Risk and Volatility

Types of risk

Investors face many different forms of risk depending on the kinds of investments they choose.

Industry/company risk
Security values can decline due to negative developments within an industry or company.

Market risk
General market fluctuations can affect securities trading in that market. Stocks tend to fluctuate more than other asset classes such as bonds and may pose more risk over short periods of time.

Credit risk
This is the risk of a bond issuer not being able to make timely payments of principal and interest. The value of a bond may also decrease due to financial difficulties or the declining creditworthiness of the issuer.

Interest rate risk
All bonds tend to rise in value when interest rates fall, and fall in value when interest rates rise. Typically, there is greater price volatility associated with bonds with a longer maturity.

Call/reinvestment risk
As interest rates fall, bonds with call provisions may be called in by the issuer prior to maturity. This may leave the investor with the problem of reinvesting the principle at a lower interest rate.

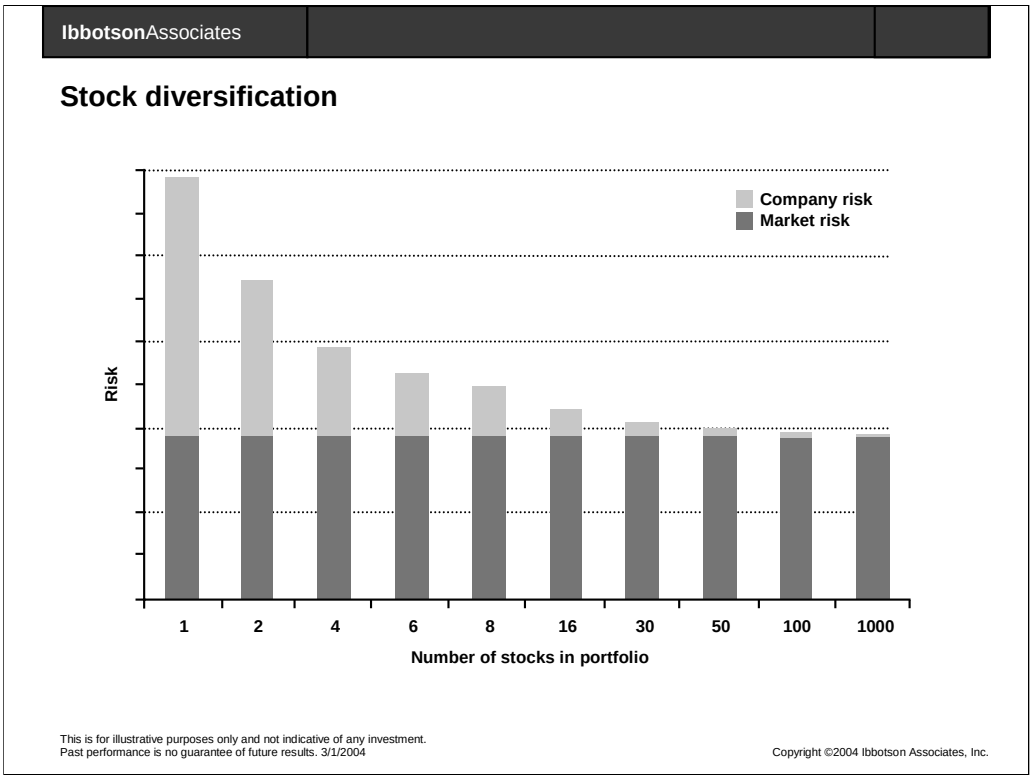
Inflation risk
This is also known as purchasing power risk. Inflation is a rise in the general level of prices for goods and services. If investments do not keep up with inflation, an investor's money will purchase less in the future than it did in the past.

Liquidity risk
Some investments may not be widely held by the public and may be difficult to sell if prices drop dramatically.

Currency risk
Currency exchange can affect the returns of a foreign security because foreign exchange rates constantly fluctuate with changes in the supply and demand of each country's currency. Thus, returns achieved by local investors are often quite different from the returns that U.S. Investors achieved—even though both are investing in the same security.

Political/economic risk
Investments in a foreign country can be affected by the political and economic developments within that country.

Market timing risk
By attempting to time market movements, investors risk being out of the market during the best times and may find themselves jumping into markets during the worst times.



Stock diversification

Diversification is a major benefit of investing in mutual funds.

Company or individual security risk is the risk that a specific stock may fall in price due to non-market-related factors such as poor company management. It is the risk in excess of the overall stock market and is not always rewarded with higher returns. You assume greater company risk when you invest in a limited number of securities.

