



Aviation Economics & Finance

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OUTLINE

Module 2 (2 hours) – Airline Finance-Financial Performance and Sources of Finance

- Institutional framework
- Key issues in airline finance
- Global airline industry performance & Factors affecting airline performance
- Sources of finance
 - Debt and equity markets
 - Aircraft leasing
 - Aircraft securitization
 - Asset sale/leaseback
 - Aircraft manufactures / Component manufacturers
- Government funding – problem or solution?

INSTITUTIONAL FRAMEWORK

A GLOBAL INDUSTRY-MAJOR COMPANIES IN AVIATION INDUSTRY

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Activity	Company Name	Nationality
Commercial Aircraft Manufacturing	Boeing	USA
	Airbus	France
	Bombardier	Canada
	Embraer	Brazil
Commercial Airlines	Turkish Airlines	Turkey
	Air Canada	Canada
	American Airlines	USA
	United Airlines	USA
	Air France	France
	Lufthansa	Germany
	British Airways	UK
	Emirates	UAE
	Cathay Pacific	Hong Kong (PRC)
	Air New Zealand	New Zealand
Aircraft Engine Manufacturing	General Electric	USA
	Pratt & Whitney	USA
	Rolls Royce	UK
	Snecma	France
	MTU Aero engines	Germany

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BUSINESS STRUCTURES AND AGENCY ISSUES

1. Sole proprietorship
 2. Partnership
 3. Corporation: public vs private
- Agency problems
 - When members of an organization do not have objectives that are aligned; principal agent problems
 - Examples from airline industry or aviation industry?
 - Business and government travellers do not pay for their own ticket
 - FFP exacerbate the problem above (private use of business points)

A. INTRODUCTION TO AIRLINE FINANCE

KEY FINANCIAL ELEMENTS OF THE AIRLINE INDUSTRY

- Capital intensive industry,
 - with long lived assets
- Significant use of leasing
- High operating leverage
 - despite high capital costs
- Pro-cyclical industry
- Foreign exchange important in a global industry
- Government limits on equity financing from foreign sources
 - Ownership restrictions

CAPITAL EXPENDITURES

- The airline industry has high capital needs to finance aircraft and other assets
 - Capital costs represent over 15% of total operating costs
 - double the requirements of the manufacturing sector
- Capital expenditures include:
 - Aircraft purchase
 - Aircraft maintenance and refurbishment
 - Lease of airport facilities
 - Significant IT investments
 - Ground property & equipment at 100 + spokes (for network carriers)

PLANNING HORIZON

The airline industry has long planning cycles

- Airline capital assets have long lives
- Adding an aircraft type to the fleet
 - 3+ years to make a decision
 - initial aircraft purchased have life of 20+ years
 - airline will continue to purchase that aircraft type for another 10-15 years
 - total life cycle can be up to 40 years
- Boeing 747 planning decisions began in the 1960s still in fleets of many carriers and will be so for 15+ years

Jet Values

RJ VALUES

	NEW	years old				NEW	years old		
		5	10	20			5	10	20
CRJ 900	28.3	20.7			Emb 175	27.3	19.6	12	
CRJ 1000	30.0	23.0			Emb195	32.7	24.3		
CRJ300-ER	35.7								
					S100-95	21.8	16.7		

NARROWBODY VALUES

	NEW	years old				NEW	years old		
		5	10	20			5	10	20
A318		17.8	9.7		717-200		6.1		
A319 (HGW)		21.7	16.6		737-300 (LGW)				2
A320-200 (IGW)		26.4	20.7	9.5	737-400 (LGW)				1.7
A320NEO	49.6				737-500 (LGW)				1.6
A321-200 (LGW,Sharklets)	49.9				737-600 (LGW)		10.0		
A321NEO	58				737-700 (LGW,Winglets)	36.8	22.2	17.2	
					737-700 (HGW,Winglets)	37.7	24.0	19.0	
					737-800 (LGW,Winglets)	46.4	29.9	22.8	
					737-800(HGW,Winglets)	47.8	31.5	24.0	
					737-900ER	49.0	32.9		
					757-300 (LGW)			13.4	
					MD-88				1.0

