

Benchmarking Airports: A Case Study on Alternative Valuation Approaches

5th Conference on Applied Infrastructure Research
Berlin
7 October 2006

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- **Conventional Benchmarking Techniques**
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- **Traditional Valuation Measures I & II**
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- **The Roots of Key Value Drivers**
- **Frame of Reference: The Airport Value Tree**
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- **Return Profiles of Sample Airports I - III**
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- **Analysis of Partial Factor Productivity, PFP**
- **Financial Ratio Analysis, FRA**
- **Assessment of Total Factor Productivity, TFP**
- **Data Envelopment Analysis, DEA**

→ The Principles of Company Value

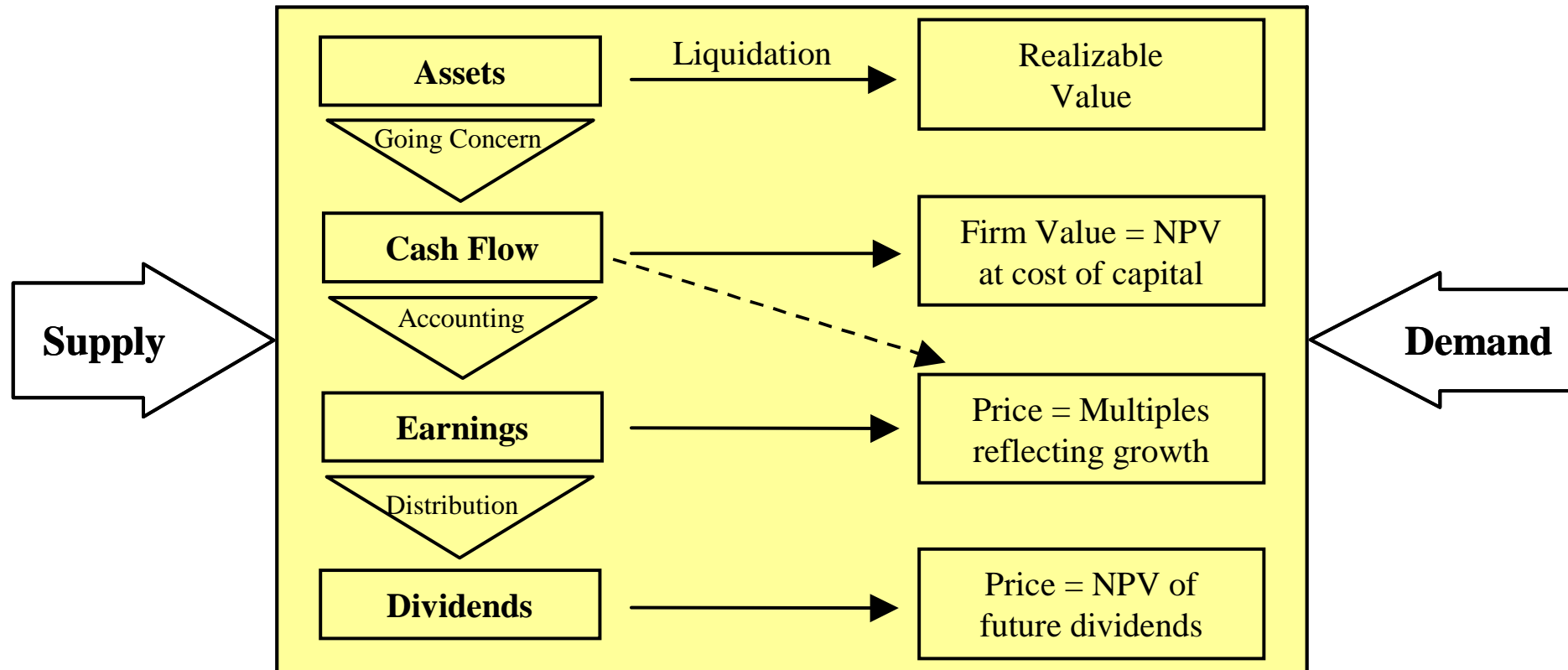


Illustration derived from Elton & Gruber, 1995; Pike & Neale, 1996

- As with any other business, an airport is valued on the basis of its current and expected revenues, earnings and cash flow.



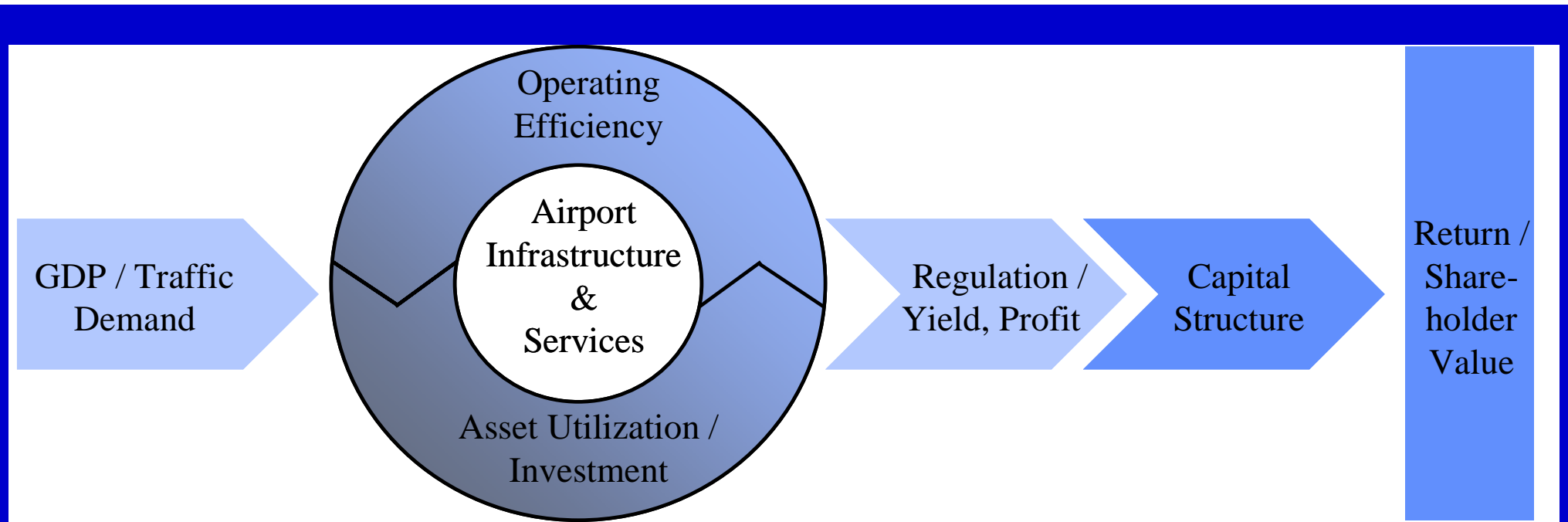
- **Share price performance, relative to local market**
- **Price / earnings (P/E) ratio**
- **Earnings per share (EPS)**
- **Price / cash flow ratio (P/CF)**
- **Price / cash earnings (P/CEPS)**

