



MANAGING YOUR BOND ALLOCATION IN A RISING YIELD ENVIRONMENT

MULTI ASSET SOLUTIONS - FOR PROFESSIONAL INVESTORS - MARCH 2017

In our view, investors need to review the duration of their benchmarks – especially any that were set up some years ago – and to look at what can be done, both strategically and tactically, to reduce the risk to portfolios from a rise in bond yields. With the current yield (as at 15th March 2017) of the Barclays Euro Aggregate Treasury benchmark at 0.71%, and the 10-year Bund yielding around 0.45%, the expected returns in the next few years from this benchmark will certainly be a lot lower than in the past. They could even turn negative if the European Central Bank’s (ECB) quantitative easing (QE) policy ultimately generates inflation.

Following a broader description of how bond markets have evolved in recent years, the Multi Asset Solutions* team presents a number of possibilities to help clients face the coming challenges of investing in bonds and to alert them to the risks that exist in this environment.

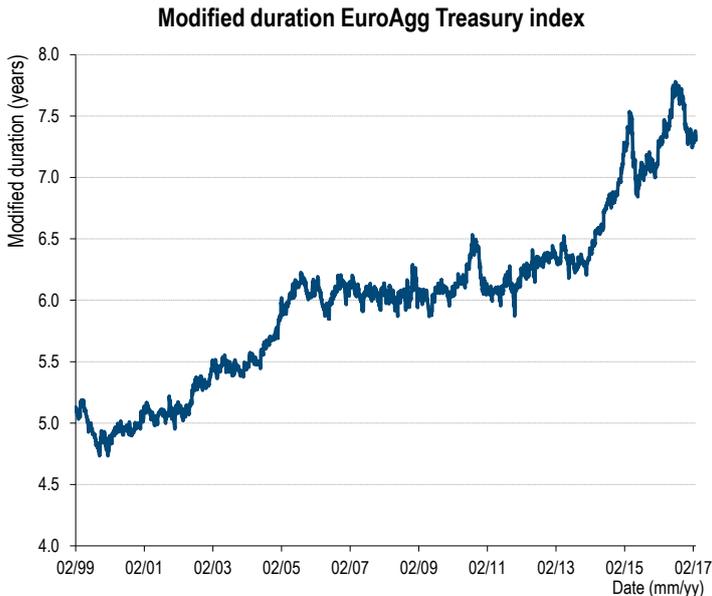
*BNP Paribas Investment Partners’ Multi Asset Solutions team offers an extensive range of multi-asset products and solutions for institutional and retail investors worldwide. With around than EUR 73 billion under management (as at 31 December 2016), the team comprises around 45 seasoned professionals with a broad range of expertise. Within the Multi Asset Solutions team, a dedicated Active Asset Allocation group conducts macroeconomic, quantitative and fundamental asset class research to establish investment views that are applied across client portfolios.

Table of Contents

I.	Evolution of bond markets and bond market characteristics.....	2
II.	Potential Solutions.....	4
III.	Conclusion.....	8

EVOLUTION OF BOND MARKETS AND BOND MARKET CHARACTERISTICS

Over the last decade and a half, the modified duration of the Barclays Euro Aggregate Treasury benchmark rose from 4.75 years at the end of 1999 to a peak of 7.8 years on 1 August 2016, before falling to 7.3 years today (as at 15th March 2017). See graph 1 below:



Graph 1: Modified duration of the Barclays Euro Aggregate Treasury - January 1999 through 15/03/17. Source: Bloomberg, Barclays

One reason (but not the only one) for the rise in modified duration has been the drop in yields over this period, as can be seen in graph 2 (we use January 1999 as the start date for both graphs 1 and 2 as it coincides with the introduction of the euro). While the global financial crisis (GFC) in 2007/8 and the eurozone sovereign crisis in 2011 caused yields to rise, the modified duration kept on rising until the recent sell-off. Another reason for increasing index duration has been a change of the pattern of issuance by governments in favour of longer maturities.

