J.P.Morgan

North America Credit Research
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Capturing Credit Excess Return

A practical approach to get exposure to credit returns on corporate bonds and bond index products

- Most liquid corporate bond index instruments are trading on a total return basis, i.e. they expose investors to both interest rate risk and credit risk.
- However, many investors look to get exposed to credit risk only.
- Therefore, it is important to develop a systematic and practical approach to separate interest rate risk from credit risk in corporate bonds.
- In this note, we discuss a strategy that uses at most three liquid Treasuries: the on-the-run 5y, 10y and 30y bonds.
- We use a bottoms-up approach which starts at the bond level.
- We show that it is generally not appropriate to use only one liquid Treasury to hedge the interest rate risk of a corporate bond, unless their maturities match. This is particularly true for long-dated bonds.
- Hedging an index product is simply achieved by adding up the hedges for each bond in the index portfolio.
- Hedging weights have to be updated over time as new Tresury bonds are issued, and the index maturity profile and composition change.
- For instance, hedging the interest rate risk of $100 of LQD exposure currently requires $43 of 5y Treasury, $33 of 10y Treasury and $19 of 30y Treasury.
- Note that rates-hedged corporate ETFs do trade (e.g. LQDH and HYGH for LQD and HYG, respectively). However, these hedged ETFs tend to be much smaller, trade much less and have higher expense ratios than the all-in yield ETFs.

US High Grade Strategy & Credit Derivatives Research

Dominique Toublan AC
(1-212) 834-2370
dominique.d.toublan@jpmorgan.com

Eric Beinstein
(1-212) 834-4211
eric.beinstein@jpmorgan.com

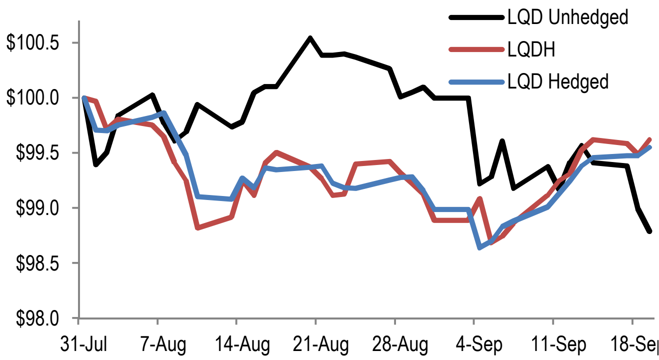
Paul Glezer
(1-212) 270-8185
paul.x.glezer@jpmorgan.com

Pavan D Talreja
(1-212) 834-2051
pavan.talreja@jpmchase.com

Sheila Xie
(1-212) 834-3036
sheila.xie@jpmorgan.com

J.P. Morgan Securities LLC

Our strategy extracts the credit return from LQD and reproduces the returns of LQDH, the rates hedged version of LQD (based on NAV)



Source: JP Morgan, Bloomberg

Current Treasury hedging weights for the most popular corporate bond index products

	Current Treasury hedge notionals for each $100 exposure in corporate product		
	5y	10y	30y
LQD	$43.4	$32.6	$18.6
iBoxx IG	$44.6	$31.3	$18.7
HYG	$54.3	$13.8	$0.0
JNK	$54.3	$17.0	$0.0
iBoxx HY	$55.8	$13.9	$0.0

See page 7 for analyst certification and important disclosures.

Accessing credit excess return from a total return corporate product

Investors who want to get exposure to pure credit risk have three options. First, they can use single name CDS and CDX indices. However, these are derivatives and they do not always trade in line with corresponding cash bond instruments.

Second, they can get exposed to interest rate hedged ETFs, such as LQDH and HYGH, the rates hedged versions of LQD and HYG, respectively. However, these rates hedged ETFs are much smaller, trade much less and have higher expense ratios than their all-in yield brethren.

Therefore, investors interested in pure corporate bond credit risk have to hedge all-in yield bond instruments, at the individual bond level or at the index level.

