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Dow 36,000



Has the long-running bull market been a contemporary version of tulip mania? In explaining their new theory of stock valuation, the authors argue that in fact stock prices are much too low and are destined to rise dramatically in the coming years.

By James K. Glassman and Kevin A. Hassett

THROUGHOUT the 1980s and 1990s, as the Dow Jones Industrial Average rose from below 800 to above 11,000, Wall Street analysts and financial journalists were warned that stocks were dangerously overvalued and that investors were caught up in an insane euphoria. They were wrong.

Stocks were undervalued in the 1980s and early 1990s, and they are undervalued now. Stock prices could double, triple, or even quadruple tomorrow and still not be too high.

Market analysts and media pundits have also persistently warned that stocks are extremely risky. About this they are wrong too. Over the long term stocks in the aggregate are actually less risky than Treasury bonds or even bank certificates of deposit. Although the experts may not be very good at predicting what the market will do, they are brilliant at scaring people -- not out of malice but out of a profound misunderstanding of stock prices. Whatever their intentions, they have performed a terrible disservice to millions of investors by frightening them away from the market.

Stocks are now, we believe, in the midst of a one-time-only rise to much higher ground -- to the neighborhood of 36,000 for the Dow Jones Industrial Average. After they complete this historic ascent, owning them will still be profitable but the returns will decline. You won't be able to make as much money from them each year. We believe that in the meantime, however, astounding profits will be made.

Many small investors are already catching on. They have ignored the dire warnings from professionals that have accompanied nearly every step of the Dow's rise from 777 on August 12, 1982. They are rejecting the outdated model that Wall Street has used to assess whether stocks are overvalued -- a model based largely on historical price-to-earnings, or P/E, ratios. That rejection reflects not their nuttiness but their sanity. Contrary to the famous warning from Alan Greenspan, the chairman of the Federal Reserve Board -- made on December 5, 1996, with the Dow at 6,437 -- many investors are *rationaly* exuberant. They have bid up the prices of stocks because stocks are a great deal.

Still, even the most enthusiastic investors have doubts. They know vaguely that stocks are wonderful, but they have no real framework of analysis. They don't know why prices are going up and up. We believe that we do.

How did we come to hold our views? We began by wondering what on earth was going on in the market. Stocks had quintupled in price in the dozen years up to 1994. Then, in 1995, 1996, and 1997, the Standard & Poor's 500 composite index, generally considered a good proxy for U.S. stocks as a whole, scored returns of more than 20 percent. ("Returns" means dividends plus capital appreciation, which is a fancy name for the increase in a stock's price.) Never before in modern history had the market had three years this good in a row.

Why were prices rising so quickly and consistently? We weren't satisfied with the explanations we heard in the press and on Wall Street: that investors -- reflecting what Charles Mackay called "Extraordinary Popular Delusions and the Madness of Crowds" (in the title of the second edition of his 1841 book) -- were acting irrationally, or that Baby Boomers all of a sudden remembered they should invest for retirement and decided to dump huge sums into stocks as protection against a penurious future. There had to be better answers.

We decided to begin with the core question. If the issue was whether the market was overvalued, we wanted to know this: What is the right value -- that is, price -- for a stock? The experts did not have an answer. They typically focused on the P/E ratio and other "valuation indicators." Wall Street analysts figure that if P/Es are too high, stocks are overpriced.

But the term "too high" relates only to history, not to substance. We decided to look at substance -- at dollars. How many dollars does a stock put in your pocket over time? As John Burr Williams, a brilliant economist with the ability to cut through the muck, wrote in 1938, "A stock is worth only *what you can get out of it.*" So we developed a method for estimating the flow of cash from a stock, and then we determined what that cash flow is worth.

A house that throws off \$1,000 a month in rental income might be worth, say, \$200,000. A restaurant that generates \$100,000 a year in profits might be worth \$1 million. What, then, is a share of IBM worth? What is the "perfectly reasonable price" -- or, as we put it, the PRP -- for *any* share of stock?

In our research we were surprised at how high PRPs turned out to be. But after refining our analysis for a year, and listening to the criticisms and suggestions of people we trust, we are convinced that our theory is correct, and that it explains -- as no other theory does -- the rise in stock prices over the past two decades. More important, we concluded that the rise will continue, at least until Dow 36,000.

The History of Stocks: A New Interpretation

THE stock market is a money machine: put dollars in at one end, get those dollars and more back at the other end. The history of these remarkable returns is vivid and undeniable, yet few investors seem to be able to make it out in the fog of hourly jabber and the haze of constant fear, and many experts seem always to draw from the past the lesson that stocks are headed for a fall. Here, instead, are the lessons that we draw from history.

Lesson 1: Stocks have been steady winners through thick and thin.

Imagine that you bought \$10,000 worth of stock on the very eve of the Great Crash, at the beginning of October, 1929. Over the next two months, if you held a portfolio similar to the modern S&P 500, you would have lost \$3,000. It would get worse: after big losses in 1930, 1931, and 1932, your \$10,000 stake would have been reduced to \$2,800.

Naturally, you would have been tempted to sell as trouble brewed in Europe. But if you had decided to hang on, you would have been rewarded: from 1933 through 1936 stocks enjoyed their best four-year period in history, tripling in value. Remember that these were some of the darkest times on the planet, with fascism infecting Europe and Asia, Stalin ruling Russia, bread lines everywhere, and Franklin Delano Roosevelt forced to remind Americans that "the only thing we have to fear is fear itself." Yet stocks rose 200 percent.

As the decade wore on, Hitler marched into Czechoslovakia and Poland, and Japan invaded China. By the end of 1939 your account would have been up to \$7,200. And because the 1930s were characterized by deflation, or falling prices, the buying power of that \$7,200 would actually be \$8,600.

As the 1940s began, the war broadened, and the United States was soon fighting both Japan and Germany. The market fell and rebounded, and by the end of 1944, fifteen years and three months after you invested your \$10,000, you would have been ahead -- by \$400. Despite the worst-timed investment imaginable, the worst depression of the century, and the worst war in history, your initial investment would have grown by four percent.

Over the next sixteen years, through the hot war in Korea and the Cold War elsewhere, through nuclear threats and labor turmoil, the market continued to rise powerfully. By the time of John F. Kennedy's election as President, in 1960, your \$10,000 would have become \$92,900.

The Vietnam War began and seemed never to end. Protests disrupted U.S. campuses, and riots burned Detroit, Washington, Los Angeles, and other cities. Inflation loomed. Then came the Arab oil embargo, wage and price controls, the closing of the gold window, and the Watergate crisis. The years 1961 to 1975 were nasty and often depressing, and included the worst two back-to-back years (by far) for the market since 1930 and 1931; nevertheless, stock values more than doubled, and by 1975 your \$10,000 would have been worth \$261,800.

Inflation accelerated to nine percent in 1978 and to 13 percent in 1979. The rate on long-term Treasury bonds took off as well, breaking 15 percent in 1981. It was hardly an atmosphere accommodating to stocks. Who would want to own equities when Treasury bonds were paying significantly more than stocks had returned historically? Yet the market continued to climb, and by 1985 your \$10,000 stake would have become \$999,000.

