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Global Convertibles

Global Convertibles Primer

Primer

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Convertibles
Global

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Traditional bond + equity warrant = convertible bond

Convertible securities originated more than a century ago, when railroad companies in the then-emerging US economy needed to raise capital. Following the success of these early years, the convertible market has evolved into a dynamic and robust global arena where the basic structure of mixing debt and equity in a single investment remains unchanged. Converts combine equity and debt features, allowing investors to participate in potential equity price appreciation with more limited downside risk, provided by the debt feature. In this primer, we open by introducing readers to the distinct nature of convertible securities with an emphasis on characteristics, behavior and structure.

Convertibles offer asymmetric exposure to their stocks

Two main determinants of a convertible's performance are parity and conversion premium. Parity, also known as the conversion value, is the value of a convertible if it were to be converted into stock. The conversion premium is the price an investor has to pay above parity to own the convert. Additionally, the investment value (or bond value) is independent of the price of the underlying stock, and it provides a theoretical floor below which the bond should not trade given an unchanged interest rate environment. As its underlying equity's price increases, the parity of the bond also increases, though if the price of underlying equity declines, the converts' price is supported by the bond floor—providing the holder with asymmetric exposure to convert's underlying stock.

Investing in converts may boost risk-adjusted returns

Longstanding analysis shows that convertibles, when added to a portfolio of stocks and bonds, potentially can provide improved risk/return characteristics for investors and can be considered as part of a broad asset allocation strategy. What's more, since convertibles are not perfectly correlated with either stocks or bonds, their addition to a portfolio can help to dampen overall volatility. In this primer, we include an analysis of long-term returns (absolute and risk-adjusted), correlations, and portfolio allocation. We also include a discussion of various convert investment strategies and types of holders.

The market is concentrated in the US and tech sector

From the 1990s through pre-crisis 2008, the CB market grew steadily, albeit cyclically. Following the Global Financial Crisis (GFC), issuance declined significantly through 2012, but has since rebounded. Amid a financing wave catalyzed by the COVID pandemic and opportunistic deals from high-growth companies, in 2020 and 2021 global convertible issuance boomed to levels not seen since the pre-crisis days. However, rapidly rising rates and declining stocks significantly cooled primary market activity in 2022, though it sharply recovered in 2023. Today's secondary market has a market value of $354bn as per main regions, about 67% of which is concentrated within the US. Top sectors include tech (software and semis), consumer, healthcare (biotech and pharma), and real estate.

A list of abbreviations can be found at the end of this report.

Refer to important disclosures on page 42 to 44. **12655443**

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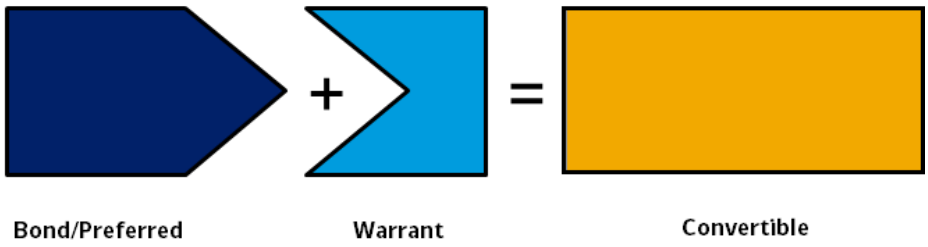
Introduction to global convertibles

The humble beginnings of convertibles date back to the 1800's. Convertible securities originated more than a century ago, when railroad companies in the then-emerging US economy needed to raise capital. By combining the option to convert bonds into equity, investors were attracted by the prospect of participating in equity appreciation in the growing US market, while at a minimum receiving interest and principal payments on their investment should the equity price fail to rise. In short, investors were able to partake in upside returns while enjoying some protection on the downside. Following the success of these early years, the convertible market has evolved into a dynamic and robust global arena where the basic structure of mixing debt and equity in a single investment remains unchanged.

Convertible securities are a hybrid financial instrument traditionally defined as an investment security which is not currently common stock, but which can be converted into common stock at the holder's option. This includes commonly known securities such as convertible bonds and preferreds but also extends to more exotic securities. Convertibles combine both equity and debt features, allowing the investor to participate in equity price appreciation with more limited downside risk, generally provided by the debt feature.

Exhibit 1: Simplified convertible structure
A convertible bond can be thought of as a straight bond + a warrant, allowing for participation with the common stock



Source: BofA Global Research

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The debt feature of a convertible bond (CB) is derived from the convertible's stated coupon and claim to principal. As such, its price is subject to changes in interest rates and the creditworthiness of the issuer. The debt feature protects the convertible from a decline in the price of the equity (more on this in the sections below). The equity feature is derived through the call option, or warrant, embedded in the bond and enables the convertible bond to participate in equity price appreciation. Accordingly, the value of the embedded option is significantly affected by the volatility of the underlying stock.

Exhibit 2: Factors influencing convertibles
CB prices are subject to both bond and equity effects

Change in Variable	Value of Convertible
Bond Effect	
Increase in Credit Spreads	-
Increase in Interest Rates	-
Addition of Investor Puts	+
Warrant Effect	
Increase in Stock Price	+
Increase in Volatility	+
Increase in Common Dividends	-
Combined Effects	
Increase in Issuer Call Risk	-

Source: BofA Global Research

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Determinants of convertible behavior

Two main determinants of a convertible security's performance are parity and conversion premium. Parity, also known as the conversion value, is the value of a convertible security if it were to be converted into stock. The conversion premium is the price an investor has to pay above parity to own the convertible. Generally, convertibles can be characterized into one of the following categories based on their delta, a measure of equity sensitivity showing the relationship between a percent change in stock price and corresponding expected percent change in convertible price:

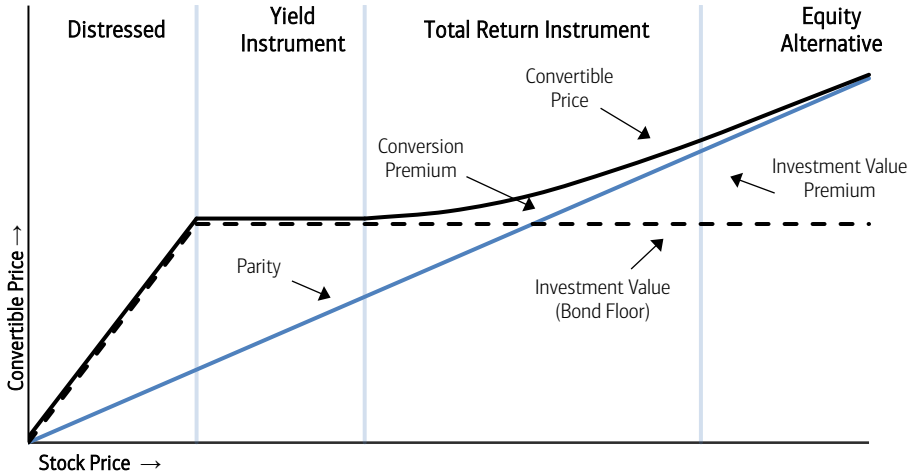
- **Distressed debt:** Convertibles in this category are characterized by distressed credit which has caused the straight bond value of the convertible to break down. Convertibles in this segment of the market tend to trade more like equity than debt as the price of the bond converges to parity and the conversion premium collapses. This type of convertible is illustrated in the far left-hand side of Exhibit 3 below.

- **Yield instrument/straight debt alternative:** Convertibles in this category are characterized by high yields and high conversion premiums. Given that their equity option is so far out of the money, these securities behave almost like pure debt instruments with little regard given to the option value, and therefore are commonly referred to as "busted" convertibles. This type of convertible is illustrated in the left-hand side of Exhibit 3 below. We consider securities with deltas between 0.0 and 0.4 to be yield instruments.

- **Total return instrument:** Also referred to as "balanced" convertibles, CBs in this category exhibit ideal characteristics of a convertible investment, characterized by moderate yields/conversion premiums and a good level of equity sensitivity. This type of convertible is illustrated in the middle section of Exhibit 3 below. We consider securities with deltas between 0.4 and 0.8 to be total return instruments.

- **Equity alternative:** Convertibles in this category behave very close to a pure equity investment, characterized by lower yields/conversion premiums and a high degree of equity sensitivity. This type of convertible is illustrated in the right-hand side of Exhibit 3 below. We consider securities with deltas greater than 0.8 to be equity alternatives.

Exhibit 3: Hybrid behavior of a convertible bond
A CB may behave more like a stock or more like a bond depending on where it trades relative to parity and the bond floor



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The investment (straight bond) value is independent of the price of the underlying stock and therefore appears as a flat line in Exhibit 3. It provides a theoretical floor below which the bond should not trade, given an unchanged interest rate environment. For very low values of equity, however, the convertible price drops with the stock price because such low equity levels are associated with worsening credit and a reduced probability of corporate survival.

As the underlying equity increases, the parity (conversion value) of the bond also increases because parity is directly proportional to the price of the underlying equity. Provided the convertible bond is not about to be called or the common does not out-yield the convertible, the convertible price lies above the greater of parity and straight bond value. A bondholder can always get parity by converting the bond to equity. In addition, in the event of a fall in the stock price, the convertible price is supported by the investment value of the bond.

Illustrative examples

We have constructed the following examples which illustrate convertible behavior in reaction to stock price changes and subsequent shifts along the parity line and conversion premium changes. For reference, below are the formulas we use to calculate parity and conversion premium:

$$\text{Parity} = \text{Conversion Ratio} \times \text{Current Stock Price}$$

$$\text{Conversion Premium} = \frac{\text{Convertible Price - Parity}}{\text{Parity}}$$

To provide an idea of how a convertible security reacts to changes in the underlying equity price, we have provided a working example of a convertible security (Exhibit 4) and summarized the results for both a 25% increase in stock price and a 25% decrease in stock price. As shown, the convertible has risen in price significantly since issue ($163.25 current price), suggesting the underlying equity has performed well. The conversion premium will generally decline as the stock price rises. In this example, the conversion premium is only 1.63%, suggesting that both the stock and the convertible have enjoyed considerable appreciation since issuance. As a result, the convertible now exhibits extreme equity sensitivity. For a 25% increase in the stock price, the convertible's price increases 24.9%, and for a 25% decline in the stock price, the convertible's price declines 21.6%. This example is characteristic of an "equity alternative," as illustrated in the right-hand side of Exhibit 3.

Exhibit 4: Illustrative convertible (high equity sensitivity)
The CB participates substantially with its underlying stock on both the upside and downside

Metric	Value	Metric	Stock +25%	Stock -25%
Issue Price	$100.00	Convert Price	$203.91 (+24.9%)	$128.03 (-21.6%)
Current Price	$163.25	Stock Price	$58.75	$35.25
Stock Price	$47.00	Conversion Premium	1.57%	6.29%
Delta	0.93	Current Yield	1.29%	2.05%
Conversion Premium	1.63%	Conversion Ratio (per $1000)	34.17	34.17
Coupon	2.63%	Parity	$200.75	$120.45
Current Yield	1.60%			
Conversion Ratio (per $1000)	34.17			
Conversion Price	$29.27			
Parity	$160.62			

Source: BofA Global Research

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Exhibit 5 illustrates a second convertible example with lower equity sensitivity. When looking at the sensitivity analysis below, there are considerable differences between these two convertible examples. As illustrated, the convertible increases 6.5% to $88.58 from $83.19 on a 25% increase on the stock. As the underlying equity price increases, parity increases and the conversion premium declines. Conversely, the convertible

declines 3.8% to $80.00 for a 25% decline in the stock. As the underlying equity price declines, parity also falls, and the conversion premium grows even larger. This convertible demonstrates only modest equity sensitivity on the upside, given that the convertible increases only 6.5% for a 25% increase in the stock. While this does not allow for much upside appreciation, it does provide yield with much greater downside protection than owning the underlying stock.

Exhibit 5: Illustrative convertible (low equity sensitivity)
The CB participates only modestly with its underlying stock on both the upside and downside

Metric	Value	Metric	Stock +25%	Stock -25%
Issue Price	$100.00	Convert Price	$88.58 (+6.5%)	$80.00 (-3.8%)
Current Price	$83.19	Stock Price	$7.58	$4.55
Stock Price	$6.06	Conversion Premium	32.03%	98.73%
Delta	0.27	Current Yield	4.23%	4.69%
Conversion Premium	54.98%	Conversion Ratio (per $1000)	88.57	88.57
Coupon	3.75%	Parity	$67.09	$40.26
Current Yield	4.50%			
Conversion Ratio (per $1000)	88.57			
Conversion Price	$11.29			
Parity	$53.67			

Source: BofA Global Research

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Advantages of convertibles for the investor

The hybrid nature of convertibles, which is to say their unique combination of debt and equity features, tends to make the convertible asset class attractive to a diverse investor base. As such, we highlight in the following the potential advantages convertibles can offer investors over straight debt and equity instruments.

Current yield advantage over equities

Convertible bonds generally offer a current yield advantage over the underlying equity. We note, however, that the yield advantage range is quite wide and can vary significantly from one individual security to another. The value of the convertible relative to its underlying stock increases with its yield advantage.

Equity upside participation with less downside

The fixed income aspect of the security tends to provide downside support, while the embedded call option supplies the potential for participation with the common stock's gains. In the event of a bankruptcy, convertibles rank higher in the capital structure than common stock. Further, the bond investment value serves as a theoretical "floor" for the convertible price. The price of a convertible security will normally not rise as rapidly as the common stock in a very bullish market environment, nor will it be quite as defensive as a pure straight bond in a declining stock market environment. Nevertheless, a portfolio of convertibles may exhibit comparable or even superior behavior to either instrument over complete market cycles (see "Potential for stock-like returns with lower volatility").

Improved risk profile of a portfolio

Because convertibles are not perfectly correlated with either stocks or bonds, the addition of convertibles to portfolios of stocks or bonds can decrease the overall risk level of the portfolio, while maintaining or improving return levels. Notably, convertibles generally exhibit higher Sharpe ratios than equities, indicating more favorable risk-adjusted returns (see "Convertibles can reduce overall portfolio risk").

Broader investment opportunities

The diversity of convertible structures and their investment characteristics can offer alternatives to meet a variety of investment objectives. Equity investors with a minimum yield requirement may be able to invest in a company through the convertibles as opposed to the common stock. In addition, risk-averse equity investors may look to convertibles as a way to hold a more defensive instrument.

Bond investors who cannot hold straight equity may be able to gain access to the company through a convertible. Fixed income managers looking to add "alpha" to their performance can consider convertibles as a way to obtain some equity exposure by sacrificing a certain amount of income.

Arbitrage opportunities

Convertible arbitrage is a trading approach based on hedging specific risk components of a convertible security, namely the equity, credit, or interest rate risk. While taking place over a broad range of securities, arbitrage tends to be most easily accomplished with an equity equivalent issue. For example, if a convert is cheap relative to the underlying stock, an investor might take a long position in the bond and short position in the equity. Please see our separate Convertible Arbitrage Primer for more details.

Advantages of convertibles for the issuer

Convertible issuers are as diverse as convertible securities themselves, ranging from small-cap and fast-growing to mature large-cap issuers looking to raise capital at favorable terms. From this broader context, we have distilled the potential advantages of convertibles into three areas, namely cost dynamics, financial flexibility, and market dynamics.

Cost dynamics

- **Lower coupon/YTM:** Because the investor has the advantage of upside equity appreciation, a convertible issuer is able to pay a lower interest rate than on straight debt, which can provide significant cash savings for the company.
- **Premium equity:** The issuer is effectively issuing equity at a premium to the underlying equity price, and that premium can be pushed out even further by overlaying a "capped-call", or call spread.
- **Less dilutive:** The issuer is raising equity capital on a deferred basis; actual dilution is deferred until conversion of the convertible (though borrowers must report a CB's impact to diluted EPS for reported purposes).
- **Monetizing equity volatility:** The higher the volatility of a company's stock price, the greater the option value of the convertible (as with a higher volatility, the chance for equity appreciation improves). As discussed above in "Lower coupon/YTM," this enables the issuer to pay a lower coupon.
- **Tax treatment:** Interest payments on debt are partially tax deductible whereas dividends come from after-tax profit, so from a tax perspective, convertible debt securities are preferable to issuing equity. Note that the US tax reform bill passed in 2017 limited the tax-deductibility of interest payments up to 30% of adjustable taxable income. While this reduces the tax advantage converts structured as coupon-pay bonds currently have over equity, it increases their advantage over straight bonds, which pay higher coupons. In other words, straight bonds are relatively more expensive as their previously larger interest deductions are capped.

