

A Work Project, presented as part of the requirements for the Award of a Master's degree in Finance from the Nova – School of Business and Economics.

# Why is the aviation industry destroying shareholder value?

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A Project carried out on the Master in Finance under the supervision of: Professor Miguel Pita

# Why are airlines destroying shareholder value and how do they contribute to the world economy?

Abstract

1. Which segment is the main driver of the aviation industry and what are the characteristics of full-service and low-cost carriers?

2. Why is the aviation industry destroying shareholder value?

3. What are the spillovers of the aviation industry?

4. Scalability: a new challenge for the future

Keywords: value chain, strategy and operations, profitability & destruction of shareholder value

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## 2. Why is the aviation industry destroying shareholder value?

### Executive Summary

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#### **2A. Aviation value chain analysis** reveals supplier's strength and outsourcing decision

- Aviation value chain is composed by aircraft manufacturers, infrastructure providers, lessors, service providers, freight and passenger airlines
- Suppliers have high bargaining power over airlines. Airlines are renting more aircrafts and increasingly outsourcing services to service providers
- Although aviation concentrates the vast majority of capital invested, it is one of the industries with the worst economic profit destroying \$18.2 billion shareholder value per year

#### **2B. The importance of strategy & operations for commercial airlines** exposes the complexity of the industry

- Airlines need thorough planning to cope with complexity and increasing air travel demand
- To plan accurately, airlines need to align strategy, capacity and scheduling
- On-time performance is influenced by six factors and depending on performance, leads to strong benefits or costs

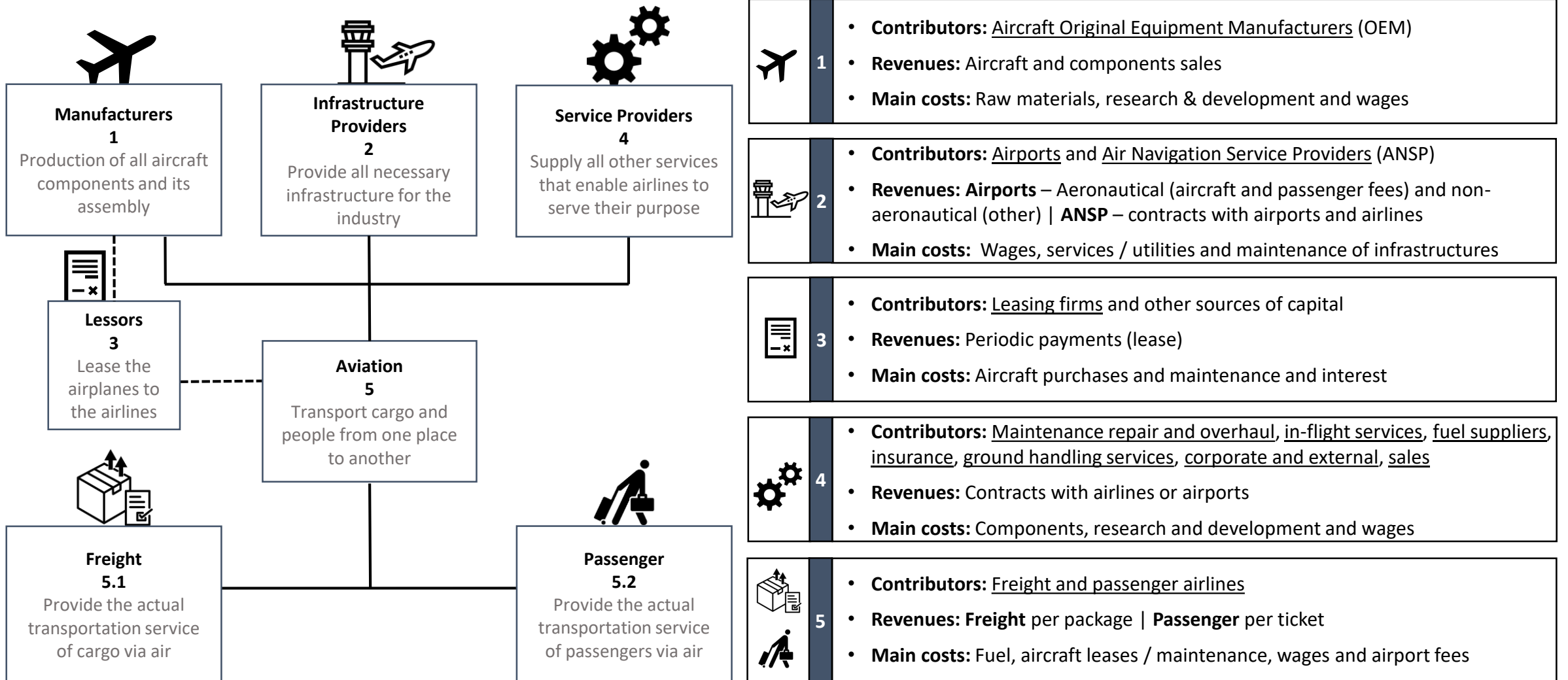
#### **2C. Commercial airlines profitability analysis** explores the volatile cost structure, yield management decisions and the key success factors

- Industry profit is driven by four primary drivers: ancillary revenue, cargo revenue, passenger revenue and total costs
- From 2009 to 2019 total revenue grew 6.16% per annum and total costs grew 5.66% per annum
- The improvement of profitability led to a historical creation of shareholder value
- When comparing the thirteen airlines that created most economic profit between 2005 and 2015, LCCs contribute to 75% of the \$12.455M created
- Six key success factors distinguish best performers
- Airline industry presents the worst ROIC and there is a big gap between best and worst performers due to four key factors

**Aviation industry has destroyed \$18.2 billion of shareholder value yearly due to four factors. Fierce competition, powerful suppliers and customers with low switching costs exert threatening forces; a volatile cost structure due to fluctuating oil prices which augments unpredictability; strategic decisions regarding yield management and outsourcing of activities might have long term implications; and legislation creates exit barriers.**

## 2A. Aviation value chain is composed of five main categories

Manufacturers, infrastructure providers, service providers and lessors are essential for the transport of cargo and people



Sources:

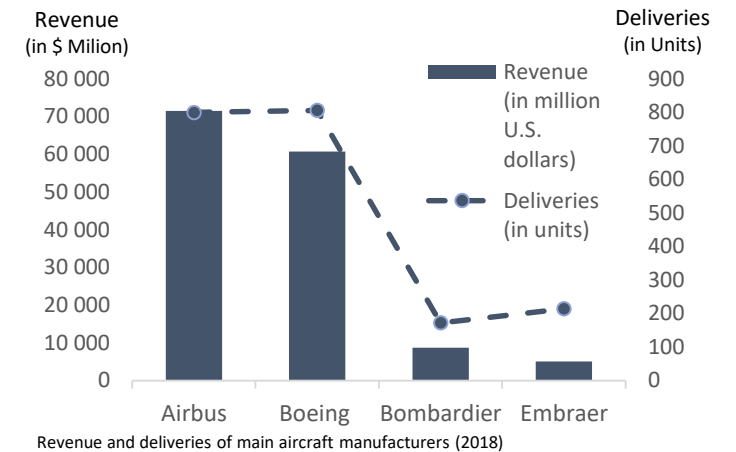
<sup>1</sup> Tretheway *et al.*; <sup>2</sup> European Commission; <sup>3</sup> BCG;  
<sup>4</sup> Boeing Financial Statements; <sup>5</sup> Deloitte; <sup>6</sup> MarketLine

## 2A. Aircraft manufacturers and infrastructure providers have high bargaining power over airlines

Airlines' margins are pressured by powerful suppliers

### ✈️ 1. Manufacturers – Aircraft sector dominated by Airbus and Boeing

- **Airbus and Boeing dominate** all sizes of aircraft manufacturing, although there are other suppliers such as Bombardier and Embraer operating in a medium-size segment
- **Aircraft manufacturers have huge bargaining power both on suppliers and airlines**
- **Capital intensive, quality and legacy reliant** industry that works with a significant **delay between order and delivery**
- Technological improvements enable more efficient aircrafts which improve airlines' margins. This allows OEMs to increase prices
- Consolidation in the manufacturer's supplier market is also pressuring margins by increasing prices
- **Engine manufacturers concentrated:** Pratt & Whitney, General Electric and Rolls-Royce dominate the market