→ Traditional Valuation Measures II



ADP (EUR)	as of 11/08/06	shares outst. (m)	Mkt cap (in €m)	Net Debt/ EBITDA	EV/Sales (x)	EBITDA Margin	EV/ EBITDA	P/E (x)	Dividend Yield
47.18	Dec 05A	99	4,671	-	3.6	30%	11.8	25.9	1.4%
Mkt cap 4,671(m)	Dec 06E	99	4,671	3.0	3.4	33%	11.2	26.8	1.9%
	Dec 07E	99	4,671	-	3.2	33%	10.4	24.8	2.0%
BAA * (GBP/p)	as of 08/06	shares outst. (m)	Mkt cap (€m)	Net Debt/ EBITDA	EV/Sales (x)	EBITDA Margin	EV/ EBITDA	P/E (x)	Dividend Yield
933	Mar 06A	1,076	14,682	-	6.8	46%	12.9	19.7	2.4
Mkt cap 10,038(m)	Mar 07E	1,076	14,682	5.5	7.1	45%	15.7	21.0	2.6
	Mar 08E	1,076	14,682	-	6.7	46%	14.5	18.8	2.6
CPH (DKK)	as of 11/08/06	shares outst. (m)	Mkt cap (€m)	Net Debt/ EBITDA	EV/Sales (x)	EBITDA Margin	EV/ EBITDA	P/E (x)	Dividend Yield
1,830	Dec 05A	8	1,962	-	6.7	53%	13.7	22.3	4.7%
Mkt cap 14,640(m)	Dec 06E	8	1,962	2.5	6.5	52%	12.6	20.4	3.6%
	Dec 07E	8	1,962	-	6.4	55%	12.1	18.8	2.7%
FRA (EUR)	as of 11/08/06	shares outst. (m)	Mkt cap (€m)	Net Debt/ EBITDA	EV/Sales (x)	EBITDA Margin	EV/ EBITDA	P/E (x)	Dividend Yield
57.10	Dec 05A	91	5,196	-	2.5	25%	9.9	31.4	1.6%
Mkt cap 5,196(m)	Dec 06E	91	5,196	0.8	2.4	26%	9.3	26.9	1.9%
	Dec 07E	91	5,196	-	2.3	26%	8.7	24.0	2.1%
VIE (EUR)	as of 11/08/06	shares outst. (m)	Mkt cap (€m)	Net Debt/ EBITDA	EV/Sales (x)	EBITDA Margin	EV/ EBITDA	P/E (x)	Dividend Yield
61.38	Dec 05A	21	1,289	-	3.2	36%	8.7	17.3	3.3%
Mkt cap 1,289(m)	Dec 06E	21	1,289	0.5	3.1	38%	7.9	17.2	3.3%
	Dec 07E	21	1,289	-	2.9	39%	7.5	17.1	3.4%
ZRH (CHF)	as of 11/08/06	shares outst. (m)	Mkt cap (€m)	Net Debt/ EBITDA	EV/Sales (x)	EBITDA Margin	EV/ EBITDA	P/E (x)	Dividend Yield
280	Dec 05A	6	1,055	-	5.0	52%	9.6	23.3	0.4%
Mkt cap 1,680(m)	Dec 06E	6	1,055	3.7	4.8	52%	9.2	19.7	1.1%
	Dec 07E	6	1,055	-	4.8	53%	9.8	15.2	1.1%

→ An Airport Business Model



- **A business model is essentially the method of doing business by which a company can sustain itself – that is, generate revenue.**
- **Selling the provision of infrastructure (massive capex) and support services (opex) in the (regulated) marketplace.**

→ The Roots of Key Value Drivers



- **Operating Efficiency, i.e.:** → **ROS**

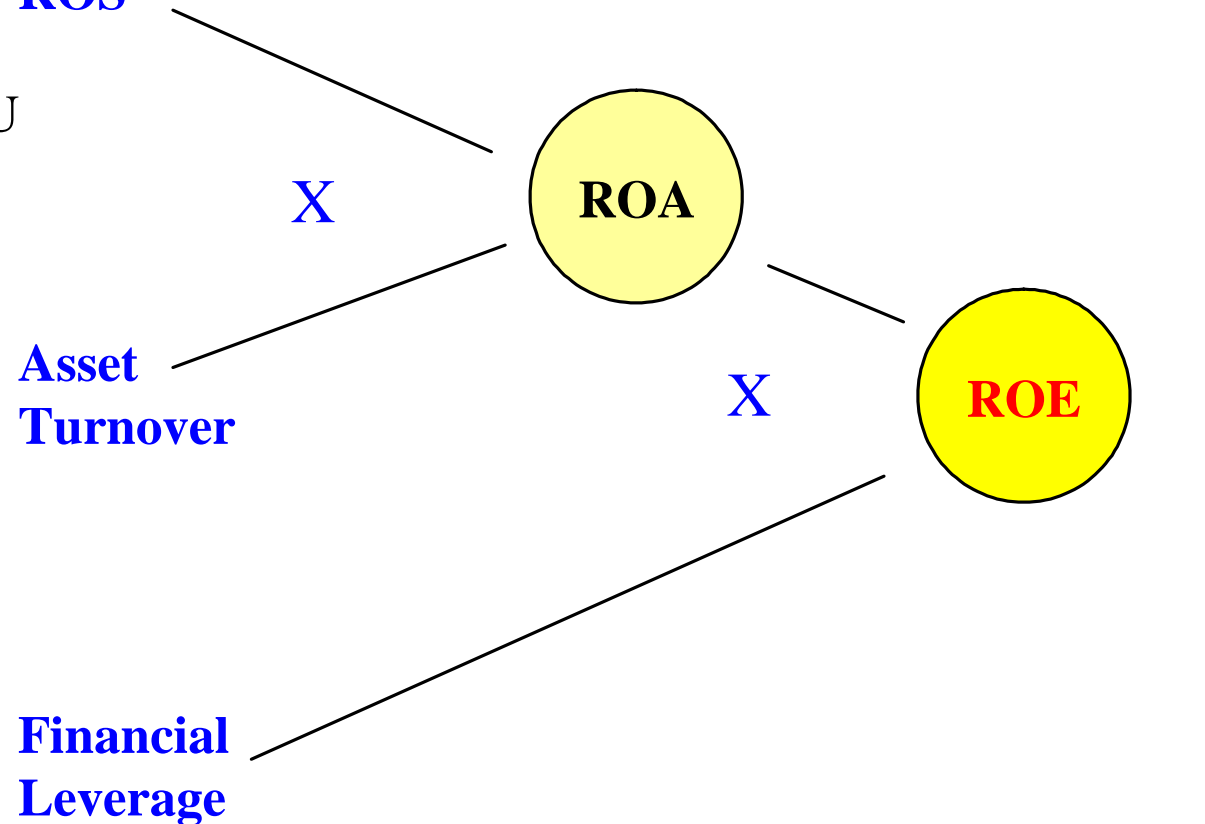
- Infl.-Adj. Total Revenue/WLU
- EBITDA Margin
- Cash Flow/Total Revenue