Over the next thirteen years inflation declined, taxes were cut, the Berlin Wall fell, and U.S. businesses rejuvenated themselves. The stock market soared, and by the end of last year your investment would have been worth \$8,414,000. It would have grown by a factor of 840 -- or, after accounting for inflation, by a factor of 90.

The calculations for this little history come from a series developed by [Ibbotson Associates](#), a Chicago research firm. We tried to pick the worst possible scenario, and chose dates after the initial one at random, but stock-market returns are so steady that you can pick any lengthy period you want and the results will be roughly the same.

The consistency of returns in the stock market over long periods is an important lesson. In his book *Stocks for the Long Run* (1998), Jeremy J. Siegel, a professor of finance at the Wharton School of the University of Pennsylvania, divided U.S. market history into three periods: 1802-1870, when stocks returned 7.0 percent in real (inflation-adjusted) terms; 1871-1925, when they returned 6.6 percent; and 1926-1997, when they returned 7.2 percent.

That last figure is especially convenient, because it works well with the "Rule of 72." Divide the percentage rate of growth into 72 and you find the number of years it takes an initial investment to double. At 7.2 percent it takes ten years. This means that if stocks continue to behave as they have over the past seventy years, a woman twenty-five years old who invests \$20,000 now will have \$320,000 in today's buying power when she reaches sixty-five. She could use that money to buy an annuity that would pay her an income she could live on until she died.

Lesson 2: Stocks are not very risky in the long run.

So why doesn't everyone invest lots of money in stocks? The main reason is that people are naturally cautious, especially with their own money, and the return on stocks is highly volatile from day to day. This inclination toward caution is perfectly reasonable, reflecting an intuitive understanding of an important financial truth: the average return is not the only thing that matters when evaluating an investment. You must also consider the likelihood of profits and the chance of losses. In other words, remember risk.

Despite its inadequacies, history is the best source of information we have when analyzing risk, and the history of stocks is clear and consistent: in the short run they are very risky; in the long run they are not.

Let's turn again to Jeremy Siegel, who examined U.S. stock prices going all the way back to 1802, using his own research supplemented by that of G. William Schwert, of the University of Rochester; Robert Shiller, of Yale University; the Center for Research in Security Prices; and others. Siegel found that in the worst year he studied, the inflation-adjusted return on stocks was -38.6 percent. In other words, an investment of \$100 became \$61.40 in real terms, taking into account both declines in price and income from dividends. In the best year the return was 66.6 percent. A \$100 stake became \$166.60 in real terms.

That is an enormous range. No wonder stocks scare so many people. Over the past seventy-three years, Ibbotson data show, large-company stocks have produced positive returns fifty-three times. So according to history, the chances that you will lose money in a single year are greater than one in four - - not a very cheerful prospect. Worse, the chances that your losses will be in double digits are one in nine.

But the research of Siegel and others shows something else about risk, and it is striking: the longer you hold on to stocks, the less volatile your returns will be and the more likely it is that you will make money. Stocks appear to obey a kind of reversion to the mean -- whatever goes down must go up.

Let's assume that you hold a diversified portfolio of large-cap stocks -- such as the S&P 500 -- for ten years instead of one year. Risk shrinks significantly. For the sixty-four overlapping ten-year periods from 1926 to 1998 (that is, 1926-1935, 1927-1936, and so on) the S&P stocks scored positive returns sixty-two times. For the fifty-nine periods of fifteen years they were positive every time. Over the *worst* twenty-year period, from 1929 to 1948, the total gain was 84 percent.

Siegel's research shows declining risk over time in another way. Whereas the worst single year since 1802 showed a loss of 38.6 percent after accounting for inflation, the worst five-year period in the past two centuries produced an average annual loss of only 11.0 percent, the worst ten-year period an average annual loss of 4.1 percent, the best ten-year period an average annual gain of 16.9 percent.

Now let's go out to a thirty-year period. The worst average annual return was 2.6 percent. In other words, an investment of \$10,000 grew to \$21,598 in inflation-adjusted dollars. Never in American history has a diversified basket of stocks failed to double in buying power over a generation. Never.

Here's another way to express the amazing decline in risk as time passes and you hold your stocks. Over a one-year period the standard deviation for stocks is 18 percent. This means that in two out of three years the return on a stock will vary by no more than 18 percentage points from the average -- in either direction. Since the average real return is about seven percent, returns should vary two thirds of the time between 25 percent and -11 percent. That's very risky. But over ten-year holding periods the standard deviation drops to five percentage points. Over thirty-year periods it drops to about two percentage points -- meaning that two thirds of the time the range is five to nine percent. That's not risky at all.

What is truly amazing about these long-term-risk figures is that they are lower than those for Treasury bonds and even Treasury bills, which mature in a year or less. If you keep your money at work for more than twenty years, stocks are actually safer than short-term T-bills rolled over annually.

Over a twenty-year period the worst inflation-adjusted return by stocks was an annual average of 1.0 percent. For bonds, however, the worst was -3.1 percent, and for T-bills -3.0 percent. Over one-year periods stocks have outperformed bonds only 61 percent of the time, but stocks beat bonds 92 percent of the time over twenty-year periods and 99 percent of the time over thirty-year periods.

Lesson 3: Traditional valuation methods have predicted catastrophe throughout the bull market of the 1990s.

The fact that stocks weren't risky in the past doesn't mean you can buy them now and be certain you will make lots of money. When you buy a stock, you are buying an asset, just like a house. If you buy in a particularly hot neighborhood, you might not feel reassured by the fact that prices there have doubled in the past three years. On the contrary, you might feel that you are in danger of buying at the top, just as a real-estate bubble is about to burst.

Is there any way to figure out what an asset -- specifically, a stock -- is worth? Traditionally, market analysts have used several different measures of what is called valuation, each based on hard data about a company. The most popular are the dividend yield and the stock's price-to-earnings ratio. In our view, these measures are limited, shortsighted, and anachronistic. Let's look at each.

Dividend yield. When you are thinking about whether to put your money in the bank or spend it on, say, a new television, one of the things you look at (besides the reception of your old television) is the interest rate the bank will give you. If the bank pays you 20 percent, you might be inclined to postpone buying the TV. If you put your money into a stock, you will get whatever dividends the firm pays, plus the increase in the price of the stock. Dividends are fairly predictable, whereas changes in price are not, so one calculation of value focuses on the current dividend. If a stock pays a \$5.00 annual dividend and the price of a share is \$100, analysts say that the stock yields five percent, just as a bank account that paid you \$5.00 on a \$100 deposit would be said to yield five percent.

Drawing on a long series of data on stocks put together by Robert Shiller, of Yale, we tracked the history of dividends back to the 1870s. From 1871 to 1885 dividend yields were typically around six percent. Buy \$100 worth of stock and each year you would receive about \$6.00 in dividends. Interest rates on long-term Treasury bonds were about the same at the time. From 1886 to 1930 dividend yields stayed fairly close to the interest rate, wandering no higher than 7.5 percent and not much lower than four percent -- the level just before the crash of 1929.

