Low yields and rising rates concerns: the implications for bond market investors

Vanguard research

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Executive summary. The global fall in interest rates to very low levels post the 2008 financial crisis has provided fixed income investors with returns from rising bond prices that are significantly above average. Fear that "bond market bubble" conditions exist, and that the bubble could burst if yields start to rise rapidly, has become a frequent discussion topic amongst investors.

In this paper, first we re-address the role of bonds and their important diversifying characteristics within a portfolio of growth and defensive assets. We discuss how the maths of bonds influence returns after an interest rate rise and the difference in the performance dynamics of bond markets and equity markets, as well as the diversifying benefits of bonds in a portfolio with growth assets. We show the likely outcome from an unexpected interest rate shock on a bond portfolio. We also analyse the strength of forward yields as a predictor of the future direction of interest rates with respect to the short end. And finally, we show the difficulties involved in trying to predict short term movements in interest rates and thus how counterproductive it could be to engage in investment strategies based on strong views about the direction of interest rates.

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The role of bonds – to provide income and capital protection

The decline in yields across global bond markets, driven by the 2008 financial crisis and the strong investor preference for relatively lower risk assets, has provided significantly above-average bond market returns. However, concerns have arisen that the returns from fixed income investments may be low or negative should interest rates rise, as a result of tighter monetary policy in response to improving economic conditions. But, in the case of bonds, a bubble is unlikely due to the mechanism of the market value of a bond converging to its face value at maturity, which acts as an anchor on bond prices. Although, going forward, returns for bonds will be lower than they have been, reflecting the current interest rate environment and low inflationary expectations on the back of weak economic growth globally.

Despite the concerns regarding a bubble-like situation in bond markets, the characteristics of fixed income assets and the role that they play in a broadly diversified portfolio of growth and defensive assets have not changed.[1] The primary role of bonds is to be a source of diversification to growth assets (equity); provide income (through the receipt of bond coupons); and offer capital stability (through the return of principal at the maturity of a bond if no default occurs). This means that, over the longer term, yield is the major contributor to performance and long-run returns from fixed income should reflect the average level of interest rates through time.

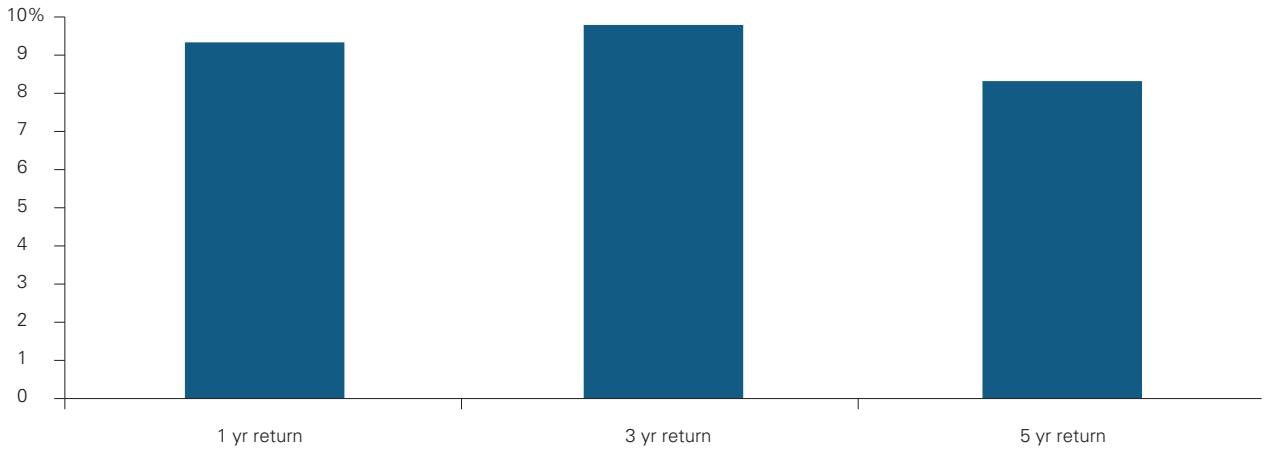
A diversified fixed income index composed of government bonds and investment-grade (IG) corporate bonds, such as the UBS Composite Bond Index demonstrates how the portfolio value trajectory has remained robust regardless of yield volatility and direction. During periods of yield volatility from 1992 until recently, in which the yield on the 10-year government bond was up about 100 basis points (bp) the average annual total return of the UBS Composite Bond Index continued to accumulate value. The average total returns (price and coupon) over one, three and five years were positive, reflecting the significant component that bond coupons contribute to fixed income returns (see **Figure 1**).

