potentials to multimodal transport connection with air for GOT airport. The excellent geographical proximity with the Port of Gothenburg is the natural advantage of Landvetter for developing a true sea-air combination. The Swedish rail service is known for its high and 'green' quality, which offers the service guarantee for air-rail combination. Considering the relatively small air cargo volumes in the Nordic area, it is not necessary to build new 'own' dry ports for GOT airport in order to better connect with other transport modes. The airport can choose some of the existing dry ports as the interface of transshipment with air cargo. Consequently the airport could acquire better access to sea and rail transport without huge investment in infrastructures. At the same time, the infrastructure in

these dry ports will be more efficiently used. Obviously the good cooperation and coordination between different transport sectors are required to smooth the processes of the whole multimodal chain and to secure the service quality of multimodal transport.

Review and study of Importers and their influence on air freight

In this study, manufacturing shippers and exporters were covered in the research sample, but the textile and garment -driven importing industry is no less important to be investigated. Especially due to manufacturing increasingly moving to cheaper production areas such as Asia, and trade balance possibly shifting towards increasing imports, importers can be seen playing even higher importance in the future.

Other identified further research subjects:

- Deeper analysis per a specific group of stakeholders
- Deeper analysis per a specific subject area within a stakeholder.
- Focus on Airlines – Airport study from airlines view-point (post-depression economics 2009 era)
- Cargo Airport (longitudinal) study, post-depression economics 2009 era – how well did the future visions corresponded with the reality?
- Impacts of potential private ownership to Nordic airports; potential pros and cons, for example by utilizing the comparison of private and non-private cases from Europe.

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2009 Financial Performance Figures, provided by Brett Weihart, CFO, LFV.

Appendix

Appendix 1: Conducted interviews

Björn Ragnebrink	Director Business Development, Intercontinental Routes and Air cargo, LFV	23 January 2009, 14 May 2009
Brett Weihart	CFO Göteborg-Landvetter Airport, LFV	03 March 2009
Johan Andersson	Manager Route and Cargo Development, Göteborg-Landvetter Airport, LFV	23 January 2009, 03 March 2009
Bengt Wennerberg,	Logistics Manager, Business Region Göteborg	19 March 2009
Lars-Gunnar Comen	Air cargo Conventions, Consultant in Air cargo industry, Euroavia	19 March 2009
Johan Jemdahl	Logistics Manager, Ericsson	16 April 2009 (phone interview)
Martin Eliasson	SKF Logistics Services, Global Product Manager, Air freight	23 April 2009
Ulrika Heinel and Peter Wederbrand	Volvo Logistics, Transport Developer (Air) and Traffic Manager	24 April 2009
Tommy Burman	Spirit Air cargo Handling Sweden AB, Göteborg-Landvetter Airport	24 April 2009 (phone interview)
Jari Aaltonen	Manager Airfreight Pricing & Sourcing, DHL Global Forwarding (Finland) Oy	28 April 2009 (phone interview)
Gert Nilsson	Airfreight Director, DHL Global Forwarding (Sweden)	29 April 2009 (phone interview)
Håkan Larsson	CEO Nordic, DB Schenker, Transport and Logistics Division of Deutsche Bahn	13 May 2009

Appendix 2: Research Questionnaire

PART 1: A) short term (1-3 y) B) long term (~ 5 y)

1. GLOBAL CARGO MARKET VISIONS - (>Goal: visions for business development, e.g. routing development, markets)

How do you see the global market changing / what do you think will happen in international markets?

How about your (/ client's) business, **Demand – Supply (International)? Which market/markets is/are the focus market century, now and in future? WHY?**

(if didn't cover, ask:)

-Among 3 areas (in Asia, N-A, CIS), which one is the most important market in future?

Why?

-What influence this will have on the air transport due to these changes? (Like more long-range, non-stop flights, bigger size of planes...?)

2. FREIGHT: IMPORT / EXPORT - development? what will change? (>Goal: market changes, enabler & possibilities for business diversification, equipment)

Talk about goods that are exported/imported today (salmon, electronics / Clothing)

Which goods do you think will be imported in the future?

Which goods do you think will be exported in the future?

What is the ratio of cargo carried in PAX planes vs. pure Freighters?

For airline and handling agent:

-What new equipment is needed to handle the new type of air cargo in the airplane?

-In the cargo handling terminal?

For Shipper / Forwarder:

-How much of your Air Cargo is actually trucked to Central European Hubs?

3. CHANGING STRUCTURES OF AIR CARGO BUSINESS ACTORS: - (>Goal: Stakeholders: AP owners, Forwarders, handling agents, Airlines, Shippers/manufacturing companies ...)

Have roles changed compared to the past years?

Is there going to be similar structure in air freight business in the future? How is it going to be different? How will these changes influence the airport management?

- How would the possible privatization of GOT airport impact your business? Why?

PART 2: a) LFV & GOT SPECIFIC

4. LFV Cargo <-> CUSTOMER RELATIONSHIPS (-> Goal: Competitive advantages / disadvantages of LFV & LVT GOT)

How would you describe your relationship with LFV? (/Landvetter AP)

Do you cooperate with them? How / why?

-Why do you / your clients choose LFV / LVT?

- Give 5 words that describe best LFV / Landvetter GOT Airport? /

5. LFV SERVICES – based on your experience, do you have ideas for 'better' LFV?

(Airport Management, Route Development, Air Traffic Control / Navigation, Weather, Shops, Parking...) OBS! CLOSE TO Q 9.

