



Hochschule für Angewandte Wissenschaften Hamburg
Hamburg University of Applied Sciences

Project

Department of Automotive and Aeronautical Engineering

Differences in Ground Handling in the Global Market

Yik Lun Tan

Supervisor: Prof. Dr.-Ing. Dieter Scholz, MSME

Delivered: 01.12.10

Abstract

In this project, the business model of Low Cost Airlines (LCA) in Asia, North America and Europe has been discussed. In Asia, LCA are lacking behind LCA in Europe and North America in many aspects. Different ways have been introduced by LCA in Asia to attract more passengers such as alternative booking and payment methods. Since internet is not as widely used in Asia as in Europe and North America, other distribution channels such as telephone and travel agents have been used by LCA in Asia. The market potential of LCA in Asia is very high and is blooming. Reason for it is Asia has the world's largest population. China and India especially, which have the world's first and second highest population, have high potential for LCA market. On the other hand, economy in Asia generally is undergoing a growth. Therefore more and more people afford to fly. In contrast, LCA in North America and Europe are doing well. The market is dominated by LCA which are already long established such as Ryanair, Easyjet and Southwest. Besides emphasizing on the fare, LCA try to improve their flight quality by providing snacks, entertainment etc. For example, JetBlue always keeps a good relationship with the passengers and provides more services on board in order to compete with their biggest competitor, Southwest Airline. Ground handling has been optimized by LCA in terms of cost and time. Usage of secondary airport enables LCA to economize their airport charges. The emergence of secondary airports is either by constructing new terminals or converting unused airports to secondary airports. The former method is more common in Europe and North America. In this project, ground handling has been further discussed and differences have been compared in the results. Ground handling is usually done by 3 parties, which are airline, airport and independent ground handling companies.





DEPARTMENT OF AUTOMOTIVE AND AERONAUTICAL ENGINEERING

Differences in Ground Handling in the Global Market

Task sheet for a project according to university regulations

Background

This student project is part of the research project Aircraft Design for Low Cost Ground Handling, ALOHA (<http://ALOHA.ProfScholz.de>). ALOHA tries to optimize the aircraft for ground handling operations. Optimized ground handling is also one of the key factors in the business model of Low Cost Airlines (LCA). LCA have optimized ground handling operations, reducing turnaround times and ground handling costs. Nevertheless, ground handling procedures are not only dependent on the airline business model, but also on the strategies of ground handling agencies, the type and size of the airport and the design of the aircraft.

Task

The project should broaden the background of ALOHA by providing a global and comparative picture of ground handling procedures and costs in different world regions. An emphasis of the investigation should be given to the comparison of ground handling between the three main world regions of the global market: Asia, Europe and North America. The tasks of the project are as follows:

Familiarization with LCA business models and ground handling characteristics within the European region. (The European region has been already analyzed within the ALOHA project).

Investigation on LCA business model characteristics with respect to Asia and North America.
Literature research on ground handling: procedures, equipment, personal, costs, airport infrastructures and typical turnaround layouts with respect to Asia and North America.

Discussion of the results and comparison between the three world regions.

The report has to be written in English based on German or international standards on report writing.

Contents

	Page
List Of Figures.....	5
List Of Tables.....	6
List of Abbreviations	7
1 Introduction.....	8
1.1 Motivation.....	8
1.2 Definitions.....	8
1.3 Objectives.....	9
1.4 Structure of the report	9
2 LCA Business Model.....	10
2.1 LCA Business Model in Asia.....	10
2.1.1 Future Plans for Secondary Airports in Asia	12
2.1.2 LCA in Asia	12
2.2 LCA Business Model in North America.....	14
2.2.1 Southwest Airline.....	14
2.2.2 JetBlue Airline	14
3 Comparison between LCA between North America, Europe and Asia.....	15
3.1 Secondary Airports in North America, Europe and Asia.....	15
3.1.1 Cost Reduction of Secondary Airports	16
3.2 Other Differences of LCA in North America, Europe and Asia.....	18
3.3 Similarities of LCA in the 3 different regions	19
4 Operating Cost of Airlines	20
4.1 Changes in Direct Operating Cost	21
5 Ground Handling	23
5.1 Ground Handling in Asia	23
5.2 Ground Handling in North America	25
5.3 Ground Handling in Europe.....	26
5.4 Standard Ground Handling Agreement.....	27
6 Summary.....	30
7 Conclusions.....	31
Acknowledgements	32
References.....	33

List of Figures

Figure 2.1 Passenger target for LCA.....	12
Figure 3.1 Growth in passengers over the years.....	15
Figure 4.1 Fuel and labour cost over the years.....	22
Figure 5.1 Ground handling in Europe.....	26

List of Tables

Table 2.1	Future plans for secondary airports in Asia	12
Table 3.1	List of countries and no. of available airports.....	16
Table 3.2	Comparison of airport charges in Malaysia	16
Table 3.3	Comparison of airport charges in Singapore.....	16
Table 3.4	Comparison of airport charges in Frankfurt.....	16
Table 3.5	Comparison of airport charges in Marseille.....	17
Table 3.6	Comparison of airport charges in Budapest.....	17
Table 3.7	Market share of LCA in North America	18
Table 4.1	Operating cost of airlines	20
Table 4.2	Changes in Direct Operating Cost	21
Table 5.1	Major airports in Asia	24
Table 5.2	Major airports in North America	25
Table 5.3	Major airports in Europe	27
Table 5.4	IGHC members in Asia.....	28
Table 5.5	IGHC members in Europe.....	28
Table 5.6	IGHC members in North America	29
Table 7.1	Variables of ground handling cost	30

List of Abbreviations

CIAS	Chnagi International Airport Services
GDP	Gross Domestic Product
IATA	International Air Transport Association
IGHS	IATA's Ground Handling Council
LCA	Low Cost Airlines
SATS	Singapore Airport Terminal Services Limited
SGHA	Standard Ground Handling Agreement
SWAT	Southwest Airlines Air Travel

1 Introduction

1.1 Motivation

LCA are a blooming industry. Due to the economy downturn, many passengers have chosen to go low cost instead of taking the traditional flights, which cost more. Besides the factor as described above, many other factors contribute to the bloom of this industry. The flight qualities of LCA have been increased over the past few years. In other words, LCA provide comfortable flights. Earlier the flight qualities of LCA were not as good as the flight qualities nowadays. The main problem that LCA face nowadays is how to go even more low-cost. Competitions are not only among LCA but also with traditional airlines, which are going lower cost as well.

Ground handling is part of the direct operating cost. In order to cut down expenses on direct operating cost, LCA have to find their way to cut cost on ground handling. North America, Europe and Asia are the 3 world regions that we investigate in this student project. These 3 world regions are very different in terms of technology and development. For example, North America and Europe have better facilities like airport, public transports and road infrastructure. However, in general labour cost in Asia is lower. Therefore, in Asia LCA can afford more workforce than in Europe and North America. Although in Asia LCA can save on labour cost, they have to spend more expenses in promoting and advertising. Due to the high labour cost, North America and Europe have to use better equipment.

1.2 Definitions

LCA are different from traditional airlines in many ways. Traditional airlines provide full service on board. Full service is including meals, drinks, entertainment and etc. In contrast, LCA provide only limited service with lower price. However, services like meals and drinks will be provided with extra cost. In other words, meals and drinks on board are optional for the passengers. This not only reduces the operating cost, it also reduces the turnaround time of the aircraft. Turnaround time is the time an aircraft needs from landing to the next take-off. Turnaround time has to be minimized for LCA. First of all, by minimizing the turnaround time, LCA can fully utilize the aircraft.

$$U_{d,f} = t_f \cdot \frac{A_d}{t_f + t_a + t_t} = t_f \cdot n_{f,d}$$

Equation 1.1 Equation of daily utilization of an aircraft (**Krammer 2010**)

Where

$U_{d,f}$ = daily utilization [h]

A_h = daily availability [h]

t_f = flight time [h]

t_a = turnaround time [h]

t_t = taxi time [h]

$n_{f,d}$ = number of flights per day

As we can see in equation 1.1, if the turnaround time is reduced, then the aircraft can make more flights per day.