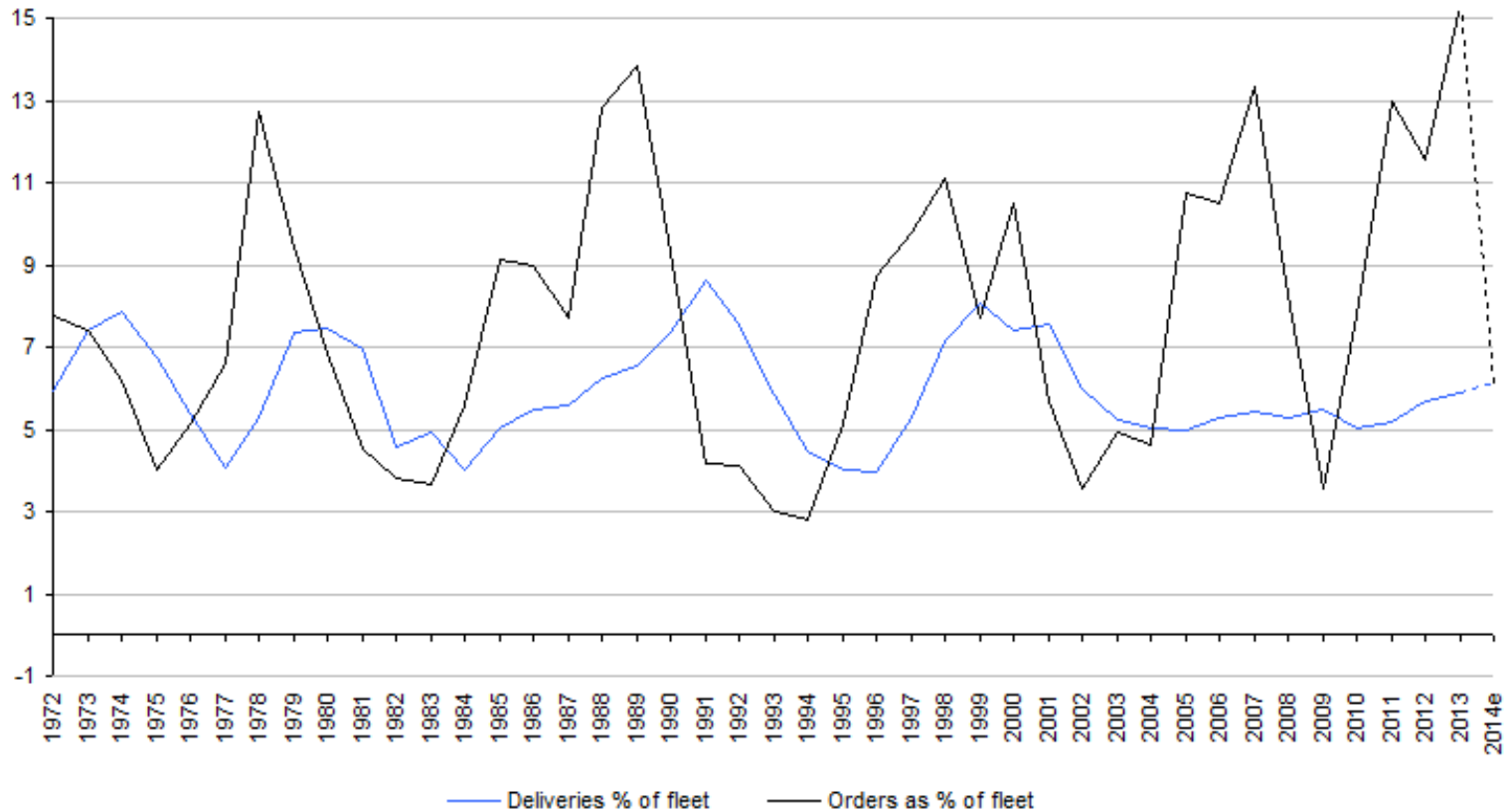
WIDE BODY JET VALUES

WIDEBODY VALUES									

AIRCRAFT ORDERS AND DELIVERY

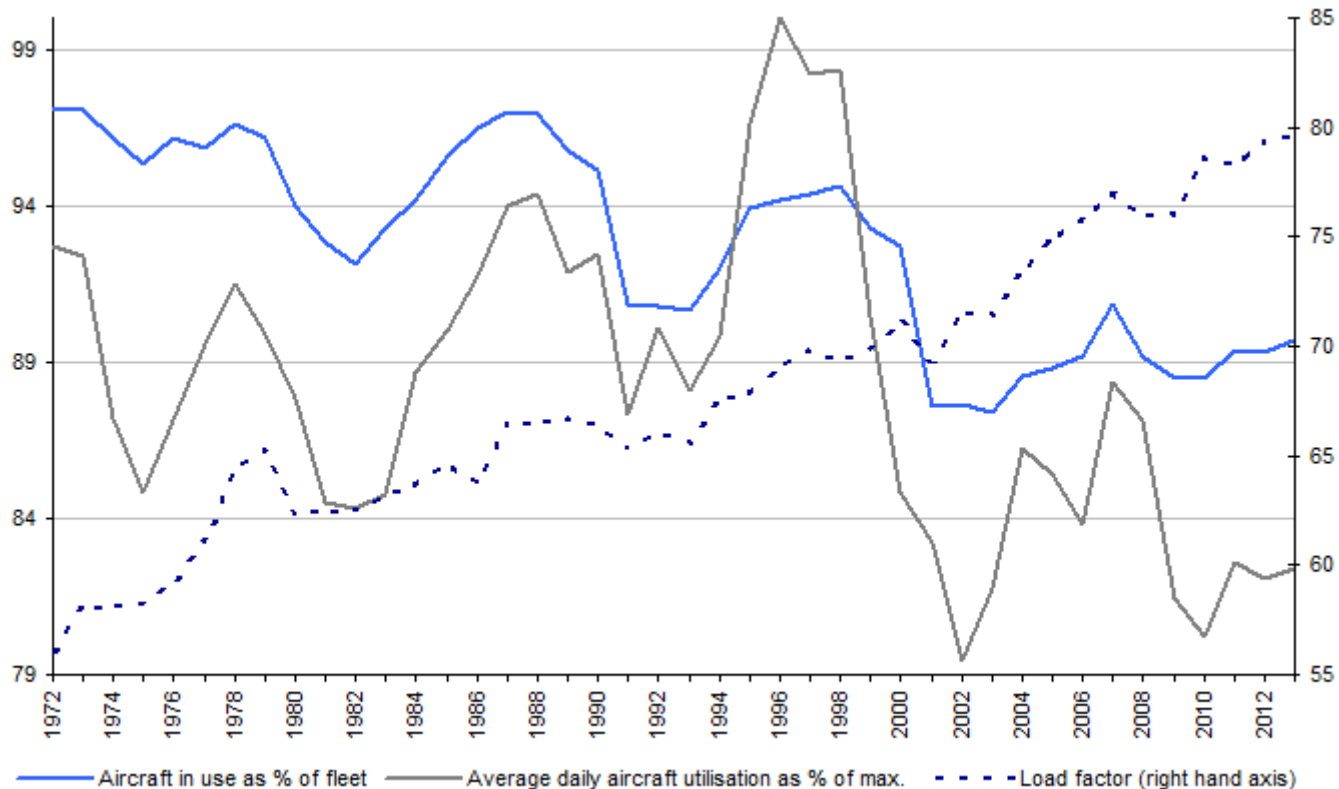
- There is a lag between aircraft orders and deliveries.
 - Delivery may occur during an economic downturn, negative profits and declining cash
 - With no traffic growth to absorb capacity
- Aircraft orders depends on:
 - projections for economic and traffic growth
 - decline in income-traffic growth multiplier
 - the real cost of air travel
 - expectations of aircraft shortage
 - Cash and financing availability

