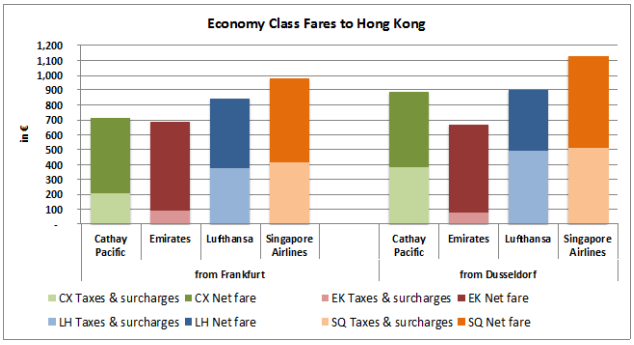
# Appendix 1 – Airline seat capacities of currently employed aircraft on routes between Germany and selected destinations

| | *from* **Germany** *to hub or direct destionation* | | | *from* **Hub** *to destination* | | | *from direct or hub to destination in* **Asia** | | |
|---|---|---|---|---|---|---|---|---|---|
| | Origin | Total Flights *(per week)* | Total Capacity *(Pax per week)* | Transfer | Total Flights *(per week)* | Total Capacity *(Pax per week)* | Destination | Total Flights *(per week)* | Total Capacity *(Pax per week)* |
| Cathay Pacific | Frankfurt & X/London | 37 | 12,229 | Hong Kong | 112 | 37,846 | *Hong Kong* | *37* | *12,229* |
| | | | | | | | Singapore | 63 | 22,166 |
| | | | | | | | Tokyo | 49 | 15,680 |
| Emirates | Frankfurt, Munich, Dusseldorf & Hamburg | 63 | 22,806 | Dubai | 70 | 25,905 | Hong Kong | 28 | 10,533 |
| | | | | | | | Singapore | 28 | 11,032 |
| | | | | | | | Tokyo | 14 | 4,340 |
| Lufthansa | Frankfurt & Munich | 40 | 15,457 | Frankfurt or Munich | 40 | 15,457 | *Hong Kong* | *14* | *4,690* |
| | | | | | | | *Singapore* | *12* | *4,845* |
| | | | | | | | *Tokyo* | *14* | *5,922* |
| Singapore Airlines | Frankfurt & Munich | 21 | 7,189 | Singapore | 91 | 22,869 | Hong Kong | 42 | 13,286 |
| | | | | | | | *Singapore* | *21* | *7,189* |
| | | | | | | | Tokyo | 28 | 9,583 |

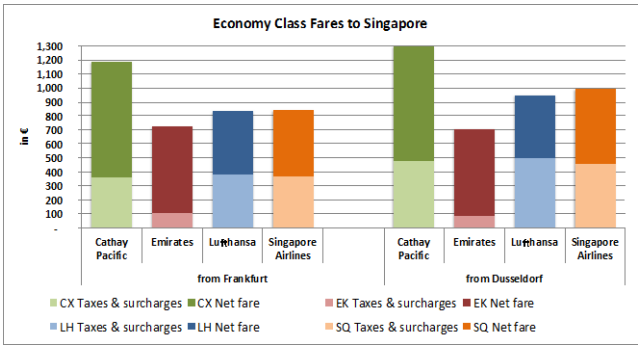
*italic destination cities represent available non-stop connection from Germany on respective airline*

*Source: Cathay Pacific, Lufthansa, Singapore Airlines (2013)*

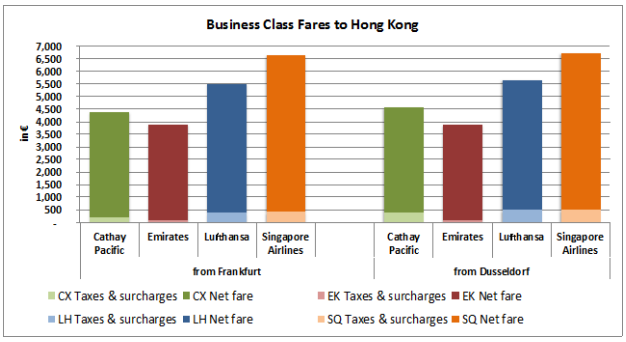
# Appendix 2 – Spot check air fare comparisons for Hong Kong and Singapore



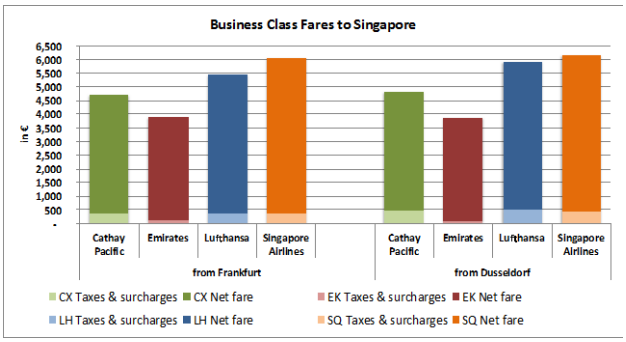

*Source: Amadeus (2013)*




*Source: Amadeus (2013)*

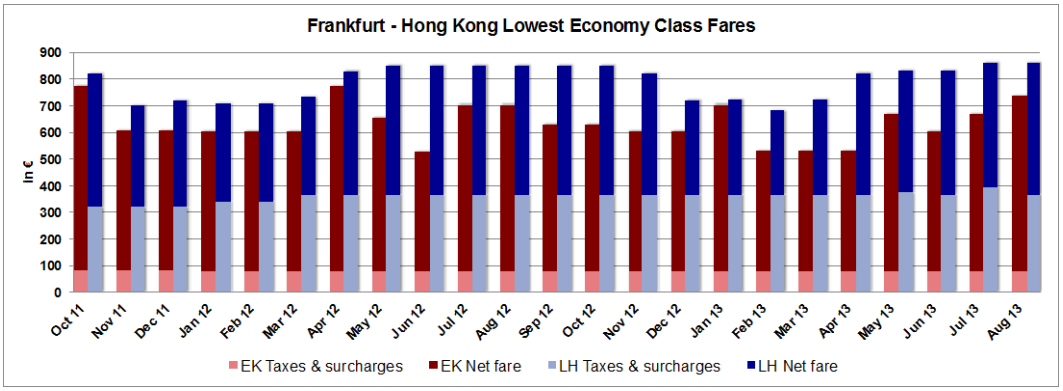



*Source: Amadeus (2013)*

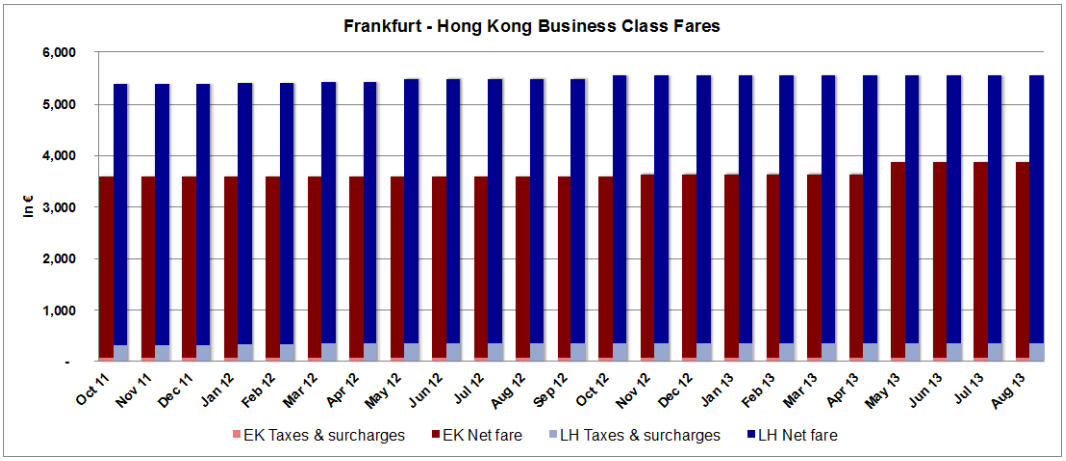



*Source: Amadeus (2013)*

# Appendix 3 – Comparison of Emirates and Lufthansa over a time span of 23 months




*Source: Amadeus (2013)*




*Source: Amadeus (2013)*

# Appendix 4 – Financial performance ratios

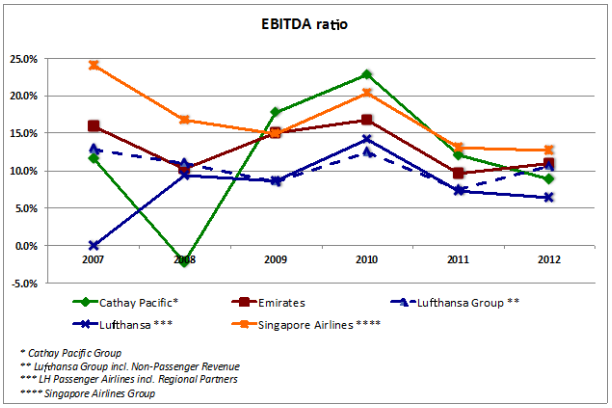



**Figure 28:** Development of EBITDA ratio

*Source: Cathay Pacific, Emirates, Lufthansa, Singapore Airlines (2013)*

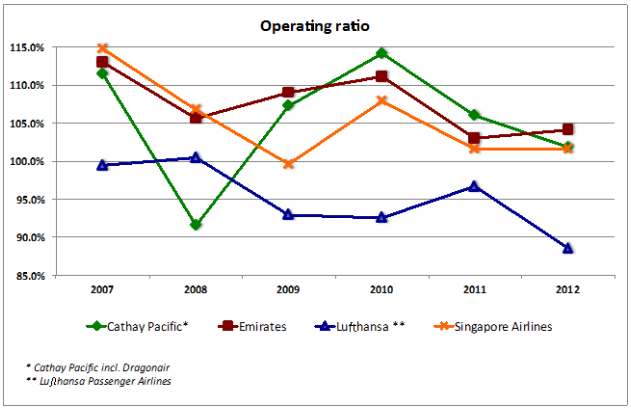



**Figure 29:** Development of Operating ratio

*Source: Cathay Pacific, Emirates, Lufthansa, Singapore Airlines (2013)*

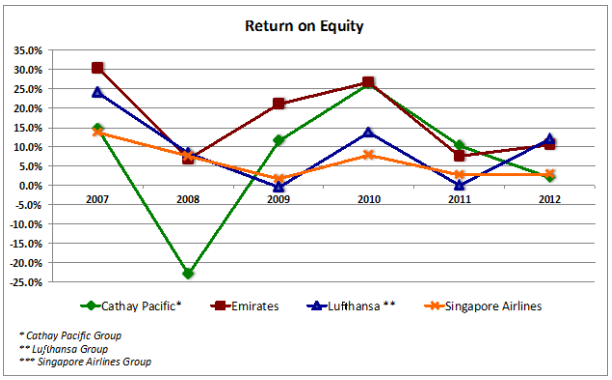



**Figure 30:** Development of Return on Equity

*Source: Cathay Pacific, Emirates, Lufthansa, Singapore Airlines (2013)*

# Appendix 5 – Travellers and travel management survey

## wbs Traveller Survey - Airport Edition

**Q1 Your purpose of air travel:**

- ❍ Leisure
- ❍ Business
- ❍ Visiting friends / relatives
- ❍ Other: _____

**Q1a What is your final destination?**

_____

**Q2 Are you travelling in:**

- ❍ Economy
- ❍ Economy Premium
- ❍ Business
- ❍ First

**Q2a Who made the airline decision for you:**

- ❍ Yourself
- ❍ Partner/Family
- ❍ Company travel policy
- ❍ Secretary
- ❍ Travel agent (tour package)