Financial flexibility

- **Fewer restrictive covenants:** Generally speaking, convertibles have fewer restrictive covenants and can minimize the impact on senior debt capacity if the convertible is issued as a subordinated issue.
- **Liberal call provisions:** Convertibles typically have shorter call protection than straight debt.
- **Customization of structure:** Features can easily be added to a convertible structure to fit a company's financial situation.

Market dynamics

- **Access to debt markets:** Converts allow companies with a weaker credit profile access to the public debt markets at reduced interest rates relative to straight corporate bonds.

- **Broad investor appeal:** Due to their hybrid nature, convertibles attract a variety of investors with different financial objectives.

Issuer objective drives structure choice

Convertible products can range from very debt-like to very equity-like, depending on the exact type of product and terms. The structure employed by issuers will depend on a variety of internal and external considerations, including those that follow.

Internal considerations

- **Desire for debt versus equity:** A company's desire to maintain a certain debt to equity ratio will impact its choice of a more debt- or equity-like security.

- **Time frame:** What maturity of a company's convertible best fits into its strategic plan?

- **Tax position:** Interest from bonds is partially tax deductible for the issuer while dividends on preferred stock are not (see our note on this above). "Phantom income" on some bonds results in a company deducting more interest than it is actually paying.

- **Ranking:** Converts can be senior, subordinated, or preferred. This will be affected by covenants in a company's bank and senior debt.

External considerations

- **Rating agency pressure:** Does the company care about how the issuance of the convertible will affect the credit rating of the company?

- **Stock market outlook:** In a bullish stock market environment, a company will not want to give away its stock too cheaply.

- **Interest rate outlook:** Anticipation of a rise in interest rates will make a company want to lock in longer-term debt at lower rates.

- **Supply/demand factors by market:** What type of instruments are investors looking for in the current market environment?

Convertible structures

Convertible structures vary greatly, covering a wide spectrum of payoff ranges. Accordingly, the flexibility of convertibles lends itself to the broad appeal of the convertible asset class for both issuer and investors alike. Over time, the popularity of structures has varied just as issuer needs and market dynamics have changed. Currently, the secondary market is still primarily concentrated in cash-pay bond structures, though zeroes are common in Asia and Japan, and their popularity had grown in the US and European primary markets during the pandemic-era, when borrowing costs were at record lows. Over the years, however, expansion of the CB market spawned product innovations tailored to issuer and investor wants. These product innovations generated a plethora of brand names, confusing to even the most seasoned convertible user.

What follows is a look into convertible structures, starting with traditional cash-pay bonds and preferreds, as well as mandatory convertibles. Next, we look at additional structure variations (listed alphabetically), most of which are much less common nowadays, but worth mentioning for reference. From an investor's point of view, most convertible products are likely to fall into one of these categories.

Cash-pay bonds and traditional preferreds

Convertible bonds and convertible preferreds share the basic fixed income structures of their namesakes—a fixed coupon or dividend rate, priority in regard to income and liquidation, a fixed maturity (outside of perpetuals), early redemption provisions, anti-takeover features and put options. For fixed coupon securities, coupon frequency is usually semi-annual, though annual and quarterly coupon frequency does exist in Europe. Of course, they are also convertible into stock. Hence, we will discuss these structures together. Typically, these structures have the following features:

- **Conversion privilege:** The conversion privilege is usually described in terms of a conversion price or a conversion ratio (number of shares obtainable by converting one share of preferred or one bond). When initially sold, the conversion price may be set anywhere above the market price of the underlying stock (conversion premium). Notably, some securities are issued with a "contingent conversion" feature which limits an investor's ability to convert unless pre-set conditions are met, while other issues may offer conversion at the option of the investor over the life of the issue. Additionally, for an upfront cost, issuers may overlay a call spread (buy call options with a strike equal to the conversion price and sell further out-of-the-money call options) to effectively increase the conversion premium from its perspective.

- **Coupon:** Coupon and dividend rates are generally set below what the issuer would have to pay in the non-convertible market. The coupon or dividend rate is often above the common stock yield.

- **Maturity:** Convertible bond maturities can vary, but on average they are around 5-7 years (though many become provisionally callable after 3 years). Some bonds offer longer-term maturities (as much as 20-30 years) with 5-7 year puts at a holder's option, which effectively shorten the bond's maturity. The puts are generally at par or the accreted value of the convertible. Traditional convertible preferreds are often perpetual but a number of issues can include mandatory redemption features. This effectively sets a "maturity date" that can be as short as ten years after issue.

Mandatory convertibles

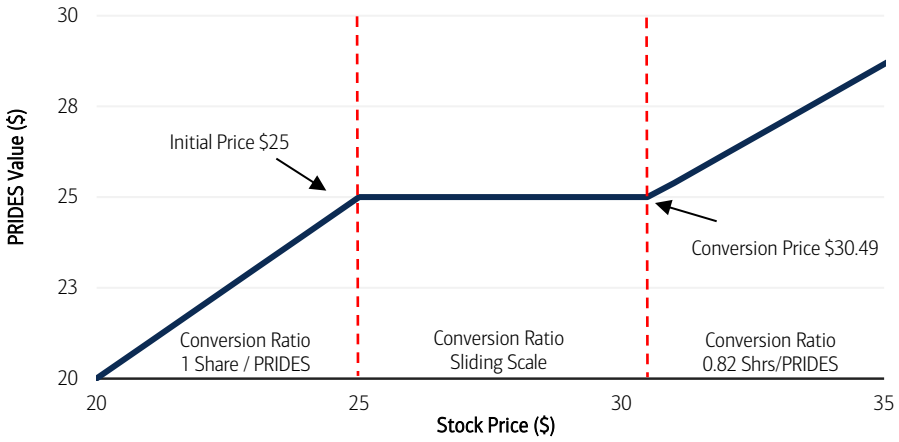
Mandatory convertibles differ from traditional convertibles in that an investor will automatically receive shares at maturity rather than cash at redemption. Since these securities mandatorily convert into stock at maturity, they resultantly have no discernible bond floor. Therefore, mandatories can be effectively thought of as yield-enhanced common stock. There are a variety of names assigned to mandatories, though generally structures have similar characteristics. For illustrative purposes we delve further into PRIDES and PERCS below, though PERCS have diminished in popularity.

PRIDES-type mandatory preferreds

PRIDES-type (Preferred Redeemable Increased Dividend Equity Securities) mandatory preferreds are preferred shares which are exchangeable at a premium any time (at the holder's option) into common shares, but mandatorily convert to common stock at maturity. The number of shares received per security is a function of the stock price on the conversion date. When the underlying stock price moves beyond the maximum conversion ratio or below the minimum conversion ratio, the value of the bond can vary, allowing for upside potential but limited downside protection. This creates a unique structure that makes PRIDES among the most equity-sensitive structures.

As depicted in Exhibit 6 below, there are three possibilities for the value of PRIDES at maturity: (1) the stock closes below the initial price and the PRIDES converts into one share of common, (2) the stock closes between the initial price and conversion price, and the PRIDES is converted into stock according to a sliding scale designed to give the holder shares equal in value to the initial issue price (the "dead zone"), or (3) the stock exceeds the conversion price at maturity resulting in the PRIDES being converted into the optimal conversion number of shares.

Exhibit 6: Hypothetical PRIDES-type payoff diagram (value at mandatory conversion date)
PRIDES-type mandos have two separate conversion ratios



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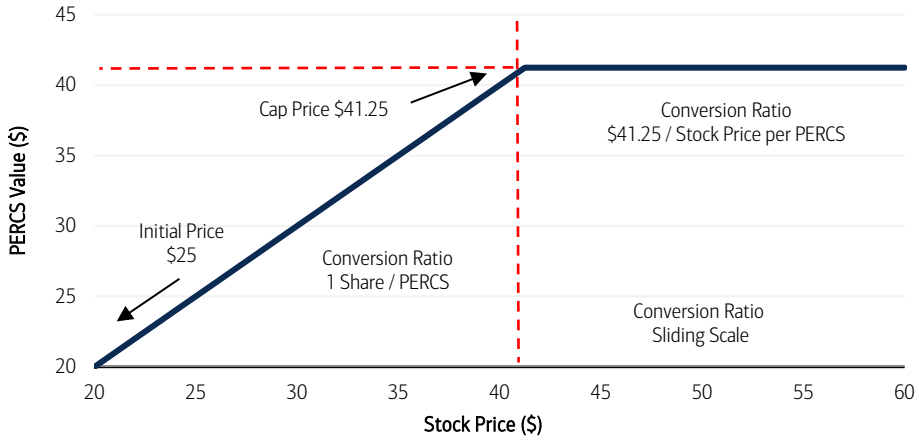
PERCS-type mandatory preferreds

PERCS-type (Preferred Equity Redemption Cumulative Stock) mandatory preferreds are preferred shares which offer limited upside participation with the underlying stock and mandatorily convert into common stock at maturity. Thus, PERCS, like PRIDES, are among the most equity-like convertible securities, offering a different risk/reward tradeoff from traditional convertible securities (Exhibit 7). Unlike PRIDES, however, the upside of PERCS is capped. Most notably, other than their yield advantage, PERCS provide no protection from a decline in the price of their underlying stock (i.e. the downside risk is in line with the common stock).

Exhibit 7: Hypothetical PERCS-type payoff diagram (value at mandatory conversion date)
PERCS-type mandos offer limited upside participation



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Cash-to-zero-coupon bonds

These are a pure hybrid between a cash-pay bond and a zero-coupon bond. These securities are issued at a deep discount to their face value and pay a coupon until the first call date (their effective accreted value stays flat equal to the at-issue price); afterwards, they stop paying the coupon and begin accreting to their face at maturity at the same (or similar) rate as the coupon's. These structures have been used by issuers who are flush with cash at the convertible's issuance but are not sure whether they will have enough cash to make interest payments down the road. Cash-to-zero coupon structures have not been prominent in recent years.

Exchangeable convertibles

Exchangeables convert into the stock of an entity other than underlying issuer. Through this structure, an issuer can monetize the value of a holding in a tax-efficient way. The issuer benefits by receiving proceeds when the exchangeable is issued, while not having to pay capital gains taxes until the bonds are actually converted. Exchangeables are attractive from an investor standpoint as well, since the underlying shares are inaccessible from the issuing company and are thereby protected from any claim on the issuer in a default.

As a general rule, conversion is not a taxable event. An investor's basis in the convertible is carried over to the stock received upon conversion. The main exception to this is for exchangeable convertibles, where conversion is into stock of a different corporation than the issuer.

Floating-rate coupon bonds

In a low-interest environment, issuance of floaters can be popular, since it allows issuers to offer even lower than traditional coupons, while investors receive protection against future rises in rates. Prior to LIBOR's cessation, most CB floaters were pegged to three-month LIBOR, which was reset quarterly and coincided with coupon payment dates.

Foreign convertible bonds

Foreign convertible securities are denominated in a currency different from that of the underlying equity. These securities are issued outside of the underlying's domestic market and are denominated in the currency where they are traded. An example would be a European company issuing a USD-denominated convertible in the US. Convertibles also come in the form of a Eurobond, issued in a currency that is different from the market where the issue is traded. An example would be a German issued and listed USD-denominated convertible on a US company. Exchange rates changes are an imperative consideration in terms of risk and valuation given the conversion value of the convertible security is now a function of exchange rates as well as the underlying equity price.

High premium convertibles

High premium (HiPr) structures are high premium convertible securities with additional non-detachable warrants stapled to them. HiPr's offer issuers the unusual combination of both high premiums and low yields but compensate investors by effectively increasing the conversion ratio (through the additional warrants) as the stock price passes the strike price of the warrants. The high conversion premium reduces the impact of stock dilution at issuance. However, as the stock rises through the warrant strike price, the increasing conversion ratio increases dilution. Issuers consider this as a "quality" problem because if the stock has risen sufficiently for the warrants to kick in, this must be in an environment where the company's stock price is outperforming, and shareholders can tolerate the extra dilution.

Original issue discount convertibles

Original issue discount (OID) convertible bonds have below-market coupon levels and are offered at a steep discount to their par (or face) value, and they gradually accrete to their face value at maturity. The most extreme version of an OID is the zero-coupon bond. In between the zero-coupon and the full coupon, almost any combination of coupon and discount is possible.

The bond component of return on an OID convert comes partly from the coupon and partly from accretion of the discount. Upon conversion, the accretion is not paid, so realization of this portion of total return becomes an either/or situation. Either the stock appreciates faster than the growth in accreted value, or the accretion is paid at maturity or earlier redemption. The steeper the initial discount, the more significant this accretion factor becomes. The accretion of OID is treated as ordinary income and is taxable, just as with zero coupon bonds. Depending on the amount of accretion relative to the coupon payments, the income taxation can result in negative cash flow for investors.

Synthetic convertibles

A synthetic convertible is a combination of bonds and warrants (that expire on or after the bonds' maturity) that resembles convertible bond. It is created by a third party, typically a bank, rather than issued by a company. Notably, the credit risk is not that of the company whose common stock underlies the synthetic convertible and provides the convertibility feature but instead that of the third party. Issuance of synthetics tends to pick up in times of low growth when there is little need for companies to raise capital.

Reverse convertibles

A reverse convertible is a synthetic convertible that gives the option of equity conversion to the issuer, not the holder. The typical structure involves issuing a note whose payoff structure is dictated by the performance of an underlying stock. Provided the stock price stays above pre-determined thresholds, the holder is expected to be paid back cash for the full par at maturity (no equity). If the stock declines, a conversion feature may be triggered, resulting in the investor receiving equity and losing a certain amount of principal. These structures carry significant differences in investment risk and return potential than traditional converts which should be fully considered by investors.

Step-up convertible bonds

In the convertible security spectrum, “step-up” converts fall between coupon pay and OID bonds. The distinguishing feature of these bonds is straightforward; after a certain period of time, the initial interest rate is stepped up to a higher rate. In most cases, this is scheduled to occur at the first call date. If the stock has performed well since the convert was issued, the bond may be called to “force” conversion and the issuer never has to pay the higher coupon. If the stock has not risen sufficiently to force conversion, the higher coupon may provide an incentive to the issuer to refinance.

Step-down convertible bonds

There have been converts issued with a coupon that steps down after a certain period of time. In most cases, this is scheduled to occur at the first call date. This allows the issuer to make the convert more attractive for investors in the earlier years, while having an option to leave the bond outstanding after the call date at a lower interest cost.

Trust preferreds

Convertible trust preferreds are essentially convertible preferred securities that pay quarterly dividends. From a holder’s standpoint, these securities are essentially the same as other convertible preferreds. Major differences are (1) trust preferreds are non-perpetual (usually 30-year maturity), and (2) the income payments are treated as interest. However, trust preferreds rank above other preferreds in the capital structure (roughly equivalent to subordinated debentures). The issues offer a measure of downside support, though not as strong as traditional convertible bonds, while typically offering higher current yields.

These securities were designed to provide tax and rating advantages to the issuer through the use of a Delaware statutory business trust. The primary issuer sets up a trust, which sells the convertible trust preferred to the public investor. The trust then uses the proceeds to purchase convertible subordinated debentures from the primary issuer with the terms virtually identical to those of the trust preferred. The coupon payments from the sub note are then used to pay the regular payments on the trust preferred. As a result of this structure, these payments are not entitled to the dividend received deduction and are treated as interest.

Since the primary issuer has sold convertible subordinated debentures to the trust, it is entitled to deduct the coupon payments for tax purposes. However, the debentures do not appear on the primary issuer's balance sheet. Instead, the primary issuer consolidates its financial statements with those of the trust and the convertible shows up as a minority interest. This consolidation allows the primary issuer to receive partial equity treatment from the rating agencies.

