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Liquidity Provision & Risk Management – Corporate Bond Markets

Hedging vs Selling Down a Position

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Contents

I. Introduction

This document is intended to provide further insight for all stakeholders into the technical complexities and uncertainties inherent in hedging market risks assumed by liquidity providers in the normal course of their critical and systemically important function of providing liquidity on demand to end investors. This piece follows on from our "MiFIR 2021 Corporate Bond Trade Data Analysis and Risk Offset Quantification" report, co-authored with Finbourne Technology, and seeks to provide further in-depth and technical analysis. This paper focuses on the material differences between fully trading out of a risk position (100% out of risk) and hedging the various market risks associated with holding that position.

We also aim to explain how these inherent complexities and uncertainties are relevant for, and should inform the ongoing reviews of MiFIR post trade transparency and deferral regimes being conducted in both the EU and UK.

II. Overview of the Functioning of Corporate Bond Markets

The role of liquidity providers

Liquidity providers perform a central and critical role in the proper and orderly functioning of the global fixed income markets. They provide end investors with the secondary market liquidity, on demand and at risk, that they require to manage client moneys and portfolios effectively and that they cannot source via other channels.

By way of illustration, ESMA's 2020 Annual Statistical Report on EU securities markets showed that only 0.2% of all corporate bond trading volume took place on a Regulated Market (typically via Central Limit Order Book), with 86% being with investment firms operating off venue and with capital at risk or OTC. A further 12% takes place on MTF's where the large majority of volume takes place using a Request For Quote trading protocol with a liquidity provider being the provider of that quote (and hence acting as a counterparty to the trade.)

A distinct market structure

This market structure, very distinct from that of equities, is largely owing to the heterogenous nature of the different securities involved, the large number of instruments[1], the relatively large average trade size (€8 mln for Sovereign Bonds and €2.5 mln for Corporate Bonds according to the ESMA report) and the very high level of infrequency with which most individual securities trade. The consequent lack of natural[2] liquidity available in each security is ultimately the reason for the OTC nature of the market and for investors' reliance on the liquidity provider function.

Hedging vs selling down a position – dealing with material residual risks

This innate illiquidity of individual bond market instruments obviously holds true for liquidity providers as well as investors. In the large majority of instances the liquidity provider will not be able to quickly trade out of risk they have assumed from the client trade and so will need to hedge their new position against a number of market risks.

Different measures can be taken by the liquidity provider to mitigate and/or hedge the risks involved; some of which we detail in Section III of this paper. Hedging these risks however is materially different from trading out of them completely by simply selling on a bond position they have just assumed from their client. Ongoing, residual interest rate and credit related risks remain after hedging. Holding a hedged corporate bond position

[1] Typically, a Corporate entity would be represented by one equity instrument while having a large range of bonds with various different maturities, cash flow profiles and legal covenants and which would be "replaced" every few years upon maturity.
[2] Natural liquidity – where there exist at any one time a sufficient number of individually motivated buyers and sellers of a security, concurrently and with material associated volume, to facilitate a 2-way market

and trading out of a position are two fundamentally different things from a market risk perspective[3].

Relevance of post-trade transparency

We believe therefore that the distinction between hedging and selling down a position is an important distinction to make and to communicate in the context of the ongoing reviews of MiFIR post trade transparency regimes being conducted in both the EU and UK.

Given the innate illiquidity of most fixed income securities, the publication of details of either a significantly large-sized trade or a trade (of more modest size) in an illiquid instrument in an untimely manner logically alerts the wider market that, it's likely a liquidity provider remains holding a position in the relevant security.

When this information becomes widely known, the market for that individual security is likely to move against the liquidity provider holding that position. This is because a potential buyer of that security will know there is a motivated seller and consequently will reduce the aggressiveness of their bid in the hope and expectation they will be able to buy that security more cheaply because of the existence of the motivated seller.

Similarly, any other potential seller of that security will now have an incentive to sell quickly, in the knowledge that there are now more bonds looking for a buyer. Their likely reaction will be to offer the bonds down in price in the hope of finding a buyer before the other seller of the same bond does.

The deferrals regime – a key feature enabling liquidity providers' robust risk management

The deferral of publication of details of trades with a material or large element of market risk in an illiquid position (whether this illiquidity derives from the illiquidity of the instrument itself or from the large size of the position) affords the liquidity provider with protection from "undue risk" which would manifest itself were trade details to be made publicly available in an untimely manner (i.e. too soon.)

Until the liquidity provider is able to find a buyer of a recently assumed position, it will take the corporate bonds into its inventory and will be exposed to market risk (changes in the asset's price during this time).

