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What Stock Market Returns to Expect for the Future: An Update

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This note updates the calculations in my previous analysis of this issue (Social Security Bulletin, 2000, vol. 63, no. 2, pp. 38-52). The calculations address two issues. First, what are the implications of assuming an annual 7% real return on equities throughout the next 75 years (along with the assumptions in the Trustees' Report), as has been the practice in OCACT projections of Social Security reform proposals that include equities. While the numbers are changed some from those based on the end of 1998, calculations done for the end of 2000 and the end of the first quarter of 2001 continue to show that a 7% return throughout the next 75 years from these starting points is implausible.

Second, what are the implications for stock market values in ten years if there is to be a lower rate of return for the next decade, followed by a return to the historical average return thereafter. As before, the returns over the next decade need to be very low, indeed an unchanged nominal value for stocks at the end of the decade is roughly consistent with close to a 7% return thereafter.

The calculations reported here are based on the Gordon formula, relating stock values to returns and the growth of returns. A first step in considering stock market returns is to project the future net cash flow to stockholders. This is normally done in three steps. First is to estimate the current net cash flow. Second is to adjust that for reasons to believe that the long-run relationship to GDP may be different from the current relationship. And third is to assume a constant relationship to GDP given the first two steps.

The cash flow to holders of publicly traded stocks as a whole contains many pieces. Easy to measure is the flow of dividends. Then there is the cash flow arising from share repurchase. This happens in two ways – direct repurchase of a corporation's own shares and acquisition of the shares of other corporations for cash or debt. Sometimes acquired shares are retired and sometimes they are not. This may be a complication in estimation given how data are presented – I have not reviewed measurement in data sources.

In order to maintain any given fraction of the value of shares outstanding, there are also pieces that are equivalent to negative cash flows. When employees exercise stock options and so acquire shares at less than market value, there is a dilution of the stock value of existing owners. This can be approached by thinking about the excess of market value over exercise price or by considering the value of options that are given to employees.

Some existing firms go out of business while new firms are created.  For considering the return on a given fraction of the entire outstanding traded stock, it is necessary to include the negative cash flow associated with additional traded companies.  The direct cash flow of IPO's that are previously owned by individuals is such a negative cash flow.  In addition, the value retained by the original owners also represents a dilution in the value of existing shareholders and also needs to be counted.  Thus actual cash flow for new firms that were previously private needs to be increased by a multiplier – with 3 being a reasonable estimate.  However, the analysis is different for new companies that are spin-offs from existing firms.  The cash flow paid for them is a negative cash flow for shareholders as a whole.  However, there is no need for a multiplier since the value of retained shares by corporations is retained by the aggregate of current shareholders.  Thus there is a need to separate out these two types of IPO's.  I have not seen an estimate separating these two parts.

In the methodology used in my previous paper, these various steps, along with any divergence of the current position from a steady state, were combined to produce a range of values referred to as adjusted dividend flow.  In Table 1 are the implied ratios of stock market value to GDP at the end of the 75-year projection period based on stock market and GDP values at the end of 1998 and the assumptions in 1999 Trustees' Report as well as values at the end of 2000 and end of the first quarter of 2001 and the assumptions in the 2001 Trustees' Report.  The Table suggests that the 7 percent assumption throughout the next 75 years is not plausible in that it requires a rise in stock values to GDP that is implausible.  The level of implausibility is not quite as high as two years ago, but it is still implausible.  A sensitivity analysis is presented in Table 2 that varies the growth rate of GDP.  Moderate increases in GDP growth above the levels assumed in the Trustees' Report still leave a 7% return throughout the next 75 years implausible.

Table 3 presents the size of the real drop in stock market values over the next ten years that are sufficient for the Gordon formula to yield a steady return of 7 percent thereafter (along with calculations for 6.5 and 6.0).  Poor returns over the next ten years are needed for consistency with a higher ultimate long-run number, almost as poor as two years ago, for a given adjusted dividend level.  Table 4 presents sensitivity analysis.

An important issue is whether it is more plausible to have a poor short-run return followed by a return to historic yields or to believe that the long-run ultimate return has dropped.  Given the rest of the assumptions used by OCACT (particularly the assumption of a 3% real yield on long-term Treasuries), that is tantamount to a drop in the equity premium.  I think many investors are not expecting as low a return as would be called for by the assumption that we are now in a steady state.  Therefore, I continue to think a poor return over the next decade is a more plausible assumption.  It seems sensible to lower the long-run return a little from the 7% historic norm in recognition of the unusually long period of very high returns that we have experienced (although one can wonder what would have happened in the late 20's and early 30's if Alan Greenspan had headed the Fed).  Moreover, since it is impossible to predict timing of market corrections and it is sensible to work with a single rate of return for projection purposes, a lower rate of return is appropriate to correct for a period of lower returns even if the correction scenario

returning all the way to 7% is right.  Thus projection values around 6.0% or 6.5% seem to me appropriate for projection purposes.  Of course, a wider band is important for high and low cost projections in order to show the extreme uncertainty associated with such a projection.

