







The Ibbotson forecasts became the linchpin of financial planning, asset allocation for institutions, cost-of-capital estimation, and a host of other practices. The equity risk premium is arguably the most important single variable in finance, because it helps you plan ahead and decide how much to save and invest, and Ibbotson found what appeared to be a reliable estimator of it.

Why were the original DDM forecasts too low? One reason is that they assumed that future repricing—change in the valuation (say, price/earnings ratio) of the market—would be zero. But in an environment of falling interest rates, repricing is not zero. Stocks were very cheap in 1979, partly because interest rates were historically high. Equities have a longer duration than intermediate Treasury bonds, so falling interest rates helped stocks more than they helped bonds. (Whether falling interest rates were part of investors' expectations in, say, 1979 is a question that is unlikely to be resolved, but it is plausible to suppose that they were.) Additional light is shed on the low prices of equities in the late 1970s in a classic article by Modigliani and Cohn (1979). Another factor is that corporate profit growth surprised on the upside in the 1980s and 1990s, as takeovers, the threat of takeovers, and other factors caused companies to focus more carefully on maximizing shareholder value.

But these trends clearly couldn't continue forever. As the economist Herbert Stein said, any trend that cannot continue forever won't. The bear markets of 2000 to 2002 and 2007 to 2009 shaved away a good portion of the historical realized risk premium, even when the measured period begins in 1926. The fact that bonds rallied strongly during most of the bear-market period further eroded the historical equity risk premium.

The events of the 2000s have had a tremendous impact on the prevailing thinking (including Ibbotson's) about the equity risk premium. Most notably, the original Ibbotson method has been shown to be procyclical, when what is needed is a forecast method that is either countercyclical or not cyclical at all.

A procyclical forecast is one that extrapolates past trends forward. An example of a procyclical forecast is as follows: The more baseball games that the Chicago Cubs win, the more games that the Cubs are expected to win. Maybe the Cubs have gotten better at playing ball or maybe some other factor is at play. At any rate, such a forecast is not ridiculous. Some teams improve over a given time period while others deteriorate, and an increased percentage of wins is evidence that the team has in fact improved its skills and will continue its winning ways. (Realists, of course, understand that the Cubs will never really be any good.)

If the stock market has a winning streak, however, it is just becoming more expensive, suggesting that further returns will be lower, not higher!

Although fundamentals, such as corporate profits, can change, I am speaking of stock price changes not explained by changes in fundamentals. Bondholders know this better than equity holders. If the price of a 5 percent Treasury bond rises because yields have fallen to 4 percent, do bond investors expect the past high returns to continue, or do they expect to now earn 4 percent? Even fairly naïve bond investors expect the latter.

As the stock market soared in the late 1990s causing the historical average equity risk premium to increase, rate-of-return forecasts using the Ibbotson method also became larger (because the forecasts embodied the future-equals-past assumption). Thus, forecasts that were reasonable in 1974 or 1979, and that were vindicated by later results, seemed extravagantly optimistic at the price levels that prevailed in 1999. Because the market's price/earnings ratio (P/E) had risen from less than 10 in 1979 to well over 20 in 1999, the future-equals-past method implied a further doubling of the P/E every 20 years into the indefinite future. Such a forecast is obviously not reasonable.

So what, at bottom, was wrong with the future-equals-past method? It not only assumed that the future would resemble the past but that the market is fairly priced. In a certain circle, the idea that the overall market might be mispriced was too politically incorrect in the 1970s and 1980s to be seriously considered and to make its way into forecasts. But by the late 1990s, the strong form of the efficient market hypothesis was no longer in vogue; the market could be over- or underpriced. And if the market is substantially mispriced, you have to use a different forecasting method, *one that includes the current price as an input*. The DDM fits this criterion, and the past 15 years or so have seen a return to the DDM for forecasting the equity risk premium. We will return to the modern use of the DDM shortly.

To Morningstar's (and Ibbotson's) credit, the firm now uses multiple methods, including the future-equals-past method, a version of the DDM, and a method (Ibbotson and Chen 2003) that combines aspects of both.

## **ARE STOCKS RISKY IN THE LONG RUN?**

Let's examine my earlier observation a little more closely. Figure F.1 gives a powerful illusion of no risk in the stock market.

Now that we've seen where the beginning and end points in Figure F.1 are, we can draw a straight line through them (or a best-fit regression line through the full data set) and see that whenever there is a deviation from the straight path, the market eventually snaps back to it and crosses it. Thus, there's no risk to the truly long-term investor. Returns are self-evidently

mean reverting; if you wait long enough, you'll earn the long-run average return!

Well, maybe not. A little logic shows that returns must be in some sense mean reverting. If extraordinarily good returns cause stocks to become overpriced, they are more likely to be followed by poor ones, and vice versa. But wait a minute. Although there's risk in the deviations around the line, as 1929 to 1932 and more recent episodes demonstrate, the biggest risk comes from the fact that we didn't know in advance what the slope of the line would be. In other words, you don't know what the mean you're reverting to is. And you never will.

