

HEDGING EQUITY DOWNSIDE RISK WITH BONDS IN THE LOW-YIELD ENVIRONMENT

VANGUARD RESEARCH

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- Owing to low and negative yields across many developed markets, the role of fixed income in portfolios has come under increasing scrutiny as the return that investors can expect from government bonds compared with five or even ten years ago has fallen significantly.
- This paper shows how—despite yields at rock-bottom levels—the diversification benefits of bonds have not diminished and how fixed income remains a shock absorber in multi-asset portfolios.
- We examine the correlations between fixed income sub-asset classes, their return distributions when equity returns are negative and their performance during equity bear markets and corrections. In particular, we assess claims that investment-grade (IG) corporate bonds can be a valid substitute for government bonds.

Investing in fixed income securities has come under scrutiny recently as the return that investors can expect from government bonds compared with five or even ten years ago has fallen significantly. At the end of November 2020, the German 10-year government bond yield was -0.57% while in the UK, it was 0.30% after having reached an all-time low of 0.10% in July. The French 10-year yield was around -0.33%, with Switzerland at -0.55% and Sweden just below the 0% threshold at around -0.01%.

Although negative yields remain concentrated in regions with a negative interest rate policy (NIRP), such as Japan and some countries in Europe, there are increasing chances of bond yields turning negative in other developed markets as well, especially if the Covid-19 pandemic turns out to have more severe and lasting economic consequences than initially expected.

With bond yields at rock bottom, it is easy to see why some investors advocate moving away from the traditional 'safe haven' of fixed income securities. More precisely, two claims are often raised: that government bonds have lost their diversification benefits as equity shock absorbers and that this is accentuated by the low or negative-yield environment; and, that investment-grade (IG) corporate bonds can be a valid substitute for government bonds and provide better downside risk protection¹.

In this research note, we address both of these claims by looking at the level of correlations between fixed income sub-asset classes (i.e., cash, government bonds and credit), their return distributions when equity returns are negative and their performance during equity bear markets and corrections. To begin with we consider two countries: the UK, where government bond yields have decreased sharply in recent years but are not quite negative, and Germany, where the 10-year government bond yield has been negative since March 2019.

Correlation between equity and bond returns

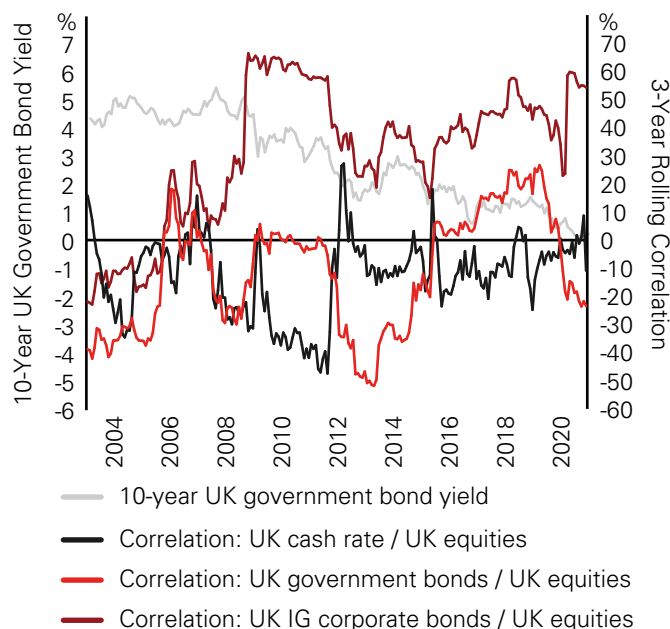
The level of correlation between two asset classes is an important indicator of the diversification benefits that investors can get from holding both asset classes in their portfolio. A lower level of correlation suggests a greater diversification benefit. The historical correlation between equities and bonds has changed between negative and positive on multiple occasions, but it has been predominately negative since the late 1990s (Ilmanen, 2003).

However, as interest rates are close to zero or negative, the question that many investors are asking is: Will the correlation between stocks and bonds hold going forward?

¹ Another common claim is that protective put indices such as the CBOE S&P 500 5% Put Protection Index or the DAXplus Protective Put Index provide a more effective protection to equity drawdown risk than typical equity/bond mixes. We keep this aspect out of the scope of analysis for this paper. For further details on the topic, see Israelov (2019).

