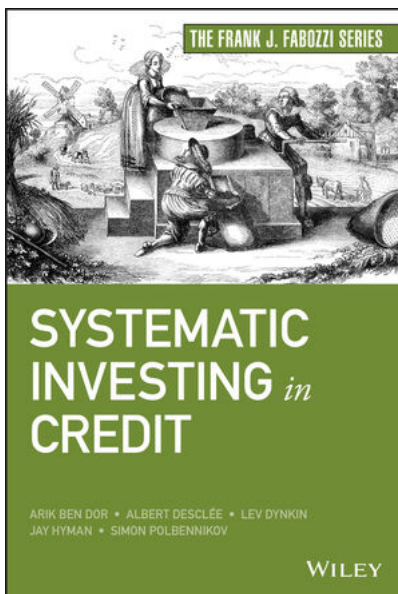


# [Active Reading with ChatGPT] Systematic Investing in Credit

Jun 3, 2023



## [Active Reading with ChatGPT] Systematic Investing in Credit

Yet another experiment with ChatGPT-4: Active reading a semi-technical book.

### Chapter 1 Can a Combination of Treasuries and Equities Replace Credit in a Portfolio?

What is the size of the corporate bond market?

As of my knowledge cutoff in September 2021, I don't have the most recent data on the size of the corporate bond market. However, as a reference, the Securities Industry and Financial Markets Association (SIFMA) estimated the total U.S. corporate bond market to be about \$11.1 trillion in 2020.

The corporate bond market worldwide is much larger than this, though, with a significant presence in Europe, Asia, and other regions. However, exact numbers can vary based on the source of the data, and how "corporate bond market" is defined, as it can include various types of bonds, from investment-grade bonds to high-yield ("junk") bonds, and bonds from both financial and non-financial corporations.

For the most current and detailed data, I would recommend checking with official or authoritative financial market sources, such as the Federal Reserve, the European Central Bank, the Bank for International Settlements, or SIFMA. Financial news sources like Bloomberg, Reuters, and the Financial Times may also have up-to-date information.

What are the "Bloomberg Barclays Indices"? How many exist? How many constituents in each of them? Are there ETFs tracking them?

The Bloomberg Barclays Indices are a set of benchmark indices that are used to track the performance of various segments of the global financial markets. These indices are widely used by asset managers, institutional investors, and financial analysts to measure market performance, manage investment portfolios, and analyze market trends. They cover a wide range of asset classes, including equities, fixed income (government and corporate bonds), commodities, and more.

As of my last training cut-off in September 2021, I can't provide an exact number of Bloomberg Barclays Indices or their constituents because they are numerous and constantly changing. Bloomberg Barclays offers hundreds of indices. Just within the category of fixed income, there are many sub-indices which track different aspects such as treasury bonds, corporate bonds, mortgage-backed securities, and bonds of different credit qualities or maturities. Each of these indices can have many constituents, ranging from dozens to thousands, depending on the size and liquidity of the market segment it's designed to represent.

There are indeed many Exchange Traded Funds (ETFs) that are designed to track various Bloomberg Barclays Indices. These ETFs enable investors to gain exposure to the performance of the markets represented by these indices. For instance, the iShares Core U.S. Aggregate Bond ETF (ticker: AGG) seeks to track the investment results of the Bloomberg Barclays U.S. Aggregate Bond Index, which represents the U.S. investment-grade bond market.

Keep in mind that while these indices and the ETFs that track them can provide a convenient way to gain exposure to certain market segments, they also come with risks. It's important to understand these risks, and to consider your own financial situation, risk tolerance, and investment goals, before investing in any financial instrument. As always, consulting with a financial advisor is recommended.

Fine, can you expand your answer by listing all the Bloomberg Barclays Indices you know that are about corporate bonds? Can you also list the associated ETFs when they exist?

