



Invesco Fixed Income White Paper Series

Structured convertibles: A custom portfolio solution

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In this paper, we highlight the positive attributes of structured convertibles that make them an attractive complement or alternative to the publically traded convertible securities market.

These attributes include:

- Expanded investment universe
- Opportunity to pair attractive credit and equity ideas
- Improved equity risk management
- Greater duration flexibility
- Targeted credit quality
- Enhanced liquidity

Robert Young, CFA
Head of International
Convertible Securities
Invesco Fixed Income

Introduction to traditional and structured convertibles

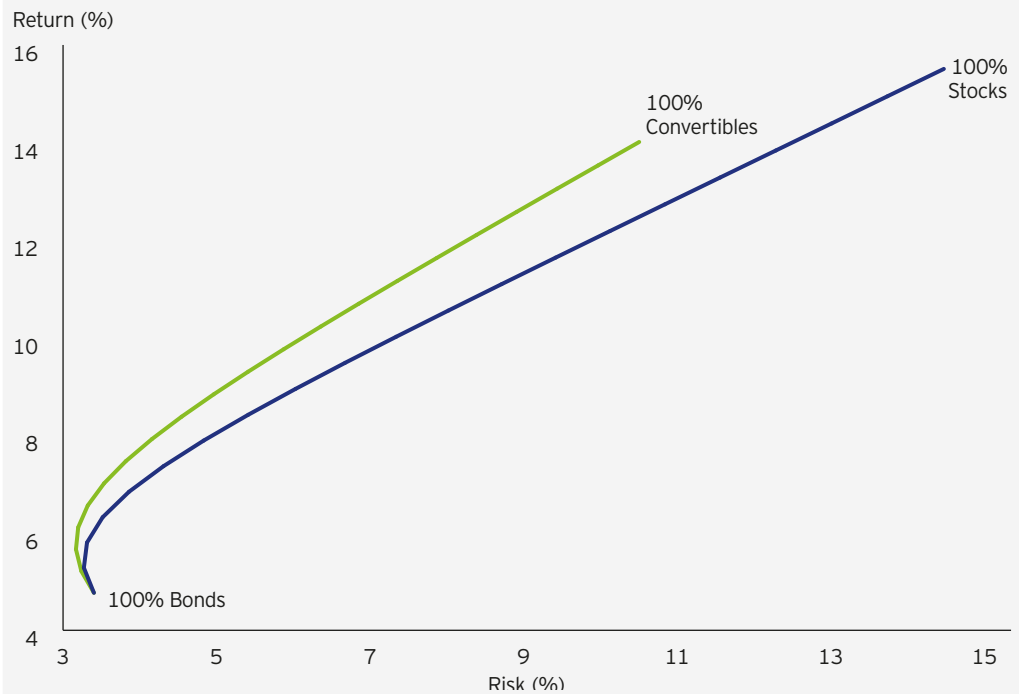
The convertible securities market is an often overlooked asset class, mainly due to its smaller size relative to other fixed income sectors. However, we believe convertible securities are powerful financial instruments that can provide unique benefits to investors not offered by traditional fixed income securities.

Convertible securities are hybrid investment vehicles that combine fixed income and equity characteristics in one security. The fixed income component of a convertible is similar to traditional debt – it has a fixed coupon and a stated maturity date. The equity portion of a convertible is designed as a stock option, providing an investor with exposure to movements in an underlying equity. Convertibles also provide access to equity volatility and equity convexity (a non-linear return profile), neither of which is offered by a traditional fixed income instrument.

As shown in the graph below, historically, including convertibles in a traditional bond portfolio has been beneficial to performance and performance volatility (risk) due to their low correlation to core fixed income strategies. The historical correlation of convertibles, as measured by the BofA Merrill Lynch All Convertibles All Qualities Index (the Convertible Index), to the Barclays Aggregate Index for the period December 2008 to June 2016, is notably low at -0.04.¹ During the same time period, average annual returns for the convertible Index were 13.4% compared to 4.5% for the Barclays Aggregate Index.²

We find that the inclusion of convertibles in a bond portfolio resulted in a positive shift of the “efficient frontier,” meaning that convertibles helped provide a higher return for a given level of overall risk, as reflected in the historical chart below (figure 1).