- **Asset Utilization, i.e.:** →

- WLU/Total Assets
- Capex/Total Revenue
- Capex/Depreciation

- **Capital Structure, i.e.:** →

- Net Assets/Total Assets
- Gearing (Debt/Equity Ratio)
- Debt Ratio



→ Frame of Reference: The Airport Value Tree

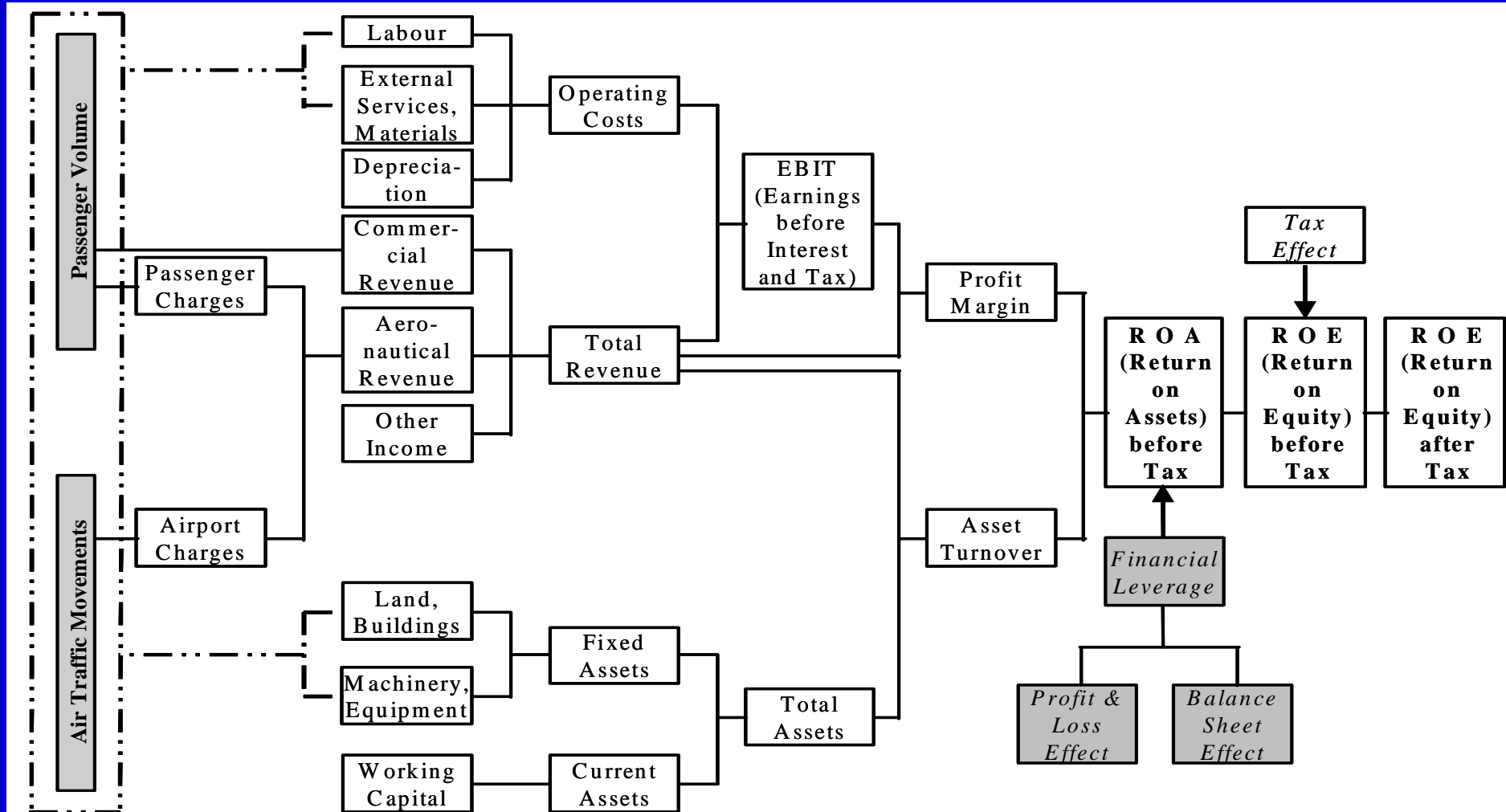


Illustration derived from the Du Pont chart and Morgan Stanley Dean Witter, 2000

- The airport value tree is rooted in traffic. It summarizes the relationships between investment, asset turnover, profit margin and financial leverage.

→ The three Drivers of Return



- Du Pont formula: $ROA = \text{Profit Margin} \times \text{Total Asset Turnover}$
- ROI (ROE) can be split into three components / drivers, turnover of total assets, return on sales, financial leverage:

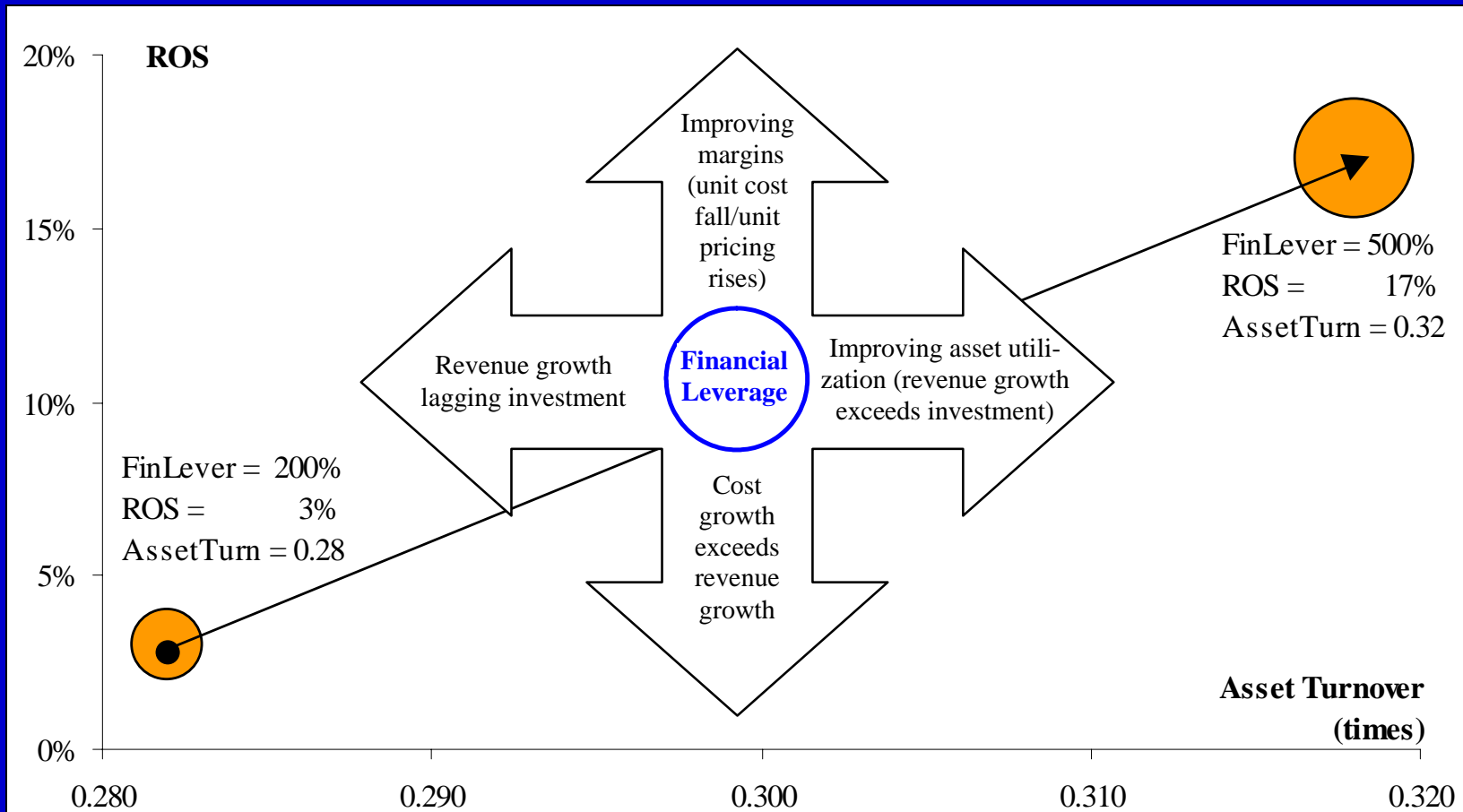
$$\frac{\text{Net Income}}{\text{Shareh. Funds}} = \frac{\text{Total Revenue}}{\text{Total Assets}} \times \frac{\text{Net Income}}{\text{Total Revenue}} \times \frac{\text{Total Assets}}{\text{Shareh. Funds}}$$

