

Predictability of Big Day and Profitability Thereafter

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Significantly higher volume in a few day window combined with significantly higher opening may signal a big up day. Negative relationships between return and volume over a three-day window may signal the danger of a big down day. Opening prices of all the big down days are significantly higher than the day's low and close, and opening prices of all the big up days are significantly lower than the day's high and close. The market usually reverses its direction in the day after the big day. A strategy is developed for excess returns.

INTRODUCTION

Researchers and practitioners have been eager to find possible patterns of stock market movements in a particular month or on a particular day. Wachtel (1942) provided the first academic reference to a January seasonal effect in stock returns, followed by Rozeff and Kinney (1976) who reported that common stock returns in January are significantly larger than those in other months, or the so called the January effect; Cross (1973), French (1980) reported abnormally high average Friday returns and significantly negative average Monday returns in the U. S. stock markets, or the weekend effect; Gu and Simon (2007) reported that common stock returns, particularly those in the Dow Jones Industrial Average in September are apparently lower than those in other months, or the September phenomenon. Recently, Gu (2003, 2004) revealed the dynamics of the January effect and the weekend effect, reported that the January effect was declining and the weekend effect was reversing.

This study examines the big days in which the DJIA achieved at least 4 percent gains and the big days in which the DJIA suffered at least 4 percent losses, which we call the big days, from 1929 through 2008, analyze returns and volumes of the big days and of the three days before and after the big days, and the relationship between the returns and percentage changes in volumes.

One of the marketplace anomalies that is related to the big day phenomenon is investors' overreaction. Graham and Dodd (1934) are of the earliest to recognize the possibility that investors often overreact at negative firm news and excessively bid down a stock price, and hence propone a contrarian approach to investment. De Bondt and Thaler (1985) suggest that investors also overreact to positive news, resulting in overpriced stocks and representing selling opportunities. Recognizing these tendencies, contrarian traders expect that stock prices that have declined will rebound and prices that have risen will fall.

Another market anomaly that is related to the big day phenomenon is the existence of positive serial correlations in stock prices (Gu and Finnerty 2002), which implies that if the stock market has recently risen (fallen), it is more likely to rise (fall) in the next period. Recognizing the tendency, momentum traders prefer to buy along a bullish market trend and sell along a bearish market trend.

Shiller (1993) finds that investors' psychological biases may cause stock prices to be temporarily over- or underpriced relative to their intrinsic value.

And it is well known that "fear" and "greed" can result in under-valued and over-valued stock market. Our purpose is to find whether there are signs that may signal a big day, and may hint profit opportunity immediately after a big day.

DATA, METHOD, AND RESULTS

Data of daily value of the DJIA index and trading volume is from the Dow Jones Co. and finance.yahoo.com. Here we define big day as days in which the DJIA changed at least 4.0 percent. From 1929 through 2008, there are 128 days in which the index declined at least 4 percent and 108 days in which the index jumped at least 4 percent. Most of the big days occurred in the great depression era, i.e., 66 big up days and 80 big down days occurred during 1929 and 1933. There are 13 big up days and 13 big down days in the period from 2000 through 2008. It is arbitrary to set the threshold at 4 percent, but the arbitrariness should not alter the purpose of this study.

In order to save space we display the 20 largest-fall days and the 20 largest-jump days in Table 1, and use these biggest days as example in the following discussions. Most of the biggest days occurred in the great depression era, that is, 11 out of the 20 biggest down days and 16 out of the 20 biggest up days occurred from 1929 to 1933. Over 70 years later, 3 of the biggest down days and 2 of the biggest up days occurred in year 2008 during the great recession. We report descriptive statistics of the returns of the largest-fall days, the largest-jump days, and the day after each biggest day in Table 2. As one can see from the table, mean return of the first days after the largest up days is almost zero, and mean return of the first days after the largest down days is significantly positive. In Table 3 we exhibit the percentage changes in the DJIA and in volume in the biggest days and three days before and after the biggest days.