What services are needed/wanted? **What is good/not so good? *******

6. COMPETITION? (->in Nordic area)

With other Airports?

What is your opinion and vision about competition with other transport modes?

Any Changes in manufacturing: Local sourcing? (e.g. due to high transport cost)? *****

7. MULTIMODALITY: **Your vision of multimodality in relation to air transport?**

Truck-Air / Air-Rail – Rail network Development? / Air- Sea

-What is the biggest obstacle of multimodal transport related with air cargo transport?

(-The possibility of Containerization in Air Cargo industry?)

8. CURRENT AIRLINE NETWORK – **Do you think that the location of global hubs, and feeder AP's will be the same?**

- How about PAX and Freight AP specialization?

Do you think LVT has the potential to be the Cargo Hub in Northern Europe?

-According to the industrial and economic environment of Nordic region, is it possible that GOT can / should attract more Airlines? *****

9. AIRPORT STRUCTURE -> **AP business centre / cargo park in GOT?**

Needed – not needed? What kind of activity / service **should be in there? Why?**

How do you evaluate the infrastructure in LVT? What extra infrastructure or equipment does LVT need to provide? (e.g. Information systems, e-bill, environmental?) *****

10. LFV CHARGES / **fee structure / prices**

(What do you think about the LFV prices (AP fees) today (*take-off, emission, noise and TNC, Parking fee, Route Charges & En-Route Charges?*)

- What about the possibility of incorporating the AP development (or infrastructure Fee) in the fees paid by users (like in India and in China)?

- GOT wants to be a Cargo Hub for the Nordic area - what do you think about the fees compared to other Cargo hubs? (lower or higher?) *****

11. DEMAND TURBULENCE & UNCERTAINTIES – IDEAS?

The demand for air cargo is highly depend on a few manufacturing industry. Any changes in these industries will make the demand vary significantly. What's your suggestion about how does the airport manage to reduce the risk caused by demand turbulence and uncertainties in air cargo transportation in order **(to keep on offering competitive service)?**

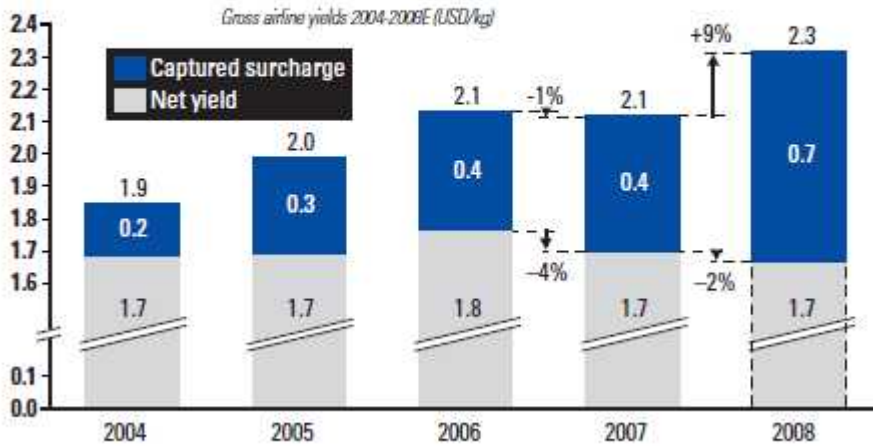
Do you have anything else you would like discuss that we have not covered? Or do you have any other ideas?

EXTRA QUESTION – ADDED: (If came up within discussion, an need to precise, ask:)

ENVIRONMENTAL ISSUES?:

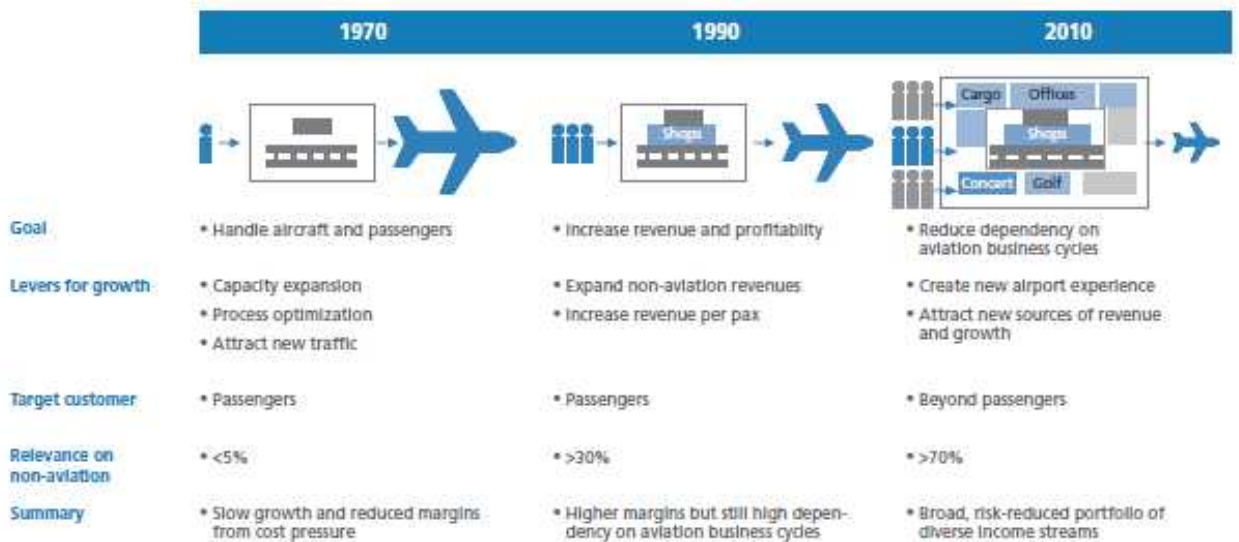
Appendix 3: Airline net yield decline

Net yield decline
 Gross airline yields are expected to grow by 9% in 2008 due to an increase in surcharges, disguising a decline in net yields of 2%.