while asset turnover x return on sales (ROS) = return on assets (ROA),

hence

- Enhanced Du Pont equation: $ROE = ROA \times \text{Financial Leverage}$

→ A Driver-Based Valuation Approach: Framework for Return Profiles




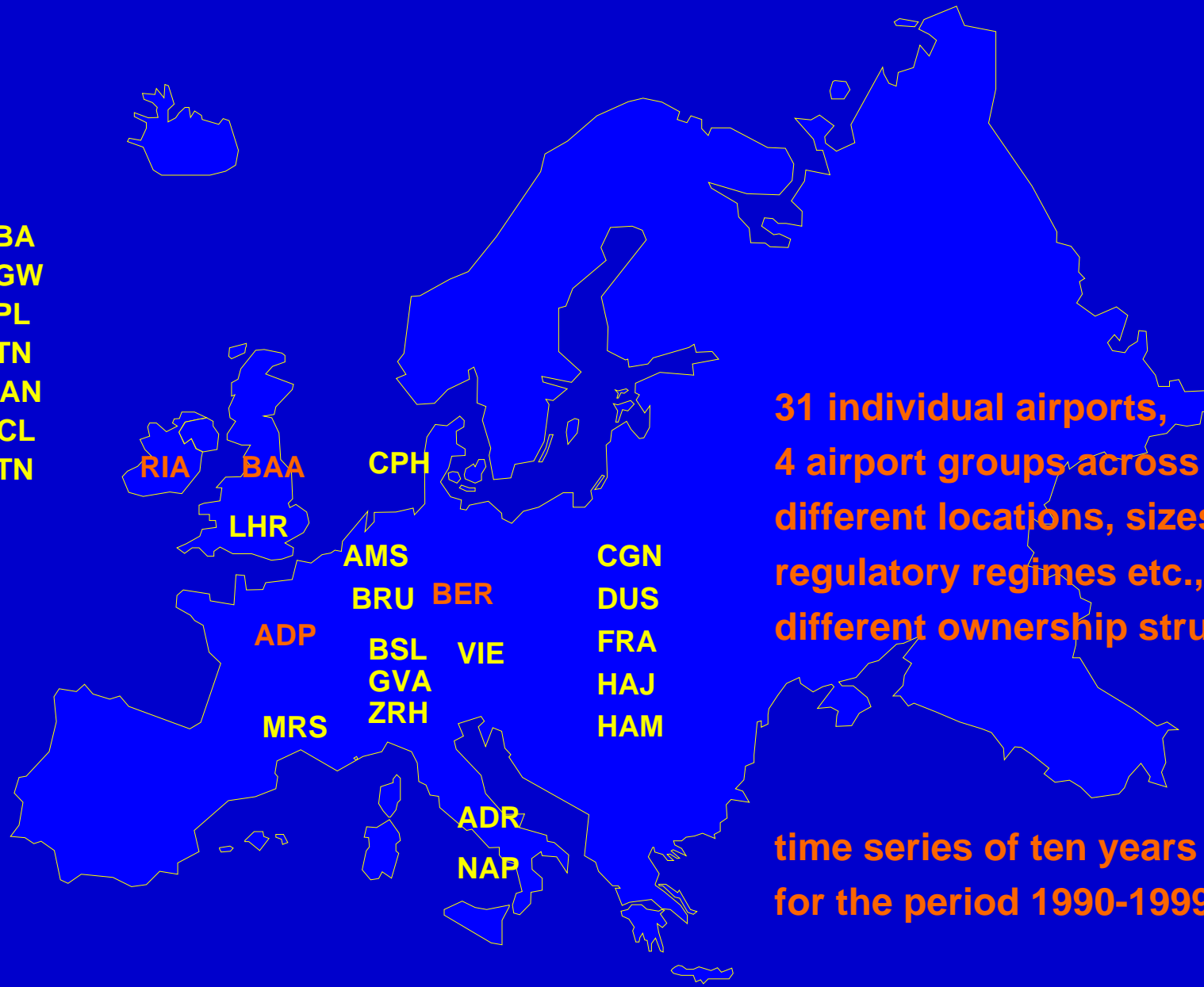
ROS (Return on Sales)	Net Income over Total Revenue
Total Asset Turnover	Total Revenue over Total Assets
Financial Leverage	Total Assets over Shareholders' Funds
	<ul style="list-style-type: none"> • The size of the bubble is determined by financial leverage. • The position of the bubble is determined by ROS and asset turnover.

Illustration derived from MSDW, 2000

→ Case Study: Sample Airports



ABZ
BFS
BHX
BRS
CWL
EDI
EMA
GLA
LBA
LGW
LPL
LTN
MAN
NCL
STN



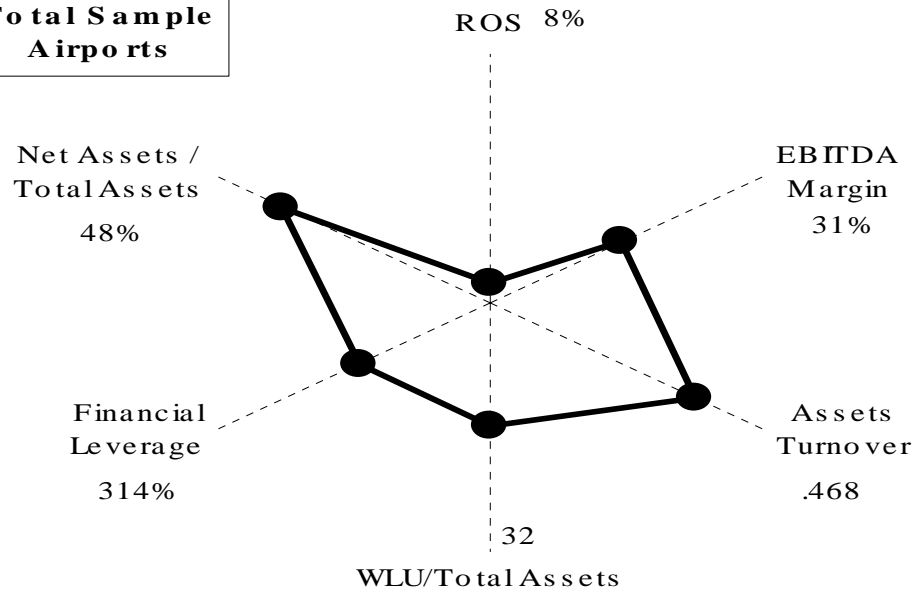
**31 individual airports,
4 airport groups across Europe;
different locations, sizes,
regulatory regimes etc., and
different ownership structures**

**time series of ten years
for the period 1990-1999/00**

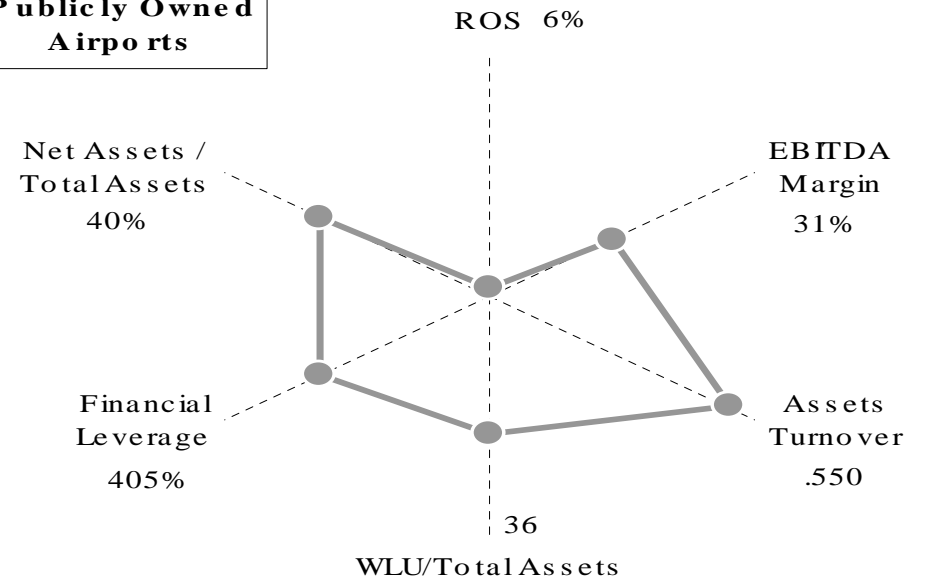
→ Performance Profiles of Sample Airports