### 🏗️ 2. Infrastructure providers – Location attractiveness drives bargaining power

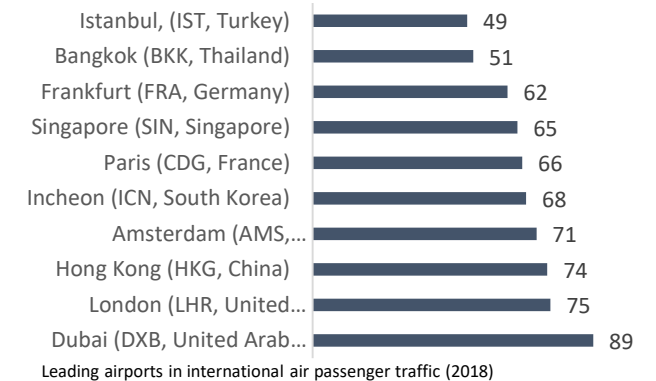
#### Airports:

- **Each city has a small number of airports** and these are run either by large corporations or the public sector
- Airports charge fees to allow airlines to operate. Depending on the **location's attractiveness**, airports' **bargaining power varies** and consequently, the fees fluctuate
- More than 500 cities in the world only have one airport; 66 cities have more than one
- **Customer experience** at the airport **heavily influences their opinion on the airline** itself

#### Air Navigation Service Providers (ANSNs):

- ANSPs usually have **exclusivity over the airspace** they control, although there are many suppliers of this service
- This power leads to a **high control over pricing** and the **need of tight regulation**
- This industry **requires high investments** of capital and training
- ANSPs are implementing new technologies for air traffic management that will create space for more flights

#### Air passenger traffic (millions of people)



## 2A. Airlines are renting more aircrafts and increasingly outsourcing services to service providers

By renting and outsourcing more, airlines are able to focus on core activities but may lose on margins



### 3. Lessors – Proportion of leased aircrafts versus owned is increasing

- Aircrafts are expensive assets – airlines' fleets are composed by owned aircrafts and leased aircrafts
- Capital intensive industry that requires **strong reputation** in order to **create lasting relationships with airlines**
- The **number of companies** performing this activity has been **increasing** – from 118 in 2008, to 153 in 2018
- **Two dominant players:** AerCap with a \$34.7 billion fleet and GECAS with a \$24.7 billion fleet
- Industry growth fueled by **M&A activity** with the objective of **upscaling** – improve relevance with clients, investors, and suppliers while decreasing costs
- Capital restrictions from airlines and risk restrictions from banks lead to the increase in demand for leasing
- The exponential growth in emerging markets will demand the purchase of 22 730 new aircrafts



Source: Boeing Current Aircraft Finance Market Outlook, 2019



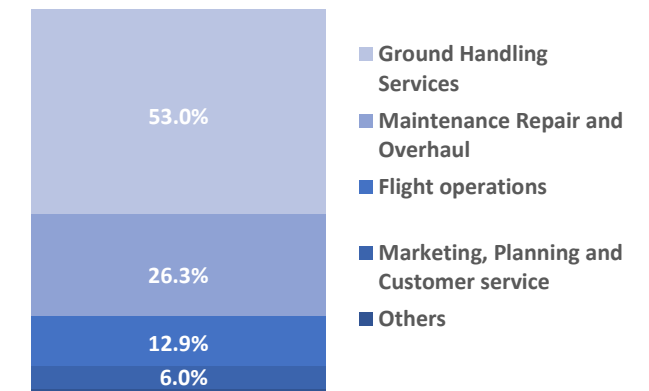
### 4. Service providers – about 60% of carriers outsource MROs, 50% outsource GHS

#### Maintenance Repair and Overhaul (MRO):

- **High barriers of entry** due to the knowledge required to perform this activity
- **60% of carriers outsource this service** – OEMs, specialized service providers and other airlines perform this service
- Going through a **consolidation phase** to increase scale and have global presence
- Technology enables better equipment – longer periods without maintenance and better monitoring of aircrafts' condition

#### Ground Handling Services (GHS):

- Provide a **wide range of services** – passenger, baggage, ramp, cargo and fuel handling. **50% of airlines outsource this service**
- **Swissport, DNATA, SATS** and **Menzies** are the largest players. **Market is concentrated**, but there are **low switching costs**
- Going through a consolidation phase – players acquire smaller companies that are present in strategic markets



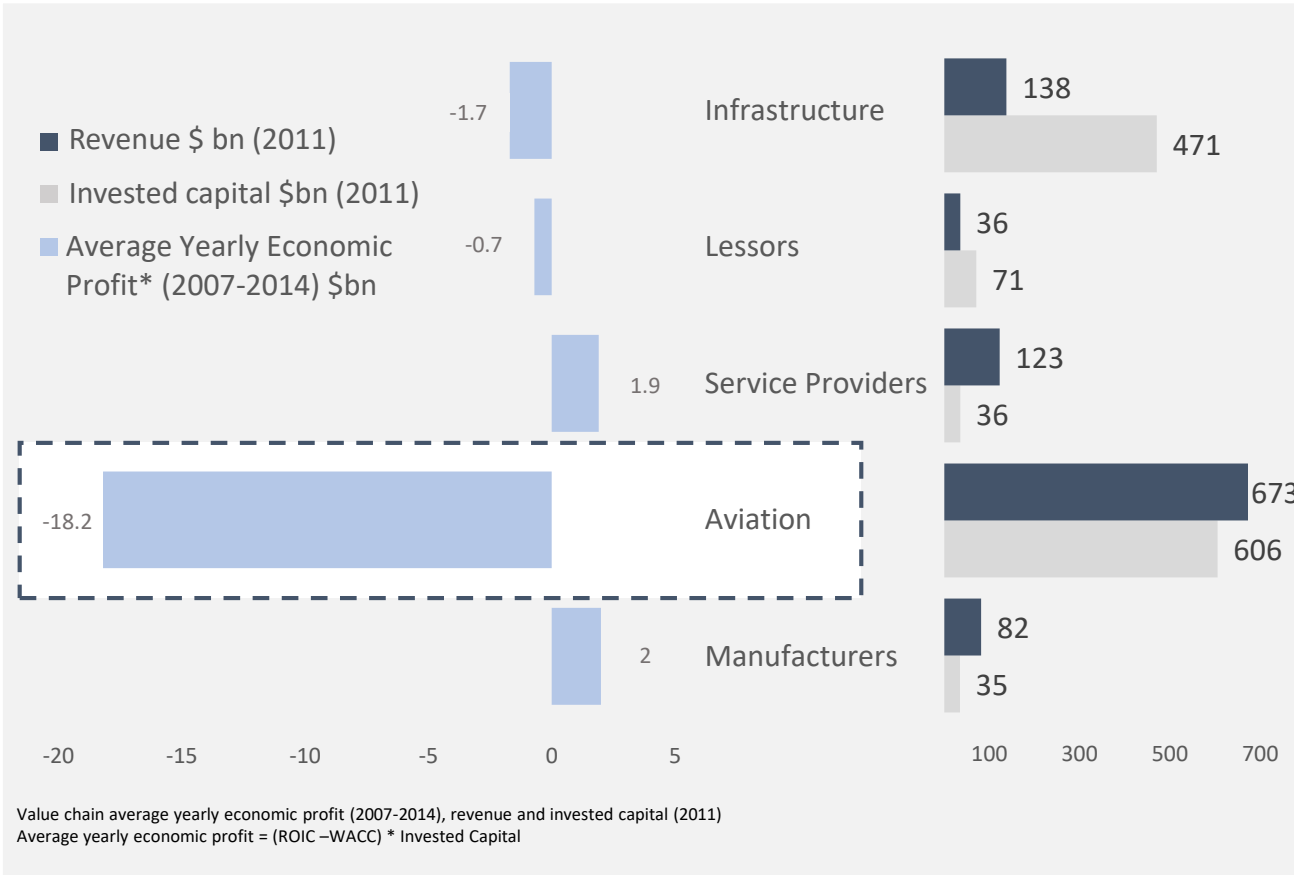
Global aviation service providers' share

Source: Boeing Commercial Market Outlook, 2019

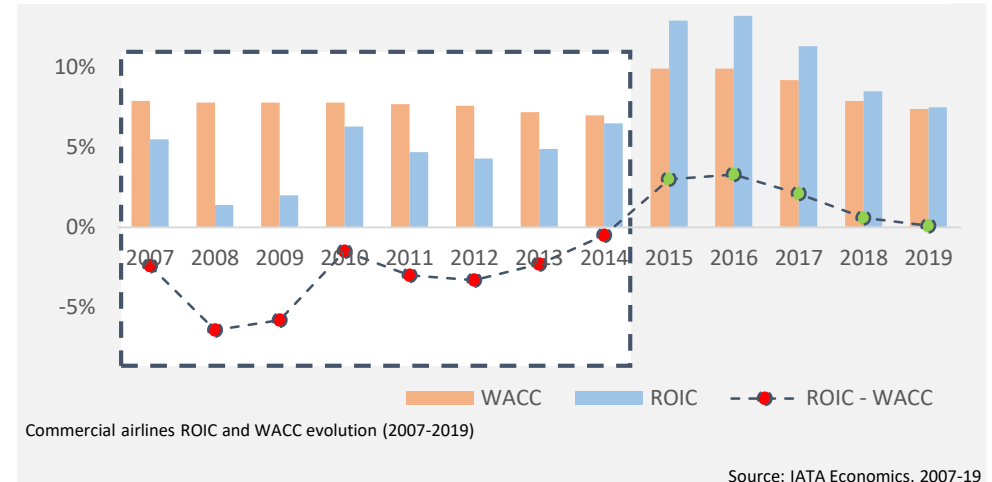
## 2A. Although aviation concentrates the vast majority of capital invested, it presents the worst economic profit

