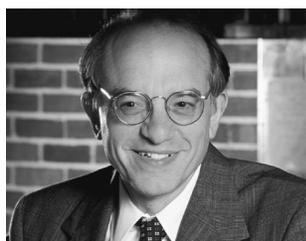


THE RISE IN STOCK VALUATIONS AND FUTURE EQUITY RETURNS

By Jeremy J. Siegel, Ph.D.



Celebrated scholar Professor Jeremy Siegel examines what caused the recent rise in the P-E ratio, the most basic and fundamental yardstick for valuing stocks, and whether that rise is justified by fundamental changes that have taken place in the economy, the equity markets, and investors' attitudes.

The great bull market of 1982 through 1999 witnessed the largest increase in total real stock returns in U.S. history. Real returns on equities averaged 13.6 percent per year during these eighteen years, nearly double the 7 percent real return that has characterized the last two centuries of U.S. stock market returns.

Increases in stock prices during this bull market far outstripped the rise in corporate profits. Despite the fact that real per-share earnings more than doubled, real stock prices increased nearly six-fold. By year 2000 the valuation of share prices relative to every traditional measure of firm value—earnings, dividends, sales, book value, replacement cost—had reached historic highs.

Many investors and analysts believed these high valuations were warranted because the U.S. was entering a new era of rapid technological change that would generate ever-rising corporate profits and stock prices. Investors' enthusiasm, especially for technology stocks, peaked in March 2000 when six out of the top twenty most valuable firms in the U.S. had price-to-earnings ratios in excess of one hundred, a level that no other large firm had ever reached before.¹

Despite the subsequent crash of the technology

sector, the economic recession, the terrorist attacks, and the Enron crisis, investors' enthusiasm for equities has not waned, and valuations have remained very high by historical standards. These rich prices have caused justifiable concern among many analysts as to whether future real stock returns can match their historical average of 7 percent per year. It is the purpose of this article to address that question by both examining what caused the recent rise in the P-E ratio and determining whether that rise is justified by fundamental changes that have taken place in the economy, the equity markets, and investors' attitudes.

Price to Earnings Ratio

The most basic and fundamental yardstick for valuing stocks is the *price-earnings ratio*. Figure 1 depicts the P-E ratio since 1870 on the S&P 500 index (or, before 1957, on the Standard and Poor Composite Average or a comparable group of stocks). The P-E ratio is computed for three earnings measures: (1) the last twelve months of GAAP (Generally Accepted Accounting Principles) reported earnings, (2) a centered five-year moving average of GAAP reported earnings, and (3) a centered five-year moving average of *operating* earnings.

Three approaches to valuation are shown because there is considerable debate about the best measure. Some economists have claimed that the P-E ratio based on a moving average of earnings is a better gauge of stock valuation since it eliminates the distortions in the raw data caused by recessions that temporarily depress earnings.² Centered moving averages take into account forecast as well as past earnings. In the last decade, analysts have often employed *operating earnings* (which exclude special charges such as restructuring, write-offs, etc.) to judge valuations instead of reported earnings.³

Figure 1 clearly shows that over the past several years, the P-E ratio on stocks has reached historically high levels, especially when calculated using past twelve months of reported earnings. The average P-E ratio based on reported earnings over this 131-year period has been 14.50, but the