Many investors do hedge single bond using one liquid Treasury only, with a notional determined by the ratio of the corporate bond's and the Treasury bond's respective durations. However, this strategy performs poorly, especially for long bonds with a maturity in between the maturities of the liquid points in the Treasury curve. For instance, the interest rate hedging of a 15y corporate bond is challenging in the absence of a liquid 15y Treasury bond. The standard procedure would be to use the liquid 10y Treasury bond to hedge it, but this will work poorly if the 10s30s Treasury yield curve moves significantly.

Therefore, the main issue in extracting credit excess returns is the concentration of Treasury liquidity in a few maturities. The most recently issued bonds naturally get the largest share of the trading volume. Therefore, any practical strategy has to rely on these liquid bonds. In the discussion below, we only use the 5y, 10y and 30y on-the-run Treasury bonds.

In this note, we describe a methodology to hedge for interest rate risk at the single bond level as well as for index products. We follow a bottoms-up approach and therefore start by discussing how to hedge a single bond.

What is credit excess return?

But first, we need to discuss what we mean by credit excess return. Credit excess return can be defined in different ways. For instance, one could consider buying a corporate bond held to maturity and simply selling the corresponding maturity-matching Treasury in 1:1 notional against it. This would simply extract the difference between the corporate bond coupon and the Treasury coupon (in its idealized form with both bonds trading at par at inception and with exactly matching maturities and assuming no default in the corporate bond). This clearly represents the credit excess return over the lifetime of the bond.

However, that is not what the market usually means. The perspective is not focused on holding to maturity but on a shorter time horizon. The market definition is based on the mark-to-market impact of a change in all-in yield that is driven by something else than a move in the Treasury yield curve. Therefore, if one hedges the interest risk of a corporate bond with a maturity-matching Treasury bond, the Treasury notional has to be weighted by the ratio of the duration of the two bonds. That something else that drives changes in the corporate bond all-in yield besides the Treasury yield is commonly referred to as the credit spread. In other words, the

Dominique Toublan
(1-212) 834-2370
dominique.d.toublan@jpmorgan.com

excess return is defined as the spread mark-to-market and spread carry of a bond. This is the definition we will use below.

There are quite a few different definitions of spreads depending on the rates instrument used to gauge the interest rate risk in the corporate bond. However, the construction discussed above is identical if one uses Treasuries or interest rate swaps, etc.

Hedging the interest rate risk of one corporate bond

In an ideal world with plenty of liquidity across the whole Treasury curve, the correct answer is to hedge with a maturity matching Treasury using a duration weighted notional.

However, as discussed above, the liquidity of Treasury bonds is highly concentrated in a few maturities, generally the new issued bonds with 1y, 2y, 3y, 5y, 10y and 30y to maturity at issuance. This concentrated liquidity is the crux of the problem to achieve accurate interest rate hedging.

Our approach is in three steps. It uses two Treasuries to hedge for the interest risk of a corporate bond, with Treasury notionals based on both their proximity to the corporate bond and their relative durations compared to the corporate bond's.

1) Choose the two liquid/on-the-run Treasury bonds that have the closest maturities on either side of the maturity of the corporate bond. So, for instance, we use the 10y and 30y Treasuries for a corporate bond which matures in 15 years.

2) Second, the initial notional of each of the two Treasuries is weighted according to the relative proximity of its maturity to each bond, imposing the total Treasury notional is to be equal to the corporate bond notional. For instance, for a $100 15y corporate bond the initial notional of the 10y Treasury is $75 and the initial notional for the 30y Treasury is $25. This is simply because the 15y bond is 3x closer to the 10y Treasury than to the 30y Treasury (5 years vs. 15 years).

3) Third, each Treasury notional is weighted by its relative modified duration vs. the modified duration of the corporate bond. For instance, assume the 15y corporate bond discussed above has a duration of 10 yrs and that the 10y and 30y Treasuries have a duration of 8.5 yrs and 19.5 yrs, respectively. The final 10y Treasury notional is about $88.2 (i.e. $75*10/8.5) and the 30y Treasury notional is about $12.8 (i.e. about $25*10/19.5).