Table 1. Projections of the Ratio of Stock Market Value to GDP Assuming 7 Percent Real Return

End of 1998 Projections

|  | Adjusted Dividends | | | |
|  | 2.0% | 2.5% | 3.0% | 3.5% |
|---|---|---|---|---|
| 2073 Market to GDP | 68.49 | 58.32 | 48.16 | 38.00 |
| Ratio 2073 to Current | 37.76 | 32.15 | 26.55 | 20.95 |

End of 2000 Projections

|  | Adjusted Dividends | | | |
|  | 2.0% | 2.5% | 3.0% | 3.5% |
|---|---|---|---|---|
| 2075 Market to GDP | 44.93 | 37.73 | 30.54 | 23.34 |
| Ratio 2075 to Current | 26.47 | 22.23 | 17.99 | 13.75 |

End of First Quarter 2001 Projections

|  | Adjusted Dividends | | | |
|  | 2.0% | 2.5% | 3.0% | 3.5% |
|---|---|---|---|---|
| 2075 Market to GDP | 39.54 | 33.29 | 27.03 | 20.77 |
| Ratio 2075 to Current | 26.81 | 22.57 | 18.33 | 14.08 |

## Table 2. Projections of the Ratio of Stock Market Value to GDP Assuming 7 Percent Real Return

### End of First Quarter 2001 Projections

|  | Adjusted Dividends | | | |
|  | 2.0% | 2.5% | 3.0% | 3.5% |
| --- | --- | --- | --- | --- |
| *Under Current Projections* | | | | |
| 2075 Market to GDP | 39.54 | 33.29 | 27.03 | 20.77 |
| Ratio 2075 to Current | 26.81 | 22.57 | 18.33 | 14.08 |
| | | | | |
| *GDP Growth 0.1% Higher* | | | | |
| 2075 Market to GDP | 36.34 | 30.43 | 24.51 | 18.60 |
| Ratio 2075 to Current | 24.64 | 20.63 | 16.62 | 12.61 |
| | | | | |
| *GDP Growth 0.3% Higher* | | | | |
| 2075 Market to GDP | 30.65 | 25.37 | 20.08 | 14.79 |
| Ratio 2075 to Current | 20.78 | 17.20 | 13.61 | 10.02 |
| | | | | |
| *GDP Growth 0.5% Higher* | | | | |
| 2075 Market to GDP | 25.81 | 21.07 | 16.34 | 11.60 |
| Ratio 2075 to Current | 17.50 | 14.29 | 11.08 | 7.86 |

*Assuming 7% stock yield, and using 2001 trustees projections.
** Using Estimated Market Value for April 1, 2001.

## Table 3

### Required Percentage Decline in Real Stock Prices Over the Following Ten Years To Justify a 7.0, 6.5, and 6.0 Percent Return Thereafter (end 1998)

| Adjusted Dividend Yield | Long-run Return | | |
|---|---|---|---|
| | 7.0 | 6.5 | 6.0 |
| 2.0 | 55 | 51 | 45 |
| 2.5 | 44 | 38 | 31 |
| 3.0 | 33 | 26 | 18 |
| 3.5 | 21 | 13 | 4 |

### Required Percentage Decline in Real Stock Prices Over the Following Ten Years To Justify a 7.0, 6.5, and 6.0 Percent Return Thereafter (end 2000)

| Adjusted Dividend Yield | Long-run Return | | |
|---|---|---|---|
| | 7.0 | 6.5 | 6.0 |
| 2.0 | 53 | 48 | 42 |
| 2.5 | 41 | 35 | 28 |
| 3.0 | 29 | 22 | 13 |
| 3.5 | 17 | 9 | -1 |

Source: Authors Calculations

Note: Derived from the Gordon Formula. Dividends are assumed to grow in line with GDP, which the OCACT assumed in 1999 is 2.0 percent over the next 10 years and 1.5 percent for the long run; and in 2001, 2.3 percent and then 1.6 percent.

## Table 4

### Required Percentage Decline in Real Stock Prices Over the Next Ten Years to Justify a 7.0, 6.5, and 6.0 Percent Return Thereafter (End 2000)

## Under Current Projections

| Adjusted Dividend Yield | Long-run Return | | |
|---|---|---|---|
| | 7.0 | 6.5 | 6.0 |
| 2.0 | 53 | 48 | 42 |
| 2.5 | 41 | 35 | 28 |
| 3.0 | 29 | 22 | 13 |
| 3.5 | 17 | 9 | -1 |

## GDP Growth 0.3% Higher Each Year

| Adjusted Dividend Yield | Long-run Return | | |
|---|---|---|---|
| | 7.0 | 6.5 | 6.0 |
| 2.0 | 48 | 43 | 36 |
| 2.5 | 35 | 28 | 20 |
| 3.0 | 23 | 14 | 4 |
| 3.5 | 10 | 0 | -12 |

Source:  Authors Calculations

Note: Derived from the Gordon Formula.  Dividends are assumed to grow in line with GDP, which the OACT assumes is 2.3 percent over the next 10 years.  For long-run GDP growth, the OACT assumes 1.6 percent.