SJH PENSION REFORM

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Honorable Brian P.Stern

Attached is a sample of thelast 15years of the S&P 500 index. The major difference in the S&P 500 index and what I have compiled is the use of the -10% stop loss and a buy stop when the price of the S&P 500 equals the stop loss price **or next years open is positive.** With a stop loss added it results in a 13% yearly average.

**(Preservation of Capital is top priority. Stop loss=11 years of -10% returns or more. One loss every 8 years. 12.5%) **(If consecutive losses per year are not included only 6 stop losses over 88 years or 6.8%. 1 every15 years.)

**(I included $1000 fee from 2700 pensioner for fifteen years to bring the fund to 100% funded.) **(10% of average payout of $10,000 per person per year. Total $2,700,000/yr.)

Without a stop-loss of -10%, the last 88 years avg.apprx. 10% yearly return

If you have any questions regarding the attached, please call.

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sjh**pension	2003	2004	2005	2006	2007	2008
beg. Balance	85,000,000	102,048,000	105,850,822	103,728,097	112,816,763	111,710,413
s&p 500 %ret.	28.68%	10.88%	4.91%	15.79%	5.49%	*10% sell stop
total $ avail.	109,378,000	113,150,822	111,028,097	120,116,763	119,010,403	100,539,371
#2700x$1000	2,700,000	2,700,000	2,700,000	2,700,000	2,700,000	2,700,000
total $ avail.	112,048,000	115,850,822	113,728,097	122,816,763	121,710,403	103,239,371
minus payout	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
ending balance	102,048,000	105,850,822	103,728,097	112,816,763	111,710,413	93,239,371

sjh**pension	2009	2010	2011	2012	2013	2014
beg. Balance	buy*93,239,371	110,610,508	119,968,450	115,199,784	126,331,749	159,950,602
s&p 500 %ret.	26.46%	15.06%	2.11%	16.00%	32.39%	13.69%
total $ avail.	117,910,508	127,268,450	122,499,784	133,631,749	167,250,602	181,847,839
#2700x$1000	2,700,000	2,700,000	2,700,000	2,700,000	2,700,000	2,700,000
total $ avail.	120,610,508	129,968,450	125,199,784	136,331,749	169,950,602	184,547,839
minus payout	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
ending balance	110,610,508	119,968,450	115,199,784	126,331,749	159,950,602	174,547,839

sjh**pension		2015	2016	2017
beg. Balance		174,547,839	169,656,599	182,647,528
s&p 500 %ret.		1.38%	11.96%	20.49%
total $ avail.		176,956,599	189,947,528	220,072,006
#2700x$1000		2,700,000	2,700,000	2,700,000
total $ avail.		179,656,599	192,647,528	222,772,006
minus payout		10,000,000	10,000,000	10,000,000
ending balance		169,656,599	182,647,528	212,772,006

fidelity corp.
no tax/non-profit
self/no fees
spx .80% fee
fxsix .03% fee

sell stop -10% yrly. losses
buy stop @exit price
or next yr positive open
yrly avg w/sell stop 13.0%

"sample"
s@p 500 index
88yrs./9.99%-avg yr.return

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Annual Returns Of The S&P 500 From 1928 To 2015

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Summary

- Over 88 years, the S&P 500 went up 64 years and went down 24 years.
- The worst return was -43.84% in 1931.The best return was 52.56% in 1954.
- What will happen next year?

I found the raw data here and wondered what conclusions I could draw from it.

I could not discern from that site if the "annual return" is "price return", "dividend return", or "total return".

Here are the raw data sorted by year:

Raw data sorted by year

Year	S&P 500
1928	43.81%
1929	-8.30%
1930	-25.12%
1931	-43.84%
1932	-8.64%
1933	49.98%
1934	-1.19%
1935	46.74%
1936	31.94%
1937	-35.34%
1938	29.28%
1939	-1.10%
1940	-10.67%
1941	-12.77%
1942	19.17%
1943	25.06%
1944	19.03%
1945	35.82%
1946	-8.43%
1947	5.20%
1948	5.70%
1949	18.30%
1950	30.81%

1951	23.68%
1952	18.15%
1953	-1.21%
1954	52.56%
1955	32.60%
1956	7.44%
1957	-10.46%
1958	43.72%
1959	12.06%
1960	0.34%
1961	26.64%
1962	-8.81%
1963	22.61%
1964	16.42%
1965	12.40%
1966	-9.97%
1967	23.80%
1968	10.81%
1969	-8.24%
1970	3.56%
1971	14.22%
1972	18.76%
1973	-14.31%
1974	-25.90%