Note that the procedure described above naturally reduces to the usual hedging construction when the corporate and Treasury bonds have the same maturity. In practice, we find that using the 1y or 3y Treasuries does not add much in terms of hedging efficiency for a portfolio. Finally, bonds with more than 30 years to maturity are hedged with the 30y Treasury only.

Dominique Toublan
(1-212) 834-2370
dominique.d.toublan@jpmorgan.com

Example for one corporate bond

To illustrate how this approach performs compared to the usual approach, we use the Merck 6.5 2033 over the last year. Exhibit 1 shows the total return and excess return for that bond, starting with a $100 investment las September. The excess return is calculated using G-spread carry and G-spread mark-to-market.

The profile of the two returns is naturally quite different given the Treasury moves over the last year (see Exhibit 1). Exhibit 2 shows compares the G-spread based returns (i.e. the same as in Exhibit 1) with the result of our two-Treasury approach discussed above, starting from the total return on the corporate bond and hedging with appropriate amount of 10y and 30y Treasuries. Finally, Exhibit 3 and 4 show the comparison between the G-spread based returns and the usual one-Treasury hedging strategy using the 10y Treasury only (Exhibit 3) and the 30y Treasury only (Exhibit 4). The results are quite clear: the two-Treasury approach works much better to reproduce the credit excess return as defined by the market.

Exhibit 1: MRK 6.5 2033, cumulative total return and excess return based on G-spread carry and mark-to-market

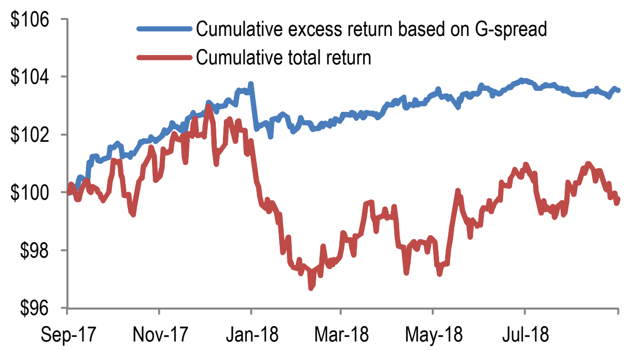


Exhibit 2: MRK 6.5 2033, cumulative excess return captured using the two-Treasury approach and excess return based on G-spread carry and mark-to-market

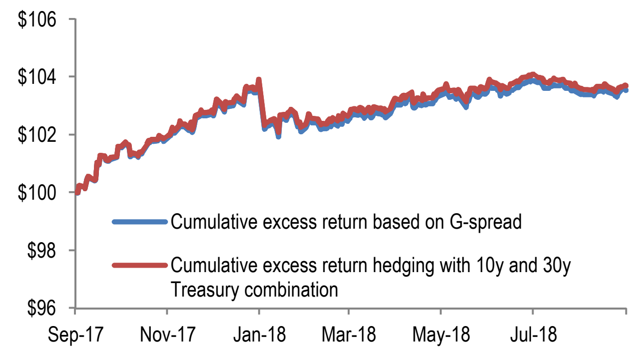


Exhibit 3: MRK 6.5 2033, cumulative excess return captured using only the 10y-Treasury to hedge and excess return based on G-spread carry and mark-to-market