Source: Seabury.

Appendix 4: Development of the Airport Business Model



Source: Oliver Wyman consulting, Aviation, Aerospace & Defence Group: *Airport Management for a World of Lower Demand and Greater Risk*, 2009. p.5.

Appendix 5: Air cargo Carriers operating on the Nordic Market

Official CASS Nordic Membership list (note that minor changes in the list has happened since 2007). List can be found at: <http://www.swedfreight.se/sv/Publikationer2/Scandinavian-Air-Cargo-Trade-Index/Tabell/>

CASS Nordic Membership list (1 Jan, 2007)

Manual			DK	NO	SE	FI
Aeroflot	SU	555			X	
Air Canada	AC	014	X	X	X	X
Air France	AF	057	X	X	X	X
Alitalia	AZ	055	X	X	X	
All Nippon Airways	NH	205	X	X	X	
American Airlines	AA	001	X	X	X	X
Atlas Air	5Y	369	X	X	X	X
British Airways World Cargo	BA	125	X	X	X	X
Das Air cargo	BV	761	X	X		
DELTA AIRLINES	DL	006			X	
Emirates	EK	176	X	X	X	X
Finnair cargo	AY	105	X	X	X	X
Jade Cargo International	JI	189	X	X	X	X
Japan Air	JL	131	X	X	X	X
KLM Cargo	KL	074	X	X	X	X
Kuwait	KU	229	X	X	X	
LAN Cargo	LA	045	X	X	X	X
Lufthansa Cargo	LH	020	X	X	X	X
Malaysian Airlines	MH	232	X	X	X	X
MartinAir	MP	129	X	X	X	X
Nippon Cargo	KZ	933	X	X	X	X
Polar Air	PO	403	X	X	X	X
SAS Cargo	SK	117	X	X	X	X
Saudi Arabian Airlines	SV	065	X	X	X	X
Singapore Cargo	SQ	618	X	X	X	X
Swiss World Cargo	LX	724	X	X	X	X
Tap Air Portugal	TP	047	X	X	X	
Thai Airways	TG	217	X	X	X	X
Turkish Airlines	TK	235	X	X	X	X
Varig Logistica	LC	183	X	X	X	X
US AIRWAYS Inc.	US	037	X	X	X	X
Weco			DK	NO	SE	FI
Africa West	FK	858	X	X		X
Austrian Airlines	OS	257	X	X	X	X
CargoLux	CV	172	X	X	X	X
Cyprus Airways	CY	048	X	X	X	X
Federal Express	FX	023	X	X	X	X
Iceland Air	FI	108	X	X	X	
Korean Air	KE	180	X	X	X	X
LTU	LT	266	X	X	X	X
Qantas Airways	QF	081	X	X	X	X
SIRIUS AIR			DK	NO	SE	FI
Cubana de Aviación S.A	CU	136	X		X	
MEA Middle East Airlines	ME	076	X	X	X	X
GSA Norway			DK	NO	SE	FI
Asiana	OZ	988		X		

Nordic GSA

			DK	NO	SE	FI
LOT Polish Airlines	LO	080	X		X	X
SN Brussels Airlines	SN	082	X		X	X
United Airlines	UA	016	X		X	X

CASS Nordic New members 1 Jan 2007

CUBIC AIR CARGO

			DK	NO	SE	FI
Air Baltic	BT	657	X			X
Bmi Cargo	BD	236	X	X	X	X
Cathay Pacific Airways	CX	160	X	X	X	X
Estonian Air	OV	960	X	X	X	
IBERIA	IB	075	X	X	X	X
QATAR Airways	QR	157	X	X	X	X
South African Airways	SA	083	X	X	X	X
UPS	UPS	406	X	X	X	X

Scanpartners International

			DK	NO	SE	FI
China Eastern	CK	781	X	X	X	X
CROATIA AIRLINES	OU	831	X	X	X	X
TAROM	RO	281	X	X	X	X
ASIANA	OZ	988	X			X
MALEV	MA	182	X	X	X	
ATLANTIC AIRWAYS	RC	767	X	X	X	X
MyTravel	DK	630	X	X	X	X
Zoom	Z4	389	X	X	X	X
Hello	HW	590	X	X	X	X
Novair	II	993	X	X	X	

Appendix 6: Best Cargo Airports

What do clients value? The ACW 2008/2009 ACE Survey asked respondents to evaluate each company by rating four measures on a scale of one as the lowest to five as the highest. For each measure, the average rating across all companies was calculated and set to a value of 100. For the complete survey of 93 airlines and 102 airports, go to: www.aircargoworld.com.