Airlines destroyed \$18.2 billion per year of shareholder value

### Shareholder value consistently destroyed in aviation; Majority of capital invested in aviation and Infrastructure



### 2015 was the first year with positive economic profit



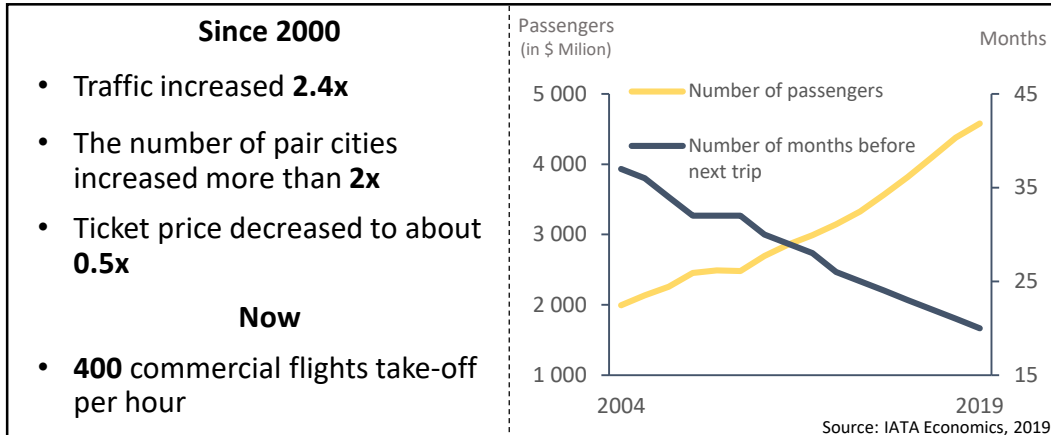
- From 2007 to 2014 airlines destroyed \$18.2 billion of shareholder value per year
- 2015 was the first year the industry presented a positive economic profit
- After five historically positive years, industry goes back to break-even values

## 2B. Airlines need thorough planning to cope with complexity and increasing air travel demand

A linear growth in air travel demand causes an exponential impact on operations' complexity

**1**

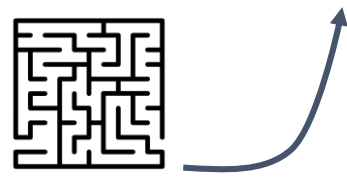
### Increasing Air Travel Demand

A linear growth in air travel demand ...

**2**

### Complexity



*... increases exponentially the complexity of airlines' operations*

Airlines perform a service that can take up to five years of preparation

Main activities:

- Network and fleet
- Crew
- Maintenance
- Airport processes
- Customer and product
- Corporate

Complexity is due to:

- Integration (people, processes, functions and technologies)
- Dependence on external factors (weather, air traffic control, infrastructures and seasonality of demand)
- Mix of durations and time-frames of the processes

### Need to plan in order to align capabilities with passenger demand

**2B. To plan accurately, airlines need to align strategy, capacity and scheduling**  
According to the competitive strategy, airlines use scheduling strategies to extract the best possible results from their capacity decisions.



Sources:  
<sup>11</sup> Airbus; <sup>18</sup> IATA; <sup>19</sup> Alan *et al.*; <sup>20</sup> Boeing; <sup>21</sup> IATA



## 2B. To plan accurately, airlines need to align strategy, capacity and scheduling

According to the competitive strategy, airlines use scheduling strategies to extract the best possible results from their capacity decisions

### Planning

Time →


#### Competitive Strategy





*“Competitive strategy is the search for a favorable competitive position in an industry, the fundamental arena in which competition occurs”*

Michael Porter, 1985

Align competitive strategy to obtain three advantages:  
(Kilinc, Oncu and Tasgit, 2012)

 Cost leadership

 Service quality

 Customer satisfaction


#### Capacity Decisions




*“Capacity strategy tries to achieve the best match between the airline’s long-term capabilities and predicted long-term passenger demand”*

Alkhatib and Migdadi, 2018

Define five criteria related to capacity:  
(Alkhatib and Migdadi, 2018)

 Fleet size  
Fleet diversity

 Number of employees

 Number of seats

 Number of airports, countries, cities and continents


#### Scheduling and Operational Decisions



*“Airline scheduling affects the airline’s ability to avoid delays, save costs, generate revenues, take more passengers, and thus satisfy their customers”*

Faust, 2017

Four steps to perform when scheduling:  
(Faust, 2017)

 Schedule design  
Aircraft maintenance routing  
Fleet assignment  
Crew scheduling

Sources:

<sup>22</sup> Saranga et al.; <sup>23</sup> Alkhatib et al.; <sup>24</sup> Faust et al.

<sup>25</sup> Porter et al.; <sup>26</sup> Kilinc et al.

2A. Value Chain

2B. Strategy & Operations

2C. Profitability

6

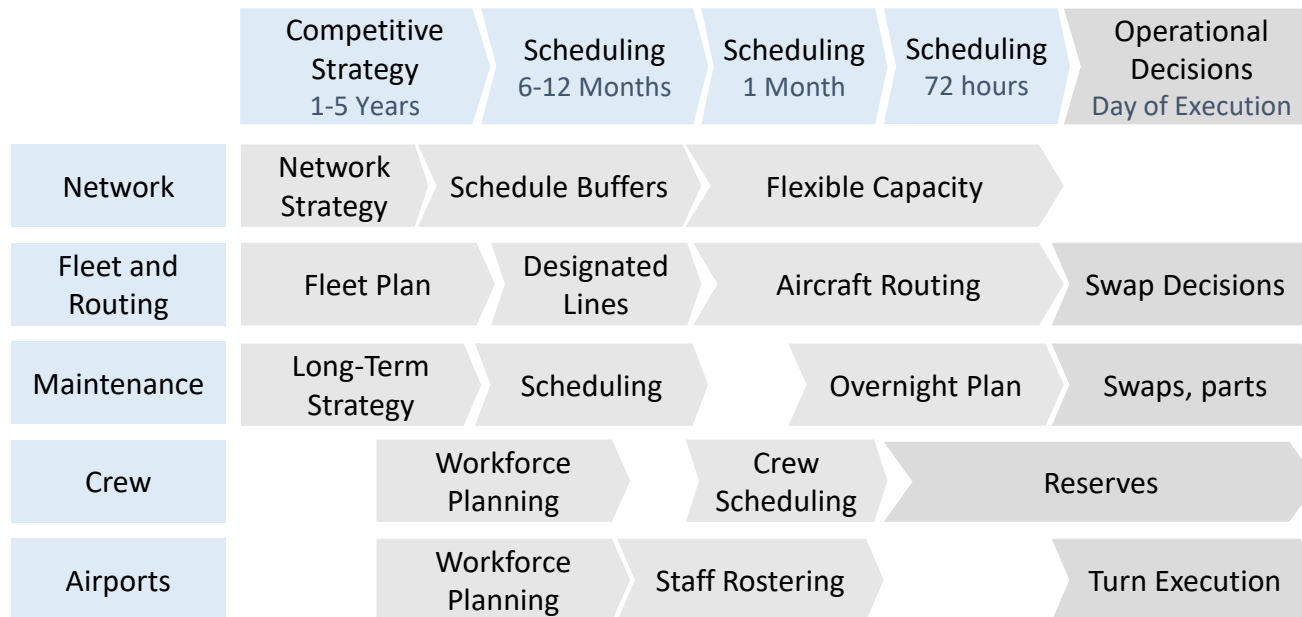
## 2B. On-time performance is influenced by six factors and depending on performance, leads to strong benefits or costs

On-time performance is the crucial non-monetary measure to evaluate airline performance

**On-Time Performance (OTP):** On-time flights are the flights that arrive or depart under 15 minutes of their scheduled arrival / departure times