The Bloomberg Barclays Indices encompass a range of indices that cover corporate bonds. Here are a few of these indices, along with associated Exchange Traded Funds (ETFs) that track them, as of my knowledge cutoff in September 2021:

**Bloomberg Barclays U.S. Corporate Bond Index:** This index measures the investment-grade, fixed-rate, taxable corporate bond market. It includes USD-denominated securities publicly issued by U.S. and non-U.S. industrial, utility, and financial issuers. Example of ETF tracking this index: iShares iBoxx

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**Investment Grade Corporate Bond ETF (LQD)**

**Bloomberg Barclays U.S. Corporate High Yield Bond Index:** This index measures the USD-denominated, high yield, fixed-rate corporate bond market. Example of ETF tracking this index: iShares iBoxx

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**High Yield Corporate Bond ETF (HYG)** **Bloomberg Barclays Global Aggregate Corporate Index:** This is a broad-based benchmark that measures the global investment-grade, fixed-rate corporate bond market. Example of ETF tracking this index: iShares Global Corp Bond UCITS ETF (LQDE) **Bloomberg Barclays Pan-European High Yield Index:** This index measures the market of non-investment grade, fixed-rate corporate bonds denominated in Euro. Example of ETF tracking this index: iShares Euro High Yield Corporate Bond UCITS ETF (IHYG) **Bloomberg Barclays Euro Corporate Bond Index:** This index measures the investment-grade, fixed-rate, taxable, corporate bond market of Euro-denominated bonds. Example of ETF tracking this index: iShares Euro Corporate Bond UCITS ETF (IEAC) Please note that while these ETFs aim to track these indices, there can be discrepancies between the performance of the ETF and the underlying index due to various factors like management fees and tracking errors.

Authors claim that "After careful issuer and risk matching, we find that corporate bonds achieved better risk-adjusted performance than a combination of Treasuries and equities of the same companies with similar risk exposures, in both IG and HY, regardless of the weighting schemes used. This is a very interesting claim. How would you show if this is true or not? How can one perform concretely this 'risk matching'?"

The authors' claim is indeed interesting. To examine the validity of such a claim, one needs to conduct a thorough analysis comparing the risk-adjusted returns of corporate bonds with a combination of Treasuries and equities of the same companies with similar risk exposures. Here is a basic outline of how one might go about this:

- **Select your sample:** First, you need to select a sample of companies that have both corporate bonds and equity outstanding. You would also need to ensure these companies have similar risk profiles.
- **Risk Matching:** To perform "risk matching", you need to take into account factors like duration, yield, credit rating, and other relevant risks for each corporate bond. For equities, this could involve considering factors like the company's beta (which measures its volatility in relation to the market), its size, valuation ratios, and industry sector. Then, construct portfolios of Treasuries and equities that match the risk profile of each corporate bond as closely as possible. This step might involve optimization techniques and/or risk model tools.

- **Calculate Risk-Adjusted Returns:** Calculate the returns for the corporate bonds and the matched portfolios over the same period. Then, adjust these returns for risk. One common way to do this is by calculating the Sharpe Ratio, which is the average return earned in excess of the risk-free rate per unit of volatility or total risk.
- **Compare the Results:** Compare the risk-adjusted returns of the corporate bonds with the risk-adjusted returns of the matched portfolios. If the corporate bonds consistently achieved higher risk-adjusted returns, this would support the authors' claim.

However, it's worth noting that such an analysis has its limitations. For one, it assumes that risk can be fully captured by the factors used in the risk matching process, which might not be the case. Secondly, it is based on historical data, and past performance is not necessarily indicative of future results.

Authors explain "To make sure our findings do not reflect simply our choice of the risk-matching method, we consider two alternative approaches: matching based on total volatility and using analytics hedge ratios based on the Merton (1974) model." Can you explain with details the two approaches?