<p>CRITERIA FOR AIRPORTS</p> <p>Performance: Fulfills promises and contractual agreements, dependable, prompt and courteous customer service, allied services—ground handling, trucking, etc.</p> <p>Value: Competitive rates, rates commensurate with service level you require, value-added programs.</p> <p>Facilities: Apron, warehousing, perishables center, access to highways and other modes.</p> <p>Regulatory Operations: Customs, Security, FTZ.</p> <p>CRITERIA FOR AIRLINES</p> <p>Customer Service: Claims handled with expedience, problems solved in a prompt and courteous manner, professional and knowledgeable sales force.</p> <p>Performance: Fulfills promises and contractual agreements, dependable, accomplishes scheduled transit times.</p> <p>Value: Competitive rates, rates commensurate with service level you require, value-added programs.</p> <p>Information Technology: Tracking and tracing of shipments, Internet, electronic commerce capabilities.</p>
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2009 Air Cargo Excellence Survey - Best Airports

Airports Europe - 1,000,000 or more tonnes

	Performance	Value	Facilities	Operations	Overall
Frankfurt, FRA	108	104	103	108	105,7
Amsterdam, AMS	105	103	105	106	104,8
Paris De Gaulle, CDG	98	98	102	96	98,7
London Heathrow, LH	88	95	90	90	90,7

Airports Europe - 500,000 to 999,999 t.

	Perform.	Value	Facilities	Operations	Overall
Cologne/Bonn CGN	99	103	101	103	101,8
Brussels, BRU	105	96	98	101	100,1
Luxembourg, LUX	96	101	101	95	98,1

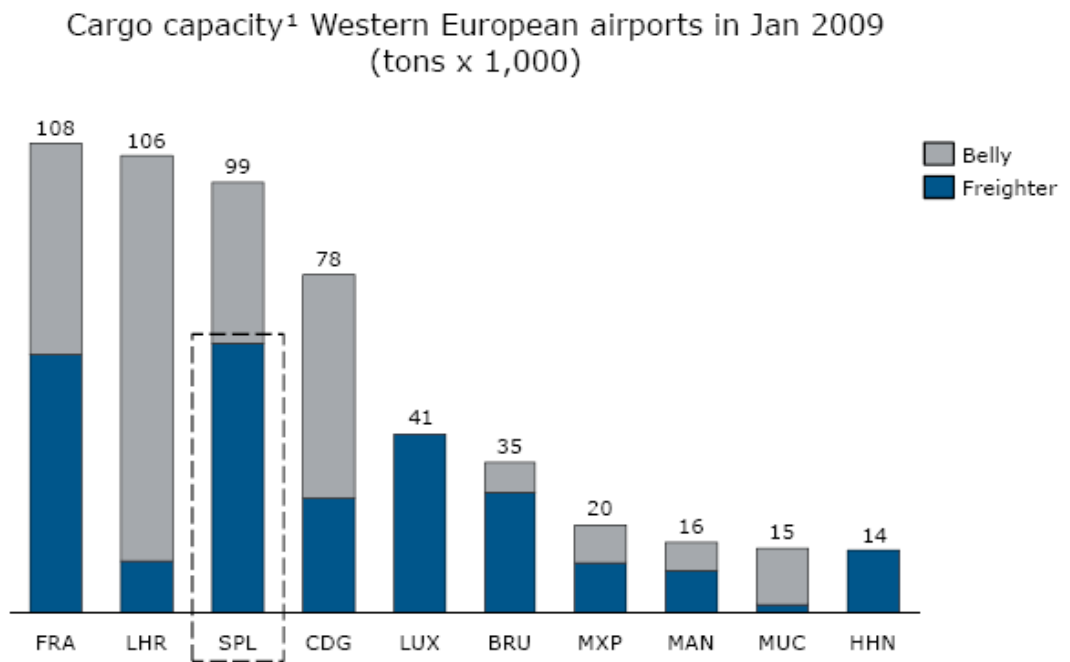
Airports Europe - 100,000 to 499,999 t.

	Perform.	Value	Facilities	Operations	Overall
Stockholm, ARN	118	116	119	115	116,9
Milan, MXP	111	110	115	108	110,7
Zurich, ZRH	106	104	111	110	107,7
Manchester, MAN	109	114	99	103	106,3
Rome, FCO	103	105	107	110	106,3
Copenhagen, CPH	104	106	101	108	104,9
Munich, MUC	112	98	106	102	104,6
Frankfurt-Hahn, HHN	99	105	105	103	103,0
London Gatwick, LGW	101	101	105	105	102,9
Vienna, VIE	104	106	103	99	102,8
Athens, ATH	103	94	113	100	102,5
Chateauroux-Deols	102	102	96	103	100,6
Madrid, MAD	96	102	103	98	99,6
Liege, LGG	94	98	98	105	98,7
Moscow, SVO	104	97	97	96	98,7
Oslo, OSL	95	99	105	97	98,7
London Stansted, STN	97	99	92	104	98,2
East Midlands, EMA	98	98	96	96	96,8
Helsinki, HEL	87	102	96	96	94,9
Barcelona, BCN	87	94	96	96	93,0
Ostend, OST	101	80	92	92	91,1
Vatry, XCR	99	90	88	81	89,3
Istanbul, IST	87	91	83	91	88,1
Lyon St. Exupery, LYS	85	89	76	83	83,5

Concerning Sweden / Stockholm Arlanda Airport:

NOTE: Despite the announcement by SAS that it is only going to focus on belly-hold cargo in the future, Stockholm's Arlanda airport made a significant jump from 105 to 116.9 overall to top the Index in the below 500,000 tonnes category.