In order to minimize turnaround time, LCA have to speed up ground handling processes. Ground handling processes including unloading passengers and baggage, refuelling, de-icing and etc. Most of the processes are done simultaneously. However, some processes like refuelling can only be done when there is no passenger on board. Turnaround time for LCA is usually around 30 minutes.

1.3 Objectives

This project is to find out the differences of ground handling in term of cost, procedure, equipment in the 3 world regions, which are North America, Europe and Asia. LCA business model will also be discussed in this project. Although LCA business model are more or less the same globally, there are some differences due to economic and geographic issue. Business model of LCA in Europe has been already analyzed in ALOHA project. A further investigation will be made in this project for Asia and North America.

The main goal of this project is to understand how LCA in different world region work and methods they use to lower their expenditure on ground handling.

1.4 Structure of the present report

This report is structured as follows:

- Chapter 2** explains the business model of LCA in North America and Asia.
- Chapter 3** describes the differences between LCA in North America, Europe and Asia
- Chapter 4** shows the relation between ground handling cost and operating cost of airlines
- Chapter 5** explains the ground handling in North America, Europe and Asia

2 LCA Business Model

2.1 LCA Business Model in Asia (Detlin 2004)

LCA have been running successfully in Europe and North America. Due to the economy downturn, LCA are preferred over traditional airlines as they offer a lower price with minimal services. Price has been taken into the main consideration of the passengers in choosing the airlines. LCA have been more and more popular in Asia because of its price, which can be lower price than other mode of transportation like buses.

Aircraft industry in Asia has the world's lowest unit costs. In other words traditional Asian carriers offer a lower price in comparison to Europe and North America carriers. For example, Singapore Airlines' unit costs are 59% lower than the unit costs of American Airlines. Another concern of Asian LCA is to lower their price even more in order to compete with the traditional airlines. Usually in Asia, the traditional airlines are flag carriers. Flag carriers are state-owned and mostly receive subsidy from respective governments. In Malaysia, government uses taxes to cut fares in order to compete with low fare airline Air Asia. Law-suits against this will turn out to be extremely difficult compared to in Europe and North America because the flag carriers are normally well-protected from being over alleged pricing. Since flag carrier like Malaysia Airlines, which is a state-owned company, are so invulnerable against law-suits, it increases the difficulty of the existence of LCA in Asia. A flag carrier's reputation reflects the reputation of its nation. Hence the government will for any cost subsidise its own carrier.

Another concern for LCA in Asia, why they are lagging behind Europe and North America is their ability to keep costs much lower than traditional airlines. We know that the wage rate in Asia is relatively low compared to Europe and North America. Hence, LCA in Asia face difficulties on keeping a big cost gap between the traditional airlines and LCA. For example, JetBlue and Southwest are able to keep their cost 30-40% lower than the traditional airlines by cutting costs on their labours' salaries. By doing so, it helps to keep a significant cost gap between the traditional airlines and LCA and hence contributes to the success of LCA in this region.

Another problem that Asian LCA face is the infrastructures that Asia provides, for example the lack of secondary airports. One of the advantages of secondary airports in comparison with primary airports is, secondary airports tend to be less congested, as secondary airports are only used for LCA. Directly it brings to a shorter taxi time and less flight delay possibilities. In short, it reduces the turnaround time which has positive implications on the aircrafts utilisation. Moreover, with a lower landing fees and airport charges, servicing secondary airports helps LCA to reduce their price significantly. Another advantage of servicing secondary airports is, these airports are less congested during peak hour. If LCAs are using primary airports, LCA' flights are limited to non-peak hours in consideration of the landing fees and airport charges. However, the usage of secondary airport is not that common compared to Europe and North America. The public transport in Asia, as in most of the countries in Asia, is not well-developed. It enhances the difficulty for passengers to travel from city centre to secondary airports because secondary airports are not central-located. If there is no public transport to the airport, the only choices left are by driving or by taking a taxi. Most people will not prefer the latter as this will increase their budget. It indirectly increases the cost of taking LCA, which might lead the passengers to choosing traditional

airlines instead. Examples of Asia secondary airports are Macao and Johor Bahru, which are the secondary airports for Hong Kong and Singapore respectively. From Macao to Hong Kong, passengers have to travel by either bus or ferry for another two hours. On the other hand, Johor Bahru is not located in Singapore but in Malaysia. It is 90 minutes away from Singapore by driving.

Asia's population is increasing and as their GDP grows, more development of airport infrastructures is required. A growth in GDP leads to a rise in the passengers of LCA, since most of the passengers are middle income or low income group.

In Asia, internet user usage remains relatively low compared to Europe and North America. In average, internet penetration in Asia is 21.5%. Except North Asia and some developed countries in Asia, internet penetration is actually lower than 20%. This means that LCA cannot depend on internet as their sole distribution channel. Consequently payment through credit card or any other online method is not effective for Asian LCA. In Malaysia, although the internet usage is among the highest in Asia, Air Asia's sales through online is only 45%. Alternative ways have been introduced to handle this problem. For example, Air Asia has introduced booking through text messages, for the convenience of the customers who have no access to the internet and credit cards. It is the first airline in the world to introduce this SMS booking service. The tickets can be collected from the ticket office within 24 hours. Call centres also have been set up for reservations, and payment can be made through ATM which is easily available in the city. This method has been proven to be effective to be one of the main distributions as the call centres accounted for 40-50% of low cost carriers' total sales in Indonesia and Thailand and 30% in Singapore and Malaysia. LCA require instant payment after a booking is made. Credit cards are so far the most convenient instant payment. Unfortunately not everyone has a credit card, especially the middle income and low income individuals. Hence, alternative ways of payment have been introduced. Air Asia opened ticket offices in the cities to enable passengers to pay in cash. Besides that, Air Asia also works together with several travel agents, which help to solve the payment convenience problem and on the other hand serve as distribution channel for Air Asia. In return, the travel agents will get commission by selling Air Asia tickets or they will charge the passengers a minimum amount of booking fees.

Convenient stores and ATM machines have become the payment medium for LCA in Asia. In Asia, somehow the people are more willing to pay cash. The payment methods stated above are surely more accepted by most of the passengers. Passengers of LCA consist mainly of low and mid income individuals, as well as students. Therefore the payment method is the main concern of the LCA, if the LCA intend to attract more new passengers. Besides that, as food and drinks are relatively cheap in Asia, certain LCA also provide on board light meals or snacks. This will increase the satisfactory of the passengers and will definitely encourage more repeat customers. Nevertheless, most airlines do not provide meals not because of the costs of the meals, but the longer turnaround time that they might need to clean the cabin.

2.1.1 Future Plans for Secondary Airports in Asia

There are some plans that have been made to handle this problem. Examples are shown in Table 2.1.