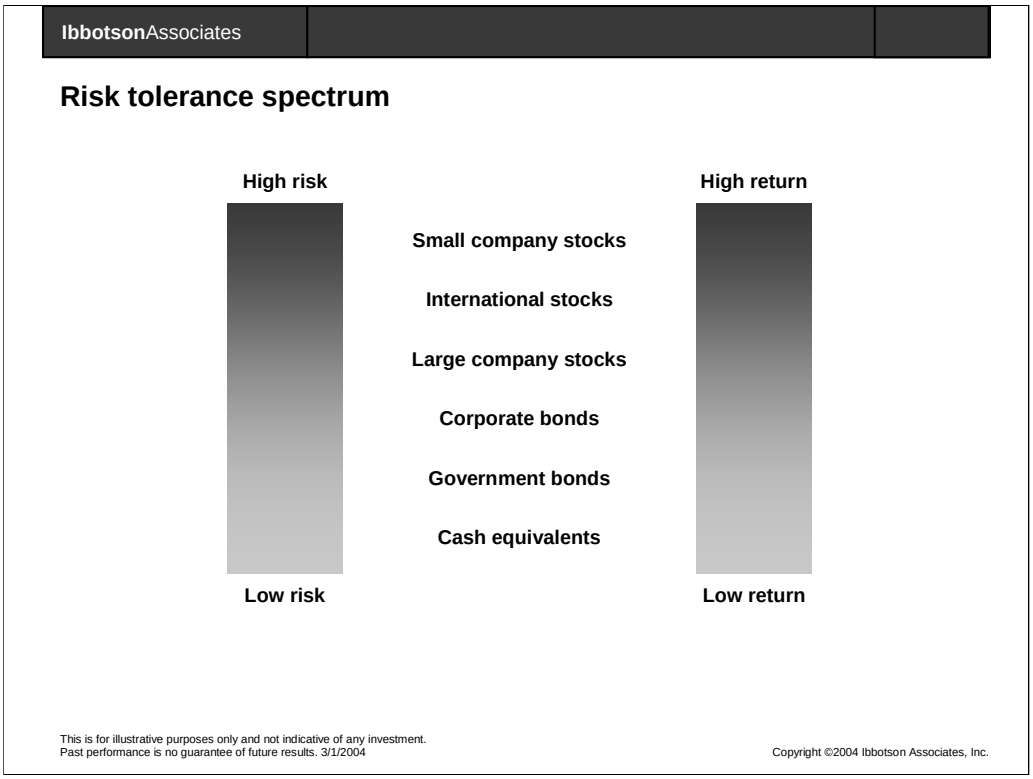
Including more securities in a portfolio can reduce the level of company-specific risk to which you are exposed. This is true for stocks as well as other types of asset classes. This image illustrates that an investor holding more than 100 stocks assumes little company risk.

Generally, it is impractical for most investors to buy hundreds of individual stocks. Mutual funds are able to reduce company risk because they have economies of scale. With millions of dollars in assets, mutual funds can afford to take positions in hundreds of stocks.

Even mutual funds, however, cannot diversify away market risk. Market risk is the risk that the entire market will experience a decline in price. Even if you hold every stock in the market and have very little company-specific risk, you will still be exposed to market risk.

The information presented herein is for illustrative purposes only and not indicative of any investment. Diversification does not eliminate the risk of experiencing investment losses. The portfolios used in this study are equally weighted. Returns and principal invested in stocks are not guaranteed. Capital gains and dividends received from stocks may be taxed in the year received. Mutual funds may have management fees and other additional costs. Past performance is no guarantee of future results.

Source: Lawrence Fisher and James H. Lorie, “Some Studies of Variability of Returns on Investments in Common Stocks,” *Journal of Business*, April 1970; Edwin J. Elton and Martin J. Gruber, “Risk Reduction and Portfolio Size: An Analytical Solution,” *Journal of Business*, October 1977; and Meir Statman, “How Many Stocks Make a Diversified Portfolio?,” *Journal of Financial and Quantitative Analysis*, September 1987.



Risk tolerance spectrum

If you desire high long-term returns, you must be willing to accept the high levels of volatility associated with the types of asset classes that produce such returns.

There is a wide spectrum of risk levels among asset classes. Risk is defined as fluctuations in returns from one period to the next.

Lower-risk investments, such as cash equivalents (for example, Treasury bills or certificates of deposit), have averaged modest long-term historical returns. Higher-risk investments, such as large company, small company, and international stocks, have averaged higher returns historically but with more volatility or fluctuations in value.

One of the first steps in developing an investment plan is to determine which is most important: return stability or long-term investment performance.