**Q3 Which class do you normally travel in?**

| | Economy | Economy Premium | Business | First |
|---|---|---|---|---|
| Leisure | ❍ | ❍ | ❍ | ❍ |
| Business | ❍ | ❍ | ❍ | ❍ |
| Visiting friends / relatives | ❍ | ❍ | ❍ | ❍ |

**Q4 How many flights for business and leisure / visiting do you make per year (on average)?**
***(count each round trip as one flight).***

____ Business

____ Leisure / Visiting

## wbs Traveller Survey - Airport Edition

**Q5 What are your criterias for choosing an airline? Please prioritise the following attributes by importance to you (1 = most important; 10 = least important):**

_____ **Assurance** (safety records, employees' capability)
_____ **Flight Patterns** (flight schedules, flight frequencies, flight network)
_____ **Reliability** (on-time departure/arrival, consistent service)
_____ **Responsiveness** (efficient service, prompt handling of requests/complaints)
_____ **Employees** (employees' appearance and attitude)
_____ **Facilities** (check-in / baggage handling service, in-flight facilities, lounges)
_____ **Customisation** (individual attention, anticipation of your travel needs)
_____ **Cost** (airfare, re-booking / cancellation policy)
_____ **Innovation** (Latest aircraft, on-board technology/infotainment)
_____ **Comfort** (seat pitch / width, legroom)

**Q6 Would you consider a long-haul flight with one stop-over?**

- ❍ Yes
- ❍ No

Answer If Would you consider a one-stop flight Yes is Selected

**Q6a How many hours could the stop-over flight exceed a non-stop one?**

_____ Maximum exceeding hours

**Q7 The following questions ask your expectation on airline services and products.**
**Please state the importance of each of the statements for you.**

| | 1 *(important)* | 2 | 3 | 4 | 5 *(unimportant)* | 0 *(no opinion)* |
|---|---|---|---|---|---|---|
| Range of quality food & beverages | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| Makes you feel safe | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| Up-to-date in-flight entertainment & programmes | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| Comfortable lounges | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| Sufficient flight attendants for individual needs/attention | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| Non-stop service to various destinations | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| Convenient flight schedules and enough frequencies | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| Global alliance partners for wider network & frequent flyer benefits. | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

2

## wbs Traveller Survey - Airport Edition

Answer If Are you travelling in: Economy / Economy Premium is Selected

**Q8 How much longer would you accept to travel (incl. stop-over time), if the fare is cheaper than a non-stop connection?**
***(multiple choice answers allowed)***

| | | | |
|---|---|---|---|
| In Economy class | ❑ up to 2 hours, if 100€ cheaper | ❑ up to 4 hours, if 150€ cheaper | ❑ up to 6 hours, if 200€ cheaper |

Answer If Are you travelling in: Business / First is Selected

**Q9 How much longer would you accept to travel (incl. stop-over time), if the fare is cheaper than a non-stop connection?**
***(multiple choice answers allowed)***

| | | | |
|---|---|---|---|
| In Business class | ❑ up to 2 hours, if 800€ cheaper | ❑ up to 4 hours, if 1,600€ cheaper | ❑ up to 6 hours, if 3,200€ cheaper |

**Q10 Have you travelled on one of the following airlines in the past 5 years?**
***(multiple choice answers allowed)***

- ❑ Cathay Pacific
- ❑ Emirates
- ❑ Lufthansa
- ❑ Singapore Airlines
- ❑ Other, please state _____

**Q10a Which cabin class did you travel?**

- ❍ Economy
- ❍ Economy Premium
- ❍ Business
- ❍ First

**Q10b Who paid the ticket?**

- ❍ Yourself
- ❍ Company
- ❍ Friends / Family

3

## wbs Traveller Survey - Airport Edition

**Q11 Which of the following attributes do you positively associate with the following airlines?**
***(max. 3 answers per airline)***

| | Cathay Pacific | Emirates | Lufthansa | Singapore Airlines |
|---|---|---|---|---|
| Assurance | ❑ | ❑ | ❑ | ❑ |
| Flight Patterns | ❑ | ❑ | ❑ | ❑ |
| Reliability | ❑ | ❑ | ❑ | ❑ |
| Responsiveness | ❑ | ❑ | ❑ | ❑ |
| Employees | ❑ | ❑ | ❑ | ❑ |
| Facilities | ❑ | ❑ | ❑ | ❑ |
| Customisation | ❑ | ❑ | ❑ | ❑ |
| Value | ❑ | ❑ | ❑ | ❑ |
| Innovation | ❑ | ❑ | ❑ | ❑ |
| Comfort | ❑ | ❑ | ❑ | ❑ |
| No association | ❑ | ❑ | ❑ | ❑ |
| Other | ❑ | ❑ | ❑ | ❑ |

Other _____ _____ _____ _____

**Q15 You are:**

- ❍ Female
- ❍ Male

**Q16 Your age group:**

- ❍ 18 to 25
- ❍ 25 to 39
- ❍ 40 to 55
- ❍ above 55

**Q17 What is your city/country of residence?**

_____

**Q18 Would be willing to provide further answers at a later stage?**

- ❍ Yes
- ❍ No

*Answer If Yes Is Selected*

**Q19 Please state your email address:**

_____

4

## Traveller Survey - Online Edition

English

**Welcome**

Dear traveller,

The following survey looks into travellers expectations and experiences with air travel. Your comment is highly important to the analysis, and will be treated with anonymity and confidentiality.

Thank you very much for your time and cooperation.

*The survey is available in English or German, which can be chosen on the top right hand corner*

Your purpose of air travel normally is:

- Leisure
- Business
- Visiting friends / relatives
- Other:

**How many flights for business and leisure / visiting do you make per year (on average)?**
*(count each round trip as one flight).*

Business

Leisure / Visiting

Which class do you normally travel in?

| | Economy | Economy Premium | Business | First |
|---|---|---|---|---|
| Leisure | | | | |
| Business | | | | |
| Visiting friends / relatives | | | | |

The following questions ask your expectation on airline services and products.
Please state the importance of each of the statements for you.

| | 1 (important) | 2 | 3 | 4 | 5 (unimportant) | 0 (no opinion) |
|---|---|---|---|---|---|---|
| The airline provides a range of quality food and beverages | | | | | | |
| The airline makes you feel safe | | | | | | |
| The airline has up-to-date in-flight entertainment facilities and programmes | | | | | | |
| The airline has comfortable lounges | | | | | | |
| Sufficient flight attendants for individual needs/attention | | | | | | |
| The airline has non-stop service to various destinations | | | | | | |
| The airline has convenient flight schedules and enough frequencies | | | | | | |
| The airline has global alliance partners in order to provide a wider network and frequent flyer benefits. | | | | | | |

**How much longer would you accept to travel (incl. stop-over time), if the fare is cheaper than a non-stop connection?**
*(multiple choice answers allowed)*

| | up to 2 hours, if 100€ cheaper | up to 4 hours, if 150€ cheaper | up to 6 hours, if 200€ cheaper |
|---|---|---|---|
| In Economy class | | | |

**How much longer would you accept to travel (incl. stop-over time), if the fare is cheaper than a non-stop connection?**
*(multiple choice answers allowed)*

| | up to 2 hours, if 800€ cheaper | up to 4 hours, if 1,600€ cheaper | up to 6 hours, if 3,200€ cheaper |
|---|---|---|---|
| In Business class | | | |

Who normally makes the airline decision for you:

- Yourself
- Partner/Family
- Company travel policy
- Secretary
- Travel agent (tour package)

What are your criterias for choosing an airline?
Please arrange the following attributes (via drag & drop) by importance to you (1 = most important; 10 = least important):

- **Assurance** (safety records, employees' capability)
- **Flight Patterns** (flight schedules, flight frequencies, flight network)
- **Reliability** (on-time departure/arrival, consistent service)
- **Responsiveness** (efficient service, prompt handling of requests/complaints)
- **Employees** (employees' appearance and attitude)
- **Facilities** (check-in / baggage handling service, in-flight facilities, lounges)
- **Customisation** (individual attention, anticipation of your travel needs)
- **Cost** (airfare, re-booking / cancellation policy)
- **Innovation** (Latest aircraft, on-board technology/infotainment)
- **Comfort** (seat pitch / width, legroom)

Would you consider a long-haul flight with one stop-over?

- Yes
- No

How many hours could the stop-over flight exceed a non-stop one?

| | hours | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 4 | 5 | 6 | 7 | 8 | 10 | 11 | 12 | |
| Maximum exceeding hours | | | | | | | | | | | | |

**Have you travelled on one of the following airlines in the past 5 years?**
*(multiple choice answers allowed)*

- Cathay Pacific
- Emirates
- Lufthansa
- Singapore Airlines
- Other, please state

Which cabin class did you travel?

- Economy
- Economy Premium
- Business
- First

Who paid the ticket?

- Yourself
- Company
- Friends / Family

**Which of the following attributes do you positively associate with Cathay Pacific?**
*(please state up to 3)*

- Assurance
- Flight Patterns
- Reliability
- Responsiveness
- Employees
- Facilities
- Customisation
- Cost
- Innovation
- Comfort
- No association
- Other

**Which of the following attributes do you positively associate with Emirates?**
*(please state up to 3)*

- Assurance
- Flight Patterns
- Reliability
- Responsiveness
- Employees
- Facilities
- Customisation
- Cost
- Innovation
- Comfort
- No association
- Other

**Which of the following attributes do you positively associate with Lufthansa?**
*(please state up to 3)*

- ☐ Assurance
- ☐ Flight Patterns
- ☐ Reliability
- ☐ Responsiveness
- ☐ Employees
- ☐ Facilities
- ☐ Customisation
- ☐ Cost
- ☐ Innovation
- ☐ Comfort
- ☐ No association
- ☐ Other

**Which of the following attributes do you positively associate with Singapore Airlines?**
*(please state up to 3)*

- ☐ Assurance
- ☐ Flight Patterns
- ☐ Reliability
- ☐ Responsiveness
- ☐ Employees
- ☐ Facilities
- ☐ Customisation
- ☐ Cost
- ☐ Innovation
- ☐ Comfort
- ☐ No association
- ☐ Other

You are:

○ Female ○ Male

Your age group:

○ 18 to 25 ○ 25 to 39 ○ 40 to 55 ○ above 55

What is your city/country of residence?

Would be willing to provide further answers at a later stage?