Sure, I'd be happy to explain these two approaches:

- **Matching based on total volatility:** In this approach, the aim is to construct a portfolio of Treasuries and equities that has the same total volatility as the corporate bond being considered. Volatility is a measure of risk, and it reflects the degree of variation in the price of a financial instrument over time. By matching the total volatility, the authors are trying to ensure that the portfolios have a similar risk profile as the corporate bonds. They could do this by adjusting the weights of the Treasuries and equities in the portfolio until its total volatility (measured, for instance, by the standard deviation of its returns) matches that of the corporate bond.
- **Using analytic hedge ratios based on the Merton (1974) model:** The Merton model is a structural model of credit risk that was developed by Robert Merton in 1974. It is based on the Black-Scholes option pricing model and treats a company's equity as a call option on its assets. According to this model, the value of a firm's equity is determined by the value of its assets, the volatility of its assets, the risk-free rate, the firm's debt, and the time to the debt's maturity. In the context of this analysis, the authors would likely use the Merton model to calculate hedge ratios for the equities and Treasuries in the portfolio. These hedge ratios would reflect how much of each security should be held in the portfolio in order to hedge the risk of the corporate bond. By using these hedge ratios, the authors can construct a portfolio that is designed to have the same risk profile as the corporate bond according to the Merton model.

Authors have shown that there is a credit component that cannot be replicated by a portfolio of equity and treasuries. What could be the drivers of this (outperformance) component?

The outperformance of corporate bonds over a portfolio of equities and treasuries of the same company, even after risk matching, suggests that there are elements unique to corporate bonds that contribute to their returns. These elements might include:

- **Credit Risk Premium:** This is the additional return that investors demand for taking on the credit risk associated with corporate bonds. This credit risk premium compensates investors for the risk of default and potential loss in the event of a default. It can vary over time depending on economic conditions, the financial health of the issuer, and changes in the issuer's credit rating.
- **Liquidity Risk Premium:** Corporate bonds, especially those that are not investment grade, tend to be less liquid than equities and treasuries. This means they can be harder to buy or sell without affecting the price. The liquidity risk premium compensates investors for this risk.
- **Recovery Rate Risk:** When a company defaults on its debt, bondholders may receive a portion of their investment back, known as the recovery rate. The risk that the recovery rate will be lower than expected is unique to bonds and could also be a component of the return that can't be replicated with equities and treasuries.
- **Structural Features:** Corporate bonds can have a variety of structural features that impact their returns. For instance, some bonds are callable, meaning the issuer can choose to repay the bond before its maturity date. These and other features can affect the bond's yield and risk profile.
- **Changes in Credit Spreads:** Changes in credit spreads, which are influenced by factors such as changes in interest rates, market sentiment, and the issuer's financial health, can also impact the return of corporate bonds.

OK, but some of the factors you are listing should also be in the equity component... Authors have a different opinion. They list the following 3 risk factors: Equity Variance Risk Premium; Bond Variance

Risk Premium; Low-Volatility Phenomenon across the Capital Structure. Given their answer, what do you think? Who is right? How can we verify those claims in practice?

The authors you're referring to seem to be focusing on three specific risk factors that they believe are driving the outperformance of corporate bonds. Here's a brief explanation of these factors:

- **Equity Variance Risk Premium:** This is the difference between the expected volatility (as implied by options prices) and the realized volatility of a stock. The fact that this is typically positive is often explained by risk-averse investors being willing to pay a premium to hedge against large downward moves in the stock market.
- **Bond Variance Risk Premium:** This is similar to the equity variance risk premium, but it applies to bonds. It reflects the difference between the expected volatility of a bond's returns and the realized volatility.
- **Low-Volatility Phenomenon across the Capital Structure:** This refers to the observation that lower-risk assets often outperform higher-risk assets, even though traditional financial theory would suggest the opposite. In this context, the authors are suggesting that lower-volatility corporate bonds outperform a combination of higher-volatility equities and treasuries.

In fact, both the factors I listed in the previous message and the ones listed by the authors can coexist. The authors are focusing on variance risk premiums and the low-volatility phenomenon as factors that can't be replicated with a combination of equities and treasuries. This does not negate the potential influence of other factors such as credit risk premium or liquidity risk premium.

To verify these claims in practice, you would need to perform a quantitative analysis that tests the impact of these factors on the returns of corporate bonds and a matched portfolio of equities and treasuries. This could involve constructing a multi-factor model that includes these factors and then estimating the model using regression analysis or similar techniques.

What kind of information relevant for trading credit can be found on the SIFMA website?

