



INVESTMENT RESEARCH

Investment research presented in papers, academic journals and other periodicals that may be of interest to individual investors.

Stock Return Probabilities

Probabilities Associated with Common Stock Returns, by Charles P. Jones, professor of finance, and Jack W. Wilson, professor of business management, both at North Carolina State University in Raleigh; published in *The Journal of Portfolio Management*, Vol. 22, No. 1, Fall 1995.

Most investors focus on average rates of return over various time periods. But averages are just that—they summarize many different periods with actual rates of return that vary considerably.

Standard deviation—the amount by which returns actually varied around the average return—is a measure that seeks to capture the level of uncertainty; the greater the standard deviation, the more that actual returns varied around the average and thus the greater the uncertainty.

In a new study, two professors decided to use historical standard deviations and the historical average rates of return for common stocks to present uncertainty in a different light, this time in terms of probabilities.

Using historical returns and standard deviations, the au-

thors produced tables of the probability of achieving compound annual average rates of return by investing in common stocks over various holdings periods of one to 40 years. Probability tables were developed based on two historical time periods, one covering 1871-1993, which included lower rates of return, and the other covering the more recent years 1926-1993, in which returns were somewhat higher.

Table 1 below presents a partial table of the probabilities for the period 1926-1993; the figures represent the probability of achieving at least the given particular rate of return or better (first column) for the holding period covered. The “average” rate of return for common stocks over this time period is 10%, which represents the median for the distribution—thus, investors have a 50% chance of achieving at least 10% or better, based on historical returns.

The study notes that over longer periods, such as 15 years or more, the probabilities of earning a zero rate of return *or less* (subtracting the probability from 100%) are very small—1.5% at 20 years, and no practical probability at 40 years. And over longer time periods, the probability of earning at least a 5% annual return or better is high—a 77% probability for a holding period of 10 years, 85% for 20 years and 90%

Table 1.
Return Probabilities
(The probability of achieving at least a given annual rate of return.)

Annual Return (%)	Investment Horizon						
	1 yr.	3 yrs.	5 yrs.	10 yrs. Return Probability (%)	20 yrs.	30 yrs.	40 yrs.
15	40.91	34.52	30.35	23.35	15.19	10.39	7.29
14	42.67	37.44	33.96	27.94	20.41	15.56	12.11
13	44.46	40.46	37.76	32.96	26.64	22.25	18.89
12	46.27	43.56	41.71	38.37	33.78	30.42	27.70
11	48.11	46.74	45.79	44.06	41.63	39.78	38.25
10	49.98	49.96	49.95	49.93	49.90	49.87	49.85
9	51.86	53.21	54.15	55.85	58.25	60.06	61.58
8	53.75	56.47	58.33	61.70	66.31	69.69	72.42
7	55.65	59.72	62.47	67.34	73.75	78.18	81.56
6	57.56	62.93	66.50	72.66	80.30	85.17	88.60
5	59.46	66.09	70.39	77.56	85.79	90.52	93.51
4	61.37	69.16	74.08	81.95	90.18	94.32	96.62
3	63.26	72.13	77.56	85.80	93.51	96.82	98.39
2	65.14	74.98	80.79	89.07	95.91	98.35	99.31
1	67.00	77.70	83.74	91.79	97.54	99.20	99.73
0	68.84	80.26	86.40	93.99	98.60	99.64	99.91

Source: *The Journal of Portfolio Management*, Vol. 22, No. 1, Fall 1995.

over 30 years. On the other hand, the authors note, the probabilities of achieving a “large” annual average rate of return over various holding periods is most likely smaller than most investors realize. For instance, the chance of realizing 12% or greater is 38.4% for 10 years and 30% for 30 years.

The study also calculated the probabilities of achieving inflation-adjusted rates of return. Interestingly, the study found little difference between the two time periods, with the inflation-adjusted average rate of return stable across time.

The bottom line for investors: *Is the stock glass half full, or half empty? The article certainly won't answer that debate, but the probability tables do present another way of looking at the risk/return equation for common stock investment that may be of some help to investors. And once again, a study offers proof that stocks do indeed provide an inflation hedge over time.*

America's Capital Productivity

Capital Productivity, a study by the McKinsey Global Institute, published by McKinsey & Co., Washington, D.C., June 1996.

What accounts for a nation's economic performance and higher standard of living? Productivity, both of labor and capital, are key to a nation's growth in wealth and standard of living.

Yet, while labor productivity is often closely examined, much less attention has been paid to the area of capital productivity.

In a widely publicized study, the McKinsey Global Institute measured capital productivity in the U.S., Japan, and Germany, focusing on five industries: auto, food processing, retail, telecommunications, and electric utilities. The con-

clusion: American companies make far better use of their physical capital stock, with productivity in Germany and Japan at only two-thirds of U.S. levels.

According to the report, a number of factors explain the higher capital productivity. At the firm level, this includes not only better use of plants and equipment, but also better marketing and finance decisions. The study also cited competition among firms and the structure of the capital markets, including pressure from, as well as competition for, investors.

The study found that higher capital productivity in turn generated higher financial returns in the U.S., which showed a 9% average return on capital between 1974 and 1993, compared with just over 7% for Germany and Japan. (The results are in local currency terms; the study did not adjust for currency differences).

These results, according to the authors, help explain why the U.S. is able to grow despite the fact that its savings rate is considerably below those of its competitors. Thus, the U.S. has been able to have its cake and eat it too, in the form of greater financial wealth and greater consumption.

“The more effectively and efficiently physical capital is employed in the production process, the higher the output generated, and the higher the return from production that can flow back to the savers,” the study notes. “Capital productivity, therefore, is an important determinant of the long-run rate of return and hence also the long-run rate of wealth creation of an economy.”

The bottom line for investors: *The study itself is of more interest to economists and individual corporations. But the implications are striking—investors in U.S. companies right now are getting the best return on their investment dollars. And continued demand for good investment performance will add to everyone's bottom line worldwide. Perhaps a little greed is good, after all.*



NASD Comes to the Aid of Individual Investors

The National Association of Securities Dealers (NASD) recently established two new offices to serve the needs of individual investors and proposed a new trading system for the benefit of individual investors.

The Office of Individual Investor Services will work with organizations such as AAIL to develop investor protection and education programs, among other goals. NASD also established an Ombudsman Office to receive and address any complaints and to direct investors to the appropriate channels to resolve any disputes.

The new NAQcess trading system, proposed by the NASD and under review by the Securities and Exchange Commission, promises to make individual orders on Nasdaq competitive with institutional investors. Limit orders to buy or sell at a certain price or better will be protected throughout the market and the limit order will be represented in the “inside quote,” the spread representing the highest bid (buy) price and lowest asked (sell) price if the order is equal to or better than the best market maker's quote. Individual investors under NAQcess will have more opportunities for exposure of their orders and better prices.

Office of Individual Investor Services: (phone number not yet available)

Ombudsman Office: 202/728-8850

Nasdaq Web Site: <http://www.nasdaq.com>

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