1975	37.00%
1976	23.83%
1977	-6.98%
1978	6.51%
1979	18.52%
1980	31.74%
1981	-4.70%
1982	20.42%
1983	22.34%
1984	6.15%
1985	31.24%
1986	18.49%
1987	5.81%
1988	16.54%
1989	31.48%
1990	-3.06%
1991	30.23%
1992	7.49%
1993	9.97%
1994	1.33%
1995	37.20%
1996	22.68%
1997	33.10%
1998	28.34%

1999	20.89%
2000	-9.03%
2001	-11.85%
2002	-21.97%
2003	28.36%
2004	10.74%
2005	4.83%
2006	15.61%
2007	5.48%
2008	-36.55%
2009	25.94%
2010	14.82%
2011	2.10%
2012	15.89%
2013	32.15%
2014	13.52%
2015	1.36%

The interval between 1928 and 2015 represents 88 calendar years.

Of those 88 years, the S&P 500 went up in 64 years (72.7273%) and went down in 24 years (27.2727%).

The ratio of up years to down years was 64 / 88 or 2.66667, which means the S&P 500 went down once every (approximately) 4 years on average.

Here are the raw data sorted by return:

Raw data sorted by return

S&P 500	Year
-43.84%	1931
-36.55%	2008
-35.34%	1937
-25.90%	1974
-25.12%	1930
-21.97%	2002
-14.31%	1973
-12.77%	1941
-11.85%	2001
-10.67%	1940
-10.46%	1957
-9.97%	1966
-9.03%	2000
-8.81%	1962
-8.64%	1932
-8.43%	1946
-8.30%	1929
-8.24%	1969
-6.98%	1977
-4.70%	1981
-3.06%	1990
-1.21%	1953
-1.19%	1934

-1.10%	1939
0.34%	1960
1.33%	1994
1.36%	2015
2.10%	2011
3.56%	1970
4.83%	2005
5.20%	1947
5.48%	2007
5.70%	1948
5.81%	1987
6.15%	1984
6.51%	1978
7.44%	1956
7.49%	1992
9.97%	1993
10.74%	2004
10.81%	1968
12.06%	1959
12.40%	1965
13.52%	2014
14.22%	1971
14.82%	2010
15.61%	2006

15.89%	2012
16.42%	1964
16.54%	1988
18.15%	1952
18.30%	1949
18.49%	1986
18.52%	1979
18.76%	1972
19.03%	1944
19.17%	1942
20.42%	1982
20.89%	1999
22.34%	1983
22.61%	1963
22.68%	1996
23.68%	1951
23.80%	1967
23.83%	1976
25.06%	1943
25.94%	2009
26.64%	1961
28.34%	1998
28.36%	2003
29.28%	1938

30.23%	1991
30.81%	1950
31.24%	1985
31.48%	1989
31.74%	1980
31.94%	1936
32.15%	2013
32.60%	1955
33.10%	1997
35.82%	1945
37%	1975
37.20%	1995
43.72%	1958
43.81%	1928
46.74%	1935
49.98%	1933
52.56%	1954

The worst return was -43.84% in 1931.

The best return was 52.56% in 1954.

Here are the raw data sorted by the frequency of similar returns:

number of losses >= -44% and < -43% is 1

number of losses >= -37% and < -36% is 1

number of losses >= -36% and < -35% is 1

number of losses >= -26% and < -25% is 2

number of losses >= -22% and < -21% is 1

number of losses >= -15% and < -14% is 1

number of losses >= -13% and < -12% is 1

number of losses >= -12% and < -11% is 1

number of losses >= -11% and < -10% is 2

number of losses >= -10% and < -9% is 2

number of losses >= -9% and < -8% is 5

number of losses >= -7% and < -6% is 1

number of losses >= -5% and < -4% is 1

number of losses >= -4% and < -3% is 1

number of losses >= -2% and < -1% is 3

number of gains >= 0% and < 1% is 1

number of gains >= 1% and < 2% is 2

number of gains >= 2% and < 3% is 1

number of gains >= 3% and < 4% is 1

number of gains >= 4% and < 5% is 1

number of gains >= 5% and < 6% is 4

number of gains >= 6% and < 7% is 2

number of gains >= 7% and < 8% is 2

number of gains >= 9% and < 10% is 1

number of gains >= 10% and < 11% is 2

number of gains >= 12% and < 13% is 2

number of gains >= 13% and < 14% is 1

number of gains >= 14% and < 15% is 2

number of gains >= 15% and < 16% is 2

number of gains >= 16% and < 17% is 2

number of gains >= 18% and < 19% is 5

number of gains >= 19% and < 20% is 2

number of gains >= 20% and < 21% is 2

number of gains >= 22% and < 23% is 3

number of gains >= 23% and < 24% is 3

number of gains >= 25% and < 26% is 2

number of gains >= 26% and < 27% is 1

number of gains >= 28% and < 29% is 2

number of gains >= 29% and < 30% is 1

number of gains >= 30% and < 31% is 2

number of gains >= 31% and < 32% is 4

number of gains >= 32% and < 33% is 2

number of gains >= 33% and < 34% is 1

number of gains >= 35% and < 36% is 1

number of gains >= 37% and < 38% is 2

number of gains >= 43% and < 44% is 2

number of gains >= 46% and < 47% is 1

number of gains >= 49% and < 50% is 1

number of gains >= 52% and < 53% is 1

Ups and Downs

After a down year, the following year was a down year 8 times out of 24 (33.33%), and was an up year 16 times out of 24 (66.67%).

After an up year, the following year was a down year 16 times out of 63 (25%), and was an up year 47 times out of 63 (75%).

Streaks

Here are the streaks of consecutive down years:

streak starting in 1973 for 2 consecutive years

streak starting in 1939 for 3 consecutive years

streak starting in 2000 for 3 consecutive years

streak starting in 1929 for 4 consecutive years

Here are the streaks of consecutive up years:

streak starting in 1935 for 2 consecutive years

streak starting in 1967 for 2 consecutive years

streak starting in 1975 for 2 consecutive years

streak starting in 1954 for 3 consecutive years

streak starting in 1978 for 3 consecutive years

streak starting in 1963 for 3 consecutive years

streak starting in 1970 for 3 consecutive years

streak starting in 1942 for 4 consecutive years

streak starting in 1958 for 4 consecutive years

streak starting in 2003 for 5 consecutive years

streak starting in 1947 for 6 consecutive years

streak starting in 2009 for 7 consecutive years

streak starting in 1982 for 8 consecutive years

streak starting in 1991 for 9 consecutive years

Streaks of up years tend to be longer, and occur more frequently, than streaks of down years.

Mean, Standard Deviation, and Compound Annual Growth Rate [CAGR]

The mean return was **11.4122%**. This is the simple arithmetic average of all of the returns.

The interpretation of "average" is not as easy as it looks. Perhaps you've heard the quote from William Kruskal's article, "Statistics, Moliere, and Henry Adams", American Scientist 55 (1967), p. 416 to 428: "A man standing with one foot in a bucket of boiling water and the other in a bucket of freezing water would be a ridiculous fool to summarize his experience by saying, "On the average, I feel fine.""

Suppose you begin with $100. During the first year, you experience a return of +50%, and end up with $150. During the second year, you experience a return of -50%, and end up with $75. It is indeed nonsensical to claim that your "average" return was 0.

Standard deviation "is a measure that is used to quantify the amount of variation or dispersion of a set of data values. A standard deviation close to 0 indicates that the data points tend to be very close to the mean (also called the expected value) of the set, while a high standard deviation indicates that the data points are spread out over a wider range of values."

The standard deviation of S&P 500 returns was **19.7028%**.

This means that 68% of the time the S&P 500 return was between the mean +/- **one** standard deviation (i.e. -8.2906 and 31.115), 95% of the time the S&P 500 return was between the mean +/- **two** standard deviations (i.e. -27.9934 and 50.8178), and 99.7% of the time the S&P 500 return was between the mean +/- **three** standard deviations (i.e. -36.284 and 81.9328).

To help you visualize what this means, there is a good diagram here.

The compound annual growth rate [CAGR] answers the question, "What constant rate of return would take you from the starting value to the ending value over the time interval?". If you bought $1 worth of S&P 500 at the beginning of 1928, you would end up with $2,940.88 at the end of 2015. The CAGR of S&P 500 returns was **9.5%**.

Conclusions

What conclusions can be drawn from these data?

I hesitate to make guesses, estimates, or predictions of future returns based on the history of past returns, because as all investors hear at least once per day, "past performance is no guarantee of future results".

One must be careful to avoid the Gambler's Fallacy - "the mistaken belief that, if something happens more frequently than normal during some period, it will happen less frequently in the future, or that, if something happens less frequently than normal during some period, it will happen more frequently in the future (presumably as a means of *balancing* nature)."

2015 was the 7th year in a streak of up years. What does that say about 2016? Sadly, very little of statistical significance.

I wish good luck to all investors.

Disclosure: I/we have no positions in any stocks mentioned, and no plans to initiate any positions within the next 72 hours.

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