Table 2.1 Future plans for secondary airports in Asia (**Bonnefoy 2008**)

China (Beijing)	A second airport, which is expected to start in 2010, will be constructed
India (Bangalore)	A new airport was constructed in 2008. The old airport will be the secondary airport
India (Hyderabad)	A new airport was constructed in 2008. The old airport will be the secondary airport
Malaysia (Kuala Lumpur)	A new airport was constructed in Subang to serve domestic traffic
Indonesia (Jakarta)	A new airport was constructed and the original one serves as a secondary airport
Philippines (Manila)	Emergence of two secondary airports in Subic Bay and Macapagal

2.1.2 LCA in Asia (Anming Zhang 2009)

Air Asia (Malaysia, Thailand and Indonesia)

Air Asia provides no frill on board..The airports used are KLIA (LCCT), Kota Kinabalu, Kuching, Johor Bahru, Bangkok (Suvarnabhumi) and Jakarta. No frill is provided on board. Other services that Air Asia provides are SMS reservation, web/online check in, charges for extra baggage weight. Air Asia provides both domestic and international flights which are within 4 hours duration. Aircrafts used are B737 and A320.

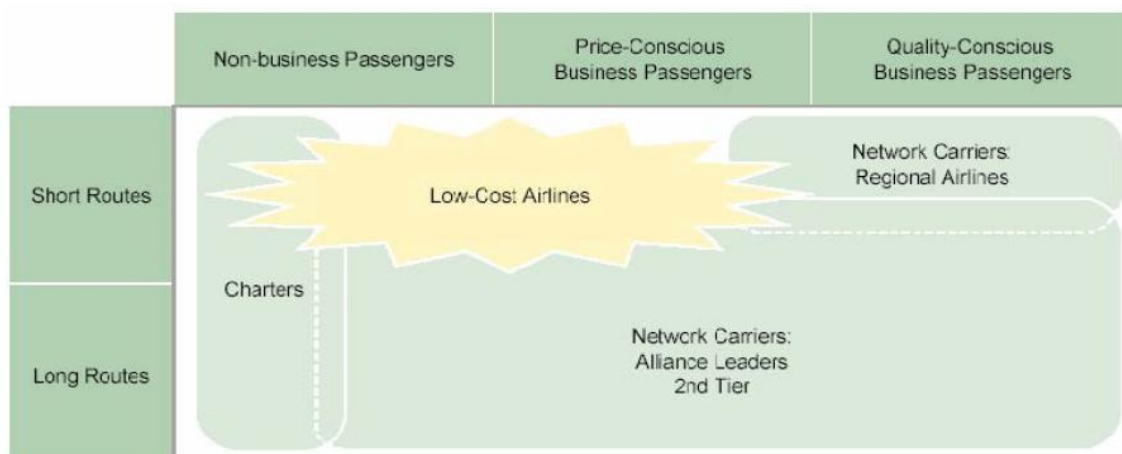


Figure 2.1 Passenger target for LCA (**Anming Zhang 2009**)

As we can see from the diagram above, the main target of AirAsia and all LCA is non-business, price-conscious business passengers for short haul flights.

Air Asia X (Malaysia)

Air Asia X is established to provide international long-haul flights which are more than 4 hours. Passengers may choose to have frill or no-frill service before boarding the flight. Besides that, light meals are available to be purchased onboard. Air Asia X is based at KLIA (LCCT). An expansion of LCCT is currently under progress and will be finished in year 2011. Aircrafts used are A330, which are less fuel consuming.

From the diagram above, Air Asia X main target group of passengers is long routes, non-business and price-conscious business passengers.

Nok Air (Thailand)

Nok Air which is based at Bangkok (Don Muang) provides only domestic flights. Free snacks and drinks are provided on board. Nok Air has a fixed fare system. Passengers can easily make the payment in bank or 7-11 (convenient store). Prepaid cards are also sold for frequent travellers.

Tiger Airways (Singapore)

Tiger Airways provides only international flight within 4 hours. This LCA is based at Singapore (BT). There is no free frill service. However, for passengers who like to enjoy a meal or some drinks on board, food and beverages are available for purchase. For flights more than 3 hours, meals are provided. Reservations can be made through ATM machines and payment can be made in 7-11 (convenient store)

Lion Air (Indonesia)

This airline which is based at Jakarta and Surabaya provides domestic and a few international flights. Free snacks and drinks are provided. Reservations can be made by SMS.

2.2 LCA Business Model in North America

2.2.1 Southwest Airline (Sven Gross 2007)

LCA were first introduced in United States and can be said as the founder of LCA. The pioneer of all LCA is Southwest Airline. In 1971 Southwest Airline started to provide low cost flights, which had no frills service and used only single aircraft type. At that time, low fare flights were uncommon. Hence services were only between Dallas, Houston and San Antonio Texas. Sooner, it was proven worthy for Southwest Airline to take the risk of introducing it, as the low fare concept was very much accepted and soon became popular globally. Besides that, a couple of initiatives were taken by Southwest Airline to maintain a competitive fare structure, such as electronic ticketing and usage of second hand aircraft.

Southwest Airlines has also introduced its own simplified computer reservation system, which is SWAT (Southwest Airlines Air Travel). Customers can easily reserve tickets through SWAT. Besides e-ticketing, travel agencies are also one of the main distribution channels of Southwest Airlines. Customers are guaranteed to receive their ticket within 24 hours after the reservation.

Moreover Southwest Airline was the first to serve secondary airport, to avoid head-to-head competition with the major carriers and on the other hand to reduce the operation cost. In

addition, Southwest airline changes its business model to fit the need of the passengers. Special treatment and special boarding were given for its passengers. These 2 new offerings are the reversal of its airborne democracy, which is “all flyers are equal”.

Although by just providing low fare flights, Southwest Airline has been able to maintain its profitability year after year, and is now the fourth largest carrier in the United States.

2.2.2 JetBlue Airline (Sven Gross 2007)

JetBlue Airline provides long haul flights from John F.Kennedy (JFK) Airport. In order to maintain low fare, JetBlue Airline uses new aircraft. Although new aircraft are at a higher price, operating them is cheaper comparable older aircraft. Another way of JetBlue to reduce operating cost is by investing in technology such as automated baggage handling.

Furthermore JetBlue offers some on board entertainment. In other words, JetBlue tries to create a distinctive brand, by offering low fares but higher standard of service.

A constant communication with customers is necessary to keep the customers up-to-date if there are any inconveniences or changes. Compensations and refunds will be made sometimes if there are inconveniences. This ensures a good relationship between the airline and the customers hence increases the rate of repeat customers.