Figure 1a shows the three-year rolling correlation from January 2003 to November 2020 between UK equities and three different types of UK bonds split by credit risk: cash, government bonds and IG corporate bonds. In the same chart, we also plot the evolution of the UK 10-year government bond yield. Our results show that UK equities have historically had a higher and positive correlation with UK corporate bonds, whereas the correlation with UK government bonds and with cash was significantly lower and negative most of the time. In addition, our results do not indicate any specific change in trend that could suggest that the correlation between equities and government bonds increases when yields are lower. On the contrary, Figure 1a shows that the correlation between UK equities and UK government bonds has over the past year become more negative, whereas the correlation with UK corporate bonds has spiked.

Figure 1a. 10-year UK government bond yield and three-year rolling correlations between UK bonds and equities, January 2003 to November 2020

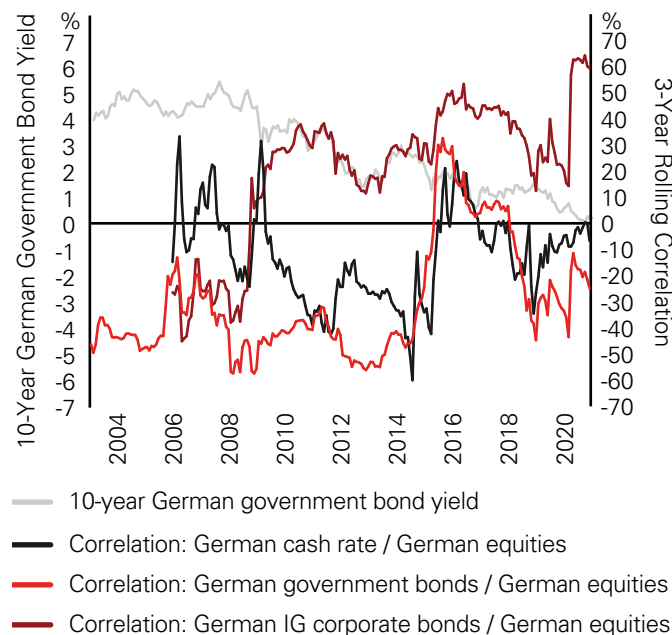


Notes: UK equities refer to the FTSE All Share Total Return Index, UK government bonds refer to the Bloomberg Barclays UK Government All Bonds Total Return Index, UK cash rate refers to the ICE 3-month GBP LIBOR and UK corporate bonds refers to the Bloomberg Barclays Sterling Corporate Total Return Index. All figures are in GBP.

Source: Bloomberg L.P., using monthly data from January 2003 to November 2020.

In Figure 1b, we show the same analysis for Germany. The results are consistent with what we observed for the UK. By focusing on the three-year correlation trend between German equities and German government bonds, we find evidence of the continued diversification benefits of government bonds even when yields are negative. In fact, the correlation has become more negative with negative yields. This suggests that if other developed countries also experience negative yields, central banks' policy responses do not qualitatively change and inflation remains low, the diversification benefits of holding government bonds in a portfolio should continue, consistent with what we have seen in Germany.

Figure 1b. 10-year German government bond yield and three-year rolling correlations between German bonds and equities, January 2003 to November 2020



Notes: German equities refer to the DAX Index, German government bonds refer to the Bloomberg Barclays Germany Government All Bonds Total Return Index, German cash rate refers to the German 3-month government bond yield and German corporate bonds refers to the Bloomberg Barclays Global Credit Germany Total Return Index. All figures are in EUR.

Source: Bloomberg L.P., using monthly data from January 2003 to November 2020.