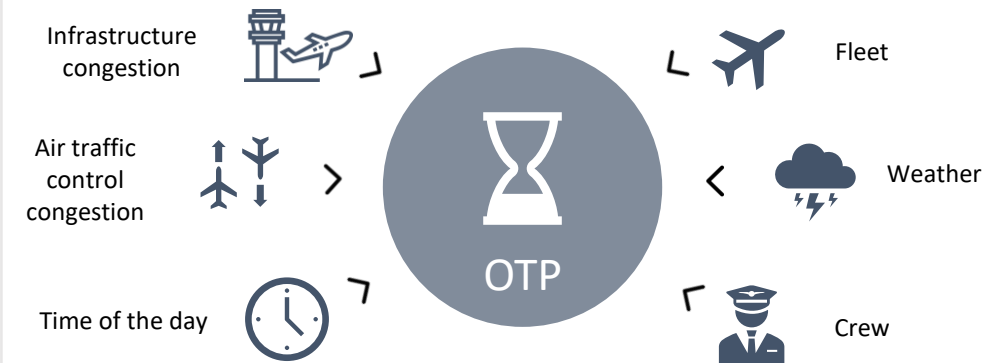
- The **first** U.S. domestic **flights** of the day average **80% OTP**, while the **last flights** average only about **50% OTP**
- One delayed aircraft in the morning can lead to more than 70 delayed planes later in that same day
- By **saving one minute** on the ground per aircraft, it is possible to **save from \$5M to \$10M a year** due to freed aircraft time and hidden costs from all operations



Commercial airlines operations

Source: BCG

### Determinants of OTP



### Consequences of OTP

#### Benefits

(from good performance)

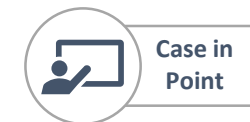
- Customer satisfaction
- Cost control (aircraft and employee efficiency)
- Culture and employee morale (better OTP increases predictability and, therefore, employee work-life balance)

#### Costs

(from bad performance)

- Direct – Payment of compensation, rebooking expenses, overtime pay to employees
- Indirect – Customer experience, brand, downstream effects (one delay may take a lot of time to recover)

## 2B. For example: competition, internal decision and customers influence route planning



Airlines pursue the maximization of total profit, not of route profit

### Route planning influencers

Many factors have influence on route planning, it is not just about profitability.

*"There are some flights that are very profitable, some flights are barely profitable and some flights that we operate that are unprofitable"*

**Mike Minerva**

Vice-President of Airport Affairs of American Airlines

### Competition

1

#### Supply analysis

- Is there enough demand for an extra supplier?
- How will competitors react?
- If there is a very important route that a competitor operates, it can be worth it to fly that same route even though it is not profitable *per se*

### Internal decisions

2

- **Opportunity cost analysis:** Is it the most profitable route to add? Can the same plane generate more revenue elsewhere?
- **Available resources:** Is there available fleet / crew to cover this new route?
- **Operational logistics:** Comply with legislations, negotiate contracts with airports and service providers
- **Other interests:** Increase on-time performance (reliability)

### Customers

3

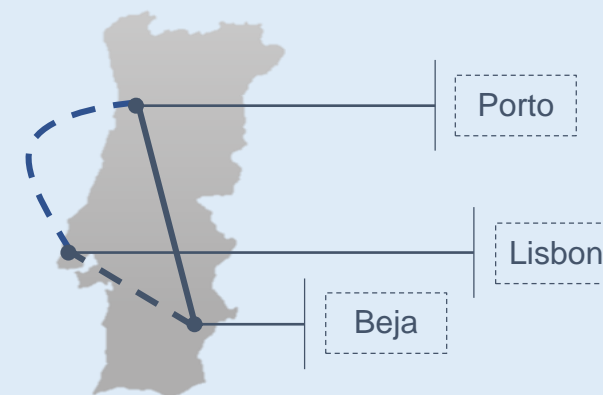
#### Demand forecast

Airlines can use their own data or purchase it. Overall, two factors are weighted:

- **Customer willingness to pay:** How much are people willing to pay to fly there?
- **Origin and destination:** How many people want to fly from one place to another?

#### New route: Porto – Beja (using own data)

Analyze the number of people that fly from Beja to Lisbon in order to have a flight to Porto



1

Competition

2

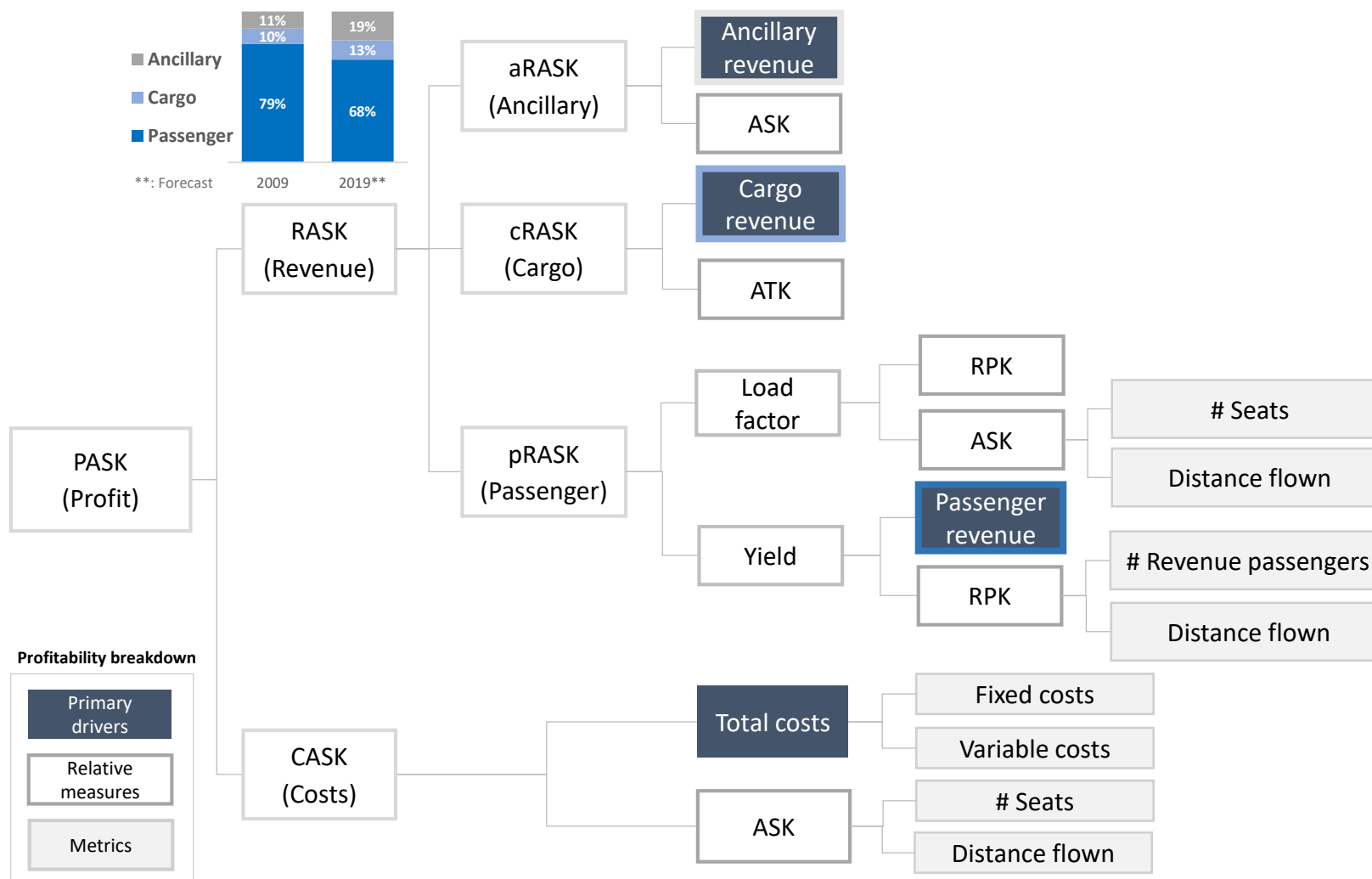
Internal decisions

3

Customers

## 2C. Industry profit is driven by four primary drivers: ancillary revenue, cargo revenue, passenger revenue and total costs

When analysing the full industry, only the primary drivers are taken into consideration