3 Comparison between LCA between North America, Europe and Asia

3.1 Secondary Airports in North America, Europe and Asia

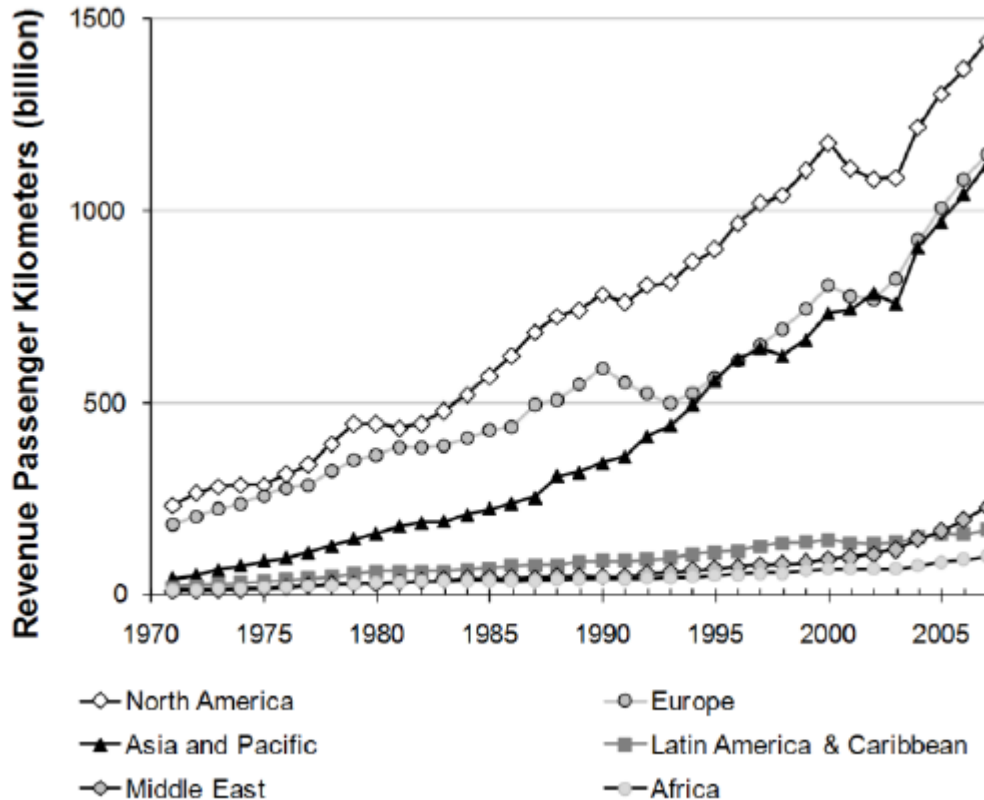


Figure 3.1 Growth in passengers over the years (Bonnefoy 2008)

As we can see from Figure 3.1, there is a dramatic growth in the number of passengers since 1990 globally. However, despite its growth of passengers, North America has more available airports in compared to other world region. In North America there is usually a serviceable secondary airport within 100km of every major city. In contrast, Asia has the highest ratio of population to airports, which means that the number of airports available in Asia is actually not sufficient. In many Asia's main cities, primary airports will be the only choice for LCA. This will increase the operating cost of the LCA and slow down the growth of LCA industry in Asia.

Table 3.1 List of countries and no. of airports available (**Bonnefoy 2008**)

Country	Population in millions	Airports with paved with runways longer than 5000 ft	Ratio of Population to Airports (millions)
Bangladesh	150	9	16.7
India	1130	141	8.0
Nigeria	135	28	4.8
China	1322	321	4.1
Indonesia	235	68	3.5
Pakistan	165	68	2.4
Japan	127	87	1.5
Brazil	190	196	1.0
Mexico	109	122	0.9
Europe	490	1013	0.5
Russia	141	379	0.4
United States	301	1836	0.2

3.1.1 Cost reduction of secondary airports (Swanson 2007)

Table 3.2 Comparison of airport charges in Malaysia (**Swanson 2007**)

Ringgits	Main Terminal			LCC Terminal		
	A319	B737-800	Total	A319	B737-800	Total
Landing Charge	440.71	507.92	948.63	440.71	507.92	948.63
Parking/Airbridge	85	85	170	0	0	0
Passenger Charge	5735.50	7229.25	12966.75	4462.50	5622.75	10085.25
Terminal Navigation	0	0	0	0	0	0
Total	7028.21	8786.07	15814.28	4903.21	6130.67	11033.88

Table 3.3 Comparison of airport charges in Singapore (**Swanson 2007**)

Singapore Dollars	Main Terminal			Budget Terminal		
	A319	B737-800	Total	A319	B737-800	Total
Landing Charge	458.51	572.76	1031.27	458.51	572.76	1031.27
Parking/Airbridge	85	85	170	0	0	0
Passenger Charge	2677.50	3373.65	6051.15	1657.50	2088.45	3745.95
Terminal Navigation	0	0	0	0	0	0
Total	3221.01	4031.41	7252.42	2116.01	2661.21	4777.22

Table 3.4 Comparison of airport charges in Frankfurt (**Swanson 2007**)

Euros	>30 Minute Turnaround			< 30 Minute Turnaround		
	A319	B737-800	Total	A319	B737-800	Total
Landing Charge	320.00	391.00	711.00	0	0	0
Parking/Airbridge	0	0	0	0	0	0
Passenger Charge	1115.63	1405.69	2521.31	870.83	1097.24	1968.06
Terminal Navigation	162.75	179.90	342.65	162.75	179.90	342.65
Total	1598.37	1976.59	3574.96	1033.57	1277.14	2310.71

Table 3.5 Comparison of airport charges in Marseille (Swanson 2007)

Euros	Main Terminal			Mp2 Terminal		
	A319	B737-800	Total	A319	B737-800	Total
Landing Charge	195.93	252.87	448.8	195.93	252.87	448.8
Parking/Airbridge	182.64	186.05	368.69	0	0	0
Passenger Charge	1566.98	1974.39	3541.36	967.73	1219.33	2187.06
Terminal Navigation	237.99	285.03	523.02	237.99	285.03	523.02
Total	2183.54	2698.33	4881.88	1401.65	1757.23	3158.89

Table 3.6 Comparison of airport charges in Budapest (Swanson 2007)

Euros	Terminals 2A/2B			Terminal 1		
	A319	B737-800	Total	A319	B737-800	Total
Landing Charge	603.62	730.43	1334.05	603.62	730.43	1334.05
Parking/Airbridge	100	100	200	0	0	0
Passenger Charge	2175.15	2740.69	4915.84	1565.70	1972.78	3538.48
Terminal Navigation	61.67	61.67	123.34	61.67	61.67	123.34
Total	2940.44	3632.79	6573.23	2230.99	2764.88	4995.87

JFK Jetblue Terminal (Swanson 2007)

1. The airline would continue to pay its appropriate landing and parking charges.
2. The airlines passengers would continue to pay a departure fee to the Port Authority.
3. The airline will pay a ground rent for the terminal for the 30 year lease period.
4. The airline is responsible for the maintenance and operation of the terminal building.
5. The Port Authority will derive a percentage of the concession fees from sales in the terminal building.
6. The airline will derive the remainder of the concession fees from terminal concessionaires.

Above are the applied charges for airlines which service in secondary airports. In Malaysia and Singapore, the airlines can save up to 35% of the airport charges if they service secondary airports. The development of JFK Terminal is financed by the Port Authority of New York. There is no rebate or pricing differential to the airline. However, a deal has been made between Jetblue and the airport, that Jetblue Airways will pay some fees for using the airport. In Frankfurt Hahn, there is a lower airport charges for aircraft with turnaround lesser than 30 minutes. For aircraft which has lesser than 30 minutes turnaround time, there is no landing charge. Passenger charge in Frankfurt Hahn also varies depending on the number of the passengers carried through the airport annually. The user of the low cost terminal in Marseille pays only around 65% of the equivalent charges payable in the main terminal. The low cost terminal in Budapest, which is used by 6 low cost airlines and the Ukrainian airline Aerosvit, charges around 75% of the equivalent charges in the main terminal.

3.2 Other Differences of LCA between North America, Europe and Asia (Nadja 2003)

Table 3.7 Market share of LCAs in North America (Nadja 2003)

Airline	Low-Cost Market	Regional Market	Long Haul Market	Entire Market
JetBlue Airways	15.70%	1.63%	3.38%	3.12%
Frontier Airlines	3.56%	0.76%	0.87%	0.71%
National Airlines	14.18%	0.41%	3.05%	2.82%
Vanguard Airlines	0.69%	0.52%	0.14%	0.14%
Spirit Airlines	5.46%	1.58%	1.17%	1.08%
Sun Country Airlines	0.51%	0.15%	0.11%	0.1%
America Trans Air	17.07%	2.03%	3.65%	3.39%
Southwest Airlines	42.65%	28.71%	9.11%	8.47%

In North America, most of the LCAs compete among themselves whereas in Asia, the LCAs compete mostly with the traditional airlines. In Asia, the cost gap between the LCAs and traditional airlines is not as huge as in North America. Therefore, LCAs face competition mainly from the traditional airlines because at the same time the traditional airlines are trying to cut cost to attract more customers. The scenario of LCAs in North America is, they have to mainly compete among themselves for the market. In table 3.7, it shows that, there are 8 airlines that are competing with each other for the low-cost market in USA itself. Not all of the airlines are LCA but some of the traditional airlines have lowered their prices to compete with LCA.

