GOVERNMENT BONDS AS CRISIS PROTECTION

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INTRODUCTION

With risk assets at elevated levels, many investors are considering how best to use government bonds to try to help protect their portfolios from a possible equity market sell-off. Investors are reminded that historically there have been scenarios in which equities sell off with bonds, or perhaps even because of bonds, and that this was more common than not for a long period of financial history (from 1750 to 1980). However, when looking at the past seven market crises over the last 40 years, government bonds have helped to offer some protection to an equity market portfolio.

Assuming that the decision to use bonds has already been made, investors have to decide whether the short end or the long end of the yield curve will provide them with better potential protection. In thinking about this question, there are two important considerations:

I. During crises, do yields fall further at the short end of the curve or the long end of the curve? In other words, does the curve steepen in a crisis?

II. During more stable periods, does the short end of the curve or the long end of the curve generate a better return to the investor for the capital employed? Simply put, how does bond carry affect the decision?

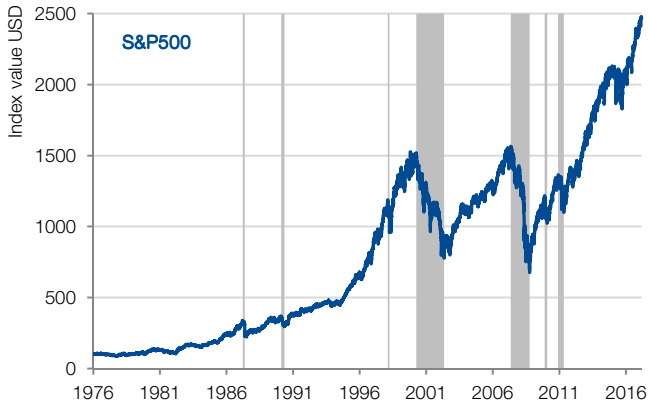
We discuss these two questions below. All of the empirical conclusions in this note are taken from a recent paper on hedging crises written by a team at Man AHL, led by Otto van Hemert, Head of Macro Research. They are summarised in a table at the end of the note.

I. DOES THE YIELD CURVE STEEPEN IN A CRISIS?

Conventional wisdom holds that in a crisis, short yields tend to fall more than long yields because, first, central banks tend to add liquidity to the money markets in order to help stabilise markets, and this in turn typically drags short yields down more than the yields at the long end. And second, a crisis often drives a flight by investors into low risk assets (read short duration government bonds) and this flow also drives yields down at the front end.

But is there any truth in the conventional wisdom? A recent research project conducted by a team at Man AHL looked at this question, studying the period from 1985 to 2017. Defining a 'crisis' as a drawdown in the S&P500 of 15% or more, they found seven such instances: the 'Black Monday' crash (1987); the Gulf War (1990); the Asian Crisis (1998); the Tech Bubble burst (2000-2002); the Global Financial Crisis (2007 to 2009); the First Euro Crisis (2010) and the Second Euro Crisis (2011).

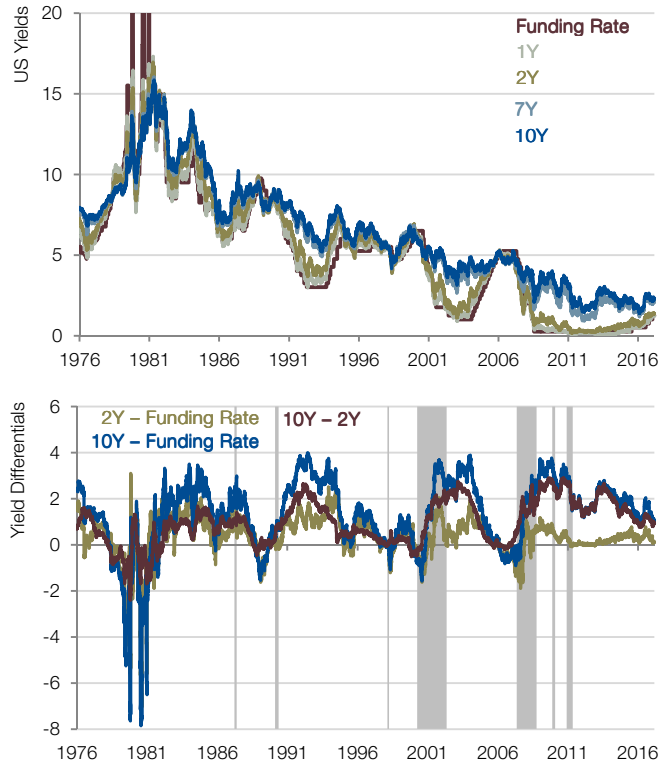
Figure 1. Seven periods of S&P500 drawdown greater than 15%



