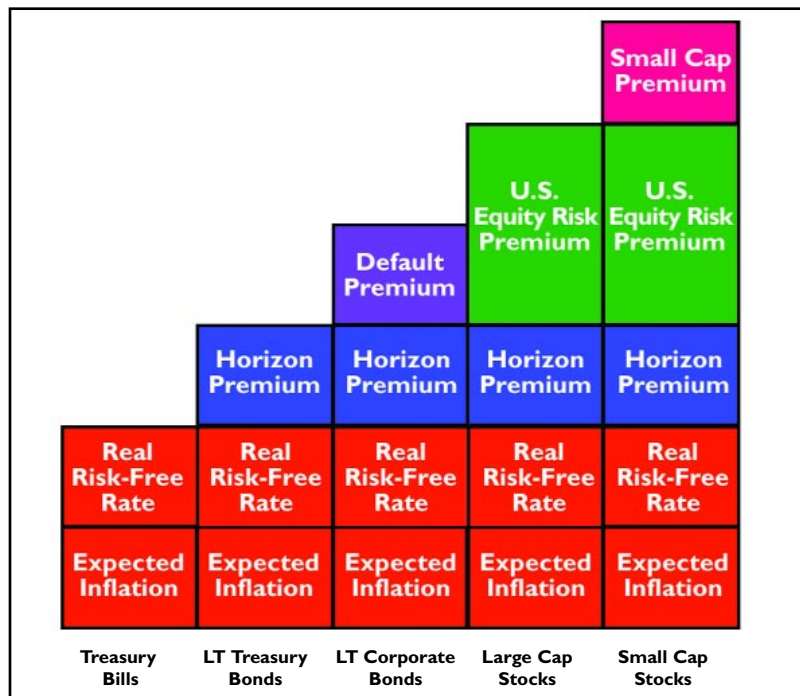


IBBOTSON ASSOCIATES' BUILDING BLOCK APPROACH

How Expected Returns Are Calculated



- Ibbotson Associates' Building Block Approach is used to generate **expected return estimates**.
- The approach uses **current market yields** as its foundation and **adds historical performance relationships**, such as **risk premiums**, to build expected return forecasts.
- It can be explained by the formula: **Expected return = risk-free rate + historical risk premia**.
- The approach separates the expected return of each asset class into three components:

Building Block Component

Description

Real Risk-Free Rate

Return that can be earned without incurring any default or inflation risk

Expected Inflation

Additional reward demanded to compensate investors for future price increases

Risk Premia

Additional reward demanded for accepting uncertainty associated with a given asset class

- The approach reveals current expectations through the U.S. Treasury yield curve.
- The expected horizon premium is the difference between long-term government bond income returns and U.S. Treasury bill total returns. From 1970 through 2002, the horizon premium was 1.5%.
- The expected default premium is the difference between long-term corporate bond total returns and long-term government bond total returns. From 1970 through 2002, the default premium was .10%.
- The long-horizon expected equity risk premium is the difference between the arithmetic average of large company stock (S&P 500) total returns and long-term government bond income returns. From 1926 through 2002, the equity risk premium was 6.97%.
- The expected small cap premium is the difference between the arithmetic average of large company stock (S&P 500) and small company stock total returns. From 1926 through 2002, the small cap premium was 4.75%.
- The long-term risk-free rate was 4.83% on December 31, 2002 based on the long-term (20-year) U.S. Treasury coupon bond yield.

Expertise

Ibbotson Associates, founded in 1977 by Professor Roger Ibbotson, is a leading authority on asset allocation, providing products and services to help investment professionals obtain, manage and retain assets.

Roger Ibbotson is the Chairman of Ibbotson Associates. He is also a Professor in the Practice of Finance at the Yale school of Management in New Haven, Connecticut, where he resides. His study with Rex A. Siquel, Stocks, Bonds, Bills, and Inflation, updated in annual yearbooks published by Ibbotson Associates, serves as the standard reference for information on investment market returns. He has also been quoted in a variety of publications and has co-authored two books with Gary Brinson, Global Investing and Investment Markets.

In the course of business over the past 25 years, Ibbotson Associates has built and maintained many strong relationships with companies including: brokerage firms, mutual fund companies, banks, insurance companies, individual planners, investment consultants, plan sponsors and investment managers nationwide.