Figure 1: Efficient frontier: Inclusion of convertibles improved a portfolio's risk/return profile



Source: BofA Merrill Lynch Convertible Research. Data from Dec. 31, 2008 to June 30, 2016. Risk is measured as standard deviation of returns. Bonds: BofA Merrill Lynch US Corporate and Government Index, Convertibles: BofA Merrill Lynch Convertible Index, Stocks: S&P 500 Index.

Advantages of structured convertibles

Over the past decade, the convertible securities market has changed significantly. The universe of investment options has become smaller, more concentrated and less liquid than in the past, due to the large number of securities called, put or matured relative to the number of new issues brought to market.

Many convertible managers are required to invest exclusively in the public convertible market and face a challenge in choosing the most effective manner in which to include convertibles in their portfolios.

Structured convertibles can help overcome many of the current obstacles with traditional convertibles, while still preserving their investment advantages. On a macro level, structured convertibles are no different from publically traded convertibles in their design – they contain a fixed income component with a coupon and a maturity date and an equity component.

Unique to structured convertibles is their fully customizable nature. They contain a tailored risk/return profile, providing investors with a significantly expanded investing toolkit to use either at the security or broader portfolio level.

Advantage #1 - Expanded investment universe

Structured convertibles meaningfully expand the investing universe. A manager has the ability to customize the fixed income component by choosing from a wide array of securities across credit and duration spectrums. The scope of the expanded universe is limited only by the availability of traditional debt instruments in the marketplace.

This is equally valid for the equity component of the structure. There are thousands of equity securities outside the traditional convertible market that can be accessed with convertible structures. This includes many companies that would not likely issue convertible securities.

Traditional structured convertible design

The traditional approach to creating a structured convertible is to use the debt of a company which does not have a public convertible bond and pair it with the equity of the same company.

For example, a manager may have a very positive credit and equity opinion of a large pharmaceutical company (Company A). However, there is no way to gain convertible exposure to this view through a public convertible security, since one has not been issued. A customized convertible structure can be created to accomplish the manager's goals.

The manager can choose a debt instrument issued by Company A as the fixed income component for the structure, and combine it with a custom equity option strategy on Company A's stock. The resulting convertible structure would have a risk/return profile that is very similar to what a public convertible bond would look like if Company A had issued such a bond. Accomplishing this result through a structured convertible is even more powerful because the fixed income/equity mix can be designed to match the manager's views on each component in a way that would not be possible with a public security.



For illustrative purposes only. This does not constitute a recommendation of the suitability of any investment strategy for a particular investor. There can be no guarantee any investment will be successful.

Enhanced design

The flexibility of structured convertibles allows a manager to choose the fixed income and equity component from different companies. Rather than choose Company A debt and Company A equity, a different combination of issuers can be used, which expands a manager's investing options and allows for a more tailored portfolio.

A manager might have a favorable view of Company A's credit fundamentals, but thinks its equity is overvalued. However, the manager may have a very optimistic outlook for the equity of a completely unrelated construction company, Company B. To express this view, a structured convertible can be created that is similar in design to the traditional design. The manager can purchase a Company A bond and combine it with a customized options package on Company B stock. The manager will have created an equity linked note using Company A debt, which is not available in the public convertible market.