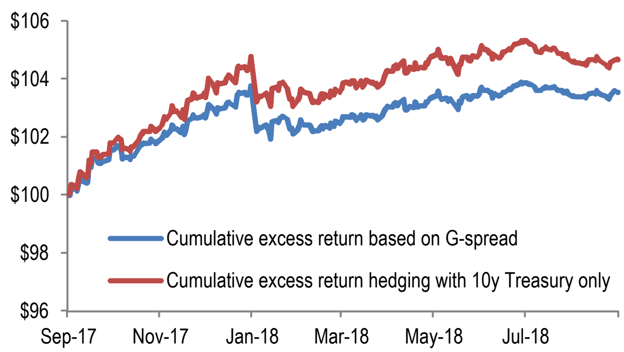
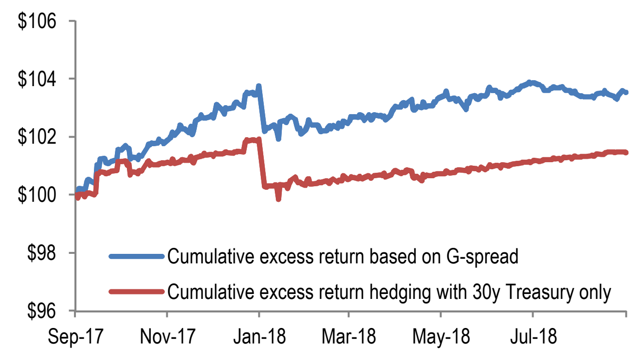


Exhibit 4: MRK 6.5 2033, cumulative excess return captured using only the 30y-Treasury to hedge and excess return based on G-spread carry and mark-to-market



Source: J.P. Morgan

The hedging notionals in the charts above are adjusted daily. More realistically, investors are likely to hedge less frequently, probably monthly or quarterly. However, the daily adjustment of notionals is small and gradual for such long dated bonds, as shown in Exhibit 5 below. Furthermore, keeping the same hedging notional over one year does not materially impact the excess return that is captured, as shown in Exhibit 6. We believe rebalancing hedges monthly or quarterly should be sufficient.

Exhibit 5: Treasury hedge notionals are relatively stable over time for such a such a long-dated bond (adjusting notionals daily)

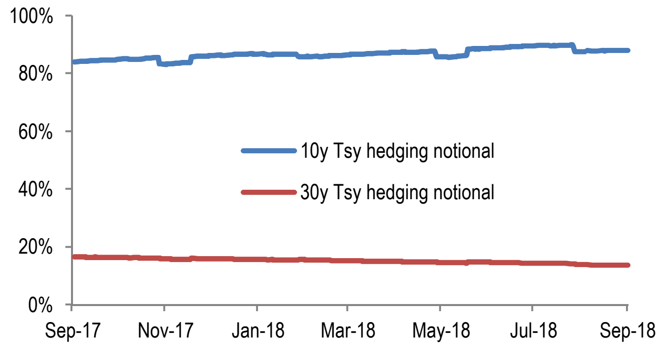
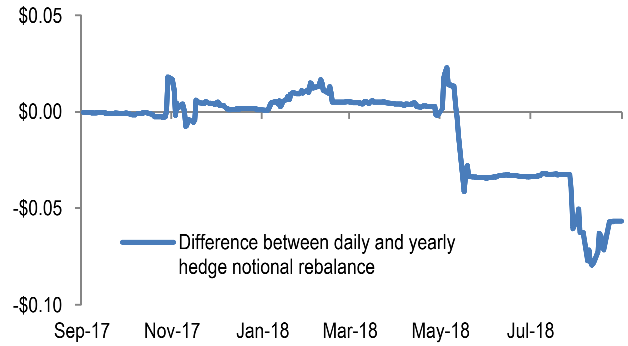


Exhibit 6: There is only a small difference between rebalancing the notionals daily or keeping them constant over one year



Source: J.P. Morgan

Hedging a portfolio of corporate bonds: bottoms up

Hedging for a corporate bond portfolio is then very simple. We simply take each bond in the portfolio and aggregate the Treasury notionals bond by bond and weight by the amount of each bond in the index.

For instance, for LQD, we find that investors should currently use $43.4 5y Treasuries, $32.6 10y Treasuries and $18.6 Treasuries to hedge for the interest rate risk of a $100 exposure in LQD.

Similarly, for HYG, we find that one should currently hedge $100 exposure with $54.3 in 5y Treasuries and $13.8 of 10y Treasuries. Note that the 10y Treasury component is not negligible as about 25% of HYG bonds have more than 7 years to maturity (to the worst date to be more precise).