After stock prices plummeted, dividend yields rose -- at least among the companies that survived. That stands to reason. For example, if a stock that cost \$100 before the crash paid a \$4.00 dividend, it was yielding four percent. If after the crash the firm traded at only \$50 and reduced its dividend to \$3.00, the yield rose to six percent. For the market as a whole the yield stayed in the six percent range until the 1950s. Since then a long and fairly steady decline has brought yields, as of last spring, to 1.5 percent for the thirty stocks of the Dow Jones Industrial Average and 1.2 percent for the 500 stocks of the S&P. Those yields are by far the lowest in history.

Another reason that many people use dividend yields as an indicator of value is that actual dividend payouts -- in dollars -- are fairly steady for a corporation. They tend to rise as earnings rise. Remember that a dividend *yield* is the payout divided by the share price. So if the price rises at the same rate as the payout, the yield will stay the same.

If dividend yields drop when stock prices rise, many Wall Street pessimists conclude that stock prices are far too high -- out of whack with dividends and earnings, the measures to which they should always be tied. But dividend yields have been falling for half a century, so if you believe that the dividend yield is the true measure of a stock's value, you would conclude that stocks have been too expensive for the better part of fifty years. Around 1950 a \$100 investment bought annual dividends of \$6.00, just as it did in the 1870s. But except for a blip in the inflation-wracked 1970s and early 1980s, when bond rates soared, that \$100 has since bought less and less. In the early 1990s it bought only \$3.00 in dividends. Now it buys less than \$1.50.

Consider Boeing, which this year paid a dividend of 56 cents while trading at \$37 a share -- a yield of 1.5 percent ($.56 \text{ divided by } 37 = 0.015$). If you believe that the appropriate yield for a stock is the historical six percent, and if Boeing's dividend remains at 56 cents, then its price should be \$9.25 a share. To achieve a yield of three percent the price would have to drop to \$18.75. Since Boeing's yield is roughly the same as the S&P's, the entire market would have to fall by either three quarters (from \$37 to \$9.25) or one half (from \$37 to \$18.75) to return to its old dividend-yield levels.

As we will see, dividends and dividend growth -- as opposed to dividend *yield* -- are essential to our 36,000 theory. But we think it's time for those who keep pointing to low dividend yields to reassess the usefulness of that indicator. Certainly, a high yield may be a signal that a particular stock is attractively underpriced. But a low yield tells us very little about whether the market is dangerously overpriced.

P/E ratio. Academic research has shown that shareholders appear to be indifferent to whether their companies pay dividends or retain earnings. If the firm you own earns \$5.00, it is your \$5.00 whether the firm formally hands you the money or not. One reason dividend yields are no longer a useful tool for valuing stocks is that companies now recognize their shareholders' indifference to quarterly payouts. In fact, owners may prefer to keep profits inside the company, because the tax liability is lower. So earnings may be even more important than dividends when it comes to valuing a company -- which is why the P/E ratio has become such a closely followed indicator.

Just as you can calculate a dividend yield comparable to a bond interest rate, you can calculate an earnings yield that takes into account all the profits a company makes after taxes -- whether those profits are distributed to shareholders or kept in the company. A stock that earns \$5.00 per share and costs \$100 has an earnings yield of five percent -- the earnings per share divided by the current price of the share. That's the earnings-to-price, or E/P, ratio. Most analysts, however, like to talk about the inverse of the earnings yield, the P/E ratio.

The P/E has a much more interesting history than the dividend yield. Firms tend to set their dividends at a level that they can comfortably maintain or increase every year -- cutting dividends is a nasty business. Earnings, however, swing down sharply in recessions and up sharply in boom years. So although from 1890 to 1900 the average dividend yield for the market was around four percent just about every year, the P/E ranged from a low of 13 to a high of 27. Such wild P/E swings have been common. From 1916 to 1921 the average annual market P/E rose from six to 25, only to fall back around 11 the next year. During the Bush Administration the P/E swung wildly between 12 and 22.

Since the P/E is so volatile, it is harder to get a handle on a "reasonable" historical ratio. The average since the 1870s is about 14 (which is the same as an E/P of seven percent). In the late 1970s the P/E dipped below that, perhaps flashing a "buy" signal to market strategists. (Buying in the 1970s was a smart thing to do -- but also very brave. The decade was the worst in modern times for the stock market, with the S&P falling by 13 percent after accounting for inflation. Even in the 1930s the S&P rose by 22 percent.) In the time since Ronald Reagan took office, the P/E has climbed from below 10 to between 25 and 30.

If you were adamant that the level of the late 1970s was the "correct" value for the P/E, as many analysts were, you would have stayed away from stocks through the greatest bull market in our history. Even if you took the longer-term view, and didn't bail out of stocks until the P/E climbed above its long-run average of 14, you would have sold out in the late 1980s and missed an octupling of your money.

Again, like the dividend yield, the P/E is a good sign to investors that an individual stock may be a bargain. But yields and P/Es do not indicate some kind of ceiling beyond which the market can't go. Consider Merck, the pharmaceutical house. From 1983 to 1998 its P/E averaged 19. But if investors had accepted that figure as a limit, they would have dumped their shares in early 1995. Over the past four years Merck has tripled in price. By June it was trading at a P/E of 32 and was still, according to our analysis, significantly undervalued. The stock has a dividend yield of 1.5 percent, and over the past five years its dividends have grown by an average of 13 percent.

A profound change has occurred in the attractiveness of stocks since the early 1980s, as investors have become more rational. The old "limits" of yields and P/Es do not apply anymore -- if they ever did.

So the prime valuation measures that market analysts have traditionally used have been flashing "overvalued" signals for many years. For the market to return to historical valuation levels by these measures, declines of 50 to 75 percent would be necessary. Yet rather than waiting for the market to revert to the historical levels, we view the measures as woefully mistaken. What are they missing?

E value stocks according to how much cash they put in your pocket. Stocks are less risky than bonds, so bonds should produce more cash. But let's be conservative and simply assume that stocks and bonds should produce the same amount of cash. In the past stocks produced more cash than bonds: stocks were too cheap. Are they still too cheap? To answer that question we need to construct a method to

determine the flow of cash that stocks are likely to deliver. Then we need to put a present value on that flow -- what it's worth today to own an asset that will give you, say, \$50,000 over the next fifty years. The second part is easy; we can use a simple financial formula. The first part -- estimating the cash flow -- is a little tougher. Ultimately we want to be able to draw conclusions about the entire market, but let's start by looking at a single firm, [Wells Fargo & Company](#).

With antecedents in the famous stagecoach line of the Old West, the San Francisco-based bank merged last year with Norwest Corporation, which had headquarters in Minneapolis and tentacles throughout the country. The new company kept the Wells Fargo name and became the seventh largest bank-holding company in the United States, with more than 2,800 conventional branches and 3,000 mini-branches inside retail stores in twenty-one states. It finished the year with \$137 billion in deposits and \$2 billion in after-tax profits. Wells Fargo also happens to be one of the better investments of [Berkshire Hathaway](#), the holding company chaired by the superinvestor Warren Buffett. Berkshire owns 67 million shares of Wells, worth \$2.9 billion -- stock that originally cost Buffett just \$392 million. Berkshire is the largest shareholder in the bank.



