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Highlights

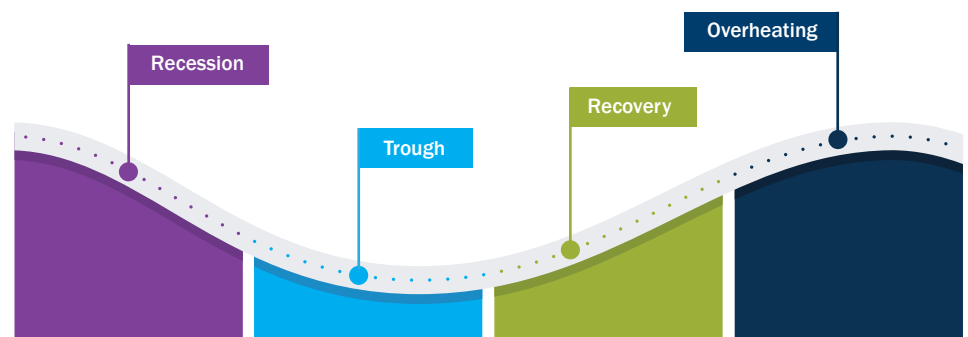
- There are four unique, major fixed-income risks — duration, currency, credit and inflation — and different fixed-income investments respond to them differently.
- Applying a full understanding of the four risks to a fixed-income portfolio may yield a better risk/return outcome.
- A multi-sector fixed-income portfolio based on the four risks may succeed where some binary risk allocation strategies are presently failing.

WHEN CAN RISK MEAN OPPORTUNITY? HARNESSING FIXED-INCOME RETURNS THROUGH THE CYCLE

The fixed-income market has become increasingly complex. Drivers of returns across bond portfolios are less transparent, dashing investors' return expectations in various environments. Much of this results from bond investors not knowing what they own.

By breaking bonds down to their most basic components, today's investors can gain a better understanding of the factors that generate risk and return. A better understanding of these drivers can help investors navigate the current market and build bond portfolios that can generate attractive returns through the cycle.

Depending on where we are in the economic cycle, different types of bonds offer attractive risk opportunities.



Fixed-income asset classes respond to risks differently

It is easy for an investor to misunderstand the risk associated with a fixed-income investment, but this can have significant portfolio strategy implications. A look at the risk composition of some common bond indices is revealing (Exhibit 1). For most domestic, investment-grade indices, an investor should expect most of the risk to come from duration, or interest rate risk. This is not surprising when you consider that the Bloomberg Barclays U.S. Aggregate Bond Index has a large portion of its market value in government-backed debt. However, investors in Treasury inflation-protected securities (TIPS) or investment-grade corporate bonds may be surprised to learn that much of their return is still derived from duration, because changes in government bond yields explain a large portion of the return of these high-quality asset classes.

The story changes further down the risk spectrum. Below-investment-grade securities like high-yield bonds and bank loans derive most of their volatility from credit risk because changes in corporate credit metrics and default probabilities

HARNESSING FIXED-INCOME RETURNS THROUGH THE CYCLE

account for most of the performance of these sectors. However, investors may be surprised to learn that duration risk is low in both asset classes despite the fixed-rate nature of high-yield bonds versus the floating-rate nature of bank loans. In international markets, currency risk drives a significant portion of the volatility profile, explaining more than half of the performance volatility of the Bloomberg Barclays Global Aggregate Index.

What is a risk factor?