Besides the differences stated above, LCA in North America mostly offer domestic flights. In Asia, more international flights are offered by the LCA. Therefore the liberalization of rules and regulations on aviation industry among Asian countries strongly promotes LCA in Asia. For example, the open skies agreement within the Southeast Asian countries has enabled the airlines to offer more destinations in Southeast Asia. In general, most intra-ASEAN flights are less than 2000 miles. This distance is suitable for single-aisle aircraft, which are used by most LCA. In short, LCA in Asia target more on international flights, whereas LCA in North America target more on regional flights.

Passengers have more variety in choosing LCA in North America compared to Asia. In other words, there are a few LCA providing the same point-to-point service with different prices and time. Therefore, passengers are more flexible in choosing the airlines as well as the time they prefer. In contrast, in Asia there is usually only one LCA that provides the same point-to-point service, which means that passengers in Asia have less choice in choosing LCA.

3.3 Similarities of LCA in the 3 different regions

LCA in general are more or less the same globally. LCA are normally cheaper than traditional airlines. There are pros and cons for LCA. Therefore, passengers must decide themselves either they are going for LCAs or traditional airlines. Typical similarities are stated below:

1. Point to point service
 - LCA provide no transit. It shortens the turnaround time and hence LCAs can save costs on airport charges.
2. No free food and drinks
 - Usually there is no special cleaning crew for LCA. The entire cleaning job is done by the cabin crew. No free food and drinks means lesser cleaning time and shorter turnaround time.
3. High aircraft utilization
 - LCA maximize the aircraft utilization by planning the route. LCA will avoid peak hours as they have to pay higher charges for the airport.
4. Same type of aircraft
 - LCA can save on aircraft maintenance if the same type of aircraft is used. Spare parts of aircraft can be interchanged.

4 Operating Costs of Airlines

Table 4.1 Operating Costs of Airlines (Detlin 2004)

Cost Item	US¢ per ATK			% of total operating costs		
	North America	Europe	Asia	North America	Europe	Asia
Flight Crew	5.3	3.5	1.4	11.3	6.4	4.1
Fuel and Oil	6.5	7.0	6.4	13.9	12.6	18.4
Flight Equipment	0.0	0.1	0.2	0.0	0.1	0.5
Insurance						
Rental of Flight Equipment	2.4	3.7	3.1	5.1	6.6	8.8
Flight Crew Training	0.0	0.2	0.1	0.0	0.3	0.4
Other Flight Expenses	0.4	0.0	0.2	0.9	0.0	0.7
Maintenance and Overhaul	5.4	5.6	3.2	11.5	10.2	9.2
Depreciation	2.6	3.4	3.0	5.6	6.1	8.7
Total Direct Operating Cost	22.6	23.5	17.7	48.2	42.4	50.8
Airport Charges	0.7	2.4	1.3	1.5	4.3	3.8
Enroute Charges	0.5	2.3	1.3	1.0	4.2	3.8
Station Expenses	7.0	7.5	2.5	14.9	13.5	7.2
Passenger Service	5.2	7.0	4.0	11.2	12.7	11.6
Ticketing and Sales	6.6	8.5	5.0	14.1	15.3	14.2
General and Administrative	2.4	4.2	1.3	5.2	7.6	3.7
Other Operating Expenses	1.8	0.1	1.7	3.8	0.1	4.9
Total Indirect Operating Costs	24.2	31.9	17.2	51.8	57.6	49.2
Total Operating Costs	46.8	55.4	34.9	100	100	100

Table 4.1 gives an overview of airline operating costs in North America, Europe and Asia. In overall, total operating costs in Europe are the highest, followed by North America and Asia. Total operating costs in Asia are 25% lower than in North America and 37% lower than in Europe.

Labour costs are low in general in Asia. Activity like aircraft maintenance and overhaul requires high labour input and hence airlines in Asia have lower unit costs in this area. Although generally the labour costs are lower, huge differences exist within the Asian carriers. For example, a flight attendant at Philippine Airlines earn 10 times lower than a flight attendant at Cathay Pacific.

The data above shows that, the airport charges in North America are relatively low compared to Asia and Europe. For example, landing fee and government taxes for a B747-400 in London-Heathrow are 3 times higher than in Singapore. Important exceptions are the Japanese airports, which have much higher charges than any other airports in Asia.

4.1 Changes in direct operating cost (IATA 2010)

Table 4.2 Changes in direct operating cost (IATA 2010)

	North America		Europe		Asia Pacific	
	2001	2008	2001	2008	2001	2008
Labour	36.2%	21.5%	27.2%	24.8%	17.2%	14.7%
Fuel	13.4%	34.2%	12.2%	25.3%	15.7%	36.7%
Aircraft Rentals	5.5%	3.0%	2.9%	2.5%	6.3%	4.5%
Depreciation and Amortisation	6.0%	4.5%	7.1%	5.7%	7.4%	7.8%
Other	38.9%	36.9%	50.7%	41.8%	53.4%	36.3%

From table 4.2, fuel and labour costs make up the biggest portion of the total costs of airlines globally. In year 2001, fuel cost was relatively low in comparison to labour costs, which makes up less than 20% of the total costs of airlines. However, due to the price increase in fuel globally, fuel cost is now the biggest portion of the total costs.

The wage level in Asia is relatively low by looking at the labour share of the airline operating cost, which was 21.5% in North America and 24.8% in Europe. There is a significant fall in labour cost in North America from 36.2% in 2001 to 21.5% in 2008 due to improvements in labour productivity and reductions in total labour costs. North American airlines underwent a large scale restructuring in 2001, which enabled them to cut down a significant amount of labour cost. In Asia, relatively cheap labour cost has been an advantage for airlines to cut down their direct operating costs. Labour cost has never exceeded 20% of the total costs of airlines. Increase in fuel price brings a great impact to Asian airlines. On a proportionate basis, Asian airlines have been most exposed to higher fuel costs in compared to the 3 world regions.

From Figure 4.1 we see that there is a point where airlines spend the same amount of money on fuel and labour costs. After that, due to the limited sources of fuel, the fuel price will never decrease. All airlines are experiencing this and in the future, fuel price will be the dominant in airlines' operating costs.