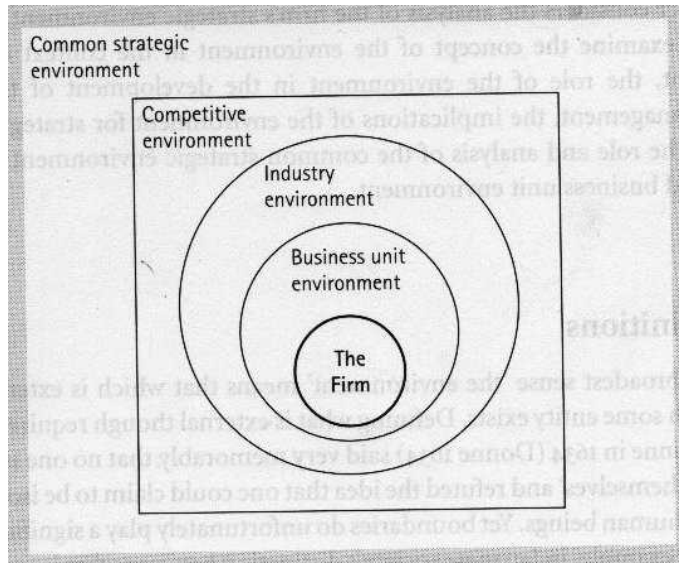
Appendix 7: Cargo Capacity, belly vs. freighter



NOTE: IATA code SPL used here refers to Amsterdam Airport Schiphol, which nowadays uses IATA code AMS.

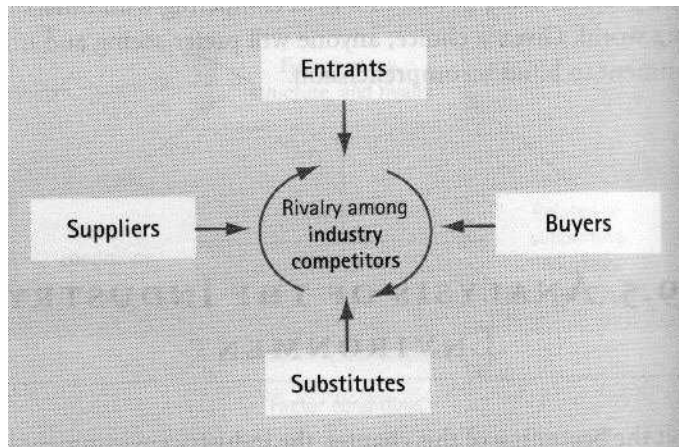
Source: Seabury 2009 Report.

Appendix 8: Models of Strategic Environment & Porter 5-forces



The Strategic Environment.

Source: The Oxford Handbook of Strategy, Volume I: Strategy overview and competitive strategy, Fig. 9.1, p. 226.



The Porter five forces.

Source: The Oxford Handbook of Strategy, Volume I: Strategy overview and competitive strategy, Fig. 9.6, p. 246.

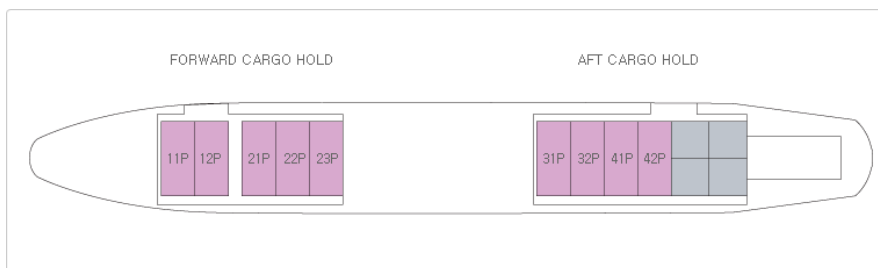
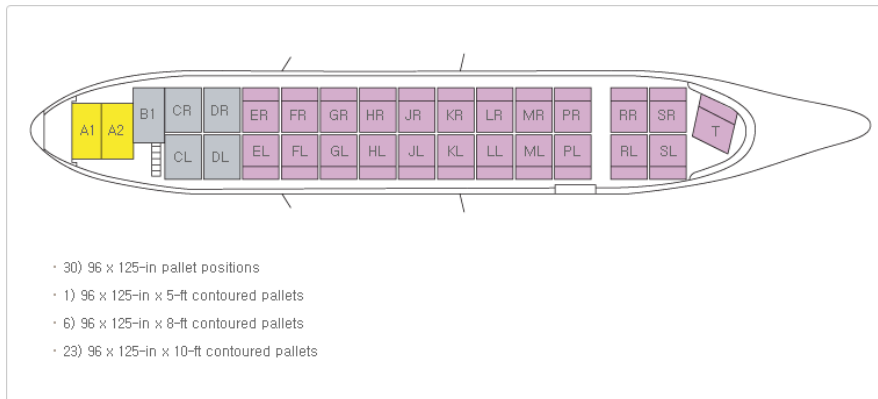
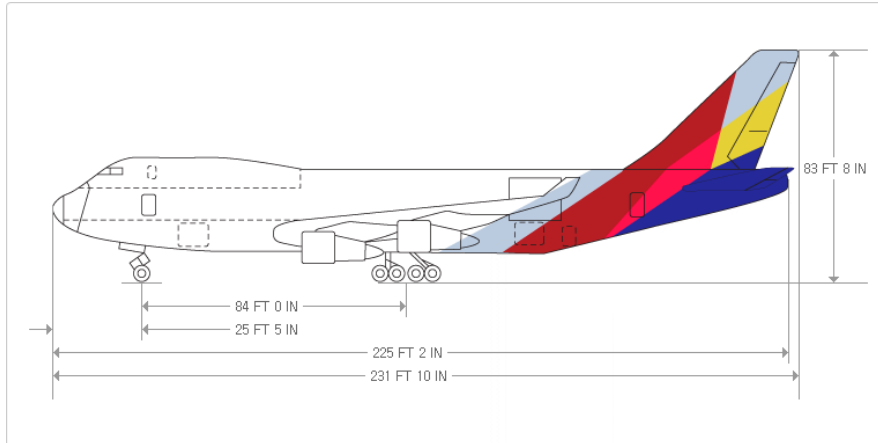
Appendix 9: Common Air Cargo Aircraft types

