In Search of Negative Beta

Daniel DeWoskin[1], Nastja Bethke[1], Tom Feng[2], Ed Tricker[3]

Abstract
Portfolio protection against sharp declines in equity markets is an important allocation consideration for investors, and has been highlighted amidst the recent crisis. In this brief note we take a closer look at the effectiveness of bonds to deliver a hedge during equity drawdowns, and find that while historically they may have performed well, it is not clear they will do so going forward.

[1] *Senior Quantitative Research Analyst*
[2] *Director of Quant Research*
[3] *CIO - Quantitative Strategies*

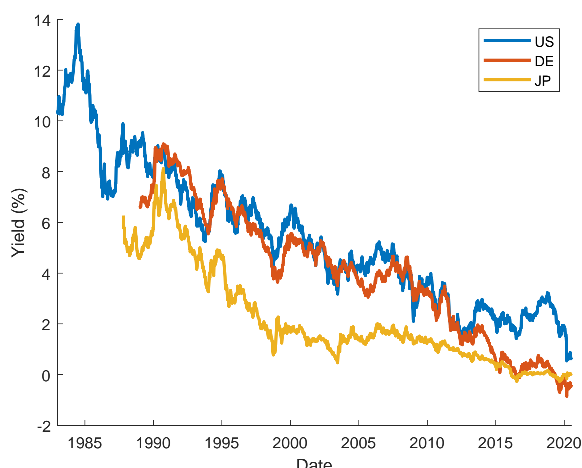

Figure 1. Historical yields for US 10-year Treasury, German 10-year Bund and JGB 10-year.

The market shock of February and March 2020 is still fresh in memory, yet enough time has passed for investors to re-assess their portfolios and potentially make adjustments offering better protection in case of a renewed downturn in the equity markets. A variety of tail protection approaches exist (see GCM paper *The Winter's Tail - Protecting Against Equity Selloffs* (June 2020)) with the most classic arguably being the addition of (government) bonds to an equity portfolio. While in the past bonds have indeed provided positive returns during equity market declines, it is far from certain that they will continue doing so in the current market regime. Bond yields are at an all-time low across various geographies, see yields for 10-year treasuries in the US, Germany and Japan in Figure 1. The potential for sizeable returns when holding bonds is thus drastically limited from the outset. But beyond low returns, we find that they do not offer the same level of protection as they used to. Figure 2 shows the beta or hedge ratio for these treasuries with respect to the relevant equity index, conditioned on the equity return being less than -2%, across a range of yields. Betas are based on monthly returns, and the data points are color coded to reflect the date of the sample.

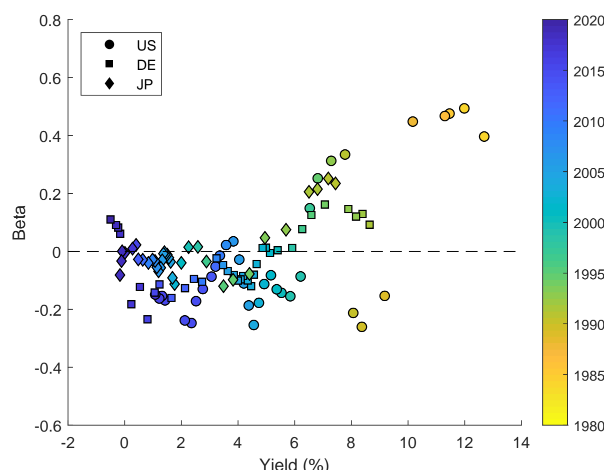

Figure 2. Conditional beta of government bond futures (US 10-year Treasury, German 10-year Bund and JGB 10-year) with respect to stock indices (S&P 500, DAX and TOPIX), when the latter posted returns of -2% or worse, plotted against yield level.

A negative beta or hedge ratio indicates that bonds are a suitable hedge in equity downturns. Several points stand out. First, we see that at high positive yields bonds tend to not provide protection at all, instead displaying mostly, and sometimes highly, positive beta and essentially becoming a risky asset themselves. Second, there is a range of yields around 1-5% where bonds do exhibit substantial negative beta, behaving as one would expect from an asset that is thought to offset equity risk. Finally, when yields are very low or even negative, namely around 0.5% or less, the beta vanishes or becomes slightly positive, indicating that there frequently is no hedge benefit provided when adding bonds to an equity portfolio.

This shows that with bonds currently trading in a very low yield regime, it is unlikely they will offer much if any downside protection, or worse they could move in sync with equities in the next selloff, exacerbating any portfolio losses. Investors may therefore wish to consider alternative protection approaches.

Legal Disclaimer

THIS DOCUMENT IS NOT A PRIVATE OFFERING MEMORANDUM AND DOES NOT CONSTITUTE AN OFFER TO SELL, NOR IS IT A SOLICITATION OF AN OFFER TO BUY, ANY SECURITY. THE VIEWS EXPRESSED HEREIN ARE EXCLUSIVELY THOSE OF THE AUTHOR(S) AND DO NOT NECESSARILY REPRESENT THE VIEWS OF GRAHAM CAPITAL MANAGEMENT, L.P. OR ANY OF ITS AFFILIATES (TOGETHER, “GRAHAM”). NEITHER THE AUTHOR NOR GRAHAM HAS ANY OBLIGATION, AND SHOULD NOT BE EXPECTED, TO UPDATE, CORRECT OR DELETE THE INFORMATION CONTAINED HEREIN IN LIGHT OF SUBSEQUENT MARKET EVENTS OR FOR ANY OTHER REASON. GRAHAM MAY TAKE POSITIONS OR MAKE INVESTMENT DECISIONS THAT ARE INCONSISTENT WITH THE VIEWS EXPRESSED HEREIN. THE INFORMATION CONTAINED HEREIN IS NOT INTENDED TO PROVIDE ACCOUNTING, LEGAL, OR TAX ADVICE AND SHOULD NOT BE RELIED ON FOR INVESTMENT DECISION MAKING.

THE INFORMATION SET FORTH HEREIN IS SUBJECT IN FULL TO THE TERMS OF USE OF THE GRAHAM CAPITAL MANAGEMENT WEBSITE AND MAY NOT BE REPRODUCED, MODIFIED, DISTRIBUTED OR OTHERWISE USED WITHOUT GRAHAM’S EXPRESS WRITTEN CONSENT.