Benchmarking Airports: A Case Study on Alternative Valuation Approaches

5th Conference on Applied Infrastructure Research
Berlin
7 October 2006

Dr. Hans-Arthur Vogel

Fachhochschule für Wirtschaft Berlin
Berlin School of Economics
- Conventional Benchmarking Techniques
- The Principles of Company Value
- Traditional Valuation Measures I & II
- An Airport Business Model
- The Roots of Key Value Drivers
- Frame of Reference: The Airport Value Tree
- The three Drivers of Return
- A Driver-Based Valuation Approach: Framework for Return Profiles
- Case Study: The Sample; Performance Profiles, B/S Structures
- The Driver-Based Valuation Approach: Framework & Drivers Revisited
- Positioning of Sample Airports per Ownership Criteria
- Return Profiles of Sample Airports I - III
- Positioning of Airports Before and After Partial or Full Privatisation
- Managing the Value of Airports
- Conclusions
Conventional Benchmarking Techniques

- Analysis of Partial Factor Productivity, PFP
- Financial Ratio Analysis, FRA
- Assessment of Total Factor Productivity, TFP
- Data Envelopment Analysis, DEA
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

<table>
<thead>
<tr>
<th>Company</th>
<th>Date</th>
<th>Shares</th>
<th>Market Cap (€m)</th>
<th>Net Debt/EBITDA</th>
<th>EV/Sales (x)</th>
<th>EBITDA Margin</th>
<th>EV/EBITDA</th>
<th>P/E (x)</th>
<th>Dividend Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADP (EUR)</strong></td>
<td>Dec 05A</td>
<td>99</td>
<td>4,671</td>
<td>-</td>
<td>3.6</td>
<td>30%</td>
<td>11.8</td>
<td>25.9</td>
<td>1.4%</td>
</tr>
<tr>
<td>Mkt Cap</td>
<td>Dec 06E</td>
<td>99</td>
<td>4,671</td>
<td>3.0</td>
<td>3.4</td>
<td>33%</td>
<td>11.2</td>
<td>26.8</td>
<td>1.9%</td>
</tr>
<tr>
<td>BAA * (GBP/p)</td>
<td>Mar 06A</td>
<td>1,076</td>
<td>14,682</td>
<td>-</td>
<td>6.8</td>
<td>46%</td>
<td>12.9</td>
<td>19.7</td>
<td>2.4%</td>
</tr>
<tr>
<td>Mkt Cap</td>
<td>Mar 07E</td>
<td>1,076</td>
<td>14,682</td>
<td>5.5</td>
<td>7.1</td>
<td>45%</td>
<td>15.7</td>
<td>21.0</td>
<td>2.6%</td>
</tr>
<tr>
<td>CPH (DKK)</td>
<td>Dec 05A</td>
<td>8</td>
<td>1,962</td>
<td>-</td>
<td>6.7</td>
<td>53%</td>
<td>13.7</td>
<td>22.3</td>
<td>4.7%</td>
</tr>
<tr>
<td>Mkt Cap</td>
<td>Dec 06E</td>
<td>8</td>
<td>1,962</td>
<td>2.5</td>
<td>6.5</td>
<td>52%</td>
<td>12.6</td>
<td>20.4</td>
<td>3.6%</td>
</tr>
<tr>
<td>FRA (EUR)</td>
<td>Dec 05A</td>
<td>91</td>
<td>5,196</td>
<td>-</td>
<td>2.5</td>
<td>25%</td>
<td>9.9</td>
<td>31.4</td>
<td>1.6%</td>
</tr>
<tr>
<td>Mkt Cap</td>
<td>Dec 06E</td>
<td>91</td>
<td>5,196</td>
<td>0.8</td>
<td>2.4</td>
<td>26%</td>
<td>9.3</td>
<td>26.9</td>
<td>1.9%</td>
</tr>
<tr>
<td>VIE (EUR)</td>
<td>Dec 05A</td>
<td>21</td>
<td>1,289</td>
<td>-</td>
<td>3.2</td>
<td>36%</td>
<td>8.7</td>
<td>17.3</td>
<td>3.3%</td>
</tr>
<tr>
<td>Mkt Cap</td>
<td>Dec 06E</td>
<td>21</td>
<td>1,289</td>
<td>0.5</td>
<td>3.1</td>
<td>38%</td>
<td>7.9</td>
<td>17.2</td>
<td>3.3%</td>
</tr>
<tr>
<td>ZRH (CHF)</td>
<td>Dec 05A</td>
<td>6</td>
<td>1,055</td>
<td>-</td>
<td>5.0</td>
<td>52%</td>
<td>9.6</td>
<td>23.3</td>
<td>0.4%</td>
</tr>
<tr>
<td>Mkt Cap</td>
<td>Dec 06E</td>
<td>6</td>
<td>1,055</td>
<td>3.7</td>
<td>4.8</td>
<td>52%</td>
<td>9.2</td>
<td>19.7</td>
<td>1.1%</td>
</tr>
<tr>
<td><strong>as of 11/08/06</strong></td>
<td><strong>shares outst. (m)</strong></td>
<td><strong>Market Cap (€m)</strong></td>
<td><strong>Net Debt/EBITDA</strong></td>
<td><strong>EV/Sales (x)</strong></td>
<td><strong>EBITDA Margin</strong></td>
<td><strong>EV/EBITDA</strong></td>
<td><strong>P/E (x)</strong></td>
<td><strong>Dividend Yield</strong></td>
<td></td>
</tr>
<tr>
<td><strong>11/08/06</strong></td>
<td><strong>shares outst. (m)</strong></td>
<td><strong>Market Cap (€m)</strong></td>
<td><strong>Net Debt/EBITDA</strong></td>
<td><strong>EV/Sales (x)</strong></td>
<td><strong>EBITDA Margin</strong></td>
<td><strong>EV/EBITDA</strong></td>
<td><strong>P/E (x)</strong></td>
<td><strong>Dividend Yield</strong></td>
<td></td>
</tr>
<tr>
<td><strong>11/08/06</strong></td>
<td><strong>shares outst. (m)</strong></td>
<td><strong>Market Cap (€m)</strong></td>
<td><strong>Net Debt/EBITDA</strong></td>
<td><strong>EV/Sales (x)</strong></td>
<td><strong>EBITDA Margin</strong></td>
<td><strong>EV/EBITDA</strong></td>
<td><strong>P/E (x)</strong></td>
<td><strong>Dividend Yield</strong></td>
<td></td>
</tr>
</tbody>
</table>
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.:** → Asset Turnover
  - WLU/Total Assets
  - Capex/Total Revenue
  - Capex/Depreciation