TABLE 1
THE BIGGEST DAYS
Twenty largest percentage drops and jumps in the Dow Jones Industrial Average

Date	Rate	Date	Rate
10/19/87	-22.61%	3/15/33	15.34%
10/28/29	-13.47%	10/6/31	14.87%
10/29/29	-11.73%	10/30/29	12.34%
10/5/31	-10.73%	6/22/31	11.90%
11/6/29	-9.92%	9/21/32	11.36%
8/12/32	-8.40%	10/13/08	11.08%
10/26/87	-8.04%	10/28/08	10.88%
10/15/08	-7.87%	10/21/87	10.15%
6/16/30	-7.87%	8/3/32	9.52%
7/21/33	-7.84%	9/5/39	9.52%
10/9/08	-7.33%	2/11/32	9.47%
10/18/37	-7.20%	11/14/29	9.36%
10/27/97	-7.18%	12/18/31	9.35%
10/5/32	-7.15%	5/6/32	9.08%
9/24/31	-7.07%	4/19/33	9.03%
7/20/33	-7.07%	10/8/31	8.70%
9/29/08	-6.98%	8/8/32	8.16%
10/13/89	-6.91%	6/10/32	7.99%
1/8/88	-6.85%	6/19/33	7.59%
2/27/33	-6.84%	6/3/31	7.12%

The 7.13% fall on September 17, 2001 is not included because it is caused by the 9.11 event; the date is the first trading day after the 9.11.

TABLE 2
DESCRIPTIVE STATISTICS OF THE RETURNS

	Maximum	Minimum	Mean	Standard Deviation
20 Largest up days	0.1534	0.0712	0.1014 (0.0049)	0.0219
The day After	0.0582	-0.0382	0.0018 (0.0072)	0.0324
20 Largest down days	-0.0684	-0.2261	-0.0895 (0.0083)	0.0370
The day After	0.1487	-0.1173	0.0267 (0.0130)	0.0581

Standard error in parentheses.

TABLE 3
PERCENTAGE CHANGES IN THE DJIA AND IN VOLUME IN THE BIGGEST DAYS, THREE DAYS BEFORE AND AFTER THE BIGGEST DAYS

Return							
Date	-3	-2	-1	0	1	2	3
10/28/29	-6.33%	-2.09%	0.58%	-13.47%	-11.73%	12.34%	5.82%
10/29/29	-2.09%	0.58%	-13.47%	-11.73%	12.34%	5.82%	-5.79%
11/6/29	12.34%	5.82%	-5.79%	-9.92%	2.61%	-0.70%	-6.82%
6/16/30	-3.19%	-0.76%	1.02%	-7.87%	-0.64%	-4.26%	4.63%
9/24/31	-3.69%	-1.29%	6.02%	-7.07%	1.92%	-4.98%	-4.40%
10/5/31	-3.20%	-0.98%	1.28%	-10.73%	14.87%	-2.03%	8.70%
8/12/32	-0.93%	3.44%	-0.71%	-8.40%	5.39%	3.61%	-2.05%
10/5/32	0.04%	-0.49%	-0.07%	-7.15%	0.32%	-5.45%	-6.70%
2/27/33	-0.50%	-3.80%	3.66%	-6.84%	2.45%	2.24%	0.00%
7/20/33	3.08%	0.37%	-4.68%	-7.07%	-7.84%	6.28%	-1.54%
7/21/33	0.37%	-4.68%	-7.07%	-7.84%	6.28%	-1.54%	2.39%
10/18/37	-0.43%	-1.20%	-0.78%	-7.20%	0.89%	6.08%	0.68%
10/19/87	-3.81%	-2.39%	-4.60%	-22.61%	5.88%	10.15%	-3.82%
10/26/87	10.15%	-3.82%	0.02%	-8.04%	2.93%	0.02%	4.96%
1/8/88	0.81%	0.31%	0.69%	-6.85%	1.77%	-0.85%	-0.20%
10/13/89	-0.22%	-0.43%	-0.49%	-6.91%	3.43%	-0.70%	0.19%
10/27/97	-0.32%	-2.33%	-1.69%	-7.18%	4.71%	0.11%	-1.67%
9/29/08	-0.27%	1.82%	1.10%	-6.98%	4.68%	-0.18%	-3.22%
10/9/08	-3.58%	-5.11%	-2.00%	-7.33%	-1.49%	11.08%	-0.82%
10/15/08	-1.49%	11.08%	-0.82%	-7.87%	4.68%	-1.41%	4.67%
	6updays	7updays	8updays		16updays	10updays	9updays

