

The rise of total return swaps as the preferred credit index product.

Why total return swaps should be added to a manager's toolkit.

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Many market practitioners on both the buy side and the sell side expect total return swaps (TRS) to become the most important product for expressing market viewpoint and risk exposures. This white paper will compare and contrast existing fixed income “beta” products and help bond portfolio managers and traders understand why TRS should be added to their toolkit.

The biggest advantage to TRS is the minimal tracking error and/or “basis” risk they exhibit relative to a defined benchmark index. This paper will explain why this is the case and how impactful the choice of index product can be on portfolio returns.

Executive summary

The lack of cash bond liquidity still remains an issue for fixed income portfolio managers and traders. Over the last several years, new instruments have emerged as alternatives to cash. These new beta products include credit default swap (CDS) indices, fixed income exchange traded funds (ETFs) and total return swaps (TRS). A close examination shows that they do not possess equal characteristics and do not address identical risks.

When considering the use of any one of these instruments, the investor should consider its basis risk. Basis risk is the financial risk that an instrument will not perfectly correlate with another instrument and thereby create potential differences in the total returns of each instrument.

All fixed income portfolios are subject to a myriad of risks, but the most important risks portfolio managers must consider are total return risk, interest rate risk and credit risk. CDS indices are very liquid but only address credit risk. If investors wish to replicate the total return of a benchmark index, they must combine interest rate swaps or interest rate futures with the CDS indices, adding additional execution cost.

Over the last several years, fixed income ETFs have grown in AUM and institutional usage. The largest and most liquid funds use sampling techniques to construct and manage their portfolios; this can create noticeable skew to the benchmark index, resulting in some basis risk.

TRS offers exposure to the same risks within a benchmark index and provides the investor with the same total return as the reference index less a funding cost. Based on its structure, TRS offers minimal basis risk. Having the ability to trade a TRS on a total return index creates the most opportunity for the greatest number of users.

The creation of the standardized BTRS contracts by Bloomberg should increase the liquidity and usability of total return swaps and provide portfolio managers and traders with the best beta product with the lowest basis risk.

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Managing Bond Portfolio Risks

Bond portfolio managers and traders often need to:

- Hedge or immunize risk rapidly when their market outlook turns bearish
- Add market exposure quickly when they become bullish or receive significant cash inflows

Managers can sometimes accomplish these objectives by trading individual bonds, but often there is insufficient liquidity to handle their flow, or the bid/ask spread makes the cost of execution prohibitive. "Portfolio trading" is emerging as an alternative to executing individual bonds, and it may improve liquidity over time, but portfolio managers and traders need effective tools now. These tools must offer:

- Liquidity so that large notional can be transacted quickly
- Minimal bid/ask spreads and reduced execution costs
- Tight tracking error and low basis risk

Today there are a few "index" or beta products that have emerged that can help managers satisfy these needs and manage their risks. The most popular are:

- Credit default swaps or CDS-based indices,
- Fixed income ETFs
- Total return swaps (TRS & BTRS).

While these products can be considered alternatives to cash bonds, it should be noted that they do not possess equal characteristics and equal ability to mitigate risk in all market sectors. TRS is the only product that can be used in every market sector where there is a benchmark index.

The next section will describe each beta product's characteristics, potential usage and limitations across market segments, but first the concept of tracking error and basis risk must be discussed.

Tracking Error and Basis Risk

Tracking error is defined as the divergence of the total return of a portfolio and the total return of a benchmark portfolio. It is the standard deviation of the periodic total return differences between a portfolio and its benchmark. Tracking error is extremely important to portfolio managers who are benchmarked against major indexes.

Basis risk is the financial risk that an instrument will not perfectly correlate with another instrument and create potential differences in total returns of each instrument. These differences can be attributed to variations in instrument construction, market sector focus or underlying index tracked.

While tracking error and basis risk may appear to be similar, they are intrinsically different, and this paper will focus on basis risk. This metric should be a regular consideration for managers deciding which beta product to use.