Asiana Cargo

Boeing 747-400F (source: <http://www.asianacargo.com/English/index.htm>)

Length: 68.13 m Cruising Speed: 915.km/h Height: 19.41m

Max Cargo Capacity: 117,000kg Wingspan: 64.44m



Lufthansa Cargo - MD-11F

Length: 61.21 m Cruising Speed: 945.km/h Height: 17.61m

Max take-off weight: 273,314kg (Operating empty: 113,920kg) Wingspan: 51.66m

Source: <http://www.airliners.net/aircraft-data/stats.main?id=112>



Boeing MD11	
Main Deck*/ Hauptdeck*	
26 positions	244 x 318 cm
Side Cargo Door	256 x 356 cm
Lower Deck*/ Unterdeck*	
Forward-Compartment	6 positions max. 244 x 318 cm
Forward-Compartment Door	167 x 264 cm
Aft-Compartment	4 positions max. 244 x 318 cm or 14 LD3 Containers
Aft-Compartment Door	67 x 264 cm
Compartment 5	Only loose cargo
Bulk-Compartment Door	91 x 76 cm
Maximum Capacity of Hold	14.4 m ³ , 2,294 kg
Loading Height / Ladehöhe	
Main Deck	Max. 245 cm
Lower Deck	Max. 163 cm
Average Cargo Capacity**	93,230 kg

DHL

Boeing 757-200/300

Length: 47.32 m/54.47m Cruising Speed: 914.km/h Height: 13.56m

Max take-off weight: 99,790kg/122,470kg (Operating empty: 57,840kg/64,590kg)

Wingspan: 38.05m

Source: <http://www.airliners.net/aircraft-data/stats.main?id=102>,

<http://www.airliners.net/aircraft-data/stats.main?id=101>



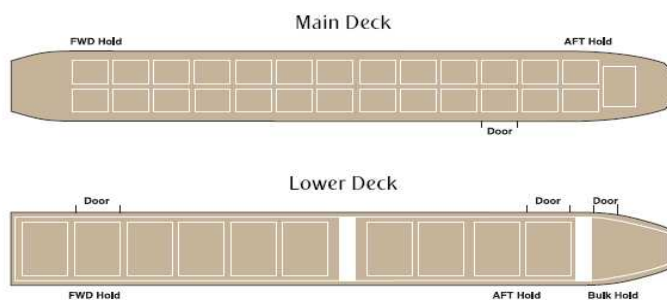
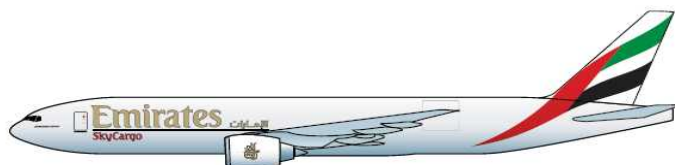
Emirates Sky Cargo

Boeing 777F

Length: 63.73 m Cruising Speed: 945.km/h Height: 18.6m

Max take-off weight: 347,450kg (revenue payload capability 103.9t) Wingspan: 64.8m

Source: <http://www.aerospace-technology.com/projects/boeing777f/>



STANDARD ULD CONFIGURATION

MAIN DECK - 27PMC (96" X 125")

22 X 118" Height (Contour)/ 4 x 116" Height (Contour)/1 x 96" Height (No Contour)

Lower Deck: Total 10 PMC (96" X 125")

Forward Hold: 6 PMC

AFT Hold: 4 PMC

ULD Combinations are permitted

Bulk Hold: 15 cubic metres

DOOR SIZES

Main Deck Door: 142" x 120"

Lower Deck Doors:

Forward Hold: 106" x 67"

AFT Hold: 106" x 67"

Bulk Hold: 35" x 47"

Cargo Tonnage: 103,000 KGS

Cargo Volume: 550 cubic metres

Source: <http://www.skycargo.com/aboutus/ourfleet/fleetinfo/777f.asp#0>

Appendix 10: Economic Crisis of 2008

Paul Krugman, the Winner of the Nobel Prize in Economics (*The return of depression on economics and the Crisis of 2008. 2009.*) states: “The world economy is not in depression; it probably won’t fall into depression, despite the magnitude of the current crisis (although I wish I was completely sure about that). But kinds of problems that characterized much of the world economy in the 1930s but have not been seen since—has staged a stunning comeback. Fifteen year ago hardly anybody thought that modern nations would be forced to endure bone-crushing recessions for fear of currency speculations, and the major advanced nations would find themselves persistently unable to generate enough spending to keep their workers and factories employed. The world economy has turned out to be a much more dangerous place than we imagined. (p. 181). Since our economists and policymakers have learned their lessons (from the bank panic developed in 1930-31, followed by the stock market crash 1929), nothing like that can ever happen again. Or ... can it?” (To deal with the emergency situation, Krugman suggest the receipt addressed to policy makers around the world: get credit flowing again and prop up spending) (p.184).