In April of this year a share of Wells Fargo stock cost \$40 and paid an annual dividend of 75 cents, for a yield of 1.9 percent. If you had taken your \$40 and put it in a long-term Treasury bond at that time, it would have paid you 5.5 percent interest, or \$2.20 a year, for thirty years. The gap of \$1.45 between the interest payment of \$2.20 and the dividend payment of 75 cents seems very large. Can Wells Fargo really increase its dividends so much in the future that it will put more money in your pocket than the bond would?

The answer depends on how much the dividend grows. Let's look first at the past. Wells Fargo increased its dividend per share over the past five years at a rate of 16.5 percent annually, and over the past ten years at a rate of 14.5 percent. Those growth rates are solid, and Wells Fargo's story is not unusual. If Wells Fargo can sustain similar growth in the future, the dividend payments will become very big very fast. Growing at 16.5 percent a year, that 75-cent dividend will be \$1.61 in five years, \$3.45 in ten years, and \$15.91 in twenty years. In thirty years it will rise to \$73.26, whereas the payment from the Treasury bond will still be \$2.20. In other words, in that thirtieth year the dividend payment to a Wells Fargo shareholder will be higher than the total of the bond's interest payments over thirty years -- and almost twice as great as the bond's \$40 principal.

But, of course, growth at 16.5 percent cannot go on forever; indeed, if a firm constantly grew faster than the economy overall, the firm would ultimately swallow the whole thing up. Sooner or later a company matures, and thereafter it just keeps up with the growth of the economy (if that). Yes, 16.5 percent is unrealistic, but if we are willing to make some assumptions about the company's growth in the future, we can predict the amount of cash the company will generate in dividends -- and from that figure we can compute its proper value today.

Let's divide a company's life cycle into two stages: "adolescence" and "adulthood" (we won't try to analyze companies that are now fast-growing infants, like so many Internet companies). During adolescence a company grows at a rate higher than that of the economy as a whole. Once it becomes an adult, it grows at a rate that is a bit slower than that of the economy as a whole.

The value of a company's stock depends on its current dividend, together with how fast the company will grow during adolescence, how long adolescence will last, and how fast the company will grow during adulthood. (The best firms, like the best people, are those that keep their adolescent energy even as they reach an advanced age.)

Wells Fargo is hardly an adolescent, but a reinvigorated management and the merger with Norwest give it teenage vitality. So let's start by assuming that Wells will maintain the 16.5 percent growth rate of its dividends of the past five years for another five years. Then let's assume that it will abruptly mature and after that will grow at a rate about 0.5 percent slower than nominal GDP growth, or about 4.5 percent a year. Let's also assume that the prevailing Treasury-bond rate is 5.5 percent, as it was in the spring of this year. This rate is really not so vital, as we will see.

Under these assumptions we can easily total all the bank's future dividends and calculate what those dividends are worth today -- their discounted present value. The answer is \$128 a share. Let's call that our first estimate of the perfectly reasonable price, or PRP, for Wells Fargo. If last April the market had smartened up and correctly priced the stock immediately, the share price would have risen from \$40 to \$128. The P/E ratio, which at the time was 33, would have increased to 105.

But this is just one scenario. Let's try some others. If we assume that the company can stay adolescent for ten years instead of five -- that is, maintain the 16.5 percent growth rate for a full decade before trailing off -- then the PRP becomes \$214.

On the other hand, slower growth can lower the numbers -- although not enough to make the company look like a bad investment. Say that the company grows at a rate of only 14.5 percent during adolescence. If the high-growth period lasts five years before the company reverts to low-growth adulthood, the PRP is \$117. If adolescence lasts ten years, the PRP is \$181.

Now assume that the company's dividends in adulthood rise only with the level of inflation -- say, 2.5 percent -- rather than at a rate slightly below the rate of GDP growth. In that case, with a five-year adolescence at a growth rate of 16.5 percent the PRP is \$42, with a ten-year adolescence \$67.

Which is the most likely scenario? The choice is yours -- which is why you should study the stock. Our guess would be a ten-year adolescence at a growth rate of 14.5 percent followed by a reversion to growth that is 0.5 percent slower than the GDP's. That would cause the price of Wells to quadruple, and the P/E to rise to 149.

Is Wells Fargo special? Not at all. The stock market universe is filled with companies that have stories at least as compelling.

[A Value for the Whole Market](#)

IN order to value the whole market, we need first to go back to the yardstick against which stock prices are measured: the U.S. Treasury bond, the main alternative for many investors who are thinking about buying stocks.

A bond is an IOU, a piece of paper indicating that the borrower promises to pay the lender back, with interest. The longest maturity of any Treasury bond you can buy today is thirty years. At the end of last year thirty-year Treasury bonds were paying interest of about five percent. In other words, if you lend the U.S. government \$1,000, it will send you checks of \$50 a year for the next thirty years, and then hand back the \$1,000. In the past bonds with even longer maturities have been issued -- by companies, not by the U.S. government. The Walt Disney Company, the Coca-Cola Company, and IBM have all sold 100-year bonds.

If you are considering a long-term bond, you are probably thinking more about how much interest it will pay than about the money you will get back thirty years from now. That is perfectly reasonable. A claim today on \$1,000 in thirty years is not worth very much. By the time you get the \$1,000, its purchasing power will be reduced significantly. At an inflation rate of 2.5 percent \$1,000 loses more than half its value in thirty years and about nine tenths of its value in a hundred years.

A stock has no definite maturity, and certainly comes with no promise to repay your original investment down the road. Sure, if a company is bought out or dissolved, the shareholders might be paid off, but if the company is successful, that event could be decades, or even a century, away. General Electric, for example, traces its beginnings to the Edison Electric Light Company in 1878 and continues to increase its profits at a rapid clip. GE's earnings were \$9 billion last year, up from \$4 billion in 1993.

So one way to think of a stock is as a bond with a really, really long maturity. Although no stock will last forever, a strategy of keeping your funds in the market as a whole through a mutual fund could be sustained for quite a long time. Extending the maturity toward a far-off horizon actually makes our analysis easier, because we can ignore the repayment of your original investment and focus on the cash flow. That, after all, is the key question in investing: How much money goes into your pocket?

Now suppose the government decided to offer a bond that lasted forever -- something called a perpetuity. If the interest rate on this bond were constant over time, it would be easy to price -- just like current long-term Treasuries.

Let's say that the rate on comparable investments, such as insured bank certificates of deposit, is 10 percent. Then a bond that paid \$1.00 a year forever would cost \$10 -- because that is how much you would have to invest elsewhere to get the same cash flow. If the interest rate on comparable investments was five percent, the perpetuity that paid \$1 a year forever would cost \$20, because that is how much you'd have to invest elsewhere to get that dollar.

Now suppose that in addition to the five percent "normal" bond, the government introduced a second kind of perpetuity, on which annual payments increased every year at some fixed rate -- say, two percent. Let's call this a growth bond. What interest rate should the growth bond pay today in order to pay exactly as much over its lifetime as the normal five percent bond would? Clearly, the initial rate on the growth bond should be lower than five percent -- because growth would make payments higher in the future. But how much lower?