○ Yes
○ No

Please state your email address:

# wbs Travel Mangement Survey

English

**Welcome**

Dear Sir/Madam,

The following survey looks into the allowance of business class travel, expectations and experiences with air travel. Your comment is highly important to the analysis, and will be treated with anonymity and confidentiality.

Thank you very much for your time and cooperation.

*The survey is available in English or German, which can be chosen on the top right hand corner.*

Do you have a travel policy in place?

- Yes
- No

Do you have a specific policy for air travel?

- Yes
- No

Does your policy regulates air travel for

- All employees equally
- Employees by hierarchy
- Employees by department/subsidiary

Do you allow your employees / or some of your employees to travel on long-haul traffic in Business Class?

- Yes
- No

Which of the following attributes are most important when you source airlines for your travel programme?
Please arrange the following attributes by importance to you (via drag and drop) :
(1 = most important; 10 = least important)

- **Assurance** (safety records, employees' capability)
- **Flight Patterns** (flight schedules, flight frequencies, flight network)
- **Reliability** (on-time departure/arrival, consistent service)
- **Responsiveness** (efficient service, prompt handling of requests/complaints)
- **Employees** (employees' appearance and attitude)
- **Facilities** (check-in / baggage handling service, in-flight facilities, lounges)
- **Customisation** (individual attention, anticipation of your travel needs)
- **Cost** (airfare, re-booking / cancellation policy)
- **Innovation** (Latest aircraft, on-board technology/infotainment)
- **Comfort** (seat pitch / width, legroom)

The following questions ask your expectation on airline services and products.
Please state the importance of each of the statements for you.

| | 1 (important) | 2 | 3 | 4 | 5 (unimportant) | 0 (no opinion) |
|---|---|---|---|---|---|---|
| The airline provides a range of quality food and beverages | | | | | | |
| The airline makes you feel safe | | | | | | |
| The airline has up-to-date in-flight entertainment facilities and programmes | | | | | | |
| The airline has comfortable lounges | | | | | | |
| Sufficient flight attendants for individual needs/attention | | | | | | |
| The airline has non-stop service to various destinations | | | | | | |
| The airline has convenient flight schedules and enough frequencies | | | | | | |
| The airline has global alliance partners in order to provide a wider network and frequent flyer benefits. | | | | | | |

What is your maximum budget for an intercontinental airfare? (flight time over 10 hours)

| | 1000 | 3000 | 5000 | 7000 | 9000 | 11000 | 13000 | 15000 |
|---|---|---|---|---|---|---|---|---|
| Airfare in Euro | | | | | | | | |

If the travel time is longer, but a stop-over flight offers cheaper airfares, would you consider to include such carriers in your travel programme?

- Yes
- No

How many hours could the stop-over flight exceed a non-stop one?

hours

| | 0 | 1 | 2 | 4 | 5 | 6 | 7 | 8 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Maximum exceeding hours | | | | | | | | | | | |

**How much longer would you accept your employees to travel (incl. stop-over time), if the Business Class fare is cheaper than on a non-stop connection?**
*(multiple choice answers allowed)*

| | up to 2 hours, if 800€ cheaper | up to 4 hours, if 1,600€ cheaper | up to 6 hours, if 3,200€ cheaper |
|---|---|---|---|
| In Business class | | | |

**Which of the following attributes do you positively associate with Cathay Pacific?**
*(Please state up to 3)*

- Assurance
- Flight Patterns
- Reliability
- Responsiveness
- Employees
- Facilities
- Customisation
- Cost
- Innovation
- Comfort
- No association
- Other

**Which of the following attributes do you positively associate with Emirates?**
*(Please state up to 3)*

- Assurance
- Flight Patterns
- Reliability
- Responsiveness
- Employees
- Facilities
- Customisation
- Cost
- Innovation
- Comfort
- No association
- Other

**Which of the following attributes do you positively associate with Lufthansa?**
*(Please state up to 3)*

- Assurance
- Flight Patterns
- Reliability
- Responsiveness
- Employees
- Facilities
- Customisation
- Cost
- Innovation
- Comfort
- No association
- Other

**Which of the following attributes do you positively associate with Singapore Airlines?**
*(Please state up to 3)*

- Assurance
- Flight Patterns
- Reliability
- Responsiveness
- Employees
- Facilities
- Customisation
- Cost
- Innovation
- Comfort
- No association
- Other

How many employees are going on business trip per year?

Which country / region you are responsible for in regards of travel management / procurement?

What is your annual total travel spend?

- up to 0.5 million Euro
- between 0.5 and 10 million Euro
- above 10 million Euro

Which industry represents your company?

- Automotive
- Construction
- Chemical
- Consulting
- Electronics
- Energy & Utilities
- Finance/Banking
- Food
- Logistics
- Retail
- Manufacturing
- Media
- Mining
- Pharma
- Public Sector
- Transport
- Other

Would be willing to provide further answers at a later stage?

- Yes
- No

Please state your email address:

The three surveys resulted in a total of 156 individual traveller (54 Airport 102 Online) and 44 travel manager responses.

The travel purpose of the online respondents is mainly for business (47%), which could be due to the fact that travel forums on LinkedIn and Xing were used. However, leisure still contributes with 36% to normal purpose of air travel (see Figure A40).

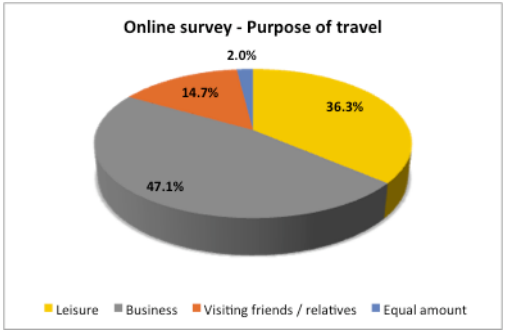



**Figure A40:** Purpose of travel from online survey

In terms of the airport respondents, they usually travel on leisure purpose (59%), which could be, because the surveys were run on a weekend (even so a large international fair ended this weekend) (Figure A41).

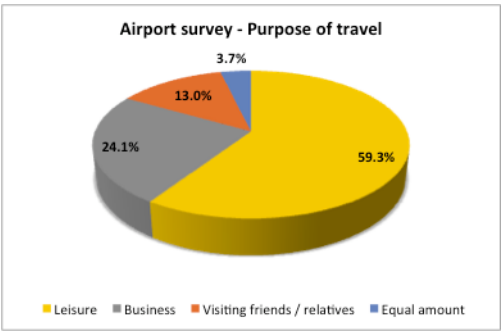



**Figure A41:** Purpose of travel from airport survey

In regards to travel policies that regulate travel, 95% of the respondent travel managers have established a travel policy that specifically regulates air travel and 91% allow their employees to travel on business class for long haul flights. In terms of travel spend 55% have a budget of € 5,000 that would theoretically allow them to travel on Cathay Pacific and Emirates on their lowest business class fares, while the other airlines in scope would be out of budget. And the full choice would have 20% of the travel managers as their budget is € 8,000.

In terms of demographics, most respondents of the online respondents are from Germany (38%) (Appendix) and the majority of airport respondents are also from Germany with 70% (Appendix). 90% of the travel managers are responsible for the German, EMEA or global travel management programme of their company (Appendix) and therefore have direct effect on the supplier sourcing within Germany.

### Criteria for choosing an airline

Across all three survey groups – airport, online and travel management – choosing an airline is made across the criteria of cost/value, flight patterns, assurance and reliability, while employees, innovation and customisation of the airlines are of least importance. Participants of the airport and online survey who normally travel on leisure purpose have the same top three ranking of importance: Assurance, cost/value and reliability and the least important are innovation and customisation.

For those who normally travel on business purpose, online participants found flight patterns, assurance and reliability the most important criteria, while respondents from the airport chose assurance as the most important one, followed by cost/value and reliability. The least important criteria are employees and customisation for online respondents, and innovation and customisation for airport participants. Details and complete ranking of the criteria are shown in the appendix.

### Willingness to stop-over and longer travel time

The online survey of individual travellers – either leisure or business purpose – resulted in 86% of the respondents to be willing to stop-over on a long-haul flight. Breaking this figure down to purpose of travel, 81% of those who normally travel for leisure would consider a stop-over flight and 90% of those who normally fly on business purpose. Since there was no significant difference between the purpose of travel among those who are willing to stop-over, it is not differentiated between leisure and business purpose travellers. The majority of travellers (47%) accept longer travel times of up to 4 hours, and almost 15% would accept travel times of up to 6 hours, opening a wide range of airlines and therefore lower airfares (Figure A42).

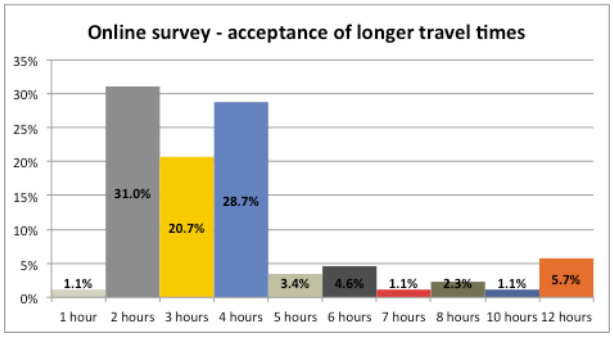



**Figure A42:** Online survey – hours travellers would be willing to fly longer than on a non-stop flight

The number of travellers from the airport survey who would consider a stop over is smaller with 70%. In terms of acceptable longer travel times, 32% would accept up to 4 hours. And in comparison to the online respondents, 7% less would accept travel times of up to 2 hours longer (Figure A43). The reason of the difference might root in the fact that Dusseldorf offers a substantial amount of non-stop flights to leisure destinations (like Florida, the Caribbean or Southwest Asia) and as a substantial higher number of respondents normally travel on leisure purpose. This is despite the fact that to most non-typical leisure destinations, travellers will need to change at least once.

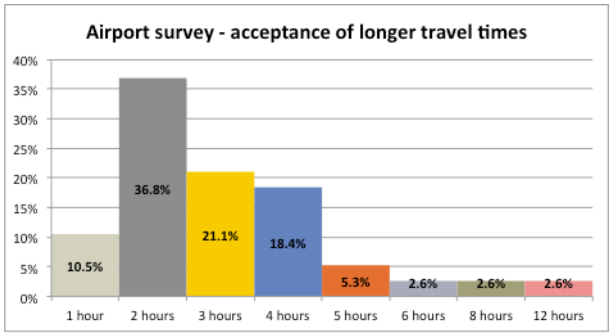



**Figure A43:** Airport survey – hours travellers would be willing to fly longer than on a non-stop flight

Among the travel managers, 86% would consider a flight with stop-over and among those, almost one third would consider flights up to 4 hours longer than a non-stop one (Figure A44), therefore opening themselves to a wide range of route options and airlines.