The explanation for a drop in yields leading to a rise in the duration and modified duration of a benchmark is to be found in the formulae for the calculation of the duration figures in Frank J Fabozzi's 'Handbook of Fixed Income Securities' (7th edition, with Steven Mann, published by McGraw Hill, 2005):

Modified duration (MD) can be written as:

$$\text{Modified duration} = 1/(1+\text{Yield}/k) * \{ (1+PVCF1 + 2*PVCF2 + \dots + nPVCFn)/k * \text{price} \}$$

Where:

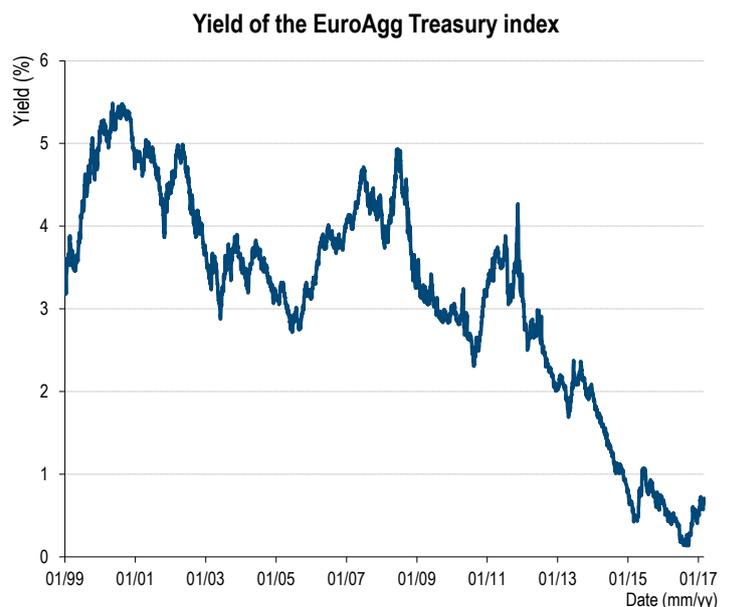
- k = number of periods, or payments, per year (e.g. k = 2 for semi-annual pay bonds)
- n = number of periods until maturity (i.e. number of years to maturity times k)
- yield = yield to maturity of the bond
- PVCFt = present value of the cash flow in period t discounted at the yield to maturity

The expression in the parentheses on the right of the modified duration formula given by the equation above is a measure formulated in 1938 by Frederick Macaulay, popularly known as the Macaulay duration.

This modified duration is commonly expressed as:

$$\text{Modified duration} = \text{Macaulay duration} / (1 + \text{yield}/k)$$

The modified duration is the percentage price change of a security for a given change in yield. The higher the modified duration of a security, the higher its risk. As the yield drops, both the duration and the modified duration increase because, as shown in the formulae, they are being divided by the yield.



Graph 2 – Yield of the Barclays Euro Aggregate Treasury index – January 1999 through 15/03/17. Source: Bloomberg, Barclays

If in 1999, a client had selected a 50/50 equity/bond balanced benchmark with the bond benchmark being the Barclays (then Lehman) Euro Aggregate Treasury benchmark with the modified duration of just under 5 – the modified duration contribution or mdc (% in benchmark * modified duration) would be 2.5. On 15th March 2017, the modified duration is just above 7 so the mdc is now 3.6, i.e. higher by 40%. To have the same interest rate risk as in 1999, the percentage of bonds needs to be 36% instead of 50% based on the current modified duration. Of course, clients may not want to increase the overall risk of their balanced portfolio by increasing the equity weight from 50% to 64%; they may choose instead to add cash or absolute return to the benchmark.

Table 1: Effect of rises in yields over a 1 year horizon on a 50/50 bond/equity portfolio with current modified duration compared to the modified duration of 1999.

Rise in yield over 1 year	Benchmark MD of 4.9 in 1999 % change in price for a 50/50 portfolio	Benchmark MD of 7.3 now % change in price for a 50/50 portfolio	Expected Sharpe Ratio with MD of 4.9	Expected Sharpe Ratio with MD of 7.3
1%	-2.8%	-3.4%	-2.3	-1.3
2%	-4.7%	-6.3%	-3.9	-2.4
3%	-6.5%	-8.9%	-5.4	-3.4

Source: BNP Paribas Investment Partners, Bloomberg

If a client has a 100% bond benchmark, then again, their mdc and risk has increased by about 40% over the period 1999 to 15th March 2017.