Bond maths and bond returns

Bonds are quite different from investments such as equities due to a well-defined and certain return stream, which responds to movements in interest rates. While a higher yield and lower bond prices (a capital loss) result from rising interest rates, the opposite is true for falling interest rates.

1 Murik, Vijay A. et al, 2012, *The role of fixed income as a part of a diversified investment strategy,* The Vanguard Group

Figure 1 Annual total return of the UBS Composite Bond Index over 1, 3 and 5 years, subsequent to a rise in 10-year government bond yields of approximately 100 bp



Note: The returns here represent the average return across all periods that saw a 100-basis-point rise in yields. As with any average, some periods saw higher returns and some saw lower returns.

Source: Factset data dated 18 April 2013

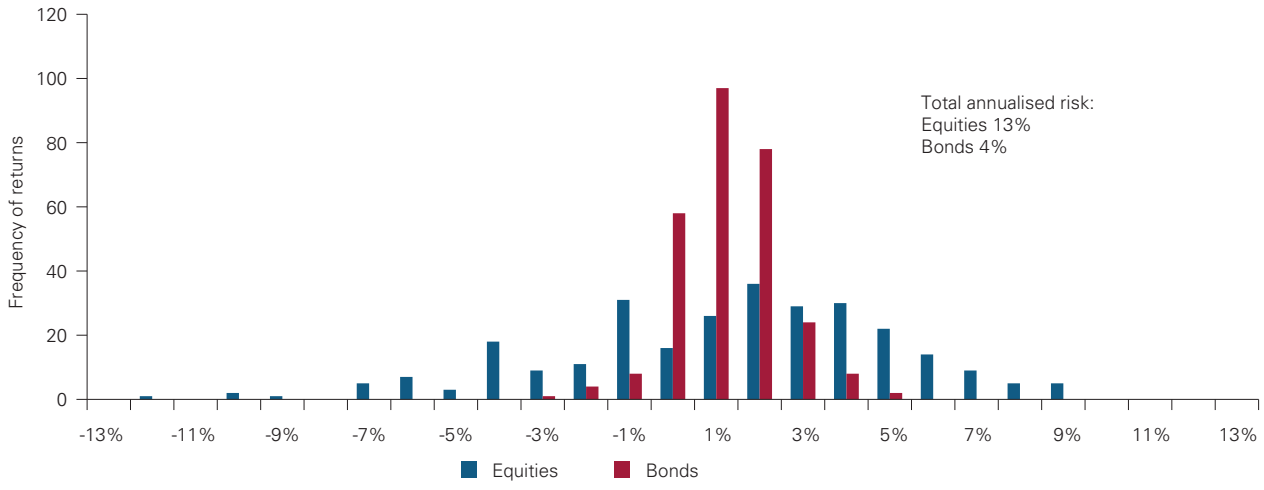
A case study – the bond market in 1994

The bond market collapse of early 1994, when yields were low versus the long term average, saw yields rise rapidly during a short period. The total return of the UBS Composite Bond Index was -6.5% for the six months ended June 1994 as the decline in the value of bonds was greater than the coupon income. For the subsequent six months the return was around 1.9% and 9.8% for the first six months of 1995, due to the receipt of coupons which contributed to the lower starting yield. During that period bonds matured and bond issuers were able to repay the principal to the bondholder. The reinvestment earnings became a significant contributor to returns due to the higher yield – with reinvestment of coupons and the replacement of maturing bonds with higher yielding bonds. For the three-year period following the 1994 collapse of the bond market, total returns for the UBS Composite Bond Index were 12.7% per annum – which is difficult to reconcile with bursting of the "bond market bubble."