AIRCRAFT ORDERS AND DELIVERY



Source: CAPA – Centre for Aviation, Airline Monitor

CAPACITY UTILISATION DRIVES PROFITABILITY - BUT IT'S NOT JUST LOAD FACTOR



Three measures of capacity utilisation for the global airline fleet: 1972 to 2013

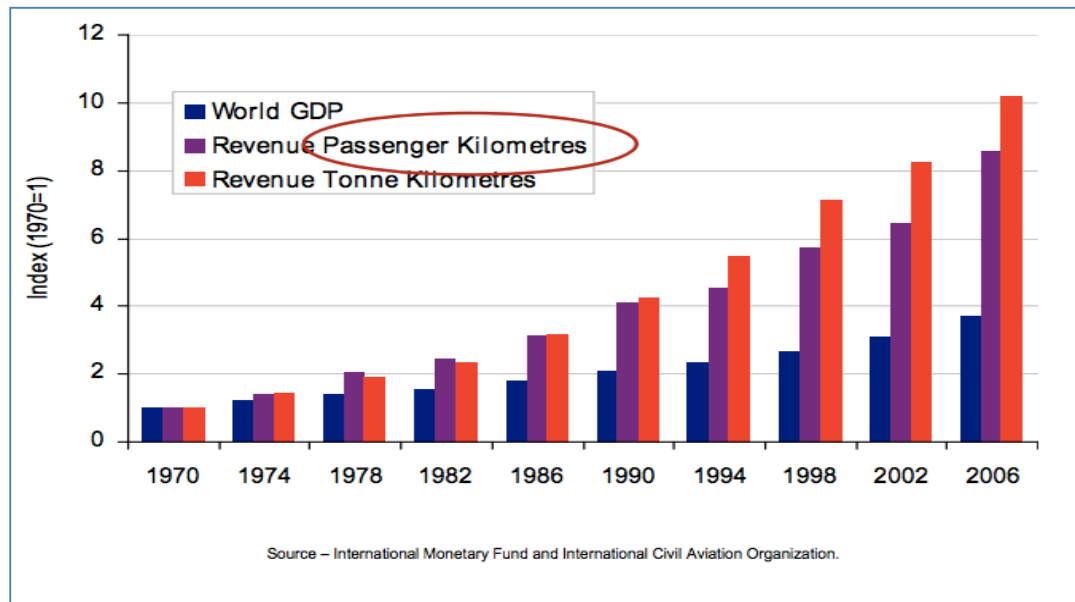
- (1) passenger load factor (%),
- (2) flown hours per day (as a % of the maximum) and
- (3) aircraft in use (as a % of the total fleet)

HIGH OPERATING LEVERAGE

- Industry capacity is “lumpy”
 - i.e., you can’t fly 45% of a plane
- Fixed costs constitute a high proportion costs.
 - In the short run, flight costs are relatively invariant to actual passenger/cargo loads.
- Thus incremental revenues can dramatically increase bottom line contribution

PRO-CYCLICAL INDUSTRY

- Income elasticity is 1.5 to 2.0
- This implies that as economy cycles, air transport will cycle up (or down) at almost double the rate



ECONOMIC PERFORMANCE & BUSINESS CYCLE

<i>Worldwide airline industry</i>	2012	2013	2014
Spend on air transport, \$billion	679	710	746
% change over year	9.8%	4.6%	5.0%
% global GDP	0.9%	1.0%	1.0%
One-way fare, \$/pax. (2014\$)	256	239	231
% change over year	-3.9%	-6.4%	-3.5%
Freight rate, \$/kg (2014\$)	2.44	2.28	2.18
% change over year	-6.5%	-6.9%	-4.0%
Passenger departures, million	2,977	3,141	3,320
% change over year	4.6%	5.5%	5.7%
RPKs, billion	5523	5839	6183
% change over year	5.3%	5.7%	5.9%
FTKs, billion	187	191	197
% change over year	-1.0%	1.8%	3.1%
World GDP growth, %	2.5%	2.4%	2.8%
World trade growth, %	1.9%	2.7%	3.6%

Note: RPK = Revenue Passenger Kilometers, FTK = Freight Tonne Kilometers, y-o-y = year on year change. GVA = Gross Valued Added (firm level GDP).

Source: IATA, ICAO, EIU, Netherlands CPB, PaxIS, CargoIS.

ECONOMIC PERFORMANCE & BUSINESS CYCLE

<i>Worldwide airline industry</i>	2012	2013	2014
Unique city pairs	15412	15782	16161
Compared to 1994	186%	190%	195%
Transport cost, US\$/RTK (2014\$)	104.1	101.5	98.8
Compared to 1994	-52%	-53%	-54%
Value of trade carried, \$billion	6,357	6,490	6,802
% change over year	0.8%	2.1%	4.8%
Value of tourism spend, \$billion	559	590	621
% change over year	7.9%	5.5%	5.2%
Supply chain jobs, million	58.1		
% change over year	1.9%		
Supply chain GVA, \$ billion	2,434		
% change over year	3.2%		

Note: RTK = Revenue Tonne Kilometers, GVA = Gross Value Added. The total number of 'routes' or airport pairs is much higher because of multiple airports in some cities and connections are counted both ways.

Source: IATA, ATAG, OAG, UNWTO, IHS Global Insight.

FOREIGN EXCHANGE

- Major airlines sell tickets in many markets in many currencies.
- Costs are typically not balanced with revenues in a particular currency.
- Currency fluctuations are important as many costs are in the US\$ currency (or Euros):
 - Aircraft purchased in US (a/c are #2 US export)
 - Fuel markets tend to be in US dollars
 - US financial markets among the largest sources of airline and aircraft finance

LIMITS OF FOREIGN EQUITY

- Governments may restrict foreign ownership in certain industries
 - broadcasting
 - telecom
 - inner and coastal water transport
 - nuclear power
 - etc.
- Airline must be predominantly domestically owned and controlled.
- This forces airlines to raise equity in domestic markets, potentially at a higher cost than could be obtained in other financial markets.