Zero-coupon bonds

To create zero-coupon convertibles, the standard convertible bond was originally redesigned in two important respects: (1) the bonds were reconfigured as deep discount zero coupon instruments; and (2) one or more relatively short-dated put options were added. Issued at deep discount, the bonds accrue to face value and have no regular interest payment. Puts allow the holder to redeem the bonds and thereby realize accreted income prior to maturity. This provides significant downside price support and ensures holders a minimum total return equal to the yield to put, provided the issuer remains solvent. The accretion to face value is treated as ordinary income. For zero-coupon bonds, this results in negative cash flow for investors for a period of time. However, in the wake of the post-pandemic era when interest rates were near zero, investors had been willing to accept less yield, and as such many zero-coupon converts priced during that era were not issued at a discount to par as they had been in the past.

Labeled convertibles

Labeled convertible bonds, which have become more popular since 2020, are intended to promote sustainability and ESG (Environmental, Social and Governance) principles. Although they come in a number of varieties (including green bonds, social bonds, and sustainability-linked bonds, among others), they generally fall into one of two distinct groups: (1) use of proceeds or (2) KPI-linked (key performance indicator). The use of proceeds-type labeled converts require the issuer to use the bond's proceeds to fund projects with a specific environmental or social benefit, while the KPI-linked deals penalize the issuer if it does not meet specific, pre-determined sustainability targets (such as reducing greenhouse gas emissions or appointing women to its board of directors). For instance, a KPI-linked bond's coupon may step-up if its goals are not met.

Prospectus fundamentals

The prospectus contains the relevant terms and conditions of a convertible security. As such, careful review of the prospectus is paramount since investors do not want to overlook essential information. In this section, we aim to highlight key issues investors should consider when reviewing a convertible prospectus.

Call protection: A typical convertible bond or preferred contains some form of protection to prevent the issue from being called for some period of time. Call protection is one of the most important factors influencing convertible performance since it effectively determines the minimum life of the embedded equity call warrant. Once call protection has expired, the option's life becomes dependent on the stock price since once parity is above the call price the convertible becomes a forced conversion candidate. The holder of a convertible faces a dilemma if the issue is called to force conversion—whether to hold the stock and risk downside, or to sell the stock and possibly forgo further upside. In contrast, during the period of call protection the holder has the luxury of continuing to participate in the stock's upside while still enjoying a degree of downside protection should the stock fall.

When considering two identical issues with the exception of their call protection (one issue has protection, the other does not), for a convertible without call protection the convertible's return will converge with that of the stock as parity approaches the call price. This reflects the fact that the issuer may exercise his call privilege and "force" the convertible holder into the stock. The call protected issue, in contrast, participates more fully in the stock's upward move.

Restrictions on the issuer's right to call a convert come in two forms, hard and soft call protections, which sometimes are combined. Hard call protection prohibits redemption under any circumstances until a certain date. Provisional or soft call protection prohibits redemption unless the underlying stock reaches a certain threshold price. For example, redemption might be prohibited unless the closing price of the underlying stock is at least 130% of the conversion price for any 20 out of 30 consecutive trading days. Like other terms, this is subject to change with market conditions.

Subordination: Convertibles can rank at various levels of seniority within the capital structure, a basic illustration of which is shown in Exhibit 8. A large portion of convertible bonds are senior unsecured debt, ranking equally with other senior unsecured obligations. There are also converts classified as senior subordinated or subordinated debt, ranking junior to any senior unsubordinated debt, whether existing or prospective.

Convertible trust preferreds generally rank at the level of the debt underlying it; most have subordinated debt passing through the interest payments on the preferred. Traditional perpetual convertible preferreds, as a type of equity, rank below all debt but ahead of common stock in the capital structure. In most cases, they rank equally with other preferred stocks. Preferreds may be further stratified using the designations "junior" or "second," if the terms of another series of preferreds give it priority.

Exhibit 8: Basic capital structure hierarchy
Convertibles can rank at various levels of seniority within the capital structure

Structure	Seniority
Senior secured debt holders	Most senior
Senior unsecured debt holders	.
Senior subordinated debt holders	.
Junior debt holders	.
Preferred stockholders	.
Common stockholders	Most junior

Source: BofA Global Research

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Change of control put provision: Various forms of "poison puts" are a feature. The goal of these provisions is to allow the investor to exit a position at par in the event of mergers (or other qualifying events, such as equity delisting) that are potentially harmful to the conversion option. There are several variations. Generally, poison puts are triggered by a "Change of Control", in which a third party obtains a defined level of voting control of the company. Some simply provide for a cash-put at par plus accrued interest; others aim to adjust the ratio so that parity will equal par.

Not all mergers will qualify (e.g., all-stock mergers typically do not trigger the put) and the terms of issues can be unique, thus each issue needs to be looked at individually. While the change in control put benefits out-of-the-money convertibles trading below par, for convertibles trading at-the-money or in-the-money this put option is worthless. Moreover, these convertibles get hurt the most from the loss of their option value associated with an all-cash or mostly-cash merger.

Cash takeover protection provision: Since convertibles lose all of their option value in a cash takeover and hedged investors can experience severe losses on short positions in the underlying stock, investors have demanded cash takeover protection ("CTP") from new issues. The most common type of cash takeover protection is "additional shares."

Additional shares protection method is most common and calls for an increase in the conversion ratio over a limited period of time, based on a matrix of prices and dates. The price-date matrix contains stock share amounts equivalent to a hypothetical premium over parity that would be lost at a future time at a given takeover offer price. The price-date matrix values for the additional shares protection method are generally predetermined at the convertible issue date, based on spread, volatility and interest rate assumptions prevalent at that time. This protection usually expires by the first call date.

Cash takeover protection language includes other features besides protection type which can affect a convert's ability to qualify for compensation, like protection triggering actions (most require conversion), protection triggering forms of merger consideration (only cash versus any non-stock consideration), minimum triggering non-stock portion (most allow "10% or more" non-stock), protection expiration (most expire after the first call date), and presence of a "public acquirer" clause (this clause effectively transforms a non-stock merger into a stock-for-stock merger from the convertible bondholder's view). Like other terms, cash takeover protection is subject to change with market conditions.

Cash on conversion: Convertibles that come with a cash-out option can be settled with either cash or shares. Upon receipt of a conversion notice from the convertible investor, an issuer has the option to deliver cash or shares. When settled in cash, the value received by the investor will be equal to parity. However, if there is a look back period associated with the cash out option, then an averaging period will be used in determining the cash payout. The look back period begins upon receipt of the conversion notice, and an average closing price of the underlying share is calculated. As such, the average price becomes the main determinant for the issuer in deciding to deliver cash or stock to the investor.

Contingent conversion: This feature limits a holder's ability to convert voluntarily, by requiring specific conditions. The most common form of contingent conversion requires the stock price to appreciate through a specific hurdle (usually, 120% or 130% of the conversion strike price), and stay above the hurdle for a minimum period. Some issues also allow conversion if the credit rating is downgraded below a set level, and most have conversion provisions for a change-in-control, issuer call, or significant asset distribution to stockholders.

Contingent payment/accretion: Contingent payment or accretion allows for additional small coupon payments triggered by a certain contingency, such as the stock price appreciating through a specific hurdle. This feature has been rare in new converts, but still exists in older ones.

Anti-dilution provision: Most convertibles protect the convertible investor in the event of actions on the company's part which might dilute their equity interest. These can include issues of equity at a discount (e.g., rights issues), subsidiary spin-offs, stock splits, or one-time extraordinary dividends. The conversion ratio can be adjusted in such events. Convertibles commonly have anti-dilution protection against initiation or increase of the underlying common stock's regular dividend.

"Screw clause": Convertible investors are likely familiar with the provision that says, "upon conversion, no adjustment will be made for interest or dividends." In other words, this means that when one converts, he doesn't get the income accrued since the last payment. The main exception is upon a call-forced conversion (that is, when the issuer calls a convertible whose parity is above the call price and holders are forced to convert to get the higher value) during the period between the record and payment dates for the interest.

However, that exception usually protects only the interest payment near the first call date, since after that the issuer can call the bond at any time outside of the record-to-payment period. Sometimes, convertibles are structured to look like there is no "screw clause" at the first call date, but small technicalities of the conversion rights negate such language. Therefore, investors should become fully aware of such provisions by reading the prospectus, as this can have a material impact on investment returns.

Make-whole clause: A typical convertible has call protection in the early years of the security's life. Some issues have built in the option to force conversion immediately if the stock has had a strong run. Issuers pay for this privilege with the "make-whole" payment, which requires them to compensate the holder for this early redemption. Make-whole payments have fallen into two categories: (1) premium or (2) forgone income (coupon).

A "premium" make-whole compensates the holder for the premium paid at issuance. This premium payment is stepped down over time, deducting dividends/coupons as they are paid. A "dividend/coupon" make-whole compensates the holder for the foregone future cash flows he would have received under a hard call scenario, generally three to five years. As in the case of a premium make-whole, the payment is reduced over time to reflect coupons received.

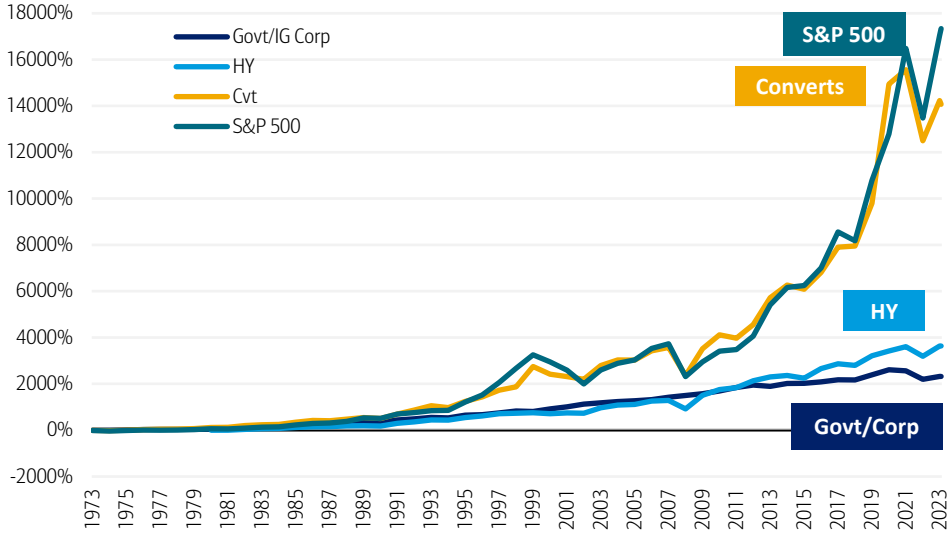
The features of convertible investing

Long standing analysis suggests that convertibles tend to offer superior risk-adjusted returns to equities and bonds. Given the versatility of convertibles and their hybrid nature, their inclusion in a portfolio allows customization in terms of risk tolerance as convertibles can be used as part of a fixed-income allocation or as a lower risk equity alternative. To better illustrate the return profile of convertibles, we look at the historic risk and return profile of convertibles across regions over the past decade, correlations, and portfolio optimization.

Equity participation with potentially less downside risk

Convertibles are hybrid securities, offering a fixed income component that provides downside support in addition to an embedded call option that supplies the potential for participation with the underlying common stock's gains. Additionally, in the event of a bankruptcy, convertibles typically rank higher in the capital structure than common stock. As discussed in the preceding section "Determinants of convertible behavior", the bond investment value serves as a "floor" for the price of the convertible.

Exhibit 9: Cross asset cumulative performance
Cumulative total returns from January 1973 to today show that converts offer comparative returns to stocks over full market cycles



Source: BofA Global Research, ICE Data Indices, LLC, Bloomberg
*Data as of 31-Jan-2024

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Due to the hybrid nature of convertibles, the price of a convertible security will normally not rise as rapidly as the common stock in a very bullish market environment, nor will it be quite as defensive as a pure straight bond in a declining stock market environment. Nevertheless, a portfolio of convertibles will often exhibit comparable or even superior behavior to either instrument over complete market cycles. Exhibit 9 illustrates cumulative total annual returns going back to 1973 for stocks, convertibles and bonds, based on the US dataset where we have the longest reliable historical data.

Potential for stock-like returns with lower volatility

In comparison with their underlying stock, convertibles generally provide higher yields, greater downside protection, and seniority over common with regard to income distribution and in cases of liquidation. This has enabled convertibles to offer superior *risk-adjusted* returns (with similar if not better absolute returns) compared to equity indices over complete market cycles (we use the Sharpe ratio, which measures the return above the risk-free rate in relation to the risk borne, as our measure of risk). The tables below illustrate the historic risk adjusted returns for the global market by region using annualized monthly USD-denominated return data since 1997.

Exhibit 10: US Sharpe ratios
Data since 1996

US	Ann'd Rtn	Ann'd Stdev	Sharpe
Govt	3.98	4.71	0.39
IG	5.26	5.91	0.53
HY	6.71	8.87	0.51
Eqty (S&P 500)	10.52	15.65	0.53
Cvt (VXA0)	9.11	13.13	0.53

Source: BofA Global Research, ICE Data Indices, LLC, Bloomberg
*Data from 31-Dec-1996 to 31-Jan-2024
Based on total return time series. Note convertible indices contain investment grade, high yield, and not rated securities

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Exhibit 11: Europe Sharpe ratios
Data since 1996

Europe	Ann'd Rtn	Ann'd Stdev	Sharpe
Govt	3.71	10.53	0.15
IG	3.72	10.73	0.15
HY	6.30	16.01	0.26
Eqty (Stoxx 600)	6.35	18.26	0.23
Cvt (VE00)	5.23	12.48	0.25

Source: BofA Global Research, ICE Data Indices, LLC, Bloomberg
*Data from 31-Dec-1996 to 31-Jan-2024
Based on total return time series. Note convertible indices contain investment grade, high yield, and not rated securities

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Exhibit 12: Asia-ex Japan Sharpe ratios
Data since 1996

Asia	Ann'd Rtn	Ann'd Stdev	Sharpe
Govt	5.57	5.86	0.58
IG	6.15	6.07	0.66
HY	6.27	13.21	0.31
Eqty (MSCI Asia-xJ)	7.44	21.08	0.25
Cvt (VASI)	7.46	12.13	0.44

Source: BofA Global Research, ICE Data Indices, LLC, Bloomberg
*Data from 31-Dec-1996 to 31-Jan-2024
Based on total return time series. Note convertible indices contain investment grade, high yield, and not rated securities

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Exhibit 13: Japan Sharpe ratios
Data since 1996

Japan	Ann'd Rtn	Ann'd Stdev	Sharpe
Govt	1.35	10.85	-0.07
IG	0.97	10.48	-0.11
Eqty (Topix)	4.42	17.12	0.13
Cvt (VJEU)	3.54	9.47	0.15

Source: BofA Global Research, ICE Data Indices, LLC, Bloomberg
*Data from 31-Dec-1996 to 31-Jan-2024
Based on total return time series. Note convertible indices contain investment grade, high yield, and not rated securities

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As seen in the tables above, convertibles on average performed similar to or better than the comparable broad market equity index on a risk-adjusted basis across all regions, and in some cases converts topped their comparable fixed-income asset classes too. During sideways-to-moderately-upbeat equity markets and stable-to-improving credit markets, convertibles tend to perform their best, providing upside participation with rising stocks while retaining downside protection of bonds in case of a pullback. As a result, the Sharpe ratio for each class of convertibles compares more favorably to stocks. This represents an unusual situation because typically, greater return is often associated with greater risk.

Convertibles can reduce overall portfolio risk

An investor knows that there is a risk-return tradeoff, and that in order to obtain greater returns on investments, the investor must be willing to take on greater risk. Yet for a specified level of return, a rational investor will prefer less risk to more risk. It is standard to measure risk in terms of the standard deviation of return. A portfolio is said to be efficient if no portfolio offers the same return with a lower standard deviation. The efficient frontier is the collection of all efficient portfolios. To construct the risk/reward profiles of these portfolios, we need their historical returns, standard deviation, and correlation with other assets.

Importance of correlation in reducing portfolio risk

We believe investors that have the ability to allocate between stocks and bonds can consider convertibles as an additional asset class for enhancing portfolios. Convertibles tend to be more highly correlated with equities and high yield bonds, while offering low correlations to investment grade bonds (see the correlation matrix tables below). Since convertibles do not move in perfect unison with stocks and bonds, their addition to a portfolio can dampen the overall volatility of a portfolio.