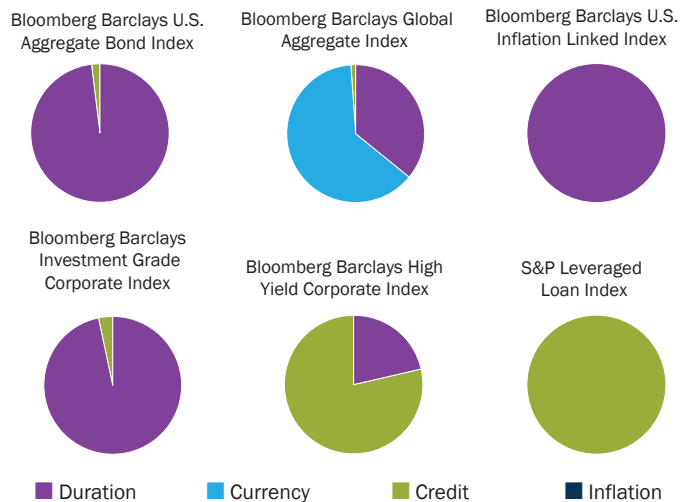
Before we can get into strategies for building better portfolios, we first need to review the major types of risk factors that drive fixed-income performance.

A risk factor is an independent market variable that helps explain the return of an investment. While “risk” often carries a negative connotation, here it equally represents positive return potential. In the bond market, while there are many risk factors that drive performance, we find four dominant risk factors:

-  **Duration** or interest rate risk, represents the price volatility of a long-term investment as prevailing market interest rates change.
-  **Currency** risk is driven by fluctuations in exchange rates.
-  **Credit** risk represents the risk of default for lending to a private corporation, consumer or risky sovereign country.
-  **Inflation** risk is driven by actual and expected changes in consumer prices.

Exhibit 1: Different risk factors drive the performance of familiar fixed-income indices

Risk composition of common fixed-income indices

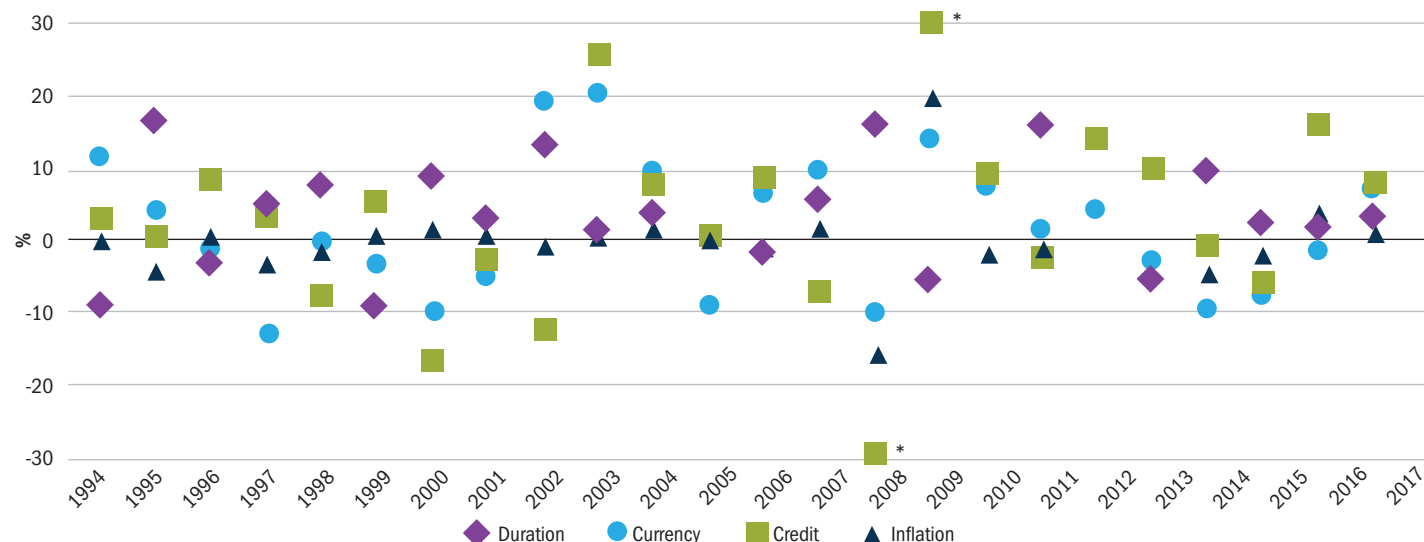


Source: BlackRock Solutions, 12/31/17.