Government bonds used to be considered risk-free assets offering a risk-free return as well as providing diversification from the higher volatility (standard deviation of returns) of equities. With the drop in yields to the very low levels of today, some observers are now labelling government bonds as assets offering return-free risk. Given that there can still be flights to safety benefiting either government bonds when equity markets fall, or German Bunds when there are concerns over the 'peripheral' eurozone bond markets, we believe most investors will still want some bond exposure in their benchmarks.

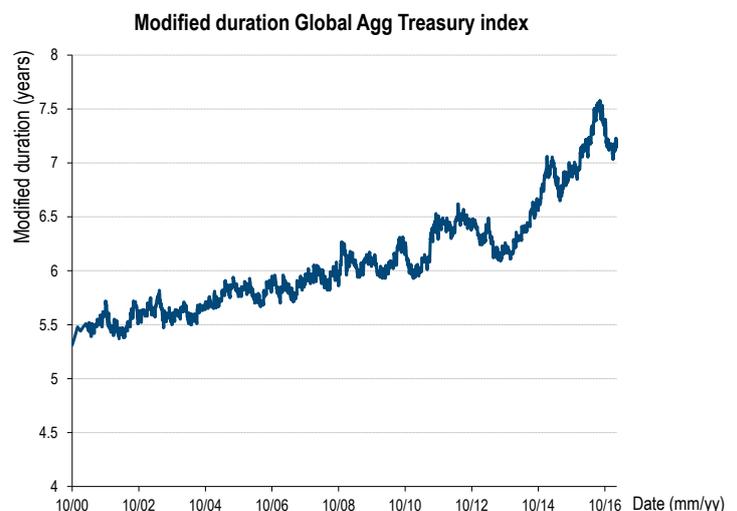
Correlations between bond and equity returns may be positive at times, which could reduce the diversification benefits. With official rates so low, they cannot be cut much further and increases in official rates are likely to be slow on account of governments' high

debt burdens. Normally, a rise in interest rates would be due to higher growth or inflation, in which case equities should benefit via an earnings increase. However, the slow recovery in the current cycle has been interpreted as being good for equities due to a delay in raising official rates in the US. Any hike of official rates by the ECB is still years away, in our view.

Fund managers are also unlikely to sell all government bonds in a portfolio if the client has chosen a benchmark with a 50% allocation to bonds. It would result in too high a tracking error, possibly even breaching a tracking error constraint, and from a tactical viewpoint, it is conceivable that bonds could rally further as the ECB's QE progresses and/or if growth/inflation data disappoint.

It could be argued that maintaining the same level of risk as in 1999 constitutes too high a level of fixed-income risk and that it should be lowered. This could be done by increasing the cash/absolute return percentage beyond the level of 14% discussed above. Unfortunately, with the repo rate at -0.40% and some custodians charging for deposits, holding cash is not cost free in this era of financial repression.

We have so far only discussed the Euro Aggregate Treasury bond benchmark, but the same trends in modified duration and yields can be seen in global bond benchmarks too, as shown in graphs 3 and 4:



Graph 3 – Change in the modified duration of the Barclays Global Aggregate Treasury index - October 2000 through 15/03.2017. Source: Bloomberg, Barclays

Yield Global Agg Treasury index



Graph 4 – Change in the yield (percentage) of the Barclays Global Aggregate Treasuries index – October 2000 through 15/03/2017

Source: Bloomberg, Barclays

II. POTENTIAL SOLUTIONS

In this section, we present a number of potential solutions to help our clients think about strategic and tactical adjustments to be made in their investment portfolio. In summary these are:

1. Reducing the allocation to bonds within the portfolio and adding cash/absolute return to the asset mix.
2. Reducing the maturity of the bonds in the portfolio.
3. Substituting part of any Euro government bond holdings in the portfolio with one or more of the following:
 - a. Global/US Treasuries
 - b. Investment-grade credit bonds
 - c. High-yield bonds
 - d. Covered, securitised bonds
 - e. Emerging market bonds
 - f. Convertible bonds
 - g. Loans
 - h. Inflation-linked government bonds
4. Using derivative instruments to actively manage the duration risk of the overall portfolio.