That seems like a difficult math problem, but actually the solution is simple -- and it's treated in nearly every finance textbook. A normal bond and a growth bond are equivalent in present value if the sum of the growth bond's interest rate plus its growth rate is equal to the normal bond's interest rate. So if the normal bond is paying five percent and the growth bond's payments will rise by two percent a year, then the growth bond should start off paying three percent. It's that easy.

Of course, the timing of the payments is different. In the first year a \$1,000 normal bond will pay \$50 in interest, whereas the growth bond will pay \$30. In the second year the growth bond will pay \$30.60, and in the tenth year \$35.85. And so on. If the sum of the growth bond's interest rate and growth rate is bigger than the interest rate of the normal bond, then the growth bond is paying its holders too much money. What does "paying too much" mean? Simply that the growth bond is underpriced.

Let's bring these mathematical calculations back to the world of stocks.

- **First, think of a stock as being the same thing as a growth bond.**
- **Second, think of a stock's dividend yield as being the same thing as the growth bond's interest rate.**
- **Third, think of the growth rate of the stock's annual dividend as the same thing as the growth rate of the growth bond's annual interest payment.**
- **And remember that we want the stock to provide the same flow of cash as a normal long-term Treasury bond.**

The stock will provide that cash flow if the sum of its dividend yield and the growth rate of its dividends (how much they increase, on average, per year) is equal to the interest rate on that normal Treasury bond. If the sum is greater than the Treasury rate, then the stock is paying too much.

Just like a growth bond, a stock that pays too much is underpriced. Again, think of bonds. If one bond that costs \$1,000 is paying interest of \$100 a year while all other bonds that cost \$1,000 are paying interest of \$50 a year, then, obviously, the bond that is paying \$100 a year is too cheap at \$1,000. Its price should rise to \$2,000, making its return the same five percent.

Think of the stock market, as represented by the S&P 500. When the sum of the S&P's dividend yield plus the growth rate of its dividends exceeds the rate on a normal Treasury bond, then the market has not reached the perfectly reasonable price. The market is too cheap. It needs to rise some more.

Let's get down to the real numbers. We need look at only three things: the interest rate on long-term Treasury bonds, the dividend yield on stocks, and the expected long-term growth rate of stock dividends.

The first two numbers are easy to find in any newspaper. Earlier this year the rate on a thirty-year T-bond was roughly 5.5 percent, and the dividend yield for the typical stock in the Dow Jones Industrial Average was 1.5 percent -- both rates low by traditional standards. The third rate -- the growth of dividends per share -- is not listed in newspapers, but its history is easy to discover, using statistics developed by the Yale economist Robert Shiller. (If you would like to see the data yourself, they are available on the Web at www.econ.yale.edu/~shiller/chapt26.html.)

The figures are compelling. From 1977 to 1997 the growth rate for dividends was 6.1 percent. From 1946 to 1997 the rate was 6.2 percent. So the past two decades have not really been much different from the rest of the postwar period. The consistency of these numbers is important. There are two possible explanations for the apparent undervaluation of stocks back in the late 1970s. Either dividends grew far more than could possibly have been expected or people were too cautious about the risks of

stocks. Since dividend growth over the past twenty years is almost precisely the same as over the past fifty years, the growth should have come as no big surprise.

But back to our calculations.

To start, let's assume that dividends will grow in the future at the same fairly steady rate as they have over the past half century -- by about 6.2 percent. You can see that stocks are paying too much when you add the yield of dividends (about 1.5 percent in 1998) to the growth rate (6.2 percent) and you get 7.7 percent, or 2.2 percentage points more than the T-bond rate (5.5 percent). Thus stocks put more money in your pocket than bonds, even though stocks are actually less risky than bonds over long periods.

Of course, applying the simple formula here is a problem, because the growth rate is bigger than the current interest rate. If firms grew that fast forever and the interest rate did not change, then the present value of future dividends would be infinite. One way to solve this problem is to rely on the simple model we used for Wells Fargo -- breaking up a firm's life into adolescence and adulthood.

Suppose, for example, that all the companies in the market will grow at six percent a year for the next ten years and then grow at 0.5 percent below the GDP growth rate after that. In that case the present value of future dividends that you buy when you buy \$100 worth of a portfolio representing the entire S&P 500 is \$172. In other words, the market would have to rise immediately by 72 percent under these extremely modest assumptions to reach the PRP.

If the growth rate that has prevailed since 1946 continues for another fifty years before tailing off, then buying \$100 worth of stock today will get you dividends worth \$270 in present value. But dividends have grown faster than GDP for some time. Perhaps we should be more aggressive. If dividends just keep up with GDP (rather than falling behind by half a point) after ten more years of six percent growth, then their present value climbs to \$329. If the six percent growth lasts twenty years, the present value climbs to \$360; if fifty years, to \$460.

After weighing the historical evidence, we support an estimate based on one of the last two numbers. The PRP for the market overall should be 260 to 360 percent higher than it is now -- three and a half to four and a half times as high. Since the dividend yield for the Dow was around 1.5 percent earlier this year, the market should rise until the yield is about 0.4 percent.

It is easy to pull the same answer out of the growth-bond relationship. If the dividend yield is 0.4 percent and the Treasury bond yield is 5.5 percent, then the equation (cash returns from bonds = cash returns from stocks, or cash returns from bonds = dividend yield plus the growth rate of dividends) balances if that growth rate equals 5.1 percent: $5.5 = 0.4 + 5.1$. This number is more than one percentage point below the average growth rate of dividends since 1946, so it seems to us perfectly reasonable.

But wait. These calculations have been based on numbers that don't allow for inflation. Inflation makes saving for tomorrow less attractive, because one dollar tomorrow can't buy as much as one dollar today. Although your dividends will be higher ten years from now, a new car or a trip to Europe will cost more, so shouldn't we take inflation into account?

Fine. Let's correct for inflation. Since the interest payment on a T-bond is the same every year, the bond's future payments are worth less and less as inflation erodes the value of the dollar. To account

for this degradation, economists talk about the "real yield" of a bond, which is the nominal, or stated, interest rate minus the inflation rate.

So let's look at some numbers that correct for inflation. In its forecast at the beginning of this year the [Congressional Budget Office](#) predicted that inflation will rise at an average of about 2.6 percent a year through 2009. That means that the real yield on long-term Treasuries paying 5.5 percent is about 2.9 percent. For stocks the dividend yield is 1.5 percent. We don't need to adjust it for inflation, so long as we adjust the growth rate for inflation.

And how do we get the real growth rate for dividends? One source is the data developed by Robert Shiller. From 1946 to 1997 dividends per share grew at a real annual rate of 2.2 percent. From 1977 to 1997 the rate was 2.3 percent. From 1987 to 1997 it was 3.0 percent.

Add the middle real-growth rate to the dividend yield of 1.5 percent and you get a total of 3.8 percent, or 0.9 percent more than the real interest rate on bonds. Use the more recent figure for real growth and the difference is even larger.