Exhibit 14: US correlation matrix (last 10 years)
Data since 2014

	US Cvt	US Govt	US IG	US HY	US Eqty
US Cvt	1.00	-0.06	0.39	0.75	0.88
US Govt		1.00	0.72	0.06	-0.13
US IG			1.00	0.63	0.35
US HY				1.00	0.75
US Eqty					1.00

Source: BofA Global Research, ICE Data Indices, LLC, Bloomberg
*Data from 31-Jan-2014 to 02-Feb-2024

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Exhibit 15: Europe correlation matrix (last 10 years)
Data since 2014

	EU Cvt	EU Govt	EU IG	EU HY	EU Eqty
EU Cvt	1.00	0.20	0.47	0.71	0.86
EU Govt		1.00	0.74	0.27	0.15
EU IG			1.00	0.70	0.38
EU HY				1.00	0.66
EU Eqty					1.00

Source: BofA Global Research, ICE Data Indices, LLC, Bloomberg
*Data from 31-Jan-2014 to 02-Feb-2024

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Exhibit 16: Asia ex-Japan correlation matrix (last 10 years)
Data since 2014

	AS Cvt	AS Govt	AS IG	AS HY	AS Eqty
AS Cvt	1.00	0.29	0.26	0.40	0.74
AS Govt		1.00	0.89	0.49	0.38
AS IG			1.00	0.55	0.27
AS HY				1.00	0.45
AS Eqty					1.00

Source: BofA Global Research, ICE Data Indices, LLC, Bloomberg
*Data from 31-Jan-2014 to 02-Feb-2024

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Exhibit 17: Japan correlation matrix (last 10 years)
Data since 2014

	JP Cvt	JP Govt	JP IG	JP Eqty
JP Cvt	1.00	-0.14	-0.15	0.82
JP Govt		1.00	0.86	-0.14
JP IG			1.00	-0.13
JP Eqty				1.00

Source: BofA Global Research, ICE Data Indices, LLC, Bloomberg
*Data from 31-Jan-2014 to 02-Feb-2024

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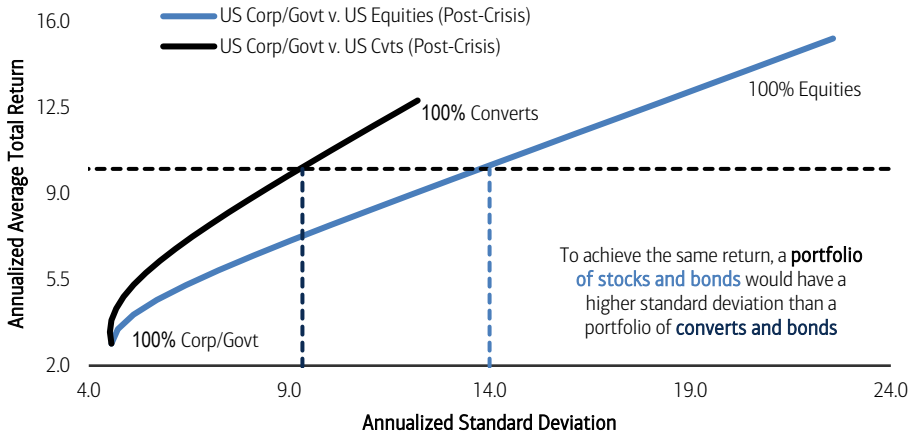
Convertibles can add return potential with lower risk

In terms of quantifying the role convertibles can play in portfolio management, we have constructed two hypothetical sets of "efficient" portfolios for the US market using post-crisis annualized returns (since the beginning of 2009). The first portfolio has been allocated between convertible bond issuer underlying stocks and broad market corporate and government bonds, and the second between convertibles and corporate and government bonds. As evident in Exhibit 18, an investor would have needed to take on higher levels of risk to achieve the same return when employing a stock and bond portfolio versus a convertible and bond portfolio. For example, based on our data, to achieve an annualized return of about 10%, a portfolio of stocks and bonds would have a standard deviation of around 9.3% while a portfolio of converts and bonds would have a standard deviation of around 14.0%. Please note that these numbers represent hypothetical historical results and similar results in the future cannot be guaranteed.

Exhibit 18: Efficient frontier analysis
A portfolio of converts and corporate/government bonds can achieve a higher efficient frontier than a portfolio of equities and corporate/government bonds



Source: BofA Global Research, ICE Data Indices, LLC, Bloomberg
*Data from 31-Dec-2008 to 31-Jan-2024

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Convertible investment strategies

We discuss five investment strategies for convertible holders. While there are many additional strategies that can be used, we provide an example of strategies that we believe are applicable in a wide range of market conditions for individual investors.

- **Aggressive equity sensitivity:** high delta, low premium, deep-in-the-money convertibles
- **Equity-like with a yield enhancement:** mandatory convertibles
- **Total return alternatives:** high gamma, balanced convertibles
- **Low-risk yield:** high grade short-dated puts
- **Higher-risk yield:** speculative grade "busted" convertibles

Aggressive equity sensitivity: high delta, low premium, deep in-the-money CBs

Deep in-the-money converts, characterized by high deltas and low conversion premiums, are extremely equity-sensitive. Since their prices are so far above their "bond floors," they have very little downside protection. Although they are not particularly interesting to more traditional outright convertible investors looking for more "balanced" converts, these low premium bonds frequently still out-yield and offer seniority over the underlying common for very bullish equity investors who do not want to give up virtually any upside participation (and are less concerned with the downside). These types of CBs are also popular among arbitragers, who prefer names with little credit risk and high vol.

Equity-like with a yield enhancement: mandatories

Mandatory convertibles are generally short-dated preferreds, typically issued with a three-year life, that mandatorily convert into the common stock at the end of their term. Through this structure, an investor gives up some potential price upside in exchange for a significantly higher income versus the common stock. Mandatories are structurally the most equity-sensitive type of convertible since they lack a true "bond floor" due to mandatory conversion, and therefore they would typically be held by investors who are neutral to slightly bullish on the prospects for the equity markets.

Holding mandatories could be attractive when an investor likes the long-term fundamentals of a company and wants exposure but has less conviction regarding the stock price potential in the near- to medium-term. Accordingly, an investor in this situation would tend to prefer receiving higher income. In this scenario, buying a mandatory would pay an investor to wait while the equity markets and a company's fundamentals develop.

Total return alternatives: high gamma, "balanced" convertibles

High gamma convertibles are typically traditional coupon bonds and preferreds that tend to demonstrate favorable upside/downside price sensitivity to an attractive underlying stock. Investors might consider income-generating convertibles, which could compensate them to wait for an upturn in the stock. In a scenario where an investor is bullish on a stock in the long term but believes that in the short- to medium-term it will be range-bound, an investor can swap into a higher yielding total return convertible bond or preferred. This strategy would tend to enhance their total return while maintaining exposure to any upward movement in the stock.

This segment would also be attractive if an investor wants to have exposure to a company but wants protection on the downside. In a scenario where the shares do fall, the conversion premium on the convertible would expand, leading to outperformance of the convertible over the stock on the downside. The investor could switch back to the stock once the downturn is over, in order to maximize the potential upward rise with the stock.

Lower risk yield: short dated out-of-the-money converts

Better quality out-of-the-money bonds with puts or a maturity within one or two years, which represent short-duration bond ideas with essentially a free equity call option, are defensive instruments that can provide attractive yields. Fixed income investors, in particular, can look for convertibles which rank *pari passu* with straight debt, have a shorter maturity and yet trade at wider spreads than the corresponding straight debt.

Higher risk yield: speculative grade "busted" convertibles

Busted coupon bonds can provide substantial yields and equity-like returns in the right environment. As discussed previously, this segment effectively is viewed as a bond alternative, with little regard ascribed to the equity component. Naturally, proper credit analysis is essential in investing in this spectrum of the marketplace, with key questions to be asked in identifying the optimal investment being:

- Why is the convertible in its present busted state?
- How long might it take management to turn things around?
- Can the company survive until then in terms of being able to make payments on its fixed income obligations?
- Once conditions improve, will management be able to regain earnings momentum?

Who tends to buy convertibles?

The diversity of products offered in the convertible market together with the range of equity sensitivity of convertible instruments makes the convertible market a fertile pasture for investors of all types. Market participants today include:

- **Equity funds:** Risk-averse equity managers who wish to hold a more defensive instrument. These investors focus on the total return segment of the convertible universe.
- **Equity income funds:** Common stock investors who require more income than is provided by a company's common stock. Such investors tend to include pension funds and insurance companies.
- **Fixed income managers seeking equity enhancement:** Fixed income managers looking to add alpha to their performance by sacrificing a certain amount of income to obtain some equity exposure. These investors tend to focus on the yield and/or total return segments of the convertible market.
- **Dedicated outright convertible funds:** Investors dealing exclusively in the management of convertible security portfolios. These investors tend to be interested in the full spectrum of convertible investments.
- **Arbitrageurs and hedge funds:** Quantitative investors looking to profit from valuation discrepancies between the convertible, underlying stock and other securities. Hedge funds are typically market neutral investors who aim to generate returns regardless of whether the markets and securities rise or fall.

Today, each region's investor bases are characterized by the following:

- **Global:** Globally, we estimate about 45% of the market is now held in long-only funds, while the remaining 55% is held by hedge funds (Exhibit 20). According to our methodology, hedge fund holdings of CBs are now the largest they've been since before the Global Financial Crisis in 2008. Indeed, in the roughly 16 years following the crisis, when the highly levered convertible arbitrage strategy infamously struggled, outright managers have been a more dominant presence in the convertibles market, comprising about two-thirds of the space, on average.

- **US:** Based on the most recent holders list of US convertible bonds, we believe that about 60% of the market is owned by hedge funds and 40% is owned by long-only funds. By domicile, we estimate that about 70% of US-based CB investors are hedge funds.

- **Europe:** While the majority of the European convertible bond market is still owned by outright CB funds (mostly domiciled in continental Europe), the portion held by hedge funds has been rising (particularly UK-based hedge funds). In fact, we believe about 65% of UK-based investors are hedge funds, while the remaining 35% are outright. This contrasts with recent years, when outrights were larger CB market participants. Note that pre-2008, the ratio was about 60% hedge funds to 40% long-only accounts.

- **Asia:** Prior to 2020, Asia long-only accounts had seen inflows while hedge funds have shied away due to a drop in volatility. This had created some liquidity problems as hedge funds turn their books more often than long-only funds. However, this trend has begun to fade. We estimate hedge funds own about 60% of the Asia CB market while outrights hold about 40%. In terms of domicile, we believe about 75% of Asia-based CB investors are hedge funds.

Exhibit 19: Convertible investor base
There is a wide variety of CB investor-types

Investor type	Reason for using convertibles
Equity fund	• Enhanced income • Manage Risk • Retain upside participation
Equity income funds	• Increase the universe of available companies
Fixed income funds	• Achieve exposure to equity markets at a reduced risk to capital • Manage the interest rate cycle
Dedicated outright convertible fund	• All of the above
Hedge funds	• Exploit the asymmetrical link between convertibles and bond/equities to achieve "risk-free" arbitrage

Source: BofA Global Research

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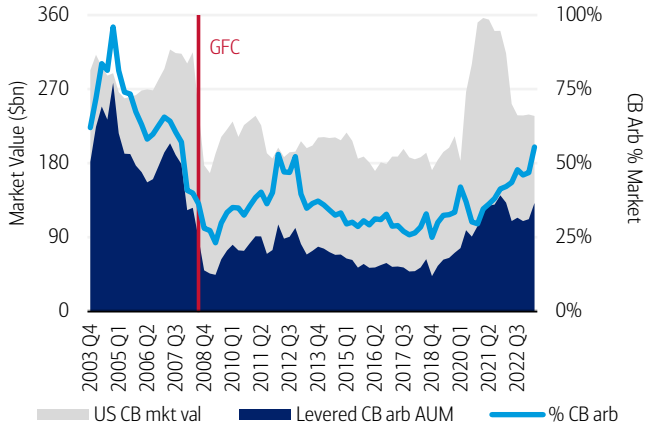
Exhibit 20: Convertible outright versus arbitrage assets
We estimate CB arb comprises about 55% of global CB assets today



Source: BofA Global Research, BarclayHedge, ICE Data Indices, LLC

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Risks and other key considerations

Given the hybrid nature of convertibles, investors are exposed to a broad array of both equity and debt market risks that can include the following:

Equity risks

- **Underlying common stock performance:** Movements in the stock price and/or volatility levels will affect convertible valuations.

- **Higher common stock dividends:** Increases in common dividends will reduce the value of a convertible by diminishing its relative value compared to the common stock. However, converts often have built-in dividend protection, where the conversion ratio is adjusted to convey the value of the dividend distribution through the parity of the convertible bond.

Credit risks

- **Declining credit quality and/or widening credit spreads:** The underlying bond value can fluctuate depending on market conditions or changes in company fundamentals and, therefore, its credit quality. We note that 81% of the global convertibles market (86% of the US market) is comprised of speculative-grade and unrated issues, as discussed further in our "Secondary market overview" section.

- **Higher interest rates:** Rising interest rates will impair the underlying bond valuations. However, we often note that rising rates paired with improving equity is a net positive for converts as gains on the stock outweigh credit losses.

- **Lower than assumed bond investment value (e.g., recovery value):** The "bond floor" serves to limit the downside in the convertible caused by equity declines and/or deteriorating credit trends. However, these valuation assumptions can be subjective and highly uncertain, particularly in the case of distressed credits. Additionally, mandatory convertibles do not offer investors a "bond floor."

- **Lack of covenants:** Unlike straight bonds, convertibles generally offer investors no protection in the form of financial covenants. This effectively gives the company greater latitude in adding debt, selling assets, etc., which can greatly reduce asset coverage for creditors. While not an important point for convertibles that are "equity alternatives," this is a material consideration for "busted" convertibles (e.g., bond alternatives).

Other investment considerations

- **Liquidity:** Some structures and/or issues may be illiquid, resulting in limited ability to buy/sell and/or unfavorable pricing. Investors can look to sources such as TRACE (Trade Reporting and Compliance Engine) for public information on pricing and volume, or they can look at bid/ask spreads. Overall market liquidity has been improving since the mid-2010s, and TRACE data suggests trading volumes still remain near their highest levels since 2011 (Exhibit 21).

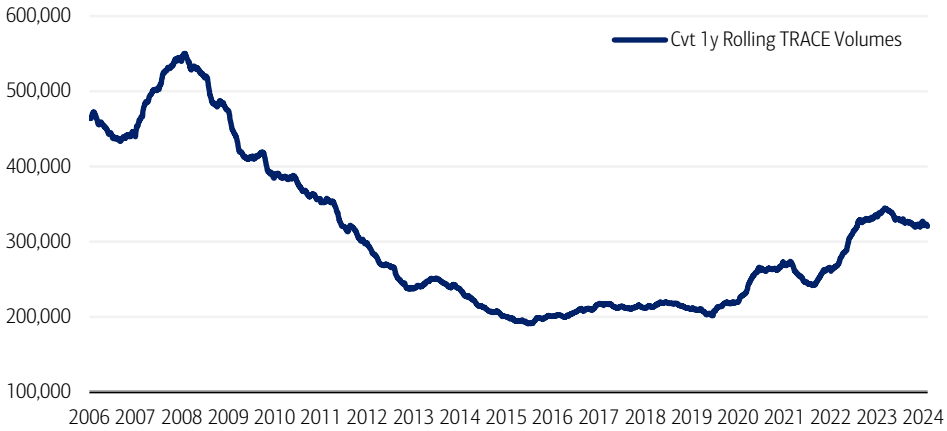
- **Currency:** Convertibles issued in foreign currencies are exposed to currency risk. Not only may convertibles be issued in a foreign currency, but also some convertibles are issued in a different currency than that of the underlying. For example, a convertible may be denominated in dollars; however, on conversion an investor will receive shares traded in euros. Convertibles such as this need to be evaluated with special care in regard to their currency.

- **Call provisions:** An issuer's call feature allows the issues to be called, which can negatively affect investment returns. Convertibles generally carry some form of call protection for a period of time, though terms can vary, as discussed more in our Prospectus fundamentals section.