1. REDUCING THE BOND ALLOCATION, ADDING CASH/ABSOLUTE RETURN

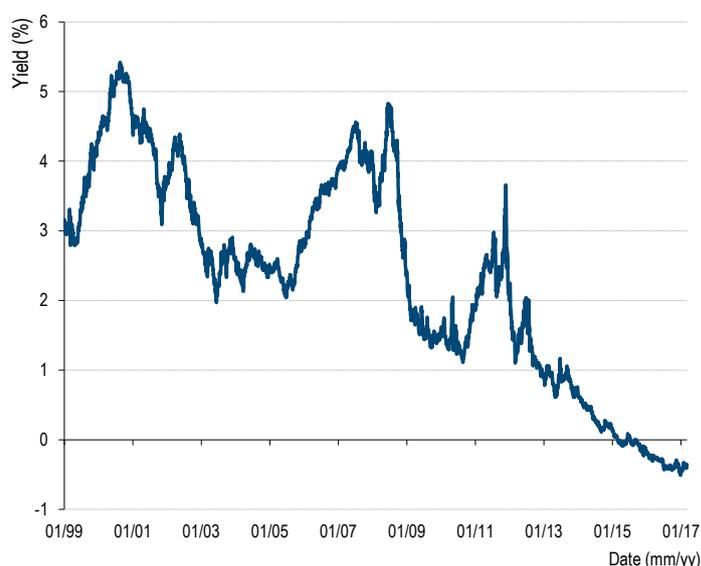
If a benchmark was selected many years ago based on a percentage of bonds and if the interest-rate risk has since risen

due to the higher current modified duration, clients could review the percentage of bonds and reduce the size of the allocation, replacing it with cash or absolute return. Most absolute return bond funds are flexible enough to be long or short duration and, provided the fund manager's view and timing are correct – they could generate positive returns even in a rising yield environment. The short duration option would be implemented via derivatives only in UCITs funds as shorting bonds is prohibited. Clients who do not wish to have net negative duration could specify a minimum positive or zero duration for the overall portfolio.

2. REDUCE THE MATURITY OF THE BOND ALLOCATION IN THE PORTFOLIO

Clients may consider changing the bond percentage from a full maturity benchmark such as those shown above to a 1-3 year benchmark like the Barclays Euro Aggregate Treasury 1-3 year, with a modified duration of 1.9. Unfortunately the yield of this benchmark is currently -0.35%, as shown in Graph 5, and buying bonds with a negative yield presumes the ECB will fail in its attempts to stave off disinflation – or a belief in the greater fool theory.

Yield Barclays EuroAgg Treasury 1-3 years



Graph 5 – Change in the yield of the Barclays Euro Aggregate Treasury 1-3 year index – January 1999 through 15/03/2017 . Source: Bloomberg, Barclays

The 3-5 year benchmark does have a yield of 0% with a modified duration of 3.8. It reached a low of -0.34% on 28th September 2016.



3. SUBSTITUTING PART OF THE EURO AGGREGATE TREASURY EXPOSURE WITH...

a) Global Aggregate Treasuries or US Treasuries to pick up yield

On the basis that investors may not want to take currency risk as well as the spread risk – at current yields of 2.53% in 10-year US Treasuries against 0.45% on 10-year German Bunds – the unhedged pick-up is 207bp, which, however, gets significantly reduced once we take into account the FX hedging cost.

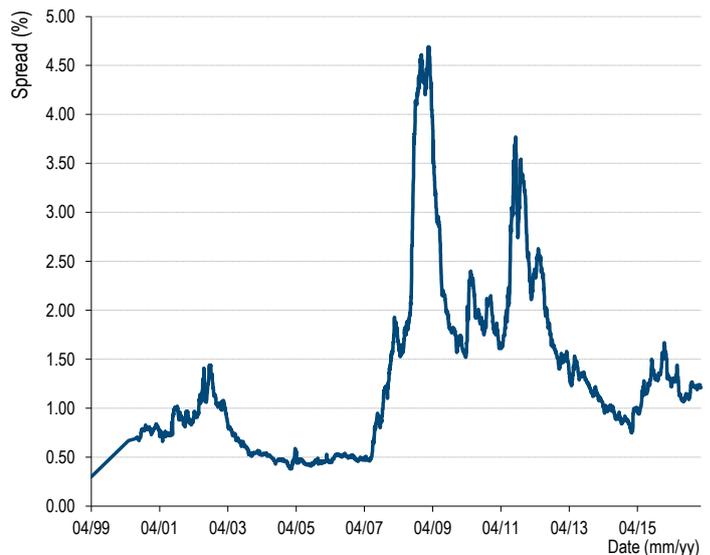
In terms of timing a shift from Euro Aggregate Treasuries to US Treasuries, we would wait for more clarity on Trump’s agenda. If investors are happy to take the USD currency risk then the pick-up would be higher. The divergence in monetary policy between the US Fed and the ECB is likely to increase over the next few years as the Fed normalises rates (though to a lower level than in the past cycles) while the ECB continues its QE programme at least until 2018.