INDUSTRY FINANCIAL PERFORMANCE

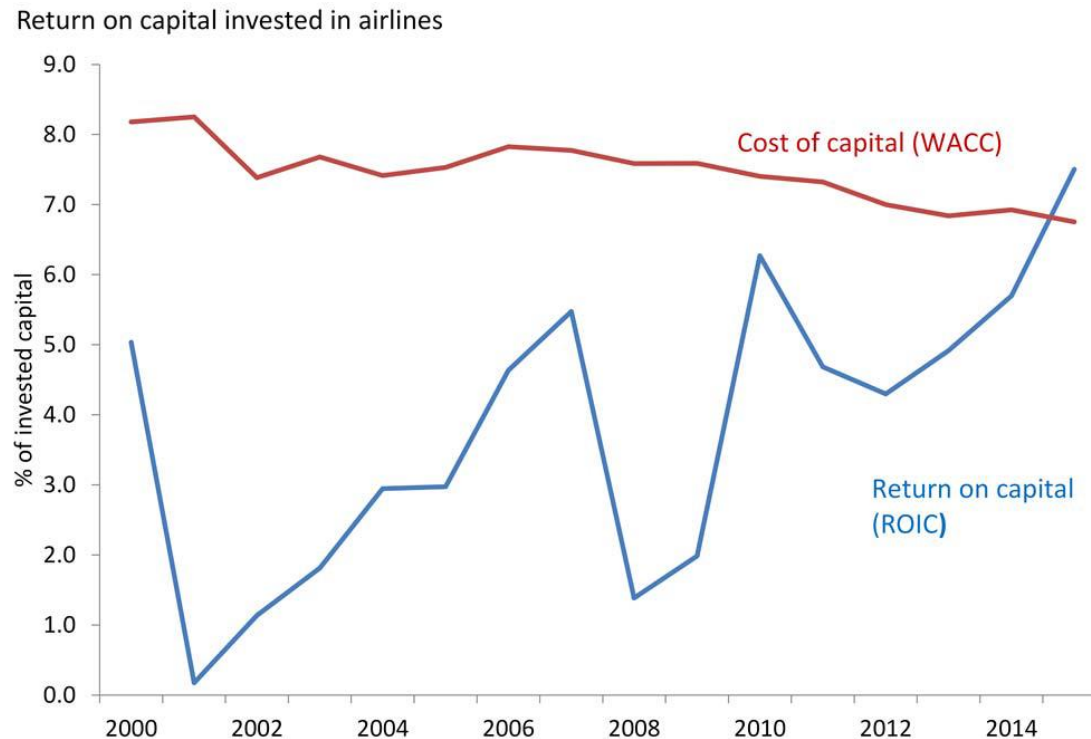


IMPROVING FINANCIAL PERFORMANCE...

- The airline industry faces challenges in attracting investors to finance extensive capital requirements.
- Main challenges:
 - Historically poor financial performance
 - *intense competition*
 - *economic recessions, terrorist attacks, natural disasters, epidemics, etc.*
 - *High operating leverage*
 - This is changing
 - most airlines are rated as non-investment grade (“junk bonds”) => high cost of borrowing

