The Friday the Thirteenth Effect: Myth or Reality?*

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Abstract

This study examines the daily return behavior of the Standard & Poor's composite index over a period of more than half a century for evidence of the Friday the thirteenth effect. The results indicate that the effect is merely a statistical artifact and not the consequence of superstition-induced investor behavior. In addition, after taking into account the tendency for stock returns to be high at the turn of the month, the hypothesis that Friday returns on all days are the same cannot be rejected.

Introduction

Recently Kolb and Rodriguez (1987) raised the issue of whether superstition plays a role in the behavior of investors. Using both the value-weighted and equally-weighted CRSP indices, they attempted to determine whether the returns on Friday the thirteenth differed from the returns observed on other Fridays. They concluded, on the basis of significantly lower returns on Friday the thirteenth, that "the market may be affected by superstition" and their paper had "uncovered the frightening 'Friday the Thirteenth' effect" (p. 1387). This conclusion runs counter to the assumption of rational economic behavior that underlies most research in finance and economics. Although some researchers recognize the possibility of overreaction on the part of economic agents, the role of superstition seems more difficult to accept.[1] Nonetheless, the profound

*Financial support for this research was provided by the Social Sciences and Humanities Research Council of Canada.

[1]For a nontechnical discussion of overreaction in the stock market, see Shiller (1987).

0747-5535/91/1300-0111 $01.00

implications of superstition for the modeling of economic behavior demand that the phenomenon be scrutinized carefully.

Dyl and Maberly (1988) questioned the existence of the Friday the thirteenth effect using S&P 500 data over the period 1940 to 1984. Like Kolb and Rodriguez, they compared Friday the thirteenth's returns with the returns on all other Fridays, but found the effect to be time dependent. They did not account for the possibility that returns on other Fridays are affected by empirical regularities, however, such as high returns at the turn of the month. In order to take account of the possible existence of confounding factors and thereby obtain more conclusive evidence on the Friday the thirteenth phenomenon, the present study was undertaken.

Data and Hypothesis Testing

The current work differs from that of Kolb and Rodriguez and Dyl and Maberly in two respects. First, the period examined is somewhat longer, covering 56 years from January 1, 1930 to December 31, 1985. Second, and more important, this paper examines the returns on Fridays falling on each day of the month. This provides an opportunity to look for other empirical regularities, particularly the turn-of-the-month effect, according to which stock returns tend to be high at the beginning and end of each month. The latter effect has been identified in previous studies by Ariel (1987) and Lakonishok and Smidt (1987).

Daily returns were calculated for every Friday over the sample period (except when Thursday or Friday was a holiday) using the daily closing prices for the S&P 500 composite index. These prices were obtained from the 1986 edition of Standard & Poor's *Security Price Index Record.* The differences between the returns on Friday the thirteenth and the returns on each of the other days then were examined using the following regression equation:

$$(1)\quad R_t = \alpha_{13} + \sum_{i=1}^{12} \alpha_i D_i + \sum_{i=14}^{31} \alpha_i D_i + \varepsilon_{i,t}$$

where:

R_t = the close-to-close return on Friday over the sample period;

D_i = a dummy variable with a value of one if R_t is the return on the ith day of the month;

α_{13} = the mean return for Fridays that fall on the thirteenth; and

$\alpha_{13} + \alpha_i,\ i \neq 13$ = the mean return on the ith day of the month.

If the returns on Friday the thirteenth are less than the returns on day i, a one-tailed t-test will indicate α_i to be significantly greater than zero. In addition, an F-test may be used to determine whether the hypothesis that the Friday mean returns on all days of the month are equal can be rejected.

To facilitate a comparison with the results reported by Kolb and Rodriguez, the sample period was divided into two subperiods, January 1, 1930 to June 30, 1962 and July 1, 1962 to December 31, 1985. The latter subperiod coincides with the period studied by Kolb and Rodriguez. The data for the two subperiods were used for two additional regressions based upon equation (1).