Volume							
	-3	-2	-1	0	1	2	3
10/28/29	54.24%	102.51%	-54.11%	55.57%	78.18%	-34.61%	-33.36%
10/29/29	102.51%	-54.11%	55.57%	78.18%	-34.61%	-33.36%	-13.29%
11/6/29	-34.61%	-33.36%	-13.29%	-4.52%	21.28%	-55.15%	13.04%
6/16/30	-6.08%	-12.95%	-42.82%	153.81%	-11.31%	28.09%	-41.52%
9/24/31	0.00%	299.13%	-43.36%	95.00%	-14.79%	51.72%	-53.41%
10/5/31	10.69%	13.40%	-30.49%	26.09%	35.11%	-34.57%	1.77%
8/12/32	-29.67%	15.36%	-0.68%	-15.68%	-48.52%	89.01%	-20.50%
10/5/32	-13.43%	-13.79%	24.00%	137.90%	-34.24%	18.56%	-0.87%
2/27/33	5.04%	-27.20%	-26.37%	-11.94%	22.03%	50.00%	-33.33%
7/20/33	21.99%	3.29%	13.05%	8.99%	17.86%	46.86%	-34.63%
7/21/33	3.29%	13.05%	8.99%	17.86%	-64.26%	3.51%	-42.37%
10/18/37	46.86%	-34.63%	51.19%	27.17%	125.70%	-40.47%	-16.13%
10/19/87	19.95%	26.90%	28.61%	78.52%	0.63%	-26.06%	-12.77%
10/26/87	-26.06%	-12.77%	-37.38%	25.73%	-15.74%	7.38%	-7.62%
1/8/88	15.24%	-18.99%	3.32%	12.51%	-19.42%	4.25%	-7.07%
10/13/89	69.98%	11.19%	-2.41%	56.86%	65.74%	-46.17%	-25.51%
10/27/97	5.35%	9.74%	0.65%	2.38%	73.35%	-35.33%	-8.41%
9/29/08	8.71%	-4.66%	-16.98%	35.69%	-8.41%	21.93%	-7.05%
10/9/08	18.46%	-11.15%	23.30%	-4.94%	38.27%	-36.60%	12.37%
10/15/08	38.27%	-36.60%	12.37%	-19.84%	22.04%	-17.57%	-21.36%
	15updays	9updays	10updays	15updays	11updays	10updays	3updays
Average	15.54%	11.72%	-2.34%	37.77%	12.44%	-1.93%	-17.60%
Return							
Date	-3	-2	-1	0	1	2	3
10/30/29	0.58%	-13.47%	-11.73%	12.34%	5.82%	-5.79%	-9.92%
11/14/29	-6.82%	-4.83%	-5.27%	9.36%	5.27%	-0.51%	2.84%
6/3/31	-2.54%	-4.43%	-0.87%	7.12%	3.34%	-1.04%	1.94%
6/22/31	-1.32%	-2.33%	-0.19%	11.90%	-1.32%	5.36%	-0.82%
10/6/31	-0.98%	1.28%	-10.73%	14.87%	-2.03%	8.70%	-1.26%
10/8/31	-10.73%	14.87%	-2.03%	8.70%	-1.26%	-4.04%	-2.96%
12/18/31	1.79%	-2.68%	-3.53%	9.35%	-3.23%	1.88%	-4.44%
2/11/32	-2.07%	-1.46%	-0.80%	9.47%	4.55%	4.34%	-4.09%
5/6/32	-2.20%	1.35%	-1.42%	9.08%	-3.34%	1.12%	0.26%
6/10/32	-3.75%	-4.78%	0.27%	7.99%	-1.70%	1.85%	3.31%
8/3/32	2.43%	1.95%	-3.24%	9.52%	2.42%	4.98%	8.16%
8/8/32	9.52%	2.42%	4.98%	8.16%	-0.93%	3.44%	-0.71%
9/21/32	-1.24%	-3.04%	3.74%	11.36%	-3.26%	1.66%	-3.87%
3/15/33	2.24%	0.00%	2.47%	15.34%	1.37%	-3.53%	-1.37%

