Mechanics of CAAR t-Test*

Return Model: Market Model; Testing CAAR = 0

1) Event Parameters

Parameter	Value	Comment
Event date:	30.04.1997	
Sample Size	4	
Pointer to the end of the estimation wind	2	
Length of estimation window:	10	
Event window:	(-1, 1)	
Length of event window:	3	
Degrees of freedom:	2	

Legend
EW = Estimation Window
AR = Abnormal Return
CAR = Cumulative Abnormal Return
CAAR = Cumulative Average Abnormal Return

2) Returns

Firm / Market	Estimation window										Event window		
	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1
Firm 1	-0.9%	-0.4%	0.5%	0.0%	-0.4%	0.7%	0.0%	-0.4%	-0.3%	-0.9%	1.1%	0.5%	1.8%
Firm 2	0.9%	1.5%	1.8%	2.4%	2.6%	3.9%	-3.0%	2.5%	-3.8%	0.3%	2.3%	-0.6%	0.0%
Firm 3	0.3%	-0.3%	-0.3%	0.9%	0.6%	0.0%	2.2%	1.5%	-1.5%	1.2%	1.2%	1.8%	0.6%
Firm 4	1.6%	0.0%	9.8%	2.1%	-1.2%	-0.2%	3.5%	-0.5%	-0.3%	2.2%	1.8%	-0.8%	-0.2%
Market	1.5%	1.2%	-0.2%	0.6%	-0.8%	1.9%	-0.1%	-0.3%	-0.8%	1.0%	2.7%	0.9%	-0.4%

Market model	
Alpha	Beta
-0.002	-0.002
0.005	1.051
0.005	0.001
0.018	-0.308

Mean Market (EW:)
0.4%

3) Abnormal Return

Firm / Stock	Estimation window										Event window		
	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1
Firm 1	-0.69%	-0.16%	0.74%	0.20%	-0.16%	0.92%	0.20%	-0.25%	-0.07%	-0.70%	1.29%	0.74%	1.99%
Firm 2	-1.13%	-0.21%	1.54%	1.22%	2.91%	1.46%	-3.35%	2.34%	-3.52%	-1.26%	-1.12%	-2.02%	-0.14%
Firm 3	-0.15%	-0.78%	-0.78%	0.48%	0.16%	-0.47%	1.70%	1.05%	-1.96%	0.75%	0.73%	1.31%	0.12%
Firm 4	0.20%	-1.45%	7.92%	0.47%	-3.25%	-1.41%	1.63%	-2.42%	-2.38%	0.69%	0.85%	-2.35%	-2.09%

Cumulative abnormal return (CAR)
4.0%
-3.3%
2.2%
-3.6%

Cumulative average abnormal return (CAAR)
-0.17%

4) Standard Deviation for CAAR t-test

$$\hat{\sigma}_{CAAR(T_1,T_2)} = \sqrt{\frac{1}{N(N-d)}\sum_{i=1}^{N}(CAR_i(T_1,T_2) - CAAR(T_1,T_2))^2}$$

$$= \quad 0.024$$

$(CAR - CAAR)^2$
0.001756
0.000964
0.000541
0.001164
Total
0.004425

5) Cross sectional t-Test

$$T_{Cross} = \frac{CAAR(T_1,T_2)}{\hat{\sigma}_{CAAR(T_1,T_2)}}$$

$$= \quad -0.0725$$

References

Brown, Stephen J., and Jerold B. Warner. "Measuring Security Price Performance", Journal of Financial Economics, 1980, 8(3), 205-258.
* Synonym name: 'Cross-Sectional t-test'