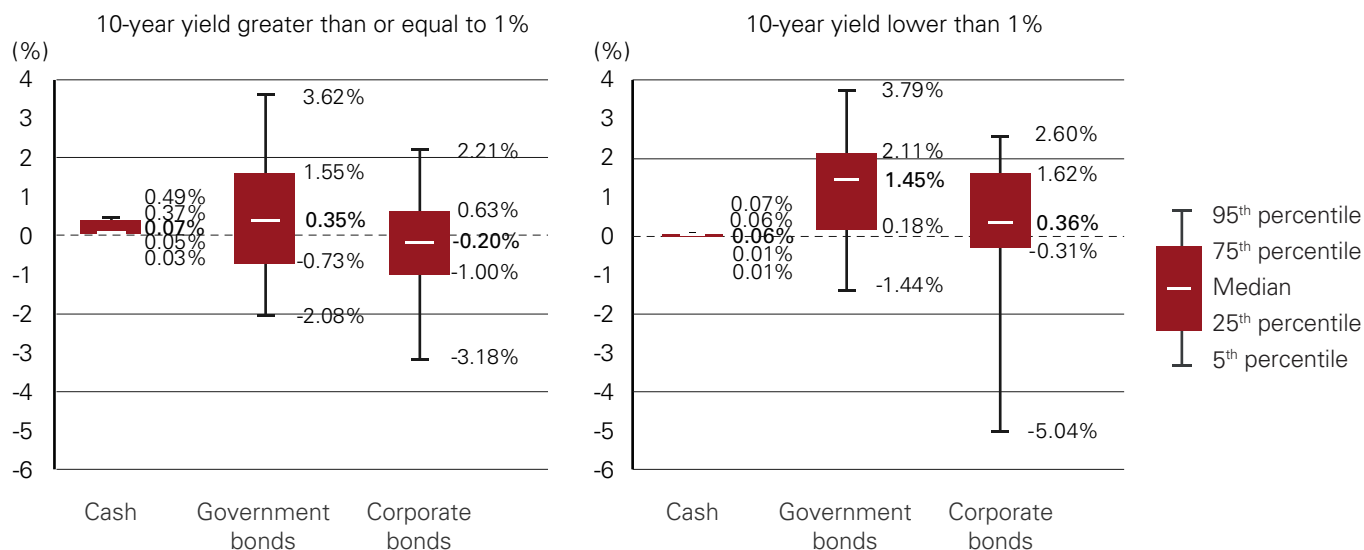
Correlation is not everything: downside risk protection is what matters

Correlation provides an estimate of how two variables, in our case equities and bonds, are linearly related. As we mentioned previously, the correlation between equities and government bonds has historically been negative. This means that, on average, when equity returns were below their historical mean, government bond returns were above their mean, and vice versa. Correlation, however, has two limitations: it provides an estimate of the average relationship whereas investors tend to be more interested in how bonds respond when equities nose-dive; and, it does not provide any indication of the magnitude of the relationship between equities and bonds. In other words, correlation does not tell us anything about how much bonds might go up when there is an equity market downturn.

For these reasons, we also look at the actual performance of bonds when equity returns are negative over the same period, from January 2003 to November 2020. Figure 2a and Figure 2b show the distribution of returns from cash, government bonds and IG corporate bonds in the UK and Germany when their respective equity returns were negative.

In **Figure 2a**, the chart on the left shows the distribution of UK bond returns for periods when the 10-year UK government yield was greater than or equal to 1% and the chart on the right shows the distribution when the yield was lower than 1%. Similarly, the chart on the left in **Figure 2b** shows the distribution of German bond returns for periods when the 10-year German government bond yield was positive and the chart on the right shows the distribution for when the yield was strictly negative.

Figure 2a. Distribution of UK bond returns when UK equity returns were negative, January 2003 to November 2020