b) Credit – Euro investment grade (IG)

Investors using a Euro Aggregate benchmark (as opposed to a Euro Aggregate Treasuries benchmark), have an allocation to IG as part of that benchmark (17% currently), so there is scope to increase the percentage allocation to IG. Spreads are currently 121bps with a modified duration of 5.3 years for the Barclays Euro Corporate index. The lower modified duration compared to the Treasury benchmark will also lower the interest-rate risk.

Graph 8 shows the spread of Euro corporate to government bonds – the levels are below average but bear in mind the fact that the average was hit by the spread widening during the 2008 financial crisis.

OAS Barclays EuroAgg corporate index



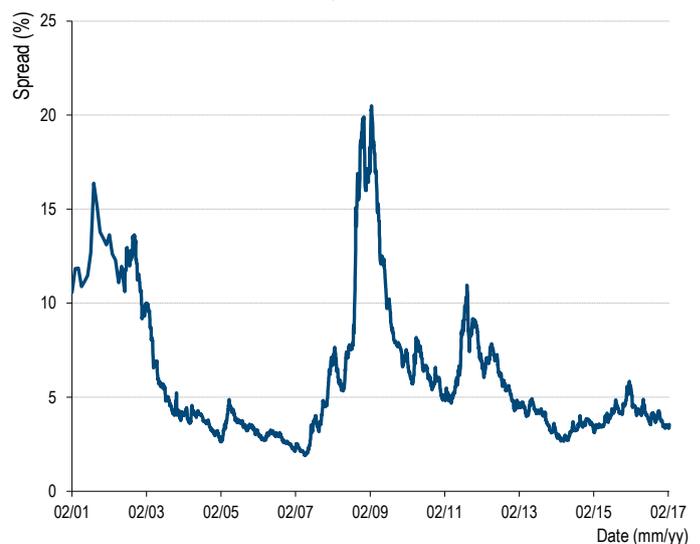
Graph 8: The evolution of the spread between corporate and government bonds (based on the Barclays Euro Aggregate Corporate Index versus the Barclays Euro Aggregate Treasury Index) – April 1999 through 15/03/2017. Source: Bloomberg, Barclays

The US corporate market is larger and more liquid than the euro market, and offers an alternative for investors looking to add credit risk.

c) Credit – Euro high-yield (HY)

There is no allocation to high yield in the Euro Aggregate benchmark. Given the lower credit quality, the spread is higher, at 363bp, and the modified duration is 4.2 for the 3%-constrained benchmark. Graph 9 shows the HY spread for this benchmark.

OAS Barclays Euro HY index



Graph 9: Evolution of the spread between high-yield and government bonds (using the Barclays Euro HY 3%-constrained spread versus the Barclays Euro Treasury index). Source: Bloomberg, Barclays

