SENSITIVITY TRAINING

SUMMARY

The recent backup in interest rates has highlighted the interest rate sensitivity of many asset classes, and is leading some investors to re-examine their interest rate risk. While we are fairly sanguine on the outlook for interest rates over the next several years, we thought it worthwhile to examine this question of sensitivity and review steps investors can take to reduce portfolio exposure to higher interest rates. We use our framework of risk control (cash and investment-grade bonds) and risk assets (high yield, equities, real assets and alternative investments) in this review, as it is foundational to our portfolio construction process. Within risk assets, broadly diversified equities have proven to have the lowest sensitivity to interest rates, while dividend paying stocks and high yield bonds also performed admirably. Within risk control assets, traditional guidance to shorten maturities in an effort to lessen interest rate risk is incontrovertible – and we think short duration fixed income is the lowest risk asset to meet near-term spending needs. Importantly, the interest rate sensitivity of these asset classes during the recent bond market volatility was generally in line with their long-term behavior – helping validate the value of the data.

EXHIBIT 1: BIG DIFFERENCES

In reviewing the risk asset classes, we note fairly high exposure to interest rate movements in global real estate and global listed infrastructure, but it is lessened during times of low interest rates. We also examined the exposure to interest rate movements in dividend-paying stocks. Interestingly, exposure is higher in low interest rate environments – perhaps because of the way in which dividend payers are viewed as a substitute for income in low interest rate environments. The interest rate exposure of global real estate and global listed infrastructure may be due more to the funding...
mechanism of those asset classes. Global equities and natural resources show little sensitivity to interest rates on a historical basis using a factor based approach (more on this later).

Going into more detail on Exhibit 1, we looked at historical exposures of the various risk asset classes since 1990. We then divided the sample size into “high” interest rate periods and “low” interest rate periods – using the average 10-year U.S. Treasury interest rate (4.9%) over the period as the divider. We also looked at exposures across all of the factors in our global risk factor model. In addition to the interest rate (term) factor, this model includes other factors such as equity, size, value, momentum and credit – basically anything that helps explain asset class return variability. Clearly, given these are all risk assets, the equity factor plays a big part – especially within our global equities asset class (which, almost by definition, will be driven entirely by the equity factor). As such, we also ran the model using just the term factor to see how much interest rates drove the various asset class returns in isolation. Through this test, we found that interest rates drove 4% of global equity return variability; 7% in global upstream natural resources; 10% in global real estate; and 17% in global listed infrastructure (in all cases the factor was statistically significant). We also ran this test on global high yield and found that, interestingly, interest rates only have 3% explanatory power. Part of the explanation here is the negative correlation between term premium and credit premium – as interest rates rise, high yield spreads have tended to tighten as a reflection of an improving economy.

EXHIBIT 2: BEHAVING AS EXPECTED

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<tbody>
<tr>
<td>5/1/13 - 9/5/13</td>
<td>+137bps</td>
<td>1.9%</td>
<td>-3.2%</td>
<td>-13.2%</td>
<td>-4.8%</td>
<td>0.2%</td>
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<tr>
<td>9/5/13 - 10/2/13</td>
<td>-32bps</td>
<td>4.0%</td>
<td>2.6%</td>
<td>6.3%</td>
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The performance of these assets during the recent interest rate cycle generally corroborates these levels of interest rate sensitivity. As shown in Exhibit 2, during the jump in 10-year U.S. Treasury yields from May 1, 2013 through September 5, 2013, global real estate was the worst performing risk asset, followed by global listed infrastructure. Natural resources performed slightly worse than expected, while dividend paying stocks performed better than history would suggest. Finally, the positive performance of equities during this period is supported by the output from the factor model, which suggests global equities have little sensitivity to interest rates.

Sensitivity to interest rates across the risk control asset class is no great mystery. In our factor models, the interest rate factor is defined as the premium gained by taking on interest rate risk. Therefore, the question now becomes: how do interest rate movements affect actual returns? We looked at periods of large increases in interest rates – both in the federal funds rate and the 10-year U.S. Treasury – to see how total returns fared. Two factors appear to be the most important – current market expectations (what is priced into the markets) and the starting level of interest rates.
Exhibit 3 illustrates the major interest rate cycles over the last 30 years. The x-axis shows the total increase in either the federal funds or 10-year U.S. Treasury rate during the cycle, with the y-axis showing the resulting total return in the Barclays U.S. Aggregate Treasury Index. If federal funds rate increases are properly telegraphed, they can be appropriately priced in the markets; and as such, we see that notable increases in the federal funds rate do not have a significant impact on total returns. However, if changes in rates are unexpected – and cause notable changes in rates further out the interest rate curve (such as the 10-year U.S. Treasury) – we see a more deleterious impact. Further, the starting point matters, as seen in data point 6. Even though the 10-year U.S. Treasury rate increased by nearly 4% between May 1983 and July 1984, the high starting interest rate of 10.3% allowed for positive returns.