Source: Man Group database and Bloomberg.

In the first five of these crises, two-year US Treasury (2yr) yields fell by more than 10-year US Treasury (10yr) yields, which fits the intuition. However, in the last two, 2yr yields fell by less, which does not. Interestingly in these last two events, the Euro crises, 2yr yields were already very low (1.1% and 0.6% respectively) and the yield curve was already steep by historical standards (exhibiting a 270bp difference on both occasions between 10yr yields and 2yr yields). The data for this is summarised in the charts and table of Figure 2.

Figure 2. US Treasury yields during periods of crisis



	Black Monday	Gulf War	Asian Crisis	Tech Bubble	GFC	First Euro Crisis	Second Euro Crisis
Change in steepness of 10yr-2yr UST yields	0.2%	0.6%	0.1%	2.2%	1.4%	-0.4%	-1.2%

Source: Man Group database and Bloomberg.

So one possible conclusion consistent with intuition is that, in yield terms, it has historically been better to hold a protective bond investment at the front end of the curve, unless current pricing is such that there is little scope for 2yr appreciation, or the curve is already very steep.

Price performance of bonds in a crisis

One potential benefit of investing at the long end of the curve is that the duration of the bonds is higher than at the short end. In this context, if yields fall equally across the curve, it will be the long end that offers the better price performance, assuming, of course, we are comparing equal amounts of invested capital. This effect is generally stronger than the change in shape of the yield curve, and as a result, the average annualised price performance of the 10yr bond in the crises is historically more than twice that of the 2yr[1]. It is this 'bang for the buck' that has led a number of investors to prefer the long end approach, as the potential drag on portfolio performance that tends to go with 'protective' investments makes the efficient use of capital particularly important.

Relative sizing of long and short end investments

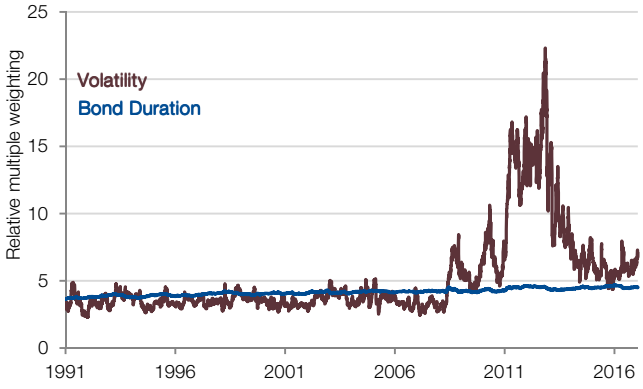
However, equal capital investments at the front end and the back end of the curve have very different risk characteristics, and we feel it is reasonable to argue that to compare the price performance of the front and back end investments we should be comparing the return on investments of equal risk. In a market where the easiest instruments to use are generally futures contracts, capital efficiency shouldn't be an issue, so scaling up the 2yr bond position should be possible (in the absence of a difficult or restrictive regulatory structure).