This crisis was ignited by the subprime mortgage crisis in US. Soon this domestic crisis spread to every corner of the world, and almost all industries have been touched. The finance industry is the first victim since it is the seedbed of the crisis. Thousands of financial companies including banks, investment companies, and consultant companies cannot afford loss and some of them filed to bankruptcy, some of them are sold out or bailed out by governments. Among these sad cases, the bankruptcy of Lehman Brothers is beyond all expectations.

As the depression deepens, the manufacturing industry is becoming the one among the biggest victims. The current conditions of three US automobile magnates provide a mimic picture of how the financial crisis overwhelmingly influences the vehicle producing industry. Crisis, it seems, has forced the US auto behemoth to move faster than ever to shed unprofitable brands. Just three days after telling the US government that it might dump its Swedish-based Saab brand, General Motors placed the struggling unit into re-organization on Friday, 20th Feb. GM also wants to shed the Hummer and Saturn brands as it tries to conserve cash and focus on Chevrolet, Cadillac, Buick and GMC to make it through an unprecedented global auto sales slump that has pushed it to the brink of bankruptcy. (*wtop.com, 2009*) Officially, Ford wants to hold on to its loss-generating subsidiary Volvo, but many in the industry think it will not do so for long. And on the stock market, GM's titles have not been so

low in over 50 years. The whole company is only valued at about \$3 billion on the stock market, while Ford's shares are worth a bit more. (*Leading US automakers GM and Ford looking into abyss, 2008*)

The aircraft manufacturing industry has been a two-role-playing market for a long time. With the rapid development of air transport, the orders have been shared by Airbus and Boeing. However, the financial crisis changed this all. Airlines around the world are opting out their orders, or postpone them for more optimistic times. Many are simply going broke. Airbus shows 122 order cancellations in the year to 30-Nov-08, while Boeing recorded seven for the full year. Details of deferrals are not disclosed, but many more carriers are seeking to delay orders than expedite them in the current environment, including major carriers such as Cathay Pacific and Southwest Airlines. Thai Airways in January of 2009 requested Airbus delay the delivery of six A330s scheduled this year (along with pre-delivery payments), citing acute cash flow problems. China's CAAC is encouraging airlines to cancel or delay planned new aircraft deliveries this year and to coordinate capacity adjustments with other airlines. The CAAC added it would strictly examine new aircraft purchase orders and noted 43 fewer aircraft would join the Chinese fleet this year than originally planned. Even more cancellations and deferrals in China's market are expected in coming months. (*centreforavation.com, 2009*)

In the first four months of 2008, air freight volume growth held up with a robust way. However since the financial crisis broke out, the volumes of cargo carried has fallen sharply, and now the growth rate has been negative for several successive months, according to IATA .