**EXHIBIT 3: BEWARE THE LONG END**

Source: Northern Trust, Bloomberg.

Different approaches to rising rates are examined in Exhibit 4. During the Federal Reserve’s (the Fed’s) “steady increase” period from June 2004 through June 2006, energy prices rose and domestic defense expenditures surged; labor conditions appeared favorable and economic growth was strong. Market participants were beginning to express concerns over a housing bubble. During this period, the Federal Open Market Committee’s meeting statements consistently indicated the likelihood that the 0.25% rate hikes would continue.

The Fed’s “heavy handed” approach to adjusting the target federal funds rate in the early 1990s, which lasted from February 1994 until February 1995, was characterized by incremental target rate hikes ranging from 0.25% to 0.75% in scale. With a thriving economic expansion underway after the recession experienced during the early 1990s, and oil prices rising after the first Gulf War, the Fed opted for precautionary rate hikes to temper the inflationary scare evidenced in rising long-term rates and growth levels unseen since the Regan era. Former Chairman Alan Greenspan favored a more reserved approach to dealing with the financial media than we are accustomed to today, so market participants were unable to predict the Fed’s moves, which manifested itself in readjustments of the futures curve after policy meetings. The Fed was successful at curbing inflation and the economy continued to grow from 3% to 4% a year over the following years. The “heavy handed”
period can be viewed as a defensive response to a thriving economy, rather than a need to curtail easy monetary policy.

While the cumulative return of the 10-year U.S. Treasury and S&P 500 Index during the two periods was positive, with the S&P 500 outperforming in both instances, the consistent upward trend of the two assets in the “steady increase” period provided more stability to the market. Interestingly, despite the lack of transparency from former Fed Chairman Alan Greenspan and the Fed, which particularly was a trend in 1994, volatility as measured by the VIX Index remained in a very consistent range throughout the two periods, averaging levels of 14.0 and 13.4, for the “steady increases” and “heavy handed” periods, respectively (below the 2013 year-to-date average of 14.3).

EXHIBIT 4: IT’S THE WAY THEY WENT ABOUT IT

Interest rates have been in a secular downward trend since 1982, leaving some to wonder: are we finally to the inflection point? We do believe that we are in a new environment for the Fed, with the focus turning toward slowly removing monetary accommodation to begin the interest rate normalization process. Market expectations, as judged by forward contracts, appear to agree to a certain extent – though this inflection point may be more “U” shaped than “V” shaped. Markets are expecting the 10-year U.S. Treasury to be at a 3.85% level in September 2018 (currently the 10-year U.S. Treasury sits at 2.63%). Our proprietary capital market assumptions group (tasked with making long-term forecasts on an annual basis) expects the 10-year U.S. Treasury to be at 3.25% in five years’ time – predicated on moderate economic growth, controlled inflation and continued involvement of the Fed.

Our historical analysis of interest rates (see The Specter of Rising Interest Rates; April 2011) looked at the key drivers of interest rates, including real rates and inflation expectations. Over the full period of the analysis (1954 to 2010), the real rate of interest and the inflation rate equally explained nominal interest rates. But, during the surge in rates, starting in the 1970s up to the peak in 1981, as well as during other cyclical spikes in rates, inflation was the prime driver. We also demonstrated that wage pressures were required to create sustained consumer price inflation, while commodity price pressures tended to prove transitory. With today’s U.S. unemployment levels still relatively elevated, we do not expect labor to gain much bargaining power; therefore, we only forecast an
inflation rate of 2.0% in five years. Average hourly earnings have fluctuated between 1.8% and 2.3% in the last four years, while productivity growth has been much more volatile.

With this moderate outlook for inflation, the key driver of rates may be “technical factors” – such as the continued involvement of the Fed in the U.S. Treasury market. The most recent backtracking by the Fed toward tapering the Quantitative Easing (QE) program only increases the odds that rates stay “lower for longer.” President Obama is likely to nominate a fairly dovish new Fed Chairperson – and the odds-on favorite looks to be Janet Yellen, the current Vice Chair. We believe she is committed to continuing very accommodative monetary policy, as the Fed continues to worry about the negative effects of long-term unemployment. Chairman Bernanke previously communicated a willingness to tolerate an uptick in inflation in the pursuit of higher job growth, and we expect that a Fed led by Yellen would be equally flexible. It is our expectation that while the Fed will likely end its QE program in 2014, it will not sell its holdings of Treasury or mortgage backed securities – choosing to let them mature and thereby slowly shrink their balance sheet. We think the Fed would face an illiquid market if they tried to sell too large a piece of their inventory, and we do not expect the growth or inflation picture to force their hand.