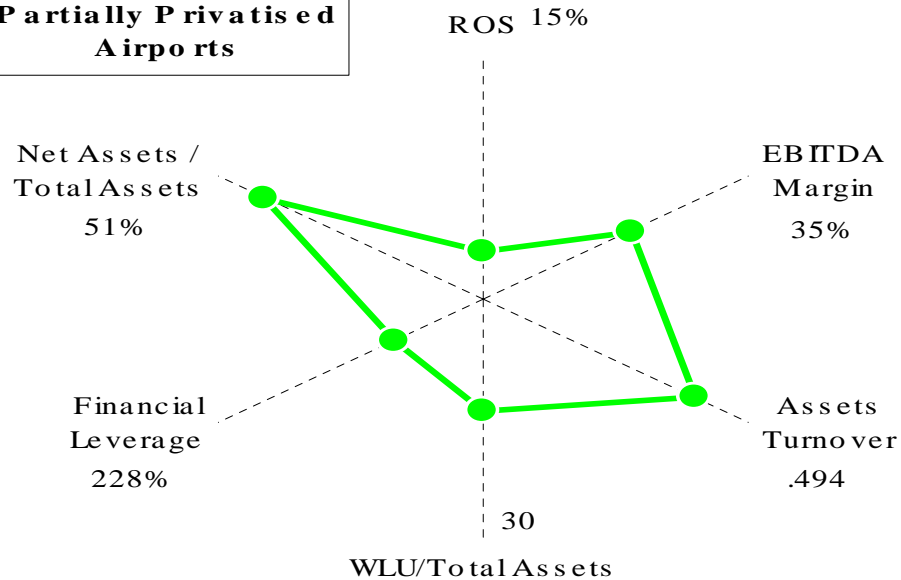
Total Sample Airports



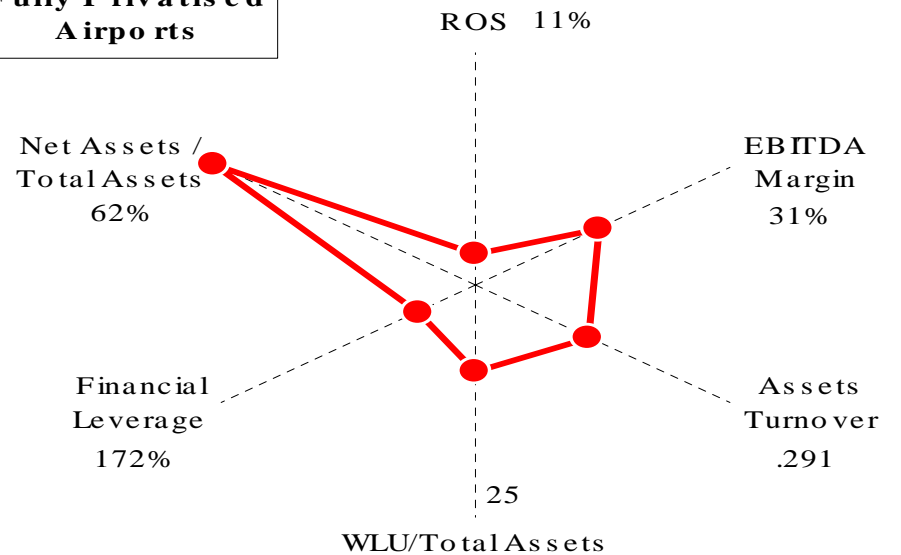
Publicly Owned Airports



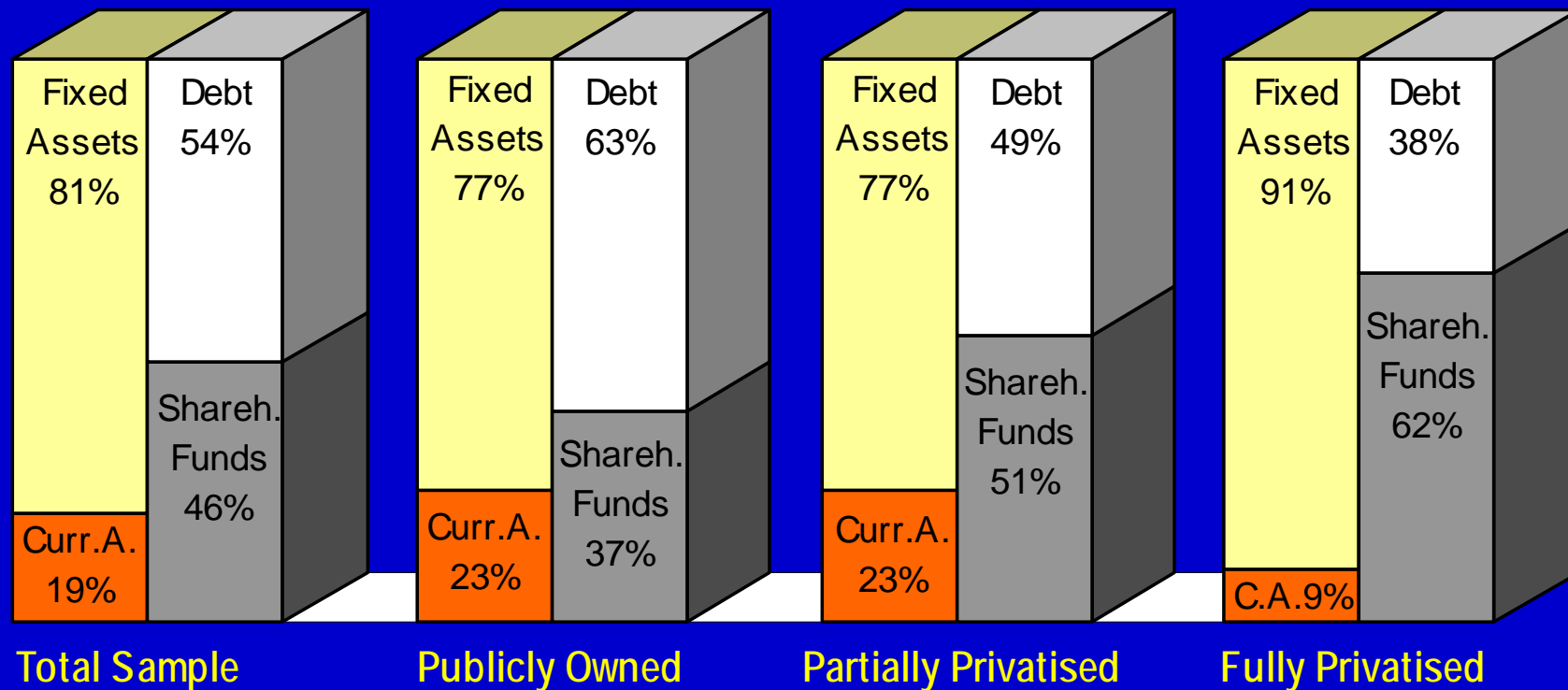
Partially Privatised Airports



Fully Privatised Airports

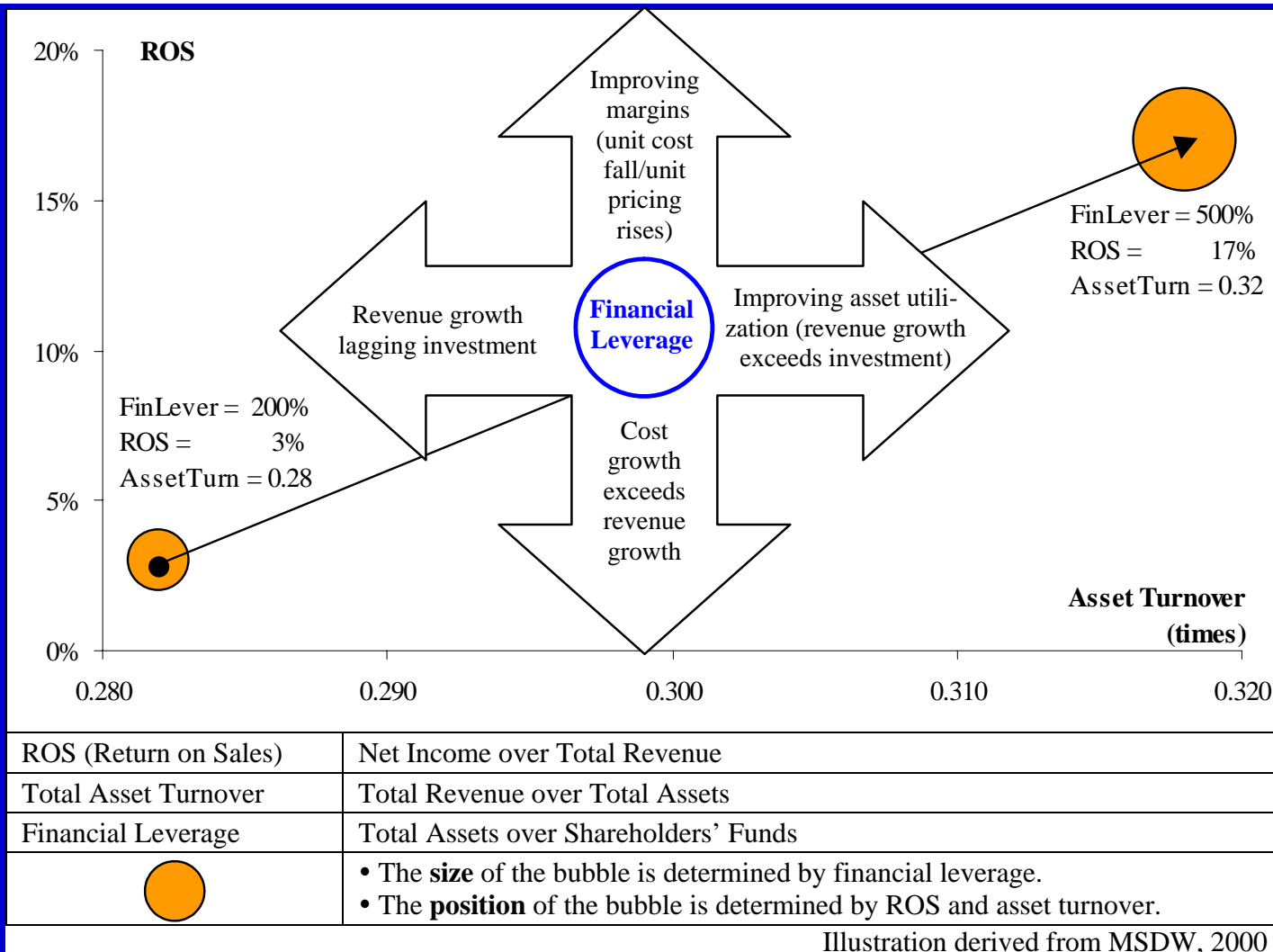


→ Balance Sheet Structures of Sample Airports



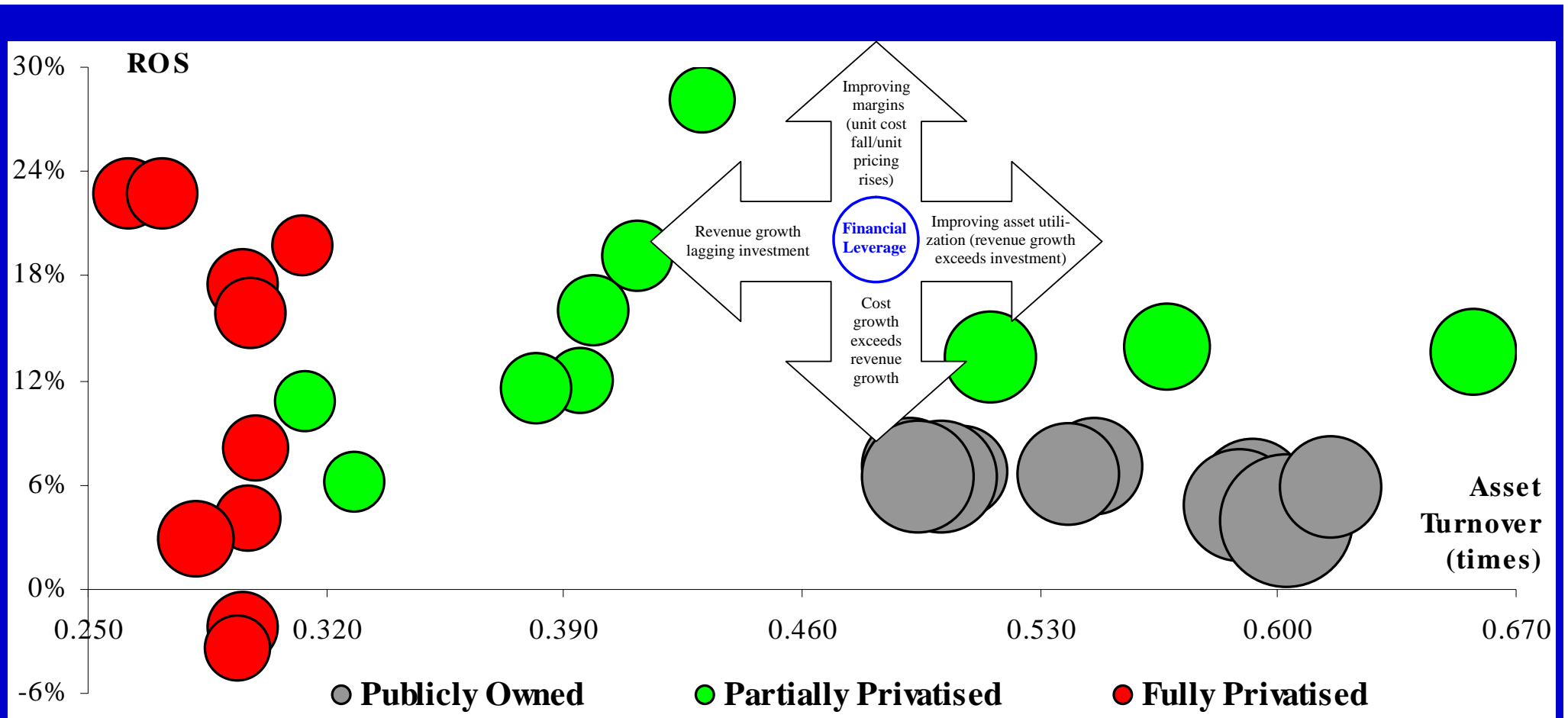
- Publicly owned airports assume more debt relative to their shareholders' funds, resulting in higher gearing and financial leverage, compensating for the comparatively low ROA generated by the business.
- Financial leverage is the use of fixed financing costs; it is acquired by choice, used to increase the return to common shareholders.