The Securities Industry and Financial Markets Association (SIFMA) website provides a wealth of information relevant to trading credit. Here are some examples:

- **Statistics and Data:** SIFMA provides comprehensive reports and data on the U.S. bond market, including data on bond issuance and outstanding, trading volume, and yield curves. This data can help you understand trends and developments in the credit market.
- **Research and Reports:** SIFMA publishes research reports and studies on a variety of topics related to the securities industry, including credit markets. These reports can provide insights into market dynamics, regulatory impacts, and industry trends.
- **Market Commentaries:** SIFMA's experts provide commentaries and analysis on current events impacting financial markets, including the credit market.
- **Regulatory Updates:** SIFMA keeps its audience informed about regulatory changes and proposals that can affect credit markets. This information can be crucial for traders to understand the changing regulatory landscape and its potential impacts on their trading strategies.
- **Events and Education:** SIFMA hosts conferences, seminars, and webinars on a variety of topics, where industry leaders and experts discuss current issues and developments in the securities industry, including credit markets.
- **Standardized Documentation:** SIFMA also provides standardized documentation for a variety of transactions, including repurchase and reverse repurchase agreements. These documents can be crucial for traders to understand the legal and contractual aspects of their trades.

## Chapter 2 Fallen Angels: Characteristics, Performance, and Implications for Investors

How many "Fallen Angels" per year in average?

A "Fallen Angel" is a term used in the finance industry to describe a bond that was originally issued as investment grade but has since been downgraded to junk or speculative status by a major rating agency. The number of fallen angels can vary significantly from year to year and largely depends on economic conditions, industry trends, and other factors.

As of my knowledge cutoff in September 2021, I don't have the exact average number of fallen angels per year. It can vary widely, particularly during periods of economic stress when companies are more likely to have their credit ratings downgraded. For instance, in the wake of the financial crisis of 2008

and during the COVID-19 pandemic in 2020, there were notable increases in the number of fallen angels.

In general, credit rating agencies such as Moody's, S&P, and Fitch publish reports on credit rating changes, and these reports often include information on the number of fallen angels. These reports can be a good source of up-to-date information on this topic.

It's worth noting that investing in fallen angels can be both risky and potentially rewarding. While these bonds carry a higher risk of default than investment-grade bonds, they also often offer higher yields, and some fallen angels may regain their investment-grade status if the issuer's financial condition improves.

Can you give me trading strategies around "Fallen Angel" events?

"Fallen Angels," or bonds that were initially issued with an investment-grade rating but have since been downgraded to a speculative or "junk" status, can create interesting investment opportunities. They often result in price declines due to forced selling by institutional investors who are mandated to hold investment-grade bonds, hence potentially being oversold. Here are several trading strategies to consider around these events:

- **Buy-and-Hold Strategy:** Given the often oversold nature of Fallen Angels, a simple buy-and-hold strategy could prove fruitful. Investors buy the bonds shortly after they're downgraded, expecting that the bond's yield has increased to sufficiently compensate for the increased risk of default.
- **Contrarian Strategy:** This strategy involves buying Fallen Angels when the market sentiment is overly pessimistic. The key to this strategy is to identify bonds that have been unfairly punished by the market and have a good chance of recovering.
- **Relative Value Strategy:** This strategy involves comparing Fallen Angels with other bonds that have similar ratings. If the Fallen Angel bond appears undervalued compared to its peers, it could be an attractive investment opportunity.
- **Event-Driven Strategy:** Some investors may look to take advantage of specific events that could lead to a recovery in the bond's price. For example, if the company announces a restructuring plan or receives a cash infusion, this could improve the bond's prospects and drive up its price.
- **Active Management:** Actively managed strategies can be beneficial in navigating the high-yield bond market, especially when dealing with Fallen Angels. A fund manager with expertise in high-yield bonds can assess the risk and reward profile of these bonds and make investment decisions accordingly.
- **Hedging:** Investors could consider hedging their exposure to Fallen Angels through credit default swaps (CDS). This would help limit potential losses if the bond's price falls further.