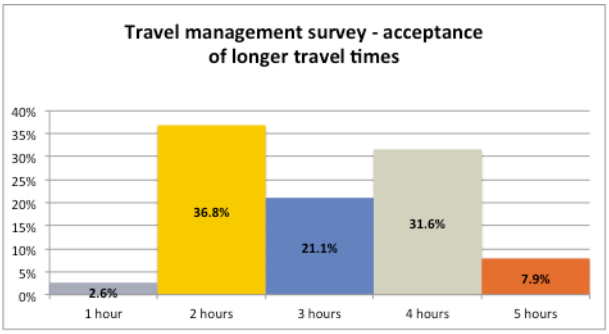



**Figure A44:** Travel management survey – hours travellers would be willing to fly longer than on a non-stop flight

## Long travel time accepted with monetary savings

The following table (Table A11) shows the results of accepting longer travel times, if these are combined with savings, hence lower airfares. Among the individual traveller responses the willingness to travel up to 4 hours longer is higher when not asked in connection with monetary savings. Only longer travel times of up to 6 hours would have a positive effect, if airfares are lower. These findings might imply that other factors than low airfares are of higher importance. Even so, the criteria "cost/value" for choosing an airline was often ranked as important by those travelling on leisure and travel managers who would consider a stop-over flight (means of 2.24 to 2.68).

| Online survey | | | | | | Travel Management survey | | | | Dusseldorf Airport | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *longer travel time* | *No monetary connection* | *Monetary connection + travel class* | | | | *longer travel time* | *No monetary connection* | *Monetary connection + travel class* | | *longer travel time* | *No monetary connection* | *Monetary connection + travel class* | | | |
| | | *Y-class* | *Saving* | *C-class* | *Saving* | | | *C-class* | *Saving* | | | *Y-class* | *Saving* | *C-class* | *Saving* |
| 2 hours | 98.9% | 58.2% | 200 € | 36.4% | 800 € | 2 hours | 97.4% | 39.1% | 800 € | 2 hours | 89.5% | 61.5% | 200 € | 60.0% | 800 € |
| 4 hours | 46.9% | 24.5% | 400 € | 39.4% | 1,600 € | 4 hours | 39.5% | 50.0% | 1,600 € | 4 hours | 31.5% | 28.2% | 400 € | 40.0% | 1,600 € |
| 6 hours | 14.8% | 17.3% | 600 € | 24.2% | 3,200 € | 6 hours | 0.0% | 10.9% | 3,200 € | 6 hours | 7.8% | 10.3% | 600 € | 0.0% | 3,200 € |

**Table A11:** Comparison of accepting longer travel times – with and without monetary savings on airfares

In regards to the travel management responses, monetary savings play a bigger role, as more travel managers would send their employees on longer flight times, if savings are achieved. Although the same respondents allow their employees to fly on business class, it also shows that travel expenses have to be lowered, if possible and that longer flight times would be accepted, if the level of comfort – business class – remains the same.

## Perceptions of travellers about airlines

The appealingness of the airline is calculated by identifying the top three most stated attributes that are positively associated with each airline for each survey. The attributes fit one-to-one to those attributes used for the rating of the criteria for choosing an airline. Therefore, the attributes for choosing one airline are given point from 1 to 10, with the attribute being considered as most important given 10 points, followed by the second attribute receiving 9 points and so until the least considered attributes only receive 1 point. This is followed by matching the points of the attributes from the criteria of choice ranking to the top 3 perceived attributes for each airline and adding them up. The airline with the highest points would therefore appeal the most to the travellers' criteria for choosing an airline.

In cases a significant difference exists between leisure and business trips for the individual travellers, the ranking is matched for each travel purpose.

In case of the travel management survey, the questionnaire was only addressing corporate travel purposes. As the analysis found significant difference between those travel managers who would consider an airline with a stop-over for their travel programme and those who would not, only the responses of those who would transfer are taken into account. The results are shown in Table A12. Lufthansa has the highest score,

as travel managers perceive them in those criteria that they also ranked of high importance when choosing an airline. Due to low ranking of employees, comfort or facilities as criteria for choosing an airline, the three other airlines match less to the top needs of the travel managers and therefore have lower total points. The complete list of perceptions from the travel management survey is shown in the appendix.

**Travel Managements' three most stated attributes that are positively associated with each airline**

| | Cathay Pacific | | Emirates | | Lufthansa | | Singapore Airlines | |
|---|---|---|---|---|---|---|---|---|
| | *Attribute* | *Points* | *Attribute* | *Points* | *Attribute* | *Points* | *Attribute* | *Points* |
| 1 | Assurance *(safety records/employee's capability)* | 8 | Comfort *(seat pitch/width, legroom)* | 5 | Reliability *(on-time/consistent service)* | 7 | Employees *(employees' appearance & attitude)* | 3 |
| 2 | Comfort *(seat pitch/width, legroom)* | 5 | Cost / Value *(airfare, booking policies)* | 9 | Flight Patterns *(schedules, frequencies, network)* | 10 | Comfort *(seat pitch/width, legroom)* | 5 |
| 3 | Reliability *(on-time/consistent service)* | 7 | Facilities *(check-in/baggage service, in-flight facilities, lounges)* | 4 | Assurance *(safety records/employee's capability)* | 8 | Assurance *(safety records/employee's capability)* | 8 |
| ***Total points*** | | ***20*** | | ***18*** | | ***25*** | | ***16*** |

**Table A12:** Travel management survey – Matching general criteria of choice against perceptions of each airline

The airport survey revealed differences for the criteria of choice, when people normally travel on leisure or business purpose (corporate travel). Moreover, there are differences between those who travel in economy class vs. business class with the purpose of corporate travel. Therefore Table A13 matches the criteria for choosing an airline against the perceptions by looking into leisure purpose (no difference between travelling economy or business class) and Table A14 considers corporate travellers who fly business class.

**Airport survey - Travellers' three most stated attributes that are positively associated with each airline - Leisure Purpose**

| | Cathay Pacific | | Emirates | | Lufthansa | | Singapore Airlines | |
|---|---|---|---|---|---|---|---|---|
| | *Attribute* | *Points* | *Attribute* | *Points* | *Attribute* | *Points* | *Attribute* | *Points* |
| 1 | Assurance *(safety records/employee's capability)* | 10 | Assurance *(safety records/employee's capability)* | 10 | Assurance *(safety records/employee's capability)* | 10 | Comfort *(seat pitch/width, legroom)* | 7 |
| 2 | Employees *(employees' appearance & attitude)* | 4 | Flight Patterns *(schedules, frequencies, network)* | 6 | Reliability *(on-time/consistent service)* | 8 | Assurance *(safety records/employee's capability)* | 10 |
| 3 | Comfort *(seat pitch/width, legroom)* | 7 | Comfort *(seat pitch/width, legroom)* | 7 | Flight Patterns *(schedules, frequencies, network)* | 6 | Employees *(employees' appearance & attitude)* | 4 |
| ***Total points (matched against criteria)*** | | ***21*** | | ***23*** | | ***24*** | | ***21*** |

**Table A13:** Airport survey – Matching general criteria of choice against perceptions of each airline for those flying on leisure purpose

**Airport survey - Travellers' three most stated attributes that are positively associated with each airline - Business Class on Business Purpose**

| | Cathay Pacific | | Emirates | | Lufthansa | | Singapore Airlines | |
|---|---|---|---|---|---|---|---|---|
| | *Attribute* | *Points* | *Attribute* | *Points* | *Attribute* | *Points* | *Attribute* | *Points* |
| 1 | Assurance *(safety records/employee's capability)* | 10 | Assurance *(safety records/employee's capability)* | 10 | Assurance *(safety records/employee's capability)* | 10 | Assurance *(safety records/employee's capability)* | 10 |
| 2 | Employees *(employees' appearance & attitude)* | 3 | Cost / Value *(airfare, booking policies)* | 8 | Flight Patterns *(schedules, frequencies, network)* | 7 | Employees *(employees' appearance & attitude)* | 3 |
| 3 | Customisation *(individual attention, anticipation of your travel* | 2 | Facilities *(check-in/baggage service, in-flight facilities, lounges)* | 4 | Reliability *(on-time/consistent service)* | 9 | Reliability *(on-time/consistent service)* | 9 |
| ***Total points (matched against criteria)*** | | ***15*** | | ***22*** | | ***26*** | | ***22*** |

**Table A14:** Airport survey – Matching general criteria of choice against perceptions of each airline for those flying on business purpose

The perceptions of leisure travellers about Lufthansa fit most to the top criteria for choosing an airline and are closely followed by Emirates. But also perceptions about Cathay Pacific and Singapore Airlines fit to the needs, especially as both airlines also give the travellers a safe impression. The complete list of perceptions is shown in the appendix.

The results of the corporate travellers who fly on business class are similar to the leisure travellers, with the exception of Cathay Pacific. Lufthansa scores even higher and Cathay Pacific looses point because corporate travellers from the airport survey rate comfort lower as a criteria for choosing an airline than those who fly on leisure purpose

Although the criteria for choosing an airline did not vary much between the airport and online respondents, the perceptions do, with the exception of Lufthansa. In both cases – leisure and corporate travellers – the perceptions about Lufthansa match best with the criteria for choosing an airline. Whereas Emirates has a similar score with leisure travellers from the online survey, corporate travellers criteria are less matched. On the other side, Singapore Airlines seems less attractive to the leisure traveller, but fulfil more the needs of the corporate traveller. The top 3 criteria are outlined in Table A15 and Table A16.

**Online survey - Travellers' three most stated attributes that are positively associated with each airline - Leisure Purpose**

| | Cathay Pacific | | Emirates | | Lufthansa | | Singapore Airlines | |
|---|---|---|---|---|---|---|---|---|
| | *Attribute* | *leisure* | *Attribute* | *leisure* | *Attribute* | *leisure* | *Attribute* | *leisure* |
| 1 | Comfort *(seat pitch/width, legroom)* | 6 | Cost / Value *(airfare, booking policies)* | 9 | Assurance *(safety records/employee's capability)* | 10 | Employees *(employees' appearance & attitude)* | 3 |
| 2 | Employees *(employees' appearance & attitude)* | 3 | Comfort *(seat pitch/width, legroom)* | 6 | Reliability *(on-time/consistent service)* | 8 | Comfort *(seat pitch/width, legroom)* | 6 |
| 3 | Reliability *(on-time/consistent service)* | 8 | Flight Patterns *(schedules, frequencies, network)* | 7 | Flight Patterns *(schedules, frequencies, network)* | 7 | Facilities *(check-in/baggage service, in-flight facilities, lounges)* | 4 |
| ***Total points (matched against criteria)*** | | ***17*** | | ***22*** | | ***25*** | | ***13*** |

**Table A15:** Online survey – Matching general criteria of choice against perceptions of each airline for those flying on leisure purpose