Duration measures the sensitivity of a bond's price to changes in interest rates (see Bennyhoff and Zilbering's research from 2010). Duration is used as the common metric for evaluating risk between two comparable fixed income investments. So, for illustrative purposes, if interest rates increase 1 percentage point (100 bp), a bond's (or fund's) value will drop by approximately the bond's (or the fund's weighted average) duration. This assumes that there is an instantaneous, parallel shift in the yield curve, an assumption that is extremely rare historically (Davis et al., 2010). But the factors driving increases in near-term rates (monetary policy implemented by the Reserve Bank of Australia (RBA)) and long-term rates (inflation expectations) are quite different.

An example of a significant, unexpected move in interest rates occurred in the 1990s, (see text box, "A case study – the bond market in 1994") and although the one-off impact was negative for a total return investor, the new much higher yield was of perhaps greater importance. Following the initial pain when there was a jump in interest rates, that same investor would expect a strong return going forward based on the higher yield, all else being equal (as we saw in subsequent years after 1994). And at some point following the initial large negative bond market return, the diversified bond investor would be breaking even, simply by reinvesting interest distributions.

Figure 2 Distribution of total returns and the total risk fixed income and equity from 1989 – 2012



Source: Bloomberg, data dated February 2013

Total returns, income, and the search for yield

Vanguard believes it is important for investors to view their portfolios from a total return perspective, rather than simply in terms of potential income (i.e., the yield to maturity on a bond fund, or the dividend yield on an equity fund). An investor looking at total return will be concerned with capital gains and losses as well as with the income derived from bond interest and equity dividends. Past Vanguard research has highlighted the importance of understanding total return and the risks that can accompany a narrow focus on income.

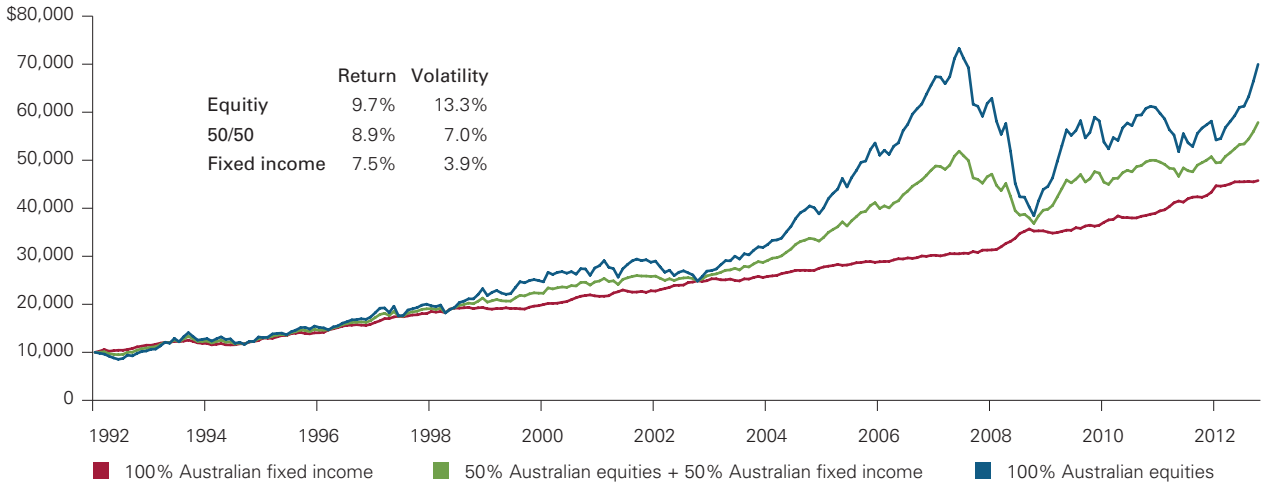
Investors who increase their allocation to higher-yielding bonds or dividend-paying equities in an attempt to meet spending needs, based on income alone, should be aware that their portfolio volatility will likely increase as a result. So while an allocation to bonds may have the prospect of providing below-average total returns going forward, the volatility-dampening properties of bonds should be carefully taken into consideration when developing a sound investment strategy.