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Comparing TRS, CDS Indices and ETFs

TRS, CDS indices and ETFs each have unique features as well as common features that must be considered when deciding which one to use in portfolio structuring and trading situations. The following table compares each product with respect to the risks each addresses.

Interest rate risk	Defines the price movement of a bond portfolio due to shifts in the overall level of risk-free interest rates. For example, U.S. Treasuries are the benchmark for interest rate risk for a U.S. dollar-denominated bond portfolio. The amount of interest rate risk varies with the duration of the underlying portfolio and often with the credit composition. (Note: Investment-grade bonds tend to be more sensitive to moves in interest rates than high-yield bonds.
Credit risk	Represents the change in bond prices that can be attributed to the widening or tightening of yield spreads to riskless benchmark securities due to changes in credit assessment. As credit risk increases or decreases, the price of the bonds will go down or up, regardless of the move in interest rates.
Total return risk	Is the change in price that is due to the combination of interest rate risk, credit risk and carry. While total return is the key focus, this paper examines how and why some products don't hedge total return but can be a useful tool for some managers.
Portfolio diversity	Refers to how broad the CDS, ETF or TRS underlying portfolios are. Most "benchmark" indices tend to be quite broad and inclusive. The broader the underlying portfolio of the beta product, the closer the instrument is to replicating the index being tracked and the lower the basis risk. The table at the end of this section presents some examples of products and a comparison of their diversity.
Portfolio maturity	Is the range of maturities of the bonds in the underlying portfolios. Once again, the closer the maturity range of the beta products underlying portfolio to the benchmark index, the lower the basis risk.
Portfolio weighting	Measures how much any individual instrument in a beta product or underlying index contributes to the return. Equal-weighted indices mean that small issuers can have an oversized impact on the overall return. Most benchmark indices use the issue size of each constituent bond as its weighting in the portfolio. This is referred to as "market cap" weighting.
Portfolio sector distribution	Defines the relative contribution of each security and industry sector of the beta product and the benchmark index. Similar to portfolio diversity, popular market indices are constructed with broad sector distributions to represent the markets that they are representing. The closer the sector distribution of the beta product to the index, the lower the basis risk.
Portfolio risk	Can be considered as the weighted average credit rating of the underlying portfolio relative to the benchmark index portfolio.

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CDS indices are unfunded (investors can gain exposure without having to exchange a notional amount of funds) products that provide exposure to credit risk only; they do not expose the holder to interest rate risk and total return risk. Managers who are focused on total return must manage their interest rate risk separately, thereby increasing execution cost and portfolio complexity. Investment grade CDS indices are comprised of an equal weight of single-name 5-year CDS contracts, and high-yield CDS indices are made up of single-name 5-year contracts. The result is that CDS indices are significantly different than cash market “benchmark” indices, which are comprised of several thousand constituent securities weighted by market cap and longer weighted average maturities and very large basis risk.

Fixed income ETFs are funded instruments that expose the investor to credit, interest rate and total return risk. While some ETF portfolios are perfect replications of the underlying index they track, the largest, most active ETFs are based on sampling routines applied to available inventories of tradable bonds. This process can often lead to ETF portfolio construction being skewed relative to the benchmark and noticeable basis risk. Executing large size can also be a problem for all but the very large funds.

TRS is an unfunded instrument that offers the user credit, interest rate and total return risk and essentially replicates the underlying risks of the underlying index that the swap is written on. Conceptually, a long position in a TRS is like buying a cash bond index and funding it with a short-term floating rate leg. By definition, this means that a TRS will return the exact return of the underlying less a cost of funding. Portfolio diversity, maturity, weighting and risk level issues are moot; hence, basis risk will be minimal. In fact, TRS basis risk is the least of all beta products. Bloomberg Barclay's indexes can be referenced in a TRS, and liquidity can be focused on popular indexes that many portfolio managers are benchmarked to.

