Expected Returns on Stocks and Bonds

Innovators must moderate their expectations.

Antti Ilmanen

The equity-bond risk premium—the long-run expected return advantage of stocks over government bonds—is one of the biggest questions in financial markets. The extent of the premium is widely debated, but it is reasonably clear that it declined in the first quarter of the 20th century to partly rebound in the first years of the 21st century.

One review provides a road map to the complex literature on the topic. We explain the key drivers of the risk premium and varying assumptions about them, letting investors themselves assess the long-run prospects for stocks versus bonds. Long-term government bond yields are known, while prospective equity returns are inherently less transparent and thus more open to question.

There is an ongoing shift in opinion about expected returns. Long-term equity premiums have traditionally been predicted from historical average asset performance assuming a constant risk premium, but today they are increasingly predicted with the help of dividend discount models, assuming time-varying expected returns.

We first review the historical average returns of major asset classes and explain why these are misleading guides for the future. Essentially, the double-digit returns of the 20th century were due to equities starting cheap and getting richer over time. Many investors extrapolated this past performance and expected (at least) as high future returns. Investors thus missed, first, the fact that a part of realized return was unexpected windfalls from rising equity valuation multiples, and, second, that when starting from high valuation levels it is not reasonable to

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EXHIBIT 1
Road Map to Equity Risk Premiums—Alternative Means for Assessing Levels

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EXHIBIT 2
Moving Average of 10-Year Stock Market Performance 1900-2001

Sources: Bloomberg L.P., Amstel priors correspondingly, Schiller website, and Schwab Charles Stock Barony.

Figure 2.3

The past has shown that high returns in the past are not indicative of future high returns. The study of historical patterns and market data can provide insights into the potential for future returns. The graph illustrates the moving average of 10-year stock market performance from 1900 to 2001, highlighting the variability and potential for future returns.

 PITFALLS OF BACKWARD-LOOKING RETURNS

The 20th century was the century of equities. Dimsom, Marsh, and Staunton [2002] review the 1990-2000

Winter, 2003

The absence of predictable valuation changes (often a good base case), feasible long-run equity return is the sum of dividend yield and a long-run earnings growth rate.1

We stress the distinction between two types of expected returns—objectively feasible long-run returns, and subjective return expectations—as well as the balance between them. Objectively high feasible returns are bullish for equities, while excessive subjective investor expectations are bearish, because high hopes make future disappointment more likely.

Neither expected returns can be directly observed, but we attempt to estimate them by analyzing historical returns, investor surveys, and market valuation indicators (see Exhibit 1). Surveys provide direct estimates of changing return expectations, but they may reflect biased-for returns as much as required returns.2

As of the time of writing in mid-2002, long-term bond yields are 4%-5%, and the DDM suggests feasible long-run equity returns between 5% and 8% (depending on input assumptions). There may still be an imbalance between the objective return prospects and subjective expectations that we put between 8% and 10%. The gap has narrowed significantly from the year 2000 when feasible returns were even lower (due to higher valuation multiples), while subjective return expectations were well into double-digits.3

winter, 2003
asset returns in 16 countries, and conclude that in all markets stocks handily outperformed bonds and cash.

We extend the data to include the 2001 experience, and discuss primarily the U.S. market history.

Even after large losses in the last two years, U.S. equities' average real returns over the 1900–2001 period are 6.5%, with excess return over long-term government bonds of 4.8 percentage points. Looking at just the 1950–1999 period, stocks did even better, outperforming bonds by 7.7 percentage points per year. For comparison, the excess return of equities over bonds was much thinner (0.5 percentage point) in the 19th century (1802–1899), while the realized average real equity return was similar (6.2%) (see Siegel [1998] and Amont and Benmecen [2002]).

Exhibit 2 plots the ten-year average compounded returns of stock/stock—comparing nominal returns, real returns, and excess returns over bonds. In some studies, equity performance is expressed in raw returns, while in others the inflation rate or long-term bond return (or short-term bill return) is subtracted from it. Another distinction is between compound (geometric) average returns and simple (arithmetic) average returns.

Given that the United States has been the world's most successful economy of the past two centuries, it is not surprising that real equity returns have been somewhat lower in most other markets. For example, the average real equity returns for the other G-5 markets over the 1900–2001 period range between 3.4% (Germany) and 3.8% (the United Kingdom). Hyperinflation experiences make excess stock returns versus government bonds harder to gauge.

Did Realized Returns Exaggerate Expected Returns?

A consensus is emerging that the high long-term returns on equities, relative to bonds, are unlikely to persist. The 20th century was favorable to stocks and unfavorable to bonds. Un Deferred valuations boosted ex post equity returns, while rising inflation expectations and real yields hurt bonds. Thus, the realized return gap almost surely exaggerates the expected return gap investors actually required (in the past, let alone after the decline in required returns).

• Various systematic biases make it likely that the publicized related equity market returns from historical studies exceed the returns that were anticipated—notably survivorship bias, easy data bias, and the so-called peso problem (see Dimson, Marsh, and Staunton [2002] and Fama and French [2002], among others).

• Survivorship bias raises the odds that we examine countries that have had good capital market performance (as the current G-5 is opposed to Russia, Austria-Hungary, India, Turkey, or Argentina).

• Easy data bias makes it likely that we start samples after annual events (war, hyperinflation, market closures), which often means that assets are cheap at the start of the period and that no comparable turmoil occurs again during the period.

• The peso problem literature recognizes that past U.S. market pricing was influenced by what could have happened but did not. With hindsight we know that the United States and its market economy survived two world wars, the Cold War, and the Great Depression, and did not suffer the hyperinflation, invasion, or other calamities of many other countries. This was not a forgone conclusion at the time, so it is little wonder that realized equity returns have been boosted by a repricing effect.

Despite these arguments, it is common to use historical excess returns as a proxy for the expected risk premium. Indeed this is the approach taken in most investment textbooks. Historical average returns equal expected returns, however, only if expected returns are constant, and if unexpected returns from midcycle value changes do not distort the within-sample results. Such valuation changes can materially impact average realized returns even over long sample periods—and indeed they have done so in the 20th century. Thus the crucial distinction between realized (ex post) average excess returns and expected (ex ante) risk premiums.