The temporary protection from the market at wide becoming aware of a new position that is provided by a well-calibrated deferral regime is fundamental to the continued orderly functioning of fixed income markets. Were liquidity providers exposed to undue risk the service of liquidity provision to the wider market would be fatally compromised.

As a result liquidity providers would widen their bid/offer spreads, reduce the size they are willing to trade in or would completely cease their liquidity provision activities. These potential outcomes would obviously have a negative impact on end investors by causing trading to be more expensive and liquidity to diminish, which in turn would reduce confidence in, and resilience of, markets as well as likely increase systemic levels of volatility.

We believe that the variety and severity of ongoing market risks involved in holding a hedged position that would be exacerbated by overly early publication of full trade details before liquidity providers could reasonably be expected to have sold out of a position illustrate that it is 'trade out time' metrics rather than length of time to hedge a position that should ultimately inform the process of calibrating post trade transparency deferrals. It is just such metrics that are analysed in our aforementioned "MiFIR 2021 Corporate Bond Trade Data Analysis and Risk Offset Quantification" report.

Furthermore, it is this that underpins our assertion that the calibration of this regime should not be determined in legislation but rather only after robust evidence-based analysis by the European Commission and ESMA.

[3] Although ongoing, residual risks may only reflect potential small dislocations inherent to the different measures that can be taken by the liquidity provider to mitigate and/or hedge those risk, the (i) relatively large average trade size on corporate bond markets, (ii) the average duration of the trader's book, (iii) the aggregate size of the trading book of a particular liquidity provider; and (iv) how long of credit risk overall the trading book of a particular liquidity provider is, make those residual risks very material, inhibiting the liquidity providers' sustained activities.

III. Complexities & Uncertainties in the Hedging Process

Any on-risk secondary market quote made available to investors or other market participants is ultimately derived from the market risk inherent in the trade, the cost of capital required to fund any consequent position as well as the likely costs in hedging that risk.

When a liquidity provider buys, for example, a corporate bond from a buy-side investor client on an outright basis they have 2 main risks that they assume as soon as the trade is executed:

1. Interest Rate Risk
2. Credit Risk

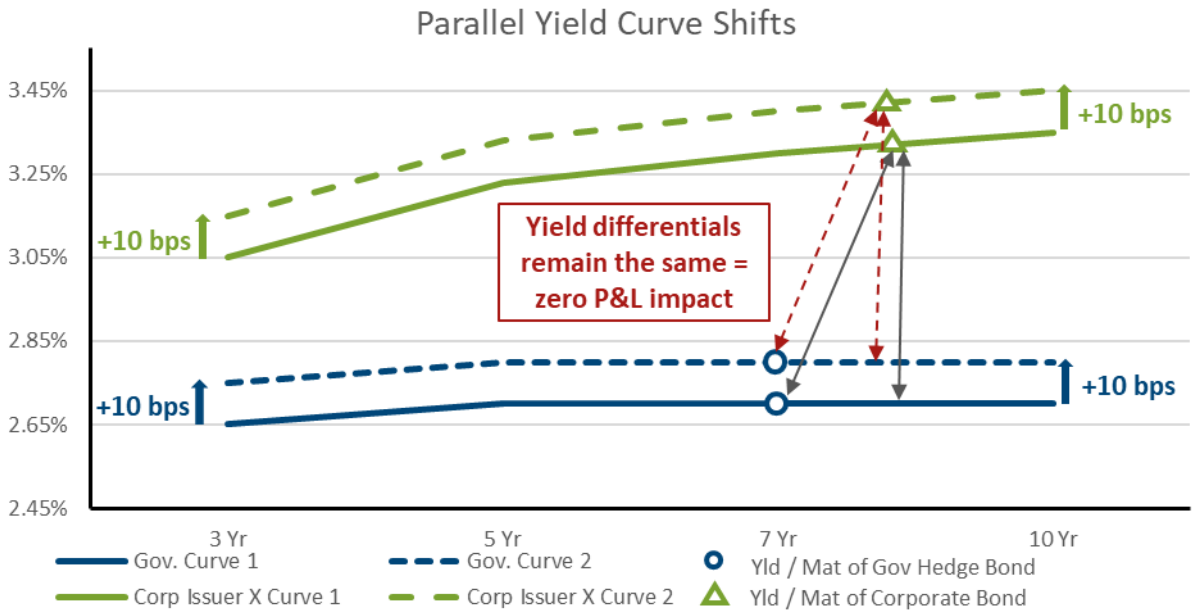
1. **Interest Rate Risk:** this is the risk that generic, long term interest rates i.e government bonds and Interest Rate Swaps ("IRS") of a similar maturity to the corporate bond move against them. There are 2 main ways to hedge this risk:

   The most common, quickest and cheapest way is to sell a duration weighted amount of government bonds of a similar maturity. These government bonds will need to be borrowed in the repo market (which bears a daily cost) in order to deliver them to the buyer of the hedge.