4/19/33	4.03%	-1.75%	1.72%	9.03%	5.80%	-3.45%	5.60%
6/19/33	-0.77%	-5.52%	0.39%	7.59%	-0.79%	0.71%	-3.11%
9/5/39	-0.90%	-1.29%	0.62%	9.52%	-0.05%	0.19%	1.16%
10/21/87	-4.60%	-22.61%	5.88%	10.15%	-3.82%	0.02%	-8.04%
10/13/08	-2.00%	-7.33%	-1.49%	11.08%	-0.82%	-7.87%	4.68%
10/28/08	1.57%	2.11%	-0.82%	10.88%	-2.42%	-3.59%	2.02%
	7updays	7updays	8updays		7updays	12updays	9updays
Volume							
Date	-3	-2	-1	0	1	2	3
10/30/29	-54.11%	55.57%	78.18%	-34.61%	-33.36%	-13.29%	-4.52%
11/14/29	13.04%	77.20%	20.31%	-28.22%	-22.08%	-36.64%	-1.09%
6/3/31	-1.91%	51.22%	7.10%	-0.30%	-4.23%	-10.09%	-40.00%
6/22/31	-17.86%	25.00%	0.00%	299.13%	-43.36%	95.00%	-14.79%
10/6/31	13.40%	-30.49%	26.09%	35.11%	-34.57%	1.77%	12.20%
10/8/31	26.09%	35.11%	-34.57%	1.77%	12.20%	-61.18%	31.20%
12/18/31	-9.00%	-25.48%	50.00%	23.13%	-46.69%	-27.46%	11.43%
2/11/32	6.48%	0.87%	12.07%	96.92%	-22.66%	26.26%	-12.40%
5/6/32	15.38%	46.67%	-24.24%	63.00%	-60.74%	15.63%	-6.76%
6/10/32	-13.54%	19.28%	20.20%	6.72%	-55.12%	33.33%	52.63%
8/3/32	-23.08%	0.48%	-31.75%	66.67%	46.67%	-23.86%	103.73%
8/8/32	66.67%	46.67%	-23.86%	103.73%	-29.67%	15.36%	-0.68%
9/21/32	-39.17%	-34.03%	-0.79%	248.00%	-15.17%	-40.38%	-5.45%
3/15/33	-13.19%	26.58%	41.00%	117.73%	7.49%	-47.58%	-54.91%
4/19/33	121.33%	-39.16%	42.57%	253.47%	40.08%	-26.79%	-7.85%
6/19/33	-11.90%	-11.89%	16.77%	-4.03%	1.09%	-29.78%	12.34%
9/5/39	4.17%	-8.00%	328.26%	201.02%	-33.56%	-34.01%	35.00%
10/21/87	28.61%	78.52%	0.63%	-26.06%	-12.77%	-37.38%	25.73%
10/13/08	23.30%	-4.94%	38.27%	-36.60%	12.37%	-19.84%	22.04%
10/28/08	16.95%	-8.90%	-15.14%	27.69%	-0.27%	-12.74%	3.54%
	11updays	12updays	14updays	14updays	6updays	6updays	10updays
Average	7.58%	15.01%	27.55%	70.71%	-14.72%	-11.68%	8.07%

0 is the big day, -1 is the first day before and 1 is the first day after, and so forth.

It appears logical that most of the big down days occurred in strong bearish trend. However, two of them occurred on the October 19, 1987 “black Monday” and the following Monday, one in October 1989 and one in October 1997. The market crash on October 28 and 29, 1929, foreran the worst bearish trend in the history of the U.S. stock market although the market was up after the crash. The DJIA peaked on April 17, 1930 at 294.07, then kept falling for 27 months and then bottomed at 41.22 on July 8, 1932.

The three big tumbles in September and October 2008 occurred 11 months after the market entered the worst bearish trend since after the great depression which started in late October 2007 and ended on March 8, 2009. The huge sell off on September 29 was triggered by the rejection of the bailout plan in the Congress.

The two big tumble days in October 1987 occurred during a moderate bullish trend. The large (7.13 percent) decline on September 17, 2001 is excluded from the sample because September 17 is the first day the markets were opened after the 9.11 attack and the big sell off is not caused by economic, financial, or market factors.

Ironically, most of the big up days also occurred in strong bearish trends. Ten of the 20 big up days occurred in the strongest bearish trend from October 1929 to July 1932, in the great depression. Six big up days are in the period from August 3, 1932 to June 19, 1933, which is in the bullish trend from July 9, 1932 to March 10, 1937 that peaked at 194.4.