Performance dynamics of fixed income and equity indexes

An often misunderstood aspect of fixed income investing through a highly diversified structure such as a composite index is that the nature of returns is very different from an equity index, in both normal and stressed market conditions. An important aspect of the fixed nature of the asset cash flows and capital structure ranking, is that returns are more narrowly distributed than the returns for an equity index. **Figure 2** shows the distribution of monthly total returns for equities (represented by the S&P/ASX 300 and ASX All Ordinaries for periods prior to 1 April 2000) and bonds (represented by the UBS Composite Bond Index) since 31 December 1989 as well the total annualised risk over the period. The diagram shows that the returns for fixed income occur in a tighter range and provide less variability borne out by the lower total risk of 4% compared to equities' total risk of 13%.

Investing in a diversified bond fund lowers the risk of loss due to default and has lower volatility than a portfolio with a 100% weighting in equities. Furthermore, investing in a portfolio that has a 50/50 weighting to equities and bonds provides long-term returns that are likely to be higher than

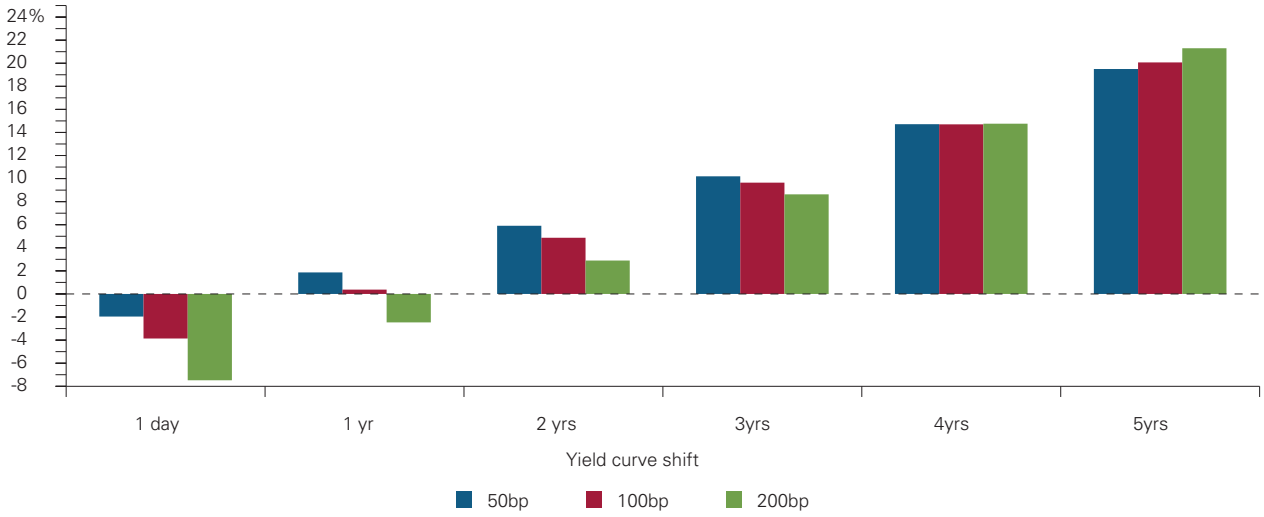
Figure 3 Returns and volatility of different weightings to equities and fixed income over twenty years – initial investment of $10,000



Note: This is not a recommendation for an asset allocation strategy but for illustrative purposes only

Source: FactSet data, dated March 2013. Equities are represented by the S&P/ASX300 and ASX All Ordinaries for periods prior to 1 April 2000 and bonds are represented by the UBS Composite Bond Index. Analysis period is 1992 to 2012

Figure 4 Impact of unexpected interest rate changes on the performance of the UBS Composite Bond Index



Note: This is a hypothetical case study of a rise in yields

Sources: UBS data as at 31 December 2012, downloaded February 2013

a 100% weighting in fixed income and, although total risk is higher than in a fixed income portfolio, it is more moderate over the long term than a portfolio with a 100% weighting in equities (**Figure 3**).