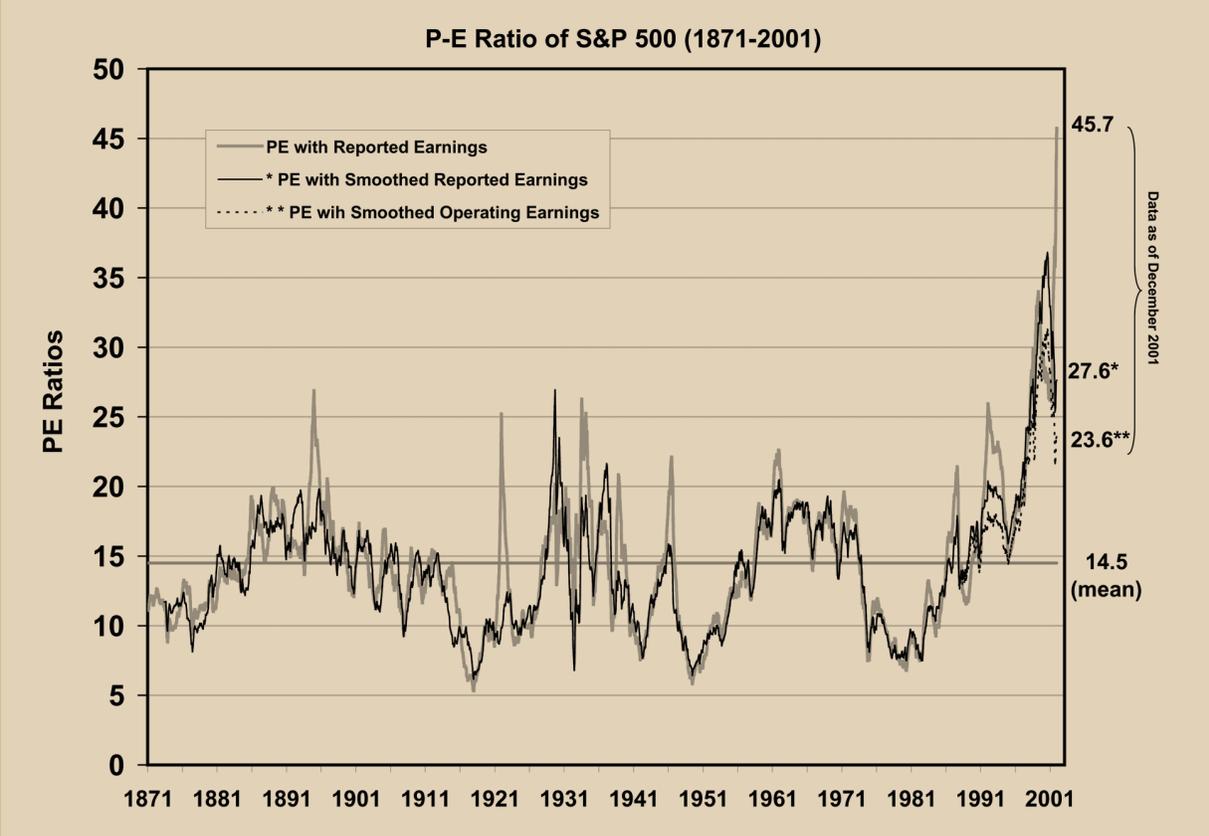
ratio reached the thirties in 1999 and soared above forty by the end of 2001.

P-E ratios based on smoothed earnings are lower, but current levels rival or exceed the highs reached at the peak of the 1929 bull market. These data have led a number of economists and money managers, such as Shiller (2000), Grantham,⁴ Smithers (2000), and Asness (2002) to conclude that the stock market is significantly overvalued, and that much lower, and perhaps even negative, equity returns are likely for many years into the future.

The P-E Ratio and Historical Stock Returns

The P-E ratio has a fairly good record of forecasting future equity returns in the long run. This is because the inverse of the P-E

Figure 1: P-E Ratio of S&P 500 (1871–2001)



ratio, called the *earnings yield* is analogous to the *current yield* on a bond. The current yield on a bond measures the ratio of the “coupon,” or cash received per year to the price paid. The earnings yield on a stock is the annual earnings per share divided by the price and measures the cash return that a stockholder would receive if all earnings were paid out as dividends.

But an important difference between stock and bond investors is that stockholders have ownership in the underlying assets of the firm. Although some firms may have difficulty passing on higher costs to customers in the short run, over the long run, the assets of the firm, which include physical and intellectual properties, tend to rise and fall in value with the general level of prices.

Therefore, the earnings yield on stocks is properly considered a *real* or inflation-adjusted return, especially when used for long-range forecasts. This contrasts to the *nominal* return earned from standard bonds, where all the payments are fixed in money terms and do not vary with inflation.⁵

The long-run data bear out the contention that the average earnings yield on the stock market is a good long-run estimate of *real* stock returns. The 14.50 average P-E ratio from 1871 through 2001 corresponds to an average earnings yield of 6.9 percent. This earnings yield almost exactly equals the 6.8 percent real return that stockholders have earned over the same period. Shiller and Campbell (1998, 2001) find that the earnings yield was a good predictor of ten-year real stock returns using a P-E ratio based on the average of the past ten years of earnings.

If the P-E ratio is a good long-term predictor of future stock returns, then the high P-E ratios of recent years portend poor future returns for stocks. P-E ratios of twenty to twenty-five that have been calculated from forecast operating earnings in 2002 predict future real equity returns of only 4 to 5 percent per year. Although these real returns may be higher than those currently expected on government bonds (both standard and inflation-indexed), they are significantly lower than what stockholders have received in the past.