The big days against market trends failed to reverse the trend. The 10 big up days from October 30, 1929 to June 10, 1932 did not reverse the strong bearish trend.

The two big tumble days in October 1987, and the big down day in October 1989 did not stop or reverse the moderate bullish trend. And the big down day in October 1997 did not alter the strong bullish trend. Similarly, the two big up days in October 2008 did not stop or reverse the strong bearish trend.

As shown in Table 3, for the three days prior to the big tumble days, most of them are down days, i.e., for the third day before the big tumble days, 70 percent or 14 out of the 20 days are down days, for the second day before the big tumble days, 13 down days, and for the first day before the big tumble days, 12 down days. 15 of the 20 big tumble days experienced 2 to 3 down days in the previous three trading days, and most of the declines are significant.

By comparison, 80 percent or 16 out of the 20 days that immediately follow the 20 big tumble days are up days, and most of the increases are significant or huge, of which, 2 increases are even bigger than the previous tumbles in absolute value. This significant next-day reverse is confirmed by the descriptive statistics in Table 2. The second and third days after the big tumble days did not exhibit any majority direction, i.e., 9 or 10 of the 20 days are up days. 12 of the 20 big tumble days are followed by 2 or 3 up days in the three after days and most of the increases are significant or huge.

Ironically, most of the three days before the big jump days are also down days. 65 percent or 13 of both the third and the second days before the big jump days are down days, and the first days before the big jump day have 12, or 60 percent down days, and most of the declines are significant or huge. From October 1929 to August 3, 1932, 10 out of the 11 first days before the big jump day are down days. Similar to the first days after the big tumble days, most of the first after days move into the opposite direction of the big days, that is, 13 days experienced market decline and most of the declines are significant. The second and the third after days have 12 and 9 up days, respectively.

Out of the 20 big jump days 11 days' openings are significantly higher than the previous close by 1% to 6%, 7 openings are moderately higher than the previous close, and 2 openings are the same as the previous close. All the big jump days' openings are significantly lower than the day's high and close. Hence, there is profit opportunity for early buyers.

Out of the 20 big down days, 12 days' openings are lower or significantly lower than the previous close, 6 days' openings are the same as the previous close, and 2 are higher than the previous close. All the big down days' openings are significantly higher than the day's low and close. Hence, there is profit opportunity for early short sellers.

As discussed above, both the big down and up days have seen significant down days in the three days before, so that the previous three day returns do not provide any signal of a big down or up day.

We then examine volume change in the big days and the surrounding three days before and after the big day. We saw trading volume increased sharply for 15 out of the 20 big down days, the average volume increase for the 20 big down days is 37.88 percent, and the average volume increase is 15.9% and 12.58% for the third and second day before, respectively.

By contrast, the three days prior to the big up days and the big up days experienced much larger volume increases than for the big down days. Specifically, the average volume increase in the big up days is 70.71 percent, and the averages increased from 7.58% to 27.55% from the third day before to the first day before the big up days. Further, 14 out of the 20 first days before the big up days have increased volumes, compared to 10 of the first days before the big down days. Hence, unusually large increases in trading volume may be a signal for big up day.

Return and volume are negatively related for most of the 3 days before the big down days, i.e., 80 percent or 16 out of the 20 first days, 13 for the second days, and 75 percent or 15 out of the 20 third days before the big down days. Hence, negative relationship between return and volume in the three days before a big down day may give the signal of the danger.

By contrast, the three days prior to the big up days did not exhibit dominating negative relationship between return and volume, specifically, 11 out of the first days, 10 out of the second days, and 12 out of the third days exhibited negative relationship between return and volume.

Volume changes and the relationship between volume and return in the three days after both the big down and big up days did not show any clear pattern that may be helpful to investors, so we do not discuss them here.

Based on the findings just discussed above, buying before the close of a huge down day one has 80 percent chance for making excess return in the following day, selling before the close of a huge up day one has 65 percent chance locking in profit. Negative relationship between return and trading volume combined with moderate volume increase may signal the danger that a big fall is looming. And large volume increases may be a sign that a big jump is coming.