Bond investors understand better than equity investors the folly of extrapolating expected returns from past average returns drawn from a time when valuation levels had trended up or down. A rally—high realized returns—caused by falling discount rates will reduce future yields (feasible expected returns), rather than raise them. The example in Exhibit 3 shows that between 1992 and 2001 ten-year Treasury yields averaged 8.1%, but the realized annual return was 10.7% because the downtrend in yields (from 14.4% to 5.1%) added almost 3 percentage points of annual capital gains to the yield income. Using the 10.3% realized annual return or even the 8.1% average yield as an expected return proxy makes little sense.

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now that the yield is 5%. The transparency of market yields prevents bondholders from harboring excessive return expectations after a long bull market.

Exhibit 3 shows that the revaluation effect was even greater for equities. The earnings-to-price (E/P) ratio fell from 12.4% to 4.0% in 20 years; that is, the market paid 3.1 times more for a given amount of dollar earnings at the end of 2001 than at the end of 1981. This repricing explains almost 6 percentage points of the S&P 500's 15.5% realized annual return (11.8% real). Again, the realized average return clearly exceeds the forward-looking return that was feasible in the 1980s, let alone now. Unfortunately, most equity investors may have focused more on historical returns than on forward-looking returns.

Repricing: Valuation-Neutral Sample or Adjusted Realized Returns

If required returns vary over time, past average returns may be poor predictors of future returns. We try to recover the past average expected returns using two approaches—by selecting a sample period when valuation changes were minimal, and by adjusting realized returns for the estimated repricing impact.

We first focus on a relatively valuation-neutral sub-period—1960-2001. Realized average returns can be dominated by unexpected capital gains/losses even over long periods if markets undergo significant valuation changes. Indeed, starting from 1900 or 1950, D/P and E/P ratios have fallen dramatically, while bond yields have risen. These within-sample changes are much smaller between 1960 and 2001, which means that future expected return extrapolations from this subperiod should be less distorted.

The 3.3 percentage point excess return in the United States falls short of the 4.8 percentage points for the 1900-2001 period. During the same period, the excess returns in Germany and Japan (1.1 and 0.6 percentage points) are even smaller as real equity returns have been lower and real bond returns higher than in the U.S.

These average returns conceal significant time variation in market performance. Besides the equity correction of 2000-2002, these numbers show that equities can underperform long bonds over a period as long as a decade (Germany in the 1970s, Japan in the 1990s). In Japan, the realized excess return over the past 30 years is now negative. Because such a sustained underperformance did not take place in the United States in the last century, many investors took the idea of equities' long-run superiority too far, and believed that equities will always beat bonds over a 20- to 30-year horizon.

By now it is clear that all statements about the probability of stocks beating bonds were distorted by the favorable sample period, and that the outperformance odds are much slimmer now, given the narrowing equity-bond premium.

Alternatively, we can pick any sample period and adjust the returns for unexpected capital gains. Several recent studies take this approach, notably Dimson, Marsh, and Staunton [2002], Fama and French [2002], and Ibbotson and Chen [2002]. Each study uses a slightly different way to remove the impact of unexpected capital gains to recover the typical expected equity risk premium over the sample period. All three studies find (adjusted) expected equity-bond risk premium near 4 percentage points in the United States, averaged over very long histories.

Moving Toward Forward-Looking Expected Returns

Exhibit 4 shows how Ibbotson and Chen [2002] decompose the realized 75-year average compound stock.
market return of 10.7% into demanded or supplied parts. The total return is split either into:

- A sum of demanded returns on the assumption that sample averages capture required returns well (5.2% nominal, 5.5% ex post equity risk premium + 5.2% ex post risk of small investors). This is summed to:
- A sum of supplied returns (3.1% inflation + 6.3% real equity risk premium + 1.8% real earnings growth rate + 1.3% reinvestment risk + small investors’ required returns).  

The third column in Exhibit 4 removes from the supplied returns the unexpected reinvestment effect (1.3%). The result is the real earned return on 9.4% between 1926 and 2006, on average.

Analysts of past average levels can be a misleading guide for the future when current dividend yields and inflation expectations are much lower than the sample average. It misses the point that if expected returns and valuations vary over time, historical averages incorporate biased information about medium-term market prospects. Using severely the dividend yield and inflation expectations from mid-2002 together with the historical real earnings growth rate, in the spirit of the DDM, the prospective long-term equity market return is below 6%. The implicit equity-bond premium is about 1 percentage point.

The question marks in the last column in Exhibit 4 are related to debates that we review below.

The ongoing shift from constant risk premiums and rational investors to time-varying risk premiums and partly irrational investors means that forward-looking (ex ante) returns are gaining ground over historical (ex post) returns. This change is moderating experts’ and investors’ perceptions of prospective long-run equity returns and equity-bond premiums, given that the fourth column in Exhibit 4 (ex ante returns) is much lower than the first column (ex post returns).

Survey Evidence on Subjective Return Expectations

There is a dichotomy between objectively feasible return prospects and less rational subjective expectations. To provide direct evidence on subjective return expectations, Exhibit 5 summarizes survey views on nominal long-term equity returns from various sources. Private investors’ subjective return expectations were especially high in the late 1990s. Poterba [2001] quotes a broad Gallup poll from 1999 when the consensus of private investors expected 15% annual returns over the long term. Precisely those were deemed moderate expectations after five years of 20%-40% annual returns.

No follow-up surveys tell us how much these excessive expectations have fallen, but we would guess around 10%. Consensus forecasts in one-year-ahead surveys seem to center around 10% (but dropped to summer 2002 below 8%), while many U.S. pension funds continue to budget well over 10% annual equity returns.

Two surveys of different U.S. experts—finance and economics professors by Welch [2000, 2001] and CFOs and treasurers by Graham and Harvey [2001]—imply long-run equity returns of 8.5%-9% and stock-bond risk premium cutbacks of 3.5 to 4.5 percentage points. The equity return forecast in the CFO survey has stabilized at around 8.2% to 8.3% in 2002.
5.2%: these forecasts imply a stock-bond risk premium of 2.4 percentage points. Are these survey-based risk premium estimates useful proxies for the equity risk premium that the market requires? One can always question how representative any survey is of market views. More important, because of behavioral biases, survey-based expected returns may tell us more about hoped-for returns than about required returns.

Private investor surveys appear especially prone to extrapolation (high hopes after high returns). Witness the striking 95% correlation between the past year’s returns and next year’s expected returns in Exhibit 6. Even the expert surveys are not free from this bias, as consensus views of future risk premiums have edged lower amid poor market performance.