Historically, TRS have been bespoke bilateral agreements between an investor and a market maker. All terms and conditions were negotiated at inception of the swap, but recently standardized TRS contracts have been created, which eliminate the need to specify each term of a swap and increase liquidity. Branded as BTRS, new standard contracts are available on a broad selection of the Bloomberg Barclay's Global Indices.

The BTRS product has been designed to normalize the terms and conditions, funding index and quoting convention of TRS. E-trading and electronic confirmation will attract more market makers and ultimately increase TRS liquidity and usage. The contracts' effective dates follow the first calendar date of the month a trade takes place in, and the maturity is the final day of the months March, June, September and December. The funding index is 1-month LIBOR “flat,” and each contract resets and pays at the end of each month during the life of a contract.

Investment Products by Credit Market

Investment grade-focused portfolio managers actively trade CDS indices, ETFs and TRS. This is the one market where CDS indices remain the vehicle of choice. Despite several shortcomings in characteristics and large basis risk, portfolio managers continue to use them, although that trend may be changing slowly.

The main advantage CDS indices have over other beta products is that they are extremely liquid and have been the dominant credit index product for more than a decade – creating a deep user base. An additional reason for their popularity is that investment grade debt is considered a “spread” product. All investment grade bonds are quoted on spread, and most trades occur with the crossing of risk-free government bonds so that the buyer and seller are trading a spread instrument. Traditionally, CDS indices have been the only way to capture spread movement, but that is changing as TRS on spread return indices are being referenced more often.

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Trading investment grade ETFs has remained constant over the last few years. Many clients prefer using the spread product CDS index or feel that investment grade cash bonds are liquid enough to execute trades of \$50 million or less. At the other extreme large trades (\$500 million or more) are difficult to execute in the ETF secondary market. These trades would be done in the primary market (creation/redemption), where the cost of execution often proves expensive. Lastly, managers who want to create a spread product would require an additional step of transacting risk-free governments.

TRS on investment grade bond indices works well and was the starting point for the TRS market. TRS referencing investment grade spread indices are gaining traction. This allows the entire benchmark index to be tracked with the appropriate bond hedge for each underlying bond. This type of TRS dramatically reduces the basis risk for an investor compared with other types of hedge trades.

Having the ability to trade a TRS on a total return index or a spread return index creates the most optionality for the greatest number of users. The benefit of having both spread return and total return indices provides arbitrageurs and market makers the opportunity to trade the two products against each other, ensuring that the liquidity in one version translates into liquidity for the other version. Essentially, the liquidity already developing in the total return product will translate into liquidity for the spread product and vice versa as the spread return TRS volumes grow.

The high-yield market is where ETFs have flourished and have taken significant market share away from CDS indices. The basis risks associated with CDS indices are amplified in the high-yield market. Every aspect of portfolio construction is more important in high-yield portfolios because the idiosyncratic risk is higher. That is the main reason why high-yield ETFs and TRS are so much more appealing. Large asset managers are as likely, or more likely, to trade ETFs and TRS in the high-yield market as they are to trade CDS. Unlike investment grade, high-yield bonds are a "total return" product. High-yield bonds are quoted in price. People talk about yields, not spreads, for the most part. Therefore, unlike investment grade, where the appeal of a spread-based product is high, the appeal of a total return product is greater in high yield.

Trading ETFs, especially as a hedge, requires asset managers to ensure that they can borrow the ETFs, and they are subject to the variable cost of borrowing the shares. Often, as investors become uneasy with the market, the cost to borrow ETFs becomes very expensive, or, even worse, the borrowed shares can be pulled and with the risk of a "buy-in" the need to close the hedge position increases. The TRS market incorporates this supply-and-demand dynamic into the pricing and is reflected in the "implied funding spread." This cost will not increase, and there will be no risk of having to close out the position and losing the hedge entirely. Once again, TRS is becoming the index of choice for trading high-yield index risk.

Emerging markets are another area where ETFs and TRS are gaining favor over CDS indices. All of the problems associated with the basis risk caused by CDS indices are amplified in this market. Not every country has the same amount of debt, so equally weighted indices seriously distort the impact a country has in a CDS index versus a benchmark index.