What are the benefits of buying bonds in the primary market?

There are several benefits associated with purchasing bonds in the primary market, including:

- **Initial Pricing:** Bonds are typically issued at par (100% of face value) in the primary market. Although there may be some issuance costs or fees, investors have the opportunity to purchase these securities without any price mark-ups that might be associated with secondary market trading.
- **Availability and Choice:** Primary issuance is often the only way to invest in a new bond, particularly for large institutional investors who wish to hold a significant position in a specific bond. The primary market offers more variety, as investors have access to all new issuances, which may not be immediately available on the secondary market.
- **Assured Allocation:** When buying in the primary market, investors can be sure of the quantity of bonds they will receive, as they are dealing directly with the issuer or underwriter. In contrast, in the secondary market, it can sometimes be challenging to find a seller for the exact quantity of bonds an investor wishes to buy, especially for less liquid bonds.
- **Transparent Pricing:** In the primary market, everyone gets the same offer at issuance. The pricing terms are laid out in the prospectus and the pricing process is overseen by regulatory authorities, leading to a high degree of transparency.
- **Potential for Capital Gains:** If demand for the bond is high, the bond's price may rise above its issue price when it starts trading in the secondary market. This provides an opportunity for early investors to realize capital gains if they choose to sell the bond.
- **Access to New Investment Opportunities:** Primary issuances may present opportunities to invest in new types of bonds, innovative structures, or issuers who are new to the market.

What is the behaviour of the cash-CDS spread basis for a Fallen Angel event? And why?

The cash-CDS basis (or the basis) represents the difference between the Credit Default Swap (CDS) spread and the yield spread of the corresponding cash bond over a risk-free rate (usually a similar maturity government bond). The basis gives information about the relative pricing of the credit risk in the bond market and the CDS market.

The behavior of the cash-CDS basis around a "Fallen Angel" event (when a bond is downgraded from investment-grade to high-yield or junk status) can depend on a variety of factors, but generally, we might expect to see the following:

- **Widening of Spreads:** Both the bond spread and the CDS spread are likely to widen following a downgrade event, reflecting the increased credit risk of the bond issuer. However, the degree to which each spread widens can depend on a variety of factors, including the reasons for the downgrade, the overall state of the credit market, and the liquidity of the bond and CDS markets.
- **Differences in Market Reaction:** The bond market and the CDS market may react differently to a downgrade event. For instance, the bond spread may widen more than the CDS spread if there is forced selling of the bond by investment-grade investors following the downgrade. Alternatively, the CDS spread might widen more than the bond spread if there is significant buying of CDS protection following the downgrade.
- **Change in the Basis:** The net effect on the cash-CDS basis can be hard to predict and can depend on the specific circumstances. However, if the bond spread widens more than the CDS spread (as might be expected if there is forced selling of the bond), the basis could become more positive. Conversely, if the CDS spread widens more than the bond spread, the basis could become more negative.

It's important to note that the behavior of the cash-CDS basis around a Fallen Angel event can be complex and can be influenced by many factors. Therefore, careful analysis and monitoring of the situation are needed when trading the basis around such events.

What is TRACE exactly? Can I have access to this data for free? Where?

TRACE, or Trade Reporting and Compliance Engine, is a system developed by the Financial Industry Regulatory Authority (FINRA) in the United States to promote transparency in the over-the-counter (OTC) securities markets.

Specifically, TRACE collects and disseminates consolidated information on secondary market transactions in publicly traded OTC corporate bonds - investment grade, high yield, and convertible debt. It provides information such as the time of trade, price, yield, and volume.

As for accessing TRACE data, FINRA provides limited data for free through its Market Data Center on the FINRA website. Here you can find aggregated statistics and recent transactions for individual bonds.

However, more detailed or comprehensive TRACE data, including intraday transactions or historical data, is typically available only through paid subscription services. These might include financial data providers like Bloomberg, Reuters, or FactSet, among others.