   As long as the yield differential between the corporate bond and the similar maturity (also known as the 'underlying') government bond does not change then the liquidity provider will not lose or make money.

   If generic yields move up (and therefore bond prices move down) then the money they lose on the corporate bond will be offset by money they make on the government bond that they are short of, and vice versa **(see Fig. 1 below.)**

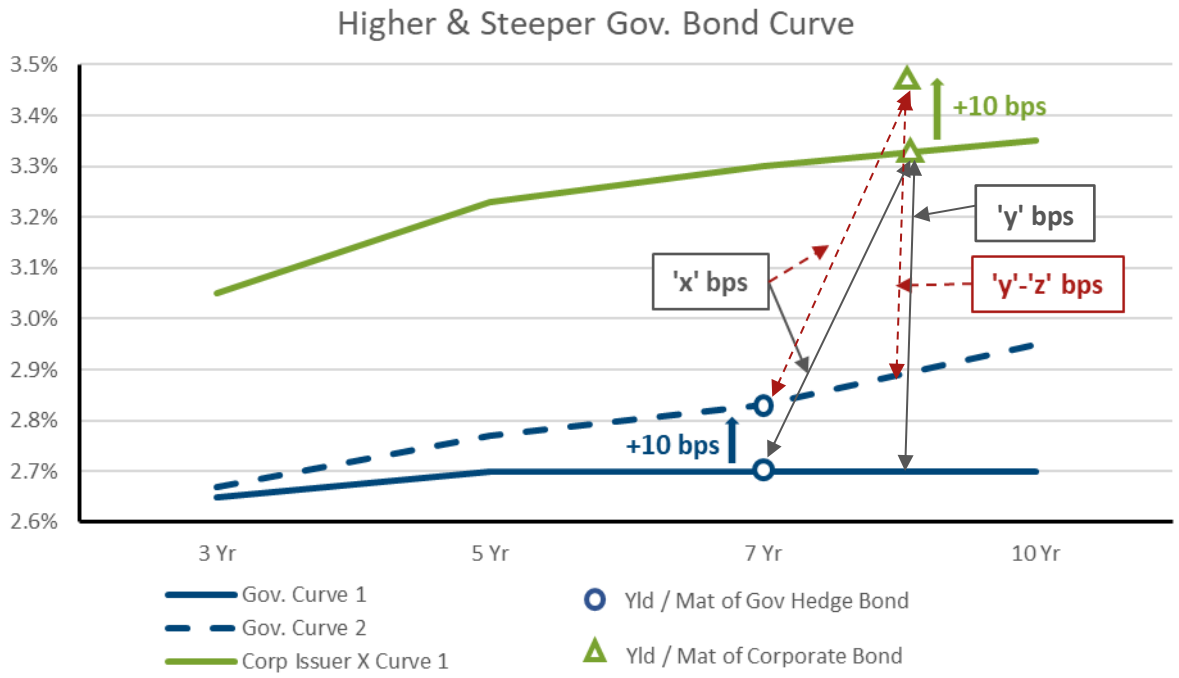
Figure 1:



This is not a perfect hedge from purely an interest rate perspective though, as a number of things could still happen, meaning that the liquidity provider could still lose money (therefore still carrying risk.)

i. **The government bond curve moves** (steepens or flattens.) If the government bond that the liquidity provider sells short is of a slightly shorter maturity than the corporate bond that he has bought and the curve steepens (yields in shorter end move up less than in the longer end) then they will likely lose money, all other things being equal. This is because the corporate bond will become more expensive vs the interpolated government bond yield curve **(see Fig. 2 below)** and vice versa.

Figure 2:

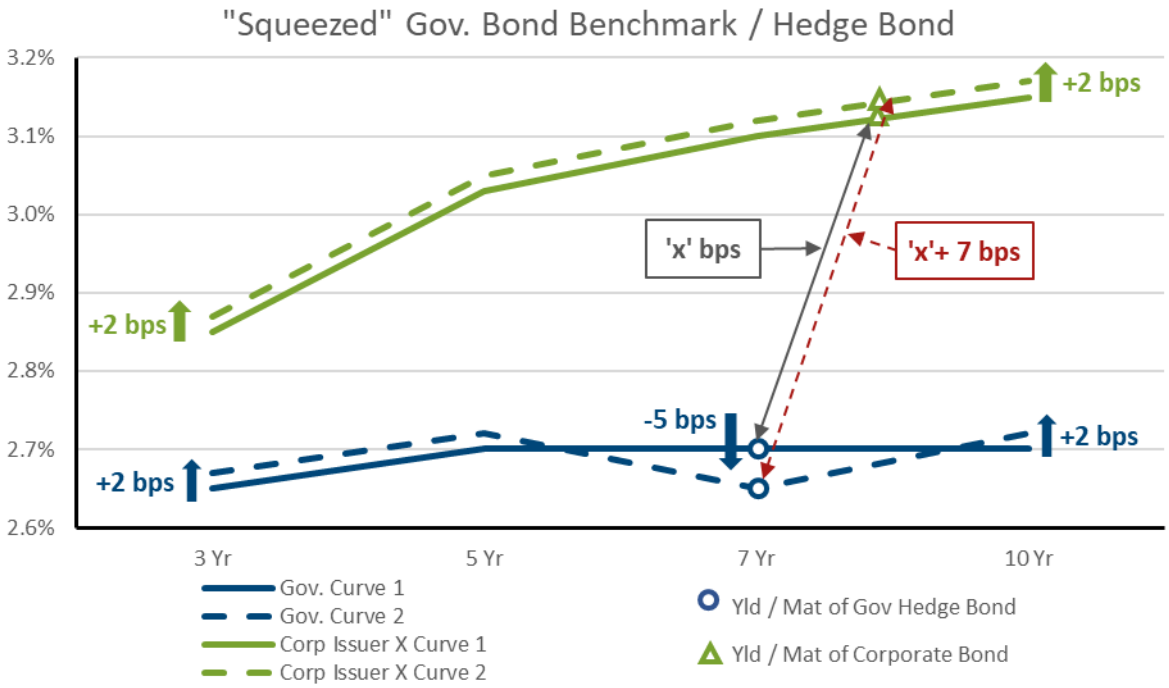


ii. **Repo risk**. The government bond that the liquidity provider has sold short may, for whatever unexpected reason, become unborrowable or very expensive in the repo market.

This tends to happen in the US Treasury market more than others where "*On The Runs*" (please see **Glossary** for definition) which most corporate bond traders use to hedge because of their liquidity can get very expensive relative to the Off The Runs (or other comparable US Treasury bonds) of a similar maturity.

This means the corporate bond liquidity provider will have to take a view and either change their hedge bond (which is expensive) or risk losing money as the hedge bond short becomes much more expensive to fund – and probably then becomes more expensive on the curve as other traders cover their short positions in it **(see Fig.3 below.)**

Figure 3:

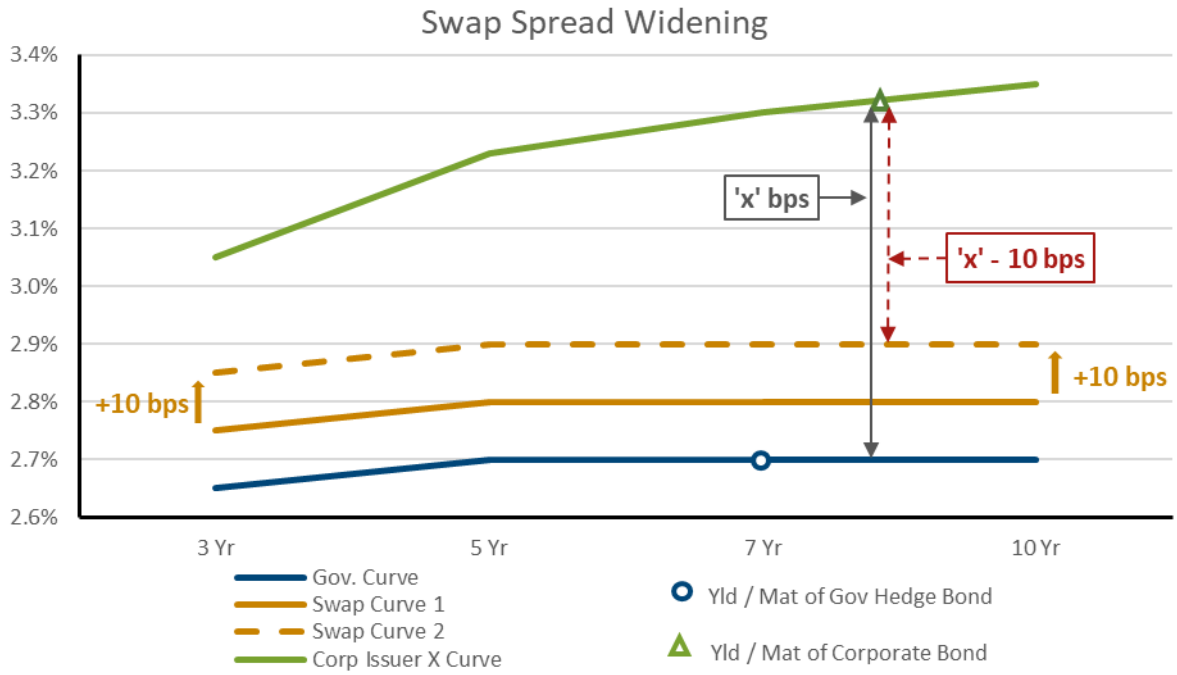


iii. **Swap spreads move**. Ultimately, and more commonly in Europe vs the US, corporate bonds are valued off the swap (IRS) curve rather than the government bond curve. This is because, in Europe especially, corporate treasurers will usually swap the proceeds of a primary market bond sale as they typically want a floating rate liability rather than fixed.