**Online survey - Travellers' three most stated attributes that are positively associated with each airline - Business Class on Business Purpose**

| | Cathay Pacific | | Emirates | | Lufthansa | | Singapore Airlines | |
|---|---|---|---|---|---|---|---|---|
| | *Attribute* | *leisure* | *Attribute* | *leisure* | *Attribute* | *leisure* | *Attribute* | *leisure* |
| 1 | Responsiveness *(efficient service, prompt handling of requests)* | 5 | Responsiveness *(efficient service, prompt handling of requests)* | 5 | Reliability *(on-time/consistent service)* | 8 | Reliability *(on-time/consistent service)* | 8 |
| 2 | Assurance *(safety records/employee's capability)* | 9 | Facilities *(check-in/baggage service, in-flight facilities, lounges)* | 4 | Assurance *(safety records/employee's capability)* | 9 | Assurance *(safety records/employee's capability)* | 9 |
| 3 | Employees *(employees' appearance & attitude)* | 2 | Cost / Value *(airfare, booking policies)* | 7 | Responsiveness *(efficient service, prompt handling of requests)* | 5 | Comfort *(seat pitch/width, legroom)* | 6 |
| ***Total points (matched against criteria)*** | | ***16*** | | ***16*** | | ***22*** | | ***23*** |

**Table A16:** Online survey – Matching general criteria of choice against perceptions of each airline for those flying on business purpose

# Appendix 6 – Model formulation

## Passenger demand

The airlines manufactures produce long-term global air traffic forecasts and anticipate global RPK growth of 5.0% CAGR (compound annual growth rate) (Airbus, 2012; Boeing, 2012; Embraer, 2012) and a route specific growth between Europe and Asia of 5.6% CAGR and between Asia and the Middle East of 7.1% CAGR (Airbus, 2012; Boeing, 2012). The short-term forecast of IATA (2012) is less optimistic with 4.0% and also include a worst case scenario with a sincere banking crisis that could result in negative growth of -1.3%. On the other side, GDP forecasts of OECD and IMF are lower at 4.0% and 3.6% respectively for 2014. Since air travel demand is related to growth in GDP, as the literature review has shown, the growth forecasts of the aircraft manufacturers have to be considered with care. Therefore the model assumes a GDP growth of 3.8% (average of OECD and IMF forecast) across all routes.

The model simplifies the O-D (origin – destination) market demand by using the historic travel numbers for each O-D segment from it's originating airport in Germany. E.g., market demand for the route Frankfurt – Hong Kong is established by taking passengers numbers flying from Frankfurt and having Hong Kong as their final destination. Therefore the model ignores the demand from Hong Kong to Frankfurt, which might be smaller or larger. Hence, the same amount of passengers that will fly from Frankfurt to Hong Kong (as final destination) will also fly back the same route; i.e. outbound traffic equals inbound traffic.

Initially, the calculation of the actual passenger numbers for each O-D market is based on the current seat capacity (i.e., current aircraft used and number of seats according to seat map from each airline) and the general load factor provided by the airlines in their annual statements. However, based on this assumption, the passengers carried alone by Cathay Pacific and Lufthansa from Frankfurt to Hong Kong, or Singapore Airlines and Lufthansa from Frankfurt to Singapore already exceed the number of total travellers recorded for these city pairs (Table A19).

| Actual total passengers from Frankfurt | | Maximum capacity | | Load factor | Passengers based on load factor | Assumed total passengers carried |
|---|---|---|---|---|---|---|
| to Hong Kong | 214,072 | Cathay Pacific | 143,262 | 86.2% | 123,492 | 241,094 |
| | | Lufthansa | 145,908 | 80.6% | 117,602 | |
| to Singapore | 378,793 | Lufthansa | 196,560 | 80.6% | 158,427 | 386,624 |
| | | Singapore Airlines | 283,122 | 80.6% | 228,196 | |

*Data based on DESTATIS, Cathay Pacific, Lufthansa and Singapore Airlines*

**Table A19:** Initial calculation of transported passengers per airline based on published load factor

Hence, the O-D specific load factor must be lower than the one provided by the airlines on regional or global level. Since it is not possible to obtain the actual load factor from the airlines or gather route passenger data through other channels, the base demand for each airline has to be assumed. In order to arrive at an assumption, the average load factor of the non-stop airlines is taken and measured against the total number of passengers flown on the specific O-D route in 2012 (Table A20).

The function is:

$$Passengers\ on\ n\ airlines = Total\ passengers\ to\ destination \times \left(\frac{LF(A) + LF(B) + LF(C) + \dots}{number\ of\ n}\right) \qquad \text{Eq. 1}$$

*where*

*LF is the load factor for each airline flying the route non-stop*

*n is the number of airlines flying the route non-stop*

The result of this calculation is taken as the assumption of total passengers who flew on the airlines in scope for each route. Further, the number of passengers flown on each airline is derived by calculating their share

through assigning the highest proportion of travellers to the airline with the highest load factor, as shown in the function below:

$$Passengers\ for\ each\ airline = Passengers\ on\ n\ airlines \times \left(\frac{LF(A)}{LF(A) + LF\ (B) + \ldots}\right) \qquad \text{Eq. 2}$$

*where*

*LF is the load factor for each airline flying the route non-stop*

*n is the number of airlines flying the route non-stop*

In addition, a new route specific load factor is assumed by measuring the assumed passengers for each airline against their actual capacity on the respective route. The results of the above equations are shown in Table A20.

| Actual Passengers from Frankfurt | | Actual load factors | | Assumed passengers based on load factor | Proportion for each airline | Assumed passengers for each airline | Actual seat capacity | Assumed load factor for route |
|---|---|---|---|---|---|---|---|---|
| to Hong Kong | 214,072 | Cathay Pacific | 86.2% | 178,536 | 51.7% | 92,265 | 143,262 | 64.4% |
| | | Lufthansa | 80.6% | | 48.3% | 86,271 | 145,908 | 59.1% |
| | | Average | 83.4% | | | | | |
| to Tokyo | 346,560 | All Nippon Airways | 75.2% | 267,891 | 32.4% | 86,871 | 157,248 | 55.2% |
| | | Japan Airlines | 76.1% | | 32.8% | 87,911 | 92,988 | 94.5% |
| | | Lufthansa | 80.6% | | 34.8% | 93,109 | 196,560 | 47.4% |
| | | Average | 77.3% | | | | | |
| to Singapore | 378,793 | Lufthansa | 80.6% | 305,307 | 50.0% | 152,654 | 196,560 | 77.7% |
| | | Singapore Airlines | 80.6% | | 50.0% | 152,654 | 283,122 | 53.9% |
| | | Average | 80.6% | | | | | |

**Table A20:** Assumptions about load factors and passengers for base year

*Source for actual passengers and load factors: Destatis, Cathay Pacific, Emirates, Lufthansa, Singapore Airlines (2013)*

The equations on assumed passengers and load factors allow estimating the market share for each airline on the individual routes. The assumption on the market share for the economy and business class of each airline is based on the actual load factor for 2012 and the distribution of economy and business class seats to the total seats per aircraft configuration (Table A21).

Airbus A380 seating configuration

| | First | Business | Economy | Total | *Load factor* | Business share | Economy share |
|---|---|---|---|---|---|---|---|
| Cathay Pacific* | 11 | 70 | 388 | 469 | *86.2%* | 13.2% | 73.0% |
| Emirates | 14 | 98 | 399 | 511 | *79.7%* | 15.3% | 64.0% |
| Lufthansa | 8 | 76 | 420 | 504 | *80.6%* | 12.1% | 68.2% |
| Singapore Airlines | 12 | 60 | 399 | 471 | *80.6%* | 10.3% | 70.0% |

** assumption based on average of Asian airlines operating A380s'*

**Table A21:** Assumed cabin class shares on total passengers flying per airline

Even so no actual data for the current market shares were available, the 2011 market share for the route Frankfurt – Tokyo Narita was distributed among the three non-stop airlines: ANA 15%, JAL 35% and Lufthansa 38% (Routes Online, 2011). Since 2012, ANA operates a second daily flight to Tokyo Haneda airport at different arrival and departures times in Tokyo in comparison to the existing ones, and therefore offering a wider choice of travel. Therefore it could be assumed that the new route by ANA shifted the market share as shown in Table A22 for the Tokyo route and reinforces the assumptions are for the model building.

| Assumed market share on route from Frankfurt | | |
|---|---|---|
| to Hong Kong | Cathay Pacific | 43.1% |
| | Lufthansa | 40.3% |
| | Other airlines | 16.6% |
| to Tokyo | All Nippon Airways | 25.1% |
| | Japan Airlines | 25.4% |
| | Lufthansa | 26.9% |
| | Other airlines | 22.7% |
| to Singapore | Lufthansa | 40.3% |
| | Singapore Airlines | 40.3% |
| | Other airlines | 19.4% |

**Table A22:** Assumed market share for non-stop airline routes

In the case of Emirates on all three routes, or Singapore Airlines and Cathay Pacific on the route Frankfurt to Tokyo, the number of airlines divides the market share of "other airlines" among each other in equal terms. That is, on the route Frankfurt – Hong Kong, Emirates and Singapore Airlines will each have 8.3% market share in their initial passenger numbers from Frankfurt to Hong Kong. In the case of Frankfurt – Tokyo, the market share of 22.7% is divided

through three airlines: Cathay Pacific, Emirates and Singapore Airlines. It is acknowledged that passengers could also travel on any other airline, but in order to create a passenger base, this simplification of the market for "other airlines" is brought forward into the model.

One additional factor are passengers flying via Dubai as hub regardless of their final destination (e.g. India, Australia or South Africa), a base of passengers from Frankfurt to Dubai is added that remains the same over the time span of the model and is not affected by changes in airfares, appealingness or travel time. The reason behind this passenger base is due to the fact that the model only considers one origin and destination, and as Emirates not only connects e.g. Dubai with Hong Kong, but also many other destinations, these factor has to be considered. Based on a total of 360,614 passengers from Frankfurt to or via Dubai to their final destination (Destatis, 2013), it is assumed that Emirates holds a market share on the Frankfurt – Dubai route of 68.8% and therefore flown 247,381 passengers on this route.

For the route Frankfurt – Tokyo, passenger numbers exist for the route from Frankfurt to Hong Kong on Cathay Pacific, and Frankfurt to Singapore on Singapore Airlines. These numbers will be used as base demand and will not change over the model time span, as described in the previous paragraph about Emirates.

**Demand, elasticities and changes in appealingness**

Based on the demand and forecasting equation by McGuigan et al. (2011):

$$Q_2 = Q_1 \left[1 + E_D(\%\Delta P) + E_y(\%\Delta Y)\right] \qquad \text{Eq. 3}$$

the effects of airfare elasticity, travel time elasticity and changes in appealingness on the future demand of each airline are calculated by the following equation within the model:

$$Q_2 = Q_1 \left[1 + E_D(\%\Delta P) + E_t(\%\Delta T)\right] \left[1 + \%\Delta A\right] \qquad \text{Eq.4}$$

*where*

$E_D$ *= airfare elasticity*

$E_t$ *= travel time elasticity*

$\%\Delta P$ *= change in airfare*

$\%\Delta T$ *= change in travel time*

$\%\Delta A$ *= change in appealingness*

The price elasticity for economy class fares is -1.6 and for business class fares -1.1 (Belobaba et al., 2009) and the time elasticity is based on the survey average of willingness to travel longer for leisure and corporate passengers, resulting in both cases in an elasticity of -1.1.