Remember that while TRACE data can be a valuable tool for understanding the bond market, it may not provide a complete picture of all bond market activity. Some transactions may be exempt from TRACE reporting requirements, and the data does not include information on primary market transactions or non-U.S. transactions. Additionally, interpreting the data may require some expertise in fixed income markets.

What is the equivalent of TRACE in Europe?

In Europe, the equivalent system to TRACE (Trade Reporting and Compliance Engine) in the United States is governed by the Markets in Financial Instruments Directive II (MiFID II) and the associated regulation, MiFIR (Markets in Financial Instruments Regulation).

MiFID II/MiFIR, which came into effect in 2018, significantly enhanced the transparency requirements for a wide range of asset classes, including equities, bonds, structured finance products, emission allowances, and derivatives. For bonds specifically, the regulations aim to bring greater price and transaction transparency to the historically opaque European bond markets.

The regulations mandate that details of trades in certain bonds (depending on factors such as liquidity and the size of the trade) must be reported to the public in real-time, and all trades must be reported to regulators within one day. This trade data is reported through Approved Publication Arrangements (APAs), which disseminate the data to the public.

However, unlike TRACE, there isn't a single centralized database where you can access all this trade data for free. Instead, the data is spread across multiple APAs and data services. Some financial data providers, like Bloomberg or Refinitiv, aggregate this data and provide it to their subscribers.

Overall, while MiFID II/MiFIR has increased transparency in European bond markets, accessing and interpreting the data can still be complex. Moreover, as the regulations are relatively new, the systems for reporting and disseminating the data are still evolving.

What is the equivalent in Asia?

As of my last knowledge cutoff in September 2021, there isn't a direct equivalent to the Trade Reporting and Compliance Engine (TRACE) in Asia that covers the entire region. Financial market regulations and transparency requirements vary widely across Asian countries, and many have their own systems for reporting and disseminating trade data.

For example:

**Japan:** The Japan Securities Dealers Association (JSDA) operates an over-the-counter (OTC) trade reporting system for corporate bonds and other securities. **Hong Kong:** The Hong Kong Monetary Authority (HKMA) maintains the Central Moneymarkets Unit (CMU), which provides a platform for the issuance, trading, clearing, and settlement of debt securities, and includes a trade repository.

**Singapore:** The Monetary Authority of Singapore (MAS) operates the Bond Price Reporting Framework, which mandates daily trade reporting for specified Singapore dollar and foreign currency bonds.

However, the level of transparency and public accessibility of trade data in these systems can vary widely. In many cases, detailed trade data is only available to market participants or through paid financial data services.

Moreover, the coverage of these systems can be limited. For example, they may not include all types of bonds or all market segments. And unlike in the US and Europe, there isn't a unified, region-wide system for bond trade reporting and transparency in Asia.

For the most up-to-date and detailed information, it would be best to refer to the specific regulatory authority or trade reporting system for the country or market you're interested in.

What is the LCS (liquidity cost score)?

The Liquidity Cost Score (LCS) is a measure of transaction costs for buying or selling a particular security, given its liquidity. Essentially, it's a measure of the potential price impact of a trade and it's designed to estimate how much it would cost to initiate or liquidate a position.

LCS is commonly used in the fixed income market, where individual securities may trade less frequently, and the cost of trading can vary widely depending on factors like the size of the trade, the credit quality of the bond, the time to maturity, and overall market conditions.

The LCS score is expressed in basis points, where a lower score indicates lower transaction costs (i.e., higher liquidity), and a higher score indicates higher transaction costs (i.e., lower liquidity).

Calculating LCS typically involves complex financial models and requires detailed trade data. Financial data providers like Bloomberg offer LCS data for a wide range of securities as part of their subscription services.

While LCS can be a useful tool for understanding the potential costs of trading a particular security, it's important to remember that it's an estimate and actual transaction costs can vary. Factors like market volatility, the size and speed of the trade, and the strategy used to execute the trade can all impact the final cost.

Can we know who are the buyers of a bond at issuance (in the primary market)?

While the identities of specific bond buyers in the primary market are typically confidential and not disclosed publicly, some general information about the types of investors who participate in a bond issuance is usually made available.