Panel A of Table 1 reports the regression results for the entire sample period and for each of the subperiods. Each α_i in equation (1) is followed by its t-ratio, while N denotes the number of times Friday occurs on the ith day of the month. For the entire sample period there are 23 positive α_i's, five of which are statistically significant at 5 percent. Similarly, in the first subperiod there are four positive and significant α_i's. The number increases to ten in the second subperiod. As for the hypothesis that the daily mean returns are equal, the F-statistics at the bottom of Table 1 indicate that it can be rejected at 1 percent for all three time periods.

Further examination of the daily return deviations in Panel A reveals that of a total of 19 significant α_i's, 12 occur on days 1 to 3 or 29 to 31. This suggests that the significant F-statistics may be attributable not to a Friday the thirteenth effect, but to the previously documented tendency for stock returns to be high at the beginning and end of the month.

In order to abstract from the apparently anomalous behavior of stock returns at the turn of the month, regressions were repeated using return data for days 4 through 28. The results are reported in Panel B. Seven of 75 α_i coefficients continue to be positive and significant, but the hypothesis that the returns on all days are equal cannot be rejected at any reasonable level of significance.

Conclusions

Is there a Friday the thirteenth effect in the stock market? From a long-run perspective, data covering more than half a century suggest that the answer is no. After taking account of a tendency for stock returns to be high at the turn of the month, the effect does not appear during the period studied by Kolb and Rodriguez. What these authors have detected is likely a statistical artifact. Although there is considerable market folklore associated with the Super Bowl, ladies' hemlines, and the like, Friday the thirteenth does not appear to have been discussed. In short, although the Friday the thirteenth effect may be a popular myth on Main Street, it does not characterize the behavior of Wall Street.

References

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Table 1
Regression Results for the ith Day of the Month[a]

Panel A: All Days Included

i	Jan. 1, 1930-Dec. 31, 1985 (Obs. = 2671)			Jan. 1, 1930-June 30, 1962 (Obs. = 1530)			July 1, 1962-Dec. 31, 1985 (Obs. = 1110)		
	α_i	t	N[b]	α_i	t	N	α_i	t	N
13	-0.612	-0.53	87	-0.105	-0.06	48	-1.237	-1.08	39
1	3.625	2.19#	86	3.565	1.37	50	3.628	2.20#	36
2	4.148	2.53*	88	4.667	1.80#	51	3.359	2.05#	37
3	5.783	3.53*	89	6.302	2.44*	52	4.963	3.03*	37
4	1.085	0.65	84	0.600	0.23	49	1.679	1.10	35
5	0.866	0.53	87	0.737	0.28	51	0.954	0.58	36
6	1.634	1.02	96	2.012	0.79	56	1.019	0.63	40
7	-0.249	-0.15	93	-1.921	-0.74	52	1.854	1.16	41
8	1.435	0.89	93	0.610	0.24	55	2.519	1.55	38
9	0.694	0.43	94	0.426	0.17	56	0.967	0.59	38
10	1.467	0.91	94	0.257	0.10	54	3.039	1.89#	40
11	0.913	0.56	92	-1.410	-0.55	52	3.897	2.42*	40
12	-0.714	-0.43	84	-3.461	-1.30	46	2.620	1.61	38
14	2.380	1.48	95	1.234	0.48	54	3.847	2.41*	41
15	2.803	1.73#	92	4.434	1.72#	53	0.521	0.32	39
16	0.940	0.58	93	0.568	0.22	55	1.367	0.84	38
17	-1.220	-0.75	94	-3.719	-1.46	55	2.213	1.37	39
18	-0.813	-0.50	95	-1.348	-0.53	55	-0.151	-0.09	40
19	-0.154	-0.10	93	-0.457	-0.18	52	0.212	0.13	41
20	0.180	0.11	93	-1.162	-0.46	55	2.012	1.24	38
21	-1.832	-1.13	93	-2.725	-1.06	54	-0.672	-0.42	39
22	0.750	0.46	89	-0.254	-0.10	50	2.013	1.24	39
23	1.819	1.08	81	2.196	0.82	46	1.281	0.77	35
24	2.536	1.52	82	2.137	0.82	51	2.983	1.74#	31
25	0.361	0.21	79	0.179	0.07	45	0.555	0.33	34
26	1.057	0.62	77	2.027	0.75	44	-0.287	-0.17	33
27	-0.872	-0.53	85	-1.170	-0.45	50	-0.548	-0.33	35
28	2.593	1.58	88	1.871	0.72	51	3.514	2.14#	37
29	2.045	1.22	80	0.544	0.21	50	4.326	2.49#	30
30	4.131	2.44*	78	5.750	2.11#	42	2.274	1.38	36
31	1.299	0.67	48	-1.043	-0.34	27	4.283	2.22#	21