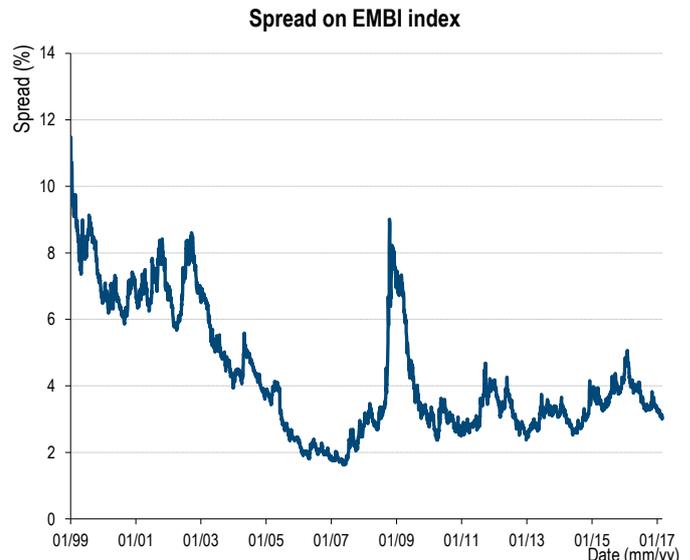
d) Credit – Securitised

European securitised credit includes instruments such as Pfandbriefe or more generally covered bonds, asset-backed securities, residential mortgage-backed securities and other asset-backed securities. The Barclays Euro Aggregate benchmark includes an allocation of around 8% to securitised credit instruments and this could be increased. The ECB is currently supporting the market. Spreads narrowed for the Barclays Euro Aggregate Securitised benchmark from 2% in 2009 and 3.15% at end 2011 (eurozone sovereign crisis) to 0.24% in March 2015. They have since widened a little to 0.65%.

Another option is US securitised credit. The largest part of this universe is mortgage backed securities (MBS) with a yield of around 3%. Again the USD currency exposure could be hedged. We believe investment in this asset class requires specialist managers given the distinctive nature of MBS and that allocation would best be made tactically given the expected rise in fed funds rates this year. MBS suffered negative returns in the 2013 taper tantrum.

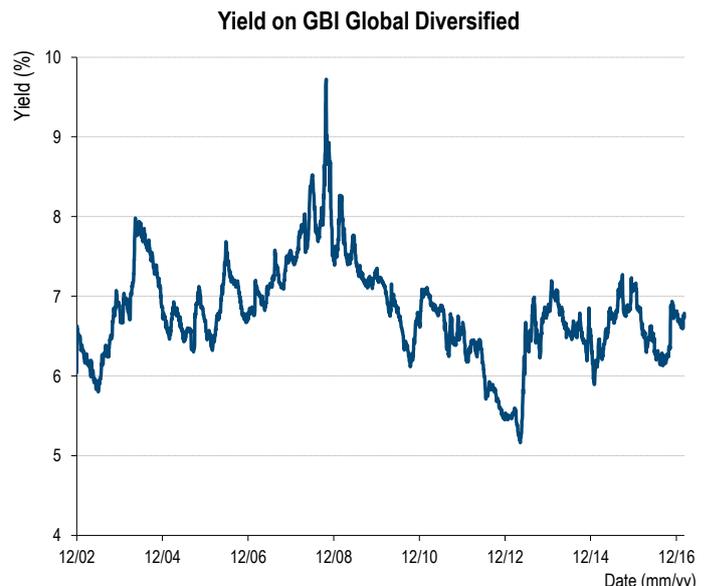
e) Emerging market debt – hard currency benchmark JP Morgan EMBI Global Diversified in USD (EMD HC).

Graph 10 shows the spread of this emerging market debt benchmark to US Treasuries. The spread is around 3.4%, with a yield of 5.6% and duration of 6.5. To eliminate the USD currency risk, a EUR-hedged share class could be bought or the USD currency risk could be hedged with Forex forwards. This benchmark is now highly diversified across more than 60 countries and it now comprises around 60% investment-grade bonds.



Graph 10: Evolution of the spread between emerging market debt and government bonds (using the JP Morgan EMBI Global Diversified spread). Source: Bloomberg, JP Morgan

The yield on emerging market debt local currency (EMD LC) is higher – see graph 11 of the JP Morgan GBI-EM Global Diversified – but the currency risk is considerable and needs to be dynamically hedged. The LC benchmark comprises far fewer countries than its hard currency counterpart and is more concentrated. The yield graph of course takes no account of the additional currency risk. Currently, EM currencies tend to be cheap in real exchange rate terms and as such offer reasonable protection in the face of the normalisation of monetary policy by the FOMC (Federal Open Market Committee).