One might then ask why corporates would not issue floating-rate notes (FRN's.) This is because the addressable market of investors to sell their bonds to is far bigger in fixed rate format than in floating. So ultimately, what a bond issuer is really looking for is where they can issue as a margin over swaps rather than over government bond yields.

Therefore if the spread between government bonds and swaps widens (which can happen for any number of unexpected reasons) there will be spread widening pressure on the corporate bond vs the government bond that they are short of, as the corporate bond spread over swaps *de facto* narrows **(see Fig. 4 below.)** To avoid this risk, then, the liquidity provider would have to hedge their corporate bond position vs IRS – see b. below.

Figure 4:



To avoid swap spread risk (a. iii. above) the liquidity provider could instead hedge with IRS (pay fixed / receive floating) of the same maturity or term as the corporate bond. There are however, factors that disincentivise this:

- It's more expensive. Bid / offer spreads in IRS – especially in sizes as small as even a large corporate bond trade – would be in the region of 1-2 basis points vs a quarter or half basis point typical in more liquid government bonds.
- It's largely impractical. IRS typically trades in very large sizes e.g. when a new bond issue is swapped these trade sizes can be €1Bln or more in size. Putting on a swap trade is also significantly more time consuming than a government bond trade – thereby leaving the corporate bond trader with interest rate risk for longer if they hedge this way. Additionally, the corporate bond trader is probably doing over 100 trades a day on their book – with 10-20 of those being in relatively large size - so hedging each of these with IRS becomes impractical from a time perspective.

2. **Credit Risk:** Once the trader has considered the above, they would need to consider the credit risk. This broadly equates to the market perception of credit quality of the issuer of the corporate bond and will manifest itself in widening or tightening of the yield spread between the corporate bond and the "risk free" government bond / IRS curve point. If news comes out that is bad for the credit of the issuer (e.g. quarterly results come out worse than expected) then the yield spread will likely widen, causing the liquidity provider holder of the corporate bond to lose money. There are 2 main ways to hedge this risk and a third which is more of a portfolio hedge and very imperfect. See below.

   i. Short sell a duration weighted amount of a bond of a similar maturity from the same issuer – if there is one **(see Fig.5 below.)**

   The difficulties with (or imperfectness of) this approach is that it can be difficult and risky to source specific corporate bonds in the repo market. Many natural holders on the buy-side, if they are prepared to repo out corporate bonds, will do so mainly as part of a bundle of bonds that they repo out at general collateral ("GC") rates. If a liquidity provider is seeking to borrow a specific bond for what is called 'term repo' (i.e. for longer than on an overnight basis) then the repo market and repo desks will know that someone is likely short and there is a danger corporate bond trading desks in the wider market will also discover this and act accordingly.

Similarly to the situation described in section 1.a.ii above / Fig. 3, this may well result in the hedge bond becoming more expensive 'on' the issuer curve and relative to the long position credit bond **(see Fig. 6 below.)** If a trader only repos the bonds on a repeated overnight basis then he would not have secured the borrowing of those bonds for the period he would likely be short of them. The borrowed bonds could get recalled by the lender, leaving the trader on what is called a 'naked short' position. It is also expensive, from a funding standpoint, to repo specific corporate bonds with the cost likely to be 100 basis points or more than GC rates

Figure 5:

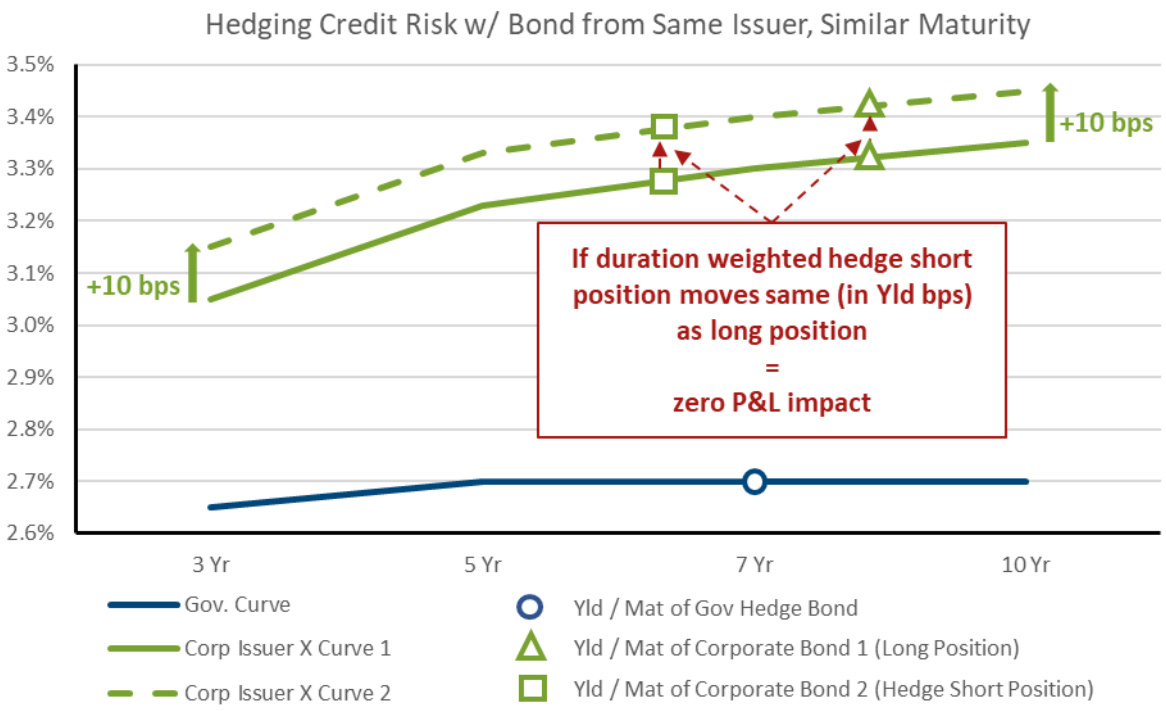
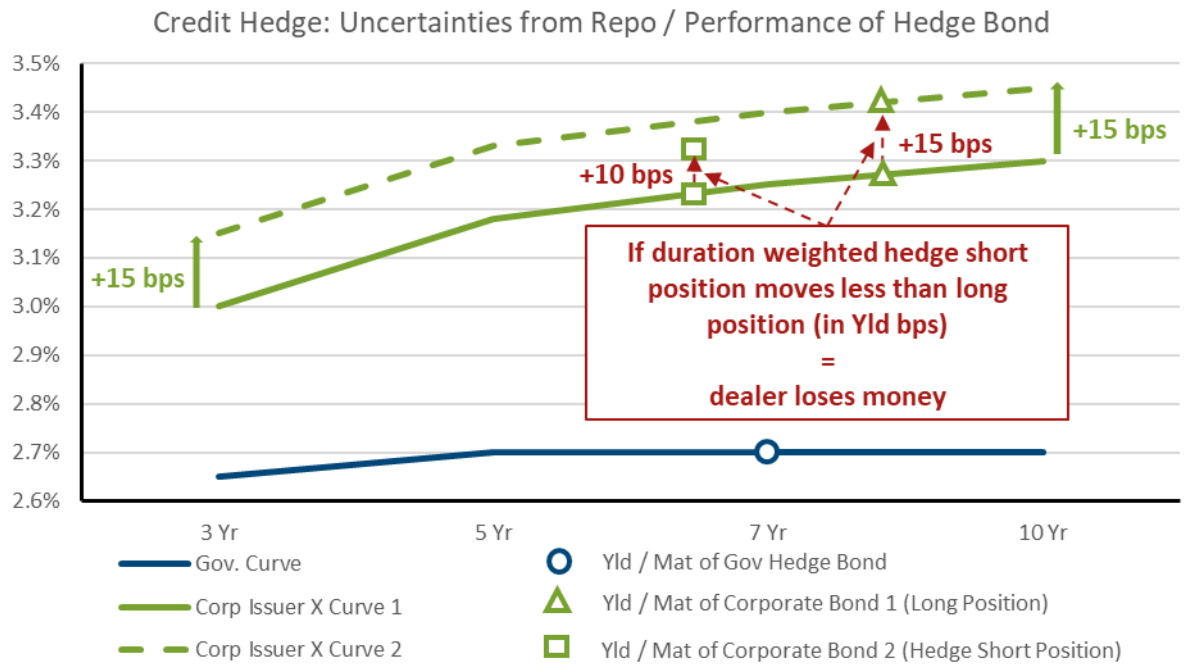