- **Taxation:** Convertibles have a wide range of income tax considerations regarding coupon, principal accretion, and conversion which can vary by structure and issue. In some cases, investors are taxed for a larger portion of income than has been received, resulting in reduced (sometimes negative) cash flow. Refer to further discussion of tax matters, "contingent payments," and "phantom income" in our structure choice section above.

- **Prospectus:** The prospectus defines the structure of a convertible security, including but not limited to call provisions, takeover protection, issuer information, and the convertibles rank. Diligence is required when reviewing the prospectus since clauses such as the before mentioned will impact valuation. Refer to our Prospectus fundamentals section for more information.

Exhibit 21: Convertible bond TRACE volumes
Convertible bond trading volumes are currently near their highest levels since 2011



Source: BofA Global Research, TRACE. Data as of 05-Feb-2024.

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General market risk across the capital markets, as well as individual security features can impact convertible valuations. Naturally, these risks can be tailored to whether the convertible is considered an equity alternative, a debt alternative, or a total return instrument. Understanding the mechanics of convertibles and their structures can help investors better understand the associated investment risks of this asset class. These attributes are discussed throughout this report. *In addition, investors should always read the prospectus before investing.*

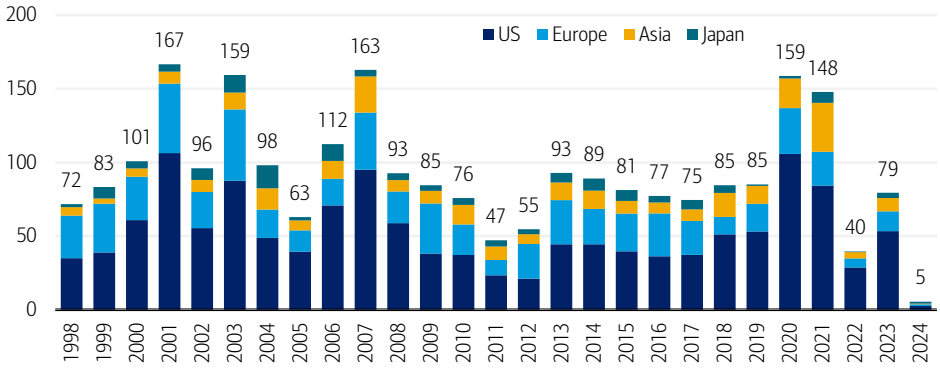
Primary market overview

CB issuance has been recovering from post-pandemic bust

Convertible issuance is driven by corporate financing needs, interest rate levels, implied volatility, and the broader regulatory environment. These factors together impact primary market activity, which in turn affects the ebb and flow of the global convertibles market. From the 1990s through pre-crisis 2008, the convertible market grew steadily, albeit cyclically. Not surprisingly, following the financial crisis issuance declined significantly through 2012.

Starting in 2013 however, the condition of the convertible primary market had improved, and in 2020, amid a financing wave catalyzed by the COVID pandemic, it roared to levels not seen since before the Global Financial Crisis. The strong pace persisted in 2021, fueled primarily by opportunistic issuance from young, high-growth companies in the tech and consumer sectors. However, rapidly rising interest rates and a drastic selloff in the high-growth stocks that drove the pandemic-era boom led to a meaningful slowdown in primary activity in 2022, which saw the least amount of global convertibles issuance on record, according to our data (Exhibit 22). Volumes rebounded in 2023 as elevated borrowing costs and improving stocks were supportive of CB issuance relative to non-convertible debt, and we're hopeful the trend will persist and expand in 2024 as rates remain high (with little sign of significantly declining) and the pandemic-era maturity hurdle looms.

Exhibit 22: Global issuance by region ($bn)
Though the pandemic-era financing boom came to a halt amid the 2022 rate spike and growth selloff, volumes rebounded in 2023, and we expect the trend to persist in 2024 as borrowing costs remain high



Source: BofA Global Research. Data as of 03-Feb-2023.

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While global CB primary market activity cooled in the aftermath of the GFC…

The composition of issuance has and will vary over time as credit quality, sector concentration, and issuer size evolve with issuer needs within the context of the broader market. Throughout the tech bubble, for example, tech, media, and telecom names came to dominate the convert market as these start-ups sought to raise capital via convertibles to meet their high cash requirements. The CB market was an ideal forum to raise cash since volatile capital structures and nonexistent track records allowed these companies to transform their high volatility into cheaper financing (the more volatile the equity, the more valuable the embedded option and the lower the coupon).

In the aftermath of the credit crisis during the late-2008 to early-2009 period, CB issuance was virtually nonexistent as broader markets struggled. An additional factor during this time period impacting large, high-quality, EPS sensitive issuers in the US was an accounting ruling (FSP APB 14-1) that required a bifurcation into debt and equity for convertibles that can be settled in all or part-cash conversion. This ruling resulted in higher reported interest expense for issuers of previously popular "net share-settled" convertibles, which offered much lower dilution than traditional all-stock settled converts. However, FASB recently updated their accounting standards to remove this

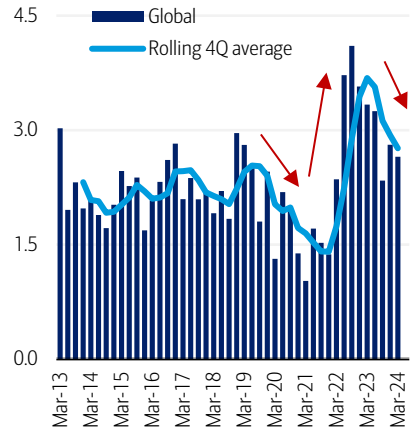
bifurcation requirement, which we think will ultimately benefit convertible issuance and promote higher quality borrowers (we saw evidence of this in 2023, when over one-quarter of global volumes were IG-rated). Note they've also changed the method in which issuers will need to calculate diluted EPS (the if-converted method rather than the treasury stock method), though the impact on issuance here is more ambiguous.

In the years following the crisis until 2022, the CB primary market had to contend with an ever-present record-low interest rate environment. Although converts typically offer coupons lower than straight debt, the historically low rates in the post-GFC era were too attractive for issuers to pass by. Still, the market had shown some resilience. In 2012, we saw the first year-over-year increase in total global issuance since 2007 as year-end supply totaled $55bn (a 16% increase over 2011's total). This pickup in supply was largely attributable to Europe, which out-issued the US for the first time. Though volumes were solid in 2013, they waned again between 2014 and 2017. However, issuance heated up again in earnest in 2018 when global new supply totaled just under $85bn amid higher rates, higher vol, US tax reform, and record-setting issuance from first-time borrowers in the CB market. However, 2018's total was quickly surpassed by 2019's $85bn, driven by many of the same dynamics the powered 2018's pickup.

...the pandemic catalyzed historic levels of CB new supply and aggressive pricing

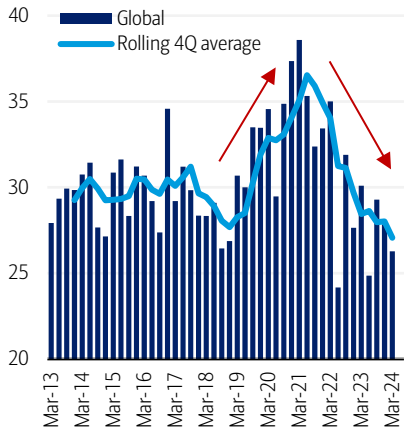
Amid the COVID pandemic, global CB issuance climbed to historic levels in 2020 (nearly $159bn, with almost $106bn from the US). In fact, it was the best year for global new supply since 2007 and the best year for US new supply since 2001. Volumes were driven by both cash-strapped borrowers raising "rescue" capital (namely in the pandemic-hit airline, travel and leisure, and retail industries) and from tech and healthcare borrowers taking advantage of the rallying stock market, tight credit spreads, and the dip in interest rates to price deals opportunistically at favorable terms. Amid demand from both CB outrights and hedge funds and a favorable macro backdrop, the strong issuance persisted in 2021. Powered by young, high-growth borrowers with their stock prices near all-time highs, global volumes totaled $148bn in 2021, the fifth-most on record, and deal terms reached historically aggressive levels. In fact, during Q1 2021 average new deal coupons dropped to lows (and nearly two-thirds were zeroes) and premiums widened to records, though they've since softened (Exhibit 23, Exhibit 24, and Exhibit 25).

Exhibit 23: Avg global new deal coupon
After collapsing in 2021, global CB new deal coupons increased meaningfully in 2022



Source: BofA Global Research. Excludes mandatories.
BofA GLOBAL RESEARCH

Exhibit 24: Avg global new deal premium
Along the same lines, global CB new deal premiums narrowed during 2022



Source: BofA Global Research. Excludes mandatories.
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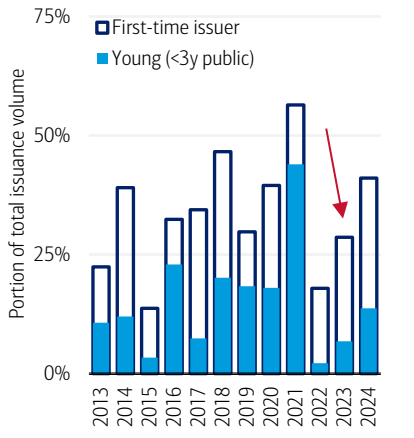
Exhibit 25: US CB aggressive issuance
In contrast to 2021, in 2022 and 2023 US volumes were led by older, more mature issuers



Source: BofA Global Research. Excludes mandatories.
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After plunging in 2022, volumes have been rebounding amid higher rates

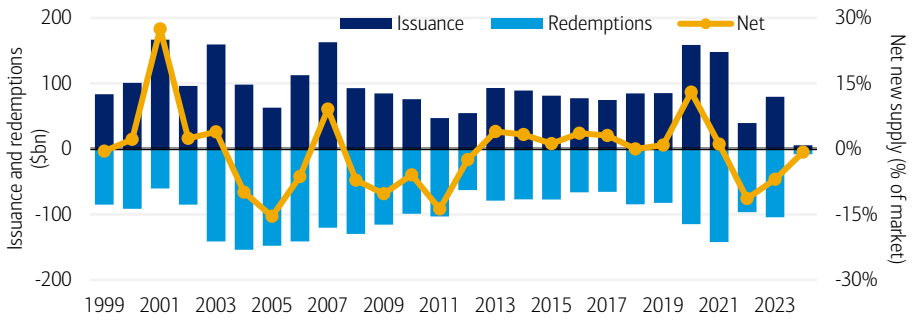
However, the tide turned significantly in 2022. Borrowing conditions deteriorated precipitously as stocks, particularly growth names, plunged from record highs, and financing costs spiked as central banks lifted rates to fight soaring inflation. Among the

hardest hit were the young, high-growth names that drove the pandemic-era issuance bonanza (Peloton, Beyond Meat, and Spotify, to name a few). As a result, 2022's primary market turned out to be everything that 2021's wasn't—a lethargic pace, tempered deal terms, and more mature issuers (Exhibit 23, Exhibit 24, and Exhibit 25). In all, just under $40bn came to market globally, the lowest total volume on record. While converts issuance was certainty disappointing, their struggle was not unique—both HY and IG primary volumes also meaningfully declined. However, volumes rebounded nicely in 2023 to nearly $80bn globally, double the 2022 volume, due heavily to refinancings of existing convertibles and a surge in new supply from higher credit quality names and utilities who found CBs to be relatively cost effective amid the elevated interest rates backdrop.

Global net supply turned negative for first time in 10 years

In terms of net new issuance (new supply minus redemptions), notably in 2013 issuance outpaced redemptions for first time since before the global financial crisis as a total of $92.9bn was added to global supply versus $79.0bn in redemptions (Exhibit 26). Since then, each year from 2013 through 2021 saw positive global net issuance on an annual basis. 2020's global net new supply gain of +13% the market's size (based on $159bn of issuance and $115bn of redemptions) was the largest net increase since 2001's +28%, though 2021's net gain (+1%) was much more modest amid a high number of conversions of deep in-the-money names. However, redemptions outpaced new issuance in 2022 (large maturity hurdle paired few new deals), and global net new issuance contracted over 11%, the first net decline since 2011. 2023 also saw a net-contraction, though it was smaller (-7%), but we expect new supply to outpace redemptions in 2024.

Exhibit 26: Global convertibles net issuance history
In 2022, net new issuance was negative for the first time since 2011, but it has been improving since



Source: BofA Global Research. Data as of 06-Feb-2024.

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New issuance is essential to market viability. As such, it's worth mentioning that primary market behavior and volumes are key components of the broader CB market. New deals generally come to the market at a discount to their theoretical "fair" value as issuers attempt to move large quantities of supply straight away. Understandably, issuers make concessions to accept cheaper terms around new issue to ensure their deal launches successfully, evading the reputational and liquidity costs inherent in a failed deal.

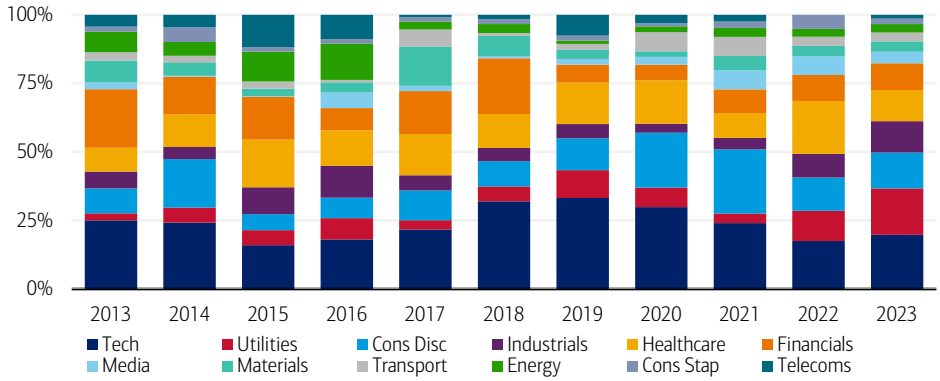
The US and tech have persistently led CB primary volumes

Tech, utilities, and consumer discretionary are now the most prominent sectors

Issuance trends are observable within sector concentrations over time, with some industries consistently providing strong sources of new supply. While tech and healthcare have persistently been dominant industries for convert issuance, consumer staples and telecoms have continued to be laggards. Exhibit 27 provides a comparison of new issuance trends globally by sector over the last 10 years through 2023 (our last complete year of data). Perhaps the most striking takeaway is how issuance from consumer discretionary issuers swelled from 2020 to 2022 (notably, both the pandemic-hit airlines, cruise lines, retailers and retail-favorite consumer tech high-growth names), and how utilities issuers boomed in 2023. In fact, they've overtaken healthcare as the second and third largest sectors in the global CB primary market, behind only tech.

A final trend worth highlighting is the demise of issuance from the financials (including real estate) and energy sectors—historically, were prominent, though in recent years their activity has been only modest. Energy issuance did see a resurgence following the crash in commodity prices at the end of 2015 as borrowers under pressure looked to CBs for their financial flexibility. Indeed, converts allow companies to reduce total debt on their balance sheets by incentivizing holders to convert their bonds to equity, a tool which could help issuers de-lever. However, we're hopeful to see more sector diversification in 2024 amid crossover issuance from companies with debt coming due that is too expensive to refinance in the non-convertible market, and from recent accounting rule changes that make CBs more attractive to IG-rated companies.

Exhibit 27: Historical comparison of global CB issuance by sector
While tech is still the top sector in the global primary market, utilities and consumer discretionary have seen the biggest pickup in new supply volumes in the post-pandemic era



Source: BofA Global Research

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The US dominates primary activity, but Asia and Europe also remain in focus

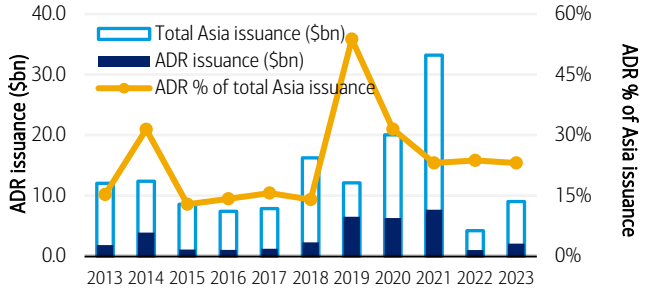
Over the past two decades, and the last decade in particular, the global convertible market has distinctly changed, given that new issuance levels have kept pace with redemptions to varying degrees across regions. Japan, once the dominant convertible market, has considerably declined in size since the late 1990's. In 1999 for example, there were over 500 issues in Japanese domestic converts market, while today there are very few (though the Japan Eurodollar market is still active). The Japanese primary market has suffered at the hands of regulatory changes and a persistently bear market.