Given the tendency of investors to extrapolate from past returns, the danger of exaggerated expectations and the scope for subsequent disappointment were especially high after two decades of double-digit returns. To quote Dimson, Marsh, and Staunton [2002, p. 4]:

The most fundamental question of all is: Do investors realize that returns are likely to revert to more normal levels, or do current valuations embody exaggerated expectations based on imperfect understanding of history?

Survey data indicate that investor expectations have corrected lower in the past two years—but it is not possible to say whether the adjustment has gone far enough.

**How High Should the Equity-Bond Risk Premium Be?**

There is also a normative question about the appropriate size of the equity risk premium, but academic theories provide limited guidance. In the context of the capital asset pricing model, the required market risk premium
should reflect the price of risk (market risk aversion) and the amount of risk (stock market volatility). Other asset pricing models relate the required risk premium to asset return variances with consumption, instrinically the risk premium should be high for assets that perform poorly in bad states of the world when losses hurt most (economic downturns with high marginal utility and low consumption).

Given the low observed correlations between equity returns and consumption data, popular utility functions need extremely high risk aversion coefficients to justify the high observed equity risk premiums, see Mehra and Prescott [1985]. Academics have proposed various solutions to this equity premium puzzle—alternative utility functions and market imperfections—but there is little agreement on the topic.

While the academic consensus has been shifting from constant risk premiums to time-varying expected returns, opinions vary about the source of the variation: rational time variation in required risk premiums or irrational fluctuations in market sentiment. We believe that both matter.

Because stock prices can be viewed in discounted values of expected future cash flows, it is an accounting identity that higher stock prices and realized returns reflect higher earnings growth expectations or lower required returns. Both factors likely contributed to the run-up in stock prices in the 1990s. The growth optimism was based on a range of factors from real evidence on higher productivity to irrational hopes about the Internet and the new economy (see Aizenman [2004a] and Shiller [2000]).

Here we focus on a host of possible reasons for the 1990s fall in required equity returns:

- Declines in riskless Treasury yields that contributed to equity discount rates.
- Changing risk—Output volatility and earnings volatility have fallen during past decades; recessions are less frequent (as well as shorter and shallower); monetary and fiscal policies are more stable; improved regulatory and legal infrastructure makes bank transactions safer; and world wars and the Cold War are history.
- Changing risk aversion—Consumer surveys reveal a fall in perceived risk aversion that may be attributed to wealth-dependent risk tolerance or demographic developments. Lower risk and risk aversion are intertwined in many arguments.
- Higher realized volatility and market losses may temind investors of their risk aversion. Many authors contrast investor caution about equities after the depression of the 1930s with the market-dips-are-buying-opportunities mentality in the 1990s. The optimistic spin is that investors learned in the 1980s-1990s about the consistency of equity long-horizon outperformance, and that this learning enhanced investors' risk tolerance and thereby slimmed equities' required return cushion over less risky assets.

Lower trading costs, better market access, greater global diversification opportunities, and negative stock-bond correlations enabled investors to reduce the systemic risk in their portfolios, which in turn raised investors' willingness to take risks.

Some of these factors have reasserted since 2000. Although macroeconomic volatility remains low by historical standards, financial market volatility has been extremely high, and perceived risks have risen since September 11, 2001, and various corporate scandals. Stock falls in share prices certainly have reminded investors of the innate risks in equity investing and brought investors closer to their subsistence levels, thereby raising the risk aversion level. If investors perceived, say, a 2 percentage point equity-bond premium sufficient three years ago, we suspect they would now require twice as high a compensation for bearing equity risks. Finally, the latest declines in government bond yields appear related to bonds' safe-haven characteristics and should not help reduce the equity discount rates.

**SIMPLE VALUATION RATIOS AS EQUITY-BOND PREMIUM PROXIES**

A stock market's price-earnings (P/E) ratio is the most popular pure-equity valuation indicator. Similarly, the ratio of government bond yield (Y) over earnings yield (E/P) is the most popular relative valuation measure for the two major asset classes and thus a shorthand for the equity-bond premium. (Sometimes the earnings yield spread is used instead of the yield ratio, but the broad patterns tend to be similar.)

**Lower Bond Yields Explain Lower Earnings Yields**

Exhibit 7 shows the history of earnings yield and the ten-year government bond yields for over one century. We focus on the earnings yield rather than its reciprocal.
EXHIBIT 7
Earnings Yield of S&P 500 (Operating Earnings) and 10-Year Treasury Yield, 1960–June 2002


EXHIBIT 8
Bond-Earnings Yield Ratio and Bond-Stock Volatility Ratio, 1900–June 2002

Source: Bloomberg, NBER, Amstat, and Salomon Smith Barney.

(P/E), because the former is a rate of return measure, akin to a bond yield. Unless otherwise stated, our earnings yield refers to the trailing one-year operating earnings per share of the S&P 500 index and its predecessors. The broad picture is that the earnings yield has ranged between 4% and 15%, but has been near historical lows for the past few years. Bond yields traded between 2% and 6% for the first 70 years, then hit a 16% peak in the early 1980s, followed by a decline to 4%-5% in 2002. Bond yields traded systematically below earnings yields for most of the century, but traded above them for the last two decades. The measures at the foot of the graph show the timing of the increasingly rare official recessions.

While earnings yields and bond yields were hardly related until 1960, since then they have shared common trends and downturns. Exhibit 8 plots the yield ratio of the Treasury yield over the earnings yield. This ratio is high when stocks are expensive versus bonds, in the sense that bond yields exceed earnings yields.

For the last 20 years, this ratio has been nearly mean-reverting, providing good relative-value signals for asset allocation trades between stock and bond markets. Over this period, we can say that lower bond yields explain lower earnings yields (higher equity market valuations). This is not surprising, because bonds are the main competing asset class for equities, and the bond yield constrains the riskless rate of equities' discount rate.

But what are we to make of the long-run meds in the yield ratio? If we cannot explain them, we may deem the last 40 years' close relation between stock and bond yields spurious, perhaps related to the broad rises and falls in inflation.
Lower Relative Risk of Stocks versus Bonds Explains the Long-Run Puzzle

The yield ratio series was relatively trendless in the first half of the 20th century but clearly upward-trending in the second, signaling relative thinning of stocks versus bonds. As noted at [2008], we propose an appealing explanation for the long upward trend in the yield ratio: The relative risk of bonds versus stocks has grown over time.

