by Frank Cross

The Behavior of Stock Prices on Fridays and Mondays

The objective of this article is to document an example of non-random movements in stock prices. Specifically, we shall examine the distribution of price changes on Fridays and Mondays, and the relationship that exists between price changes on those two days. Other researchers have found little or no evidence of dependence in successive daily price changes. Apparently, however, these researchers have not investigated the possibility that dependence might occur on some days of the week but not on others.

We shall focus our attention on changes in the Standard & Poor's Composite Stock Index (hereinafter "S & P Composite"). Results very similar to those presented below are obtained by examining other measures of market performance such as the Dow Jones Industrial Average or the New York Stock Exchange Composite Index. The use of a price index is often unsuitable for the analysis of successive price changes because apparent positive dependence can be partly or wholly attributed to the fact that transactions in the index's component stocks do not occur simultaneously.[1] However, the S & P Composite is convenient for our purposes, and our results are such that they cannot be explained by spurious "inertial" properties of that index.

Our sample period consists of the 844 sets of Fridays and following Mondays from January 2, 1953 through December 21, 1970 for which the New York Stock Exchange was open on both days. We begin with 1953 because that was the first year the market was always closed on Saturday.

1. Footnotes appear at end of article.

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The Distribution of Price Changes on Fridays and Mondays

In recent years stock prices have risen on Fridays more often than on any other day of the week, and have risen least often on Mondays. For example, Merrill found that between 1952 and 1965 the Dow Jones Industrial Average advanced on 64.6 per cent of all Fridays, but on only 43.0 per cent of all Mondays. The chances of a rise on Tuesday, Wednesday, and Thursday were, respectively, 54.0 per cent, 56.3 per cent, and 56.5 per cent.[2]

The behavior of the S & P Composite on the 844 Fridays and Mondays in our sample is summarized in Table I. It will be seen that the S & P Composite rose on 523 Fridays, or 62.0 per cent of all Fridays, whereas it rose on Monday only 333 times, or on 39.5 per cent of all Mondays. The difference between the proportion of times

TABLE I

Changes in the Standard & Poor's Composite Stock Index on Fridays and Mondays 1953 to 1970 Inclusive

	Friday	Monday
Number of times the Index advanced	523	333
Number of times the Index declined	313	501
Number of times the Index was unchanged	8	10
Total	844	844
Percentage of times the Index advanced	62.0 %	39.5 %
Mean percentage change	+ 0.12%	— 0.18%
Median percentage change	+ 0.13%	— 0.12%

there was an advance on Friday and the proportion of times there was an advance on Monday (0.620 − 0.395 = 0.225) is highly significant; the probability that such a large difference could be explained by chance variations is less than one in a million.

The difference between Fridays and Mondays has been consistent from year to year. The S & P Composite performed better on Fridays than on Mondays in terms of both mean percentage change and the percentage of times the Index advanced in every one of the last eighteen years. The median percentage change on Friday was algebraically greater than the median percentage change on Monday in seventeen out of the eighteen years. We analyzed the difference between the distribution of price changes on Fridays and the distribution of price changes on Mondays for each year, using the Mann-Whitney U Test, one of the standard non-parametric tests. The difference in distributions was found to be significant at the 10 per cent level in seventeen out of the eighteen years.[3] Indeed, in ten years the difference in distributions was found to be significant at the one per cent level. The cumulative probability that the observed difference in distributions in all eighteen years could be due to chance is less than 1 in 10^{20}.

The Dependence of Monday's Price Changes on Friday's Price Changes

Table II shows how the S & P Composite performed each Monday in the sample contingent on the direction of change the preceding Friday. It will be seen from Table II that on those 523 occasions on which the S & P Composite rose on Friday, there was a further gain on Monday 49 per cent of the time. In the 313 cases in which there was a decline on Friday, there was a subsequent rise on Monday only 24 per cent of the time. Thus, while there were about equal chances of an advance or decline on Monday after an "up Friday," the odds were three to one in favor of a decline after a "down Friday." The observed difference between proportions (0.488 − 0.240 = 0.248) is highly significant statistically.

TABLE II

Changes in the Standard & Poor's Composite Stock Index on Monday Contingent on Its Direction of Change on Friday — 1953 to 1970 Inclusive*

	Performance of the Index on Monday	
	After an Advance on Friday	After a Decline on Friday
Number of times the Index advanced	255	75
Number of times the Index declined	260	236
Number of times the Index was unchanged	8	2
Total	523	313
Percentage of times the Index advanced	48.8 %	24.0 %
Mean percentage change	—0.001%	—0.48%
Median percentage change	0.00 %	—0.40%

*Excluding eight observations of zero change on Friday.

The mean percentage change in the S & P Composite on those Mondays preceded by a rise on Friday was −0.001 per cent, whereas the mean change on those Mondays preceded by a decline on Friday was −0.48 per cent. The corresponding median values were 0.00 per cent and −0.40 per cent, respectively.