PROFITABILITY IN THE GLOBAL AIRLINE INDUSTRY

Airline industry ROIC above cost of capital in 2015



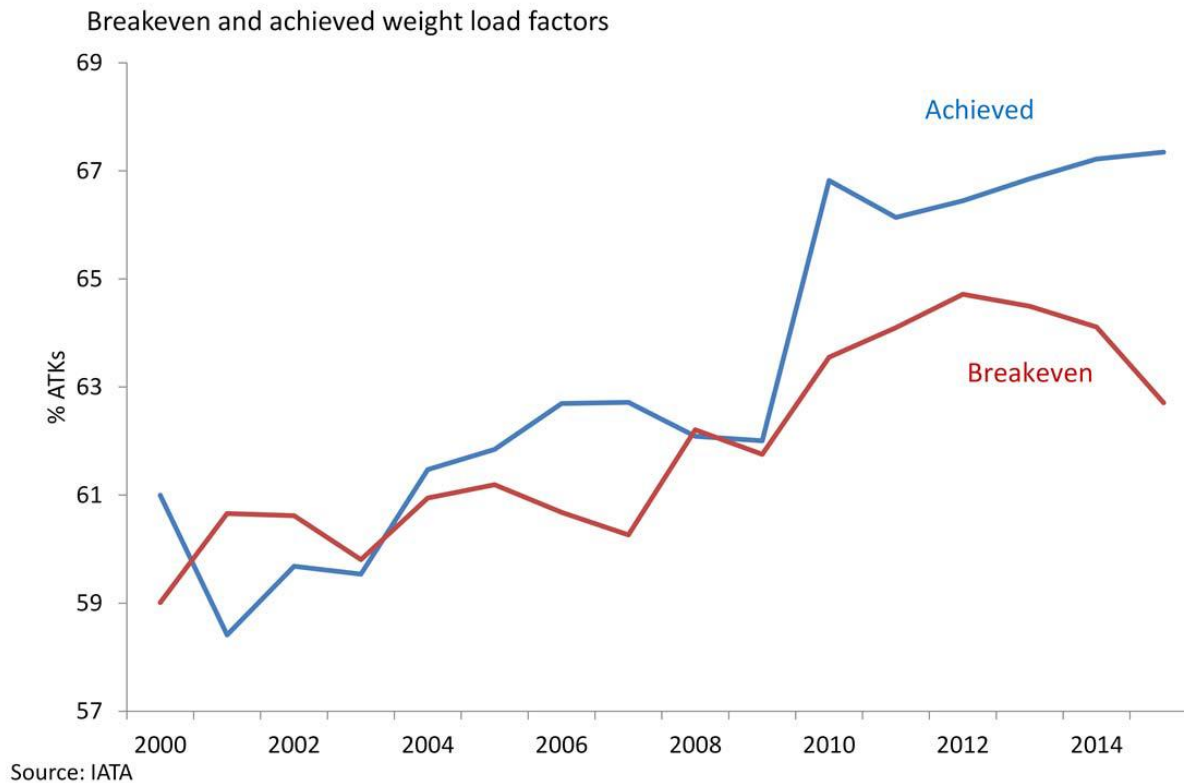
Source: IATA, McKinsey

IATA Economics www.iata.org/economics

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SOURCES OF PROFITABILITY

Widening gap above breakeven driving returns



IATA Economics www.iata.org/economics

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SOURCES OF PROFITABILITY

<i>Worldwide airline industry</i>	2012	2013	2014
Africa			
Net post-tax profit, \$billion	-0.1	-0.1	0.1
Per passenger, \$	-1.64	-1.66	1.64
% revenue	-0.8%	-0.8%	0.8%
RPK growth, %	7.5%	5.1%	5.8%
ASK growth, %	6.4%	5.0%	6.5%
Load factor, % ATK	55.9%	55.7%	55.3%
Breakeven load factor, % ATK	56.1%	56.0%	54.8%
Asia-Pacific			
Net post-tax profit, \$billion	2.7	2.0	3.2
Per passenger, \$	2.91	2.01	2.98
% revenue	1.5%	1.1%	1.6%
RPK growth, %	6.1%	7.2%	7.4%
ASK growth, %	5.4%	7.1%	7.0%
Load factor, % ATK	67.3%	67.1%	67.3%
Breakeven load factor, % ATK	66.0%	65.2%	64.2%
Middle East			
Net post-tax profit, \$billion	1.0	1.0	1.6
Per passenger, \$	6.90	6.33	8.98
% revenue	2.1%	1.9%	2.6%
RPK growth, %	14.7%	11.9%	13.0%
ASK growth, %	12.4%	11.4%	13.0%
Load factor, % ATK	60.6%	60.2%	60.2%
Breakeven load factor, % ATK	58.8%	58.7%	58.2%

Latin America			
Net post-tax profit, \$billion	-0.2	0.2	1.1
Per passenger, \$	-0.91	0.82	4.21
% revenue	-0.6%	0.6%	3.0%
RPK growth, %	9.5%	6.5%	6.0%
ASK growth, %	7.6%	4.6%	6.5%
Load factor, % ATK	59.7%	61.2%	61.0%
Breakeven load factor, % ATK	58.8%	59.8%	58.5%
North America			
Net post-tax profit, \$billion	2.3	7.0	9.2
Per passenger, \$	2.83	8.55	11.09
% revenue	1.1%	3.3%	4.3%
RPK growth, %	1.0%	2.2%	2.7%
ASK growth, %	0.4%	1.6%	2.0%
Load factor, % ATK	64.0%	64.0%	64.3%
Breakeven load factor, % ATK	61.8%	60.6%	60.0%
Europe			
Net post-tax profit, \$billion	0.4	0.5	2.8
Per passenger, \$	0.53	0.58	3.23
% revenue	0.2%	0.2%	1.3%
RPK growth, %	4.5%	4.0%	4.7%
ASK growth, %	2.8%	2.5%	4.5%
Load factor, % ATK	66.5%	66.9%	67.0%
Breakeven load factor, % ATK	66.0%	66.4%	65.8%

Note: RPK = Revenue Passenger Kilometer, ASK = Available Seat Kilometers,
ATK = Available Tonne Kilometers. Current year or forward-looking industry

OPERATING RATIO IN AIR TRANSPORTATION

- Operating Ratio
= operating expense /
operating revenue
- 1960-1977:
US average OR of 94.2
- 1978-1995:
US average OR of 98.3
- 1977-1992:
global revenue \$2 trillion
operating profit 2%
net profit 0.6%