The impact of unexpected interest rate shocks on a portfolio of bonds

An important factor that has influenced bond markets has been the increase in transparency by central banks and the introduction of inflation targeting policy.[2] This has reduced the likelihood of unexpected, potentially large interest rate adjustments due to reducing inflationary expectations, by maintaining inflation within the average band.

Historically, Australia had periods of high inflation with spikes at different times but since inflation targets were introduced in the 1990s the inflation rate has averaged 2.7%, as interest rates adjustments have influenced inflationary expectations.

Even if there is a future spike in inflation (unlikely due to the RBA's use of monetary policy), the nature of fixed income returns means that there would be short-term negative returns, arising from the decline in value of existing assets due to the increase in yield – but for a longer-term investor, this gives way to longer-term positive returns from bond coupons and pull-to-par effect (see text box "Pull-to-par").

2 RBA, 2009, The Australian Experience with Inflation Targeting, http://www.rba.gov.au/speeches/2009/sp-ag-150509.html downloaded 13 February 2013

Pull-to-par

Pull-to-par effect is where the market price of a bond converges to the face or par value, as the bond moves closer to its maturity date, assuming the bond does not default. There is also the amortisation impact with a rise in yield causing a price fall (all else being equal) but the investor is compensated for the fall in price in the form of relatively higher coupons. Bond funds also receive the benefits of pull-to-par as the principals from maturing securities are rolled into new issues which are typically priced at or close to par. The proviso is that by the time that securities in a bond fund mature, the par yield will have moved to prevailing market levels, which are likely to be different from those for maturing securities. So although the pull-to-par effect still holds for bond funds, it applies at different points in time as existing securities mature and new issues are added to the portfolio.

In the case of a rise in value of existing assets from a decrease in yield, the immediate one-off positive impact from the bond's price rise is greater but, over the longer term, the prevailing yield will be lower and will have a less positive impact on total return.

An analysis of the impact of a hypothetical unexpected uniform interest rate increase on the yield to maturity of the securities in the UBS Composite Bond Index demonstrates the effect on total return with the fall in price and the positive impact from the higher coupon. **Figure 4** shows the immediate impact to the index from a yield increase of 50, 100 or 200 bp and how the cumulative return changes over one, two, and up to five years, assuming no further yield change.[3] The immediate impact shows returns will fall by 2.0%, 3.0% and 7.5% respectively (predominantly due to the fall in the price of the bond), for each shift up the yield curve of 50, 100 and 200 bp, reflecting the duration and convexity of the index.

This loss will only affect investors' returns if the security is sold and the loss realised. If the investment is held for another year, only the 200 bp move would have resulted in a negative return of 2.5% and holding the investment for two years, would result in all returns being positive. For five years, cumulative total returns are 19.5%, 20.1% and 21.3%, respectively for the 50, 100 and 200 bp increases in interest rates.

If we break down the performance of a bond into yield and price, we can distinguish that over the longer term, the coupon (income) will have the greatest impact on returns but there is also the guaranteed return of the principal. The remaining coupons and the principal repayment at maturity, assuming no default, provide a natural ceiling to the price of the bond. So in reality a bond market bubble in the same context as an equity market bubble is not possible for bonds.