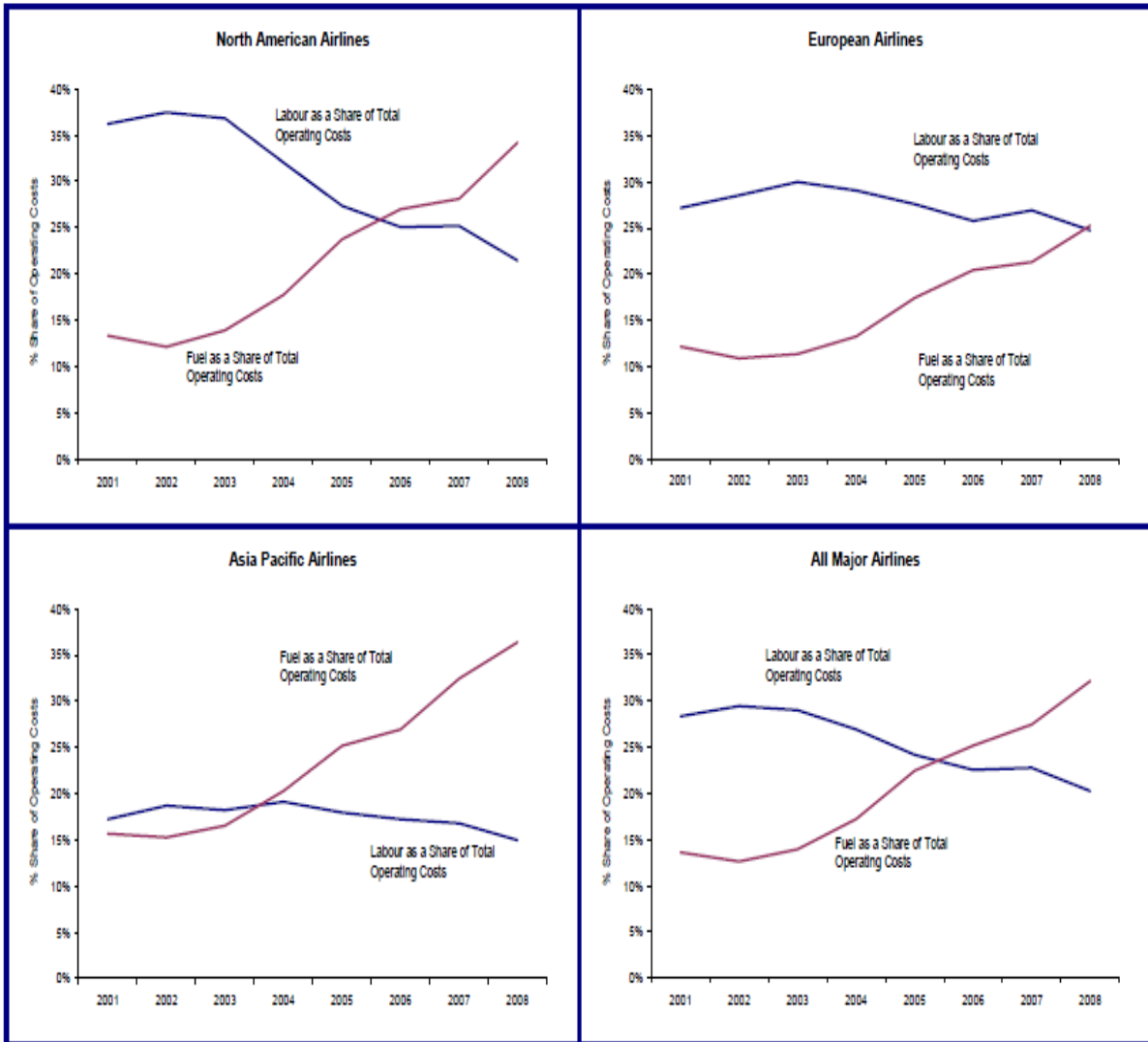


Figure 4.1 Fuel and labour cost over the years (IATA 2010)

5 Ground handling

5.1 Ground handling in Asia (Air Transport 2005)

In order to keep the fares low, LCA have been trying to cut cost on ground handling. For example, Air Asia and Jetstar have agreed to pool resources and expertise to cut cost and expenses. One of the areas that they are cooperating in is ground handling as Air Asia and Jetstar are both using the same type of aircraft. In one way they can reduce their cost on training the workers for ground handling, and in another way they can pool the equipment needed for ground handling. The alliance of the 2 low cost carriers can also profit both carriers by pooling their aircraft components and spare parts. Both of the low cost carriers are expected to save USD 183 million annually in their running costs (**Flight Global 2010**).

Asia has been lacking behind of Europe and North America in terms of ground handling and other aviation-related services. Certain regulations have been implemented to prevent the intruding from foreign ground handlers. For example, the Terminal 3 in Manila, airlines have no other choices but to use the monopoly suppliers of catering and ground handling services as required by the airport.

In Japan, the ground handling market is only restricted to local companies, or in other words it is very difficult for foreign companies to interfere. The major airlines (JAL and ANA) dominate the ground handling market themselves.

In China, it is more common for airport operators to form joint-ventures with external providers although ground handling services are provided by the airport operators. The network carrier also provides self and third party handling at its own hub. For example, Beijing and Guangzhou form joint-ventures with Singapore Airport Terminal Services (SATS) and Changi International Airport Services (CIAS) (owned by DNATA) respectively. SATS is a subsidiary of Singapore Airlines whereas CIAS was formed by the Port of Singapore and four airlines which are Air France-KLM, China Airlines, Garuda Indonesia and Lufthansa. Besides that, Air China has transferred its ground handling business in Beijing into a joint-venture with Jardines. Cathay Pacific and Jardine are the primary handling agents in Hong Kong.

In Bangkok, Thai Airways and TAGS are the two main handling agents. In the new airport TAGS, World Flight Services and Bangkok Airways have formed a new joint-venture company for ground handling services. Beside SATS and CIAS, Swissport has been appointed as ground handling agent in Singapore. The majority of ground handling services is provided by two airlines in the Republic of Korea, which are Korean Airline and Asiana Airline.

In India, ground handling services are performed by multiple agencies which are frequently unlicensed. Many of the ground handlers do not fulfil the requirements of IATA Standard Ground Handling Agreements. The ground handlers are more accurately manpower companies. New policy has been announced by the Government of India. The new policies state that only certain companies which are authorized are allowed to perform ground handling services in Indian metro airports. In order to be able to perform ground handling services, the following requirements must be met:

1. The company must be an airport operator
2. The company must be a subsidiary of the national carrier or its joint ventures
3. For independent ground handling companies, they must go through a competitive bidding process

Table 5.1 Major airports in Asia (IATA 2010)

<i>Airport</i>	<i>Million Passengers per annum</i>
Tokyo (HND)	63.3
Beijing (PEK)	41.0
Hong Kong	40.3
Singapore	39.0
Tokyo (NRT)	31.5
Sydney	29.0
Jakarta	27.9
Seoul (IGN)	26.2
Shanghai (PVG)	23.7
Guangzhou	23.6
Kuala Lumpur	23.2
Taipei	21.7
Melbourne	21.2
Osaka (ITM)	18.9
Fukuoka	18.7
Sapporo	17.8
Shanghai (SHA)	17.8
Mumbai	17.4
Brisbane	16.2
Manila	16.2
Osaka (KIX)	16.2
Shenzen	15.1
New Delhi	15.1
Chengdu	13.9
Naha	13.5
Seoul (GMP)	13.4
Jeju	11.4

5.2 Ground handling in North America

The ground handling market in North America is different from other world regions. Most of the ground handling services is handled by the airlines themselves. However self handle by the airlines is not permitted in a few places in the United States, for example the private Branson (Missouri) airport. Foreign airlines' ground services are either provided by independent suppliers or joint venture suppliers with US airlines. For low cost airlines self handling is common but some of the low cost airlines outsource ground handling. In the United States some regulations have been made to restrict the number of ground handling agents in most major airports. The market of ground handling in United States is dominated by the airlines and there is only a small market for independent suppliers.

In contrast to the United States, independent ground handlers are more significant in Canada. There are many independent agents provide ground handling services at most Canadian airports.

