Whither the stock market?

The United States stock market has long provided the highest average return among all financial assets. According to figure 1, stocks earned significantly higher average returns over the last 68 years than other financial assets such as corporate bonds or Treasury bills. While the stock returns shown in figure 1 are impressive, investors are more concerned with inflation-adjusted returns. Panel B of figure 1 presents average real returns after adjusting for inflation. The stock market’s performance has been even more remarkable in recent years. Figure 2 presents data on average real returns over the past 12, 24, and 36 months. The market’s superior performance has led investment advisors to recommend stocks for retirement saving and has prompted calls for privatizing Social Security so that individuals can exploit these exceptional returns. In a December 1996 Wall Street Journal article, one-time presidential hopeful Steve Forbes compared the “historic 9% to 10% annual returns from stock market investments” to the “lifetime return of only about 2.2%” a worker receives from the current social security system. His argument for privatization seems especially compelling given the stock market’s recent performance.

There is, however, a down side to the recent run-up in stock prices: the currently high stock market valuation may actually forecast low future returns. There are many ways to determine whether stock prices are “high.” For example, the ratio of stock prices to either earnings, book value, or cash flows provides a measure of the relative level of stock prices. In this Fed Letter, we use the dividend yield, defined as the ratio of dividends to stock prices. When the dividend yield is low, stock prices are considered relatively high and vice versa. As figure 3 indicates, the average dividend yield from 1927 to 1995 was about 4.4%. Figure 4 displays the level of dividend yields over time and shows that the average dividend yield in 1997 was at a historic low of 2.0%. According to the figure, the current high level of U.S. stock prices (as measured by dividend yields) is without precedent.

A look back at stock returns

In the past, very high stock prices have not been good news for future stock returns. In a recent Economic Perspectives article, John Cochrane shows that over long horizons (five years), low dividend yields tend to be associated with low future stock returns. Over time, the dividend yield tends to move toward its mean. When stock prices are relatively high, the dividend yield can be restored to its mean by either having future stock prices fall or having dividends rise to restore the ratio’s mean. Historically, the former has been the case: future stock prices, not dividends, adjust to move the dividend yield back to its long-run average. Therefore, in times of high stock prices, future returns generally fall. It is important to note, however, that these adjustments occur over long periods of time. While stock returns may be expected to fall, the decline usually occurs gradually. Therefore, a low dividend yield does not necessarily forecast a crash or lower returns in the immediate future; rather, it forecasts lower returns over the next several years.

How much lower will future stock returns be? While we can’t say for sure, we can get some insight into this question by using a very simple model of stock prices proposed by Gordon and Shapiro. Their model relates the dividend yield to stock returns and per-share dividend growth rates. Gordon and Shapiro make two simplifying assumptions. First, they assume that expected returns to stocks are steady. Second, they assume that dividends per share are expected to grow at a steady rate. Under these assumptions, the future dividend yield is simply

<table>
<thead>
<tr>
<th>Period</th>
<th>Real return (percent per year)</th>
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<tbody>
<tr>
<td>1995</td>
<td>19.61</td>
</tr>
<tr>
<td>1994–95</td>
<td>17.13</td>
</tr>
<tr>
<td>1993–1995</td>
<td>11.88</td>
</tr>
</tbody>
</table>

Notes: Returns are returns to a value-weighted portfolio of stocks traded on the NYSE. Source: CRSP.
the difference between the expected stock return and the expected dividend growth rate per share:

\[ \text{Dividend Yield} = \text{Expected Stock Return} - \text{Expected Dividend Growth Rate Per Share} \]

Because our focus is on the long run, the simplifying assumptions aren't unreasonable. This model may still aid in understanding the implications of the currently low dividend yields.

According to figure 3, the simple Gordon-Shapiro model fits the historical data quite well. Figure 3 presents mean dividend yields, stock returns, and dividend growth rates from January 1927 to December 1995 as well as for the pre- and post-war periods. The last row in figure 3, “average model error,” shows the difference between the Gordon-Shapiro model and the actual data. During every period but two, which include Great Depression data, this difference is less than 1%. Furthermore, statistical tests indicate that the difference is approximately zero. Therefore, over the periods we study, mean dividend yields are not substantially different from stock returns less dividend growth rates.