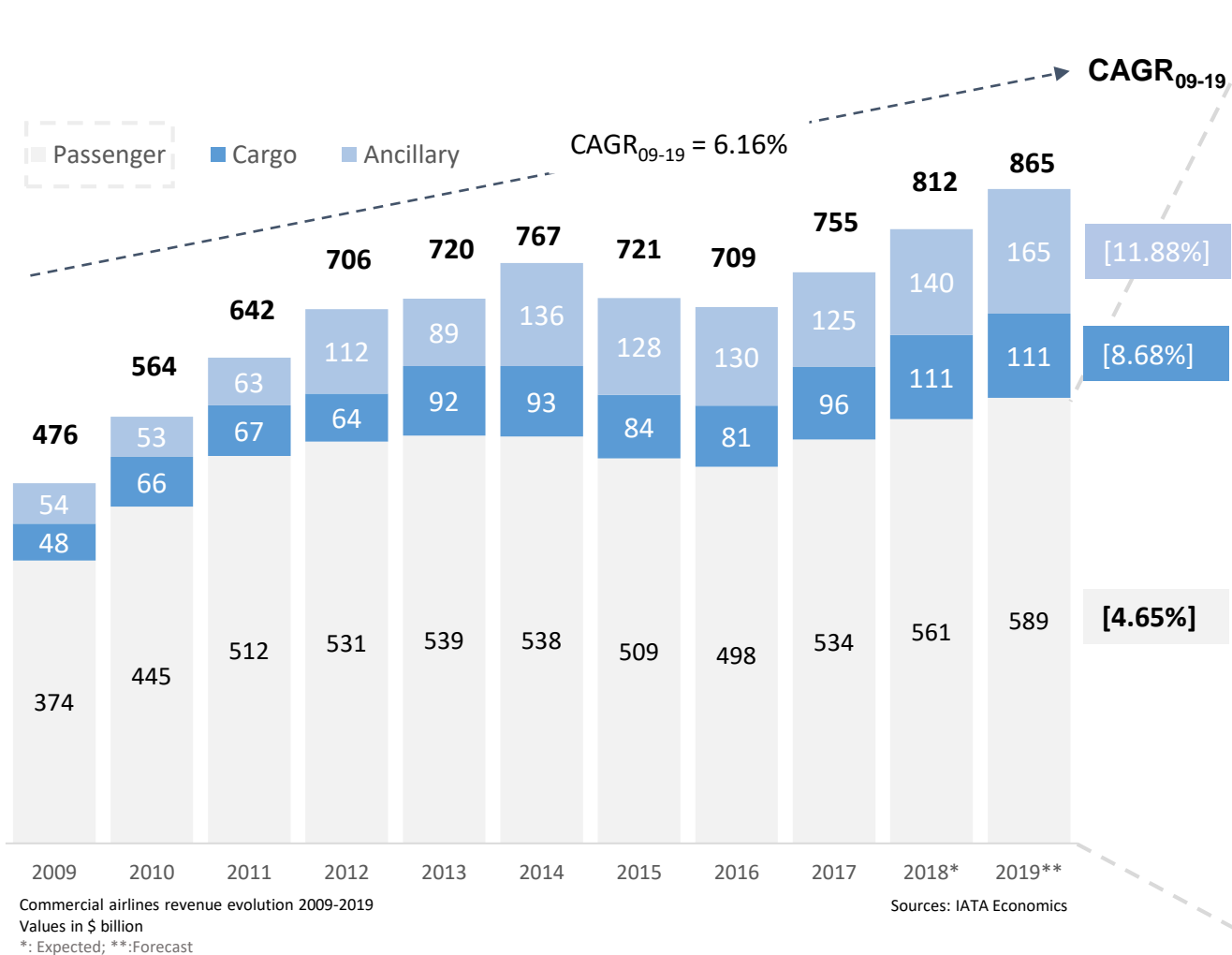
### Profitability drivers

- **Ancillary revenue:** consists of every source of revenue besides ticket and freight sales. In the last ten years, it has almost doubled in importance for airline total revenue
- **Cargo revenue:** revenue from the transport of cargo
- **Passenger revenue:** driven by two factors
  - **Load factor:** represents the percentage of the overall capacity being used by passengers. It is calculated by dividing the capacity that earns revenue (RPK) by the total capacity (ASK)
  - **Yield:** represents the average fare received by passenger kilometer. It is calculated by dividing total ticket revenue by the RPK
- **Total costs:** Fuel, labour, aircraft financing and maintenance as well as airport fees are the biggest costs of airlines

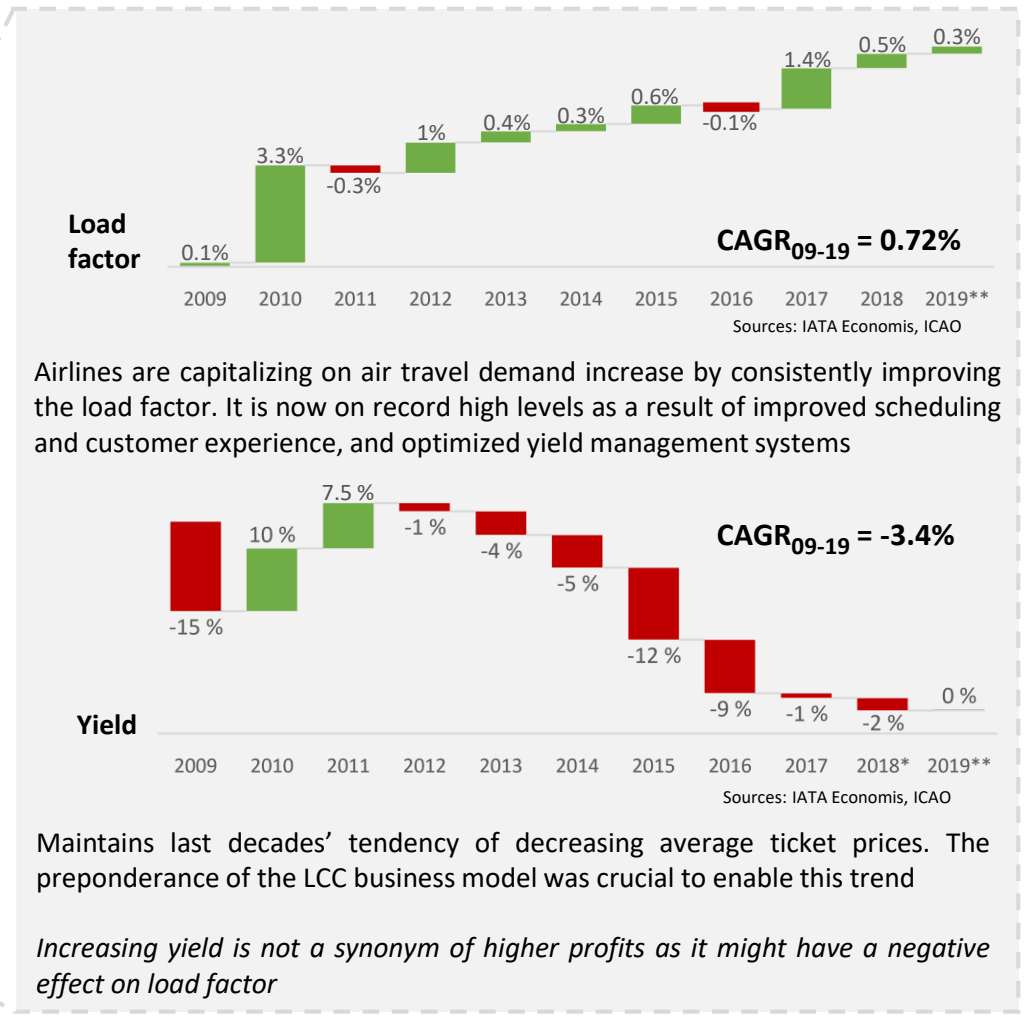
## 2C. From 2009 to 2019 total revenue grew 6.16% per annum (p.a.), reaching \$865 billion in 2019

A 0.72% p.a. increase in load factor was enough to cover a 3.4% p.a. decrease in yield which led to a 4.65% p.a. increase in passenger revenue

Although in 2015 and 2016 there was a revenue decrease, total revenue still grew 6.16% p.a.