Suppose we compare the performance of 2yr and 10yr bonds in a crisis, where both investments have been sized to seek 10% volatility in performance over the whole period. To achieve this level of risk, our hypothetical model scaled up the investment in both 2yr and 10yr bonds relative to their risks (i.e. the 2yr was scaled up by roughly four times more than the 10yr). This changes the answer on relative performance dramatically. Now it is the 2yr bonds which outperformed in the crises. Note, however, that if using shorter-term measures of volatility, 2yr bonds have historically been stable at lower yields, frozen to a yield floor by aggressive central bank rates policies, and this has driven the scaling factor much higher in recent years to levels many investors might consider unreasonable.

Another approach to scaling the respective positions is to weight exposure by duration. This is a typical practice when thinking about bond investment, often intended to have the same effect as the volatility equivalence approach described above, and in general the results have been very similar historically. The exception, of course, is more recently when historically low volatility at the front end of the curve has changed the picture.

Figure 3 below shows the relative multiple of weighting to the 2yr bonds versus 10yr bonds to achieve a similar level of risk under volatility and duration metrics.

Figure 3. Weighting of 2yr and 10yr bonds to achieve similar levels of risk



Source: Man Group database.

The performance data of 2yr and 10yr bonds under stand-alone and risk-weighted metrics is given in Table 1 in the conclusion to this paper.

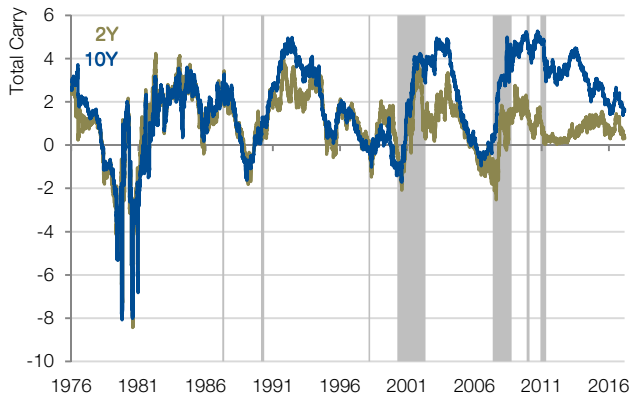
1. Source: Man Group database, showing annualized return of 10.7% for 10yr bonds versus 4.2% for 2yr bonds.

II. HOW BOND CARRY IMPACTS THE DECISION

The other key question is how relative performance compares historically between the front and back end of the curve in more normal market conditions and across the period. Clearly the historical numbers have been significantly affected by the rally in bond markets over the last thirty years, and in the context of the question about front versus back, it may be more useful to think about the relative returns to carry on the respective positions independent from the return to bonds as a whole.

Carry has two components to consider: the yield on the bond versus the funding rate (i.e. the carry itself), and the shift in yield that takes place with the passage of time as the bond rolls down the curve. Figure 4 shows the total carry (both components combined) for the 2yr and 10yr benchmark bonds, before applying any volatility or duration scaling. For extended periods of time, both 2yr and 10yr bonds offer similar levels of overall carry. After periods of curve steepening, the 10yr tends to offer more carry (unlevered) for some time. This has also been the case for several years following the Financial Crisis. But if we apply the volatility or duration scaling factors, then again the 2yr generally looks to be a potentially better option across the whole period; effectively the level of return represented by the gold line should be multiplied by 3.5-4x. However once again, in the more recent period, with 2yr frozen to the floor, this conclusion does not apply.

Figure 4. Total carry for 2yr and 10yr benchmark bonds



Source: Man Group database.