**What does the future hold?**

What does the past tell us about future stock returns? Suppose the dividend to price ratio remains permanently lower. According to Gordon and Shapiro’s model, stock returns will permanently decrease or dividend growth rates will permanently increase. Let’s assume stocks will continue to provide real annual returns of 11.9%, the average return over the past three years. If the dividend to price ratio stabilizes at 2.0%, the model would require that dividends per share grow at an inflation-adjusted rate of 9.9%. This level of dividend growth would be truly remarkable. The average real dividend growth has been only 1.4% over the past 10 years. According to figure 3, for the entire period we studied, real dividend growth has averaged only 1.1%. In other words, per-share dividend growth rates would have to be 900% higher than their historical average if stock returns remain permanently high and dividend yields remain permanently low. Suppose instead that stocks will provide returns that are equal to their post-war historical average of 7.0%. A 2.0% dividend yield would then require real dividend growth of 5.0%, which is more than three times the average growth rate over the past 10 years. In fact, from 1927 to the present, there have never been ten consecutive years when dividends per share grew at an average rate exceeding 4.85%. If we exclude 1955 (when dividends grew at an extraordinary rate of 16.3%), there is no ten-year period when dividend growth exceeded 4.0%. We conclude that to achieve historical stock returns in the future, we would need implausibly high dividend growth rates.

Because we consider these high dividend growth rates to be unrealistic, let’s look at stock returns given more realistic dividend growth rates. If dividends per share grow at an inflation adjusted rate of 2.5% (a high but plausible figure, given the results in figure 3) and dividend yields remain at 2.0%, the Gordon-Shapiro model implies that real stock returns will average only 4.5% annually, substantially below the post-war average of 7.0%.

Thus far, we have assumed that dividend yields will remain at their current low levels indefinitely. Suppose instead that the dividend yield adjusts back to its mean. In this case, either stock prices will fall or dividends will increase. On March 14, Warren Buffett, chairman of Berkshire Hathaway, Inc., told stockholders that he believes the historically high stock prices are justified as long as interest rates remain low and corporations continue to produce “remarkable” return on equity. Buffett apparently believes that future dividends will rise to justify the low dividend to price ratio. Unfortunately, history tells a different story. It is adjustments in stock prices, not dividends, that historically have driven the dividend yield back toward its mean value. If dividend yields do revert to their long-run mean over the next few years, the long-term prospects for the stock market over this period are not favorable.

Our results have important implications for those saving for retirement. Many retirement planners base their investment allocation strategies on the continued strong performance of the stock market. If stock returns decline to a new, permanently lower level of 4.5%, many retirees will have undersaved for retirement. Similarly, those who advocate privatizing Social Security argue that individuals could more effectively save for their retirement by investing their Social Security contributions in the stock market. This argument assumes that stocks will continue to provide investors with the same outstanding returns that they have historically provided. Our analysis casts doubt on this assumption. Therefore, estimates of the benefits of Social Security privatization, like retirement savings strategies, should consider both pessimistic and optimistic forecasts of future stock returns.

### 3. Yields, returns, and growth, 1927–95

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Dividend yield</td>
<td>4.37</td>
<td>4.95</td>
<td>4.14</td>
<td>4.51</td>
<td>4.14</td>
</tr>
<tr>
<td>Real returns</td>
<td>6.43</td>
<td>4.86</td>
<td>7.03</td>
<td>6.73</td>
<td>6.40</td>
</tr>
<tr>
<td>Real dividend growth</td>
<td>1.12</td>
<td>-1.62</td>
<td>2.15</td>
<td>0.71</td>
<td>2.34</td>
</tr>
<tr>
<td>Average model error</td>
<td>0.009</td>
<td>0.0142</td>
<td>0.007</td>
<td>0.0147</td>
<td>0.004</td>
</tr>
</tbody>
</table>

Notes: The dividend yield is per-share dividends paid during a month divided by per-share stock price as of the previous month-end for stocks traded on the NYSE. Dividend growth is the average annual growth in monthly dividends per share. Average model error equals real returns – real dividend growth – dividend yield. In the last row, robust t-statistics are in parenthesis.