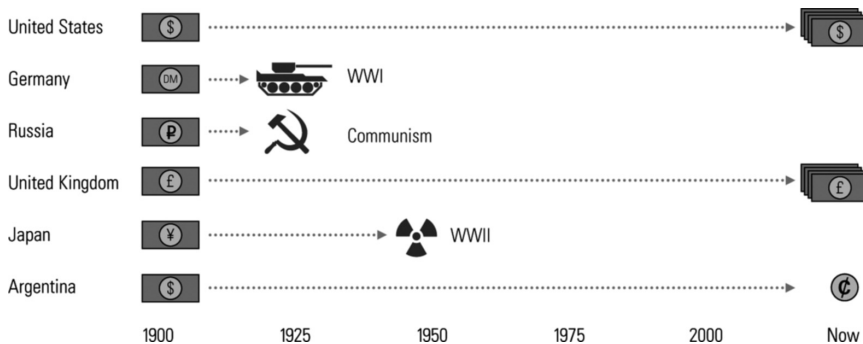
Ibbotson Associates, or Roger Ibbotson and Rex Sinquefeld, never themselves said that stocks were riskless or almost riskless in the long run. To the contrary, their method emphasized the risk of stocks by drawing wide confidence bands around the forecast means. That stocks are riskless (or have low risk) if you wait long enough is a misunderstanding of Ibbotson and Sinquefeld, promoted by others. Those who adhere to that misunderstanding sometimes use Ibbotson and Sinquefeld's data to support their cause, but they shouldn't.

### **SURVIVAL BIAS: DID YOU KNOW IN ADVANCE THAT THE UNITED STATES AND UNITED KINGDOM WOULD SUCCEED?**

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A number of investigators, including Roger Ibbotson himself in his collaboration with Gary Brinson,<sup>4</sup> pointed out that historically based forecasts of long-run rates of return may be biased because one is observing only markets that were lucky enough to have survived. This principle is best illustrated relative to a hypothetical portfolio of country index funds, purchased at the beginning of the last century, when there were no developed markets, and Europe, North and South America, and other parts of the world were bursting with emerging markets. (See Figure F.2.) As it turned out, an investor who held funds in the United States, the United Kingdom, and a few other small countries would have enjoyed uninterrupted equity markets up to the present, but investors who bought in Germany, Japan, Russia, Austria-Hungary, China, and so forth would not have. All of these countries now have stock markets, but, at some point, the investor would have lost everything and, in order to remain an investor, would have had to inject new capital earned in the labor market. I developed this theme and William Goetzmann of Yale has applied it to everything under the sun.<sup>5</sup>

This observation implies that the return achieved after the fact by investors in the U.S. or U.K. equity index is an overestimate of the return they



**FIGURE F.2** How Global Investment Opportunities in 1900 Fared

expected before the fact. In other words, the U.S. or U.K. result is one of the better outcomes an investor in 1900 might have hoped for. Most investors fared much worse. That such a wide range of outcomes was not only possible but likely must have been known by investors in 1900, a date when the U.S. Civil War and various upheavals in Europe were within living memory. Thus, the expected return on equities is almost surely lower than the historical number. Fama and French (2000) appear to have confirmed this conjecture by using the Dividend Discount Model to estimate the returns that U.S. investors expected or required at each point in historical time; they come up with an equity risk premium of about 3 percent.