For example, underwriters and issuers may provide a general breakdown of the types of investors who bought the bonds, categorized by investor type (e.g., mutual funds, pension funds, insurance companies, hedge funds, retail investors) and/or by region (e.g., North America, Europe, Asia). This type

of information can give market participants a sense of the demand for the bond and the diversity of the investor base.

The specifics of this disclosure can vary depending on the bond issuer, the underwriters, and the regulatory environment. For example, in some cases, the issuer might provide more detailed information about the allocation of bonds to different types of investors, while in other cases, the information might be more general.

However, the exact identities of the bond buyers – such as the names of specific funds or individuals who bought the bonds – are typically not disclosed, to protect the privacy of investors and to comply with financial regulations.

For a given bond (issue), can we know who are the major bond holders?

The identities of individual bondholders are usually not made publicly available due to privacy regulations and the desire of many investors to keep their holdings confidential. However, some information about bond ownership can be inferred from various sources.

For example, mutual funds, exchange-traded funds (ETFs), and other regulated investment companies are required to disclose their holdings on a periodic basis, typically quarterly. These filings are publicly available and can show if a fund owns a particular bond.

Financial data providers like Bloomberg, Morningstar, and FactSet aggregate these fund holdings data and can provide a snapshot of which funds own a particular bond at a given point in time. However, this only covers a portion of the bond market, as it doesn't include bonds held by other types of investors like private individuals, corporations, or governments.

Additionally, some countries require certain types of investors, like pension funds or insurance companies, to disclose their bond holdings. This can provide another source of information about bond ownership.

Finally, in some cases, the issuer of a bond may have information about who holds their bonds, particularly for registered bonds where the owner's name is recorded. However, this information is usually not made publicly available.

In summary, while it's usually not possible to get a complete picture of who owns a given bond, you can get some idea of the major bondholders from fund holdings data and other sources. However, this data is often delayed and may not accurately reflect current ownership, particularly in more volatile or less liquid segments of the market.

## Chapter 3 Fallen Angels: Capacity, Transaction Costs, and the Bond-CDS Basis

What are the factors driving the bond-CDS basis?

The bond-CDS basis, or the difference between a bond's yield spread and the corresponding CDS spread for the same issuer, can be influenced by a variety of factors:

- **Liquidity:** Differences in liquidity between the bond and the CDS market can influence the basis. If the bond is less liquid than the CDS, it might trade at a yield premium, leading to a wider bond spread relative to the CDS spread, which can make the basis more negative.
- **Counterparty Risk:** In the CDS market, there's risk that the seller of the CDS might default and not be able to fulfill their obligation. This risk is incorporated into the CDS spread but not the bond yield, which can make the basis more negative.
- **Regulatory Factors:** Changes in financial regulation can impact the bond-CDS basis. For instance, regulatory capital requirements can make it more expensive for banks to hold bonds on their balance sheets, which can be reflected in the bond's yield and therefore influence the bond-CDS basis.
- **Funding Costs and Repo Rates:** The bond-CDS basis can also be influenced by the costs to finance a bond position. If the cost of financing (the repo rate) is higher than the risk-free rate used in the CDS contract, it can push up the bond's yield, leading to a more negative bond-CDS basis.
- **Recovery Rate Assumptions:** Bonds and CDS contracts may have different assumptions about the recovery rate in the event of a default. If the bond's implied recovery rate is lower, it can lead to a higher yield and a more negative bond-CDS basis.



- **Market Sentiment and Demand-Supply Factors:** The bond-CDS basis can be influenced by the relative demand and supply in the bond and CDS markets, which can be driven by investor sentiment, market conditions, and specific trading strategies.
- **Tax Considerations:** Bonds and CDS contracts may have different tax implications, which can also influence their relative pricing and the bond-CDS basis.

What are the sources for credit default swaps data?