→ The Driver-Based Valuation Approach: Framework & Drivers Revisited



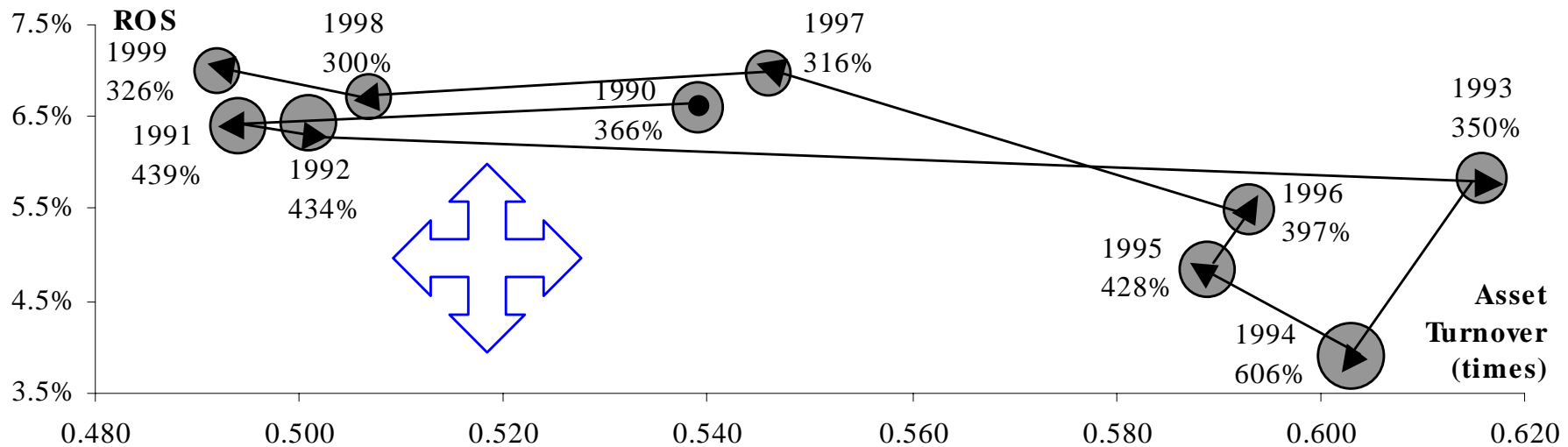
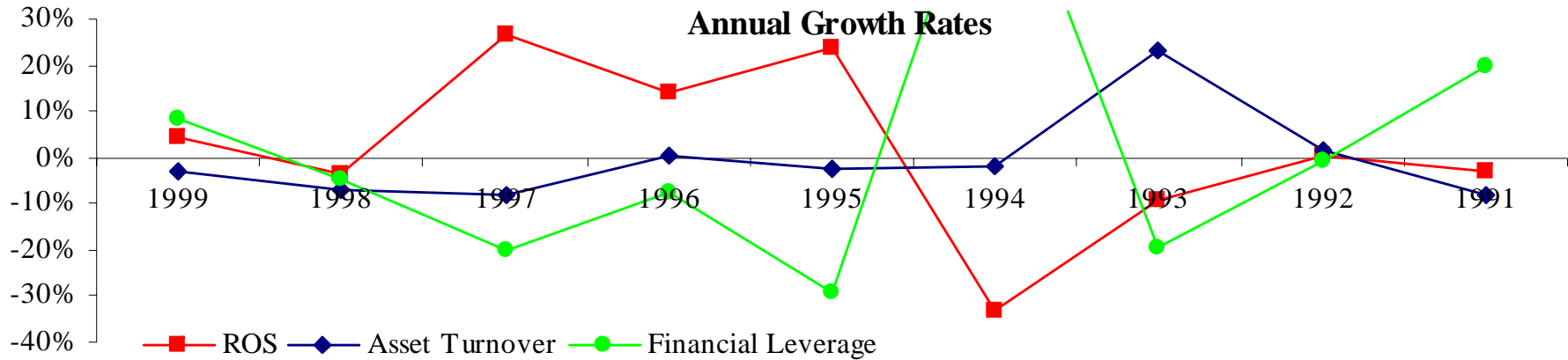
- The three drivers of return are: 1. operating efficiency → ROS, 2. Asset utilization/capital productivity → total asset turnover and 3. capital structure → financial leverage.

→ Positioning of Sample Airports per Ownership Criteria



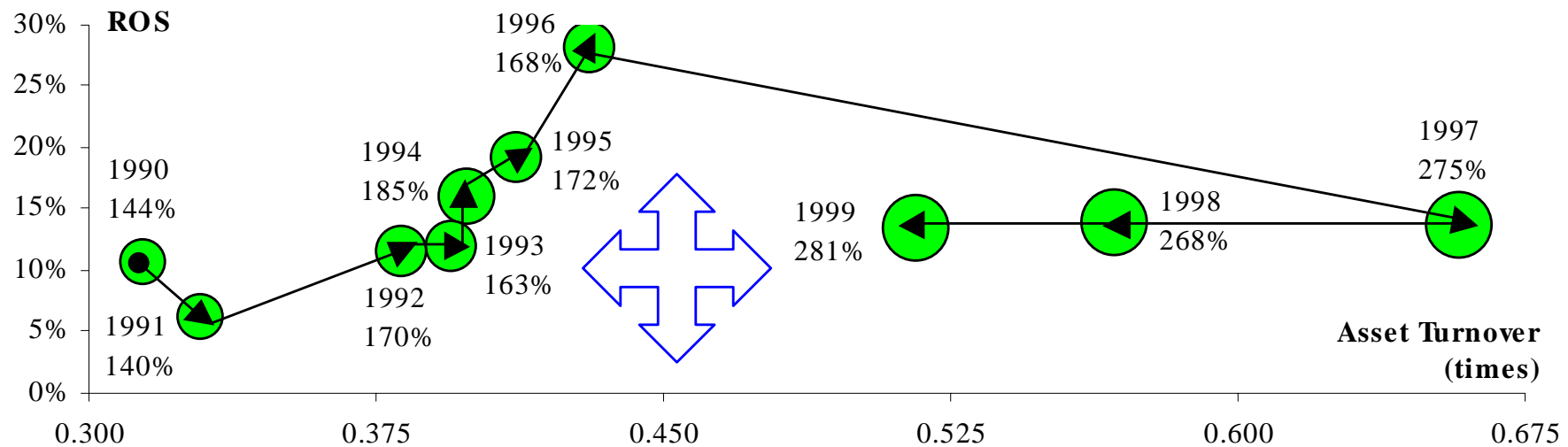
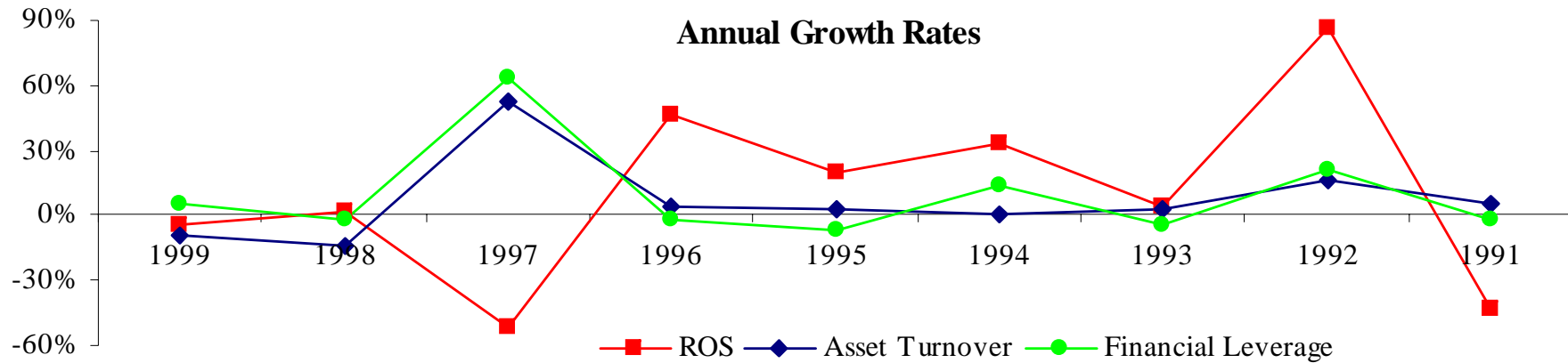
- ROA and ROE of publicly owned, partially and fully privatised airports are based on considerably different intensities of the same key drivers.