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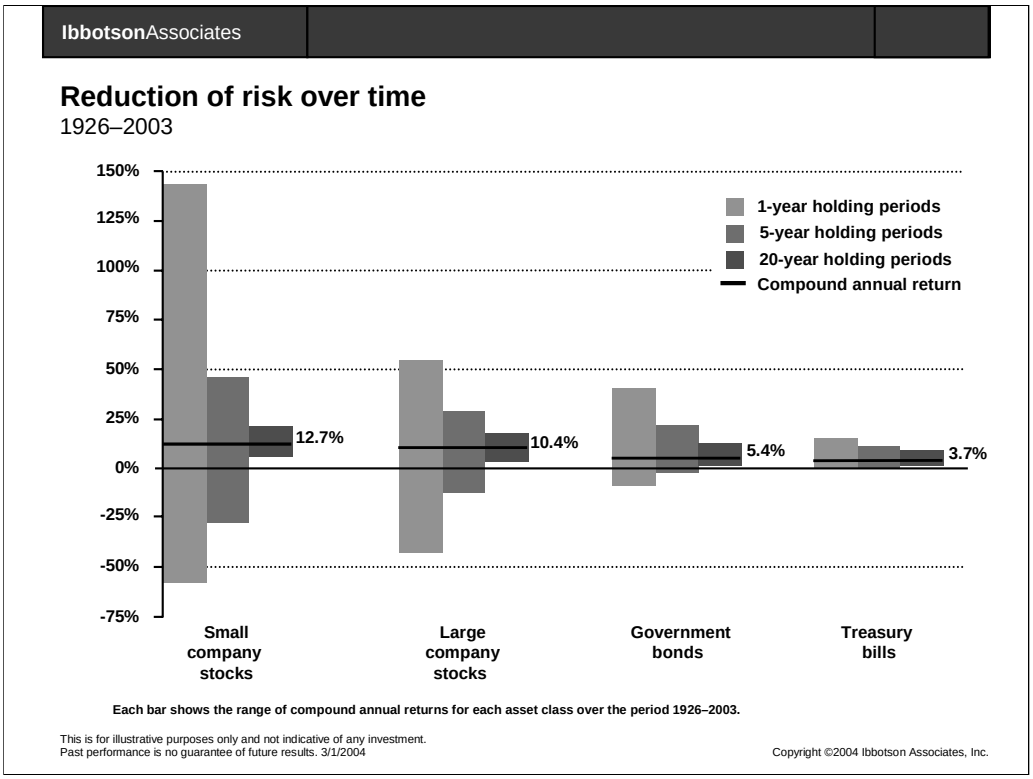

Reduction of risk over time 1926–2003

One of the main factors you should consider when investing is the amount of risk, or volatility, you are prepared to assume. However, recognize that the range of returns appears less volatile with longer holding periods.

Over the long term, periods of high returns tend to offset periods of low returns. With the passage of time, these offsetting periods result in the dispersion of returns gravitating or converging toward the average. In other words, while returns may fluctuate widely from year to year, holding the asset for longer periods of time results in apparent decreased volatility.

This graph illustrates the range of compound annual returns for stocks, bonds, and cash over 1-, 5-, and 20-year holding periods. On an annual basis since 1926, the returns of large company stocks have ranged from a high of 54% to a low of –43%. For longer holding periods of five or 20 years, however, the picture changes. The average returns range from 29% to –12% over five-year periods, and between 18% and 3% over 20-year periods. During the worst 20-year holding period for stocks since 1926, stocks still posted a positive 20-year compound annual return.

Although stockholders can expect more short-term volatility, the risk of holding stocks appears to diminish with time.

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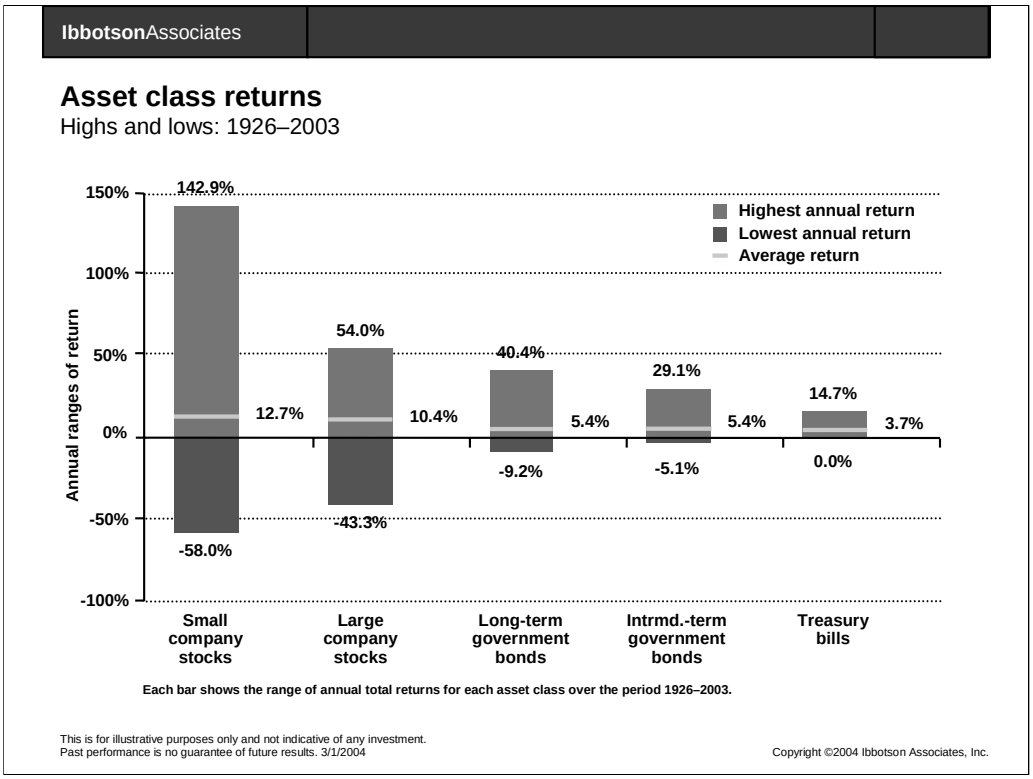
Source: Small Company Stocks—represented by the fifth capitalization quintile of stocks on the NYSE for 1926–1981 and the performance of the Dimensional Fund Advisors, Inc. (DFA) U.S. Micro Cap Portfolio thereafter; Large Company Stocks—Standard & Poor's 500®, which is an unmanaged group of securities and considered to be representative of the stock market in general; Government Bonds—20-year U.S. Government Bond; Treasury Bills—30-day U.S. Treasury Bill.



