

# An Analysis of the Effects of Operating and Financial Leverage

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# Financial History of U.S. Airline Industry

- A series of “Boom/Bust” cycles
  - Record losses in early 1990’s
  - Record profits in late 1990’s
  - Record losses starting again in 2000
- Since deregulation, over 145 carriers filed for receivership

# Research Motivation

- Volatility may be due to over leverage
  - An intensely competitive marketplace and the inherently high fixed-cost structure of the industry
  - Highly-leveraged nature of airline financing
- We examine the effects of leverage on air carrier profitability

# Leverage Analysis

- Degree of Operating Leverage (DOL):

$$\frac{R - V}{R - V - F}$$

- Degree of Financial Leverage (DFL):

$$\frac{\text{EBIT}}{\text{EBIT} - I}$$

- Degree of Combined Leverage (DCL):

$$\frac{R - V}{R - V - F - I}$$

## DOL DFL DCL

**Positive  
Values  
(+1 to  $\infty$ )**

Low Risk = Small Values

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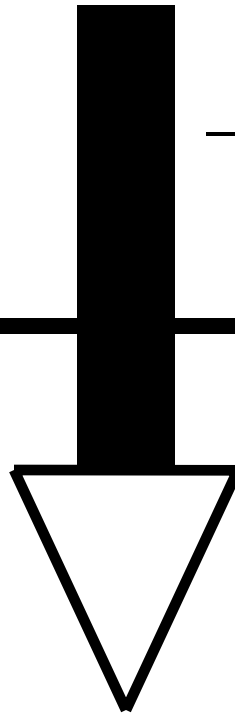
High Risk = High Values

**Negative  
Values  
( $-\infty$  to 0)**

Very High Risk = Large Absolute Values

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Highest Risk = Small Absolute Values



# Table 1 – Mean DOL – 1990-2003

	DOL		
	1990-1994	1995-1999	2000-2003
<b>American</b>	45.74	4.60	-0.11
<b>Continental</b>	-13.68	5.08	12.40
<b>Delta</b>	-11.11	4.86	-0.35
<b>Northwest</b>	-15.65	-0.73	-1.46
<b>Southwest</b>	5.18	3.37	3.55
<b>TWA</b>	29.49	-4.87	-1.50
<b>United</b>	-12.64	4.97	1.43
<b>USAir</b>	-5.91	8.28	-17.68
<b>Alaska</b>	5.60	22.17	-21.83
<b>America West</b>	-2.47	2.88	-6.23

# Table 1 – Mean DFL – 1990-2003

	DFL		
	1990-1994	1995-1999	2000-2003
American	1.01	1.40	-0.35
Continental	-0.47	1.88	0.05
Delta	-0.62	1.28	-0.14
Northwest	0.54	1.03	0.01
Southwest	1.80	1.15	1.19
TWA	-0.57	-0.47	-0.82
United	-1.83	1.38	0.33
USAir	-0.60	4.56	-0.59
Alaska	1.90	1.44	-0.42
America West	0.39	1.80	-0.55

## Table 4 – ROA & ROE – 1990-2003

		Return	SD	Median	CV
<b>American</b>	<b>ROA</b>	1.60%	6.40%	3.90%	4
	<b>ROE</b>	-50.70%	157.60%	8.10%	-3.1
<b>Continental</b>	<b>ROA</b>	1.10%	6.90%	-0.30%	6.3
	<b>ROE</b>	-20.10%	82.00%	-16.90%	-4.1
<b>Delta</b>	<b>ROA</b>	1.40%	6.90%	-2.10%	4.9
	<b>ROE</b>	-8.40%	37.10%	-17.10%	-4.4
<b>Northwest</b>	<b>ROA</b>	2.40%	5.60%	1.60%	2.3
	<b>ROE</b>	-2.60%	21.10%	-1.50%	-8.1
<b>Southwest</b>	<b>ROA</b>	9.30%	3.90%	9.40%	0.4
	<b>ROE</b>	16.10%	7.70%	16.40%	0.5
<b>TWA</b>	<b>ROA</b>	-7.80%	7.80%	-8.00%	-1
	<b>ROE</b>	-210.20%	543.50%	89.00%	-2.6
<b>United</b>	<b>ROA</b>	0.20%	7.70%	2.20%	38.5
	<b>ROE</b>	-40.70%	179.90%	-7.80%	-4.4
<b>US Air</b>	<b>ROA</b>	-1.80%	6.90%	-2.50%	-3.8
	<b>ROE</b>	-123.30%	212.40%	-37.10%	-1.7
<b>Alaska</b>	<b>ROA</b>	2.40%	6.10%	1.80%	2.5
	<b>ROE</b>	-0.60%	22.10%	-1.30%	-36.8
<b>America West</b>	<b>ROA</b>	1.70%	9.90%	2.80%	5.8
	<b>ROE</b>	-35.20%	70.40%	-11.60%	-2

# Conclusion

- Impact of Degrees of Leverage on ROE
- Volatile period for Airline Carriers
  - Exceptions were Southwest & TWA
- Over-leverage caused Boom/Bust Cycle