The thin line in Exhibit 8 shows the relative return volatility of ten-year government bonds and the stock market index, measured by ten-year moving standard deviations. In the first half of the century, stock market returns were about seven times as volatile as bond returns. By the 1980s, relative volatilities were virtually equal—although subsequent disinflation has reduced bond volatility to about half of stock market volatility.

The trend increase in the volatility ratio reflects an increase in bond volatility, particularly in the 1970s-1980s, and a decline in stock volatility since the 1930s. The related underlying macroeconomic trends are:

- Growing inflation uncertainty associated with the persistent rise in inflation until the early 1980s.
- More stable real growth, as evidenced by lower volatilities in real output and earnings growth rates and by less frequent, shorter, and shallower recessions.

Changing relative risk between asset classes is a structural change that undermines the usefulness of valuation signals like the yield ratio. This ratio will serve well as a mean-reverting signal within any one regime, but typically gives a wrong value signal when a structural change occurs.

How to watch out for those structural changes?
One guideline is the relative importance of long-run inflation and growth risks.

- If central bank credibility and other arguments, for example, convince people of future inflation stability, and thus of relatively higher real growth risks, relative bond-stock volatility may again shift lower. Such a change should favor bonds and perhaps move the yield ratio back below unity in the medium term. Exhibit 8 shows a reversal in the volatility ratio in the past 15 years but not yet any trend reversal in the yield ratio. (In third quarter 2002, the yield ratio did fall below unity; however.)

- As in more current example, we think that in the world after September 11, 2001, with heightened security concerns and policy uncertainties, both growth and inflation risks have increased. It is less clear which has increased more, making the impact on the yield ratio debatable.

- Deflation would arguably reduce the required bond risk premium and raise the required equity risk premium. Thus, inescapable deflation should systematically reduce the yield ratio.

Drivers of Earnings Yields

Since stock prices reflect the discounted values of expected future cash flows, it is an accounting identity that low earnings yields (high P/E ratios) reflect some combination of low discount rates and/or high expected earnings growth rates.

Like many others, we find that various growth indicators are only loosely related to earnings yield fluctuations and that P/E ratios have only a modest ability to predict subsequent earnings growth. Discount rate effects may reflect the riskless yield component or the required equity-bond risk premium. The sensitivity of earnings yields to nominal bond yields can be traced back to expected inflation rates or required real bond yields. Historical analysis suggests that earnings yields have been more closely related to inflation than to any other series, including nominal or real bond yields.

Exhibit 9 depicts the relation between U.S. earnings yields and the previous three years' average inflation. There is a similarly close relationship in other countries, including Japan.

A high correlation between earnings yields and inflation rates may be surprising, because the E/P/P is supposed to be a real variable. The textbook view is that stocks are real assets since higher inflation should be fully compensated by higher nominal earnings growth rate, with little impact on the stock price or the D/P or E/P ratios.

What explains this anomalous correlation? Here are the main candidates, all of which may contribute:

- Inflation may impact real earnings growth prospects—steady low-but-positive inflation appears to be the optimal environment for real growth.
- Inflation may raise prospective real returns because irrational money illusion makes equity markets undervalued (overvalued) when inflation is high (low).

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EXHIBIT 9
Dependence of Earnings Yields on Inflation Level—1900-2001

- Inflation may raise required real returns on bonds and equities (real dividend risk).

We can explain the bulk of the past 50 years’ variation in earnings yields by just two factors: inflation level, and output volatility (see Bernstein [1999], Wrosch [2001], and Lowen [2002]). The rise and fall in inflation explain the humped shape (20-year rise in earnings yields before 1980 and 20-year fall thereafter), while the trailing volatility of GDP growth rates (or earnings growth rates) explains the general downward trend.

By the end of the century, equity markets benefited from low levels in both factors, in addition to a record-long expansion, productivity optimism, and high risk tolerance after a persistent bull market. No wonder that irrational exuberance and overshooting valuations followed.

The good news is that at least part of the multiple expansion is fundamentally justified. Above-average P/E levels may then be sustainable (as long as inflation stays at the apparently optimal level for equities, near 2%-3%, and macroeconomic stability rather than equity volatility drives equity investors’ risk aversion). Yet, many observers appear to forget that sustainability high P/E still means low E/P and low long-term equity returns; sustainability would just remove the need for further choppin in the near term (as the P/E falls to the historical mean).

EXPECTED EQUITY PREMIUMS BASED ON DDM

While the yield ratio is a useful shorthand for the equity–bond premium, the dividend discount model gives us directly what we really want to see: the difference between stocks’ and bonds’ expected long-run returns.12 In the basic version of the DDM, equity cash flows (dividends) are assumed to grow at a constant annual rate G. A feasible long-run return on equities is then the sum of the cash flow yield (D/P) and the trend cash flow growth rate (see the appendix). The required return on equities, or the discount rate, can be viewed as a sum of the risk-free long-term government yield (Y) and the required equity–bond risk premium (ERP).

Intuitively, markets are in equilibrium when the equity market return that investors require (Y + ERP) equals the rationally feasible expected return (D/P + G). This equality can be rephrased to express the ex ante equity–bond risk premium in terms of three building blocks:

\[
\text{Equity–Bond Risk Premium} = \text{Expected Stock Return} - \text{Expected Bond Return} = \text{ERP} = \frac{D}{P} + G - \frac{Y}{Y}.
\]

The appendix shows how this model can be extended to real (inflation-adjusted) terms or to discounted earnings terms. The DDM framework is simple, but there is a wide disagreement about the inputs to the equity premium calculation. There are two main observable, ERP and G. One can estimate the ERP for a given G assumption, or one can estimate the ERP and infer the ERP for a given G assumption. Even the observable inputs—dividend yield and bond yield—are ambiguous. It may be debatable whether to include write-downs in dividend yield and whether to use a ten-year or longer-maturity Treasury yield.

16 EXPECTED RETURNS ON STOCKS AND BONDS
Debates on Inputs for Statistical Risk Premium Estimates

There will never be full agreement about the equity-bond premium, because there are a wide range of views about DDIM inputs. Here we simply summarize the key questions.

Long-Run Growth Rate (G). This is the main debate. Since G is the least-anchored DDIM input, differing views on it can shift risk premium estimates by several percentage points, while disagreements about dividend yields and bond yields are worth about 1 percentage point, at most.