Common Explanations of Higher Stock Valuations

The record high stock valuations have prompted equity investors to search for reasons to justify these high prices. The two most prominent explanations offered are (1) low interest rates and low inflation, and (2) faster economic growth. Unfortunately, both of these rationales are nowhere near as strong, either theoretically or empirically, as their supporters claim.⁶

It is true that bonds are the major asset class that competes with stocks in an investor's portfolio, so one might expect that low interest rates would be favorable for stocks. But since in the long run low interest rates are caused by low inflation, low interest rates imply that the rate of growth of earnings, which depends in large part on the rate of inflation, will be lower also. Over long periods of time, changes in the inflation rate cause changes in earnings growth of the same magnitude and do not change the valuation of stocks.

This proposition is borne out by the historical data. The 13.8 average P-E ratio for stocks in the late nineteenth century and first half of the twentieth century was essentially the same as the 14.1 P-E ratio from World War II to 1997. Before the war, however, there was very little inflation, and interest rates were quite low; since the war, both inflation and interest rates have been significantly higher. If the recent decline in interest rates is a valid argument for high stock valuations, the prewar era should have witnessed a P-E ratio that was higher than the postwar era, but that was not the case.⁷

Faster Economic Growth

The second reason often given for higher P-E ratios relies on the belief that accelerating productivity gains will drive economic growth, and thus earnings growth, to higher levels. Since stock prices are the present value of future dividends, it would seem natural to assume that economic growth would raise future earnings and dividends and be an important factor influencing stock prices.

But this is not necessarily so. The determinants of stock prices are earnings and dividends calculated on a *per-share* basis. Although economic growth influences *aggregate* earnings and dividends favorably, economic growth does not necessarily increase the growth of per-share earnings or dividends.

The reason for this is that economic growth requires increased capital expenditures, and this capital does not come freely. Implementing and upgrading technology require substantial investment. These expenditures must be funded either by borrowing in the debt market or by floating new shares.⁸ The added interest costs and the dilution of profits that this funding requires often offset the extra revenue that such growth achieves.

Many investors believe that investment in productivity-enhancing technology can increase profit margins and spur earnings growth to permanently higher levels. But “cost-saving investments,” frequently touted as a source of increasing profit margins, only temporarily impact bottom-line earnings. As long as these investments are available to other firms, competition will force management to reduce product prices by the amount of the cost savings, and extra profits will quickly be competed away. In fact, capital expenditures are often undertaken not necessarily to *enhance* profits, but rather to *preserve* profits when other firms have adopted competitive cost-saving measures.

The data on economic growth and earnings back up these points. Real per-share earnings growth from 1871 through 2001 has been a paltry 1.25 percent per year, considerably below the nearly 4 percent growth rate of real GDP.⁹ Because of the requirement to fund capital expenditures, the growth of earnings per share falls far behind aggregate economic growth over the long run. In fact, the 1.25 percent growth in real per-share earnings can be explained solely by the investment of retained earnings and not by aggregate economic growth.

If neither lower interest rates nor faster economic growth are satisfactory justifications of higher stock valuations, then investors must look for other explanations. It turns out that there are valid reasons for the increase in P-E ratios. These

reasons recognize the changes in the business cycle, taxation, and the liquidity of stocks as well as the awareness of the investing public of the superior historical returns to equity.

The Return on Equity and the Equity Premium

Before exploring these factors, it is important to consider whether the extra return that investors have earned historically on stocks above those on government bonds—called the *equity premium*—has been justified on the basis of the risks of stock ownership. The real returns on long-term government bonds have averaged 3.5 percent over the past two hundred years, about one-half the 7 percent return enjoyed by stocks. Therefore, the equity premium has averaged about 3.5 percent per year over the past two centuries. Over the past fifty years, primarily because the real return on bonds has fallen, the equity premium has averaged nearly 6 percent.

In 1985, just a few years after the great bull market in stocks began, economists Rajnish Mehra and Ed Prescott published a paper entitled “The Equity Premium Puzzle.”¹⁰ In their work they showed that the standard models of risk and return that economists had developed over the past generation could not explain the high level of the equity premium. They claimed that either the rate of return on stocks should be lower, or the rate of return on fixed income assets should be higher, or both. In fact, their studies justified an equity premium as low as 1 percent or less.¹¹

Mehra and Prescott were not the first to note that stock returns appeared to be “too high” in relation to the return on other financial assets. In 1937, Alfred Cowles III, founder of the Cowles Commission for Economic Research, constructed capitalization-weighted stock indexes back to 1871 of all stocks traded on the New York Stock Exchange. Cowles examined stock returns including reinvested dividends and concluded:

During that period [1871–1926] there is considerable evidence to support the conclusion that stocks in general sold at about three-quarters of their true value as measured by the return to the investor.¹²

Later researchers also found that historical equity returns were very high compared to those obtained by holding risk-free assets. The works by Fisher and Lorie in 1964, Ibbotson and Sinquefeld in 1975, and my own book, *Stocks for the Long Run*, first published in 1994, strongly supported the case for long-term equity investment.¹³

One explanation, therefore, for the rise in the level of equity prices relative to economic fundamentals is the recognition by investors that stocks were in fact underpriced during most of their history. This means that historical P-E ratios are not the correct yardstick to judge future ratios. As investors have learned of the favorable returns on stocks, they have priced equities at higher levels.

This underpricing of equities in earlier years resulted from several factors. Clearly one was the ignorance of investors of the true long-term risk and return characteristics of stocks. To ordinary investors, stocks appeared much riskier than the long-term data suggest. Investors had no knowledge of the now-considerable evidence that stock returns display *mean reversion*, a phenomenon that makes the long-term risk of holding stocks not as high as predicted by examining their short-term volatility.¹⁴ Until recently, the data on historical returns that make such a compelling case for owning stocks was not widely disseminated.

Drop in Transactions Costs

Another factor contributing to the underpricing of equities was the high cost of acquiring and maintaining a diversified portfolio of equities. The returns calculated from stock indexes were abstractions that could not be duplicated by the average investor.

The recent increase in the liquidity of stocks and the concomitant drop in transactions costs have enabled stockholders to diversify portfolios and are an important factor increasing share prices. Charles Jones of Columbia University has documented the precipitous fall in the costs of trading stocks over the last century.¹⁵ These costs include both the fees paid to brokers and the “bid-asked spread,” or the difference between the buying and selling price. His analysis shows that the average one-way cost to either buy or sell a stock has

dropped from over 1 percent of value traded as late as 1975 (before the deregulation of brokerage fees) to under 0.18 percent today.

The collapse of transactions costs over the past two decades means that stockholders can now obtain a completely diversified portfolio at an extremely low cost.¹⁶ It has been well established that liquid assets, i.e., assets that can be sold quickly in the public market and at little cost on short notice, command a premium over illiquid securities.¹⁷ Through most of the past two centuries, stocks were far less liquid than today and therefore sold at a significant discount to such safe and liquid assets as government bonds. As stocks become more liquid, their price relative to earnings and dividends should rise.¹⁸

Increased Stability of the Economy

The drop in transactions costs and the recognition of the superior historical returns on equities are not the only reasons why stock valuations should be higher. The increase in the stability of the overall economy has played an important role in boosting stock prices. Although policymakers have not been able to completely eliminate the business cycle (and probably never will), the central bank and fiscal authorities have been able to avoid the sharp swings in real output and inflation that in the past made stocks far riskier investments.

One could counter that if the real economy is more stable, why has there not been a trend toward more stable stock returns? It is true that the volatility of equity returns has remained relatively constant over time despite the greater stability of the overall economy. One reason for this is that firms have taken advantage of the increased economic stability to leverage their equity stake, capitalizing on the gap between the cost of borrowing and the return on equity. The increased leverage adds an extra layer of risk to equity returns, largely nullifying the effects of the economy's stability.

But greater economic stability has another, perhaps more important, implication for equity prices. Greater economic stability means that *labor* income, which is about three-quarters of all national income, has become more stable. Workers

can therefore be persuaded to put a larger share of their savings in riskier assets such as equities since they feel more confident of their employment.¹⁹ The strong gains in share ownership over the past decade were aided immeasurably by the public's justifiable confidence that the government could avoid periods of severe unemployment and would establish a safety net, such as unemployment compensation, for those who lost their jobs.

As a consequence, the average worker is willing to take investment risks in stocks that would have been considered unthinkable in the nineteenth and early twentieth centuries. Safe assets, such as government bonds, therefore lose their appeal relative to riskier assets, such as equity, thereby raising the level of stock prices and lowering the equity premium.

Tax-Induced Changes in Equity Valuations

Over the past twenty years there have been substantial changes in the effective taxability of equity returns, and most of these have been very favorable to stockholders. One very beneficial tax development has been the drop in inflation.

In the United States, capital gains taxes are paid on the difference between the cost of an asset and the sale price, with no adjustment made for inflation. Investors must pay taxes on any gain in price, whether or not they have realized any *real* gain. This means that an asset that appreciates by less than the rate of inflation, producing a real loss, will nevertheless be taxed upon sale.