The US, now the dominant market, comprises about two-thirds of the global market as measured by market value. The US market grew through product innovation and diversification in the early 2000's and through the use of private placements under SEC Rule 144a, and it has continued to adapt (the use of call spreads to offset potential dilution and zero-coupon deals, for example).

Asia-ex Japan rebounded from the early days following the 1997 currency crisis, aided by the introduction of defensive structures and the emergence of issuance out of China and Hong Kong. In fact, the four-year stretch between 2018 and 2021 was strong for Asian new supply—China property developers dominated the primary market in 2018, and US-listed Chinese tech companies (ADRs) led volumes in 2019. Though ADR issuance cooled somewhat in 2020 and 2021 amid investor concerns over share delisting in the US and corporate management credibility (Exhibit 28), the Asia CB primary market was still very active in 2021 as about $33bn came to market, its best year on record, as large-locally listed names supported new volumes. However, amid 2022's capital markets doldrums, just over $4bn priced in Asia, the least since 1999, and just $9bn came to market in 2023 amid ongoing struggles in China's equity market and weakness in the real estate sector. Finally, while not included in our issuance counts, we would be remiss to ignore that China onshore convertible bond issuance spiked to record levels in 2019 amid favorable domestic policy support and strong investor demand, though the fervor has since cooled.

Finally, Europe, which comprises the second largest convertible market region by market value, had seen its new supply pipeline slow somewhat in post-GFC era in light of ongoing ECB stimulus. Specifically, the asset purchase program and low rates had kept a lid on borrowing costs in Europe, making straight bond issuance too cheap to ignore. However, the tides turned in 2020 as corporate need for capital amid the COVID pandemic helped to jumpstart CB issuance—in all, over $31bn came to market, the most since 2009, while 2021 saw nearly $23bn, also a sizable amount. However, Europe suffered the same fate as the US and Asia in 2022—just over $6bn priced, the least on record. Due in part to the changing economy in light of the pandemic, the European primary market had become more US-like in both its sector and issuer mix (more tech/growth focused) and its deal terms (more aggressive) between 2018 and 2021. However, the collapse of growth assets in 2022 re-shifted the European primary market back toward its roots of "older economy", value-type sectors, such as industrials, energy, and materials—a trend that persisted in 2023 (Exhibit 29).

Exhibit 28: ADR issuance as a percentage of total Asia CB issuance
ADR issuance dropped to just $2.1bn in 2023, comprising just about 23% of Asia CB issuance (ex-onshore) down from its peak of 54% in 2019



Source: BofA Global Research

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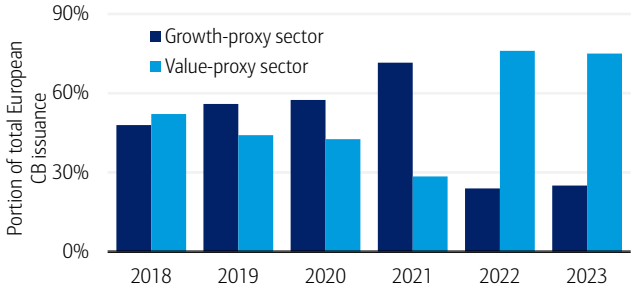
Exhibit 29: European issuance from growth- and value-proxies
Once again, in 2023 value-proxy sectors (75%) outpaced growth-proxy sectors (25%) in the European CB primary market



Source: BofA Global Research

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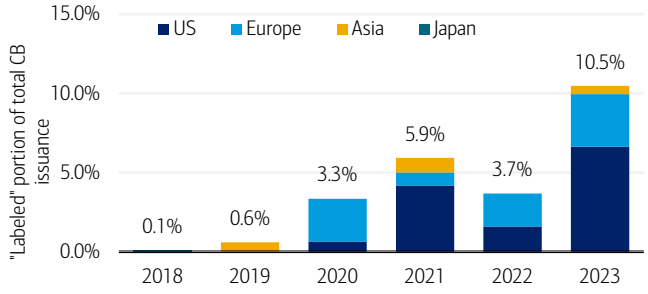
Green and "labeled" deals have slowed, though ESG demand remains firm

In recent years, the CB primary market has also participated in the ESG wave that has become crucial to global markets. In fact, issuance of "labeled" CBs (a category that includes green bonds, sustainability-linked bonds, and social bonds) grew each year since 2018 (except for a small drop 2022), with the large portion driven by Europe and the US. Despite ongoing pushback against ESG (driven by regulatory hurdles and greenwashing concerns) and outflows from ESG funds, "labeled" issuance grew to almost 11% of global volumes in 2023, nearly double 2021's high of about 6%, driven by electric vehicle-maker Rivian, which offered two new green CBs last year (Exhibit 30). Notably, "labeled" deals did not carry premium pricing relative to the broader market as they had in the past, likely in response to the headwinds in the ESG investing space (Exhibit 31).

Exhibit 30: Green and sustainability-linked CB issuance history
Green and sustainability-linked deal volumes rose to records in 2023 (as a percentage of total volumes) despite the broader pushback against ESG



Source: BofA Global Research

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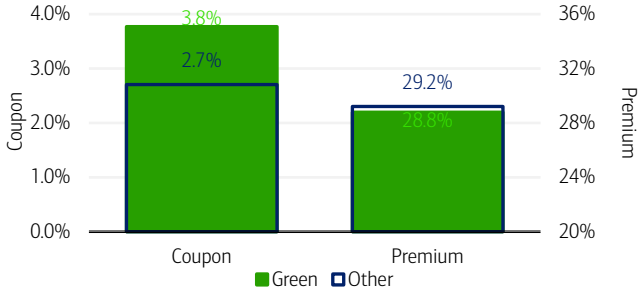
Exhibit 31: Pricing of 2023's "labeled" deals v. the broader market
In contrast to previous years, "labeled" new deals were not priced at a premium to deals from the broader market



Source: BofA Global Research

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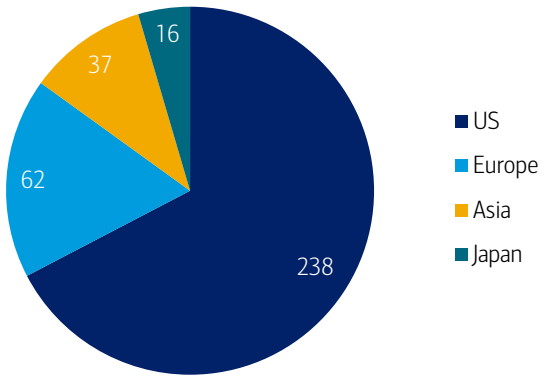
Secondary market overview

Global market regional, sector, and structure breakdown

Today's convertible market has a market value of about $354bn[1]. Although the largest region is the US, sizable markets exist in Europe and Asia, while the Japan market is much smaller. See the following section for historical characteristic data, including average conversion premium, average delta, and average theoretical discount for each of our global regions. Today, the global landscape of the convert market has the following characteristics:

- While a large portion of names in the global CB market are not rated by credit ratings agencies (about 78%), the credit quality of issuers tends to skew toward high yield, especially in the US. However, the IG portion globally grew meaningfully in 2023 following a slew of new issuance from large, high quality utilities names.
- There is a high concentration in the technology (mostly software and semis), healthcare (mostly pharma and biotech), and consumer discretionary sectors both in the US and globally, while the financials and real estate sector is quite sizable, especially outside the US. Consumer staples and telecommunications are the smallest sectors, by market value. While the European market has become more concentrated in high-growth issuers over the past few years (like the US and Asia markets), industrials is still a dominant sector in the region.
- Due to the recent weakness among 2021's aggressively-priced deals from high-growth borrowers, the global market has recently shifted toward a lower-delta, more "yield-like" profile (deltas of 0-40%). This has attracted distressed and high yield credit investors to the space.
- The most common structure today is the traditional bond-like convertible bond. Specifically, within the US, about 94% of convertibles have traditional bond-like structures (79% coupon paying, 15% zero coupon). Preferred and mandatory structures have become less prevalent both globally and in the US.
- In the US, Europe, and Asia, coupon paying CBs are most common, while in Japan zeroes are more popular. However, zero coupon CBs had become more popular in the US, Europe, and Asia amid 2021's wave of aggressively-priced issuance (in Q1 2021 two-thirds of all new deal volume were zero-coupon CBs). While not many new zeroes have priced lately, the pandemic-era deals remain. Specifically, 15%, 28%, and 31% of the US, European, and Asia CB markets, respectively, are now zeroes.

Exhibit 32: Convertible market breakdown by region ($bn)
The US is the largest CB market, comprising about 67%



Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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[1] Total includes the market values of the ICE BofA VXA0, VE00, VASI, VJDM, and VJEU indices.

Below, we break down both our global and US secondary universes and compare today's market to historical convert markets. Please be cognizant of the following:

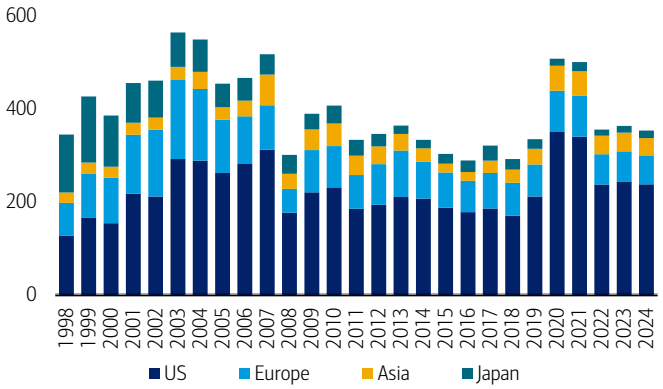
- We use the ICE BofA G300 Global Convertibles Index as a proxy for the global convertible market since its construction is intended to represent the global convert universe. Nonetheless the index may introduce biases due to rule constraints.
- For this primer, the US market is represented by the ICE BofA VXA0 US Convertibles Index, which contains all CBs that were issued in the US, have the majority of their risk focused within the US, and have at least $100mn in par amount outstanding.
- The European, Asia-ex Japan, and Japan regions are represented by the ICE BofA broad regional convertible indices: VE00, VASI, and VJDM+VJEU.
- Please note that the convertible indices have rules restricting the size of issues to ensure a base-level of liquidity. For USD- and EUR-issues, the minimum size requirement for entry is $100mn and €100mn respectively, while for JPY-issues the minimum size requirement is ¥10bn.
- Since the US market makes up over half of the global convertibles market, it is worth highlighting US secondary market characteristics since they are a large contributor to aggregated global trends.

Global CB market value is still near the post-GFC average, topped by the US

The current convertible market contains 672 individual issues and is valued at roughly $354bn. Of this, $238bn, or about 67%, comes from the US region, while the next largest region, Europe, is valued at about $62bn. Asia and Japan are $37bn and $16bn respectively (Exhibit 32). Note that China onshore converts are excluded from this count, but we estimate that the market's size is comparable to Europe.

The global CB secondary market has seen considerable change over the past 30 years, the most notable of which is the major shift from Japanese market dominance to US leadership. In 1995, Japanese CBs totaled $205bn, or 54% of the market, while the US, with $100bn outstanding, made up only 26%. However, as we've continued through the past nearly three decades, the US has replaced Japan as the largest region in the market. Much of this shift away from Japan was the result of regulatory changes and the incessantly bear market. Today, Japan makes up just 5% of the global CB market value. While the 2022 selloff has pushed the global CB market value well-below its 2020 and 2021 peak levels, its face value (about $350bn) is still above the average level since the Global Financial Crisis era in 2008 (Exhibit 34).

Exhibit 33: Global convertibles market value
While market value is below peak levels, it is still near the post-GFC average



Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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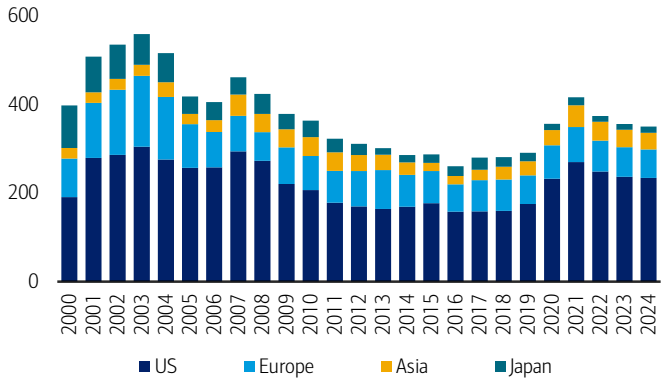
Exhibit 34: Global convertibles notional value
The global CB notional value remains above its post-GFC average



Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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When looking at the convertible market based on individual countries as opposed to broader regions, we find that the market is highly concentrated around several countries. The top 10 countries by market value, as shown in Exhibit 36, make up over 93% of the entire convertible universe, or about $331bn. As we've mentioned, the US is the single largest market at $238bn, followed by China (note this excludes onshore CBs), France, and Japan, which have $17bn, $16bn, and $16bn outstanding respectively. Until late 2019, Japan was still the second-largest country market ahead of China (Exhibit 35).

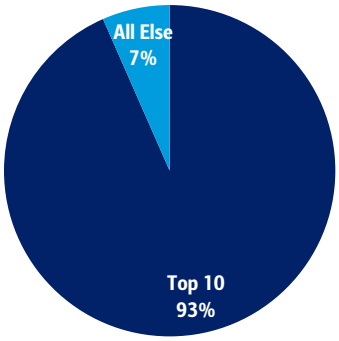
Exhibit 35: Top ten countries by market value ($bn)
The US comprises more than 67% of the global CB market

Country	Count	Market Value	% Global
US	423	238.4	67.3%
China	36	17.3	4.9%
France	30	16.2	4.6%
Japan	52	16.1	4.5%
Germany	29	14.5	4.1%
Italy	10	6.8	1.9%
Korea	5	5.7	1.6%
Netherlands	12	5.6	1.6%
Spain	7	5.5	1.5%
UK	11	4.5	1.3%
All Else	57	23.3	6.6%
Global	672	354	100%

Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

BofA GLOBAL RESEARCH

Exhibit 36: Top ten countries by market value versus all else
The top ten countries comprise over 93% of the global CB market



Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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While the majority of CBs do not have credit ratings, most have a HY profile

As measured by the ICE BofA Global Convertibles G300 index, about 78% of global CB issues are not rated by S&P or Moody's. However, we've determined that most of these names have a HY credit profile. Of the remaining 22% of names that are explicitly rated by credit ratings agencies, the breakdown leans IG with a larger skew toward higher quality names in Europe and Asia. Exhibit 37 below lists the ratings breakdown across each of the global regions. By market value, Asia and Europe have the highest proportion of investment grade names with 26% and 23%, respectively, while the US has 14% with IG ratings. Indeed, the quality portion of the market expanded in 2023 following a number of large IG-rated deals by big utilities, tech, and industrials names. In terms of explicit speculative grade ratings, the US is currently the only region with any (7%). It's worth pointing out that the vast majority of outstanding issues in Asia and Japan are not rated by major credit ratings agencies, though some are rated by local agencies.