Source: CRSP.
implies that their money. Some reasonable parking place for a lower return in order to secure
cates that savers are willing to accept both drives asset prices up and indi-
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In other words, expected future stock
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misperceive the amount of risk in the
Finally, some investors today may truly
have been in a new industrial era in this
country. We are making progress industrially and economically not
even by leaps and bounds, but on a
perfectly heroic scale. This quotation appeared in Forbes magazine in
June 1929, and the sentiment reflects a popular opinion of the cur-
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which of these explanations proves
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—David Marshall
Economic advisor and
senior financial economist

Conclusion
What might account for the current
low dividend yields and the implied
low expected future returns? At this
point, we can only form tentative con-
jectures. One theory is that members
of the Baby Boom generation had not
adequately saved for retirement in
their early working years. Now that they
are in their prime earning years, they
are making up for lost time. The re-
sulting flood of retirement savings
both drives asset prices up and indi-
cates that savers are willing to accept
a lower return in order to secure
some reasonable parking place for their
money.

The problem with this theory is that it
implies that all expected returns (not
just stock returns) should drop. Ho-
ever, we find, along with Cochrane,
that the equity premium (the expec-
et equity return above the Treasury
bill rate) has dropped in recent years.
In other words, expected future stock
returns are lower relative to alternative
assets. The equity premium is proper-
ly understood as a compensation for
risk. Why would today’s investors re-
quire a lower compensation for bear-
ing the considerable risk of the stock
market? Three possibilities emerge.
Perhaps the current generation is
simply less risk
averse. The per-
capita wealth of in-
vestors is higher
than in the past. It
is reasonable to be-
lieve that wealthier
investors are more
willing to bear in-
vestment risk. Per-
haps the stock
market is less risky
now than in the past.
This is a possibility, but arguments of
this type have been made before only
to be refuted by the
next crash. Consid-
er, for example, the
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Note: Dividend yield data are based on the Standard
& Poor’s Composite Stock Price Index.


![Graph showing dividend yields from 1871 to 1997]

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1John H. Cochrane, “Where is the
market going? Uncertain facts and
novel theories,” Economic Perspectives,
21, No. 6, November/December 1997.

2Steve Forbes, “How to replace Social
Security,” The Wall Street Journal,
December 18, 1996, p. 20.

3M. J. Gordon and E. Shapiro, “Capital
equipment analysis: the required rate of
profit,” Management Science, Vol. 3,
1956, pp. 102–110.

4The model also requires the additional
technical assumption that dividends per
share are greater than zero. The model
does not, however, require that cash
dividends are the only way cash is dis-
bursed from firms to shareholders. In
a recent article, (“Cash distributions to
shareholders,” Journal of Economic
Perspectives, Vol. 3, No. 3, Summer 1989,
pp. 129–140), Laurie Simon-Bagwell and
John Shoven show that in recent years
over half of all cash disbursements are
made in the form of share repurchases
and other cash tender offers. Because
share repurchases reduce the number
of shares outstanding, a share repurchase
will cause dividends per share to increase
for a given dividend payout. Therefore,
as long as dividends are paid, the trend
toward non-dividend cash disbursements
does not affect the validity of our study.

5In particular, the t-statistics (in paren-
thesis) are less than 1.96.

6James P. Miller, “Buffett sees stock pric-
es as justifiable,” The Wall Street Journal,
The Midwest purchasing managers' composite index (weighted average of the Chicago, Detroit, and Milwaukee surveys) for production decreased to 56.8% in June from 63.0% in May. Purchasing managers' indexes decreased in Chicago and Detroit, but increased slightly in Milwaukee. The national purchasing managers' composite index also decreased from 54.1% in May to 50.7% in June.

The CFMMI increased 0.2% in May following a revised increase of 0.6% in April. The Federal Reserve Board's IP rose 0.2% in May after increasing 0.5% in April. Total light motor vehicle production (seasonally adjusted annual rate) increased from 11.9 million units in April to 12.1 million units in May. In May, light truck production increased from 6.4 million in April to 6.5 million units and car production increased from 5.5 million to 5.6 million units.

Sources: The Chicago Fed Midwest Manufacturing Index (CFMMI) is a composite index of 16 industries, based on monthly hours worked and kilowatt hours. IP represents the Federal Reserve Board's Industrial Production Index for the U.S. manufacturing sector. Autos and light trucks are measured in annualized units, using seasonal adjustments developed by the Board. The purchasing managers' survey data for the Midwest are weighted averages of the seasonally adjusted production components from the Chicago, Detroit, and Milwaukee Purchasing Managers' Association surveys, with assistance from Bishop Associates, Comerica, and the University of Wisconsin-Milwaukee.