Many emerging market (EM) bonds are very long-dated, and these countries have credit curves that are very volatile - making 5-year CDS contracts problematic. There is an additional issue for EM indices in that the underlying bond or CDS market is often only liquid for a portion of the day when those countries are open for business. The liquidity for Asian EM debt is highest while Asia is trading, while Africa, the Middle East and Eastern Europe are most active during UK trading hours. Latin American and Caribbean bonds tend to be most liquid during U.S. trading hours. This can also be problematic for ETFs that need to buy bonds to replicate the index, but is not an issue faced by TRS traders.

In emerging markets, TRS has the additional advantage of helping bridge the gap between local trading hours better than either CDS indices or ETFs, which tend to need underlying open markets for transacting.

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Recent Examples of Large Basis Risk

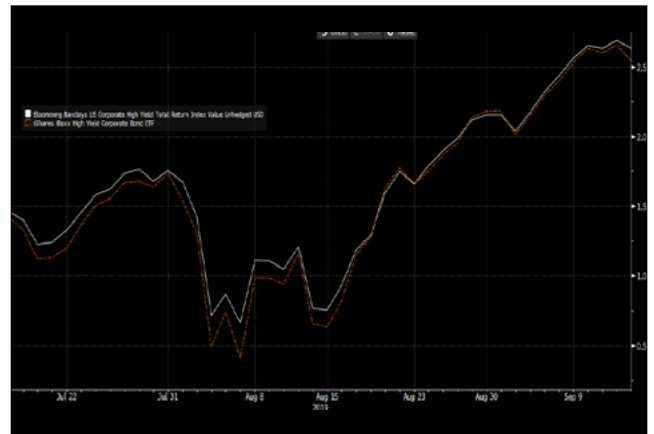
In August, the OAS spread for the Bloomberg Barclays USD High Yield index widened by 80 bps compared with 45bps for the Bloomberg Barclays Index CDX HY Basket OTR RBI Index (LX13SPR), (see Graph 1), yet the Bloomberg Barclay's Index total return outperformed the Bloomberg Barclay's CDX High Yield OTR RBI index due to the drop in Treasury yields. Here the impact of the interest rate risk exposure of the index and the total return risk helped the index outperform the CDS Index (see Graph 2), illustrating the impact of basis risk.

The traditional concept of decreasing credit risk with increasing company size seems to apply to Malaysia. In terms of risk level, from 2006 to 2016, the median credit default risk of small-cap firms was always higher than that of mid-cap firms and large-cap firms monotonically. In terms of sensitivity of credit health to size change, from 2006 to 2008, the median credit default risk of small-cap companies rose faster than that of mid-cap and large-cap firms. The trend held after the crisis. Since 2009, the default risk of mid-cap and large-cap companies has been declining much more slowly than that of small-cap firms (Figure 3).



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The following graphs show the comparison of the Bloomberg Barclays USD High Yield index "Yield to Worst" and the iShares High Yield ETF's (HYG) "Yield to Worst." In Graph 3 it appears that from the end of July until mid-August the Bloomberg Barclay's Index yield drops, while the ETF yield actually rises. Eventually the ETF begins to track the index, but it can be seen on Graph 4 that during this basis divergence the index outperforms the ETF with respect to total return.