We believe that understanding the four risk factors lays the foundation for successful, strategic bond market investing. Because these factors are not highly correlated, they can provide diversification benefits in a portfolio when used together. Exhibit 2 illustrates the returns generated by these factors over the past 20 years. Since each risk factor is unique, they produce positive returns in different periods throughout market cycles, creating opportunities for investors to emphasize different risks at different times and in different market environments.

Exhibit 2: Risk factors produce positive returns in different stages of the market cycle

These risk factors have low correlation to each other and generate positive returns at different periods in the cycle.



*Credit factor returns were -34.84% in 2008 and 59.85% in 2009. These data points were truncated to fit on the chart.

Sources: Bloomberg Barclays, Columbia Management Investment Advisers, 12/31/17.

DURATION RISK

Duration risk is most attractive when...

- Long-term interest rates exceed expected short-term interest rates over the holding period.
- The Federal Reserve is easing monetary policy and economic growth is slowing.
- A flight-to-quality mindset creates demand for safe assets (typically in periods of crisis).

Duration risk is least attractive when...

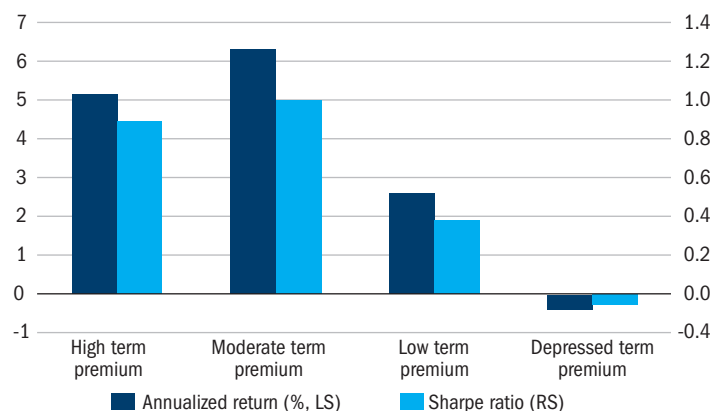
- Economic growth is improving and inflation expectations are rising.
- Investing in a low term premium environment.

Duration performance depends on how well investors are rewarded for holding longer term bonds

When establishing a basis for future return expectations, it is helpful to start with the price of risk. The term premium is the compensation an investor earns for holding longer term bonds. In this case, it is essentially the price of duration risk.* It can be measured as the difference between 10-year Treasury yields and the expected path of future short-term interest rates. In other words, when the term premium is zero, an investor should be indifferent about owning a 10-year Treasury bond versus continually reinvesting the proceeds of a three-month T-Bill for 10 years. Under normal economic circumstances, investors demand a positive term premium to compensate for the uncertainty of the future path of short-term interest

Exhibit 3: Higher starting term premiums have corresponded to higher duration-based returns

Performance of duration versus starting term premium



Sources: Bloomberg Barclays, Columbia Management Investment Advisers, 12/31/17.

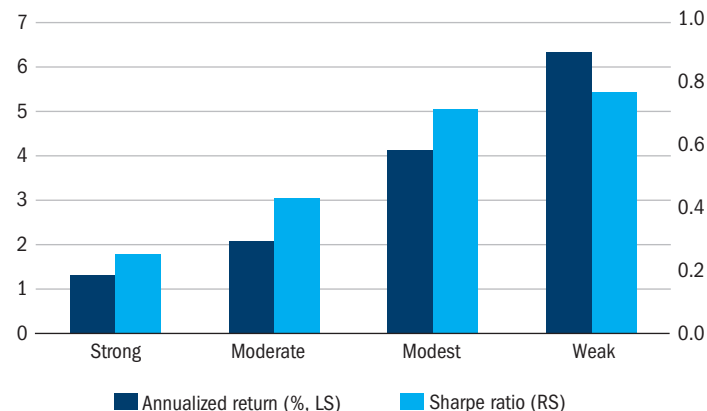
rates. Historically, future returns to duration have been highly dependent on the beginning level of the term premium. Excess returns per unit of volatility are greatest when the term premium is high. Conversely, risk-adjusted returns have been lower when investing from a low term premium environment. To illustrate this, we divide historical observations of the term premium into quartiles, described as high, moderate, low and depressed (Exhibit 3). Next, we calculate prospective monthly returns based on the beginning level of the term premium. Higher beginning term premiums are associated with greater future returns, as one might expect.