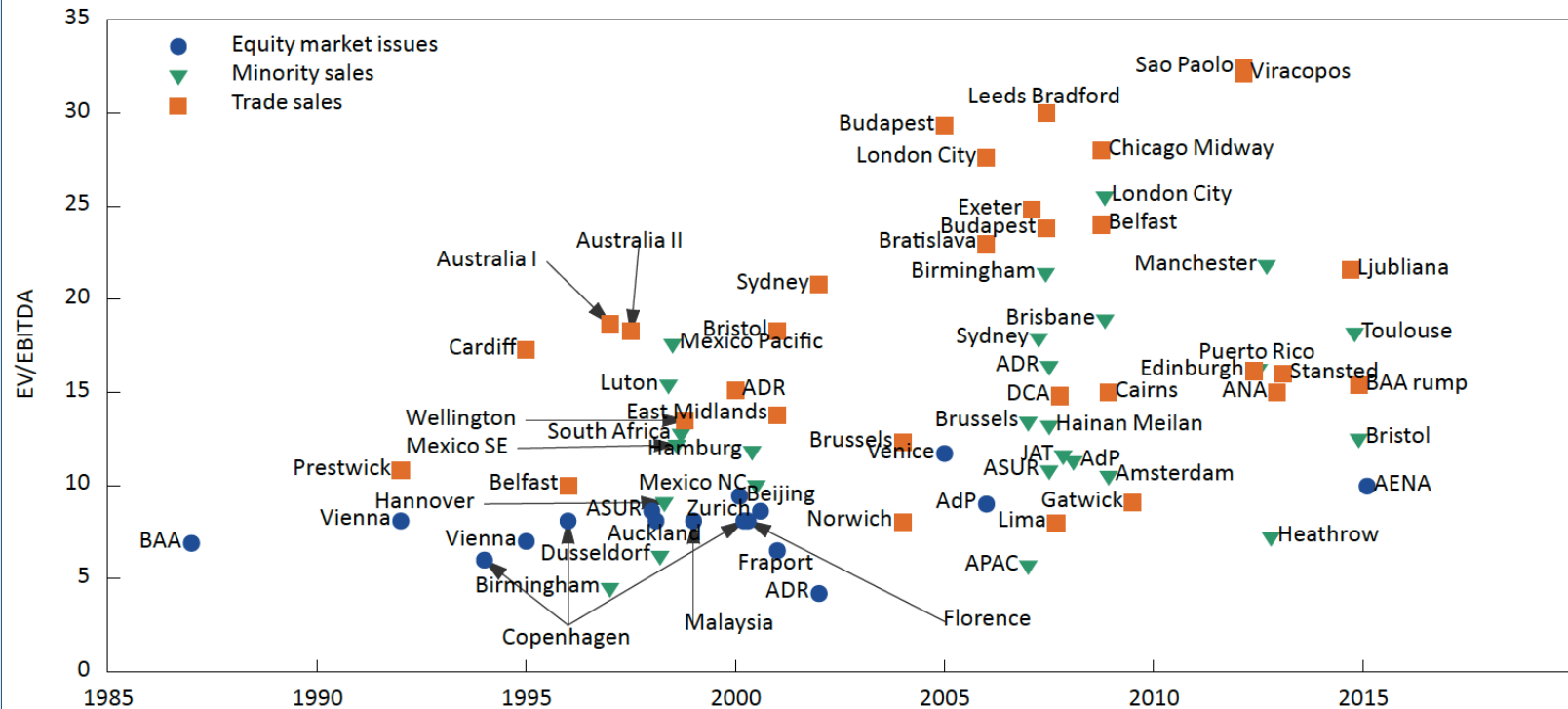
	2004	2005	2006	2007	MEAN
Electronics	94.6	94.3	94.2	94.1	94.3
Air Transportation	92.9	98.1	90.8	90.0	93.0
Retail Stores	93.1	93.0	92.7	92.9	92.9
Office Equip	89.8	90.1	89.6	89.5	89.8
Computers	89.4	89.5	89.3	89.5	89.4
Trucking	88.2	87.5	88.1	89.0	88.2
Auto/Truck	87.3	89.4	85.5	87.5	87.4
Machinery	87.5	86.9	86.2	86.0	86.7
Chemical Basic	85.5	84.6	86.7	87.0	86.0
Metal Fabrication	86.1	85.6	85.6	86.5	86.0
Paper/Forest Products	83.9	85.4	85.9	86.0	85.3
Precision Instruments	85.9	84.9	83.8	85.0	84.9
Petroleum	84.9	83.2	82.0	82.5	83.2
Building Materials	79.4	82.0	83.8	84.5	82.4
Steel [General]	83.3	82.2	80.9	83.0	82.4
Beverage	78.0	78.8	81.6	90.0	82.1
Tobacco	82.6	79.7	79.5	79.0	80.2
Chemical [DIV]	79.1	79.1	79.2	80.5	79.5
Railroads	73.6	70.4	67.9	66.5	69.6
Drugs	67.0	66.7	66.0	65.9	66.4
Semiconductors	63.9	64.3	68.8	64.0	65.3
Natural Gas	64.6	64.7	62.4	65.0	64.2
Maritime	54.1	60.3	64.6	65.0	61.0
GRAND MEAN	81.5	81.8	81.5	82.1	81.7

OPERATING RATIO IN AIRLINES

TABLE I AIRLINE OPERATING RATIOS: 2004-2007					
	2004	2005	2006	2007	Mean
American	94.6	80.4	90.2	91.0	89.1
AirTran	86.8	97.5	96.2	91.9	93.1
Alaska	97.7	91.6	92.4	90.4	93.0
Continental	96.9	96.3	93.3	92.4	94.7
Delta		103.5	92.2	88.2	94.6
JetBlue	85.0	90.6	88.2	87.9	87.9
Southwest	84.9	83.0	84.1	89.6	85.4
United	92.1	96.2	92.9	90.7	93.0
Mean	92.9	98.1	90.8	90.0	93.0

The average for the industry is 93.0 and only one of the carriers, Southwest, is far below the 90.0 level. Delta and Continental have particularly high OPRs. But how do these ratios compare to other industrial and transportation groups.

Airport Transaction Values



SOURCES OF FINANCE

SOURCES OF FINANCE

- Equity financing
- Debt financing
- Third-party financing
 - aircraft manufacturers
 - engine manufacturers
- Leasing
- Internal financing
 - Retained earnings equity
- **Prepaid Tickets**



EQUITY FINANCING

- An airline can raise capital by issuing shares.
- Common shares
 - full voting shares with no restrictions.
 - Shareholders are owners
 - Right to vote at shareholder meetings
 - Right to receive dividends
 - Right to receive the value of liquidated assets
- Preferred shares
 - a special class of shares with preferential rights.
 - E.g., payment of dividends prior to other shareholders
 - Repayment of liquidated value prior to other shareholders
 - Sometimes can be converted into common shares
 - Trade off between voting rights and better privileges

TRENDS IN EQUITY FINANCING

- Privatisation
 - Privatisation has been major user of equity markets
 - Previously, only US had major private airlines and hence few countries had developed airline equity markets and support institutions
- IPO
 - Launch of new air carriers, IPO of government airline
 - Often, new carriers launched by private placement, with subsequent IPO
- Airline stocks are viewed as “traders”
 - Often viewed as trading stocks, not long-term investments

DEBT FINANCING

- Debt financing
 - Banks
 - Insurance companies, super-annuity funds, etc.
 - Long life assets of airlines
match long life liabilities of insurance/annuities
 - Loans in the form of a bond, debenture or note
 - Typically provides a fixed rate of return to investors
 - Some debentures may enable investors to tap into profits (e.g. income debentures, participating debentures)
 - Income and participating debentures have advantage over preferred shares
 - No board approval is required to pay dividends
 - Repayable at a fixed time

THIRD-PARTY FINANCING

- Airframe manufacturers
 - becoming an increasing source of finance for new aircraft purchases
 - sometimes will agree to acquire an airline's old equipment
- Engine manufacturers
 - a large component of total aircraft price
 - on some aircraft models,
very intense competition between engine manufacturers
- Export-Import Banks