In order to confirm the findings reported above and further identify the relationship between the big-day return and volume, and returns and volumes of the three days before and after, we conduct regression analyses.

$$R_{T0} = \alpha + \sum \beta_i R_{T+j} + \sum \beta_i V_{T+j} \quad (1)$$

Where,

R_{T0} = Return (percentage change in the DJIA) of the big day

R_{T+j} = Return of the days around the big day, $j = -3, -2, -1, 1, 2, 3$, and $i = 1, 2, 3, 4, 5, 6$, or

$$R_{T0} = \alpha + \beta_1 R_{T-3} + \beta_2 R_{T-2} + \beta_3 R_{T-1} + \beta_4 R_{T+1} + \beta_5 R_{T+2} + \beta_6 R_{T+3}$$

V_{T+j} = percentage change in volume of each of the seven days, $j = -3, -2, -1, 0, 1, 2, 3$, and $i = 1, 2, 3, 4, 5, 6, 7$, or

$$\beta_1 V_{T-3} + \beta_2 V_{T-2} + \beta_3 V_{T-1} + \beta_4 V_{T0} + \beta_5 V_{T+1} + \beta_6 V_{T+2} + \beta_7 V_{T+3}$$

First, we regress the dependent variable or percentage declines in the DJIA of the 128 big down days against the independent variables, i.e., percentage changes in the index value of the three days before and after the big down days, and percentage changes in trading volume in the big days and the three days before and after. The results are reported in Table 4. As shown in the table, the coefficients for the variables R_{T+1} and R_{T+2} , are both negative and significant, which indicates that most of the big down days are followed by two up days. This result implies that buying before the close of a huge down day generally results in profit in the following two days. These regression results confirm or are consistent to the above report about the return behavior after the big down days.

TABLE 4
REGRESSION RESULTS

Dependent Variable	R Square	Adjusted R Sq.
The big falls	0.269	0.187
	<i>Coefficients</i>	<i>t Stat</i>
Intercept	-0.052	-21.445
T-3 Return	0.019	0.328
T-2 Return	0.002	0.032
T-1 Return	0.062	1.069
T+1 Return	-0.202	(-3.396)***
T+2 return	-0.206	(-3.548)***
T+3 Return	0.033	0.572
T-3 Volume	-0.008	-1.562
T-2 Volume	-0.004	-0.775
T-1 Volume	0.003	0.486
T0 Volume	-0.006	-1.548
T+1 Volume	-0.012	(-2.072)**
T+2 Volume	-0.005	-0.940
T+3 Volume	0.006	1.197

Dependent Variable	R Square	Adjusted R Sq.
The big jumps	0.199	0.088
	<i>Coefficients</i>	<i>t Stat</i>
Intercept	0.051	13.893
T-3 Return	-0.068	-0.773
T-2 Return	-0.027	-0.312
T-1 Return	-0.008	-0.073
T+1 Return	-0.104	(-1.755)*
T+2 return	-0.117	(-2.234)**
T+3 Return	-0.053	-0.833
T-3 Volume	0.000	0.046
T-2 Volume	0.000	0.050
T-1 Volume	-0.003	-0.284
T0 Volume	0.011	(3.061)***
T+1 Volume	0.008	(1.672)*
T+2 Volume	0.006	1.078
T+3 Volume	0.000	0.052

Dependent Variable	R Square	Adjusted R Sq.
All the big changes	0.16	0.111
	<i>Coefficients</i>	<i>t Stat</i>
Intercept	-0.013	-2.585
T-3 Return	0.167	1.432
T-2 Return	0.198	1.607
T-1 Return	0.142	1.165
T+1 Return	-0.211	(-2.005)**
T+2 return	-0.279	(-2.934)***
T+3 Return	-0.020	-0.178
T-3 Volume	0.006	0.640
T-2 Volume	-0.021	(-1.912)*
T-1 Volume	-0.021	(-1.662)*
T0 Volume	0.006	0.915
T+1 Volume	0.022	(2.348)**
T+2 Volume	0.020	2.229
T+3 Volume	0.016	1.649

* significant at the 10% level, ** significant at the 5% level, and, *** significant at the 1% level.