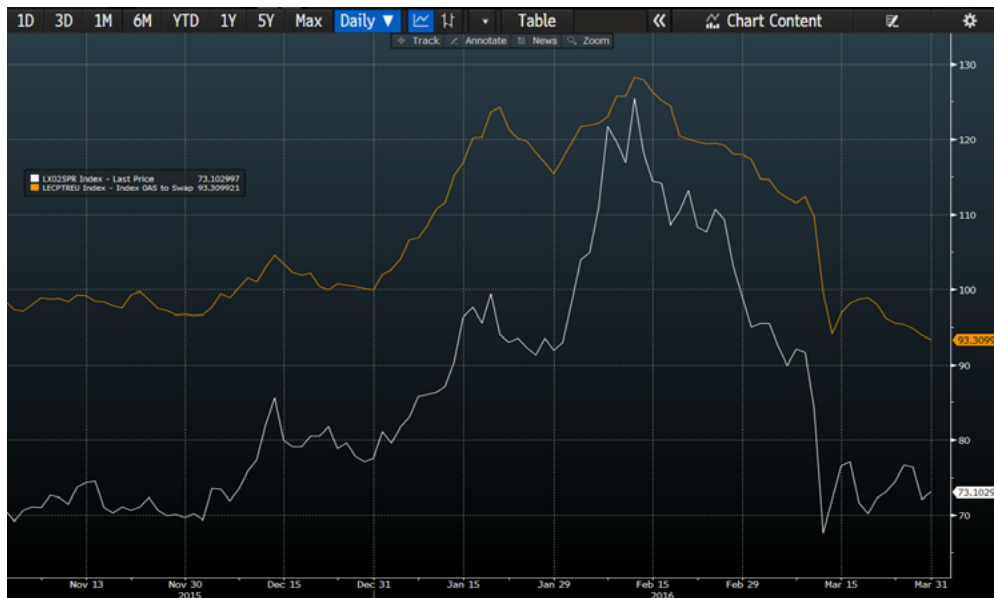


As mentioned above, most managers run their high-yield portfolios as total return portfolios, and as such they find it difficult to hedge the interest rate risk in the high-yield bonds because sensitivity to interest rates changes depending on the credit quality of the underlying bonds (the weaker the credit the less the sensitivity to interest rates). High-yield bonds are typically callable, which makes it more difficult to determine what interest rate hedge ratio to use.

For high yield, it should become clear that TRS provides the least basis risk and should be considered the best beta product to use.

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Europe CoCo Crisis Q1 2016



The OAS spread to swaps on the Bloomberg Europe Corporate Index (LECPTREU) was 99 bps in November, while the Bloomberg Barclays iTraxx EUR 5yr. Basket Index (LX02SPR) was at 70. The spread between the two indices was 29 bps. Both spreads widened as bank spreads widened as the Contingent Convertible (CoCo) market was under severe pressure.

In a "normal" environment, the spread is expected to widen (decompression). At the higher levels, spreads should widen faster than at lower spreads. In fact, the spread compressed to 1 bp in mid-February 2016.

Three things caused this unexpected performance:

- The weighting of banks in the two indices. Banks bore the brunt of the pain and widened more than non-banks.
- Curves flattened. As investors got nervous about banks, the credit curves flattened, causing shorter maturity spreads to widen faster than longer maturity spreads, which hit CDS more as it is a 5-year index.
- While CoCo's were not typically in either index, many hedge funds resorted to shorting bank credit by buying single-name CDS protection on the banks. They were less likely to short the actual bonds due to liquidity issues, meaning that bank single-name CDS widened even faster than their debt widened.

All three of these factors contributed to this large shift in basis between the two products. This highlighted that TRS, by reducing the basis risk, provides more certainty that the hedge or additional risk taken on has performance that most closely matches a portfolio or benchmark.

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Conclusion

All "beta" products are not created equal. In structure and characteristics they do not possess equal "basis" risk. While CDS indices are the most liquid product they only address credit risk, and in times of market stress they do not track benchmarks very closely. The largest and most liquid fixed income ETFs are exposed to the same risks as benchmark indices, and they have attracted increased institutional usage. Unfortunately, due to the sampling techniques used to construct and manage the funds, they have exhibited noticeable basis risk and poor tracking in times of stress.

The best beta product with the lowest basis risk and most favorable tracking of benchmark indices is TRS. The structure insures that a buyer of a TRS will receive the same total return as the underlying index less a funding cost. The standardization of total return swaps by Bloomberg (BTRS), along with e-trading and electronic confirmation, should contribute to a broader adoption by portfolio managers and traders, more participating market makers and an overall increase in the liquidity of TRS.

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