Earnings or dividend data? In historical analyses, some authors use earnings data, others dividend data, and yet others gross domestic product data to proxy for cash flows. While earnings data have their own shortcomings, we use them. Historical dividend growth is arguably understated by the declining trend in dividend payout rates since the late 1970s, partly related to firms’ shift from dividend payments toward share repurchases.

Nominal or real? Many observers refer to historical earnings-growth rates in nominal terms (perhaps even using arithmetic averages), thereby overstating future prospects now that inflation rates are quite low. We prefer to assess expected inflation and real earnings growth separately. We do concede that assuming stable nominal earnings growth rates over time could work surprisingly well, because inflation may be inversely related to real earnings growth. Relation to GDP growth? It is useful to first assess the trend GDP growth rate and then the gap between earnings and GDP growth.

• The long-run productivity growth is important because it determines the potential earnings growth rate, and because persistent changes influence stock prices much more than cyclical changes. If the recent extraordinary productivity growth is sustained, it could be quite bullish for long-run profits and share valuations.

• Historical evidence on the gap between earnings (or dividends) and GDP growth is low encouraging—indeed, recent findings are shocking to many market participants. Several recent studies show that per-share earnings and dividends have over long histories lagged the pace of GDP growth, and in many cases even per-capita GDP growth. Focusing on our past-century sample period (1900-2001), U.S. GDP growth averaged 3.3% in real terms, compared with 1.9% GDP per capita growth, 1.5% earnings growth, and 1.1% dividend growth.
Exhibit 11 shows that cumulative real growth of earnings has consistently lagged GDP growth in the past 50 years, while stock prices beat GDP only because of the multiple expansion. International evidence in Arnott and Ryan [2001] is hardly more encouraging, and Dimson, Marsh, and Staunton [2002] show that real dividend growth has lagged real GDP per capita growth between 1960–2000 in 15 of the 16 countries they examine.

- What explains these disappointing results? Arnott and Bernstein [2002] attribute them to the dynamic nature of entrepreneurial capitalism. New entrepreneurs and labor (perhaps especially top management) capture a large share of economic growth at the expense of current shareholders. Stock market indexes (made up of listed stocks) do not participate in all growth, and indeed may miss the most dynamic growth of yet-started new ventures. Arnott and Bernstein argue that aggregate earnings growth of the corporate sector (listed and unlisted firms) should better keep pace with aggregate GDP growth, and this conjecture seems to hold in the national accounts data.

Siegel [1999] adds that real output growth related to technological progress may have been largely labor-augmenting and wage-enhancing rather than the capital-enhancing type that would spur EPS growth (also see discussion in Nonhaus [2002] and "Proceedings of Equity Risk Premium Forum" [2002]).

Can we do better than using historical averages? Empirical studies find limited predictability in long-term earnings growth rates (see Fama and French [1992]). No predictability implies that the historical sample average may be the best estimate of future earnings growth.

How long a sample? The compound average real earnings growth rate over very long periods is around 1.5%. Others argue that the world has changed, and that the future should be more like the 1990s' experience, with its 4.3% average real earnings growth, and unlike the preceding decades (0.4% in the 1980s and 1.8%–2.9% in the 1950s, 1960s, and 1970s).

Payout rates appear to have some ability to predict future growth, but the results are debatable. Liboros and Chen [2001] argue on theoretical grounds that low dividend payout ratios are a sign of high growth prospects. Arnott and Amos [2002] show that the empirical experience has been exactly opposite. Low dividend payout rates have preceded low subsequent earnings growth. If this pattern holds, it is a bad omen for the coming years, given the low payout rates of the booming years.

On a positive note, there are some signs that real earnings growth is higher when the trend productivity growth is higher, when the inflation rate is lower (but positive), and when earnings volatility is lower. Lower inflation and volatility may have boosted real earnings in the last 15 years and, if sustained, could keep future trend earnings growth more in line with the GDP growth (see Wijey [2001]).

Dividend Yield (D/P). Dividend yields in the United States fell even lower in the 1980s and 1990s than earnings yields. The declining propensity to pay dividends partly reflects a shift toward more tax-efficient share repurchases; by the late 1990s, U.S. firms disinvested cash flows more in share repurchases than in dividends (see Wadhwani [1998], Fama and French [2001], and Japan-
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EXHIBIT 12
Estimates of Expected Asset Class Returns and Underlying Input Assumptions

<table>
<thead>
<tr>
<th>Input/Assumption</th>
<th>Mid-2002</th>
<th>End-09</th>
<th>(5-yr avg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D/P</td>
<td>3.0</td>
<td>2.5</td>
<td>2.2</td>
</tr>
<tr>
<td>* Real Growth</td>
<td>5.9%</td>
<td>4.0%</td>
<td>5.9%</td>
</tr>
<tr>
<td>(E/Eps)</td>
<td>0.5%</td>
<td>0.5%</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

EXHIBIT 13
Three Components of Ex Ante Nominal Stock Return—1990-June 2002

Survey forecasts are available, we use them as our expected inflation proxy. This set of inputs results in the feasible ex ante real long-term stock and bond return series shown in Exhibit 14. The estimated real stock returns varied between 4% and 9% most of the century, sweeping from the top of this range to the bottom between 1982 and 1999. The estimated real bond returns varied between 0% and 5% except for the 1980-1985 period, when ex ante real returns occasionally exceeded 8%. Overall, the post-Second World War pattern of a long upward trend (pre-1982) and a long downward trend (post-1982) in inflation is matched in required real bond returns, although with a short lag.

Bernstein (2002) notes that the great variation in required bond and stock returns in recent decades makes the use of historical returns either irrelevant or, worse, misleading for any kind of future projections.

The equity-bond premium (the difference between the other two series) experienced a clear downward shift 20 years ago. Before 1982, the premium ranged between 2% and 10 percentage points most of the time, while since 1982 the range has mostly been 0 to 2 percentage points.

The lowest equity-bond premi- ums—June 1984, September 1987, and December 1999—coincided with temporary peaks in bond risk premiums. On all three occasions, a Fed tightening triggered a heavy bond market sell-off (year-end yields of 310bps, 220bps, and 180bps, respectively), while equity markets had not yet suffered much. Over
the following year, stocks underperformed bonds by 8, 25, and 26 percentage points, respectively.

It is counter-intuitive that the ex-ante equity-bond premium was averaging just 1 percentage point during the great bull market, while realized equity returns between 1989-2001 were 16% per year (see Exhibit 5). Using the more conservative Arnott and Bernstein estimates, the ex-ante premium was actually negative most of this period.