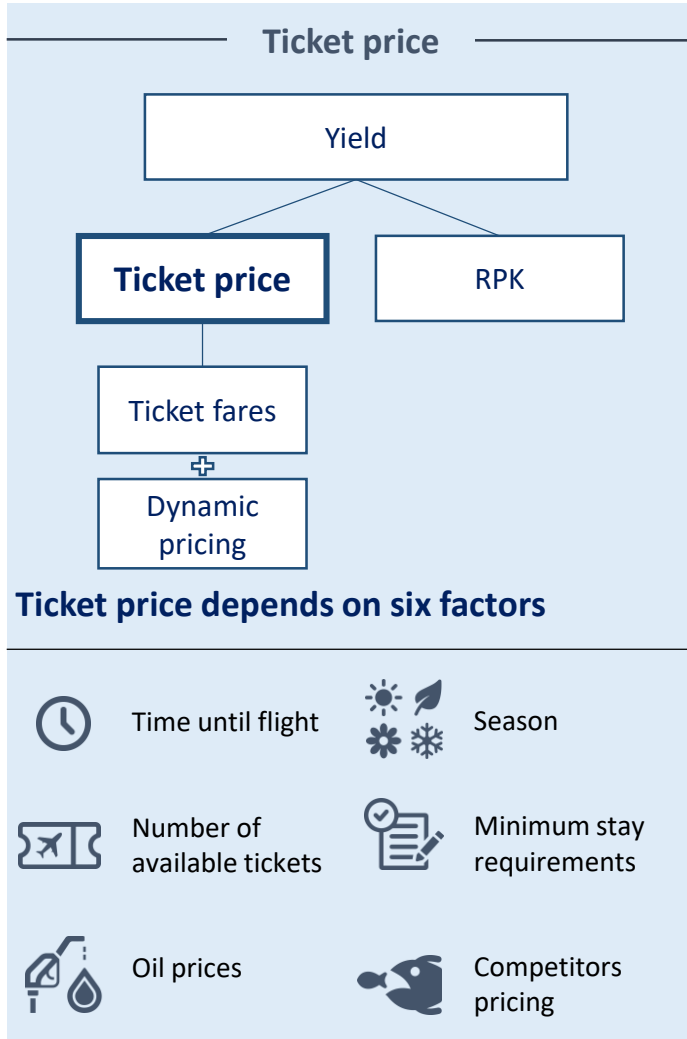


Load factor has increased 0.72% p.a. while yield has decreased by 3.4%



## 2C. Ticket fares define ranges of prices that fluctuate based on dynamic pricing

Constant price changes for the same service leads airlines to price closer to marginal costs more often



### Key figures:



3.5M passengers per year

5 airlines flying the route

8 prices from \$129 to \$472

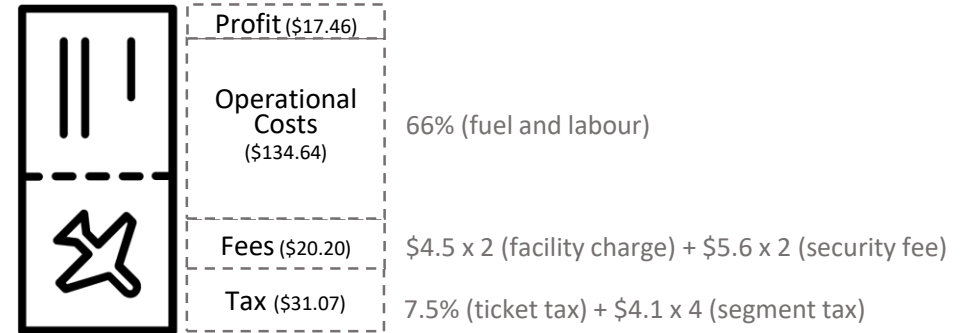
### Ticket Fares for Economy class:

B	B	N	G	V	L	M	K
\$129	\$144	\$159	\$204	\$269	\$318	\$357	\$472

### LAX to JFK

Source: David Richardson, Director of Government Affairs, Southwest Airlines

### Base Fare (\$204 ticket) decomposed:



### Pricing:

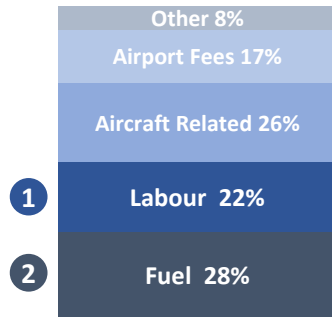
B, B, N, G, V, L, M and K are ticket fares that have a number of tickets associated. When the airline sells all the tickets in fare B, it starts selling tickets from fare N

Within these fares, dynamic pricing accounts for changes in the six factors and alters the ticket price

## 2C. Total costs grew 5.66% p.a. although a decrease between 2014 and 2016 was enabled by a drop in oil prices

Fuel, aircraft related costs and labour represent the greatest share of airlines' costs

### Cost structure



Sources: IATA, Doganis (2010)

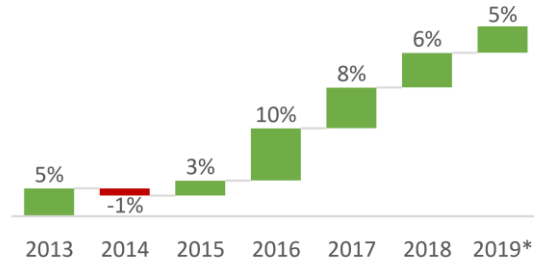
Fuel, aircraft related costs and labour compose the largest share of total costs. Fuel price is very volatile, labour costs have increased for the past six years and aircraft related costs have been stable

#### Fuel Price:

- Decreased in 2009, from 2013 to 2016 and in 2019
- Increased from 2010 to 2011 and from 2017 to 2018