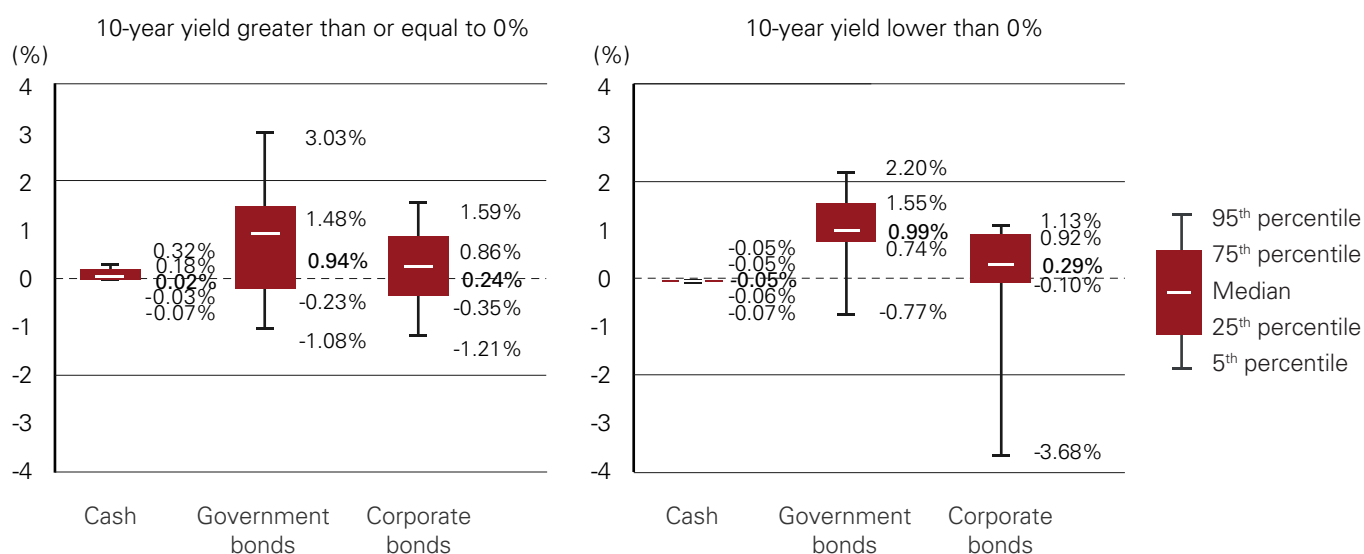


Notes: UK equities refer to the FTSE All Share Total Return Index, UK government bonds refer to the Bloomberg Barclays UK Government All Bonds Total Return Index, UK cash refers to the ICE 3-month GBP LIBOR and UK corporate bonds refers to the Bloomberg Barclays Sterling Corporate Total Return Index. All figures are in GBP. The chart on the left shows the distribution of monthly returns for periods when the UK 10-year government bond yield was greater than or equal to 1%. The chart on the right shows the distribution of monthly returns for periods when the UK 10-year government bond yield was lower than 1%.

Source: Bloomberg L.P., using monthly data from January 2003 to November 2020.

Our results show that government bonds have historically provided higher median returns compared with corporate bonds and cash when equities fall. In addition, even at the lowest 5th percentile of the distribution, government bonds have delivered higher returns than corporate bonds. It is also worth noting that when yields have been below 1% for the UK or negative for Germany, the distribution of government bond returns has shrunk whereas for corporate bonds it has increased. This is further evidence suggesting that even if negative-yielding bonds contribute weakly to the income of a multi-asset portfolio which also comprises equities, they still provide significant risk-mitigation benefits and tend to be better shock absorbers than corporate bonds.

Figure 2b. Distribution of German bond returns when German equity returns were negative, January 2003 to November 2020



Notes: German equities refer to the DAX Index, German government bonds refer to the Bloomberg Barclays Germany Government All Bonds Total Return Index, German cash refers to the German 3-month government bond yield and German corporate bonds refers to the Bloomberg Barclays Global Credit Germany Total Return Index. All figures are in EUR. The chart on the left shows the distribution of monthly returns for periods when the German 10-year government bond yield was greater than or equal to 0%. The chart on the right shows the distribution of monthly returns for periods when the German 10-year government bond yield was lower than 0%.

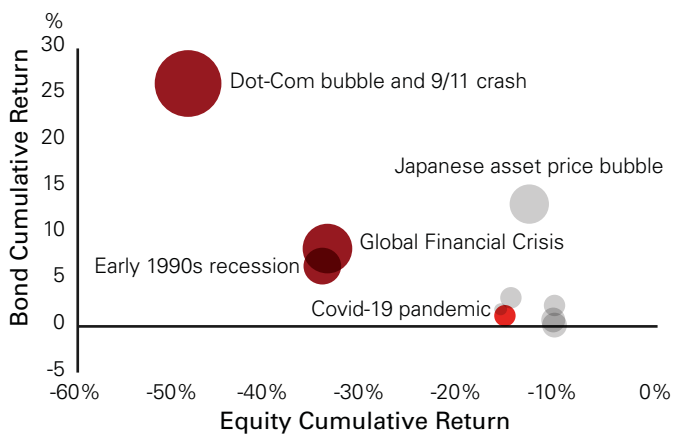
Source: Bloomberg L.P., using monthly data from January 2003 to November 2020.

We looked in more detail at the performance of bonds during equity market downturns. More specifically, we compared aggregate bond returns during cumulative periods of equity bear markets and corrections. Also, instead of just focusing on the UK and German markets, we considered a portfolio composed of global equities and bonds².

Figure 3 shows—on the horizontal axis—cumulative global equity returns during bear markets or market corrections from January 1988 to November 2020³. Here we define a bear market as a decline of more than 20% from peak to trough (red circles). Similarly, a correction is defined as a decline of more than 10% but less than 20% (grey circles). On the vertical axis, we show the cumulative return for global aggregate bonds. The size of each bubble is proportional to the number of calendar days that the period covers. The negative relationship between equity and bond returns is clear.

We can see from the chart how more severe global equity downturns are consistently accompanied by higher returns for bonds. For instance, during the 2007-08 global financial crisis (GFC), global equities declined by roughly 34%. During the same period, global aggregate bonds went up by more than 8%. Similarly, when the Japanese asset price bubble burst at the start of 1992, equities lost around 13% while bonds returned roughly 13%.