Return potential: Beginning valuation matters most, but it's not all that matters

To assess the potential future returns of any asset class or risk factor, we find that the most important determinant is the beginning valuation. Investors, however, cannot focus completely on valuation alone. Fundamental factors also influence the returns on bond market risk factors. This is particularly true for duration risk, because it tends to perform best when the economy is at its worst. To illustrate this, we compare duration risk returns to labor market conditions, using monthly changes in nonfarm payrolls, which have a high correlation to economic growth and the overall business cycle. We separate these monthly job gains into quartiles and calculate future returns from each starting point. Future excess returns from duration risk display a strong correlation to the monthly change in non-farm payrolls, as duration performs best when the economy and labor market are slowing (Exhibit 4).

Exhibit 4: Weak economic conditions favor duration

Performance of duration versus the labor market



Sources: Bloomberg Barclays, Columbia Management Investment Advisers, 12/31/17.

*Duration factor returns are represented by excess return of 7-to-10-year U.S. Treasury securities relative to 3-month Treasury bills.

Sources: Bloomberg Barclays, Columbia Threadneedle Investments.

CURRENCY RISK

Currency risk is most attractive when...

- Economic growth and monetary policy abroad create attractive conditions for investing overseas.

Currency risk is least attractive when...

- Foreign currencies tend to underperform the U.S. dollar when economic growth is waning and global interest rates are declining relative to U.S. interest rates.

Currency risk depends on global yields and growth rates

Currency risk represents the return generated by fluctuations in exchange rates — a large portion of the risk in global bond markets.* Currency risk is driven by the movement of global capital and the relative attractiveness of investing in one market versus another. Inherently, currencies are unique financial assets because they do not generate specific cash flows, making it difficult to establish return expectations in a traditional financial framework.

Future excess returns from foreign currencies rise as foreign yields become more attractive relative to those in the U.S.

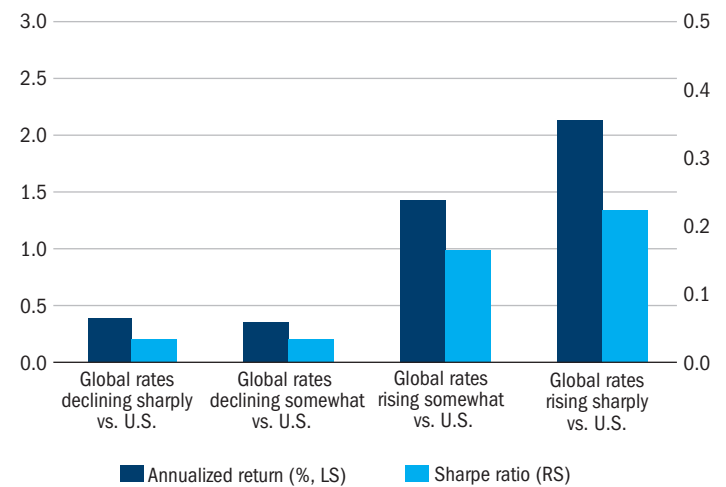
However, movements in exchange rates can be significant and can trend in one direction for months, if not years, at a time. Therefore, bond investors should be mindful of how currency risk can create opportunities and affect returns.