→ Return Profiles of Sample Airports I



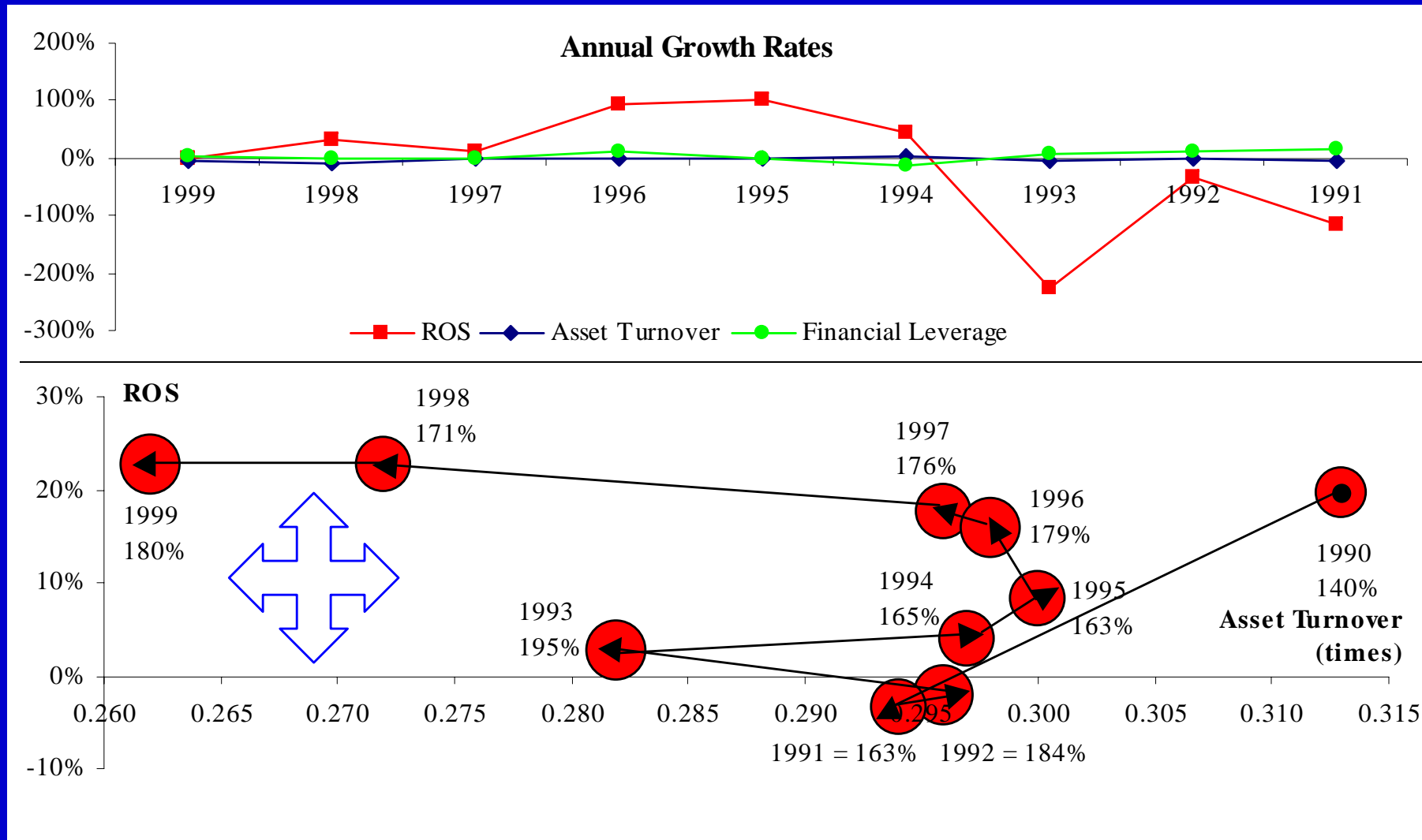
- Publicly owned airports are characterized by comparatively high asset utilization and financial leverage, and low operating efficiency.

→ Return Profiles of Sample Airports II



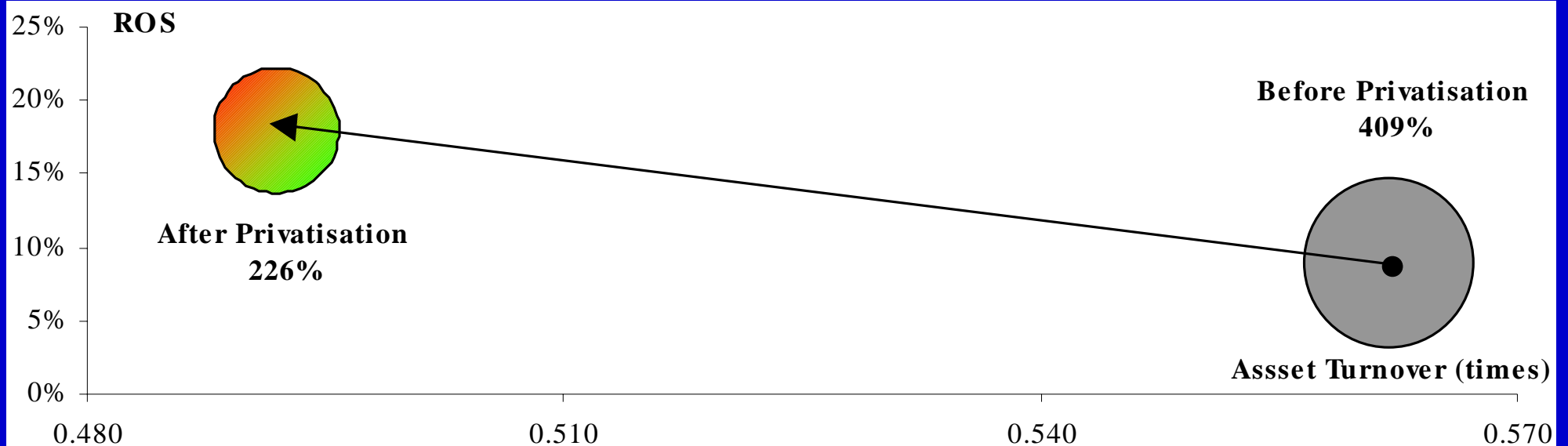
- **Partially privatised airports are characterized by medium high asset utilization and financial leverage, as well as high operating efficiency.**

→ Return Profiles of Sample Airports III



- Fully privatised airports, in contrast, are characterized by comparatively low asset utilization and financial leverage, and high operating efficiency.

→ Positioning of Paired-Sample Airports Before and After Partial or Full Privatisation



- **The positioning of sample airports changes significantly with an increase in the degree of privatisation:**
 - **Capex grows faster than revenue → decreased asset utilization / capital productivity and asset turnover.**
 - **Operating margin and ~ efficiency increase on average → increased return on sales.**
 - **Financial leverage decreases → higher equity commitment !**



- Maximising capacity utilization appears to be the formula for success in the airport business. This requires project management and financial skills for a thorough phasing of capex and optimisation of the use of debt facilities and equity supply.
- ‘Sweating’ the assets includes efficient management of traffic flows and optimal allocation of capital, finally maximizing the effectiveness of investment spending, return rates and shareholder value.
- Criteria for (strategic) investments: growth and commercial potential, potential for margin growth, existing capacity, appropriate regulatory framework and capital finance structure.



- **Airport economics are dominated by the investment cycle; and although footed on the same business model, not all airport earnings are created equal.**
- **Airports should not be valued with a single multiple but with measures recognising the key features of success of their business model and value tree.**
- **It is useful to analyse the intensity and changes of the key drivers: return on sales, asset turnover and financial leverage.**
- **Identifying the distinct differences in terms of operating efficiency, capital productivity and capital structure is the added value of this alternative, driver-based valuation approach.**

Benchmarking Airports: A Case Study on Alternative Valuation Approaches

Thank you for your attention,
please feel invited for questions !

The author has compiled this presentation in his personal capacity and views mentioned herein should not be attributed to his position within the Fraport group.