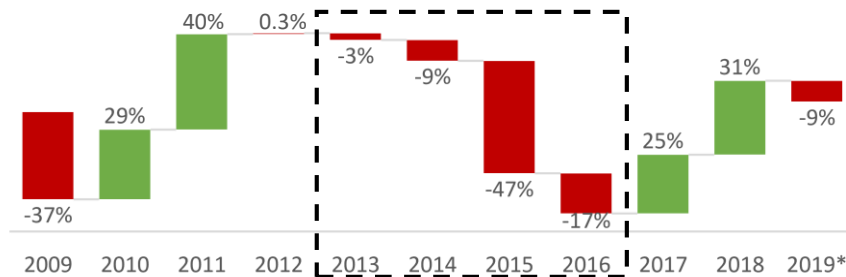
### Cost evolution

#### 1 Labour costs



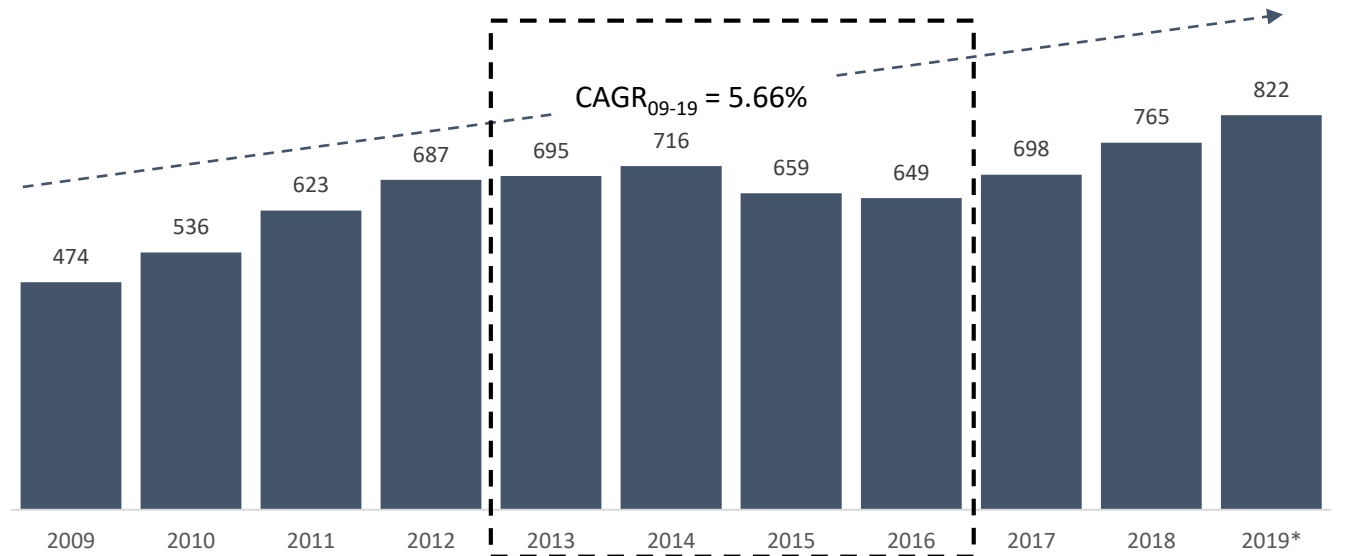
Sources: IATA Economics

#### 2 Fuel price



Sources: Statista

\*: Expected

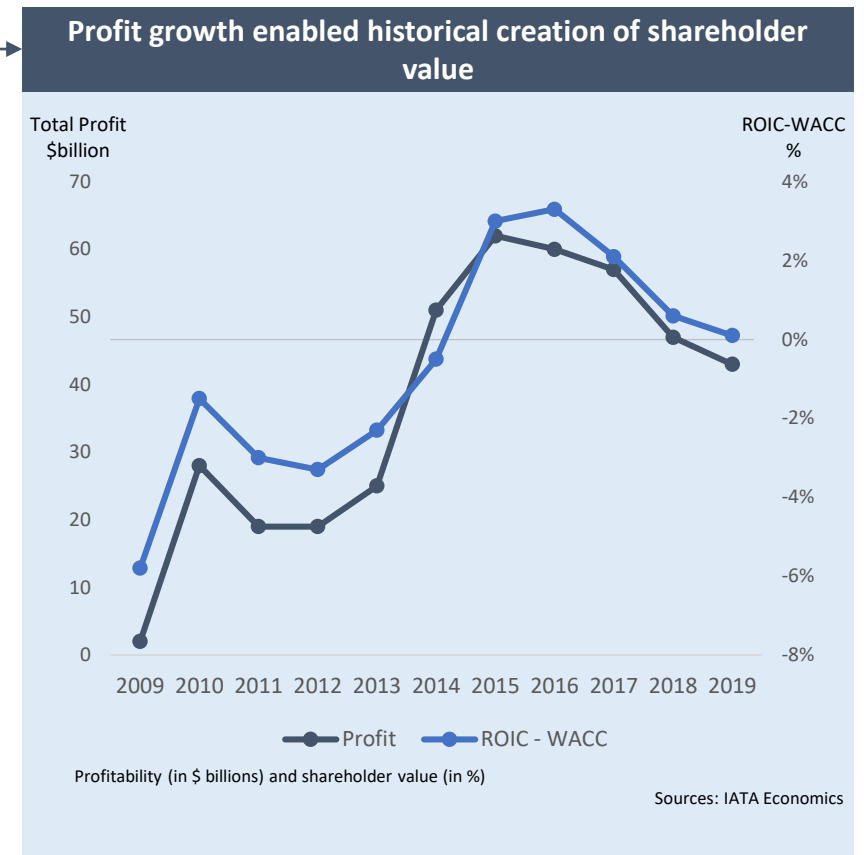
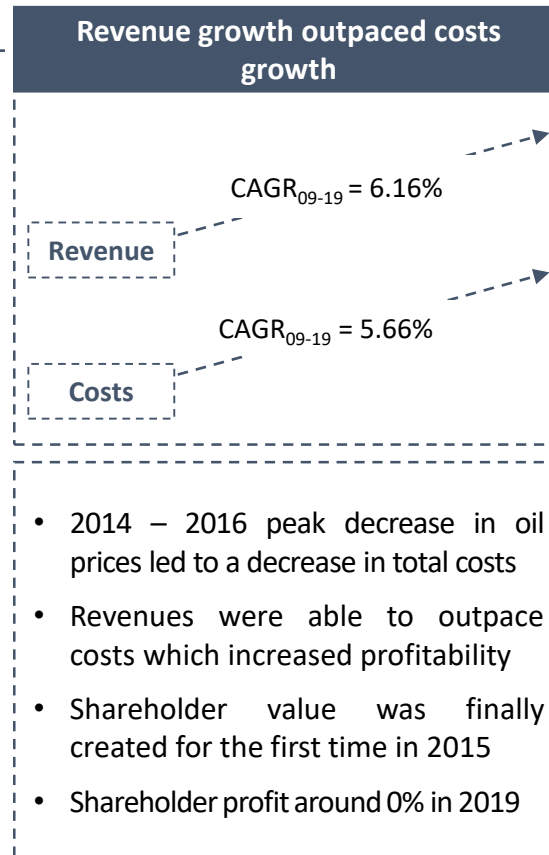
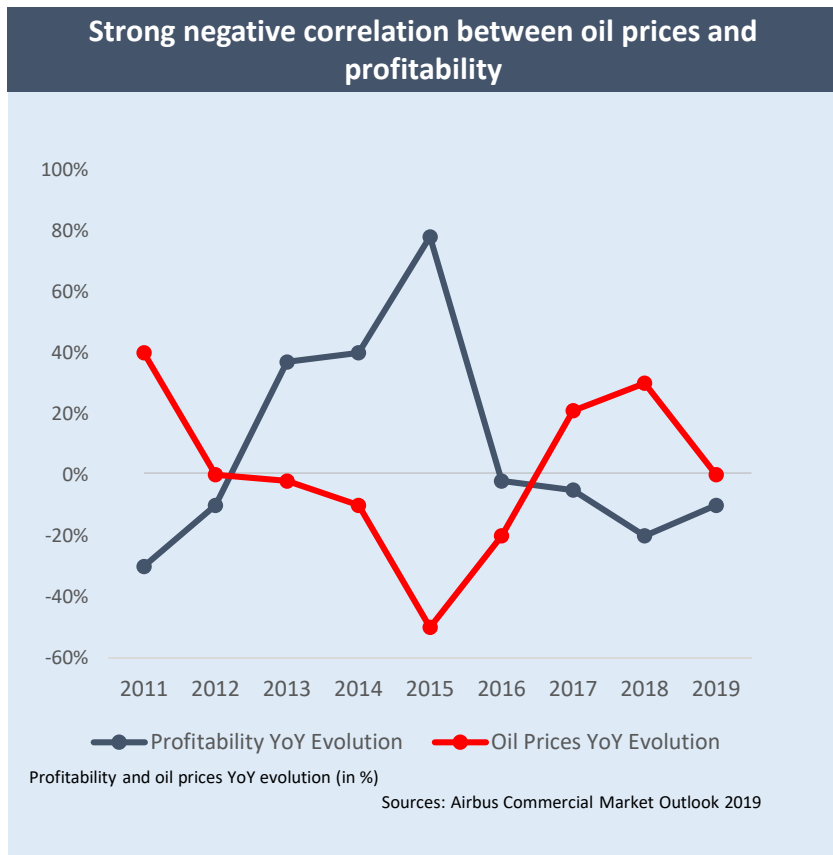