Even though there is overwhelming evidence that the *before-tax* real return on equities has remained constant over long periods of time, inflation dramatically alters the after-tax real return. For even a moderate inflation of 3 percent, a taxable investor in the 28 percent tax bracket with a five-year average holding period suffers a 50 basis point reduction in real return compared to the case when there is no inflation. If inflation rises to 6 percent, the loss in annual return is more than 94 basis points.²⁰ Furthermore, the inflation-tax is more severe the shorter the investor's holding period because turning over stocks more frequent-

ly gives the government more opportunities to collect the tax on nominal capital gains.

The reduction in inflation over the past decade has not been the only favorable tax development for stockholders. Another beneficial change is the reduction in the capital gains tax. The current capital gains tax of 20 percent on stocks held over one year and 18 percent on stocks held more than five years is the lowest tax rate since 1941.

A third favorable tax development involves the shift in the composition of stock returns away from taxable dividends and to capital gains. This shift is motivated not only by the low capital gains tax rate, but also by the proliferation of employee stock options. Since the value of these options is related only to the price of the shares, this motivates management to boost share price by repurchasing stock instead of paying dividends.²¹ Taxes and employee stock options are major reasons why the dividend payout ratio of corporations has fallen to an all-time low of 32 percent in recent years.

The reduction in inflation, the shift from dividends to capital gains, and the reduction in the capital gains tax have been very important factors boosting the after-tax return on equities. The changes in these variables have added about 1.5 percentage points to the after-tax return of taxable investors compared to the return under the average levels of these variables over the past fifty years.²² Furthermore, the proliferation of tax-deferred accounts, such as IRAs, 401(k) plans, and Keoghs, has dramatically increased the tax-free accumulations in equity.²³

The "Age Wave" and Stock Valuations

One explanation of the high valuations of equities is focused on the massive demographic shift that is impacting not only the U.S. but all developed countries.²⁴ The "age wave" theory of stock valuation states that the "baby boomers," a very large bulge in the population born between 1946 and 1964, are now in their peak earnings and saving years. The accumulation of their retirement nest eggs necessitates the accumulation of assets and sends their valuation upward.

However, the age wave theory of stock prices

has a dark future. As these boomers retire, they will be forced to sell their stocks to finance their retirement. Because of a demographic mismatch, there are an insufficient number of “generation Xers,” born after the boomers, to absorb the stock sold by the boomer generation. The prospective sales by the boomers will drive equity prices and valuations decidedly downward, precipitating a massive bear market.

The age-wave theory of stock prices does have some theoretical support. Demographic trends could cause changes in discount rates that lead to swings in market prices. But the demographic trends noted above are too narrowly focused. They ignore the fact that outside of the developed world, which has less than 20 percent of the world’s population, there is no age wave or demographic mismatch at all. Furthermore, the critical question is not the *number* of people in the post-baby-boom generation, but their wealth, a variable that is greatly impacted by future productivity growth. If generation Xers are sufficiently productive, their income may be great enough to acquire boomers’ assets at reasonable prices. Finally, there is an implicit assumption that the bulk of wealth of the boomers will be *sold* to the next generation instead of *bequeathed*. To the extent that the baby-boom generation desires to leave a legacy to the next generation, the demographic-based stock market cycle disappears.

Finally, the savings from the boomers should have flowed not just into stocks but into *all* assets, such as bonds, real estate, precious metals, and even money markets. Yet equities have enjoyed by far the greatest returns. This suggests that there must be some special reasons other than demographics why boomers have favored stocks over other assets.

New Justified P-E ratios

What do all these developments mean for stock market valuation? First, they mean that the average historical P-E ratio of fourteen or fifteen is no longer appropriate in today’s market. It is not possible to quantitatively analyze how all the factors noted above impact the P-E ratio. However, there are some factors for

which good estimates can be derived.

Economic theory indicates that the price of stocks should be set so that the *after-tax* return is equated to the rate of return required by investors, adjusted for the appropriate level of risk. This means that investors will bid up or down stock prices in response to changing taxes, transactions costs, and other factors noted above, to bring future expected stock returns in line with those required by stockholders.²⁵

It was noted that the reduction in inflation, the capital gains tax, and the switch from dividends to capital gains have boosted after-tax returns by about 150 basis points compared to the average level over the past fifty years. It can be shown that a P-E ratio in the low twenties will yield a long-term real return on stocks (based on the earnings yield) that is identical to what a 14.5 P-E ratio would yield when inflation was higher and taxes were not as favorable toward stocks.