Asset class returns 1926–2003

The highest and lowest return experienced by an asset class provides valuable insight into its demonstrated risk.

All assets contain some degree of risk; however, some assets are considered more volatile (riskier) than others. This image illustrates the range of annual returns over the period 1926 through 2003 for five asset classes commonly considered in the asset allocation process.

Generally, the safest, most stable asset class has been Treasury bills, as indicated by their narrow range of historical returns.

Both intermediate- and long-term government bonds have wider ranges of returns than Treasury bills. This is because longer-maturity bonds are more interest-rate sensitive, resulting in greater short-term risk.

The asset classes with the greatest range of returns are also the asset classes with the highest compound annual returns: large and small company stocks. Although stocks have historically offered higher returns, they have also experienced greater volatility than that of bonds and Treasury bills.

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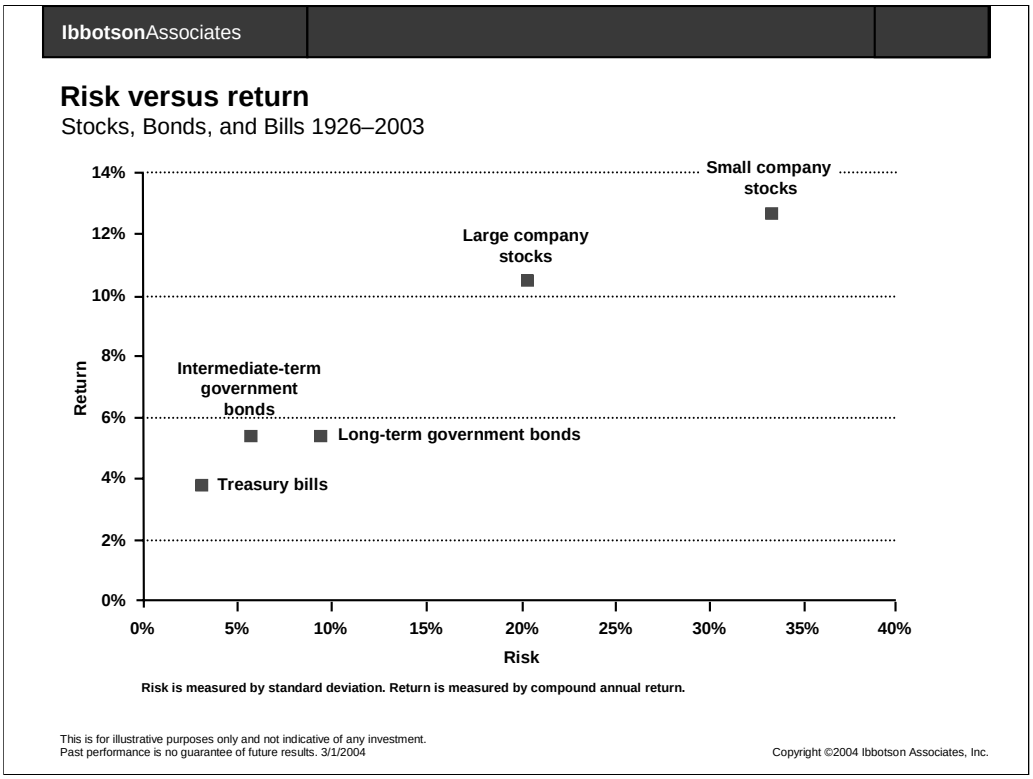

Risk versus return

When developing an asset allocation policy, it is important to understand the risk and return relationship of those assets being considered.

The image illustrates the risk-and-return relationship of five traditional asset classes based on performance over the past 78 years.

The asset classes are plotted according to risk, as defined by standard deviation, along the horizontal axis and compound annual return along the vertical axis. As expected in an efficient market, asset classes exhibiting higher returns are associated with higher risk.

Small company stocks have exhibited the highest risk of the asset classes shown. Small company stocks' high volatility, however, has been accompanied by high returns. At the low-risk end of the spectrum are cash equivalent investments. These investments have demonstrated very small fluctuations in principal, but have historically offered lower returns as well.

The goal is to select and combine assets in an efficient manner in order to meet your future needs at a risk level with which you feel comfortable.