The implications for bond market investors

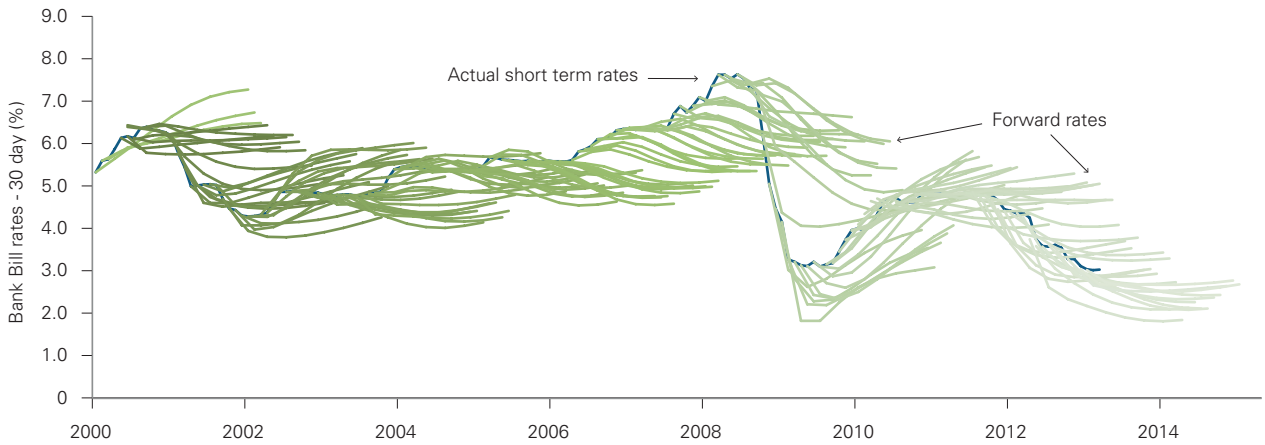
The bond market's expectations for the future shape of the yield curve may seem reasonable but, as history has shown, rates are likely to evolve differently from what is expected today. The forward yield curve – as with other interest rate forecasts – may be a poor predictor of actual future rates (see **Figure 5** which shows short term interest rates versus the forward rates).[4] So, considering the current market conditions and the lessons learnt post the 2008 crisis, how should bond investors think about the risks to current market rate expectations?

Investors in bonds must be aware that implementing bond strategies, involving shortening duration or investing solely in riskier bond instruments, can expose them to unintended yield curve or market risks, while potentially depriving them of a higher

3 Assuming bonds that mature are not replaced, especially after three years as more bonds mature

4 For a more detailed and technical discussion of interest rate predictability please see Ilmanen (1996) and Davis and Aliaga-Díaz (2007), as well as the citations therein.

Figure 5 Short term rates versus market expectations



Source: Reserve Bank of Australia, downloaded 14 April 2013, with Vanguard analysis

Mitigating bond risk by moving into cash

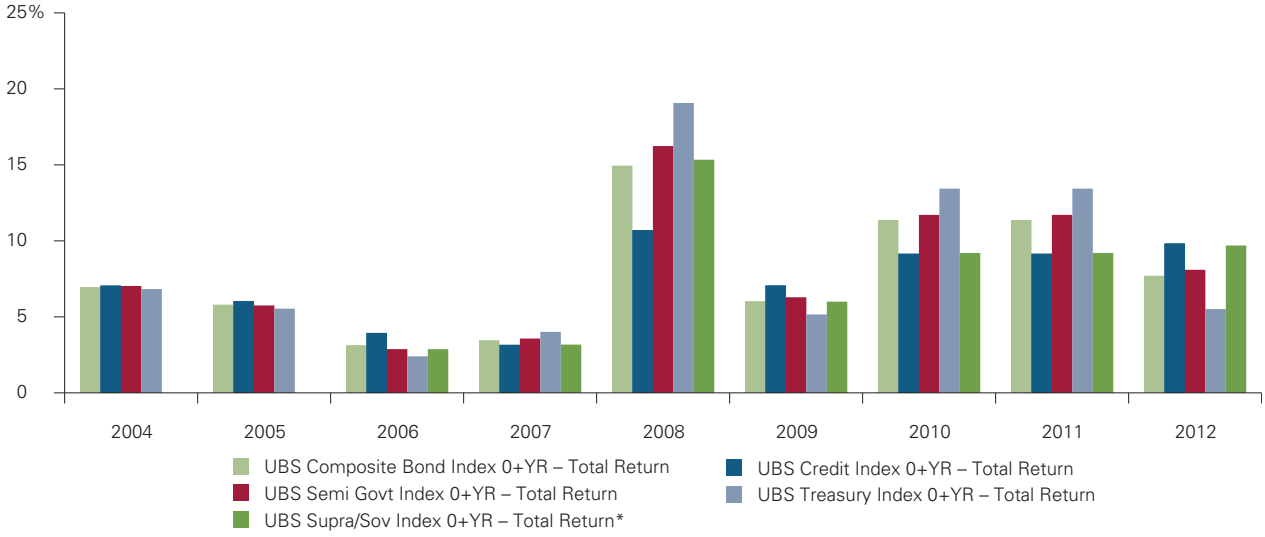
We recognise that bond investors, facing the prospect of rising rates, are naturally inclined to either shorten duration or move into cash. There are several potential concerns with such a strategy. Davis et al. (2010) note the risks inherent in such a strategy if the yield curve experiences a "bear flattening," meaning short-term rates rise, while longer-term rates remain anchored. In addition, investors who shift from bonds to cash will realise an opportunity cost in the form of lower yield while they wait for the anticipated rise in rates. The longer the wait, the greater the yield give-up. Finally, because cash has historically offered a low real return, investors using such a strategy would then need to correctly time their exit. This is because, historically, cash investments have tended to underperform both equities and bonds following a given rise in interest rates in both nominal and real returns.