Then we regress the dependent variable or percentage increase in the DJIA of the 108 big up days against the independent variables, i.e., percentage changes in the index value of the three days before and after the big up days, and percentage changes in trading volume in the big days and the three days before and after. As shown in Table 4, the coefficient for the variable R_{T-1} is negative and significant, which indicates that most of the huge up days occur after a down day. The coefficients for the variables R_{T+1} and R_{T+2} are both negative and significant, which shows that most of the big up days are followed by two down days. This result implies that selling before the close of a big up day generally results in profit in the following two days.

Finally, we regress the dependent variable or percentage increase in the DJIA of all the 236 big up and down days against the independent variables, i.e., percentage changes in the index value of the three days before and after the big up days, and percentage changes in trading volume in the big days and the three days before and after. As shown in Table 4, the coefficients for the variables R_{T+1} and R_{T+2} are both negative and significant, which indicates that most of the big up days are followed by two down days and most of the big down days are followed by two up days. The result is consistent to the results from regressing the big up days and big down days individually.

CONCLUSION

This study examines return and trading volume of the 128 big down days in which the DJIA experienced at least 4 percent losses and 108 big up days in which the index experienced at least 4 percent gains from 1929 through 2008, and returns and trading volumes of the three days prior to and three days after the big days. Most of the big down and up days occurred in the great depression and the great recession years.

The results of this study reveal some phenomena that signal the coming of large market movements, i.e., the big up days usually follow a few days of significantly higher trading volume and start with significantly higher opening; and the big down days usually follow a few days of negative relationship between return and volume.

The big day phenomenon reflect that momentum traders' actions push the price further lower or higher at negative or positive macroeconomic news, and then contrarian investors believe other investors and momentum traders overreact to negative or positive information and hence the market was oversold or overbought in the previous one or two days, thus they buy or sell and made the market move significantly in the opposite direction for one or two days.

Results of this study have implication for investors: One may buy before the close of a huge down day and sell before the close of a huge up day for profit. In addition, there are opportunities to reduce loss in big down days as openings of all the biggest down days are significantly higher than the day's low and close, and opportunities to make profit in big up days as openings of all the biggest up days are significantly lower than the day's high and close.

REFERENCES

- Browning, E.S. (2011). Volatile Market Sends a Warning. *The Wall Street Journal*, October 10, A1.
- Cross, F. (1973). The Behavior of Stock Prices on Fridays and Mondays. *Financial analysts Journal*, 29, 67-69.
- De Bondt, W.F.M., & Thaler, R.H. (1985). Does the Stock Market Overreact? *Journal of Finance* 40, 793-805.
- French, K. (1980). Stock Returns and the Weekend Effect. *Journal of Financial Economics*, 8, 55-69.
- Graham, B. & David L. D. (1934). *Security Analysis*, New York: McGraw-Hill.
- Gu, A.Y. (2003). The Declining January Effect: Evidence from U.S. Equity Markets. *Quarterly Review of Economics and Finance*, 43, (2), 395-404.
- Gu, A.Y. (2004). The Reversing Weekend Effect: Evidence from the U.S. Equity Markets. *Review of Quantitative Finance and Accounting*, 22, (1), 5-14.
- Gu, A.Y. & Finnerty, J. (2002). The Evolution of Market Efficiency: 103 years of the Dow, *Review of Quantitative Finance and Accounting*, 18, (3), 219-237.
- Gu, Y.A. and Simon, J. (2007). The September Phenomenon in the U.S. Equity Markets, *Advances in Quantitative Analysis of Finance & Accounting*, 5, (2), 48-58.
- Jegadeesh, N. & Titman, S. (1993). Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency. *Journal of Finance*, 48, 65-91.
- Morrin, M., Jacoby, J., Johar, G.V., He, X., Kuss, A. & Mazursky, D. (2002). Taking Stocks of Stockholders: Exploring Momentum versus Contrarian Investor Strategies and Profiles. *Journal of Consumer Research*, 29, (2), 188-198.
- Rozeff, M. S. & Kinney, W.R. Jr. (1976). Capital Market Seasonality: The Case of Stock Returns, *Journal of Financial Economics*, 3, 379-402.

Shiller, R.J. (1993). Stock Prices and Social Dynamics, in *Advantages in Behavioral Finance*, ed. Richard H. Thaler, New York: Sage 167-217.

Wachtel, S.B. (1942). Certain Observations on Seasonal Movements in Stock Prices, *Journal of Business*, 15, 184-193.