CONCLUSION

A summary of the data to which we have referred, originally set out in a paper[2] by colleagues at Man AHL, is shown in Table 1. Assuming investors can move past concerns about whether bonds will offer the type of protection they have offered so far this century, we have asked which bonds are potentially the most useful. We considered two issues: first, the behaviour of the yield curve in 'crisis' type conditions, where we determined that historically it generally steepens for reasons that seem intuitively clear. Second, we considered the carry offered by short-term bonds versus long-term bonds. Provided the positions are of equivalent duration (or risk) then the carry on the shorter-term bonds has generally been better historically. Both of these considerations point to a general conclusion that holding shorter-term bonds may offer greater protection potential, provided the position is scaled appropriately. There are two important caveats. The first is that we believe care needs to be taken with the scaling factors when rates are unnaturally stable – duration matching may be intuitively less obvious as an approach, but simpler to implement. The other caveat is that where the curve is already very steep, or the short end rates are already so low that there is little room for appreciation in crisis markets, then long end rates may be the better place to be.

Table 1: Empirical observations on yield and return during seven periods of crisis

	Black Monday	Gulf war	Asian crisis	Tech burst	Financial crisis	Euro crisis I	Euro crisis II
Peak day	25-Aug-87	16-Jul-90	17-Jul-98	01-Sep-00	09-Oct-07	23-Apr-10	29-Apr-11
Trough day	19-Oct-87	11-Oct-90	31-Aug-98	09-Oct-02	09-Mar-09	02-Jul-10	03-Oct-11
Weekdays count	39	63	31	548	369	50	111
Total return							
S&P 500 (excess)	-33.5%	-20.7%	-19.7%	-51.0%	-56.3%	-15.7%	-18.6%
US 10Y Fut	-8.3%	-2.7%	3.0%	24.2%	20.4%	5.7%	10.1%
US 2Y Fut	-1.6%	0.4%	1.0%	11.2%	7.1%	1.2%	0.9%
US 10Y Fut (10% vol)	-10.1%	-4.0%	11.4%	48.6%	27.2%	9.1%	17.7%
US 2Y Fut (10% vol)	-11.0%	2.5%	12.1%	77.1%	30.5%	9.6%	9.2%
Yield curve moves							
2y yield (peak, trough)	[7.8%, 8.9%]	[8.2%, 8.0%]	[5.5%, 4.9%]	[6.1%, 1.7%]	[4.2%, 1.0%]	[1.1%, 0.6%]	[0.6%, 0.2%]
10y yield (peak, trough)	[8.7%, 10.2%]	[8.4%, 8.9%]	[5.5%, 5.1%]	[5.7%, 3.6%]	[4.7%, 2.9%]	[3.8%, 3.0%]	[3.3%, 1.8%]
10y-2y slope yield (peak, trough)	[0.9%,1.2%]	[0.3%,0.9%]	[0.1%,0.1%]	[-0.4%,1.9%]	[0.5%,1.9%]	[2.7%,2.4%]	[2.7%,1.6%]
Change 10y-2y slope	0.3%	0.6%	0.1%	2.3%	1.4%	-0.4%	-1.2%

	Annualized return			Other statistics			
	Crisis (14%)	Normal (86%)	All (100%)	St. Dev	SR	Corr. to S&P500	IR to S&P500
S&P 500 (excess)	-45.1%	20.2%	7.3%	16.7%	0.51	1.00	n/a
US 10Y Fut	10.7%	3.4%	4.4%	6.5%	0.69	-0.04	0.72
US 2Y Fut	4.2%	1.1%	1.5%	1.8%	0.86	-0.08	0.92
US 10Y Fut (10% vol)	20.1%	4.9%	7.0%	10.6%	0.69	-0.04	0.71
US 2Y Fut (10% vol)	25.1%	5.3%	8.0%	10.8%	0.76	-0.06	0.81

Source: Man Group database. Table reports the total return of the S&P 500 and various passive strategies during the seven worst drawdowns for the S&P 500 and the annualised (geometric) return during crisis, normal and all periods. Volatility is the annualised standard deviation of 5-day overlapping returns. The row 'Peak = HWM' indicates whether the index was at an all-time high before the drawdown began. The data run from 1985 to 2016.

2. The Best Strategies for the Worst Crises, June 2017, Man AHL. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2986753

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