One way to check whether our approach works is to compare what we get on LQD and HYG, the largest corporate ETFs, with their interest rate hedged versions, LQDH and HYGH, respectively. The results, based on NAV, are shown below for the last two months. It is quite clear that our approach correctly extracts the credit excess return from the all-in yield ETFs. Note that LQDH and HYGH are much smaller, trade much less and have higher expense ratios than LQD and HYG, respectively. We believe it is therefore advantageous for investors to take positions in the all-in yield ETFs and then hedge with our approach rather than taking direct exposure in the smaller ETFs.

Dominique Toublan
(1-212) 834-2370
dominique.d.toublan@jpmorgan.com

Exhibit 7: Our approach allows to extract the credit excess return from LQD and get the same exposure as if trading LQDH

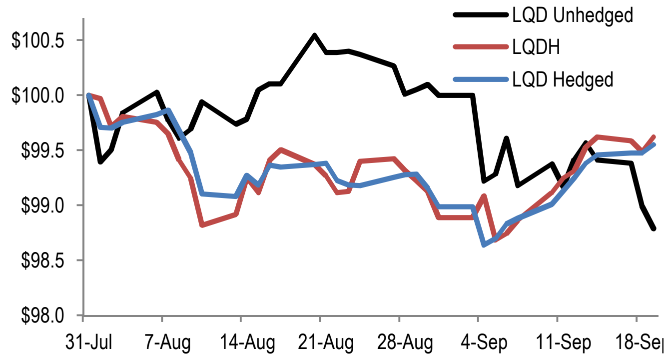
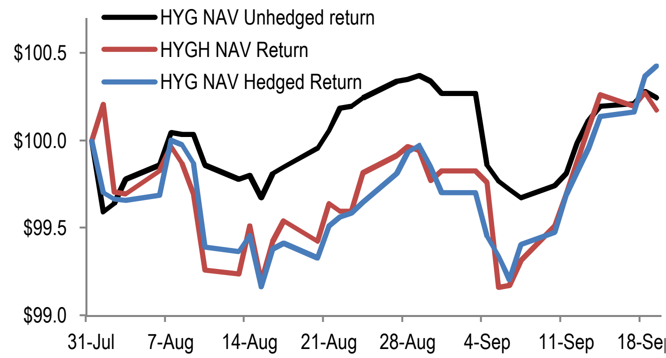


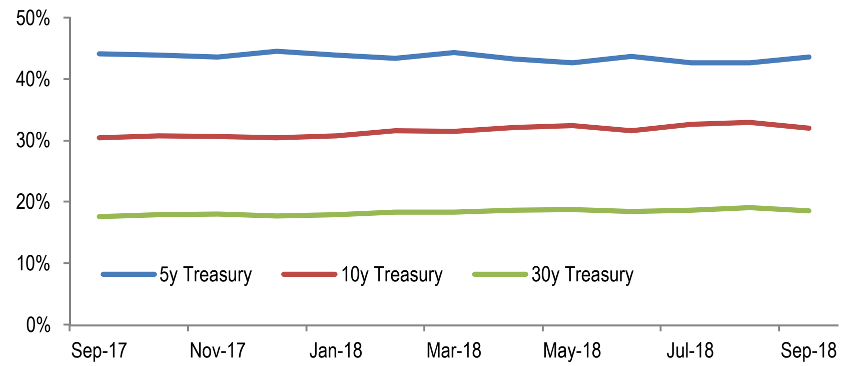
Exhibit 8: Our approach allows to extract the credit excess return from HYG and get the same exposure as if trading HYGH



Source: J.P. Morgan

Finally, as discussed above, the hedging notionals change over time as hedges are rolled into the most recently issued Treasuries, but also because the composition of the index product changes over time. However, hedging notionals tend to move slowly over time. For instance, Exhibit below shows how hedging weights changed over the last year for LQD. All the weights stayed with a range of about 2.5%. We therefore believe that updating hedging notionals monthly or quarterly should be sufficient.

Exhibit 9: Hedging weights for LQD were relatively stable over last year (updating monthly)



Source: J.P. Morgan

Dominique Toublan
(1-212) 834-2370
dominique.d.toublan@jpmorgan.com

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