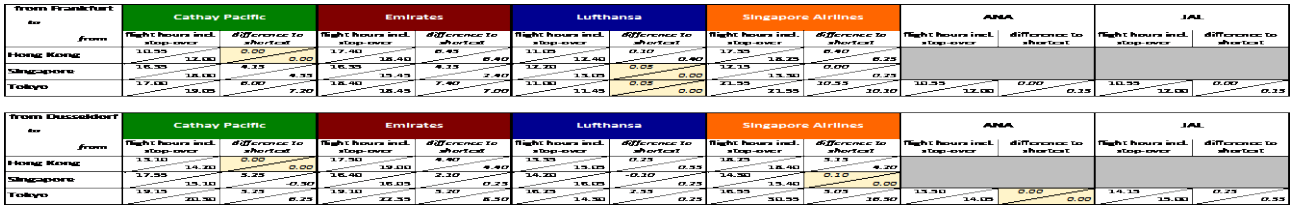
**References airfares**

The model uses the lowest economy airfare regardless of advance booking, cancellation fees, and minimum or maximum stay restrictions as obtained during the spot check. In regards to the business class fare, the lowest business class fare without minimum stay and advance booking restrictions is chosen (Figure 17 and Figure A20).

**Reference flight times**

The base of the model are the actual flight times (Table A23), but with the option to alter these due to changes in frequencies and therefore allowing shorter connection times at hub airports. This will have a

direct effect on passenger demand for these stop-over routes, as the survey showed that passengers willingness to stop-over increase with short transfer times.



| from Frankfurt to / from | Cathay Pacific | | Emirates | | Lufthansa | | Singapore Airlines | | ANA | | JAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | flight hours incl. stop-over | difference to shortest | flight hours incl. stop-over | difference to shortest | flight hours incl. stop-over | difference to shortest | flight hours incl. stop-over | difference to shortest | flight hours incl. stop-over | difference to shortest | flight hours incl. stop-over | difference to shortest |
| Hong Kong | 11.55 | 0.00 | 17.40 | 6.45 | 11.05 | 0.10 | 17.55 | 6.40 | | | | |
| | 16.55 | 12.00 | 16.55 | 18.40 | 12.20 | 12.40 | 12.15 | 18.25 | | | | |
| Singapore | | 4.35 | | 4.35 | | 0.05 | | 6.00 | | | | |
| | 17.00 | 18.00 | 18.40 | 15.45 | 11.00 | 11.05 | 21.55 | 11.30 | 10.55 | 0.00 | 10.55 | 0.00 |
| Tokyo | | 6.00 | | 7.40 | | 0.05 | | 10.55 | | 0.33 | | 0.33 |
| | 19.05 | 7.20 | 18.45 | 7.00 | 11.45 | 0.00 | 21.55 | 10.30 | 12.00 | | 12.00 | |

| from Dusseldorf to / from | Cathay Pacific | | Emirates | | Lufthansa | | Singapore Airlines | | ANA | | JAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | flight hours incl. stop-over | difference to shortest | flight hours incl. stop-over | difference to shortest | flight hours incl. stop-over | difference to shortest | flight hours incl. stop-over | difference to shortest | flight hours incl. stop-over | difference to shortest | flight hours incl. stop-over | difference to shortest |
| Hong Kong | 13.10 | 0.00 | 17.30 | 4.40 | 13.33 | 0.23 | 18.25 | 5.15 | | | | |
| | 14.20 | 0.00 | 19.10 | 4.40 | 13.05 | 0.33 | 18.40 | 4.20 | | | | |
| Singapore | 17.55 | 3.25 | 16.40 | 2.30 | 14.20 | -0.30 | 14.30 | 0.10 | | | | |
| | 19.10 | -0.30 | 19.10 | 0.23 | 18.05 | 0.23 | 15.40 | 0.00 | | | | |
| Tokyo | 19.15 | 5.25 | 19.10 | 5.20 | 18.25 | 2.33 | 18.55 | 5.05 | 13.50 | 0.00 | 14.15 | 0.23 |
| | 20.30 | 8.25 | 22.35 | 8.30 | 14.30 | 0.25 | 20.55 | 10.30 | 14.05 | 0.00 | 15.00 | 0.33 |

**Table A23:** flight times as of July 2013 from Frankfurt

*Source: Cathay Pacific, Emirates, Lufthansa, Singapore Airlines (2013)*

For simplicity reasons, only the flight time from Germany to the destination – in this case Hong Kong – is considered. It is acknowledged and as shown in above table that flight times from Asia to Germany are longer. Since these are longer irrespective of the direct airline, only the outward flights times are being applied to the model.

### Reference appealingness

The average of the appealingness scoring of each airline as described in the case presentation is used for the leisure traveller (airport and online), and for the corporate traveller (airport and online) together with the travel manager, as shown in Table A24.

| | Cathay Pacific | Emirates | Lufthansa | Singapore Airlines |
|---|---|---|---|---|
| *Appealingness Leisure Traveller* | *19* | *22* | *24* | *17* |
| Appealingness Corporate Traveller & Travel Managers | *17* | *18* | *24* | *20* |

**Table A24:** Reference appealingness for each airlines

## Further model

The three main cost drivers – fuel, wages and taxes & charges – are calculated individually as shown below, while all other identified operating expenses (as shown in Figure 33) are a calculated on a ASK times distance flown basis.

Fuel cost = X litre per passenger per 100 km flown (fuel price per litre 0.7635$ = 0,58628€/litre (IATA, 2013)

Airport charges = taxes and chargers per ticket sold (i.e., per passenger) as of 01 July 2013 (see Appendix )

Staff cost = monthly block hours per aircraft divided by monthly block hours per cabin crew times cabin crew size for aircraft used by airline times monthly salary (i.e, wage per employee)

Average monthly block hours per cabin crew: Cathay Pacific: 80; Emirates: 90; Lufthansa: 70; and Singapore Airlines: 80.

All variables and units used can obtained from the following appendix.

### Time horizon

The root of the problem might be further in the past than the above airfare, revenue and cost analysis can provide. Over the last 10 years, Emirates continuously increased its flight frequencies and capacities to the destinations in scope, while most of the incumbent airlines have not. However, the last 6 years provide a good time horizon in relation to events that effect air travel, like the global financial crisis, closure of European airspace due to volcanic eruptions in Iceland, or the tsunami in Japan.

In terms of looking into in the future, a time span of 10 years is chosen with the option to adjust airfares, travel time and appealingness on an annual basis. 10 years as a time horizon is chosen, as changes in the macro-economic environment would have the largest impact. Especially, for a business that depends on a global and high yielding customer base, macro-economic shocks would have a large impact.

# Appendix 7 – Variables and formula from the model build with Vensim

(001) airfare business class CX= GAME (4357)

Units: EUR/Passenger [3500,8000]

(002) airfare business class EK= GAME (3882)

Units: EUR/Passenger [3500,8000]

(003) airfare business class LH= GAME (5149)

Units: EUR/Passenger [3500,8000]

(004) airfare business class SQ= GAME (6619)

Units: EUR/Passenger [3500,8000]

(005) airfare economy class CX= GAME (707)

Units: EUR/Passenger [600,1000]

(006) airfare economy class EK= GAME (682)

Units: EUR/Passenger [600,1000]

(007) airfare economy class LH= GAME (845)

Units: EUR/Passenger [600,1000]

(008) airfare economy class SQ= GAME (979)

Units: EUR/Passenger [600,1000]

(009) airport charges and taxes CX=33

Units: EUR/Passenger

(010) airport charges and taxes EK=92

Units: EUR/Passenger

(011) airport charges and taxes LH=92

Units: EUR/Passenger

(012) airport charges and taxes SQ=106

Units: EUR/Passenger

(013) airport costs CX=airport charges and taxes CX*(Corporate Demand CX+Leisure Demand CX)

Units: EUR

(014) airport costs EK=airport charges and taxes EK*(Corporate Demand EK+Leisure Demand EK)

Units: EUR

(015) airport costs LH=airport charges and taxes LH*(Corporate Demand LH+Leisure Demand LH)

Units: EUR

(016) airport costs SQ=airport charges and taxes SQ*(Corporate Demand SQ+Leisure Demand SQ)

Units: EUR

(017) annual wage CX=59980

Units: Wage/Cabin crew

(018) annual wage EK=49225

Units: Wage/Cabin crew

(019) annual wage LH=70891

Units: Wage/Cabin crew

(020) annual wage SQ=70296

Units: Wage/Cabin crew

(021) appealingness corporate CX= GAME (17)

Units: points [6,27]

(022) appealingness corporate EK= GAME (18)

Units: points [6,27]

(023) appealingness corporate LH= GAME (24)

Units: points [6,27]

(024) appealingness corporate SQ= GAME (20)

Units: points [6,27]

(025) appealingness leisure CX= GAME (19)

Units: points [6,27]

(026) appealingness leisure EK= GAME (22)

Units: points [6,27]

(027) appealingness leisure LH= GAME (24)

Units: points [6,27]

(028) appealingness leisure SQ= GAME (17)

Units: points [6,27]

(029) block hours aircraft CX=travel time CX*2*7*52*number of aircraft in service CX

Units: hours

(030) block hours aircraft EK=travel time EK*2*7*54*number of aircraft in service EK

Units: hours

(031) block hours aircraft LH=travel time LH*2*7*52*number of aircraft in service LH

Units: hours

(032) block hours aircraft SQ=travel time SQ*2*7*52*number of aircraft in service SQ

Units: hours

(033) block hours cabin crew CX=80*12

Units: hours [840,1080]

(034) block hours cabin crew EK=90*12

Units: hours [840,1080]

(035) block hours cabin crew LH=70*12

Units: hours [840,1080]

(036) block hours cabin crew SQ=80*12

Units: hours [840,1080]

(037) cabin crew CX=21*number of aircraft in service CX

Units: crew/aircraft

(038) cabin crew EK=24*number of aircraft in service EK

Units: crew/aircraft

(039) cabin crew LH=21*number of aircraft in service LH

Units: crew/aircraft

(040) cabin crew SQ=22*number of aircraft in service SQ

Units: crew/aircraft

(041) Capacity Cathay Pacific= INTEG (new seat capacity CX, 469*7*52)

Units: seats/Year

(042) Capacity Emirates= INTEG (new seat capacity EK, 489*7*52)

Units: seats/Year

(043) Capacity Lufthansa= INTEG (new seat capacity LH, 526*7*52)

Units: seats/Year

(044) Capacity Singapore Airlines= INTEG (new seat capacity SQ, 471*7*52)

Units: seats/Year

(045) change in appealingness business class CX competitors=(change in appealingness corporate EK + change in appealingness corporate SQ + change in appealingness corporate LH)/3

Units: fraction/Year

(046) change in appealingness business class EK competitors=(change in appealingness corporate CX + change in appealingness corporate SQ + change in appealingness corporate LH)/3

Units: fraction/Year

(047) change in appealingness business class LH competitors=(change in appealingness corporate CX + change in appealingness corporate EK + change in appealingness corporate SQ)/3