$F_{30,2671} = 2.199$* $F_{30,1530} = 1.814$* $F_{30,1110} = 1.753$*

Table 1 (continued)
Regression Results for the ith Day of the Month[a]

Panel B: Days 1-3, 29-31 Removed

i	Jan. 1, 1930-Dec. 31, 1985 (Obs. = 2208)			Jan. 1, 1930-June 30, 1962 (Obs. = 1264)			July 1, 1962-Dec. 31, 1985 (Obs. = 919)		
	α_i	t	N[b]	α_i	t	N	α_i	t	N
13	-0.612	-0.52	87	-0.105	-0.06	48	-1.237	-1.10	39
4	1.085	0.65	84	0.600	0.23	49	1.679	1.02	35
5	0.866	0.52	87	0.737	0.28	51	0.954	0.59	36
6	1.634	1.01	96	2.012	0.78	56	1.019	0.64	40
7	-0.249	-0.15	93	-1.921	-0.74	52	1.854	1.18	41
8	1.435	0.88	93	0.610	0.24	55	2.519	1.57	38
9	0.694	0.43	94	0.426	0.17	56	0.967	0.60	38
10	1.467	0.90	94	0.257	0.10	54	3.039	1.92#	40
11	0.913	0.56	92	-1.410	-0.54	52	3.897	2.46*	40
12	-0.714	-0.43	84	-3.461	-1.29	46	2.620	1.63	38
14	2.380	1.47	95	1.234	0.48	54	3.847	2.44*	41
15	2.803	1.72#	92	4.434	1.71#	53	0.521	0.33	39
16	0.940	0.58	93	0.568	0.22	55	1.367	0.85	38
17	-1.220	-0.75	94	-3.719	-1.44	55	2.213	1.39	39
18	-0.813	-0.50	95	-1.348	-0.52	55	-0.151	-0.10	40
19	-0.154	-0.09	93	-0.457	-0.18	52	0.212	0.13	41
20	0.180	0.11	93	-1.162	-0.45	55	2.012	1.25	38
21	-1.832	-1.12	93	-2.725	-1.05	54	-0.672	-0.42	39
22	0.750	0.46	89	-0.254	-0.10	50	2.013	1.26	39
23	1.819	1.08	81	2.196	0.82	46	1.281	0.78	35
24	2.536	1.51	82	2.137	0.81	51	2.983	1.76#	31
25	0.361	0.21	79	0.179	0.07	45	0.555	0.34	34
26	1.057	0.62	77	2.027	0.74	44	-0.287	-0.17	33
27	-0.872	-0.52	85	-1.170	-0.44	50	-0.548	-0.33	35
28	2.593	1.57	88	1.871	0.71	51	3.514	2.17#	37

$F_{24,2208} = 1.172$ $F_{24,1264} = 1.108$ $F_{24,919} = 1.431$

[a]The regression model is

$$R_t = \alpha_{13} + \sum_{i=j}^{12} \alpha_i D_i + \sum_{i=14}^{m} \alpha_i D_i + \varepsilon_{i,t},$$

where j = 1 and m = 31 in Panel A and j = 4 and m = 28 in Panel B. R_t is the close-to-close return on Friday t, and D_i is a dummy variable that has a value of one if R_t is the return on the ith day of the month. α_{13} is the mean return for Fridays that fall on the thirteenth, while α_i, $i \neq 13$, is the mean deviation from

Table 1 (continued)
Regression Results for the ith Day of the Month[a]

α_{13} of the returns on day i. All values for α_i, including α_{13}, should be multiplied by 10^{-3}

[b]N is the number of times Friday occurs on the ith day of the month

*denotes significance at the 1 percent level, and # denotes significance at the 5 percent level. In the case of the t-statistics, one-tailed tests apply