One important signaling variable for the future performance of foreign currencies is the relative attractiveness of interest rates across borders. To illustrate this, we examine the difference between short-term (1-3 year) interest rates in

the U.S. and abroad. We then measure how these interest rate differentials change from month to month, and separate these changes into quartiles. Finally, we compare these interest rate changes with the returns generated from an equally weighted basket of developed-market currencies. We find that future excess returns from foreign currencies rise as foreign yields become more attractive relative to those in the U.S. (Exhibit 5). However, when foreign yields fall compared with U.S. yields, the future returns generated from foreign currencies are not particularly attractive for U.S. investors. Therefore, it is important for investors to be cognizant of the trend in global bond yields relative to the U.S. when incorporating currency risk into a bond portfolio.

Exhibit 5: Foreign currency returns rise as foreign yields become more attractive

Performance of currency versus global yield changes



Sources: Bloomberg Barclays, Bloomberg, Columbia Management Investment Advisers, 12/31/17.

*Currency factor returns are represented by the equal weighted average of G10 currency spot market returns. Sources: Bloomberg, Columbia Threadneedle Investments.

CREDIT RISK

Credit risk is most attractive when...

- Spreads provide sufficient compensation for default risk.
- Economic growth is stronger.

Credit risk is least attractive when...

- Economic growth is slowing, causing financial conditions to tighten and default risk to rise.

Credit performance depends on economic growth and credit spreads

Credit performance is highly cyclical. The best returns tend to occur in periods just after episodes of underperformance, when investor sentiment begins to shift. This effect was quite notable in 2003 after the meltdown in the telecom sector and 2009 when credit rebounded sharply from heavy losses during the financial crisis. Credit also performed well in 2012 and 2013, as global liquidity pushed investors to search for yield. Returns generated by credit risk are dependent on both the level of spreads, or risk premiums, and the pace of economic growth.* We find that economic conditions are a directional indicator, pointing to positive returns when economic growth is accelerating and negative

returns during slowdowns. Furthermore, the beginning level of spreads determines the magnitude of returns, as future returns are significantly higher when spreads are above long-term medians. To illustrate this, we measure economic growth by calculating changes in the Goldman Sachs Activity Indicator (a measure of real-time U.S. economic growth). We then combine this with the level of spreads, characterized as above median (cheap) or below median (expensive). Credit tends to perform better when growth is improving, particularly when the starting level of spreads is cheaper (Exhibit 6).

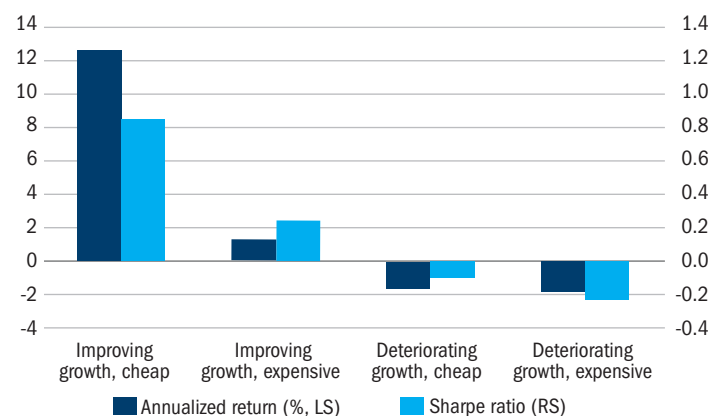
Future excess returns from credit risk depend on financial conditions more broadly as well. Here we measure changes in the Goldman Sachs Financial Conditions Index for the U.S., then separate these changes into four quartiles. Exhibit 7 illustrates future monthly returns from credit based on recent changes in financial conditions. As financial conditions begin to improve, the risk-adjusted returns generated by credit become much more attractive. Conversely, tighter financial conditions can create significant headwinds.

When investors think about credit risk for a portfolio, they should consider:

- What they are being paid (spreads) relative to their growth outlook.
- How the evolution of financial conditions will affect the way credit-sensitive sectors will perform.