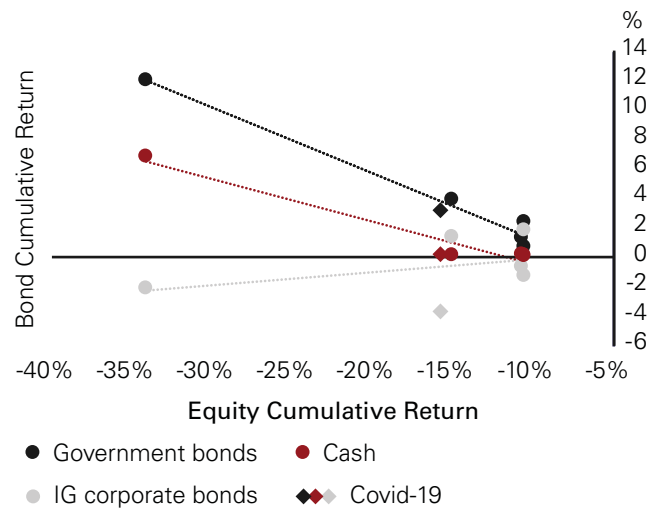
Figure 3. Global equity and aggregate bond performance during equity bear markets and corrections, January 1988 to November 2020



Notes: Equity returns are defined from the MSCI AC World Total Return Index and bond returns defined from the Bloomberg Barclays Global Aggregate Total Return Index, hedged to GBP. Both equity and bond returns are reported in GBP. A bear market is defined as a decrease of more than 20% from the previous maximum. Similarly, a correction is defined as a decline of more than 10% but less than 20%. The size of each circle is directly proportional to the number of calendar days that the period covers. Source: Bloomberg L.P., using monthly data from January 1988 to November 2020.

From January to the end of March 2020, the period encompassing the Covid-19 pandemic equity-market downturn (orange bubble), global aggregate bonds returned around 1.2% while global equities lost almost 16%. During a few days in March, however, bonds suffered significant losses and overall bond returns in March were negative. In general, we cannot expect bonds to go up every time that equities go down. In fact, from January 1988 to November 2020, whenever monthly global equity returns were negative, global bond returns were positive roughly 71% of the time. This means that 29% of the time, they were negative too.

Figure 4. Global equity and bond performance during equity bear markets and corrections, January 2001 to November 2020



Notes: Equity returns are derived from the MSCI AC World Total Return Index. Government bond returns are derived from the Bloomberg Barclays Global Aggregate Treasuries Total Return Index GBP Hedged, corporate bond returns are derived from the Bloomberg Barclays Global Aggregate Credit Total return Index GBP Hedged and cash returns are derived from the ICE GBP LIBOR 3-month rate. A bear market is defined as a decline of more than 20% and a correction as a decline of more than 10% but less than 20%.

Source: Bloomberg, using monthly data from January 2001 to November 2020.

However, these can be considered temporary anomalies; once markets are given enough time to factor in the monetary policy responses, we observe that the usual relationship between bonds and shares is re-established. Indeed, our analysis of recent prolonged market downturns suggests that the longer a crisis drags on, the more likely bonds are to play a stabilising role in multi-asset portfolios. However, this dynamic does work less effectively when interest rates are already low—as in the current economic environment—since there is less room for rates to decrease further.

Finally, we expand on Figure 3 and in Figure 4 we split the relative performance of global bonds by providing data on how cash, global government bonds and global corporate bonds responded during equity downturns⁴.

² See Donaldson et al., 2017 for further details on the benefits on global diversification.

³ Using global indices allows to increase the historical time span of our analysis compared to Figure 1a, Figure 1b, Figure 2a and Figure 2b.

⁴ Because of data availability we reduce our historical analysis to the period from January 2001 to November 2020.

Consistent with our findings in **Figures 2a and 2b, Figure 4** shows how government bonds have been better shock absorbers than IG corporate bonds and cash. This has held true even during periods of very low yields, including the Covid-19 pandemic equity crash.

Conclusion

Although mitigated by the current low-yield environment, our research shows that the diversification benefits of bonds have not changed as a result of rock-bottom yields. If anything, the downside protection characteristics of government bonds compared to corporate bonds in particular look stronger. We do not find any evidence that equity-bond diversification does not work at high and low levels of yields. In addition, the claim that corporate bonds would provide better protection seems unfounded. In our research, corporate bonds do show some diversification benefits to equities but should not be considered as pure replacements for government bonds.

High market volatility is the result of many variables impacting the market simultaneously, including irrational investor behavior. We cannot expect the negative relationship in equities and bonds to hold each and every day, but rather on average over the investment horizon. Certainly, we find no reason to believe that bonds will not continue to play their role as a shock absorber in multi-asset portfolios.

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