Table 5.2 Major Airports in North America (**Air Transport 2005**)

Airport	Million passengers per annum
Los Angeles	61.5
Las Vegas	44.3
New York (JFK)	40.6
San Francisco	33.6
Miami	31.0
Boston	27.1

5.3 Ground handling in Europe

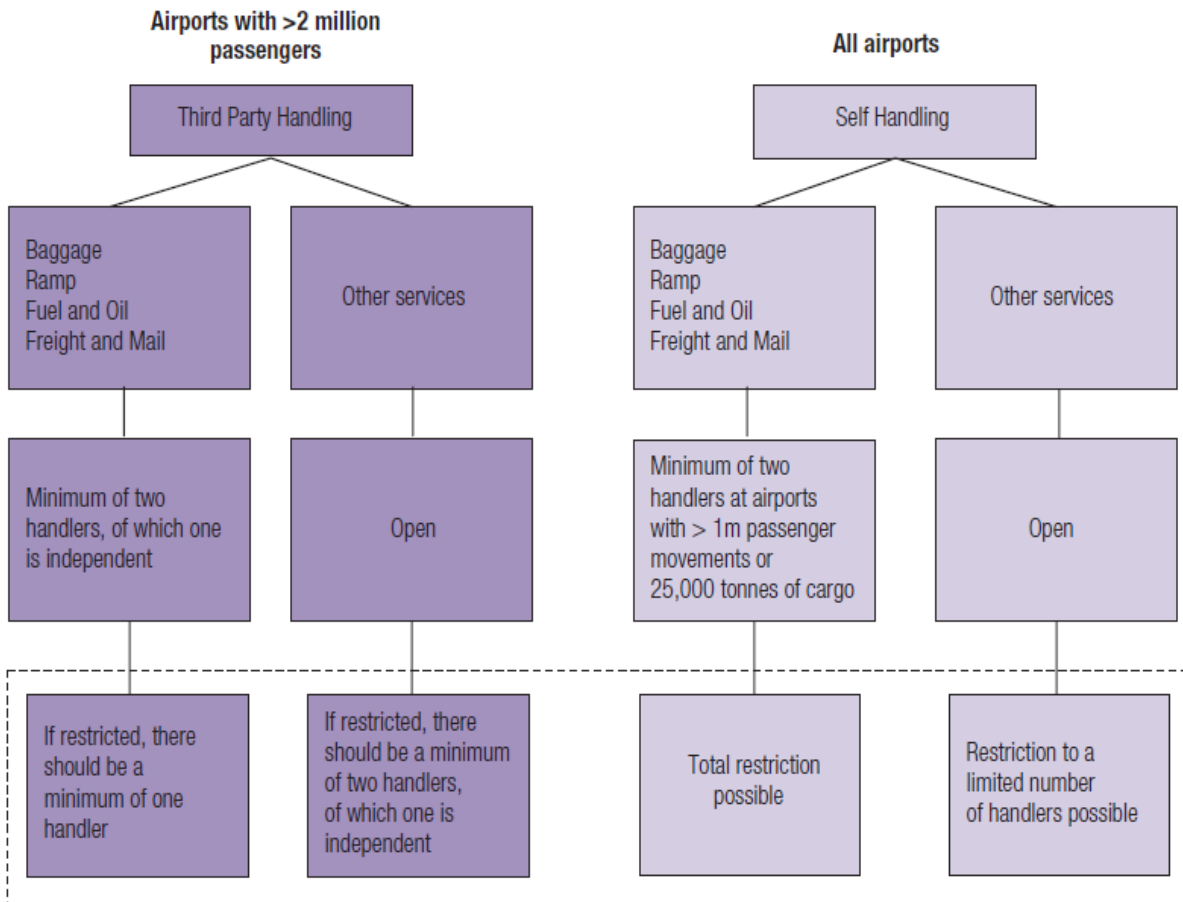


Figure 5.1 Ground handling in Europe (Air Transport 2005)

The EC Directive 96/67 has opened up the ground handling market to competitors to prevent the monopoly of EU airports. By opening up the market of ground handling to competitors not only reduces the costs of ground handling for the airlines but also improves the quality of the ground handling services. In major EU airports, which have more than 2 million passengers or 50000 tonnes of freight per annum, at least two ground handling suppliers must be available for certain service categories. At least one of the suppliers must be independent from the airport and the carrier. For airlines that self handle, the services must be admitted by at least two carriers.

Since this legislation has been implemented, many ground handling suppliers enter the market of ground handling in Europe. Basically there are 4 types of ground handling suppliers, which are:

1. Airports' handling companies
2. Independent handling operators
3. Self handling airlines
4. Third party handling companies

Figure 5.3 Major airports in Europe (**Air Transport 2005**)

<i>Airport</i>	<i>Million passengers per annum</i>
Paris (CDG)	51.3
Frankfurt	51.1
Madrid	38.7
Rome (FCO)	28.1
Barcelona	24.6
Paris Orly	24.1
Palma	20.4
Brussels	15.6
Duesseldorf	15.3
Vienna	14.7
Athens	13.6
Malaga	12.0
Berlin (TXL)	11.0

5.4 Standard Ground Handling Agreement

In general, ground services are provided by the airport, the airline or an independent ground handling company. In the phenomenon today, not all ground handling services will be provided by a single service provider. The ground handling services are usually spilt between a few suppliers. For example, airline which takes care of the passenger service can sub the ramp service to other ground handling service provider.

According to International Air Transport Association (IATA)'s standard ground handling agreement (SGHA), ground handling contains 8 types of activities. SGHA is widely used and will be updated from time to time by IATA.

- Representation, administration, supervision
- Passenger service
- Ramp services
- Load control, communication and flight operations
- Cargo and mail services
- Support services
- Security
- Aircraft maintenance

The IATA Ground Handling Council (IGHC) is the major forum of international ground handling executives. The council brings together over 400 organisations providing or purchasing ground handling services to airlines worldwide. All IGHC members will follow the ground handling procedures according to SGHA. (**IATA 2010**)

IGHC members are available worldwide and ground handling services are provided by IGHC members in all major airports. Examples are provided in Table 5.4 to Table 5.6.

Table 5.4 IGHC Members in Asia

Bangkok International Airport (BKK)	Tokyo Airport (NRT)	Kuala Lumpur International Airport (KLIA)
(SAS) Scandinavian Airlines Systems Aircraft Service International Group (ASIG) Bangkok Flight Services KLM Royal Dutch Airlines Lufthansa Cargo AG Lufthansa Services (Thailand) Ltd. Northwest Airlines Inc. SKY CARE - Aviation Services Ltd Thai Airports Ground Services Co. Ltd United Services	All Nippon Airways Co. Ltd. Delta Air Lines Inc. Japan Airlines Co. Ltd. Japan Airport Service Co., Ltd. Lufthansa Cargo AG Northwest Airlines Inc. Swissport International Ltd. United Services	KL Airport Services Lufthansa Cargo AG Malaysia Airline

Table 5.5 IGHC Members in Europe

Hamburg Airport (HAM)	Paris Airport (CDG)	London Airport (LHR)
Acciona Airport Services AHS Aviation Handling Services GmbH Checkpoint B Jet Service GmbH Deutsche Lufthansa AG Flughafen Hamburg GmbH Hapag Lloyd Flug Losch Airport Service GmbH Lufthansa Cargo AG Randstad Swissport International Ltd.	(SAS) Scandinavian Airlines Systems Aeroports de Paris Air Dispatch Limited Aviapartner bmi British Midland Delta Air Lines Inc. Flighcare Corporation France Handling Lufthansa Cargo AG Randstad Servisair Swissport International Ltd. Transdev Aeroport Services United Services Worldwide Flight Services	Aer Lingus P.L.C. Air Canada Air Dispatch Limited Aircraft Service International Group (ASIG) American Airlines Groundstar Ltd. KLM Royal Dutch Airlines Lufthansa Cargo AG Menzies Aviation PLC Servisair Servisair Cargo Swissport International Ltd. United Services Worldwide Flight Services