If we assume that the real growth of dividends will continue at two to three percent, then we find, again, that stocks are paying too much. The only way this imbalance can be corrected is for stocks to rise in price.

But there is a serious problem with these numbers. The dividend payouts are far, far too low. Why?

Two reasons. First, when a firm pays out dividends to its shareholders, the shareholders are forced to pay tax immediately on the dividends. When the firm retains its earnings, the shareholders pay no tax. As we pointed out above, firms have been gradually learning that shareholders prefer not to pay taxes, and the fraction of earnings that is paid out in dividends has dropped dramatically -- from above 70 percent in the 1930s to less than 40 percent today. This downward trend absolutely does not reflect a decline in firms' ability to pay dividends.

Second, the data we have used so far are based on the dividends of the S&P 500. One intriguing characteristic of the recent bull market is that many of the firms that have soared are computer and Internet companies that pay no dividends. This change in the composition of the S&P 500 means that dividend statistics are currently biased downward. (Our assumption is that a firm like Microsoft, with \$20 billion in cash, will put money in shareholders' pockets in the future.) A better measure might correct for this big-firm low-dividend bias by looking at the market as a whole.

To do this, we constructed an aggregate measure of dividend yield and growth rate of dividends for all companies from the Federal Reserve's Flow of Funds tables. These numbers make the market look even better. The dividend yield for U.S. companies last year, according to calculations from the Fed data, was 2.0 percent, and the growth rate of dividends averaged 9.4 percent over the preceding twenty years. Adding those two numbers, we get 11.4 percent, as against the six percent we have been using in our conservative calculations.

How much will prices have to rise? Until they reach our PRP, or perfectly reasonable price. And what, precisely, is that?

Let's step back. If a stock's dividend payout in dollars stays the same but the stock rises in price, its yield will decline. Take [AT&T](#). Suppose it pays a dividend of \$1.50 a share while shares are trading at

\$100. Its yield is 1.5 percent. Now assume that AT&T triples in price but its dividend stays the same; its yield becomes 0.5 percent.

Let's suppose that the entire market is represented by that single share of AT&T. After all, at the start of this year the stocks in the Dow Jones Industrial Average were offering a dividend yield of about 1.5 percent. If the entire market triples in price and the market's dividend payout in dollars stays the same, the yield will drop to 0.5 percent.

Add that yield to our conservative real growth rate of dividends (2.3 percent) and you get 2.8 percent - - approximately equal to the real T-bond interest rate. The equation balances.



At the start of this year, the Dow Jones Industrial Average was about 9,000. If the Dow, representing the entire market, tripled, then dividend yields would decline to their "perfectly reasonable" level -- the level at which stocks put the same amount into your pocket as bonds. If we use the dividend yield from the Fed data as our starting point, the market needs to quadruple to reach the PRP.

Recognize that our assumptions are modest. First, we are looking just at dividends. Second, we are using a conservative estimate for real dividend growth. It could easily be three percent or higher.

Give this powerful idea some time to sink in: By our simple, logical calculation, stocks may be undervalued by as much as three quarters. They need to triple or quadruple to get to where they should be: the PRP.

But firms earn far more than they pay out in dividends, and those earnings, too, count in figuring out how much money ends up in an investor's pocket. How much do they count? A lot.

A More Reasonable Look at How High the Market Can Go

IF you own a restaurant or a dry-cleaning shop, you aren't picky about what the profits are called. What's important is that your cash flow in is greater than your cash flow out, and that you have actual money to put into your bank account. This positive flow of cash is the reason for investments.

But so far we have been using just one kind of cash flow -- dividends -- as the measure for all cash flow. This is a very conservative approach, because in recent years the total profits (official after-tax earnings, as reported to the [Securities and Exchange Commission](#)) of the average company have been nearly three times the dividends it pays to shareholders.

Earnings are much higher than dividends because many firms keep part (or all) of that money to make investments, which they expect will deliver more profits in the future. In addition, businesses recognize that there's a tax advantage to retaining earnings, because the tax rates that shareholders pay on dividends are higher than the rates they pay on capital gains, or increases in the value of their stock -- in the case of rich shareholders, roughly twice as high.

Certainly earnings are real money, but it would be an egregious error to apply the analysis we just used for dividends to all earnings for all companies. In the case of most companies, however, some of the earnings beyond dividends will flow to shareholders. Now we will calculate how much -- and, from

that, make a less cautious but more reasonable estimate of how stocks should be priced than we did in our dividend-based estimate. We will also explain why a P/E ratio as high as 100 is justified for the market as a whole, and P/Es even higher are justified for some stocks.

But first listen to Warren Buffett, America's most successful investor, explaining to shareholders at the 1998 annual meeting of Berkshire Hathaway why not all earnings are created equal. He defined what he called a "wonderful business": "The business is wonderful if it gives you more and more money every year without [your] putting up anything -- or [with your putting up] very little. And we have some businesses like that.... The worst business of all is the one that grows a lot, where you're forced to grow just to stay in the game at all, and where you're reinvesting the capital at a very low rate of return. And sometimes people are in those businesses without knowing it."

In other words, the fact that a company's earnings are rising every year doesn't mean that its long-run prospects are improving. Those rising earnings may have to go straight back into the business to pay for vital capital investments just to stay on an even keel.

Consider, for example, a limousine company that has to use all its profits each year to buy new cars to keep up with the competition. If it does not buy new cars and its rivals do, the company will lose customers and eventually go bankrupt. So even if its profits are rising at 10 percent a year, they never go into the pockets of the owners. They are sunk into new cars. In the end the limo company is an asset with no value, because it has no cash flow.

Now consider a company that owns a seaside hotel that requires almost no upkeep. As people get richer, demand for rooms increases, so the hotel raises its rates. But very little money has to go back into the hotel. If the hotel distributes the money that's left over to its shareholders, then we can do our usual calculations -- dividend rate plus growth rate of dividends should equal or exceed the T-bond rate -- and everything is fine. But if the hotel decides to retain all those earnings and stash the cash in, say, a savings account paying five percent interest, we have a problem. Earnings will be inflated in subsequent years by the interest from the bank -- interest that the shareholders could have earned if the hotel had paid the dividends to them.

These are the two reasons that cash flow to shareholders is rarely equal to reported earnings: 1) huge reinvestments may be necessary just to maintain a firm's competitive position in the future, and 2) there's the potential for double-counting.

The reported earnings of most companies, very clearly, are greater than the cash that flows into your pocket over the time you own a stock. But just as clearly, quarterly dividends are *less* than that cash flow. After all, many of today's greatest success stories -- Microsoft, Amgen, Dell Computer, to name a few -- do not pay conventional dividends at all. Yet their stock prices have risen sharply -- a sign that investors believe that they will see cash in the future.

Is there any way we can value a company when all we have is reported earnings?

Actually, there are several. One way is to use the two stages we introduced earlier -- adolescence and adulthood -- but with a subtle change. Assume that during adolescence, as a company pours its earnings back into the firm rather than handing them out to shareholders as dividends, the company will increase its earnings at a high rate. At maturity the firm will start paying dividends, and will increase them at a low rate. Back before tax considerations became an important determinant of payouts, mature firms paid out about 70 percent of earnings as dividends, so we will use that figure.