Credit default swap (CDS) data is crucial for many types of financial analyses and trading strategies. There are various sources to find CDS data, both paid and free, but keep in mind the coverage, update frequency, and accuracy may vary significantly between different sources. As of my last training cut-off in September 2021, here are some of the sources:

- **Bloomberg Terminal:** Bloomberg is one of the leading financial information providers globally. It offers comprehensive CDS data for a wide range of issuers and maturities. The Bloomberg Terminal is a paid service.
- **Thomson Reuters Eikon:** Eikon is another comprehensive data platform that provides wide-ranging financial market data, including CDS data. This is also a paid service.
- **Markit (IHS Markit):** Markit is a leading provider of financial information services and is particularly well-known for its CDS data, which is used as a benchmark by many financial institutions. Access to Markit's data usually requires a paid subscription.
- **Central Banks and Regulatory Agencies:** Some central banks and regulatory agencies publish aggregated CDS data as part of their effort to monitor financial system risks. Examples include the Federal Reserve Bank of St. Louis's FRED database and the European Central Bank's Statistical Data Warehouse.
- **Academic Databases:** Some academic databases like WRDS (Wharton Research Data Services), which include data from Markit, provide CDS data. Access usually requires an institutional subscription.

What are the sources for corporate bond data?

- **Bloomberg Terminal:** Bloomberg provides comprehensive corporate bond data, including pricing, yield, volume, issuer details, and more. The Bloomberg Terminal is a paid service but is widely used in the financial industry.
- **Reuters Eikon:** Reuters Eikon provides comprehensive data for a variety of bonds globally, including corporate bonds. This is a paid service.
- **TRACE (Trade Reporting and Compliance Engine):** Operated by the Financial Industry Regulatory Authority (FINRA), TRACE consolidates transaction data for all eligible corporate bonds - investment grade, high yield, and convertible debt. While some information is available for free, detailed data often requires a subscription.
- **Moody's Analytics and S&P Global:** These ratings agencies provide a wealth of data on corporate bonds, including issuer information, ratings, and sometimes pricing. Access to this data usually requires a paid subscription.
- **Financial Data Vendors:** Companies like FactSet, Morningstar, and S&P Capital IQ provide comprehensive data on various financial instruments, including corporate bonds.
- **Investing.com:** This is a freely accessible website that provides financial news and data, including information about corporate bonds.
- **Exchange Websites:** For corporate bonds that are listed on exchanges, the exchange's website often provides some level of data.

How to get bond OAS?

Option-Adjusted Spread (OAS) is a measure of the yield spread (expressed in basis points) of fixed-income securities, such as bonds or mortgage-backed securities, to the risk-free rate of return, typically measured by U.S. Government Treasuries.

The OAS adjusts the spread to make it equivalent across all bonds, regardless of their embedded options, such as call or put provisions. This allows investors to compare the relative value of different fixed-income investments more accurately.

Here are some ways to obtain the OAS of a bond:

- **Financial Terminals:** Financial data services such as Bloomberg Terminals or Reuters Eikon provide OAS data for a wide range of fixed-income securities. These are paid services, but they are comprehensive and widely used in the finance industry.

- **Financial Data Providers:** Companies like FactSet, Morningstar, and S&P Capital IQ also provide comprehensive data on various financial instruments, including OAS for bonds. Access to this data usually requires a paid subscription.
- **Bond Pricing Services:** Bond pricing services often provide OAS as part of their valuation metrics. These are typically subscription services.
- **Financial Modeling Software:** Software that performs financial modeling, such as MATLAB's Financial Toolbox or similar tools in R or Python, often include functions to calculate OAS using market data and the security's cash flow characteristics.
- **Bond Issuer's Financial Reports:** In some cases, the OAS may be reported in the financial disclosures of the bond issuer, especially for structured products like mortgage-backed securities.

Note: Calculating OAS involves complex mathematical modeling and typically requires data like the bond's cash flows, yield, price, and characteristics of any embedded options, as well as market data like the risk-free rate and the volatility of the yield. It's usually calculated using numerical methods like binomial trees or Monte Carlo simulation.

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gautier.marti.ai tech blog

gautier.marti.ai tech blog  
[gautier.marti@polytechnique.edu](mailto:gautier.marti@polytechnique.edu)

Musings around quantitative finance and machine learning.