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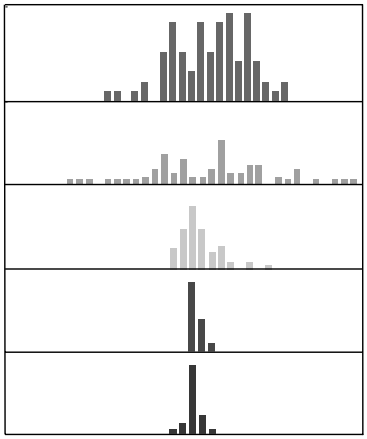
IbbotsonAssociates

Stocks, Bonds, Bills, and Inflation

Summary Statistics 1926–2003

	Compound annual return	Arithmetic annual return	Risk (standard deviation)
Large company stocks	10.4%	12.4%	20.4%
Small company stocks	12.7%	17.5%	33.3%
Government bonds	5.4%	5.8%	9.4%
Treasury bills	3.7%	3.8%	3.1%
Inflation	3.0%	3.1%	4.3%



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*The 1933 small company stock total return was 142.9%.

This is for illustrative purposes only and not indicative of any investment.
Past performance is no guarantee of future results. 3/1/2004

Stocks, Bonds, Bills, and Inflation: summary statistics 1926–2003

This image summarizes, quantitatively, the risk/return trade-off inherent in investing; that is, the potential return of an asset generally increases with the asset's risk.

The compound annual return shown in the first column reflects the annual rate of return achieved over the entire 78-year time period assuming the reinvestment of all income. It is the average rate of return which, when earned each year, equates the investment's beginning value with its ending value. The figure in the second column represents a simple, or arithmetic average of the individual annual returns over the past 78 years.

Standard deviation, shown in the third column, is used to measure the risk of an investment. It shows the fluctuation of returns around the arithmetic annual return of the investment. The higher the standard deviation, the greater the variability of the investment returns.

The "skyline" or distribution for each asset class graphically depicts the information contained in the summary statistics table. Riskier assets, such as stocks, have spread out "skylines," reflecting the broad distribution of returns from very poor to very good. Less risky assets, such as bonds, have narrow "skylines," indicating a tight distribution of returns around the average.

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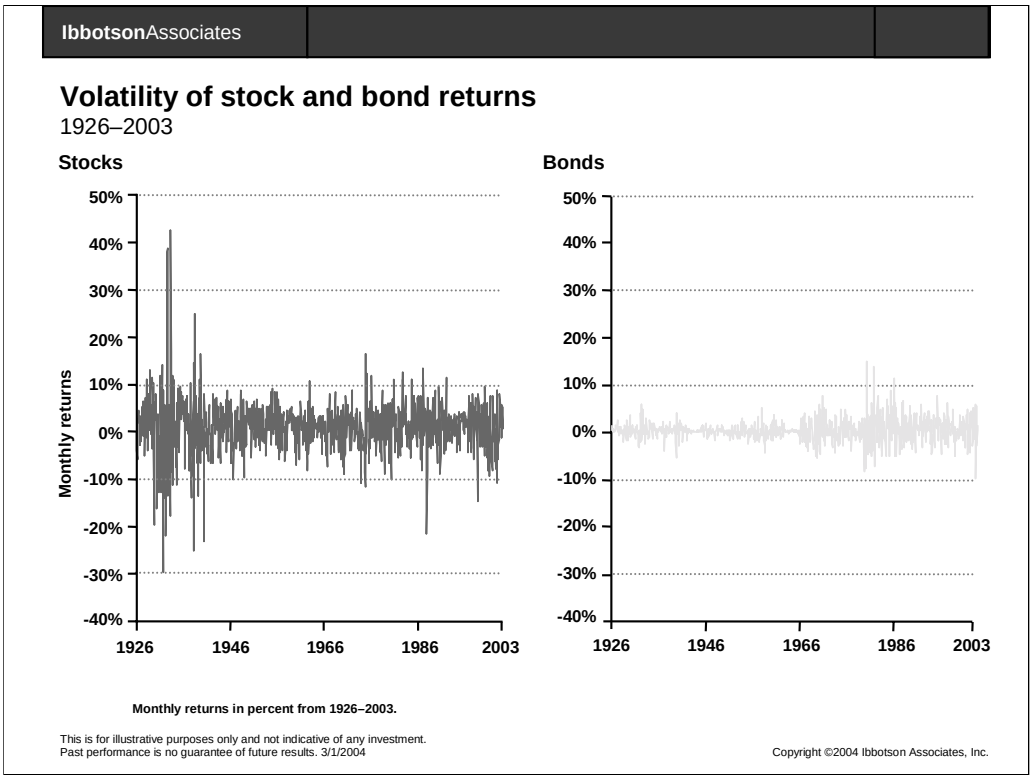
Source: Small Company Stocks—represented by the fifth capitalization quintile of stocks on the NYSE for 1926–1981 and the performance of the Dimensional Fund Advisors, Inc. (DFA) U.S. Micro Cap Portfolio thereafter; Large Company Stocks—Standard & Poor's 500®, which is an unmanaged group of securities and considered to be representative of the stock market in general; Government Bonds—20-year U.S. Government Bond; Treasury Bills—30-day U.S. Treasury Bill; Inflation—Consumer Price Index.



Volatility of stock and bond returns 1926–2003

Stocks and bonds have experienced different levels of return over the past 78 years.