The consistency from year to year of the relationship between price changes on Fridays and Mondays is illustrated in Table III. The mean percentage change on Mondays preceded by "up Fridays" was algebraically less than that on Mondays following "down Fridays" in every one of the 18 years in question. The proportion of Mondays on which there was an advance was greater after an advance on Friday than after a decline on Friday in 16 out of the 18 years, and was equal in the remaining two years. The median percentage change was less after a Friday decline than after a Friday advance in 16 out of the 18 years.[4]

A Comparison of Monday to Other Days of the Week

The relationship between price changes on Monday and price changes on Friday is significantly different from the relationship between price changes on other successive business days. Table IV shows how the S & P Composite performed on Monday and on days other than Monday contingent on the direction of change the previous day.[5]

After an advance on the previous day, there was a further advance on days other than Monday 63.9 per cent of the time, as compared to 48.8 per cent on Monday. Following a decline the previous day there was a subsequent rise on 49.0 per cent of days other than Monday, compared to 24.0 per cent on Monday. The observed difference between proportions for Monday (0.488 − 0.240 = 0.248)

TABLE III

Changes in the Standard & Poor's Composite Stock Index on Monday Contingent on Its Direction of Change on Friday By Year — 1953 to 1970 Inclusive*

Year	Percentage of Mondays the S & P Advanced After: +Friday	−Friday	Mean Percent Change of S & P on Monday After: +Friday	−Friday	Median Percent Change of S & P on Monday After: +Friday	−Friday
1970	58%	22%	+0.11%	−0.64%	+0.13%	−0.76%
1969	32	32	−0.27	−0.42	−0.24	−0.40
1968	48	41	+0.14	−0.15	−0.01	−0.16
1967	48	7	+0.01	−0.58	−0.03	−0.44
1966	50	16	+0.06	−0.72	+0.03	−0.58
1965	56	15	−0.03	−0.37	+0.02	−0.21
1964	40	36	−0.02	−0.12	−0.05	−0.03
1963	53	14	−0.00	−0.32	+0.04	−0.56
1962	44	16	−0.01	−0.63	−0.02	−0.33
1961	64	27	+0.12	−0.45	+0.07	−0.28
1960	44	16	−0.08	−0.70	−0.09	−0.62
1959	53	27	+0.04	−0.51	+0.08	−0.36
1958	62	46	+0.16	−0.31	+0.30	−0.56
1957	38	11	−0.29	−0.67	−0.20	−0.52
1956	40	21	+0.04	−0.42	−0.04	−0.39
1955	44	33	−0.14	−1.14	−0.07	−0.70
1954	54	54	+0.15	−0.02	+0.07	+0.09
1953	36	25	−0.19	−0.34	−0.16	−0.22
Total	48.8%	24.0%	−0.00%	−0.48%	−0.00%	−0.40%

*Excluding eight observations of zero changes on Friday.

is significantly larger than the difference between proportions for other days (0.639 − 0.490 = 0.149).

The mean percentage change on those days other than Monday preceded by an advance was +0.16 while the mean change on Mondays preceded by "up Fridays" was −0.001 per cent. After a decline the previous day, the mean change on other days was −0.02 per cent compared to −0.48 per cent on Monday. Standard non-parametric tests show that the distribution of price changes on Mondays preceded by "up Fridays" is significantly different from the distribution of price changes on other days preceded by an advance. Likewise, the price changes on Mondays following "down Fridays" are significantly different from price changes on other days following a decline.[6] ♦

TABLE IV

A Comparison of Changes in the Standard & Poor's Composite Index on Monday and on Other Days of the Week Contingent on the Direction of Change the Previous Day — 1953 to 1970 Inclusive

Percentage of Times the Index Advanced	Performance of the Index On Monday	On Other Days
After an advance the previous day ..	48.8%	63.9%
After a decline the previous day	24.0	49.0
Mean Percentage Change		
After an advance the previous day ..	−0.001%	+ 0.16%
After a decline the previous day	−0.48	− 0.02

FOOTNOTES

1. Fama, Eugene F., "Tomorrow on the New York Stock Exchange," *Journal of Business*, 38 (July, 1965), pp. 285-299.
2. Merrill, Arthur, *The Behavior of Prices on Wall Street* (Chappaqua, New York: Analysis Press, 1966), p. 14.
3. The year in which the difference in distributions was not significant at the 10 per cent level was 1968. The market was closed on Wednesdays during the second half of that year, and it is possible that these Wednesday closings altered the distribution of price changes on the other days of the week.
4. Both years (1954 and 1964) which were the exceptions contained relatively few observations of a decline on Friday (11 each as compared to an average of 18 in the other years.)
5. Based on all sets of two successive business days for which the New York Stock Exchange was open on both days, after excluding those sets for which there was zero change on the first of the two days.
6. Both differences in distributions would occur because of chance variations less than one time in a million.