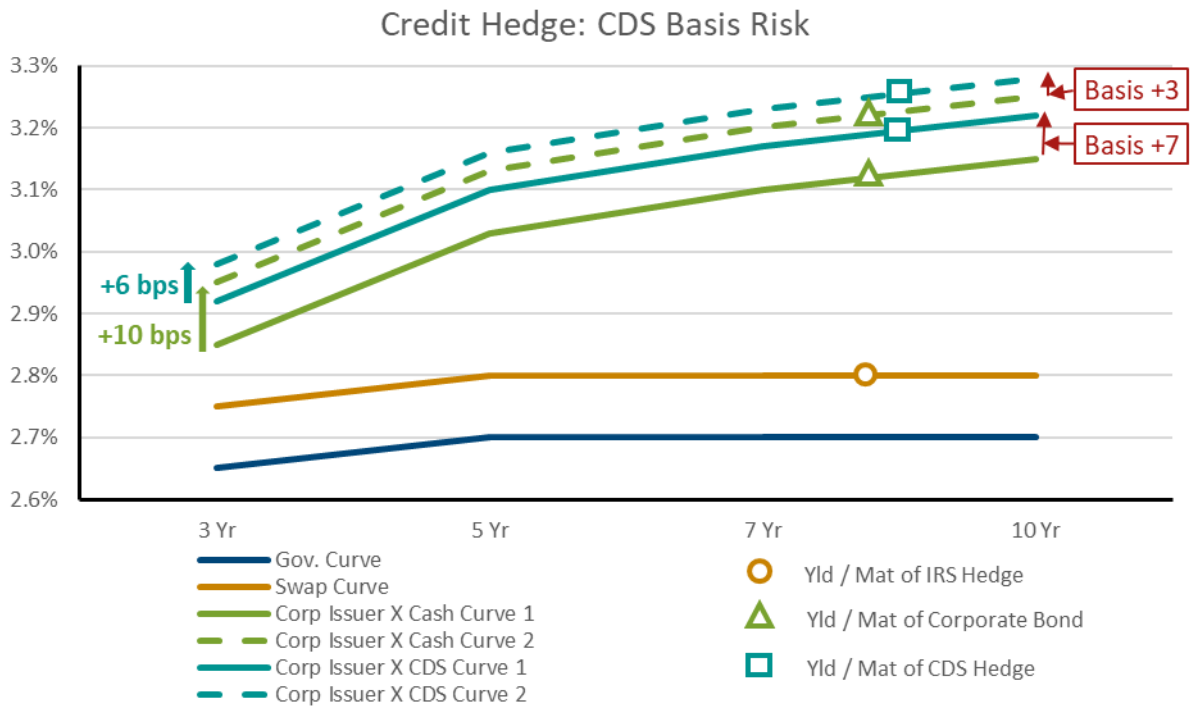
Figure 6:



ii. Another way to hedge the credit risk is via single name CDS. This is a credit derivative and is in essence an insurance contract against that issuer defaulting on their debt.

From a trading perspective, single name CDS does generally move in line with how the corporate bonds from the same issuer move, but is far from an exact correlation. This relationship is known as "*the basis*". During the GFC ("Great Financial Crisis" of 2008) for example, the basis moved very violently and became almost detached from where bonds were trading. Because most dealers were long of bonds, and hedged with CDS, the bonds collapsed in price but the CDS did significantly less, because so many were hedged using this instrument **(see Fig. 7 below**.)

Figure 7:



Single name CDS is also expensive to trade in and out of. Whereas the typical bid / offer spread on a reasonably liquid single A rated corporate bond might be 2-3 basis points, CDS bid / offer in the same names will be in the region of 5-10 basis points wide, leaving the liquidity provider trader at significant risk of, in fact somewhat likely to lose more on the bid / offer of their hedge than they would (notionally) make on the bid / offer of their corporate bond position.

As an additional complicating factor, being a derivative, CDS uses the swap curve as its benchmark. Therefore to be hedged on a like-for-like basis the corporate bond trader would also need to asset swap the corporate bond they hold, as well as buy protection in the CDS market with all the costs that both those trades would entail.

Finally, CDS single names trade with fixed quarterly maturity (IMM) dates, so there will again likely be a small maturity mismatch between the corporate bond position and the single name CDS credit hedge.

iii. The third approach mentioned above is to have a more generic credit hedge in place. This involves shorting a basket of credits which is a very imperfect way of hedging a variety of credits you are long across your book.

This can be done either with CDS index or also, what is becoming increasingly common now, by selling short a corporate bond ETF. As mentioned though, this is far from a perfect hedge but has the advantage that the vehicles used are quite liquid and so trade on a relatively small bid / offer spread.

