Mechanics of GSIGN-Test

Return Model: Market Model; Testing CAAR = 0

eventstudytools.com

Draft Version

1) Event Parameters

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

Legend
EW = Estimation Window

2) Returns

	Estimation window										Event window		
Firm / Market	-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

	Estimation window										Event window			Cumulative abnormal return
Firm / Stock	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	
Firm 1	-1%	-0.2%	0.7%	0.2%	-0.2%	0.9%	0.2%	-0.3%	-0.1%	-0.7%	1.3%	0.7%	2.0%	4.0%
Firm 2	-1.1%	-0.2%	1.5%	1.2%	2.9%	1.5%	-3.3%	2.3%	-3.5%	-1.3%	-1.1%	-2.0%	-0.1%	-3.3%
Firm 3	-0.2%	-0.8%	-0.8%	0.5%	0.2%	-0.5%	1.7%	1.1%	-2.0%	0.7%	0.7%	1.3%	0.1%	2.2%
Firm 4	0.2%	-1.5%	7.9%	0.5%	-3.3%	-1.4%	1.6%	-2.4%	-2.4%	0.7%	0.8%	-2.3%	-2.1%	-3.6%

3) Sign Table

	Estimation window										Event window			Cumulative abnormal return
Firm / Stock	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	
Firm 1	-	-	+	+	-	+	+	-	-	-	+	+	+	+
Firm 2	-	-	+	+	+	+	-	+	-	-	-	-	-	-
Firm 3	-	-	-	+	+	-	+	+	-	+	+	+	+	+
Firm 4	+	-	+	+	-	-	+	-	-	+	+	-	-	-

4) GSIGN test statistics

Firm / Stock	P
Firm 1	40.0%
Firm 2	50.0%
Firm 3	50.0%
Firm 4	50.0%
P hat	47.5%
w	2
GSIGN test statistics	**0.1001**

$$Z_G = \frac{w - n\hat{p}}{[n\hat{p}(1-\hat{p})]^{\frac{1}{2}}}.$$

Source: Cowan (1992), page 6

Variable	Desciption
w	number of stocks in the event window for which the cumulative abnormal return is positive
n	Number of firms (4)
P	proportion of positive sign in the estimation window for a firm
P_hat	binomial distribution of positive signs (= average P)
Z_g	GSIGN test statistics

References

Cowan, A.R. 1992. Nonparametric event study tests. *Review of Finance and Accounting,* 2(4): 343-358.