Let's see how much cash can be expected to go into your pocket if you put your money in a popular firm, [Cisco Systems](#), that had very high P/Es last spring but that doesn't pay dividends.

Founded in 1984 by a small group including Leonard Bosack and Sandra Lerner, a husband-wife team from Stanford University, who mortgaged their house to raise money and built prototypes in their garage, Cisco Systems has become the largest manufacturer of networking products in the world. Specifically, Cisco controls 85 percent of the market for switches and routers. It also makes the dial-up servers that give computer users access to the Internet.

Cisco's sales rose from \$27.7 million in 1989 to \$8.5 billion in 1998. Over those ten years Cisco increased its earnings by an annual average of 115 percent. Growth has slowed recently, but not much. Over the five years ending in 1998 average annual earnings increases were 59 percent. The company has a fabulous balance sheet, with no debt, \$1.7 billion in cash and marketable securities, and another \$1.3 billion in notes due from others. Cisco puts much of its profits back into the business, but not all.

Last June, Cisco was selling at \$64, and with earnings per share of 74 cents had a P/E of 86. Pretty expensive stock? Not really. If Cisco's earnings increase at the same rate over the next five years as they have over the past five, they will increase by a factor of 10, to about \$7.50 a share. Suppose that Cisco's price doubles over that five years. Its P/E at that time will be 17 -- hardly outrageous.

Now suppose that Cisco has five years of adolescence and then, hitting maturity, starts paying 70 percent of earnings out as dividends. Let's use our assumption that dividends per share will grow at about 0.5 percent below the GDP growth rate after the firm reaches maturity.

Using the standard formula for calculating a stock's present value according to the flow of cash it generates over time, we find that Cisco's PRP should be \$399 a share. In other words, Cisco's price last June would need to sextuple. Its P/E would rise to 539 (no, that's not a misprint).

But even with the Internet boom, it may be stretching credulity to project a 59 percent growth rate for Cisco. Value Line's analysts project a 25.5 percent growth in earnings for the company over the next five years, so let's use that figure -- and again assume that when adolescence ends, dividend payouts of 70 percent of earnings will begin, with dividends growing slightly more slowly than the U.S. economy. In that case, with a five-year adolescence the PRP for Cisco should be \$122, for a P/E of 165. If growth continues at 25.5 percent for ten years, the PRP is \$291 (about five times this year's price for the stock), and if it continues for twenty years, \$1,652.

The point is that at its current levels Cisco is not an overvalued stock. Whether it should rise by a factor of two or by a factor of 30 to reach its PRP depends on your assumptions. We think a factor of four or five is reasonable.

A PRP for the Dow

IT is not difficult to find firms that logically should have prices and P/E ratios well above the historical averages. But what about the market as a whole? Let's look more closely at cash flow and at the relationship between earnings and dividends.

Using earnings to calculate the cash that flows into shareholders' pockets can be very complicated; a good reference is the book *Valuation: Measuring and Managing the Value of Companies*, by Tom Copeland, Tim Koller, and Jack Murrin. The authors suggest several complementary approaches, of

which we like the financial-flows technique best, because it is easy to compute using national statistics. The technique adds repurchases to dividends, but penalizes firms if they finance those dividends with debt.

When we do the arithmetic, using data from the Federal Reserve Board, we find that for the market as a whole since the Second World War, the correct measure of cash flow that shareholders could expect to take out of firms is about 68 percent of earnings. This is a useful fact, because it allows you to look at earnings and make a quick guess at the PRP without doing any further digging.

Growth in cash flow has been even greater than earnings growth by the measure that we have been using. The earnings measure came from Robert Shiller's data, which looked only at the S&P 500, the usual proxy for the market as a whole. But lately go-go stocks like America Online and Qualcomm are gaining more importance on that index. When an Internet company with minuscule current earnings but a large market capitalization and great promise replaces a manufacturer on the S&P, earnings for the index as a whole can drop significantly. But in our examination of the aggregate cash-flow figures we look at the Fed data for all firms, and there's a big difference.

The "cash yield" from these numbers is much higher than the dividend yield for the market as a whole, confirming the intuition that our dividends-only calculations were extremely cautious.

For the market as a whole, the nominal growth rate for cash flow has been about 10 percent annually since the Second World War, as against a 7.3 percent growth in earnings (using the Shiller data) over this period; for the past twenty years cash flow has grown at 12.5 percent, and earnings have grown at 6.7 percent.

More impressive, for all corporations the average cash-flow yield last year was 3.3 percent, as compared with the 1.5 percent dividend yield we found above.

The cash flow from owning stocks, then, may be more than double the lowly dividends of today, and it has grown faster than dividends as well. If we use this alternative measure to evaluate how high the market needs to go to reach the PRP, then our conclusions become even more optimistic. When we used dividends, it looked like the market would have to triple. By this measure, which gives firms credit for money earned on behalf of shareholders but not paid out in dividends, the market would have to grow by a factor of six, even if we assume that cash flow will grow at about the same rate as dividends have grown in the past. If we assume that the recent spurt in cash flow will continue, the PRP is even higher.

Our circumspect assumptions show that the PRP is much higher than the market valuation is today, but it cannot be calculated precisely. For that reason we like to think of the perfectly reasonable price as defining the upper boundary of a "comfort zone." As long as you are a long-term investor with a diversified portfolio, you should not be concerned about warnings of overvaluation or manias or bubbles -- provided that P/Es are under 100 and the Dow is below 36,000.

One common warning is that stocks will fall as interest rates rise. But unless the rate increase is dramatic and long-lasting, we are not greatly concerned. The reason is that our theory depends on the level of real interest rates, which have been steady throughout modern U.S. history. For example, if the nominal interest rate on Treasury bonds shoots up to eight percent, the reason for the rise will almost certainly be that investors are worried about higher inflation and are demanding extra compensation for lending their money to the government. But higher inflation would also push up revenues,

earnings, and dividends for corporations, so the increase would not change our bullish story. If, however, inflation stays in check but interest rates climb to, say, 10 percent, then real rates will have reached a point where stocks are no longer cheap compared with bonds. That is very much a long shot.

We can't know whether the PRP for the Dow is really 27,000 or 54,000. However, we are sure of two things: thinking about stocks in the way we have described forces investors to ask the right questions, and anyone who claims that the market is too high today is viewing matters from an outdated and flawed perspective.

The Decline of the Risk Premium

INVESTORS aren't familiar with our PRP calculations, and they've been warned constantly that they are overvaluing the market, yet they have bid stock prices up dramatically. Why?

Earlier we presented evidence that stocks are less risky than bonds in the long run. We decided to make the cautious assumption that stocks and bonds are equally risky; then the PRP of a stock is the one that produces a flow of cash over time that equals the flow of cash from a Treasury bond.

But we have also shown that in the past investors who have owned stocks have put much more cash in their pockets than those who have owned bonds.

Remember that to find out the returns you can expect from a stock, you simply add the dividend yield to the anticipated growth rate of dividends. That number has typically been much higher than the yield on a Treasury bond, whose interest payments don't rise over time.