It could be that equities outperform bonds by 5 percentage points per year with such a slim ex-ante premium? The first answer that comes to mind, a falling equity-bond premium, is not valid for this period; the premium already had shrunk by 1989 and actually edged a bit wider during the 20-year period. A better answer is that discount rates fell (ex-ante real returns for stocks fell by 3.5 percentage points), and expected long-run inflation fell even more, and the longest-duration asset class, equities, escaped the greater windfall gains from falling rates.

This analysis assigns almost all of the equity outperformance and PE multiple expansion to lower discount rates rather than greater growth optimism. But recall that our series of feasible ex-ante equity returns is based on pretty rational real earnings growth forecasts (that rose just by 1% in the 1990s; see Exhibit 13). Actual subjective growth forecasts probably were much less rational during the Internet boom. Indeed, analysts' medium-term earnings growth forecasts rose from their normally overoptimistic 11%-12% level to a heady 18%-19% level in 2000, before tailing off (see Exhibit 15).

EXHIBIT 14
Estimated Long-Term Real Stock and Bond Returns and their Difference (Ex Ante Premium)—1960-June 2002

EXHIBIT 15
Forward-Looking P/E Ratio and Analysts' Medium-Term Earnings Growth Forecasts—1985-June 2002
EXHIBIT 16  
Forecasting Ability of Various Predictors—Predictive Correlations  
Based on Quarterly Data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Predict Real Equity Return Using:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trailing Earnings Yield</td>
<td>0.58</td>
<td>0.27</td>
<td>0.17</td>
<td>0.06</td>
<td>0.33</td>
</tr>
<tr>
<td>Ex Ante Real Equity Return Estimate</td>
<td>0.40</td>
<td>0.31</td>
<td>0.03</td>
<td>0.25</td>
<td>0.26</td>
</tr>
<tr>
<td>Past 5yr Real Equity Return</td>
<td>-0.13</td>
<td>-0.13</td>
<td>0.26</td>
<td>-0.14</td>
<td>-0.40</td>
</tr>
<tr>
<td>Predict Real Bond Return Using:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal Bond Yield</td>
<td>0.54</td>
<td>0.42</td>
<td>0.65</td>
<td>0.29</td>
<td>0.50</td>
</tr>
<tr>
<td>Ex Ante Real Bond Return Estimate</td>
<td>0.54</td>
<td>0.61</td>
<td>0.77</td>
<td>0.60</td>
<td>0.62</td>
</tr>
<tr>
<td>Past 5yr Real Bond Return</td>
<td>0.08</td>
<td>0.17</td>
<td>0.10</td>
<td>0.04</td>
<td>0.23</td>
</tr>
<tr>
<td>Predict Equity-Bond Excess Return Using:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earnings Yield Gap (Earnings/GDP)</td>
<td>0.53</td>
<td>0.32</td>
<td>0.19</td>
<td>0.20</td>
<td>0.35</td>
</tr>
<tr>
<td>Ex Ante Equity-Bond Premium Estimate</td>
<td>0.51</td>
<td>0.32</td>
<td>0.05</td>
<td>0.26</td>
<td>0.47</td>
</tr>
<tr>
<td>Past 5yr Equity-Bond Excess Return</td>
<td>-0.03</td>
<td>-0.22</td>
<td>-0.28</td>
<td>-0.21</td>
<td>-0.32</td>
</tr>
</tbody>
</table>

Sharpe (2002) cites these growth forecasts, without prejudging their rationality, and estimates that about half of the late-1990s P/E expansion reflects lower discount rates and half greater growth optimism. Thus, part of the late-1990s decline in sensible real equity return in Exhibit 14 likely should be attributed to irrational growth forecasts.

How robust is these estimates of ex ante asset class returns? Details are sensitive to the input assumptions, but the broad consensuses of such estimates tend to be similar (compare Exhibits 10 and 14); because all are anchored by market yields on equities and bonds, the long-term growth forecasts can vary more widely, and in the basic DDM, these forecasts translate one-on-one into higher or lower estimated equity returns or premiers.

**Predictive Ability of Equity-Bond Premium Estimates**

To assess the usefulness of our ex ante expected returns estimates, we use these measures to predict real stock returns and real bond return and their difference (excess return) over ten-year, five-year, and one-year horizons. Exhibit 16 displays for each trade the predictive ability of our ex ante expected return measure and two alternative predictors, a simpler yield proxy and a past-return measure.

In all cases, our estimates exhibit reasonable forecasting ability, but they are clearly better predictors than the simple yield measures only at the short (one-year) horizon. The long-horizon correlations are typically higher than short-horizon correlations, mainly because the realized returns are smoother at longer horizons.

For example, the correlations between the ex ante equity-bond premium and subsequent realized outperformance of equities over bonds are 0.51 for the ten-year horizon, 0.32 for the five-year horizon, and 0.26 for the one-year horizon. In a scatterplot of ex post long-term equity-bond premiums on the ex ante premiums, the 1998-2000 observations show up as major outliers.

Past five-year equity returns (real and excess) have generally been negatively correlated with future returns, consistent with a mean-reversion tendency. This pattern underscores the extrapolation risk following an extended period of above-average market returns. Past bond returns on the contrary have been positively related to future returns, consistent with down-mowing variation in required returns.

WHERE DO WE STAND?

While our analysis cannot unambiguously reveal the current extent of the equity-bond premium, our framework does clarify the assumptions needed for various risk premium estimates. Moreover, we argue that...
Since inflation is also likely to remain low, high returns need to be earned the hard way — by very high real profit growth rates.

The mega-bullish equity market view requires throwing away the history books and fully embracing the "this time is different" idea. For example, technology-related arguments might be used to justify a tripling of long-run GNP to 4%-5%, which would enable long-run nominal equity returns near 9%-10%. (The finding that the trend earnings growth lag the trend GDP growth does challenge the credibility of such assumptions, given the consensus view of next-decade real GDP growth at 3.1%) A moderately constructive case is that feasible and subjectively expected long-run equilibrium return expectations are in balance near 7%-8%. The deliberately optimistic assumptions we use in Exhibit 12 give rise to 8% feasible (nominal) return, almost as high as the EFO survey forecasts. Stable inflation, low macroeconomic volatility, reduced trading costs, and better diversification opportunities may help sustain the above-average P/E levels. And, given the fall in bond yields, equities again offer more than a negligible risk premium.