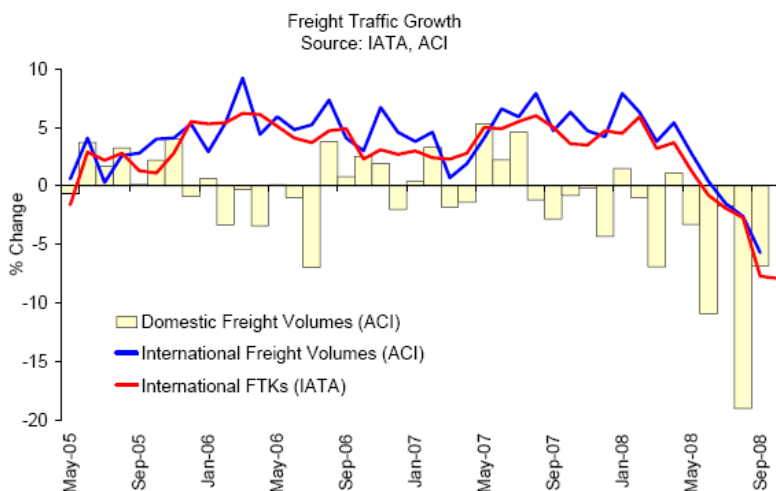


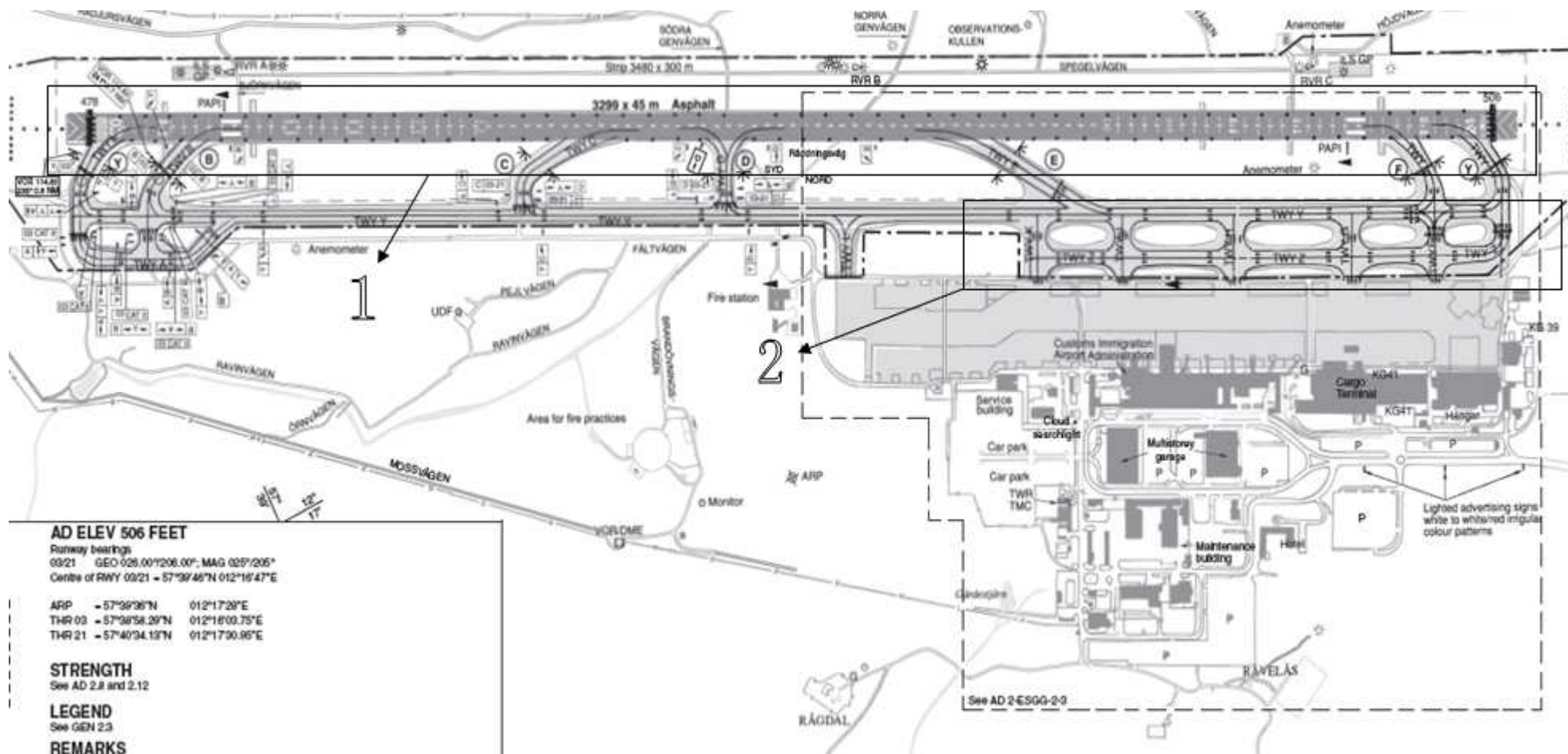
Figure A8.1: Air Freight Traffic Growth in the first three seasons of 2008 (*IATA Cargo Chart Book Quarter 4, 2008*)

The amount of shipments is decreasing since the large scale of order cancellation and postponement in the manufacturing chains. The products shipped by air are usually high value items and use air transport to decrease the lead time, in order to reduce the tight-up inventory cost. However, for the direct customers of these kinds of products, the banks are reluctant to lend loans as they used to. Their cash turnover will confront big problem if they still use huge amount of money purchasing such expensive goods. And at the same time, their customers who are the second layer customers of these valuable products, may also suffer the same problem and reduce, postpone or even cancel the orders as well. And in turn the first layer customers or direct customer will reduce, postpone, or cancel the orders to evade the risk of high inventory. From the manufacturers' point of view, as the number of orders is falling down; they have to constrain the production and figure out any possible way to reduce the cost. The manufacturers will cut down their sourcing and purchasing due to the same reason. In general, all actors in the supply chain are decreasing their businesses during this tough time.

The competition between container shipping and air cargo transport further weakens the current status of air cargo industry. The crisis force shippers to choose other cheaper ways delivering freights so that they can reduce the transport cost. Two Sweden based world famous groups, Volvo Group and Ericsson have decided to shift parts of their products from air transport to sea because of cost pressure. Except cost factor, as mentioned above the declining of manufacturing capacity caused by less orders also pushes more shippers from air to sea. Before crisis, under the guideline of JIT or Agile manufacturing, air transport is the best solution to reduce the lead time. Right now, the number of order is shrinking, and for manufactures, the urgency of short lead time is not as important as it was. From rates point of view, since year of 2007 container freight rates have fallen 9%, compared with a decline of just 3% in air freight yields, which turned up in Q2 of 2008. Therefore the expensive air option temporarily has lost its attractiveness.

Appendix 11: GOT Airport Structures

- 1: Runway
- 2: Taxiway
- 3: Airport Apron
- 4: Passenger Terminal, International Part
- 5: Passenger Terminal, Domestic Part and Airport Administration Offices
- 6: Cargo Terminal
- 7: Hangar
- 8: TNT and DHL cargo Terminal
- 9: Custom Immigration
- 10: Maintenance Building
- 11: Hotel
- 12: Environmental Station
- 13: Heating Center
- 14: Parking Place
- 15: Multi-storey Garage (Source: LFV GOT Airport)



AD ELEV 506 FEET
Runway bearings
03/21 GEO 026.00/206.00°; MAG 025/205°
Centre of RWY 03/21 = 57°39'46"N 012°16'47"E

ARP = 57°39'36"N 012°17'29"E
THR 03 = 57°36'58.29"N 012°16'03.75"E
THR 21 = 57°40'34.13"N 012°17'30.95"E

STRENGTH
See AD 2.8 and 2.12

LEGEND
See GEN 2.3

REMARKS