Commercial airlines total costs evolution 2009-2019  
Values in \$ billion

Sources: IATA Economics

## 2C. Revenue growth outpaced costs growth allowing historical creation of shareholder value

The decrease in oil prices was very important for this historical moment



**Is the industry going back to unprofitability?**

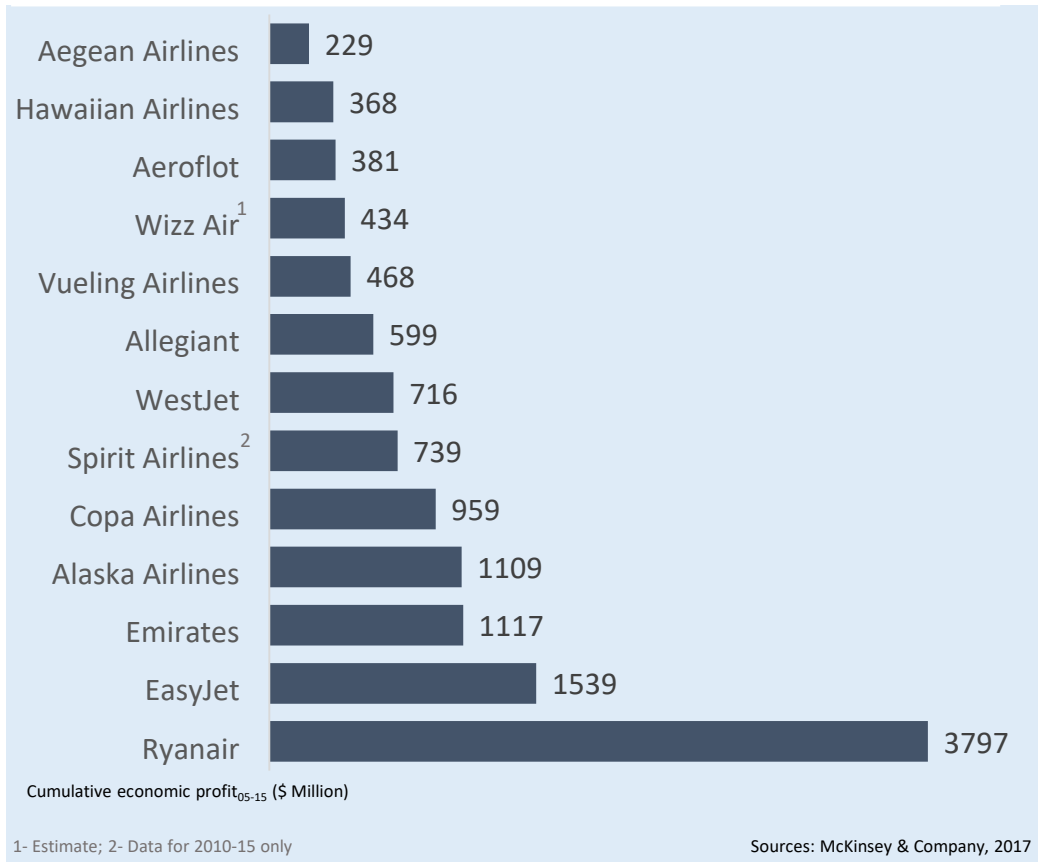


## 2C. Thirteen airlines created \$12 455 million of economic profit

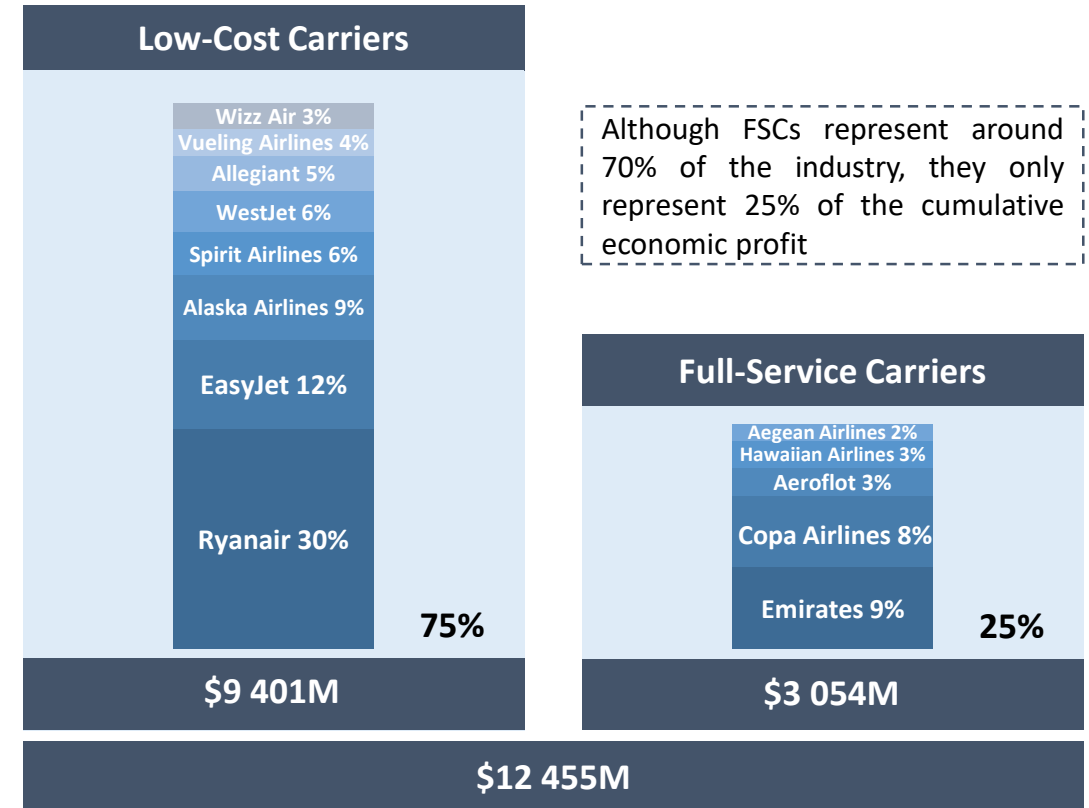
Within the thirteen airlines that created most economic profit, LCCs represented 75% of total value

### Airline cumulative economic profit

#### Few airlines earned their cost of capital between 2005 and 2015



#### LCCs created more value for their shareholders



## 2C. Six key success factors distinguish best performers

These factors allow the thirteen companies to create value for their shareholders

### Key success factors

<p><b>Emphasis on short-haul</b></p>	<p><b>Flying shorter distances</b></p> <ul style="list-style-type: none"> <li>• Amongst the most profitable airlines, 8 out of 13 emphasize short-haul</li> <li>• Under a wide range of assumptions, a plane generates less revenue per dollar of capital employed in long-haul, than in short-haul</li> </ul>	<p><b>Brand</b></p>	<p><b>Create a brand that people care about</b></p> <ul style="list-style-type: none"> <li>• Invest in brand presence: products, promotion, service and reputation</li> <li>• This leads to a more direct distribution and improves the management of client relationships</li> </ul>
<p><b>Lower capital needs</b></p>	<p><b>Using smaller amounts of capital</b></p> <ul style="list-style-type: none"> <li>• Using older fleets enables better-quality revenues (less flights, better schedules), but as fuel prices drop and interest rates rise, it becomes less profitable</li> </ul>	<p><b>Cost advantage to peers</b></p>	<p><b>Having the lower costs is not the goal</b></p> <ul style="list-style-type: none"> <li>• The goal must be creating cost advantage regarding competitors</li> <li>• Using cheaper labour markets, lean manufacturing or driver-based planning</li> </ul>
<p><b>Strong organizational structures</b></p>	<p><b>Make sure the airline is cohesive</b></p> <ul style="list-style-type: none"> <li>• Management team aligned</li> <li>• People spend time with their teams to drive performance, not debating causes</li> <li>• Every employee knows his role</li> <li>• People are accountable for their actions</li> </ul>	<p><b>Privileged sources of revenue</b></p>	<p><b>Offer a unique value proposition</b></p> <ul style="list-style-type: none"> <li>• Attractive schedules to certain destinations</li> <li>• Using their own capacity (hubs, fleet, geographic markets) to create uniqueness</li> <li>• Quality of service</li> </ul>

## 2C. Airline industry presents the worst ROIC and a wide spread between best and worst performers due to four key factors

Threatening forces, a volatile cost structure, strategic decisions and legislation led to the destruction of shareholder value

### Why such low profitability?

#### Key (in)success factors

##### Threatening forces

- Fierce competition drives prices down
- Suppliers have high bargaining power
- Customers have very low switching costs and are price sensitive

##### Volatile cost structure

- Fuel has represented 40% of total costs in peak times and 10% in low times
- Fuel prices are negatively correlated to profitability

##### Strategic decisions

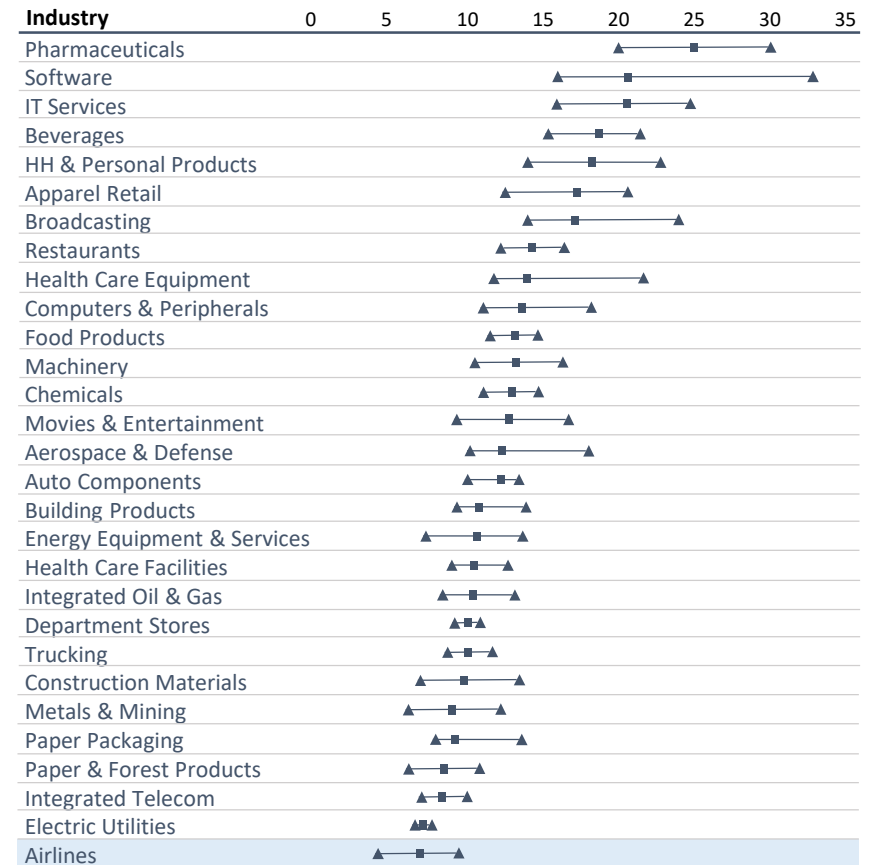
- Yield management
- Outsourcing of activities

##### Legislation

- Price setting and capacity increasingly liberalized while strategic decisions regarding areas of operation still restricted
- Exit barriers and government subsidies constrain market forces of letting the best grow and worst improve or leave

→ Why is money still being invested?

### Airlines rank last in ROIC and show the gap between performers



Industry median ROIC without goodwill  
Average 1965-2007

▲ 1st quartile    ■ Median    ▲ 3rd quartile

Source: McKinsey for IATA (2013)

# Appendix

## Chapter 2 references

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