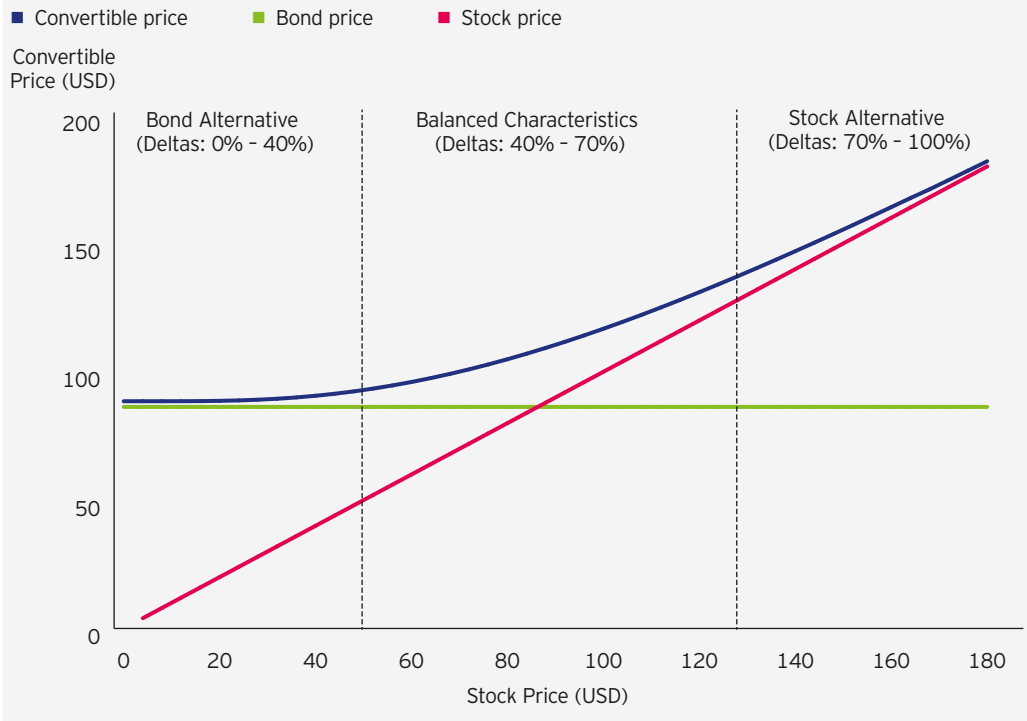


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Advantage #2 - Equity convexity - Managing delta and gamma

One of the more powerful attributes of convertible return profiles, especially relative to traditional fixed income, is equity convexity, which is a non-linear return profile, illustrated in the "balanced" portion of figure 2. The convexity is the result of the interaction between two concepts: delta and gamma.

Figure 2: Convertible bond valuation depiction



For illustrative purposes only.

Delta

Delta is an important component of convertible bond management. Delta is the sensitivity an option has to changes in the price of its underlying equity. Delta ranges from 0% on one end of the spectrum (no equity sensitivity – fixed income alternative) to 100% (full equity sensitivity – equity alternative) on the other.

This is shown in the valuation graph above, where, on the left hand side, a convertible, represented by the blue line, and the bond value of the convertible, represented by the green line, are almost identical in their sensitivity to the underlying stock price. There is no equity sensitivity (no delta) for a convertible in this part of the graph – as the stock price rises, the price of the convertible security changes very little.

Conversely, on the right hand side of the graph, the convertible price and its underlying equity value, the red line, are almost identical – again there is very little difference in price. Convertibles in this segment have high equity sensitivity (high delta) and their return profile is approximately linear (the price of the convertible bond rises almost one-for-one with the underlying equity price).

Both the fixed income and equity alternative profiles are already available through traditional fixed income and equity markets and are generally not of interest to a convertible investor. What makes convertibles unique is the ability to obtain a convex return profile in the “balanced portion” of the market – the segment in between the dashed lines.

Gamma

In the balanced portion of the valuation chart, a bond’s delta is not constant; it is always changing. This is due to a concept called gamma. Gamma measures the sensitivity and stability of delta. It represents the change in the delta of an option for a change in its underlying stock price. It is sometimes referred to as “the sensitivity of the equity sensitivity” or sometimes “the delta of the delta.”

Only in the balanced portion of the valuation graph is there any meaningful gamma exposure, which means delta can change rapidly. Therefore, as an underlying stock price rises, the convertible’s delta rises, and as an underlying stock price falls, its delta falls.

From a traditional fixed income investor's perspective, he or she is able to potentially enhance the return of his or her portfolio by including convertibles in this region, mainly by choosing bonds closer to the fixed income alternatives crossover point. The delta is initially lower, but there is a large amount of gamma. There is attractive upside opportunity because the delta exposure will typically grow quickly as the underlying stock price rises. However, convertibles in this region will not participate as much on the downside because the delta will usually drop quickly.

From an equity investor's perspective, risk in an equity portfolio can be reduced by purchasing bonds closer to the equity alternative area. If a stock price rises, the delta exposure in this segment allows them to participate in that upside to a large degree. However, the gamma in these positions will typically lower the equity exposure as a stock price falls.

Structured convertibles can be used to keep an overall portfolio within a desired delta spectrum, and to create or retain gamma, by adjusting the sensitivity and exposures of individual securities within the structures.