Exhibit 6: The best conditions for credit: improving growth and cheaper spreads

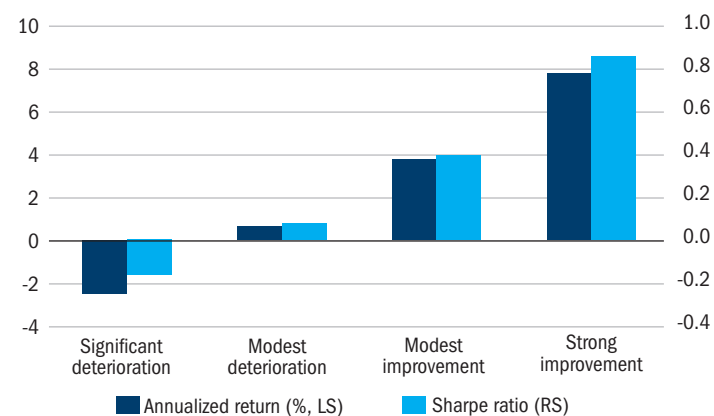
Performance of credit versus growth and valuation



Sources: Bloomberg Barclays, Bloomberg, Columbia Management Investment Advisers, 12/31/17.

Exhibit 7: Credit becomes more attractive as financial conditions improve

Performance of credit versus financial conditions



Sources: Bloomberg Barclays, Bloomberg, Columbia Management Investment Advisers, 12/31/17.

*Credit factor returns are represented by excess return of high-yield corporate bonds relative to similar duration U.S. Treasury securities.

Sources: Bloomberg Barclays, Columbia Threadneedle Investments.

INFLATION RISK

Inflation risk is most attractive when...

- The economy is overheating.
- Investors have very low expectations for future price pressures, and actual inflation surprises to the upside.

Inflation risk is least attractive when...

- The economy has a lot of spare capacity, or slack, creating little impulse for wages and prices to rise.

Inflation risk depends both on the actual and expected future rate of inflation

Inflation risk performs best when the economy is overheating and prices and wages are rising.* This directly benefits inflation-protected bonds, the value of which increases as consumer prices rise. Despite a broad disinflationary trend in the global economy recently, inflation risk has paid off meaningfully in specific countries at certain periods of time. Returns generated by inflation risk depend not only on the actual level of inflation, but also heavily on the market's expected future rate of inflation, known as the breakeven inflation rate.

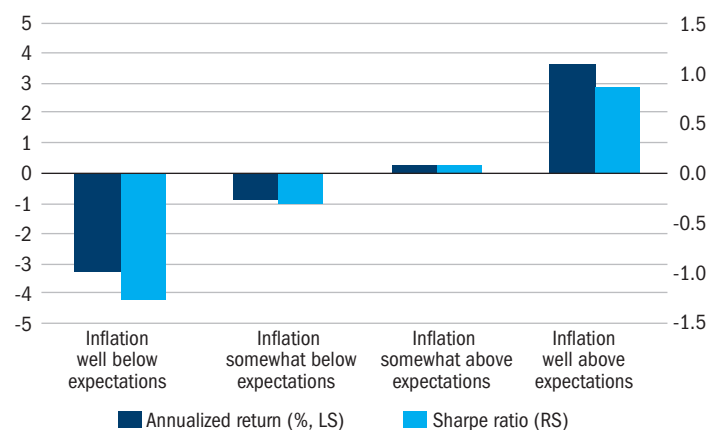
Returns generated by inflation risk depend not only on the actual level of inflation, but also heavily on the market's expected future rate of inflation.