It is true that the assumption that investors demand the same after-tax real return whenever taxes and inflation changes may overstate their impact on the P-E ratio. This is because real returns on competing assets may not remain constant when these tax factors change. Nevertheless, this estimate ignores the impact of other favorable factors noted above, such as the greater stability of the economy, reduced transactions costs, and the increased demand for stocks generated by the investors’ recognition of the superior past returns for stocks.²⁶ Therefore, the low twenties is a reasonable estimate of the current justified P-E ratio of the market given all the factors impacting stock valuations.

Implications for Future Equity Returns

Although most investors welcome news that the stock market is deserving of higher P-E ratios, many are not ready to accept the consequence of lower future returns that necessarily attends this development. All the factors that make stocks more attractive, such as lower economic risk, higher liquidity, more favorable tax treatment, and investors’ knowledge of the superior past returns, also mean that stocks will not be

able to command the same outsized returns they have earned in the past.

This conclusion is not new. In 1937, Professor Chelcie Bosland of Brown University stated that one of the consequences of the spread of knowledge of superior stock returns in the 1920s would be a narrowing of the equity premium. He stated:

Paradoxical though it may seem, there is considerable truth in the statement that widespread knowledge of the profitability of common stocks, gained from the studies that have been made, tends to diminish the likelihood that correspondingly large profits can be gained from stocks in the future. The competitive bidding for stocks which results from this knowledge causes prices at the time of purchase to be high, with the attendant smaller possibilities of gain in the principal and high yield. The discount process may do away with a large share of the gains from common stock investment and returns to stockholders and investors in other securities may tend to become equalized.²⁷

Are future real stock returns likely to be as low as the 4 to 5 percent predicted by a P-E ratio that ranges between twenty and twenty-five? In the very long run this is quite possible. But there are both favorable and unfavorable factors impacting equities over the next five to ten years that are likely to cause real stock returns to deviate from that predicted by their earnings yield.

Favorable Intermediate-Run Factors

The proposition that economic growth does not impact per-share earnings growth depends on the market value of the firm's capital equaling its replacement cost. Although this might be a good long-run characterization of the equity market, it is not generally true in the short run. It can be shown that when the market value of equity exceeds the replacement cost of capital, as prevails for the overall market in 2002, the earnings yield *underestimates* future returns.²⁸ This occurs because higher equity prices allow firms to fund capital expenditures by floating less

equity, thereby reducing the dilution that this investment entails.

Another factor reducing the costs of capital expenditures is ironically the same factor that caused the collapse of technology stocks. The *over-investment* in many technology areas, such as networking and telecommunications, has been extremely painful for the firms *producing* such technology, but it is ultimately favorable to those firms *using* this technology. The excess supply of capital lowers funding costs and may hasten faster earnings growth.

The current situation of overinvestment in telecommunications is comparable to the aftermath of the railroad mania that hit the United Kingdom in the 1840s and produced a tremendous overbuilding of rail lines. After the prices collapsed, the cheaper and faster transportation brought many benefits to the Victorian economy.²⁹

There are other factors favoring equities in the short run. The U.S. is still viewed in the global economy as the center for entrepreneurship and the incubator of new technology. Financial and intellectual capital are flowing into the United States from abroad as the openness and flexibility of the U.S. economy are seen as a magnet for the type of firms that will spur growth in this new century. This flow is enhanced since the economic policies of many developing countries do not promote stability or entrepreneurship. There is a large and growing stream of funds from abroad seeking safe haven, a factor that boosts U.S. equity prices.

Furthermore, there is still room for U.S. corporate profits to grow without distorting the returns to capital and labor. The share of corporate profits relative to national income was only slightly above its historical average in year 2000, before the recession. But the total return to capital, including corporate profits and proprietors' income, has declined relative to income and is now significantly lower than its postwar average. As a result, *total* capital income does not appear especially high, and this leaves corporate profits with room to grow before impinging significantly on the share of labor income in our national accounts.

Unfavorable Intermediate-Run Factors

Yet one can point to negative short-term factors impacting stock returns. The quality of earnings has undoubtedly declined over the past several decades. It is not only the Enron affair where illegal concealment of debt is alleged, but in the legal concealment of the costs of employee stock options, the lax treatment of inventory losses, and other special charges that bias earnings upward. (Although one can point to the overexpensing of research and development as a countervailing downward bias.)