Exhibit 37: Credit rating breakdown by region
By market value, Asia and Europe have the highest amount of IG names

	IG	HY	NR
Global (G300)	19%	3%	78%
US	14%	7%	79%
Europe	23%	0%	77%
Asia	26%	0%	74%
Japan Euro	0%	0%	100%
Japan Domestic	--	--	--

Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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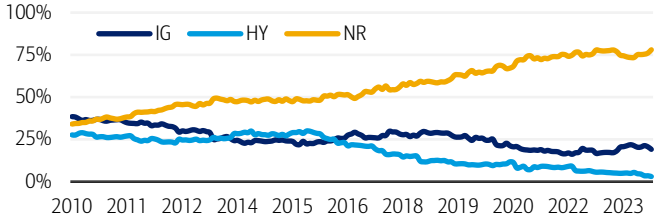
Exhibit 38: Global (G300) credit rating breakdown historically
The vast majority of CBs are not rated by credit ratings agencies



Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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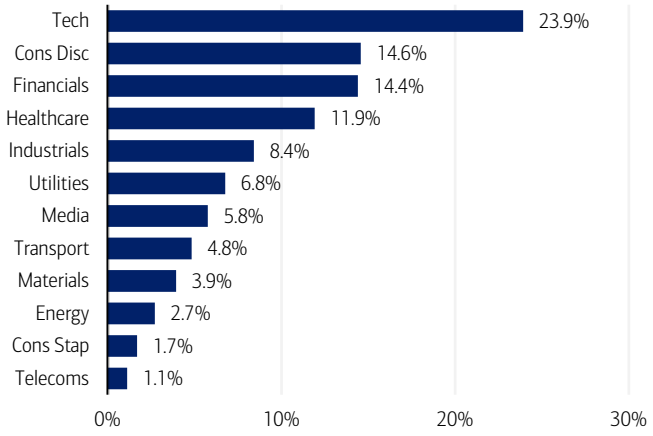
The CB secondary market has a high concentration of high-growth sectors

As we mentioned earlier, there is a high concentration in the technology (mostly software and semis), healthcare (mostly pharma and biotech), and consumer discretionary sectors (a mix of travel, retail, and leisure) both in the US market and globally. Notably, the rise of the consumer discretionary sector in CBs is a relatively new phenomenon in light of the pandemic-driven rescue deal and subsequent high-growth "disruptor" company issuance booms. Additionally, at the global level the financials/real estate sector is also quite sizable (it is third in the G300, behind tech and consumer). Not

depicted in the exhibits below, but in Europe industrials remains a dominant sector (the second-largest overall) despite higher-growth industries becoming more prominent in the past few years, while in Asia the telecoms and transportation sectors are among the largest, following tech, real estate, and consumer. In contrast, the smallest sectors globally are consumer staples and telecoms (Exhibit 39 and Exhibit 40).

Exhibit 39: Global (G300) sector breakdown
Globally, tech, consumer discretionary, and financials are the top sectors...



Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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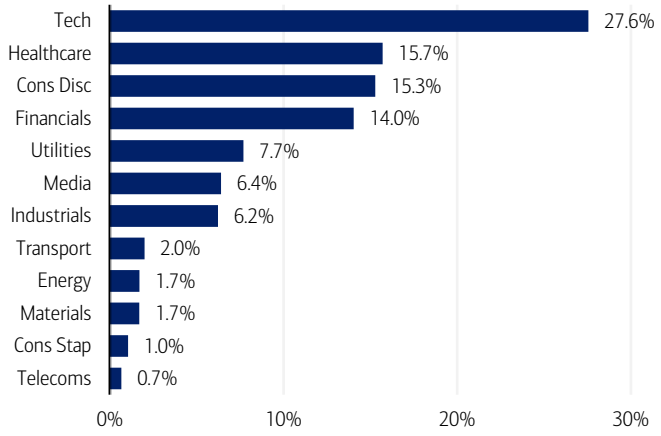
Exhibit 40: US sector breakdown
...while US top sectors are tech, healthcare, and consumer discretionary



Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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From a historical perspective, we can see that certain sectors stand out in the global market as represented here by the ICE BofA G300 Global index (Exhibit 41). Consumer discretionary and financial converts were prominent during the early to mid-2000s while consumer staples made up essentially 0% of the market. During the tech-boom, the tech and telecoms sectors together made up nearly one quarter of the market. Financials peaked in 2008, comprising roughly 25% of total market value.

Exhibit 41: Global (G300) sector allocation over time
Tech, consumer discretionary, and financials have consistently been among the most prominent CB sectors globally

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Tech	16%	18%	16%	17%	16%	16%	17%	20%	21%	19%	19%	20%	18%	20%	25%	25%	24%	23%	24%	28%	27%	24%	22%	23%	24%
Cons Disc	9%	10%	13%	13%	13%	12%	11%	10%	8%	10%	11%	11%	13%	13%	11%	10%	9%	10%	10%	9%	17%	15%	15%	14%	15%
Financials	20%	15%	14%	15%	16%	19%	19%	16%	25%	20%	19%	19%	20%	20%	22%	20%	18%	19%	17%	16%	12%	15%	14%	14%	14%
Healthcare	6%	6%	8%	8%	9%	11%	12%	12%	13%	11%	11%	11%	13%	12%	14%	13%	12%	12%	12%	12%	12%	13%	13%	12%	12%
Industrials	9%	9%	10%	11%	12%	11%	10%	6%	5%	6%	6%	7%	7%	9%	8%	8%	9%	9%	8%	9%	9%	6%	7%	8%	8%
Utilities	7%	6%	7%	6%	6%	4%	3%	3%	2%	1%	1%	2%	1%	1%	2%	4%	3%	4%	5%	3%	3%	4%	6%	7%	7%
Media	6%	5%	6%	6%	5%	6%	5%	4%	3%	3%	2%	3%	2%	2%	1%	2%	3%	3%	3%	5%	7%	8%	8%	6%	6%
Transport	2%	2%	2%	2%	2%	2%	3%	2%	3%	3%	3%	2%	2%	2%	3%	3%	4%	3%	3%	2%	4%	4%	4%	5%	5%
Materials	8%	6%	5%	4%	4%	6%	5%	6%	6%	10%	10%	7%	7%	7%	4%	3%	4%	4%	5%	6%	4%	5%	4%	4%	4%
Energy	5%	5%	5%	4%	5%	6%	7%	11%	6%	8%	7%	8%	7%	8%	6%	6%	8%	5%	5%	4%	4%	4%	4%	3%	3%
Cons Stap	2%	3%	3%	2%	2%	1%	1%	2%	3%	3%	4%	4%	3%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%	2%	2%
Telecoms	10%	14%	12%	12%	11%	8%	7%	8%	6%	6%	5%	6%	7%	3%	2%	4%	4%	5%	5%	5%	1%	2%	3%	2%	1%

Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

BofA GLOBAL RESEARCH

In the US, we see similar sector trends as technology, healthcare, and financials stand out over time. In the mid-2000s, distribution across sectors was relatively even—tech had the largest share with about 20-25%, but it was followed closely by financials with about 10-15%. As seen in Exhibit 42, during the tech boom around 2000, the tech allocation ballooned to over 25% of the US market while other sectors such as consumer staples and transportation shrank to nearly 1%. Then when tech sector volume cooled a bit during the mid- to late-2000s, financials took over as the sector with the largest market share. Today, the tech sector is once again dominant, representing 28% of the US market value, while healthcare and consumer are next with 16% and 15% shares.

Exhibit 42: US sector allocation over time
Similar to the global market, in the US CB space tech and healthcare have historically been dominant, though more recently consumer discretionary has risen

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Tech	27%	26%	21%	22%	18%	16%	17%	19%	18%	20%	20%	22%	23%	27%	30%	32%	34%	35%	35%	36%	30%	30%	25%	27%	28%
Healthcare	15%	14%	16%	15%	16%	18%	19%	19%	23%	19%	18%	16%	17%	18%	19%	20%	16%	17%	17%	18%	16%	17%	19%	15%	16%
Cons Disc	5%	10%	14%	14%	14%	12%	12%	9%	6%	9%	11%	10%	11%	9%	9%	7%	3%	6%	7%	8%	19%	14%	13%	16%	15%
Financials	8%	10%	13%	14%	15%	20%	21%	20%	24%	20%	20%	22%	19%	19%	18%	16%	15%	18%	15%	13%	9%	13%	13%	14%	14%
Utilities	5%	5%	4%	5%	5%	3%	2%	2%	2%	1%	2%	3%	3%	2%	4%	3%	5%	4%	4%	6%	5%	6%	8%	8%	8%
Media	7%	8%	6%	6%	6%	6%	6%	4%	3%	2%	2%	3%	3%	2%	2%	2%	4%	5%	5%	7%	9%	8%	8%	6%	6%
Industrials	4%	6%	7%	7%	7%	7%	6%	5%	4%	5%	5%	5%	5%	5%	4%	5%	5%	5%	5%	5%	6%	4%	6%	6%	6%
Transport	1%	1%	1%	1%	2%	2%	2%	2%	1%	2%	2%	1%	2%	2%	2%	1%	0%	1%	1%	1%	2%	2%	2%	2%	2%
Energy	10%	6%	7%	6%	7%	8%	7%	10%	9%	9%	9%	8%	8%	8%	6%	5%	8%	5%	6%	2%	2%	2%	3%	2%	2%
Materials	3%	3%	3%	3%	5%	4%	2%	5%	4%	6%	5%	5%	5%	4%	3%	1%	2%	2%	2%	1%	1%	1%	1%	2%	2%
Cons Stap	1%	1%	2%	1%	1%	0%	1%	2%	3%	3%	3%	3%	2%	2%	2%	3%	2%	1%	2%	1%	0%	1%	1%	1%	1%
Telecoms	13%	8%	6%	5%	4%	4%	4%	3%	3%	3%	2%	2%	3%	2%	2%	4%	4%	2%	3%	2%	1%	2%	2%	1%	1%

Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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Though larger-cap issuers lead, a large portion of CB issuers are mid-cap

When looking at company size as defined by equity market cap, most global CBs, as represented by the ICE BofA G300 index, fall within the $10+ billion range (53%). The second largest bucket is $2bn-10bn (36%). However, this large divergence is mainly attributable to the fact that larger companies generally offer larger CBs. If we were to instead measure by the absolute number of issues, mid-caps lead, followed by large- and then small-caps (Exhibit 43). The US breakdown by equity market cap looks very similar to the global breakdown when comparing by market value. Approximately 16% of all US issuers (by market value) fall into our $0-2bn bucket, and about 48% are in the $10bn+ bucket. However, by issue count the US mid-cap bucket is the largest with 172 issues.

Exhibit 43: Equity market cap breakdown
Large-cap issuers, as defined as those with $10bn+ market cap, are the largest component of the CB market by market value, though mid-caps lead by issue count

		Global			US			Europe			Asia			Japan		
Bucket	**Size**	**Count**	**Mkt Val**	**Pct**	**Count**	**Mkt Val**	**Pct**	**Count**	**Mkt Val**	**Pct**	**Count**	**Mkt Val**	**Pct**	**Count**	**Mkt Val**	**Pct**
Small	$0-2bn	71	19	11%	148	37	16%	22	4	6%	18	4	11%	20	3	18%
Mid	$2-10bn	136	64	36%	172	86	36%	59	28	45%	28	9	24%	25	7	42%
Large	$10bn+	93	95	53%	103	115	48%	42	30	49%	28	24	65%	7	6	39%
Total		300	179	100%	423	238	100%	123	62	100%	74	37	100%	52	16	100%

Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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Amid the 2022 selloff, low-delta "yield-like" names have become dominant

Looking at investment objective profiles, globally the market is skewed toward low-delta (0-40%) yield alternatives (about 61% of the global market). This is a relatively new feature of the modern converts space—pre the 2022 selloff, the market was concentrated in mid-delta "balanced" names and higher delta equity alternatives, especially in the US and Asia. However, the weakness in 2021's new deals has shifted the landscape as now many names trade below par and near their bond floors—this has attracted new distressed and high yield credit investors to the space. Regardless, Japan and the US still have the highest portion of equity-like, high-delta names, though note Japan's total market size remains quite small (Exhibit 44).

Exhibit 44: Investment objective breakdown
In the past three years, the global CB market has become much more "yield-like" as a sizable portion of 2021's new deals trade well-below par near their bond floors

		Global			US			Europe			Asia			Japan		
Bucket	**Delta**	**Count**	**Mkt Val**	**Pct**	**Count**	**Mkt Val**	**Pct**	**Count**	**Mkt Val**	**Pct**	**Count**	**Mkt Val**	**Pct**	**Count**	**Mkt Val**	**Pct**
Yld Alt	0-40%	194	109	61%	266	132	55%	91	43	68%	55	25	67%	29	7	43%
Rtn Alt	40%-80%	80	49	27%	120	72	30%	26	16	25%	15	9	25%	14	3	20%
Eqty Alt	80%-100%	26	21	12%	37	34	14%	6	4	7%	4	3	9%	9	6	37%
Total		300	179	100%	423	238	100%	123	62	100%	74	37	100%	52	16	100%

Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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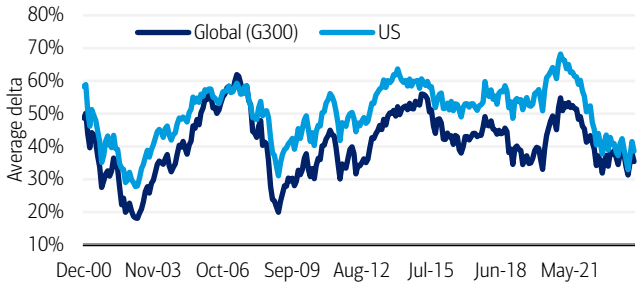
We also see this shift reflected in average deltas and conversion premiums—deltas remain low versus history while premiums have widened (Exhibit 45 and Exhibit 46).

Exhibit 45: Global (G300) and US average delta
In light of 2022's selloff, average CB deltas have declined off all-time highs...



Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.
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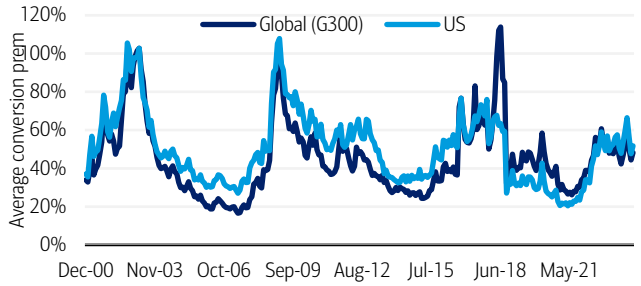
Exhibit 46: Global (G300) and US average conversion premium
...while CB conversion premiums have widened from their near-record lows



Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.
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Coupon bonds dominate the market, though zero-coupon CBs remain prominent

As we review above in the "Convertible structures" section, there are a variety of structures issuers choose from when issuing converts. Here, we combine all of the structures into five basic categories: traditional coupon bonds, zero coupon bonds, preferreds, mandatories, and other. Traditional bond-like converts dominate the overall market as they make up about 72% of the ICE BofA G300 Global Convertibles index (Exhibit 47). Following bond-like converts are zeroes, which total about 24%, preferreds, which total 3%, and mandatories, which total 2%. As of year-end 2022, mandatories were still quite prevalent, particularly in the US market (about 10% then), though they've dwindled over the past two years amid high borrowing costs and little M&A activity.

In the US, we see a similar distribution of structures, but zeroes play a smaller role (however, more recently they have become more prevalent after the wave of aggressively-priced new deals in 2021, many of which paid no coupon). Traditional bond structures dominate (79% of the market), and they are followed by zeroes (15%). Non-mandatory and mandatory preferreds are much smaller at just 4% and 2%, respectively.

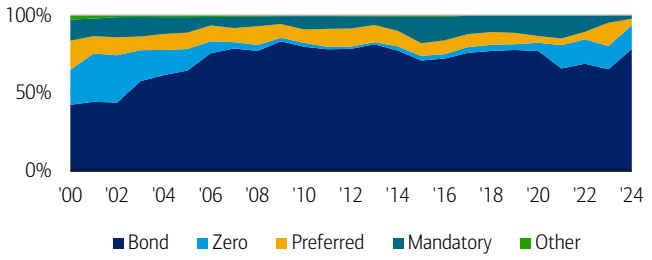
Historically, we've seen a large shift towards straight bond-like converts in the US. As mentioned earlier, today's US converts market contains about 94% structured like either coupon-bearing bonds or zeroes. However, until 2003, less than half the convert market had bond-like structures—issuers used preferreds almost as much as bonds. Additionally, we note that from 2015 to 2016, mandatories had made a strong resurgence and were near all-time highs relative to the entire US market based on market value (Exhibit 48). Outside the US, we've seen a marked pickup of zero-coupon converts, most notably in Europe where in 2016 only 20% of the market was zeroes versus today's 28%. Zero or even negative yielding CBs had become popular in Europe amid record central bank easing post-GFC, but that dynamic has shifted as rates picked up meaningfully in 2022.