EXHIBIT 6: TOP RECIPIENTS OF ECA FINANCING 2000-2012

Rank	Carrier	Ex-Im Financing (Millions)	ECGD Financing (Millions)	Total (Millions)
1	Ryanair	\$6,033	\$0	\$6,033
2	LATAM	\$3,959	\$1,495	\$5,454
3	Air India	\$5,216	\$0	\$5,216
4	Korean Air	\$4,032	\$512	\$4,544
5	Emirates	\$3,486	\$871	\$4,357
6	Turkish Airlines	\$2,900	\$934	\$3,834
7	Cathay Pacific Airways	\$3,258	\$302	\$3,560
8	Thai Airways Intl Ltd.	\$1,676	\$617	\$2,293
9	Ethiopian Airlines	\$2,157	\$0	\$2,157
10	KLM Royal Dutch Airlines	\$1,769	\$221	\$1,990
11	Air China	\$1,573	\$203	\$1,776
12	China Airlines	\$1,503	\$270	\$1,773
13	WestJet Airlines	\$1,745	\$0	\$1,745
14	Virgin Australia	\$1,705	\$0	\$1,705
15	Etihad Airways	\$1,137	\$472	\$1,608
16	Jet Airways Ltd.	\$1,433	\$156	\$1,589
17	Qantas Airways	\$567	\$906	\$1,473
18	Copa Airlines	\$1,336	\$0	\$1,336
19	Air Canada	\$1,132	\$192	\$1,324
20	Asiana Airlines	\$1,224	\$66	\$1,290
21	Lion Air	\$1,124	\$0	\$1,124
22	Egyptair Holding Co.	\$408	\$385	\$793
23	Qatar Airways	\$0	\$766	\$766
24	China Southern Airlines	\$337	\$407	\$744
25	AirAsia	\$0	\$627	\$627
26	China Eastern Airlines	\$0	\$564	\$564
27	Oman	\$110	\$305	\$415
28	Aeroflot Russian Airlines JSC	\$0	\$328	\$328
29	SAS	\$0	\$311	\$311
30	Taca Intl Airlines	\$0	\$224	\$224

Sources: Annual Reports of U.S. Export Import Bank and Annual Reports of ECGD. (ECGD through 2011).

Note: Top carriers receiving financing defined as Top 20 Ex-Im Financed Carriers and Top 20 ECGD Financed Carriers from fiscal years 2000 through 2012 (ECGD through 2011). Carriers include wholly-owned subsidiaries throughout the time period (Air France excludes KLM); LATAM includes Lan Peru; AirAsia includes AirAsia X. ECGD figures converted to US Dollars using average annual USD-GBP bid/ask midpoint rates from www.oanda.com/currency/historical-rates/. Excludes aircraft leasing companies and cargo airlines.

OPERATING LEASE

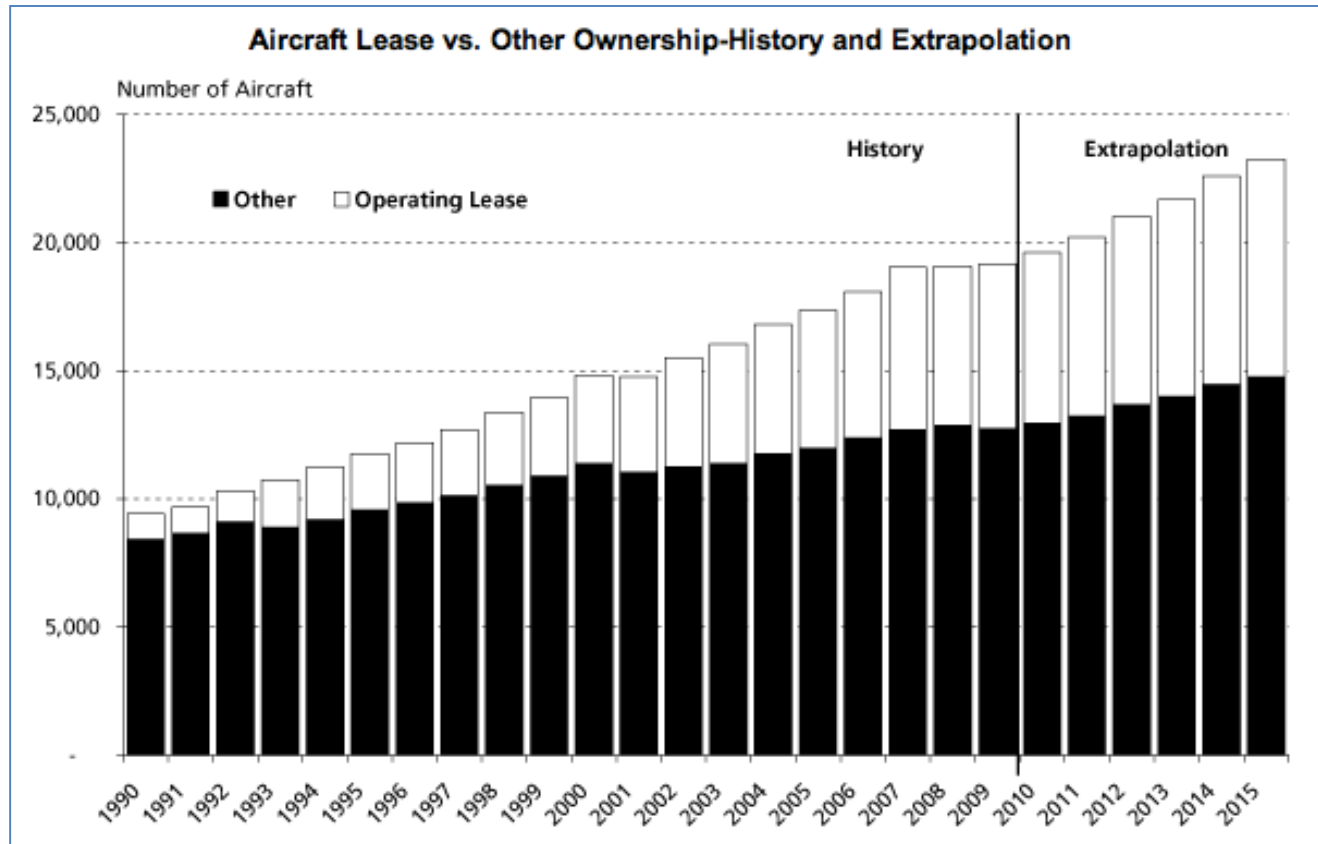
Under an operating lease structure:

- the airline commits to a long-term lease agreement for the aircraft from a lessor (typically between six to 12 years),
- all related operating expenses borne by the airline.
- At the end of the lease term, the aircraft lease can either be extended for a further period, or the aircraft is returned to the lessor in compliance with the provisions in the lease agreement, which typically relate to the aircraft's maintenance condition.
- In the latter case, the lessor will transition the aircraft to another operator, or when the aircraft has reached the end of its useful life, sell it for parts in the spares market.