- **Capital Structure, i.e.:** → Financial Leverage
  - Net Assets/Total Assets
  - Gearing (Debt/Equity Ratio)
  - Debt Ratio

(ROE)
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 = Profit Margin \times Total Asset Turnover

- ROI (ROE) can be split into three components / drivers, turnover of total assets, return on sales, financial leverage:

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

while asset turnover \times \text{return on sales (ROS)} = \text{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

- 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

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**
- ROS 8%
- Net Assets / Total Assets: 48%
- EBITDA Margin: 31%
- Financial Leverage: 314%
- Assets Turnover: 0.468
- WLU/Total Assets: 32

**Publicly Owned Airports**
- ROS 6%
- Net Assets / Total Assets: 40%
- EBITDA Margin: 31%
- Financial Leverage: 405%
- Assets Turnover: 0.550
- WLU/Total Assets: 36

**Partially Privatised Airports**
- ROS 15%
- Net Assets / Total Assets: 51%
- EBITDA Margin: 35%
- Financial Leverage: 228%
- Assets Turnover: 0.494
- WLU/Total Assets: 30

**Fully Privatised Airports**
- ROS 11%
- Net Assets / Total Assets: 62%
- EBITDA Margin: 31%
- Financial Leverage: 172%
- Assets Turnover: 0.291
- WLU/Total Assets: 25
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 three drivers of return are: 1. operating efficiency → ROS, 2. Asset utilization/capital productivity → total asset turnover and 3. capital structure → financial leverage.

- 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
• ROA and ROE of publicly owned, partially and fully privatised airports are based on considerably different intensities of the same key drivers.
Publicly owned airports are characterized by comparatively high asset utilization and financial leverage, and low operating efficiency.
Partially privatised airports are characterized by medium high asset utilization and financial leverage, as well as high operating efficiency.
Fully privatised airports, in contrast, are characterized by comparatively low asset utilization and financial leverage, and high operating efficiency.
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.
**Conclusions**

- 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.