Conclusion

In conclusion, the descriptions and illustrations contained in this document demonstrate the ongoing risk factors inherent in the assumption of a corporate bond position by a liquidity provider as well as the difficulties involved in the different measures that liquidity providers may take in their best efforts to mitigate them.

Above all we hope to have effectively shown that holding a hedged corporate bond position and trading out of a position are two very different things from a market risk perspective.

We believe that this is an important distinction to make and communicate in the context of the ongoing reviews of MiFIR post trade transparency regimes being conducted in both the EU and UK.

We further hope that this adds weight to the importance taking full account of the metrics around "trade out times" contained in our aforementioned "MiFIR 2021 Corporate Bond Trade Data Analysis and Risk Offset Quantification" report, again in the context of the MiFIR review processes and the calibration of appropriate deferral periods in the post trade transparency regime.

Glossary

Basis Point(s) (bp / bps)
In the context of debt securities this is the metric expressing 1/100th of 1% in yield / interest.

Buy-side
Investor institutions that use the buying & selling services of liquidity providers to trade securities in the secondary market.

CDS (Credit Default Swap) Curve
Curve (fitted or interpolated) that represents the current annual rate demanded by the market to insure against default a specific issuer of debt. Expressed as a spread or margin in basis points over the interest rate swap curve for that same specific maturity date.

Corporate Issuer Curve
Yield curve (fitted or interpolated) that represents the current fixed yields offered by a specific corporate bond issuer across the different maturities of its outstanding fixed rate bonds.

Credit Risk
The market risk associated with the perception of the credit worthiness of an individual debt issuing institution (i.e. the ability and willingness to repay all scheduled debt principle and associated interest payments in a timely manner.)

Curve Flattening
When a yield curve does not move an a parallel fashion – when the shorter maturity point yields move **less** favourably (to the holder) than longer maturity date points. I.E. when the shorter maturity date points **reduce less** (in yield basis points) than longer maturity date points reduce or when shorter maturity date points **increase more** than longer maturity date points increase.

Curve Steepening
When a yield curve does not move an a parallel fashion – when the shorter maturity point yields move **more** favourably (to the holder) than longer maturity date points. I.E. when the shorter maturity date points **reduce more** (in yield basis points) than longer maturity date points reduce or when shorter maturity date points **increase less** than longer maturity date points increase.

Duration Weighted Amount
The face value amount of a second security needed to be bought or sold to offset the financial risk associated with a 1 bp yield change in the value of a position in a first security.

FRN (Floating Rate Note)
An interest paying bond where the coupon / interest rate is reset typically every 3 or 6 months. This is typically at a fixed spread over current 3 month or six month Euribor / SONIA rates.

Government Bond Curve
Yield curve (fitted or interpolated) that represents the current fixed yields offered by a specific Sovereign Government bond issuer's debt instruments across the different maturities of its outstanding fixed rate bonds. Commonly used as a benchmark for valuating yields of bonds from other issuers of fixed rate bonds (e.g. corporate bond issuers.)

Hedge
A transaction / trade entered into with the specific purpose of offsetting, to the maximum extent possible, the risk inherent in owning a position in a different security / investment.

IMM Date
'International Money Market' date. In terms of credit derivatives, IMM dates are the four quarterly maturity dates: 20th March, 20th June, 20th September and 20th December.

Interest Rate Risk
The market risk of prevailing live, fixed, short or long term interest rates changing.

Liquidity Provider
Investment firm, or division thereof, dedicated to the provision of liquidity in securities to other market participants (usually investor clients of the firm) – that is the service of buying or selling of financial instruments upon demand at a price determined by the liquidity provider firm.

Maturity of a Bond
The term date of a bond; at the completion of which the principle amount / face value of the bond becomes repayable by the bond issuer.

'On The Runs' (US Treasuries)
The bonds US Treasury bonds viewed and used by the market as the benchmark bonds for each benchmark maturity. This is usually the most recent benchmark issued for each benchmark maturity (once it has been trading for a week or two after issuance.)

'Off The Runs' (US Treasuries)
Older US Treasury bonds that no longer carry benchmark status (usually because they have been superseded by another, more recent issue.

Repo Market
The market for borrowing and lending of securities, secured by a cash deposit in the opposite direction. The cost / benefit of this activity is reflected in the rate of interest paid / earned on the cash deposit flowing in the opposite direction to the security being lent / borrowed.

Swap / IRS (Interest Rate Swap) Curve
A graph of current fixed coupon rates across different maturity dates where wholesale market participants would be prepared to exchange a fixed for a floating rate return for the duration of the maturity concerned.

Yield Curve
A single curve (fitted or interpolated) that linearly represents the current fixed yields offered by a specific bond issuer's debt instruments across the different maturities of its outstanding fixed rate bonds.

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