Units: fraction/Year

(048) change in appealingness business class SQ competitors=(change in appealingness corporate CX + change in appealingness corporate EK + change in appealingness corporate LH)/3

Units: fraction/Year

(049) change in appealingness corporate CX=1-reference appealingness corporate CX/appealingness corporate CX

Units: fraction/Year

(050) change in appealingness corporate EK=1-reference appealingness corporate EK/appealingness corporate EK

Units: fraction/Year

(051) change in appealingness corporate LH=1-reference appealingness corporate LH/appealingness corporate LH

Units: fraction/Year

(052) change in appealingness corporate SQ=1-reference appealingness corporate SQ/appealingness corporate SQ

Units: fraction/Year

(053) change in appealingness economy class CX competitors=(change in appealingness leisure EK + change in appealingness leisure SQ + change in appealingness leisure LH)/3

Units: fraction/Year

(054) change in appealingness economy class EK competitors=(change in appealingness leisure CX + change in appealingness leisure LH + change in appealingness leisure SQ)/3

Units: fraction/Year

(055) change in appealingness economy class LH competitors=(change in appealingness leisure CX + change in appealingness leisure EK + change in appealingness leisure SQ)/3

Units: fraction/Year

(056) change in appealingness economy class SQ competitors=(change in appealingness leisure CX + change in appealingness leisure EK + change in appealingness leisure LH)/3

Units: fraction/Year

(057) change in appealingness leisure CX=1-reference appealingness leisure CX/appealingness leisure CX

Units: fraction/Year

(058) change in appealingness leisure EK=1-reference appealingness leisure EK/appealingness leisure EK

Units: fraction/Year

(059) change in appealingness leisure LH=1-reference appealingness leisure LH/appealingness leisure LH

Units: fraction/Year

(060) change in appealingness leisure SQ=1-reference appealingness leisure SQ/appealingness leisure SQ

Units: fraction/Year

(061) Corporate Demand CX=corporate market share CX-flying on other airlines business class CX

Units: Passenger/Year

(062) Corporate Demand EK=corporate market share EK - flying on other airlines business class EK + corporate market share FRA XXX EK

Units: Passenger/Year

(063) corporate demand elasticity CX=-0.8

Units: demand elasticity

(064) corporate demand elasticity EK=-0.8

Units: demand elasticity

(065) corporate demand elasticity LH=-0.8

Units: demand elasticity

(066) corporate demand elasticity SQ=-0.8

Units: demand elasticity

(067) Corporate Demand LH=corporate market share LH-flying on other airlines business class LH

Units: Passenger/Year

(068) Corporate Demand SQ=corporate market share SQ - flying on other airlines business class SQ + corporate market share FRA XXX SQ

Units: Passenger/Year

(069) corporate market share CX=Total Potential Demand FRA HKG * reference market share CX/100 * reference load factor business class CX/100 * (1 + corporate demand elasticity CX*(1-reference airfare business class CX/airfare business class CX) + corporate time elasticity CX*(1-reference time CX /travel time CX) + change in appealingness corporate CX)

Units: Passenger/Year

(070) corporate market share EK=Total Potential Demand FRA HKG * reference market share EK/100 * reference load factor business class EK/100 * (1 + corporate demand elasticity EK*(1-reference airfare business class EK/airfare business class EK) + corporate time elasticity EK*(1-reference time EK/travel time EK) + change in appealingness corporate EK)

Units: Passenger/Year

(071) corporate market share FRA XXX EK=37849/3

Units: Passenger/Year

(072) corporate market share FRA XXX SQ=12612/2

Units: Passenger/Year

(073) corporate market share LH=Total Potential Demand FRA HKG * reference market share LH/100 * reference load factor business class LH/100 * (1 + corporate demand elasticity LH*(1-reference airfare business class LH/airfare business class LH) + corporate time elasticity LH*(1-reference time LH/travel time LH) + change in appealingness corporate LH)

Units: Passenger/Year

(074) corporate market share SQ=Total Potential Demand FRA HKG * reference market share SQ/100 * reference load factor business class SQ/100 * (1 + corporate demand elasticity SQ*(1-reference airfare business class SQ/airfare business class SQ) + corporate time elasticity SQ*(1-reference time SQ/travel time SQ) + change in appealingness corporate SQ)

Units: Passenger/Year

(075) corporate time elasticity CX=-1.3

Units: time elasticity

(076) corporate time elasticity EK=-1.3

Units: time elasticity

(077) corporate time elasticity LH=-1.3

Units: time elasticity

(078) corporate time elasticity SQ=-1.3

Units: time elasticity

(079) FINAL TIME = 10

Units: Year

The final time for the simulation.

(080) flight distance FRA HKG CX=9169*2*7*52

Units: km/Year

(081) flight distance FRA HKG EK=10777*2*7*52

Units: km/Year

(082) flight distance FRA HKG LH=9169*2*7*52

Units: km/Year

(083) flight distance FRA HKG SQ=12835*2*7*52

Units: km/Year

(084) flying on other airlines business class CX=corporate market share CX * change in appealingness business class CX competitors

Units: Passenger/Year

(085) flying on other airlines business class EK=corporate market share EK * change in appealingness business class EK competitors

Units: Passenger/Year

(086) flying on other airlines business class LH=corporate market share LH * change in appealingness business class LH competitors

Units: Passenger/Year

(087) flying on other airlines business class SQ=corporate market share SQ * change in appealingness business class SQ competitors

Units: Passenger/Year

(088) flying on other airlines economy class CX=leisure market share CX * change in appealingness economy class CX competitors

Units: Passenger/Year

(089) flying on other airlines economy class EK=leisure market share EK * change in appealingness economy class EK competitors

Units: Passenger/Year

(090) flying on other airlines economy class LH=leisure market share LH * change in appealingness economy class LH competitors

Units: Passenger/Year

(091) flying on other airlines economy class SQ=leisure market share SQ * change in appealingness economy class SQ competitors

Units: Passenger/Year

(092) fuel consumption A380 CX=3.3

Units: fuel/Passenger

According to A380 based on consumption per passenger per 100 km flown

(093) fuel consumption A380 EK=3.3

Units: fuel/Passenger

According to A380 based on consumption per passenger per 100 km flown

(094) fuel consumption A380 LH=3.3

Units: fuel/Passenger

According to A380 based on consumption per passenger per 100 km flown

(095) fuel consumption A380 SQ=3.3

Units: fuel/Passenger

According to A380 based on consumption per passenger per 100 km flown

(096) fuel costs CX=fuel consumption A380 CX * (Corporate Demand CX + Leisure Demand CX) * total flight distance FRA HKG CX / 7 / 54 / 100 * jet fuel price CX

Units: EUR

Fuel cost = fuel consumption per km times distance flown time fuel price per litre (fuel price per litre 0.7635$ = 0,58628,Ç¨/litre (IATA, 2013)

(097) fuel costs EK=fuel consumption A380 EK * (Corporate Demand EK + Leisure Demand EK) * total flight distance FRA HKG EK / 7 / 54 / 100 * jet fuel price EK

Units: EUR

Fuel cost = fuel consumption per km times distance flown time fuel price per litre (fuel price per litre 0.7635$ = 0,58628,Ç¨/litre (IATA, 2013)

(098) fuel costs LH=fuel consumption A380 LH * (Corporate Demand LH + Leisure Demand LH) * total flight distance FRA HKG LH / 7 / 54 / 100 * jet fuel price LH

Units: EUR

Fuel cost = fuel consumption per km times distance flown time fuel price per litre (fuel price per litre 0.7635$ = 0,58628,Ç¨/litre (IATA, 2013)

(099) fuel costs SQ=fuel consumption A380 SQ * (Corporate Demand SQ + Leisure Demand SQ) * total flight distance FRA HKG SQ / 7 / 54 / 100 * jet fuel price SQ

Units: EUR

Fuel cost = fuel consumption per km times distance flown time fuel price per litre (fuel price per litre 0.7635$ = 0,58628,Ç¨/litre (IATA, 2013)

(100) GDP growth rate=3.8

Units: fraction/Year [?,6]

(101) INITIAL TIME = 0

Units: Year

The initial time for the simulation.

(102) jet fuel price CX=0.5862

Units: EUR/Litre [0.5,1]

(103) jet fuel price EK=0.5862

Units: EUR/Litre [0.5,1]

(104) jet fuel price LH=0.5862

Units: EUR/Litre [0.5,1]

(105) jet fuel price SQ=0.5862

Units: EUR/Litre [0.5,1]

(106) Leisure Demand CX=leisure market share CX-flying on other airlines economy class CX

Units: Passenger/Year

(107) Leisure Demand EK=leisure market share EK - flying on other airlines economy class EK + leisure market share FRA XXX EK

Units: Passenger/Year

(108) leisure demand elasticity CX=-1.6

Units: demand elasticity

(109) leisure demand elasticity EK=-1.6

Units: demand elasticity

(110) leisure demand elasticity LH=-1.6

Units: demand elasticity

(111) leisure demand elasticity SQ=-1.6

Units: demand elasticity

(112) Leisure Demand LH=leisure market share LH-flying on other airlines economy class LH

Units: EUR/Passenger

(113) Leisure Demand SQ=leisure market share SQ - flying on other airlines economy class SQ + leisure market share FRA XXX SQ

Units: Passenger/Year

(114) leisure market share CX=Total Potential Demand FRA HKG * reference market share CX/100 * reference load factor economy class CX/100 * (1 + leisure demand elasticity CX*(1-reference airfare economy class CX/airfare economy class CX) + leisure time elasticity CX*(1-reference time CX/travel time CX) + change in appealingness leisure CX)

Units: Passenger/Year

(115) leisure market share EK=Total Potential Demand FRA HKG * reference market share EK/100 * reference load factor economy class EK/100 * (1 + leisure demand elasticity EK*(1-reference airfare economy class EK/airfare economy class EK) + leisure time elasticity EK*(1-reference time EK/travel time EK) + change in appealingness leisure EK)

Units: Passenger/Year

(116) leisure market share FRA XXX EK=158324/3

Units: Passenger/Year

(117) leisure market share FRA XXX SQ=85714/2

Units: Passenger/Year

(118) leisure market share LH= Total Potential Demand FRA HKG * reference market share LH/100 * reference load factor economy class LH/100 * (1 + leisure demand elasticity LH*(1-reference airfare economy class LH/airfare economy class LH) + leisure time elasticity LH*(1-reference time LH/travel time LH) + change in appealingness leisure LH)

Units: Passenger/Year

(119) leisure market share SQ= Total Potential Demand FRA HKG * reference market share SQ/100 * reference load factor economy class SQ/100 * (1 + leisure demand elasticity SQ*(1-reference airfare economy class SQ/airfare economy class SQ) + leisure time elasticity SQ*(1-reference time SQ/travel time SQ) + change in appealingness leisure SQ)