future income stream. Different scenarios are possible going forward with respect to the direction and timing of interest rate movements. However, the uncertainty surrounding the future direction of economic indicators with respect to correctly forecasting what happens and when, is a powerful reminder that focusing on interest rate moves and short-term changes in bond prices can be counterproductive.

The implication for bond market investors with respect to uncertainty supports fixed income diversification – as the historical variable performance (see **Figure 6**) of various segments of the bond market (which are constituents of the UBS Composite Bond Index) reinforces the benefits of a broadly diversified fixed income portfolio regardless of the future direction of interest rates.

The time horizon of the investor may also need to be considered, for example if the investor has a short-term investment period then a diversified bond fund may not be the best investment option. However, investors should be aware of the risks of staying in cash or shorter duration bonds due to the opportunity cost from lower yields (see the text box, "Mitigating bond risk by moving into cash").

Figure 6 Annual returns for different segments of the bond market – constituents of the UBS Composite Bond Index, data for years ending December 2004 – 2012



*No returns available until 2006

Source: Factset data dated 22 April 2013

Over the long term, interest income – and the reinvestment of that income – accounts for the largest portion of total returns for many bond funds. The impact of price fluctuations can be more than offset by staying invested and reinvesting income, even if the future is similar to the rising-rate environment seen at different times in history.

As seen during the high interest rate environment of 1994, the average yield nearly doubled, but after a three-year period the annualised total return from a diversified bond index such as UBS Composite Bond Index was nearly 13%, which is certainly not unattractive. Subsequent to the peak in interest rates in 1994, lower interest rates continued for the next few decades as inflation expectations declined, resulting in even higher bond returns over that period.

Conclusion – how an investor should respond to concerns about rising interest rates

The investors' response to concerns about higher interest rates may depend on their investment time horizon, but in most cases the following will apply:

- A majority of diversified, long-term investors should not view a bond bear market with the same level of apprehension as an equity bear market. As we saw in 1994, despite a massive rise in yields, a diversified fixed income benchmark such as the UBS Composite Bond Index still had a strong return over a three-year period, and even over a shorter time the return was still relatively attractive. A bubble-like scenario as we have seen in equity markets ("the tech crash") is not really possible in the bond market due to the guaranteed and fixed future cash flow.
- A decline in bond prices, as the result of a rise in yield, in most cases will be offset with higher nominal yields and potentially higher subsequent nominal returns; and
- A balanced diversified portfolio, which invests in defensive and growth assets, will produce an attractive risk-return outcome during any interest rate scenario.

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