EXHIBIT 5: A NEW PARADIGM FOR RATES

What if we do go into a sustained period of rising interest rates? The 1954 through 1981 period may be of help here. During that time, the 10-year U.S. Treasury showed a secular rise from 2.4% to 13.9%. At first glance, some investors might assume that bond investing must have been a bloodbath during this period. However, intermediate government bonds (five-year maturity) fared pretty well, only having negative returns in four years. Long-term government bonds (20-year maturity) displayed more volatility, with 12 years of negative returns. However, short-term government bonds fared the best, generating a compound annual return of 5.4%, beating the return of intermediate bonds (4.7%) and long-term bonds (2.3%).

Especially interesting to note is the 1977 to 1981 period, where rates surged from 7.4% to 13.9%. Clearly, this was an unexpected increase in rates and the long-term government bonds’ returns suffered (falling 1.1%). Intermediate-term government bonds were able to shoulder the blow better than long-term bonds, generating a positive return of 4.4% during this period. Short-term bonds,
however, performed best during this period with a positive return of 9.0%. Ultimately, the decision around appropriate duration risk should be based on an investor’s cash flow needs and risk tolerance. Also interesting to note is the impact starting points can have. For instance, even in the late 1970s, when interest rates were spiking, the negative returns from long-term government bonds were minimal compared to the impact of much smaller interest rate increases in 1956 and 1958.

**EXHIBIT 6: INTERMEDIATE CUSHION**

To analyze this further, Exhibit 7 looks at a breakeven analysis on various bond types. We show how much rates would have to rise (instantaneously) for the income component to be fully offset by declines in the value of the principal. Twenty years ago there was a great deal more leeway as compared with today – though today is notably better than the lows of May 2, 2013. In September 1993, Intermediate Treasuries had a breakeven of 1.36%, which then shrunk to 0.14% in May 2013. This has since edged up to 0.26% as of the end of September 2013.

High yield stands out as an option in this analysis, although we treat it as a risk asset due to its higher volatility and correlation to the equity markets. High yield has a breakeven of 1.45% today, down from 2.15% in September 1993 but up from 1.32% in May 2013. High yield gets its income more through taking on credit risk than duration risk. Our studies demonstrate that credit risk is negatively correlated to the risk of higher rates. This is due to the fact that higher interest rates have historically occurred due to improving economic conditions, which tend to improve credit quality and therefore reduce credit risk. Validating this phenomenon, high yield fell 2.3% during the backup in interest rates from May 2013 through early September 2013, less than the 4.9% drop in investment-grade fixed income.

Floating-rate debt is another asset considered by investors during periods of interest rate uncertainty. While floating rate debt typically maintains its value during rising interest rate environments as income payments rise with rates, the loans tend to be non-investment grade and have less liquidity. Because of the negligible duration with this asset, there is no statistically significant relationship to interest rates, but it does have credit exposure (with a credit factor of 0.11). This exposure to credit was heightened during the global financial crisis. In September 2008 (the epicenter of the crisis), the floating rate notes index was down 6.2%. By comparison, Treasuries were up 0.6%, the Barclays
Aggregate Index was down 1.3% and high yield was down 8%. During the recent rate cycle from May 1, 2013 through September 5, 2013, floating rate notes showed their lack of interest rate sensitivity with a positive return of 0.2%. Investment grade fixed income, in contrast, lost 4.9%. In the subsequent bond rally from September 5, 2013 through October 2, 2013, floating rate notes gained just 0.1% while investment-grade fixed income gained 2.1%. Aside from the credit issues, it comes down to whether investors want their principal or their coupon payments to be subject to changes in value. Historically speaking, taking on duration risk has provided investors with statistically significant return premiums.

EXHIBIT 7: REBUILDING A CUSHION

CONCLUSION

In this report, we have identified the significant variability in interest rate sensitivity among risk assets. Global equities tend to show little direct correlation with rates, and dividend paying stocks and high yield bonds also aren’t overly affected by changes in rates. Global real estate, and global infrastructure to a lesser extent, is more directly impacted by movements in interest rates. Within risk control assets, we do not expect a significant increase in interest rates in coming years and are therefore comfortable with duration risk. However, we believe it is critical that the risk control portfolio be constructed to ensure the maturities of the assets are determined based on a careful analysis of expected spending and liquidity plans. Within this approach, the lowest risk plan is to keep durations short and quality high to maximize the probability of success.

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