A moderately bearish view is that the feasible long-run nominal equity return is closer to 5%-6% than 7%-8%. Such estimates simply follow from using (unadjusted) dividend yields and historical average dividend growth rates.

The most bearish view involves further declines (mean reversion) in the market's P/E multiples. Below-average earnings growth and higher risk aversion are plausible scenarios (see Campbell and Shiller [2001] and Asquith and Aron [2002]). Unwarranted investor optimism, a remnant of the 1990s bull market return, can also be bad news. Refusal of investors to reconcile themselves to the moderate feasible long-run return is not sustainable in the medium term.

**APPENDIX**

**Dividend Discount Models and Equity-Bond Premiums**

Dividend discount models analyze stocks as if they were perpetual (censored) bonds, with the twist that their coupon rate is expected to grow over time. We describe here the basic Gordon [1962] model with a constant dividend growth rate. Given a constant discount rate, D, which can be viewed as a sum of the riskless component, r, and an equity-bond risk premium, ρ,

\[ D = \frac{G}{r + \rho} \]

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The stock price can be expressed as the sum of expected discounted future cash flows:

\[ P = E \left( \sum_{t=1}^{\infty} \frac{1}{(1+R)^t} \right)(D_{t+1}) \]

where \( R = Y + ER P \).

If we assume a constant growth rate \( G \),

\[ E_t(D_{t+1}) = (1 + G)E_t(D_{t+2}) = (1 + G)D_t \]

we can express the stock price simply as

\[ P_t = E_t(D_{t+1})/(R - G) = (1 + G)D_t/(R - G) \]

Thus:

\[ E_t(D_{t+1})/P_t = R - G \]

or as an approximation of the dividend yield:

\[ D/P = R - G = Y + ER P - G \]

To equilibrate the equity return that investors require \((R = Y + ER P)\) must equal the rationally feasible long-run return \((D/P + G)\).

**Earnings Discount Model:** To express the equation in terms of the \( E/P \) ratio, we assume a constant dividend payout rate \( k \) in \( D/E \). With a constant dividend payout rate, dividend growth rate and earnings growth rate are equal. Then

\[ D/P = (E/P)(D/E) = Y + ER P - G \]

Thus:

\[ E/P = Y + ER P - G/k \]

**Real or Nominal:** The DDM can be expressed in real terms or in nominal terms. Mechanically, a rise in expected inflation rate raises both the dividend growth rate and the bond yield, without having an impact on the stock price. Empirically, however, the correlation between inflation and earnings yields suggests that other real growth rates, payout rates, or equity risk premiums are related to inflation.

**Dynamic Models:** It is not necessary to assume a constant growth rate. Practical implementations often involve multistage models where growth rate varies over the horizon (see Cornell [1999] and Japannathan, McGrattan, and Schorbyna [2001]). Sharpe [2000] uses a dynamic version of the growth model that allows growth rates and required returns to vary over time. It still follows that low earnings yields are related to high growth prospects or low required returns.

**ENDNOTES**

The authors thank Robert Amrit, Clifford Asness, Peter Bernstein, Allan Byrne, and Steven Wiener for helpful discussions and for help in acquiring historical data. This article is largely based on research reports written for Schroder Salomon Smith Barney in May and June 2002. The original disclaimer there applies.

1. If the payout ratio is constant, dividend growth rate and earnings growth rate are equal. We use the latter because payout rates fell in the 1980s and 1990s, and many observers argue that share buybacks have replaced dividend payments.

2. The distinction between objective and subjective expectations implies that the subjective expectations can be irrational. In fully rational markets, there is just one expected return that clears the market. The feasible asset return that investors can rationally expect is, by assumption, equal to the required asset return.

3. Most of our data analysis focuses on U.S. markets because the literature has concentrated on them, partly because of better data availability and reliability. The global leading role of the U.S. economy and asset markets and higher valuation ratios than in most other major equity markets also make the U.S. experience the most interesting topic.

4. All returns are expressed in annual compound returns, unless otherwise stated.

5. One reason is that U.S. government bonds were not perceived to be riskless until the 20th century. In addition, yield spreads were more favorable for bonds in the 19th century ended with extended deflation. Long yields then halved from 1802's near-6% level to near 3% at the beginning of 1900, and then doubled back by the end of 2001. Of course, equity and bond markets also were less developed in the 1800s, making data less comprehensive and reliable.

6. The peso problem refers to infrequent, unlikely events such as currency devaluations that may influence market pricing (e.g., forward bias in peso-dollar pricing) but may not show up even in a long historical sample.

7. The CFO survey and our bond investor survey asked for views on the expected annual return of a major equity index over the next decade. The academic survey required some adjustments because it asked for the 30-year equity bill premium (and only an arithmetic average in 1996). We first subtract from the 7% consensus view in 1998 0.8 percentage point (the gap between arithmetic and geometric means in the later survey), then add a 5% expected average bill rate (typical long-run view of economists in 1998 from another survey) to get an 11.2% expected nominal return. In 2001, the survey quotes a 4.7 percentage point geometric mean premium over bills we add 4.7% expected average bill rate to it to get a 9.4% estimate.

8. The falling consensus views may partly reflect a red change due to the growing literature on the changing equity risk premium, besides simple extrapolation from recent returns.

9. Specifically, we have found that the negative correlation between stock and bond returns has made government bonds
the ultimate safe haven. The negative beta feature can even jus-
tify a negative risk premium for government bonds when the
real inflation risk premium has fallen to near zero. All else
equal, a low or negative bond risk premium (over cash) makes the
current equity-bond premium wider. (See Bliss, Byrne, and
Flavin [1998] and Emmer [2002].)

We use operating earnings rather than reported earn-
ings since the former became available in the early 1990s.
Broadly speaking, operating earnings are earnings from con-
ventional operations, excluding non-recurring items. Operating
earnings may give a better picture of trend earnings, as they are
less influenced by one-off events and cyclical downturns (see
Wiering and Peng [2002]).

Findings of aggressive and even illegal earnings account-
ing practices, however, have made many investors prefer the
reported earnings. Smash option expensing and pension return
assumptions are other conventional earning topics. Any adjust-
ment to recent earnings levels would implicitly lower earnings yields
and lower expected equity returns in our empirical analysis.

"Improving assets stability has not brought along financial
market stability, an unattainable outcome for equity
investors," Alan Greenspan, among others, highlighted the con-
trast between low output volatility and high equity market
volatility in his annual Jackson Hole speech in August 2003.