LEASE

- Operating lease
 - The asset is not fully amortized over the lease term
 - The lessee does not acquire title to the asset
 - Annual lease payment appears as expense item on income statement (tax advantages)
- Capital lease
 - The asset is fully amortized over a fixed lease term
 - Lease payments cover capital costs + lessor's profit
 - The lessee may acquire asset at the end of the term (purchase option)

INCREASE IN OPERATING LEASES



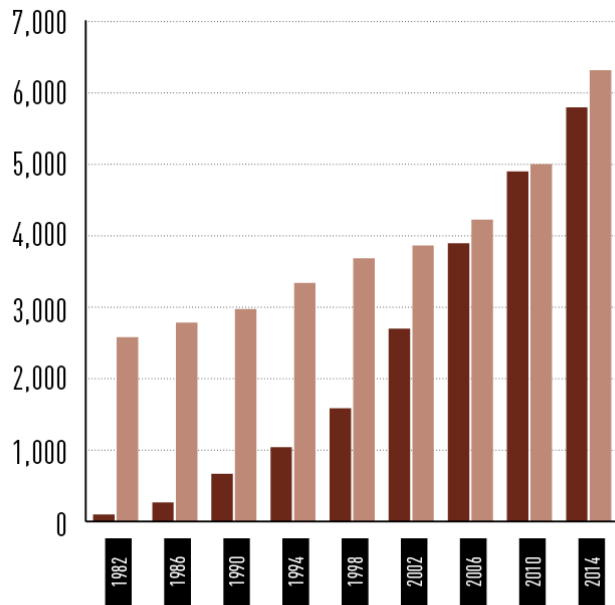
Source: Historical data ACAS; forecast AVITAS

LEASES VS AIRLINE OWNERSHIP

Fig 1 Ownership of narrowbody aircraft

NUMBER OWNED BY

■ OPERATING LESSORS ■ AIRLINES



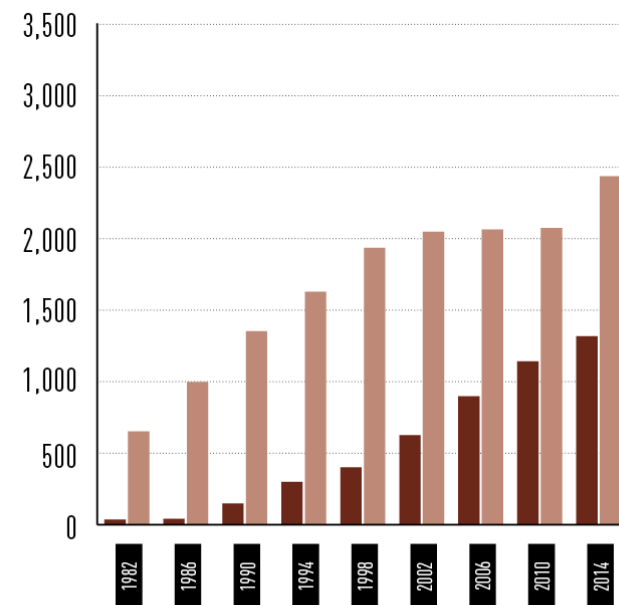
SOURCE: ASCEND FLIGHTGLOBAL

Notes: Includes Boeing & Airbus passenger aircraft only

Fig 2 Ownership of widebody aircraft

NUMBER OWNED BY

■ OPERATING LESSORS ■ AIRLINES



SOURCE: ASCEND FLIGHTGLOBAL

Notes: Includes Boeing & Airbus passenger aircraft only

LEASE CLASSIFICATION

- Dry lease
 - Lease of aircraft, but not aircrew
- Wet lease
 - Lease of aircraft and aircrew
- Damp lease
 - Part of the crew is provided by the lessee and part by the lessor (e.g., Air France lease to Air Seychelles)
- Swap lease
 - Airlines swap aircraft depending on high/low season
- Cross-border lease
 - Double-dip lease, Irish lease, Samurai lease

LEASE

- Advantages of leasing
 - A lessor retains title to the aircraft
 - The provides protection of lessor against insolvent debtors
 - A lessee benefits from tax incentives
 - Leasing can lower equipment costs compared to other sources
- Problems with leasing
 - Withholding of taxes
 - Double sales tax
 - (e.g., sale-and-leaseback in certain jurisdiction (US States, Canadian Provinces)

Source: D. Bunker (1988), The Law of Aerospace Finance in Canada

INTERNAL FINANCING

- Internally generated cash from operations
 - Retained earnings
 - As fleets are depreciated, airlines become strong cash generators
 - May be cheaper than borrowing
 - Avoids cash flow drain of interest payments on debt
 - But requires sufficient retained earnings
- Converting existing assets into cash
 - Sale of aircraft and other equipment
 - Sale and leaseback of equipment
 - Sale of residual value of leased aircraft

OTHER FORMS OF FINANCE

- Enhanced equipment trust certificates (EETC)
 - an airline may issue bonds to pay for the acquisition of aircraft
 - a special purpose vehicle (SPV) is a company set up to raise cash and purchase aircraft
 - the airline makes lease payments to SPV which are remitted to the bond holders in the form of interest payments

PREPAID TICKETS

- Aviation is one of the only economic sectors where customers prepay in full (other Dell Computers)
 - Typically this amounts to several weeks of cash flow
 - This is a major element of start up airlines' financing.
- Charters
 - Higher risk of failure to perform service
 - Some countries require charter prepayments be protected in a trust until the aircraft departs

END OF MODULE 2