To illustrate this we compared the actual level of consumer price inflation over rolling 12-month periods to the expected level of inflation implied by the market, or the breakeven rate. We then divided these observations into quartiles and calculated future monthly returns from these starting points. We found that when recent inflation over the preceding 12 months ran below current market implied levels, the

subsequent returns generated by inflation risk tended to be poor (Exhibit 8). Conversely, following a period when inflation ran well above expectations, future returns from inflation risk were much better. This suggests that investors should be mindful of the current level of inflation implied by the market, and take inflation risk when market expectations for inflation, or breakeven inflation rates, are low. In addition, the market seems to underestimate the persistence of inflationary trends over time. Therefore, investors should also be patient, as future returns from inflation risk tend to be better when actual inflation has already achieved some momentum in running above expectations (12 months in our example).

Exhibit 8: The more inflation exceeds expectations, the better inflation risk performs

Performance of inflation versus inflation expectations



Sources: Bloomberg, Columbia Management Investment Advisers. 12/31/17. Performance derived from a proprietary model based on inflation expectations of a 10-year TIPS and Bureau of Labor Statistics.

*Inflation factor returns are represented by the excess return of 10-year Treasury inflation-protected securities relative to 10-year nominal U.S. Treasury securities. Sources: Bloomberg, Columbia Threadneedle Investments.

Meeting your income needs in all markets requires a more flexible approach

In the current investing landscape, traditional bond market exposure may be less attractive. While a multi-sector fixed-income portfolio based on the four unique risk factors is more complex, it may also:

- Satisfy investors' individual income goals without compromising their risk tolerance.
- Avoid the purely binary outcome that results from concentration on a single risk factor.
- Lower volatility and offer potentially superior performance through all four phases of the market cycle.

Low yields and interest rate uncertainty make the current fixed-income environment challenging. Nevertheless, most investors still need bonds in their portfolios. When allocating to fixed income, we believe the best starting point is selecting the risk factors to which an investor wants exposure and then choosing the appropriate alpha sources. Importantly, not all bond market risks are undesirable. In particular, investors should seek opportunities presented by bond market risk factors beyond duration. Today's bond market offers profitable total return opportunities for investors who are able to allocate their risk budgets efficiently.

Stronger portfolios through advanced risk balancing

While basing fixed-income allocation on the four risks is an important first step, more may be required to optimize a portfolio.

Accounting for risk factor correlation

Beyond assessing the prospects for each risk factor, it's also important to monitor correlations across risk factors, as they move together at times. Adjusting for these cross-factor correlations in portfolio construction can minimize the effect of adverse price movements on future returns.

Fine-tuning the four risks through hedging

Correlation is just one of several reasons to fine-tune a portfolio's risk composition. While this fine-tuning can be achieved by altering the mix of traditional bond investments, employing other instruments for hedging or gaining exposure to specific risk factors has advantages. This is often accomplished with derivatives.

Derivatives are complicated, but they can play an important role in portfolio construction. For example, a U.S. investor is considering a 10-year bond issued by a German company. A closer look reveals that this bond has interest rate risk (driven by the 10-year nature of the cash flows), credit risk (driven by corporate fundamentals) and currency risk (driven by the fluctuations in the euro).

Let's assume this investor has a positive outlook for interest rates and likes the credit profile of the company, but is uncomfortable with taking currency risk associated with the euro. This investor could purchase the bond and hedge — or reduce — the currency risk by selling a currency forward contract on the euro. This would help the investor isolate the risks they are most comfortable with while avoiding those viewed as unattractive.

Other instruments are also available to help isolate the individual risk factors of duration, credit, inflation and currency. Taken together, these tools provide investors with the ability to focus portfolios on the specific risk factors of their choosing.