Table 5.6 IGHC Members in North America

Toronto International Airport (YYZ)	Los Angeles International Airport (LAX)	New York International Airport (JFK)
Air Canada Air Canada Ground Handling Services Air Transat Airport Terminal Services, Inc. American Airlines Delta Air Lines Inc. Handlex Inc. Lufthansa Cargo AG Servisair Swissport International Ltd. United Services Worldwide Flight Services	Aero Port Services, Inc Aeroground, Inc. Air Canada Ground Handling Services Air Pacific Ltd. Aircraft Service International Group (ASIG) America West Airlines American Airlines China Airlines Ltd. Continental Airlines Inc. Delta Air Lines Inc. Evergreen / Eagle Hallmark Aviation Services Integrated Airline Services, Inc. (IASAir) Lufthansa Cargo AG Menzies Aviation PLC Nippon Cargo Airlines Northwest Airlines Inc. Pacific Aviation Corporation Qantas Airways Limited Swissport International Ltd. United Services Worldwide Flight Services	Aer Lingus P.L.C. Aircraft Service International Group (ASIG) Alliance Airlines America West Airlines American Airlines American Sales & Management Organization ("ASMO") Cargo Airport Services China Airlines Ltd. Delta Air Lines Inc. Evergreen / Eagle Icelandair KLM Royal Dutch Airlines Lufthansa Cargo AG Menzies Aviation PLC Nigeria Airways Ltd. Nippon Cargo Airlines Northwest Airlines Inc. Servisair Swissport International Ltd. United Services Worldwide Flight Services

6 Summary

In this student project, differences of LCA business model in North America and Asia have been discussed. Due to economic reason, LCA business model in Asia is different from LCA business model in North America and in Europe. As discussed above, in general people in Asia are less affordable to fly compare to Europeans and North Americans. Therefore flying is not as common as in North America and Europe. Other mode of transport, mentality of Asians and airport facilities has been the main problems for LCA in Asia. The price gap between other mode of transport and flying is significant, whereas in Europe and North America, the price gap is less significant. Less competition from other mode of transport helps to make LCA in North America and Europe more successful. Besides that, internet penetration influences the business model of LCA. In Asia, besides those more advanced countries like Japan and South Korea, internet penetration is not sufficient. Booking, payment and promotion are done through internet normally. Therefore, Asian LCA have introduced some alternatives like ticket offices and SMS bookings. Main LCA in the 3 world regions are listed above. In Asia, Air Asia has been by far the most successful LCA. In Europe, Easyjet and Ryanair dominate the LCA market. In North America, Southwest and JetBlue are the main LCA. Southwest was the pioneer of LCA and mostly all LCA follow the business model of Southwest.

Ground handling procedures are standardized. All the procedures are according to IATA's Standard Ground Handling Agreement. Alteration will be made from time to time and all the members of IGHC (IATA's Ground Handling Council) will take part to make alterations and new regulations for ground handling. Ground handling cost is influenced by the labour cost, equipment and fuel price. Labour cost is the cheapest in Asia, followed by North America and Europe. Most ground handling services are provided by airport and individual ground handling service providers. LCA usually handle the ground handling services by themselves. Some ground handling service providers are active globally, such as Swissport, Servisair and SATS.

7 Conclusions

LCA need to keep their operating costs as low as possible to keep up with the low fares they offer and at the same time minimize their turnaround time. So far a turnaround time between 25-35 minutes is the lowest turnaround time LCA can meet. Lower than 25 minutes is seemingly impossible as not all the ground handling procedure can be done simultaneously. For example, refuelling aircraft can only be done when all the passengers have been deboarded. Internet has been the cheapest and main distribution channel for LCA worldwide. Another method which LCA could use to reduce their operating cost is by pooling resources. However, this method is not applicable for all LCA due to company policy and aircraft used. More secondary airports are to be constructed to meet the need of LCA in the future.

Ground handling costs are subject to many variables such as equipment cost, labour cost, fuel cost and etc. There are 2 types of variables that we need to take into consideration for ground handling cost, which are manipulative variables and fixed variables. Manipulative variables are variables which are different depending on region and country whereas fixed variables are standardized globally.

Table 7.1 Variables of ground handling cost

<i>Manipulative</i>	<i>Fixed</i>
Airport charges	Fuel price
Labour cost	Equipment cost
...	...

In short, the difference of ground handling cost in the 3 world region depends on the airport charges and labour cost. Airport charges are the lowest in North America followed by Asia and Europe. Asia has lowest labour cost followed by North America and Europe.

Acknowledgements

I would like to sincerely thank Prof. Dr.-Ing. Dieter Scholz and Diana Rico S áchez who were my supervisors. Diana Rico S áchez has given me a lot of informative opinions and assisted me in doing my student project. She has been patient in correcting my mistakes from time to time.

References

- Airport Mag 2004** SASHA N. PAGE: Measure of the Month: How Do North American Airports Compare Internationally, 2004
- Air Transport 2005** WTO PRODUCTION: Documentation For the Second Air Transport Review Under the General Agreement on Trade in Services (GATS), Volume 1: Auxiliary Services, Geneva, 2005
- Anming Zhang 2009** ANMING ZHANG: Deregulation, Regional Liberalization and Secondary Airports, 2009
- Bonnefoy 2008** PHILLIPE A.BONNEFOY, RICHARD DE NEUVILLE, LM ASCE, R. JOHN HANSMAN: *Evolution and Development of Multi Airport Systems: A Worldwide Perspective*, 2008
- CAPA 2009** CENTRE OF ASIA PASIFIC: Handling Policy Grounded Yet Again: Market Research and Intelligence Unit, 2009
- Detlin 2004** PHILIP DETLIN: The Potential for Low-Cost Airlines in Asia, 2004
- Dobson 2007** PAUL W. DOBSON, CLAUDIO A.PIGA: Mergers and Business Model Assimilation: Evidence from Low-Cost Airlines Takeover, 2007
- Flight Global 2010** URL: <http://www.flightglobal.com/articles/2010/01/06/336788/airasia-and-jetstar-ink-wide-ranging-cooperation-agreement.html> (2010-11-03)
- Harumi 2003** HARUMI ITO, DARIN LEE: Low Cost Carrier Growth in the U.S. Airline Industry: Past, Present, and Future, 2003
- Hong 2007** HONG WEI JIANG: Competitive Strategy for Low Cost Airlines, 2007
- IATA 2010** URL: www.iata.org/economics (2010-10-22)
- Krammer 2010** PHILIP KRAMMER, DIANA RICO SANCHEZ, DIETER SCHOLZ: *Cost Estimation and Statistical Analysis of Ground Handling Processes*, 2010
- J. O'Connell** JOHN F. O'CONNELL, GEORGE WILLIAMS: Passengers' Perceptions of Low Cost Airlines and Full Service Carriers: A Case Involving Ryanair, Aer Lingus, Air Asia and Malaysia Airlines

- Nadja 2003** CHARLES NADJA: Low Cost Carriers and Low Fares: Competition and Compensation in the U.S. Airline Industry, 2003
- Neufville 2006** RICHARD DE NEUFVILLE: Planning Airport Access in an Era of Low-Cost Airlines, 2006
- O' Connell, 2008** DR. FRANKIE O'CONNELL: *The Business of Low Cost Carriers and Their Impact on the Industry*, 2008
- SH&E 2002** SH&E: International Air transport Consultancy: Study on the quality and efficiency of ground handling services at EU airports as a result of the implementation of Council Directive 96/67/EC, London, United Kingdom, 2002
- Sven Gross 2007** SVEN GROSS, ALEXANDER SCHROEDER: *Handbook of Low Cost Airlines: Strategies, Business Processes and Market Environment*, 2007
- Swanson 2007** DARRELL SWANSON: Review of Dedicated Low-Cost Airport Passenger Facilities, 2007
- Yose Rizal 2005** YOSE RIZAL DAMURI, TITIK ANAS: Strategic Directions for ASEAN Airlines in a Globalizing World: The Emergence of Low Cost Carriers in South East Asia, 2005