The decline in the dividend yield, although a favorable development from a tax standpoint, could be unfavorable if firms are not reinvesting their earnings profitably. There is considerable economic literature that claims that cash flows not committed to shareholders or debtholders may be uneconomically employed—used for expansion, acquisitions of firms, and other pursuits that are more in the interest of management than shareholders.³⁰

Furthermore, the increase in corporate leverage, which for many firms is a rational response to the increased stability of the economy, has already led to some high-profile bankruptcies. With inflation at extremely low levels, firms cannot count on rising prices to reduce the burden of indebtedness.

Perhaps the greatest threat to the market's intermediate-term performance could arise from the disappointment of investors who are expecting higher returns than the stock market can deliver. As noted at the onset of this article, stock returns from 1982 through 1999 ran at about double the long-term average. For many investors, the period since 1982 encompasses their entire investing experience. It is easy to understand why so many stock investors believe that 15 percent or even 20 percent annual returns are likely in the future.³¹ If real stock returns revert to their 7 percent mean or lower, some investors will sell equities, searching (probably in vain) for other asset classes whose returns match their past experience with stocks. If disenchantment becomes widespread, stocks could fall to an undervalued position.

Conclusion and Future Equity Returns

The P-E ratio has been a valuable predictor of long-term real equity returns. The historical average P-E of fourteen to fifteen corresponds to the 6.8 percent real return earned by stockholders over the past one hundred thirty years. But there is much evidence to suggest that that average is not an appropriate level today. Reductions in equity taxes, lower transactions costs, greater economic stability, and the general recognition that equities were historically underpriced should lead to substantially higher levels of valuation. Although it is impossible to quantify all the factors impinging on stock prices, those that can be evaluated suggest the appropriate level of stock prices of between twenty to twenty-five times earnings.

Although these valuations forecast long-term real returns of only 4 to 5 percent based on the earnings yield analysis, I believe that there are on balance positive forces impinging on stock prices over the next decade that will boost their returns above this level.

Despite the collapse of the technology bubble, the U.S. is the crucible for entrepreneurial talent that has the capability of generating significant future returns for stockholders. If the U.S. maintains this first-mover advantage, it will be able to extract profits from the rest of the world until the competition catches up. Transactions costs are likely to fall further, and taxes on equity returns may become even more favorable as the political power of the stockholder class increases. All these factors will boost equity returns.

Nevertheless, I predict that annual stock returns over the next five to ten years will be 5 to 7 percent above inflation, somewhat below their long-term average, but above that predicted by their earnings yield. As long as investors are not discouraged by these lower returns, stocks should sell at twenty to twenty-five times earnings. With real returns on Treasury inflation-indexed bonds at 3 to 3.5 percent and those projected for standard Treasury bonds even lower, stocks should easily outperform high-grade, fixed-income securities.

Although equity returns will be considerably below the level of the past two decades, I believe they will be significantly above the levels predicted by the pessimists who believe the market is dangerously overvalued.

Endnotes

1. These six were Cisco, Sun Microsystems, Oracle, Nortel, EMC, and AOL. See “Big Cap Stocks Are a Sucker’s Bet,” *Wall Street Journal*, 14 March 2000, A30.

2. This technique is motivated by Robert Shiller, who ascribes it to Graham and Dodd (Shiller [2000], p. 7).

3. The gap between operating and reported earnings was especially wide in the 2001 recession. Generally, operating earnings is a better measure of ongoing, sustainable earnings although many firms have taken too much liberty with subtracting inventory and other repetitive losses.

4. See “Dialogues” by Larry Siegel, editor of *Investment Policy* 1 (May/June 1998): 31–64.

5. Inflation-indexed bonds, which the U.S. government first floated in January 1997, combine the protection against inflation with a guarantee of the U.S. government and are the best estimate of the current real risk-free rate.

6. It turns out that in the U.S. over the past fifty years, low inflation is good for stock investors because of the way that the U.S. tax system penalizes capital gains caused by inflation. This explanation is wholly different from the reasons offered by most investors for why low interest rates are good for stocks.

7. For research claiming that investors wrongly discount dividends at the nominal rather than the real rate of interest, see F. Modigliani and R. Cohn, “Inflation, Rational Valuation, and the Market,” *Financial Analysts Journal* 35 (March/April 2000): 24–44, and J. Ritter and Richard Warr, “The Decline of Inflation and the Bull Market of 1982 to 1999,” *Journal of Financial and Quantitative Analysis* 37 (March 2002): 29–61. Also see Clifford S. Asness, “Stocks versus Bonds: Explaining the Equity Risk Premium,” *Financial Analysts Journal* 56 (March/April 2000): 96–113 for another reference on the relation (or lack thereof) between interest rates and stock prices.