Exhibit 47: Convertible bond market structure breakdown
Traditional bond-like structures dominate today's market, followed by zeroes

	Global	US	Europe	Asia	Japan
Bond	72%	79%	69%	69%	1%
Zero	24%	15%	28%	31%	99%
Preferred	3%	4%	0%	0%	0%
Mandatory	2%	2%	3%	0%	0%
Other	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%

Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.
BofA GLOBAL RESEARCH

Exhibit 48: US convert structures over time
Historically, the US market used a wider variety of structures



Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.
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Global market characteristics summarization

The tables below summarize historical characteristic data for each of the global markets as represented by their respective ICE BofA indices: Global (VG00), US (VXA0), Europe (VE00), Asia ex-Japan (VASI), Japan Domestic (VJDM), and Japan Euro (VJEU).

Exhibit 49: Global market characteristic snapshot (VG00)
Global CB historical market snapshot

	Current	YE 2023	YE 2022	YE 2021	YE 2020	YE 2013
Mkt Val ($bn)	178.7	181.2	162.7	195.8	210.1	176.5
Issues	300	300	300	300	300	300
Curr Yield	1.7%	1.6%	1.3%	1.1%	1.1%	2.4%
Conv Prem	48.2%	44.4%	55.3%	35.0%	28.6%	28.2%
Inv Val Prem	15.5%	18.2%	15.5%	28.2%	43.5%	30.7%
Delta	35.4%	38.0%	34.0%	45.4%	54.8%	51.0%
Imp Vol	42.9%	46.2%	48.3%	42.0%	40.5%	35.9%
Duration	2.1	2.0	2.5	2.5	2.2	1.6

Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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Exhibit 50: US market characteristic snapshot (VXA0)
US CB historical market snapshot

	Current	YE 2023	YE 2022	YE 2021	YE 2020	YE 2013
Mkt Val ($bn)	238.4	244.6	238.0	340.9	351.0	211.0
Issues	423	429	497	538	499	493
Curr Yield	2.0%	2.0%	2.1%	1.7%	1.7%	2.8%
Conv Prem	51.8%	47.7%	56.9%	28.6%	20.5%	34.1%
Inv Val Prem	19.5%	23.4%	18.0%	38.6%	72.3%	80.9%
Delta	38.6%	41.5%	38.9%	55.3%	68.2%	61.9%
Imp Vol	48.1%	50.9%	48.8%	42.8%	38.9%	42.5%
Duration	2.1	2.0	2.4	2.0	1.7	1.8

Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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Exhibit 51: Europe market characteristic snapshot (VE00)
Europe CB historical market snapshot

	Current	YE 2023	YE 2022	YE 2021	YE 2020	YE 2013
Mkt Val ($bn)	62.3	64.5	64.9	87.9	88.7	100.0
Issues	123	124	140	153	149	184
Curr Yield	1.4%	1.3%	1.0%	0.8%	0.6%	2.7%
Conv Prem	59.7%	55.9%	60.1%	40.1%	37.9%	34.6%
Inv Val Prem	8.3%	9.1%	9.2%	15.9%	21.5%	26.6%
Delta	28.8%	30.3%	27.8%	38.5%	43.7%	40.0%
Imp Vol	30.6%	31.1%	34.9%	35.9%	40.2%	38.8%
Duration	2.0	2.0	2.0	2.2	2.0	1.2

Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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Exhibit 52: Asia-ex Japan market characteristic snapshot (VASI)
Asia-ex Japan CB historical market snapshot

	Current	YE 2023	YE 2022	YE 2021	YE 2020	YE 2013
Mkt Val ($bn)	37.2	40.3	39.9	53.1	53.8	35.7
Issues	74	78	85	91	71	123
Curr Yield	1.8%	1.7%	1.3%	0.9%	0.9%	1.8%
Conv Prem	75.5%	60.1%	72.7%	51.1%	20.1%	52.6%
Inv Val Prem	6.7%	11.4%	5.0%	15.8%	68.3%	5.3%
Delta	28.3%	33.9%	24.4%	36.1%	65.3%	20.4%
Imp Vol	28.3%	39.8%	37.0%	36.4%	36.3%	35.9%
Duration	1.4	1.2	1.5	1.8	1.0	1.2

Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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Exhibit 53: Japan Domestic market characteristic snapshot (VJDM)
Japan Domestic CB historical market snapshot

	Current	YE 2023	YE 2022	YE 2021	YE 2020	YE 2013
Mkt Val ($bn)	--	--	0.1	0.9	1.3	1.8
Issues	0	0	1	3	3	7
Curr Yield	--	--	0.0%	0.0%	0.0%	0.1%
Conv Prem	--	--	11.2%	1.7%	6.4%	14.6%
Inv Val Prem	--	--	0.7%	117.6%	70.9%	23.5%
Delta	--	--	9.5%	87.1%	81.5%	49.7%
Imp Vol	--	--	13.7%	84.1%	56.0%	27.4%
Duration	--	--	0.5	0.2	0.0	0.4

Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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Exhibit 54: Japan Euro market characteristic snapshot (VJEU)
Japan Euro CB historical market snapshot

	Current	YE 2023	YE 2022	YE 2021	YE 2020	YE 2013
Mkt Val ($bn)	16.1	14.5	13.3	18.6	13.7	16.2
Issues	52	49	49	58	44	60
Curr Yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Conv Prem	20.9%	23.3%	34.8%	41.8%	48.7%	20.6%
Inv Val Prem	22.5%	18.9%	11.8%	12.2%	8.5%	29.3%
Delta	50.9%	47.1%	31.5%	29.3%	25.5%	57.9%
Imp Vol	37.1%	32.4%	38.0%	42.4%	34.0%	33.6%
Duration	1.4	1.4	1.5	1.7	1.6	1.2

Source: BofA Global Research, ICE Data Indices, LLC. Data as of 31-Jan-2024.

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Appendix

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Appendix 1: Convertibles glossary

Breakeven: Breakeven is synonymous with payback (see below).

Calls and call protection: Most bond issuers retain the right to redeem their bonds before the maturity date. This is known as a call. However, most bonds have call protection for a period of time. This call protection enhances the convertible's attractiveness because it ensures that the income advantage the convertible offers over the common stock may be enjoyed for a definite period of time.

Issuers usually redeem convertibles in order to force conversion into their underlying stock. For this to occur, parity must be well above the call price. If the underlying stock advances rapidly, and the issue is immediately callable, a convertible may be called before its income advantage has kicked in. Issuers also call convertibles when they have an opportunity to refinance at a lower interest cost.

Call protection usually takes one of two forms: (1) unconditional call protection where the issue cannot be called prior to a certain date or (2) conditional call protection where an issue cannot be called before a certain date unless certain conditions have been met, usually the underlying stock must trade at a premium for a specified period. Generally, this is 130% (or some multiple) of the conversion price. The period of unconditional call protection is also known as the "Hard No Call" period.

Conversion premium: The excess of the convertible's price above parity, usually expressed as a percentage.

$$\text{Conversion Premium} = \frac{\text{Convertible Price - Parity}}{\text{Parity}}$$

where parity is calculated as

$$\text{Parity} = \text{Conversion Ratio} \times \text{Current Stock Price}$$

Conversion price: Set at issue, the conversion price may be calculated as follows:

$$\text{Conversion Price} = \frac{\text{Par Value}}{\text{Conversion Ratio}}$$

Conversion ratio: Also set at issue, the number of shares into which each bond may be converted.

Convertible price: Recent price of the convertible security (usually the offer price for convertibles that traded on the day of the data capture). For illiquid issues or issues with large bid / offer spreads, a mid-price is used.

Coupon: Nominal income rate for convertible, expressed as a percent of par. We use the term “coupon” generically to refer to both bond coupons and preferred dividends.

Current yield: The annual convertible bond coupon divided by the current price.

Investment value: Also known as the bond floor, the level at which a straight bond with the same maturity and credit risk would trade. Investment value effectively provides a "floor" for the price of the convertible if it loses all its equity content and trades as a fixed income instrument.

Investment value premium: The premium of the convertible price above investment value, expressed as a percentage.

Issue: Convertible bonds are known by the name of the issuer, the coupon and the maturity date, e.g., Ford 4.25% 2/15/2036. Issuers may have a number of different issues outstanding.

Issuer: The company name under which the security trades. As some bonds can be exchanged into shares of different entities, the issuer name is not always the same as the underlying security name.

Market cap: We use the term "market cap" to refer to the current total equity market capitalization for the underlying stock. We usually express the figure in millions of dollars.

Parity: Also known as conversion value

$$\text{Parity} = \text{Conversion Ratio} \times \text{Current Stock Price}$$

Payback: The number of years it takes for the convertible's income advantage to offset the premium paid. In other words, payback is the premium recovery period. Although payback calculations give no credit to the time value of money, payback is still commonly used as a valuation benchmark. There are two methods of calculation:

$$\text{(1) Traditional Payback} = \frac{\frac{\%\ \text{Premium}}{1 + \%\ \text{Premium}}}{\text{Cvt Current Yield} - \frac{\text{Stock Div Yield}}{1 + \%\ \text{Premium}}}$$

where % premium is the conversion premium expressed in decimal form.

$$\text{(2) Dollar for Dollar Payback} = \frac{\frac{\%\ \text{Premium}}{1 + \%\ \text{Premium}}}{\text{Cvt Current Yield} - \text{Stock Div Yield}}$$

We use the dollar-for-dollar method in all of our research reports.

Percent cheap (rich): Percent cheap is the observed price's discount to theoretical value. Theoretical value is a result from our arbitrage model, which assesses the convertible as a sum of its parts: the embedded option(s) plus the income portion. Among the assumptions used is realized underlying stock volatility, on which we impose fairly conservative issuer-specific caps, and a credit spread, which we estimate based on implied or actual credit rating from a spread matrix built on straight-bond index option-adjusted spread (OAS) values.

Screw clause: A prospectus provision in which a holder who voluntarily converts into common shares before the first call date forfeits income accrued since the last payment.

Share price: Bid price of the underlying security into which the convertible is exchangeable.

Stock dividend yield: The annual yield on the common stock, i.e. the annual gross dividend / stock price.

Yield to put and call: The gross redemption yields that are calculated to the date of the earliest put or call.

Yield advantage: Yield advantage is the simple difference between convertible current yield and stock dividend yield.

Yield to maturity: YTM on any security is computed by determining the interest rate that will make the present value of the cash flow from the security equal to its price. Mathematically, the yield on any security y is the interest rate that will make the following relationship hold:

$$P = C_1 / (1+y)^1 + C_2 / (1+y)^2 + C_3 / (1+y)^3 + \ldots\ldots + C_N / (1+y)^N$$

where

- P = price
- C_t = cash flow in period t
- N = Number of periods

Solving for the yield (y) is an iterative procedure. The objective is to find the interest rate that will make the present value of the cash flows equal to the price.

Appendix 2: Convertible sensitivity measures

Delta: A measure of equity sensitivity showing the relationship between a *percent* change in stock price and corresponding expected *percent* change in convertible price; it is also known as price elasticity:

$$\text{Delta} = \frac{\%\ \text{Change in Convert Price}}{\%\ \text{Change in Parity}}$$

$$= \frac{C_2 - C_1}{C_1} * \frac{P_1}{P_2 - P_1}$$

$$= \text{Parity Delta} * \frac{P_1}{C_1}$$

$$= \text{Parity Delta} * \frac{P_1}{P_1 * (1 + \text{Conv Prem})}$$

$$= \text{Parity Delta} * \frac{1}{1 + \text{Conv Prem}}$$

$$= \frac{\text{Parity Delta}}{1 + \text{Conv Prem}}$$

where

- C_1 and C_2 are beginning and ending convertible prices
- P_1 and P_2 are beginning and ending underlying parity values
- $C = P * (1 + \text{Conv Prem})$

So mathematically, delta can be expressed as the parity delta adjusted for the amount of conversion premium paid, when purchasing a convertible:

$$\text{Delta} = \text{Parity Delta} / (1 + \text{Conversion Premium (in \%)})$$

The relationship between conversion premium and delta is therefore inverse, meaning high conversion premiums equate to low deltas.

Gamma: This measures the rate of change of delta with respect to the underlying asset or parity. If gamma is small, delta changes very slowly, and adjustments to keep a convertible position delta neutral need only be made at relatively infrequent intervals. However, if gamma is large in absolute terms, delta is highly sensitive to movements in parity. For the mathematically inclined, gamma is a measure of convexity and is the second derivative with respect to the underlying asset.

Interest rate vega: The change in price of a convertible with respect to a 1% change in the volatility of interest rates.

Parity delta: By its very nature the price of a convertible is sensitive to movements in the underlying equity. Parity delta is a measure of equity sensitivity showing the relationship between a *points* change in conversion parity and corresponding expected *point* change in convertible price. It is the slope of the curve that relates the convertible security price to its parity. More formally parity delta is the first derivative with respect to the underlying security:

$$\text{Parity Delta} = \frac{\text{dConvert Price}}{\text{dParity}} = \frac{C_2 - C_1}{P_2 - P_1}$$

where

- C_1 and C_2 are beginning and ending convertible prices
- P_1 and P_2 are beginning and ending underlying parity values.

Alternatively, parity delta can be expressed as:

Parity Delta = points change in convertible price / 1 point change in parity

Rho: Also known as bond delta, this is the correlation of movements between the convertible price and interest rates.

Stock vega: The change in price of a convertible with respect to a 1% change in the volatility of the underlying stock.

PRIDES-type mandatory preferreds glossary

Conversion premium: The percentage difference between the PRIDES price and conversion value.

$$\text{Conversion Premium} = \frac{\text{PRIDES Price}}{\text{(Stock Price x Min Conv Ratio)}} - 1$$

Conversion value:

$$\text{Conversion Value} = \text{Stock Price x Min Conv Ratio}$$

It is important to note that this value calculation uses the lowest conversion ratio (usually in the range 0.80-0.85). The actual conversion ratio could be as high as 1 depending on the common stock price at maturity.

Conversion price: PRIDES are convertible into common stock at a premium price. The conversion price can be calculated as follows:

$$\text{Conversion Price} = \frac{\text{PRIDES Price}}{\text{Minimum Conversion Ratio}}$$

Early redemption: After three years the company can call the PRIDES at pre-specified premiums to the issue price, plus accrued dividends (the call premium starts at one quarter's dividend and amortizes to zero over the fourth year). The PRIDES will convert into common shares equal in value to the call price, or the optional conversion ratio of shares, whichever is greater.

Mandatory conversion ratio: At maturity the PRIDES mandatorily converts into common stock. The number of shares received per PRIDES is determined by the stock price on the conversion date. There are three possibilities for the value of the PRIDES at maturity:

1. The common closes below the initial price. The PRIDES converts into one share of common.
2. The common closes between the initial price and the conversion price. The PRIDES converts into common according to a sliding scale designed to give the PRIDES holder common shares exactly equal in value to the initial issue price. The exact ratio is laid out in the prospectus but will be between 1 and the minimum ratio.
3. The common price exceeds the conversion price at maturity. The PRIDES converts into the optional conversion number of common shares.

Optional conversion ratio: The PRIDES holder has the right to convert into common stock at any time prior to the mandatory conversion date. A holder who converts early will receive the optional conversion ratio number of shares for each PRIDES share.

$$\text{Optional Conversion Ratio} = \frac{1}{(1 + \text{Initial Conv Prem})}$$

Appendix 3: Abbreviations

- ADR: American depository receipt
- AUM: Assets under management
- CB: Convertible bond
- Cvt: Convertible
- Div: Dividend
- ECB: European Central Bank
- EPS: Earnings per share
- ESG: Environmental, Social, and Governance
- ETF: Exchange-traded fund
- FASB: Financial Accounting Standards Board
- Fed: The Federal Reserve
- GDP: Gross domestic product
- GFC: Global Financial Crisis
- HF: Hedge fund
- HY: High yield
- IG: Investment grade
- LO: Long-only
- M&A: Mergers and acquisitions
- OAS: Option-adjusted spread
- OID: Original issue discount
- SEC: Securities and Exchange Commission
- Stdev: Standard deviation
- YTM: Yield to maturity
- YTW: Yield to worst

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