Units: Passenger/Year

(120) leisure time elasticity CX=-1.1

Units: time elasticity

(121) leisure time elasticity EK=-1.1

Units: time elasticity

(122) leisure time elasticity LH=-1.1

Units: time elasticity

(123) leisure time elasticity SQ=-1.1

Units: time elasticity

(124) load factor business class CX=Corporate Demand CX/seat capacity business class CX*100

Units: percent

(125) load factor business class EK=Corporate Demand EK/seat capacity business class EK*100

Units: percent

(126) load factor business class LH=Corporate Demand LH/seat capacity business class LH*100

Units: percent

(127) load factor business class SQ=Corporate Demand SQ/seat capacity business class SQ*100

Units: percent

(128) load factor economy class CX=Leisure Demand CX/seat capacity economy class CX*100

Units: percent

(129) load factor economy class EK=Leisure Demand EK/seat capacity economy class EK*100

Units: percent

(130) load factor economy class LH=Leisure Demand LH/seat capacity economy class LH*100

Units: percent

(131) load factor economy class SQ=Leisure Demand SQ/seat capacity economy class SQ*100

Units: percent

(132) new A380 purchase CX=IF THEN ELSE(load factor economy class CX >= 90 :OR: load factor business class CX >= 90 , 1 , 0 )

Units: fraction/Year [0,2]

(133) new A380 purchase EK=IF THEN ELSE(load factor economy class EK >= 90 :OR: load factor business class EK >= 90 , 1 , 0 )

Units: fraction/Year [0,2]

(134) new A380 purchase LH=IF THEN ELSE(load factor economy class LH >= 90 :OR: load factor business class LH >= 90 , 1 , 0 )

Units: fraction/Year [0,2]

(135) new A380 purchase SQ=IF THEN ELSE(load factor economy class SQ >= 90 :OR: load factor business class SQ >= 90 , 1 , 0 )

Units: fraction/Year [0,2]

(136) new seat capacity CX=new A380 purchase CX*Capacity Cathay Pacific

Units: seats/Year

(137) new seat capacity EK=new A380 purchase EK*Capacity Emirates

Units: seats/Year

(138) new seat capacity LH=new A380 purchase LH*Capacity Lufthansa

Units: seats/Year

(139) new seat capacity SQ=new A380 purchase SQ*Capacity Singapore Airlines

Units: seats/Year

(140) number of aircraft in service CX=Capacity Cathay Pacific/52/7/469

Units: aircraft

(141) number of aircraft in service EK=Capacity Emirates/52/7/489

Units: aircraft

(142) number of aircraft in service LH=Capacity Lufthansa/52/7/526

Units: aircraft

(143) number of aircraft in service SQ=Capacity Singapore Airlines/52/7/471

Units: aircraft

(144) operating profit CX=total revenue CX - total costs CX

Units: EUR

(145) operating profit EK=total revenue EK - total costs EK

Units: EUR

(146) operating profit LH=total revenue LH - total costs LH

Units: EUR

(147) operating profit SQ=total revenue SQ - total costs SQ

Units: EUR

(148) other costs ASK CX=0.021

Units: EUR/ASK

(149) other costs ASK EK=0.026

Units: EUR/ASK

(150) other costs ASK LH=0.025

Units: EUR/ASK

(151) other costs ASK SQ=0.026

Units: EUR/ASK

(152) other costs CX=(Capacity Cathay Pacific*flight distance FRA HKG CX*other costs ASK CX) / 7 / 54

Units: EUR

Since capacity and flight distance are not used togehter in any other way and both are annualised figures, the result has to be diveded by 7 / 54 to equalise this effect

(153) other costs EK=(Capacity Emirates*flight distance FRA HKG EK*other costs ASK EK) / 7 / 54

Units: EUR

Since capacity and flight distance are not used togehter in any other way and both are annualised figures, the result has to be diveded by 7 / 54 to equalise this effect

(154) other costs LH=(Capacity Lufthansa*flight distance FRA HKG LH*other costs ASK LH) / 7 / 54

Units: EUR

Since capacity and flight distance are not used togehter in any other way and both are annualised figures, the result has to be diveded by 7 / 54 to equalise this effect

(155) other costs SQ=(Capacity Singapore Airlines*flight distance FRA HKG SQ*other costs ASK SQ ) / 7 / 54

Units: EUR

Since capacity and flight distance are not used togehter in any other way and both are annualised figures, the result has to be diveded by 7 / 54 to equalise this effect

(156) potential new passengers=(GDP growth rate/100)*Total Potential Demand FRA HKG

Units: Passenger/Year

(157) reference airfare business class CX=4357

Units: EUR/Passenger [3500,7000]

(158) reference airfare business class EK=3882

Units: EUR/Passenger [3500,7000]

(159) reference airfare business class LH=5149

Units: EUR/Passenger

(160) reference airfare business class SQ=6619

Units: EUR/Passenger

(161) reference airfare economy class CX=707

Units: EUR/Passenger

(162) reference airfare economy class EK=682

Units: EUR/Passenger

(163) reference airfare economy class LH=845

Units: EUR/Passenger [600,1000]

(164) reference airfare economy class SQ=979

Units: EUR/Passenger

(165) reference appealingness corporate CX=17

Units: points

(166) reference appealingness corporate EK=18

Units: points

(167) reference appealingness corporate LH=24

Units: points

(168) reference appealingness corporate SQ=20

Units: points

(169) reference appealingness leisure CX=19

Units: points

(170) reference appealingness leisure EK=22

Units: points

(171) reference appealingness leisure LH=24

Units: points

(172) reference appealingness leisure SQ=17

Units: points

(173) reference load factor business class CX=13.2

Units: percent

(174) reference load factor business class EK=15.3

Units: percent

(175) reference load factor business class LH=12.1

Units: percent

(176) reference load factor business class SQ=10.3

Units: percent

(177) reference load factor economy class CX=73

Units: percent

(178) reference load factor economy class EK=64

Units: percent

(179) reference load factor economy class LH=68.2

Units: percent

(180) reference load factor economy class SQ=70

Units: percent

(181) reference market share CX=43.1

Units: fraction/Year

(182) reference market share EK=8.3

Units: fraction/Year

(183) reference market share LH=40.3

Units: fraction/Year

(184) reference market share SQ=8.3

Units: fraction/Year

(185) reference time CX=11

Units: hours

(186) reference time EK=17.75

Units: hours [11,17.75]

(187) reference time LH=11

Units: hours

(188) reference time SQ=17.5

Units: hours

(189) revenue business class CX=airfare business class CX*Corporate Demand CX

Units: EUR

(190) revenue business class EK=airfare business class EK*Corporate Demand EK

Units: EUR

(191) revenue business class LH=airfare business class LH*Corporate Demand LH

Units: EUR

(192) revenue business class SQ=airfare business class SQ*Corporate Demand SQ

Units: EUR

(193) revenue economy class CX=airfare economy class CX*Leisure Demand CX

Units: EUR

(194) revenue economy class EK=airfare economy class EK*Leisure Demand EK

Units: EUR

(195) revenue economy class LH=airfare economy class LH*Leisure Demand LH

Units: EUR

(196) revenue economy class SQ=airfare economy class SQ*Leisure Demand SQ

Units: EUR

(197) SAVEPER = TIME STEP

Units: Year [0,?]

The frequency with which output is stored.

(198) seat capacity business class CX=IF THEN ELSE(Capacity Cathay Pacific <= 170716 , 25480 , 50960 )

Units: seats/Year

(199) seat capacity business class EK=IF THEN ELSE(Capacity Emirates <= 177996 , 27664 , 55328 )

Units: seats/Year

(200) seat capacity business class LH= IF THEN ELSE(Capacity Lufthansa <= 191464 , 35672 , 71344 )

Units: seats/Year

(201) seat capacity business class SQ=IF THEN ELSE(Capacity Singapore Airlines <= 171444 , 21840 , 43680 )

Units: seats/Year

(202) seat capacity economy class CX=IF THEN ELSE(Capacity Cathay Pacific <= 170716 , 141232 , 282464 )

Units: seats/Year

(203) seat capacity economy class EK=IF THEN ELSE(Capacity Emirates <= 177996 , 145236 , 290472 )

Units: seats/Year

(204) seat capacity economy class LH=IF THEN ELSE(Capacity Lufthansa <= 191464 , 152880 , 305760 )

Units: seats/Year

(205) seat capacity economy class SQ=IF THEN ELSE(Capacity Singapore Airlines <= 171444 , 145236 , 290472 )

Units: seats/Year

(206) staff costs CX=(block hours aircraft CX/(block hours cabin crew CX*cabin crew CX))*annual wage CX

Units: Wages/Year

(207) staff costs EK=(block hours aircraft EK/(block hours cabin crew EK*cabin crew EK))*annual wage EK

Units: Wages/Year

(208) staff costs LH=(block hours aircraft LH/(block hours cabin crew LH*cabin crew LH))*annual wage LH

Units: Wages/Year

(209) staff costs SQ=(block hours aircraft SQ/(block hours cabin crew SQ*cabin crew SQ))*annual wage SQ

Units: Wages/Year

(210) TIME STEP = 1

Units: Year [0,?]

The time step for the simulation.

(211) total costs CX=airport charges and taxes CX+fuel costs CX+other costs CX+staff costs CX

Units: EUR

(212) total costs EK=airport charges and taxes EK+fuel costs EK+other costs EK+staff costs EK

Units: EUR

(213) total costs LH=airport charges and taxes LH+fuel costs LH+other costs LH+staff costs LH

Units: EUR

(214) total costs SQ=airport charges and taxes SQ+fuel costs SQ+other costs SQ+staff costs SQ

Units: EUR/Year

(215) total flight distance FRA HKG CX=flight distance FRA HKG CX*number of aircraft in service CX

Units: km/Year

distance x number of aircraft x 2(return) x 7 day x 54 weeks

(216) total flight distance FRA HKG EK=flight distance FRA HKG EK*number of aircraft in service EK

Units: km/Year

distance x number of aircraft x 2(return) x 7 day x 54 weeks

(217) total flight distance FRA HKG LH=flight distance FRA HKG LH*number of aircraft in service LH

Units: km/Year

distance x number of aircraft x 2(return) x 7 day x 54 weeks

(218) total flight distance FRA HKG SQ=flight distance FRA HKG SQ*number of aircraft in service SQ

Units: km/Year

distance x number of aircraft x 2(return) x 7 day x 54 weeks

(219) Total Potential Demand FRA HKG= INTEG (potential new passengers, 214072)

Units: Passenger/Year

Total demand FRA HKG 2012

(220) total revenue CX=revenue business class CX + revenue economy class CX

Units: EUR

(221) total revenue EK=revenue business class EK + revenue economy class EK

Units: EUR

(222) total revenue LH=revenue business class LH + revenue economy class LH

Units: EUR

(223) total revenue SQ=revenue business class SQ + revenue economy class SQ

Units: EUR

(224) travel time CX= GAME (11)

Units: hours [11,18,0.25]

(225) travel time EK= GAME (17.75)

Units: hours [14.75,18,0.25]

(226) travel time LH= GAME (11)

Units: hours [11,18,0.25]

(227) travel time SQ= GAME (17.5)

Units: hours [16.75,18,0.25]