For example, early this year the stock of [AlliedSignal, Inc.](#), a diversified manufacturer that makes aerospace and automotive products, was paying a dividend of 68 cents a year and trading at \$45 a share, for a yield of about 1.5 percent. The growth rate of the company's dividends was projected at 11.5 percent. Add 1.5 percent and 11.5 percent and you get the expected cash return from the stock -- 13 percent. Meanwhile, a long-term Treasury bond was yielding 5.5 percent.

Think of the 13 percent cash return on AlliedSignal stock as exactly comparable to the payments from a risky bond paying a fixed rate of 13 percent. For a risky bond, that extra 7.5 points over the Treasury rate is called the risk premium, and so it is for the risky stock. It is the extra cash flow that investors demand to compensate them for the extra risk of owning stocks instead of Treasury bonds.

But wait. In truth there is no extra risk in stocks. On average, stocks are actually less risky than bonds over long horizons. But investors have historically not believed this. They have perceived that stocks were riskier, so they have demanded higher returns. How much higher?

No official risk-premium figure is reported every year, but by making some assumptions we can construct a series -- a historical record. Once again using the raw data compiled by Robert Shiller, we can go all the way back to the 1870s. The risk premium is the number of percentage points you have to add to the Treasury-bond rate in order to make the total equal to the dividend yield for stocks plus the growth rate of dividends. It is easy to find the bond rate and the dividend yield, but we have to guess what people expected that the growth rate of dividends would be each year. For simplicity we made the assumption that the expected growth rate was a consistent six percent -- about the average for the entire postwar period.

Take a year when the dividend yield was three percent and the bond rate was five percent. Yield (three percent) plus the growth rate of dividends (six percent) equals nine percent. Subtract the bond rate (five percent) from nine percent and you get an estimate of the risk premium: four percent.

Now look at the actual results. From 1872 to 1929 the risk premium averaged 6.5 percent a year. The 1929 crash scared investors so badly that they boosted the premium even higher. From 1933 to 1950 it hovered around 11 percent. As the Second World War ended and the economy picked up, fears began to diminish, and during the 1950s the average premium dropped to about 9.5 percent. In the 1960s it continued to fall. The rate then fluctuated wildly as Paul Volcker, the chairman of the Federal Reserve Board, launched a war against inflation by hiking interest rates and creating enormous uncertainties. But the premium fell all the way down to about 2.5 percent in the late 1990s.

What happened as investors wised up to reality? They gradually bid down the irrationally high risk premium.

What does this do to stock prices? Say you own a house in northern California in a neighborhood that everyone believes is an earthquake zone. You rent out the house for \$500 a month, or \$6,000 a year -- the going rate in that part of the country. The market value of the house is \$60,000 -- a relatively low figure, because of the threat of quakes and the risk of losing the entire investment. Therefore the annual return on your investment, if the investment is the value of the house, is 10 percent (\$6,000 divided by \$60,000).

Suddenly a new seismological study is released showing that in fact the neighborhood is *not* in an earthquake zone, so the risk of losing your house in a catastrophe plummets to practically zero. The value of the house soars to \$100,000. The income from the tenant, however, remains the same: it was set by the market, because the tenant could always move to another neighborhood. Therefore your annual return is now six percent (\$6,000 divided by \$100,000).

This is a good illustration of what happens to the risk premium after a shift of perception. The risk-free rate of return on the house turned out to be six percent, but you were getting a return of 10 percent when it appeared that you were in an earthquake zone. So you were receiving a risk premium of four percentage points. As the risk was unmasked as illusion, the premium vanished. The value (or price) of the house rose, and the return fell.

This is exactly what has been happening in the stock market. On average the risk premium has historically been about seven percent, and its sharp decline is what has been propelling stocks higher in the bull market of the late twentieth century. Changes in other elements in the equation have been slight. Although many analysts talk about the growth in corporate profits, the truth is that dividend increases have been remarkably steady. Earnings growth has been fairly regular as well, and though nominal bond rates have gone up and down, the real rate has been notably consistent. No, it is the declining risk premium that explains the market's boom.

The historically high risk premium has posed a major intellectual challenge to financial scholars for a long time. Hundreds of academic papers have offered explanations, but none has received wide acceptance. Why has the risk premium now dropped? Scholars are again at a loss.

Without a theory, the experts have to fall back on the argument that the 458 percent return that was produced by the market from June of 1989 to June of this year reflected a temporary euphoria over stocks, and that the historical risk premium accurately reflects people's preferences, as irrational as

they may appear. Investors are naturally scared to death of stocks, according to this view, and a huge correction is coming, in which the risk premium will revert to its historical norm.

If the risk premium did return to normal, the carnage would be devastating. Add a seven percent risk premium to a 5.5 percent Treasury yield and you get a 12.5 percent target for the sum of the dividend yield and the growth rate of dividends. Assume that growth is 6.5 percent -- the yield would have to quadruple, from 1.5 percent to six percent. For that to happen, stock prices would have to fall by 75 percent. A \$100 stock paying a \$1.50 dividend would drop to \$25 a share.

We aren't worried about a return to an absurdly high risk premium, however, because we have a different explanation for what has happened over the past few decades. We see the decline in the risk premium as reasonable and long-lasting, not as insane and transitory. Investors have gradually learned about stocks and how their prices move over time. The prices that held in the past reflected an irrationally high aversion to risk as we measure it today, but in the past our understanding of risk and its calculation was in its infancy.

As stock ownership expands, so does education by mutual funds, banks, brokerage firms, journalists, and scholars. Research is far better today than it was in the past, and it is easily disseminated on the Internet. Seventy years ago few investors understood that excessive trading undermines profits, that stock-price fluctuations tend to cancel themselves out over time, making stocks less risky than they might appear at first glance, and that it is extremely difficult to outperform the market averages. American investors have learned to buy and hold.

Over the past few decades investors have entered the stock market the way a cautious child enters cool water. First he puts in a toe and pulls back. Then he tentatively submerges his foot and leaves it there. Then he wades in up to his knees, to his waist. At last he dives in. Americans are now diving into the stock market, having found that the water's fine. Having survived a 508-point drop in the Dow in a single day in 1987, a 554-point drop in a single day in 1997, and an 1,800-point drop in just six weeks in 1998, they feel that the risks are not nearly so great as they feared. They are using their resources and energy to learn about stocks and the best strategies for owning them. It makes good sense that such efforts would push the price of stocks toward the PRP. As the information has arrived, investors have brought their beliefs up to date and become more willing to hold on to stocks.

To believe that the market is overvalued, you have to believe that the risk premium, once irrationally so large and getting rationally small, will become irrationally large again. It is our strong belief that the risk premium will continue to shrink, and for good reasons. The best reason is the one that has prevailed for the past 200 years: stocks are actually less risky, in the aggregate and over the long term, than bonds.

Every time an analyst says that P/E ratios are too high today in the light of historical experience, she is implicitly saying that the risk premium is too low. In other words, she expects investors to go back to the days of being irrationally risk-averse. Maybe they will -- but we strongly doubt that the profitable lessons of the contemporary stock market, once learned, will quickly be unlearned.