8. If these expenditures are funded from retained earnings, then current dividends must be cut.

9. See Jeremy J. Siegel, *Stocks for the Long Run*, 3rd ed. (McGraw-Hill, 2002), chap. 6.

10. Rajnish Mehra and Edward C. Prescott, “The Equity Premium: A Puzzle,” *Journal of Monetary Economics* 15 (March 1985): 145–62.

11. Mehra and Prescott used the Cowles Foundation data going back to 1872. In their research they did not mention the mean reversion characteristics of stocks that would have shrunk the equity premium even more.

12. Alfred Cowles III and Associates, *Common Stock Indexes 1871–1937* (Bloomington, Indiana: Principia Press, 1938): 50.

13. See *Stocks for the Long Run*, 3rd ed., 2002, chap. 5, for a review of these works.

14. See *Stocks for the Long Run*, 3rd ed., 2002, chap. 2. Also, see Luis M. Viceira and John Y. Campbell, *Strategic Asset Allocation: Portfolio Choice for Long-Term Investors* (Oxford University Press, 2002).

15. Charles M. Jones, “A Century of Stock Market Liquidity and Trading Costs,” working paper, June 2000.

16. The cost of some index mutual funds or exchange-traded funds is less than 0.2 percent per year for even small investors.

17. Y. Amihud and H. Mendelson, “Asset Pricing and the Bid-Asked Spread,” *Journal of Finance* 46, no. 4 (1991): 1411–25.

18. See John B. Carlson and Eduard A. Pelz, “Investor Expectations and Fundamentals: Disappointment Ahead?” Federal Reserve Bank of Cleveland, *Economic Commentary*, 1 May 2000.

19. See John Heaton and Deborah Lucas, “Portfolio Choice in the Presence of Background Risk,” *Economic Journal* 110 (January 2000): 1–26.

20. These returns are discussed in greater detail in chap. 4, *Stocks for the Long Run*, 3rd ed., 2002.

21. This could cause some unfavorable developments for shareholders, as noted later.

22. See *Stocks for the Long Run*, 3rd ed., 2002, chap. 4.

23. Ellen McGrattan and Edward Prescott, “Is the Stock Market Overvalued?” Federal Reserve Bank of Minneapolis, *Quarterly Review* 24 (fall 2000), provide another tax-motivated argument for high stock prices. They claim that the growing fraction of stocks held in tax-exempt form boosts their after-tax yield and stock prices.

24. See Harry Dent (1994) and, in Canada, David Cork, *The Pig and the Python* (Stoddart Publishing Co., Ltd., 1998).

25. Assume $r_t(T_t, P_t)$ equals the *before-tax* rate of return, dependent on tax parameters T and stock price level P at time t . Assume P changes as the tax parameters T change so that the *after-tax* real rate of return $r_t(T_t, P_t)$ is a constant, r^* . r^* , in turn, is dependent on the long-run growth characteristics and time

preferences of the economy. In this case the valuation level P_t can be derived as a function of T_t and r^* (see Prescott and McGrattan, 2000).

26. The drop in transactions costs could add almost 4 points to the justified P-E ratio based on an average three-year holding period.

27. Chelcie C. Bosland, *The Common Stock Theory of Investment* (New York: Ronald Press Co., 1937), 132.

28. The general formula relating the earnings yield to the expected return on equity, r , is $r = EY + g(1 - RC/MV)$, where EY is the earnings yield (inverse of the P-E ratio), and RC/MV is the ratio of the replacement cost of capital to the market value. As long as $RC/MV < 1$, then $r > EY$. See Thomas K. Philips, "Why Do Valuation Ratios Forecast Long-Run Equity Returns?" *The Journal of Portfolio Management* (spring 1999): 39–44.

29. See Edward Chancellor, *The Devil Take the Hindmost* (New York: Farrar, Straus and Giroux, 1999), chap. 5.

30. Michael C. Jensen, "The Agency Costs of Free Cash Flow: Corporate Finance and Takeovers," *American Economic Review* 76 (May 1986).

31. See "Expecting Lower Market Returns in the Near Term," The Vanguard Center for Retirement Research, The Vanguard Group, December 2001, and John B. Carlson and Eduard A. Pelz, "Investor Expectations and Fundamentals: Disappointment Ahead?" Federal Reserve Bank of Cleveland, *Economic Commentary*, 1 May 2000.

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