Both stocks and bonds have experienced changes in return behavior over the past 78 years. Although stocks exhibited tremendous volatility before World War II, the market has been much less dramatic since that time. Conversely, bonds exhibited more stability in earlier periods, but have seen dramatic increases in volatility over the past 20 years.

One relationship has remained constant: stocks have been more volatile than bonds on a month-to-month basis. Over the long term, however, stock investors have been rewarded for assuming this greater volatility.

Due to a moderately low correlation between stock and bond returns (stocks and bonds have responded differently to economic events), a mix of these two asset classes can provide significant diversification benefits.

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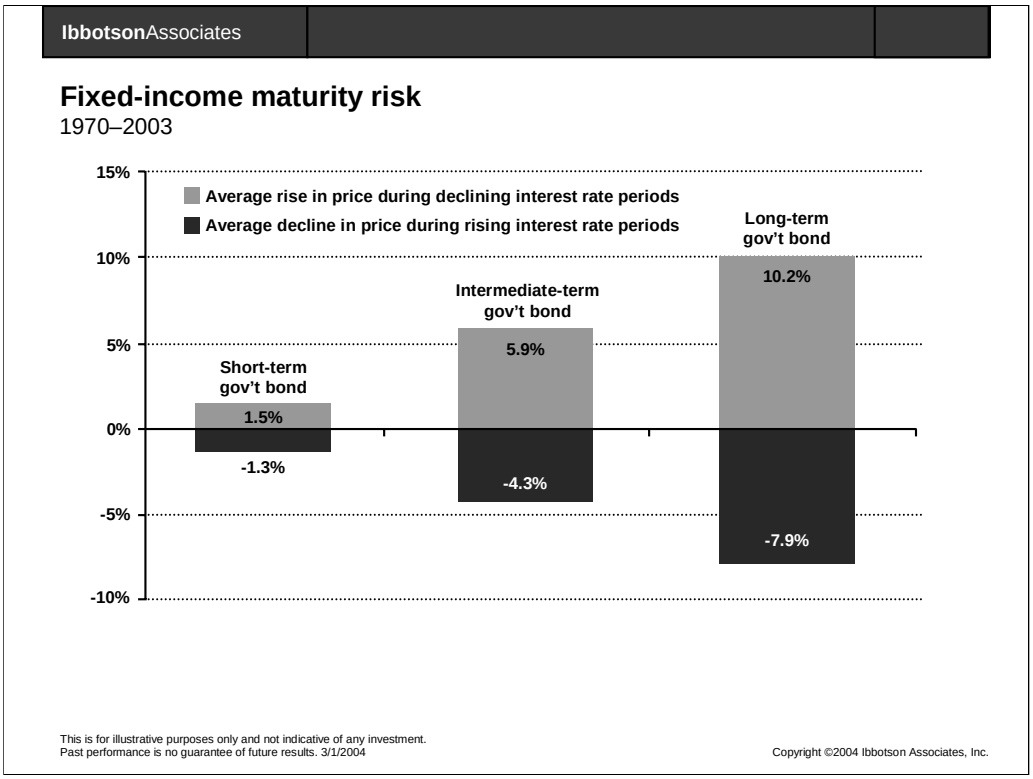
Source: Stocks—Standard & Poor's 500®, which is an unmanaged group of securities and considered to be representative of the stock market in general; Bonds—20-year U.S. Government Bond.



Fixed-income maturity risk

A bond's riskiness and performance potential are closely tied to its maturity. The longer a bond's maturity (date when it comes due), the more volatile its price will be when interest rates rise or fall.

This graph illustrates the relationship between the length of a bond's maturity and its sensitivity to interest rates. When interest rates fall, bond prices rise, and vice versa. The amount of fluctuations when interest rates move is called maturity risk. The greater a bond's maturity, the greater the maturity risk.

For the annual periods 1970 through 2003, each year was categorized as a year when yields rose or a year when yields fell. The price changes during all years when yields rose were then averaged. The same was done for years in which yields declined. The price change was isolated, as opposed to the total return, so that the effect would be more pronounced.

Since 1970, bonds of different maturities have reacted differently to interest rate increases or decreases. Shorter maturity bonds have been relatively insensitive to movements in interest rates, dropping an average of –1.3% when interest rates have risen and gaining an average of 1.5% when interest rates have fallen. Bonds with longer maturities have been the most sensitive, dropping an average of –7.9% when interest rates have risen and gaining an average of 10.2% when interest rates have fallen.