To find out more, call 800.426.3750
or visit columbiathreadneedle.com/us



Exhibits 3–8 – Numerical definitions of terms

Exhibit 3: Performance of duration versus starting term premium (in term premium)

- High – greater than or equal to 1.33%
- Moderate – between 0.71% and 1.32%
- Low – between 0.14% and 0.7%
- Depressed – less than or equal to 0.13%

Exhibit 4: Performance of duration versus the labor market (in monthly change in nonfarm payroll employment)

- Strong – greater than or equal to 230,000
- Moderate – between 185,000 and 229,000
- Modest – between 66,000 and 184,000
- Weak – less than or equal to 65,000

Exhibit 5: Performance of currency versus global yield changes (in global vs. U.S. 1-to-3-year rates)

- Global rates declining sharply vs. U.S. – decline by at least 0.13%
- Global rates declining somewhat vs. U.S. – decline by up to 0.12%
- Global rates rising somewhat vs. U.S. – increase by up to 0.11%
- Global rates rising sharply vs. U.S. – increase by at least 0.12%

Exhibit 6: Performance of credit versus growth and valuation

- Improving growth – positive 3-month rate of change in Columbia Activity Indicator
- Deteriorating growth – negative 3-month rate of change in Columbia Activity Indicator
- Cheap – high-yield index spreads above long-term median of 577 basis points
- Expensive – high-yield index spreads below long-term median

Exhibit 7: Performance of credit versus financial conditions (in change in GSFCI)

- Significant deterioration – greater than 0.10
- Modest deterioration – between -0.01 and 0.09
- Modest improvement – between -0.10 and -0.02
- Strong improvement – below -0.11

Exhibit 8: Performance of inflation versus inflation expectations

- Inflation well below expectations – 10-year breakeven inflation exceeds 12-month change in consumer price inflation by at least 0.81%
- Inflation somewhat below expectations – 10-year breakeven inflation exceeds 12-month change in consumer price inflation by up to 0.80%
- Inflation somewhat above expectations – 12-month change in consumer price inflation exceeds 10-year breakeven inflation by up to 1.13%
- Inflation well above expectations – 12-month change in consumer price inflation exceeds 10-year breakeven inflation by at least 1.14%

Past performance is not a guarantee of future results.

The **Bloomberg Barclays Global Aggregate Index** is an unmanaged broad-based, market-capitalization-weighted index that is designed to measure the broad global markets for U.S. and non-U.S. corporate, government, governmental agency, supranational, mortgage-backed and asset-backed fixed-income securities.

The **Bloomberg Barclays Investment-Grade Corporate Index** includes dollar-denominated debt from U.S. and non-U.S. industrial, utility and financial institution issuers. Subordinated issues, securities with normal call and put provisions and sinking funds, medium-term notes (if they are publicly underwritten) and 144A securities with registration rights and global issues that are SEC-registered are included. Structured notes with embedded swaps or other special features, as well as private placements, floating-rate securities and eurobonds, are excluded from the index.

The **Bloomberg Barclays U.S. Aggregate Bond Index** is a market-value-weighted index that tracks the daily price, coupon, pay-downs and total return performance of fixed-rate, publicly placed, dollar-denominated and non-convertible investment-grade debt issues with at least \$250 million par amount outstanding and with at least one year to final maturity.

The **Bloomberg Barclays U.S. Corporate High Yield Bond Index** is composed of fixed-rate, publicly issued, non-investment-grade debt.

The **Bloomberg Barclays U.S. Government Inflation-linked Bond Index** includes publicly issued, U.S. Treasury inflation-protected securities that have at least one year to maturity on index rebalancing date, with an issue size equal to or in excess of \$500 million.

The **Goldman Sachs Financial Conditions Index** (Goldman Sachs FCI) is a weighted sum of a short-term bond yield, a long-term corporate yield, the exchange rate and a stock market variable. The Federal Reserve Board's macroeconomic model (the FRB/US model), together with Goldman Sachs modeling, were used to determine the weights. An increase in the Goldman Sachs FCI indicates tightening of financial conditions, and a decrease indicates easing. The index is set so that October 20, 2003 = 100.

The **S&P/LSTA Leveraged Loan Index** reflects the market-weighted performance of institutional leveraged loans based upon real-time market weightings, spreads and interest payments.

Indices shown are unmanaged and do not reflect the impact of fees. It is not possible to invest directly in an index.

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