Graph 11: Change in the yield of local currency emerging market debt (using the JP Morgan GBI-EM Global Diversified Yield) – December 2002 through 15/03/17 Source: Bloomberg, JP Morgan

f) Convertible bonds – European or Global

For a balanced benchmark such as 50/50 equities/bonds – the equity allocation could be increased directly since convertibles can be regarded as a mix of IG and HY bonds with a delta of around 0.4 to 0.5, i.e. their sensitivity to equities is 40%-50%, while incurring credit risk. For a 100% bond benchmark, convertibles could be used tactically when clients have a positive view on equities.

g) Loans

As loans are higher in the capital structure of corporates and are floating-rate instruments, they have the advantage of a very low to almost zero duration. Unfortunately there are no UCITs loans funds to meet potential demand from investors. Among UCITs funds, the closest instruments to loans are FRN funds – floating rate notes – as these are bonds. Loans can be accessed via closed-end funds (CEFs), which are investment trusts. The spreads are lower than those of HY bonds given the better recovery rates and seniority. Alternatively, CLO (Collateralised Loan Obligations) income notes funds also in CEF format offer much higher yields and their default rates remained low even after 2008.

h) Inflation-linked EUR government bonds

Real yields on German and French inflation-linked bonds with maturities of up to 10 years are still negative but have been rising from even more negative levels. These could be used tactically to replace nominal bonds. Alternatively, a Euro-hedged global inflation-linked bond fund could be used.

4. ALLOW USE OF DERIVATIVES TO ACTIVELY MANAGE DURATION RISK

As well as modifying the allocation, the use of derivatives allows for more active duration risk management of the overall portfolio. This will enable the manager to lower the duration risk of the portfolio instantaneously and cost-effectively based on tactical considerations.

III. CONCLUSION

In our view clients should review their benchmarks if they have not done so recently – there has been a major increase in interest-rate risk due to the rise in the duration of bond benchmarks over recent years. Investors should, in our opinion, consider increasing allocations to cash or the other fixed income segments discussed above. We have proposed several effective ways to modify the composition of a balanced or bond portfolio – by adding other asset classes such as cash/absolute return into the benchmark and/or by increasing the breadth of the fixed income investments included in the portfolio, for example, instead of investing solely in Euro government bonds and Euro investment grade credit bonds, seeking to invest as well in high yield and emerging market bonds, government debt and investment grade credit denominated in another currency.

Colin Harte - Senior Strategist, Multi Asset Solutions

+44 (0)20 7063 7277

colin.harte@bnpparibas.com

DISCLAIMER

This material is issued and has been prepared by BNP Paribas Asset Management S.A.S. (BNPP AM)* a member of BNP Paribas Investment Partners (BNPP IP)**.

This material is produced for information purposes only and does not constitute:

1. an offer to buy nor a solicitation to sell, nor shall it form the basis of or be relied upon in connection with any contract or commitment whatsoever or
2. any investment advice .

Opinions included in this material constitute the judgment of BNPP AM at the time specified and may be subject to change without notice. BNPP AM is not obliged to update or alter the information or opinions contained within this material. Investors should consult their own legal and tax advisors in respect of legal, accounting, domicile and tax advice prior to investing in the Financial Instrument(s) in order to make an independent determination of the suitability and consequences of an investment therein, if permitted. Please note that different types of investments, if contained within this material, involve varying degrees of risk and there can be no assurance that any specific investment may either be suitable, appropriate or profitable for a client or prospective client's investment portfolio.

Given the economic and market risks, there can be no assurance that the Financial Instrument(s) will achieve its/their investment objectives. Returns may be affected by, amongst other things, investment strategies or objectives of the Financial Instrument(s) and material market and economic conditions, including interest rates, market terms and general market conditions. The different strategies applied to the Financial Instruments may have a significant effect on the results portrayed in this material. Past performance is not a guide to future performance and the value of the investments in Financial Instrument(s) may go down as well as up. Investors may not get back the amount they originally invested.

The performance data, as applicable, reflected in this material, do not take into account the commissions, costs incurred on the issue and redemption and taxes.

* BNPP AM is an investment manager registered with the "Autorité des marchés financiers" in France under number 96002, a simplified joint stock company with a capital of 70,300,752 euros with its registered office at 1, boulevard Haussmann 75009 Paris, France, RCS Paris 319 378 832. www.bnpparibas-ip.com.]

** "BNP Paribas Investment Partners" is the global brand name of the BNP Paribas group's asset management services. The individual asset management entities within BNP Paribas Investment Partners if specified herein, are specified for information only and do not necessarily carry on business in your jurisdiction. For further information, please contact your locally licensed Investment Partner.