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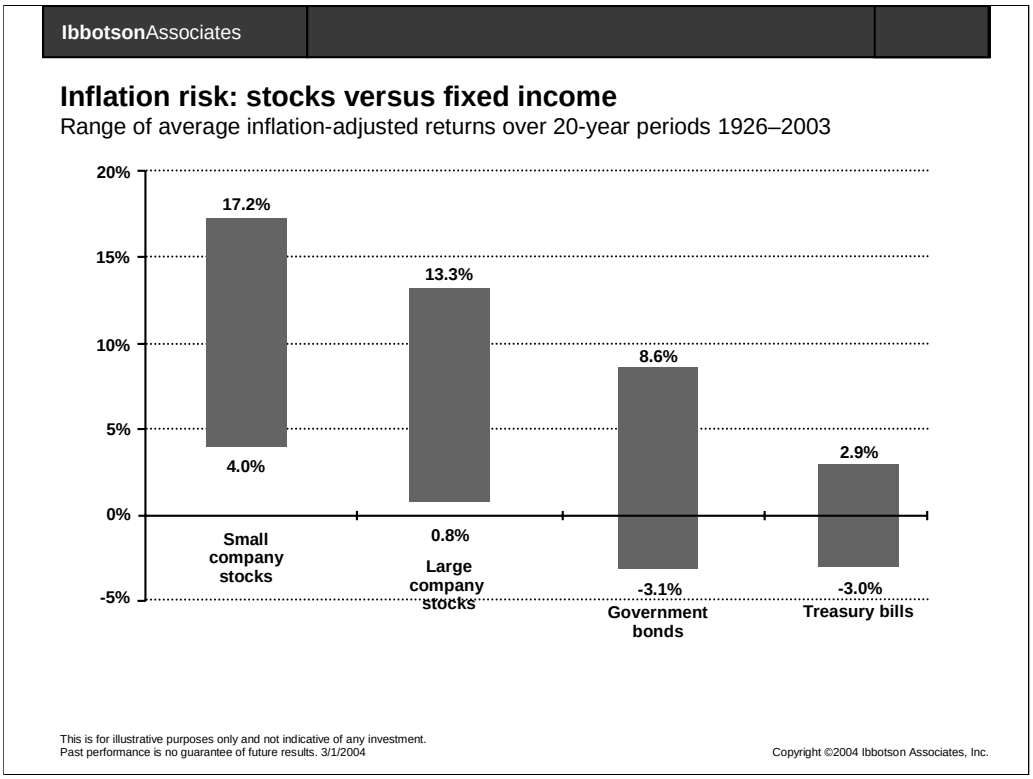
Source: Short-Term Government Bonds—represented by 1-year U.S. Government Bond for 1970–2000 and Lehman Brothers 1-3 Year Government Bond Index thereafter; Intermediate-Term Government Bonds—5-year U.S. Government Bond; Long-Term Government Bonds—20-year U.S. Government Bond.



Inflation risk: stocks versus fixed income

Since inflation most significantly impacts investments over the long run, it is important to examine the range of inflation-adjusted average returns for various asset classes over a long-term period.

Inflation, the rise in prices, erodes each dollar you earn on your investments. By not considering the negative impact inflation has on investment returns, you could run the risk of overestimating your future purchasing power.

This image illustrates the best and worst average inflation-adjusted returns over 20-year rolling periods for small and large company stocks, government bonds, and cash. Rolling period returns are a series of overlapping, contiguous periods of returns. When examining 20-year rolling periods of returns for annual data that starts in 1926, the first rolling period is 1926–1945, the second rolling period is 1927–1946, the third rolling period is 1928–1947, etc. At their best, fixed-income asset classes have experienced very modest 20-year real (inflation-adjusted) returns: 2.9% for Treasury bills and 8.6% for government bonds. Historically, there have been periods when such assets have shown negative returns over 20 years after accounting for inflation. Stocks, however, have consistently exhibited positive real returns over 20-year periods. By investing in large or small company stocks, you would have been better equipped to avoid losing purchasing power over the long run.

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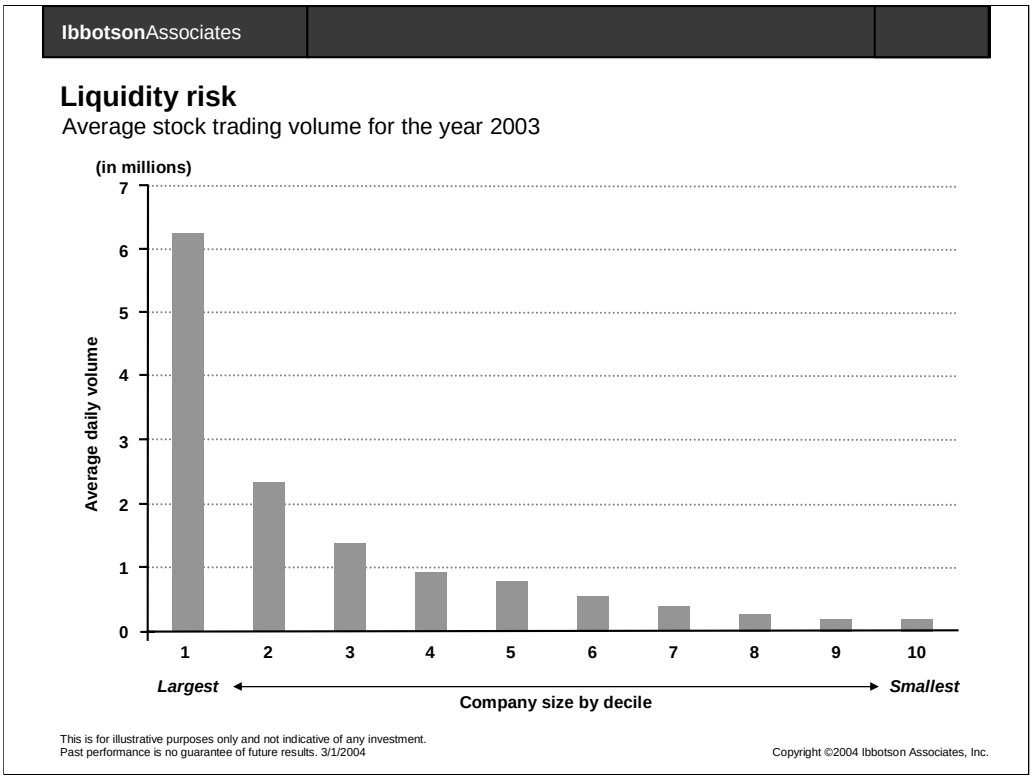