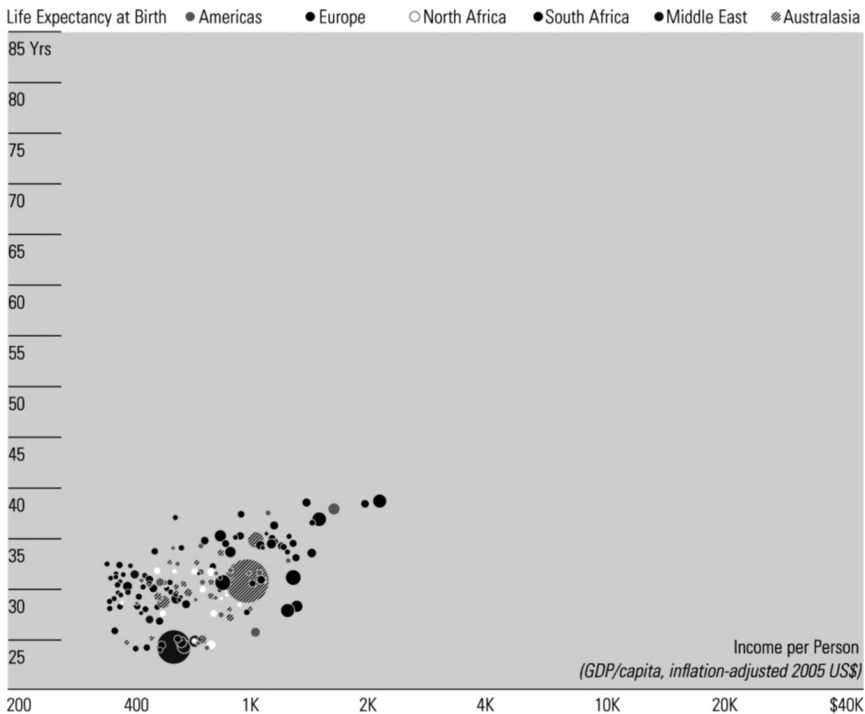
## **SAMPLE PERIOD BIAS: WERE THE PAST 200 YEARS REALLY TYPICAL?**

Another likely source of upward bias in using historical returns as forecasts comes from the time period that was studied. Although Roger Ibbotson and Rex Sinquefeld originally studied only the time period from 1926 to 1974, they and others extended the period both backward (to 1802, in the case of Schwert) and forward (to the present), and found that the extended results confirmed the 1926–1974 finding of a high equity risk premium. It was comforting to those expecting a high equity premium that, no matter what period you looked at, you got roughly the same result. But is a 210-year look at history really long enough? Angus Maddison, who estimated global GDP data from the year one (that’s right, the beginning of the Christian era) through the present, would say no. His celebrated work shows that human economic progress was painfully slow—with annual per capita real GDP growth rates of 0.0 percent to 0.1 percent—until about 1820, when the rate zoomed, approaching 2 percent on a global basis (Maddison 2007).

Note that the period during which humanity made almost all of its economic progress—1820 to the present—is almost identical with the period from which the very long estimate of the historical equity premium is taken. No wonder the number is high.

Now, we could get into interesting debates about whether Shakespeare’s London or Mozart’s Vienna had really experienced no economic progress relative to London and Vienna a millennium earlier. Although Professor Maddison (1926–2010) is no longer around to answer the question, I think he would tell us that these civilizations really had experienced growth, but that they are outliers and that his estimates of almost-zero growth in almost all countries for almost all of human history are correct.

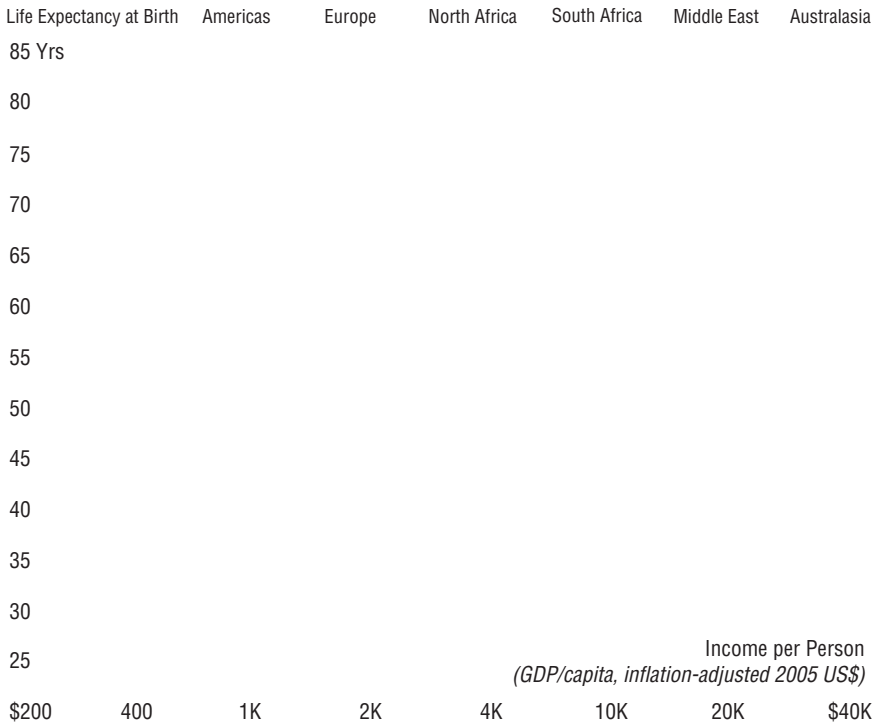
Hans Rosling, a Swedish statistician who has become popular for his lively computer animations of economic history, would probably agree.<sup>6</sup> Figure F.3 shows Rosling’s mapping of countries in 1800 according to their real GDP per capita and their life expectancy. All of the countries had real



**FIGURE F.3** The World in 1800

Source: gapminder.org. Used by permission.





**FIGURE F.4** The World in 2009

Source: gapminder.org. Used by permission.

GDPs per capita of less than \$3,000 (in today's dollars)—roughly that of India now. The United Kingdom had the highest GDP, followed by the Netherlands and then the fledgling United States. All of the countries had life expectancies of 40 years or less. (The bubble representing each country is drawn with its area proportional to that country's population.)

Figure F.4 is the same map, but showing data as of 2009. The sickest country today (Zimbabwe) has a longer life expectancy than the healthiest country in 1800. Regrettably, the poorest countries today are still poorer than the richest country in 1800, but most countries, including many considered developing or in the emerging markets, are much richer than the richest were in 1800.

This progress did not take place evenly. The Western countries, Japan, and a few others first pulled ahead in what I would like to call the Great Decompression (roughly 1820 to 1945), wherein the rich and healthy left the poor and sick far behind. Then, starting about 1945, a Great