"Overall, Japan's experience confirms the inflation-
dependence of earnings yields but there is a hint of a learning
Jap mode. We conjecture that earnings yields could actually rise
in inflationary environment. Low-base inflation is the
optimal environment for equity valuation; both higher infla-
tion and deflation can hurt equities and raise RE/ERP ratios.
This also suggests that U.S. equity multiples already reflect all the
possible gains from disinflation and that the best they can do now
is to hold onto these gains (if inflation remains near 2%-4%)."

"Modigliani and Cohn [1997] argue that investors and ana-
lysts uniformly discount real dividend streams with nominal dis-
count rates, resulting in too low a price for real fundamentals
when inflation is high. For a recent review, see Bitter and Warr
[2005]." Mynatt [2002] suggests a variant of inflation illusion:
investors and analysts actually discount nominal cash flows using
nominal discount rates, but do not make sufficient inflation
adjustments or their extrapolative nominal growth forecasts.

"Under certain conditions, the earnings yield equals the
expected real equity return—for example, if the constant ret-
turn one (1 = payout rate) matches the constant dividend growth
rate. Intuitively, earnings yield underestimates expected return
because it excludes dividend growth, but it exaggerates expected
returns because only a part of earnings are paid out as dividends.

While the two extra terms just balance, the DDM should pro-
vide a better equilibrium price than the DDM yields. The equity-
cash premium is the difference between the
expected equity return and the expected average Treasury bill rate over the next decade. The equity-

The nominal ex-ante equity return is estimated as a sum of
the dividend yield (proposed by a forward-looking earnings
equation using a constant assumed payout rate), expected long-run
real GDP growth rate, and expected inflation. The main raw
material in economists' consensus forecasts of next-decade aver-
age real GDP growth, inflation, and Treasury bill rates from the
semimonthal Blue Chip Economic Indicators survey.

Note that using the current Treasury bill yield in equity
premium calculations could be quite misleading when short rates
are exceptionally low (or high) and expected or recent to

level. For example, the current three-month rate is near 2%,
while the expected next-decade average short rate is above 4%.
"The theoretical argument is in the "Modigliani-Miller spot",
based on the idea that management obtains a greater share of
earnings when it sees greater future profit opportunities.
The empirical finding that high retention rates predict low earnings
growth may reflect management's overconfidence or inefficient
empire building (see Amott and Amott [2002]). Alternatively,
management may be concerned with dividend smoothing, and
will pay higher dividends only when it can afford (or afford to
do so, given its expectations of long-run future profit growth.

In the DDM context, the equity market can be viewed as a
commodity bond with a growing coupon rate. It follows from sim-
ple algebra that the modified duration of equities is 1/(R - G),
which is just the inverse of the dividend yield. For D/P of 2.5%,
this duration is 40, but this result is model-dependent; recall that
the basic model assumes constant R and G. More generally, if
equities really are long-duration assets, that is very sensitive to
permanent discount rate changes—and more so when dividend
yields are low.

"Amott and Berntson present the real dividend growths rate component in two parts: the projected long-run growths
rate of GDP per capita, and the predicted dilution of dividend
growth versus GDP per capita growth.

"Our exercise follows in the same spirit as the Amott-
Berntson study—aiming to come up with reasonable views on all
of the DDM inputs (say, what long-term real growth rate and
what inflation rate investors could have expected at the
time). There is sufficient uncertainty about those inputs that both
sets of assumptions can be deemed plausible. Our assumptions
are deliberately more optimistic than those of Amott and Bernt-
son, so we look much more optimistic returns to if we add an
implicit adjustment for share buy-backs to dividend yields, and
if we use higher, but not outrageous, earnings-growth estimates.

"Recall that D/P = (D/E)(E/P). Since one-year trailing
cash earnings are volatile, we use smoothed five-year-average
earnings.

"We do not use geometric averages but rather a closely
related procedure proposed in Fama and French [2002]. We
reduce arithmetic averages by half, the variance difference
between the earnings growth rate and dividend growth rate.

The simple approach we use captures both the past average as an anchor and the varying sensitivity of future expectations to current inflation; it sensibly increased during the 20th century once inflation became more persistent. We explored other inflation forecasting models with yield shifts and growth indicators. The results were not robust, perhaps because forecasting decade-ahead developments leaves us with few independent observations.

War-related inflation had typically been temporary before the First World War. More generally, inflation had not been persistent in the past, so investors had little reason to raise long-term inflation expectations (yet high) and would have been right, as a definition soon followed. The 8% cap actually may be too high, given that the 1916-1918 experience failed to define, and given that bond yields stayed below 5% through the 1915-1919 period.

Our proxy series and the consensus forecasts are closely related during the overlapping period, and there is no large jump when moving from one series to another.

As we have noted, even these yields are subject to debate about the impact of market buy-backs on dividend yields and about the appropriate Treasury maturity. Our current D/P estimate of 5.6% in Exhibit 1.2 is especially high, virtually double the more usual. This high level is partly offset in the equity-bond premium by our use of the 30-year Treasury yield (1 percentage point higher than the 10-year yield).

Our analysis ends in mid-2002, but even during the third-quarter 2002 equity sell-off the dividend yield rose only to 2.5%. The long-duration of equities means that feasible returns rise painfully slowly; a 1900-2002 price decline may increase the feasible long-term return by about 6.5 percentage points. Yet the 1% fall in long-term Treasury yields in the third quarter had a greater impact on the equity-bond premium, raising our estimate to only 4 percentage points. Greater attractiveness versus bonds can benefit equities in the near term, but a wide cushion does not make the absolute level of feasible equity returns any higher. It is unclear whether absolute or relative return prospects matter more.

Further disqualification or yield declines are unlikely to boost P/E ratios, because they likely would reflect productivity losses. Moreover, there appears little chance that the late-1990s growth optimism, exuberant sentiment, and risk tolerance will reappear any time soon. Observed empirical patterns (mean revert, low payout rates) point rather to lower P/E multiples over the future. A cyclic uplift supported by easy monetary policy can of course raise equity valuations and realized returns over a shorter horizon.

Siegert [1999] and Carlson, Pelz, and Wehar [2002] review these arguments. Jones [2003] provides specific evidence of falling trading costs during the past century and notes that the gross equity premium may have fallen by 1 percentage point as a result.

REFERENCES


Wieringa, Steven. "Regress to the Mean or Cause and Effect?" Salomon Smith Barney, 2002.


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