Liquidity risk

If there is insufficient demand for a security, it may be difficult to sell, causing the price to drop significantly.

The image illustrates the average daily trading volume of stocks by decile. Each stock in the market was arranged by market capitalization and divided into ten segments or deciles. The first decile represents the largest companies in the market, while the tenth decile represents the smallest companies.

Decile one companies are widely held and are heavily traded, allowing an investor to more easily sell a position at a desired price. Decile ten companies are often very small or micro-cap companies that are not widely held and may not be well-known by the public. This makes it more difficult for investors to sell their shares at desired prices, and if prices are declining, investors may not be able to sell their shares at all.

Some historical performance results show that the average rate of return for stocks has been higher for smaller companies than for large. There may be a greater potential for growth with smaller companies, but investors should be aware that there is also a greater risk of loss.

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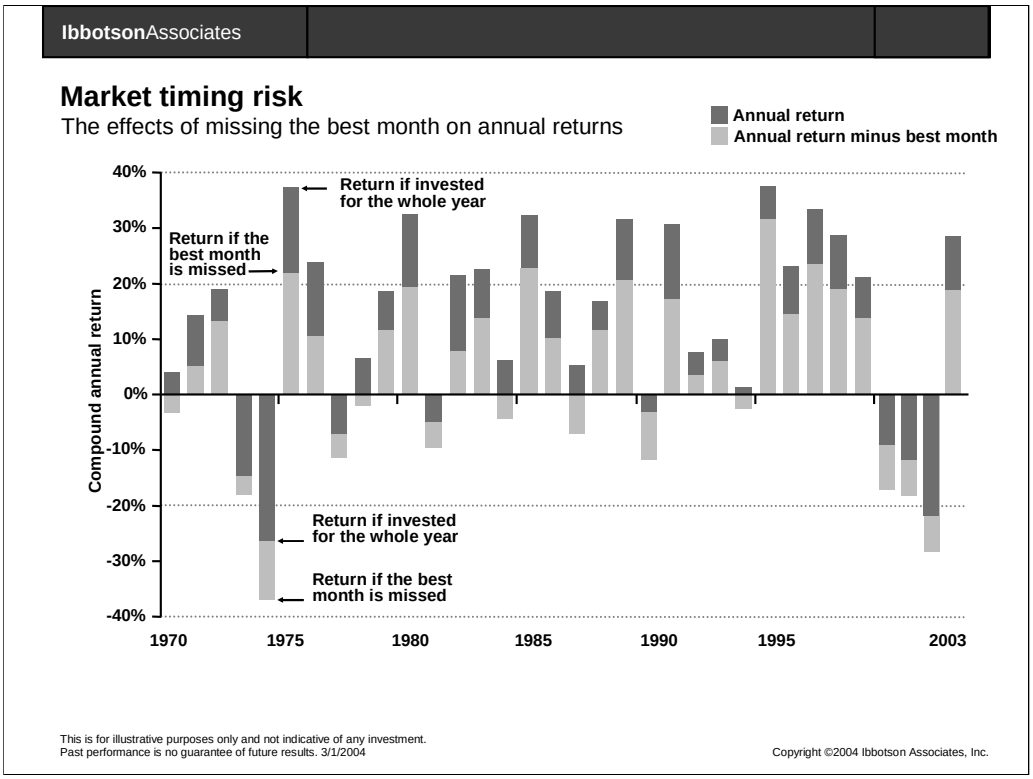
Source: Trading Volume—Average daily trading volume of stocks from the Standard & Poor's Compustat® database.



Market timing risk

Investors who attempt to time the market run the risk of missing periods of exceptional returns. This practice may have a negative effect on a sound investment strategy.

This image illustrates the risk of attempting to time the stock market by showing the effects of missing the one best month on an annual return.

Missing the one best month during a year drastically reduced returns. During years when returns were already negative, the effect of missing the best month only exaggerated the loss for the year. In five of the 34 years shown, 1970, 1978, 1984, 1987, and 1994, otherwise positive returns would have been dragged into negative territory by missing the best month in those years.

Although successful market timing may improve portfolio performance, it is very difficult to time the market consistently. In addition, unsuccessful market timing can lead to a significant opportunity loss.

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