Advantage #3 - Tailored risk/return profile

In addition to the ability to expand the investing universe and target delta and gamma, structured convertibles can provide a manager with many tools to tailor the risk/return profile of a convertible on a security level:

Fixed income component

Customization of the fixed income component can take place in a variety of ways. A manager can target a specific duration profile and then use an appropriate fixed income security for the structure. This can range from a floating rate, short-duration security at one end of the spectrum, to a fixed rate, long-duration security on the other. Credit quality can also be targeted – such as high yield versus investment grade – or a capital structure view can be incorporated – such as junior versus senior debt. The convertible structure is adaptable to whatever fixed income instrument the manager chooses.

Equity component

Customization can also take place within the equity component. A manager can choose a favored stock, two stocks, a basket of stocks or an ETF to incorporate into the structure. Once the desired securities have been selected, an option strategy can be constructed to fit existing convictions.

Example: Modulate equity exposure

One of the advantages of customization within the equity component is the ability to modulate equity exposure. A manager may want to have more or less equity sensitivity in a security and can construct the equity option strategy of the structured convertible to match that view. The manager can layer in an appropriate degree of equity sensitivity for non-equity sensitive securities or can dampen equity exposure for securities whose performance may be too tilted toward underlying equity movements.

To illustrate this, we can use a Company XYZ convertible bond as an example. We assume that Company XYZ's stock price is well above the strike price of the bond's embedded equity option, which indicates the performance of the bond is substantially determined by movements in Company XYZ's stock price. This bond is considered to be an equity alternative and lacks the traditional balanced profile (fixed income and equity mix) that most managers look for in a convertible.

A potentially effective method to address the high equity sensitivity is to use the Company XYZ public convertible as an anchor for a structure, then include an offsetting equity option strategy to reduce the sensitivity. The amount of equity offset required through options can be tailored by the manager to match his or her outlook for Company XYZ's stock. The resulting structure is a customized, balanced security with reduced equity sensitivity.



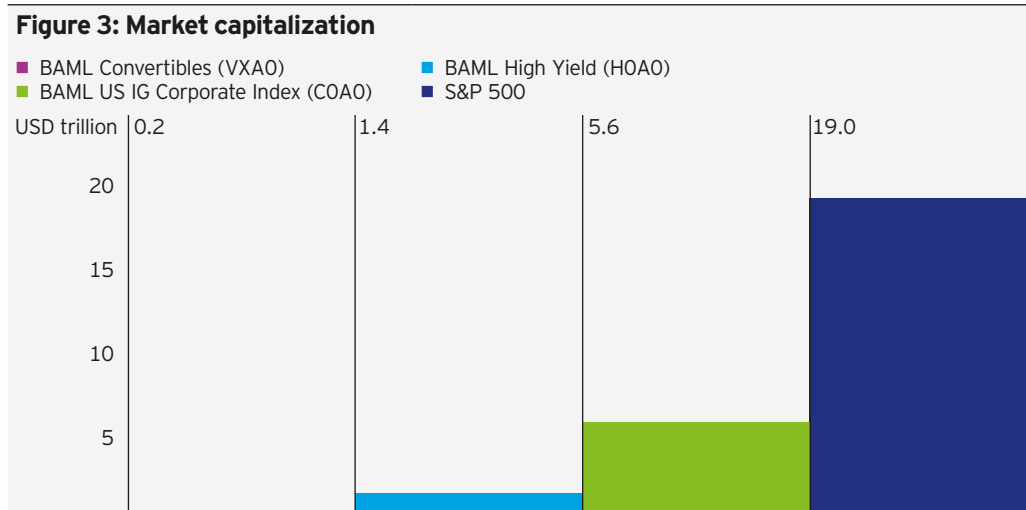
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Advantage #4 - More efficient replication of public convertibles

There are times when publically traded convertibles are trading rich to their theoretical value for reasons unique to the convertible market, such as low new issue supply. This is currently true for a large portion of the investment grade convertible bond universe. When managers have a favorable opinion of a public company's convertible bonds, they are often compelled to buy them, even if the bonds are trading rich, because there are no other viable options for the desired exposure. However, structured convertibles can allow a manager to re-create a similar profile by purchasing the same company's traditional debt and designing a custom equity option strategy for its stock. In this way, the manager can obtain a more fairly valued investment than what is available in the public market.

Advantage #5 - Liquidity

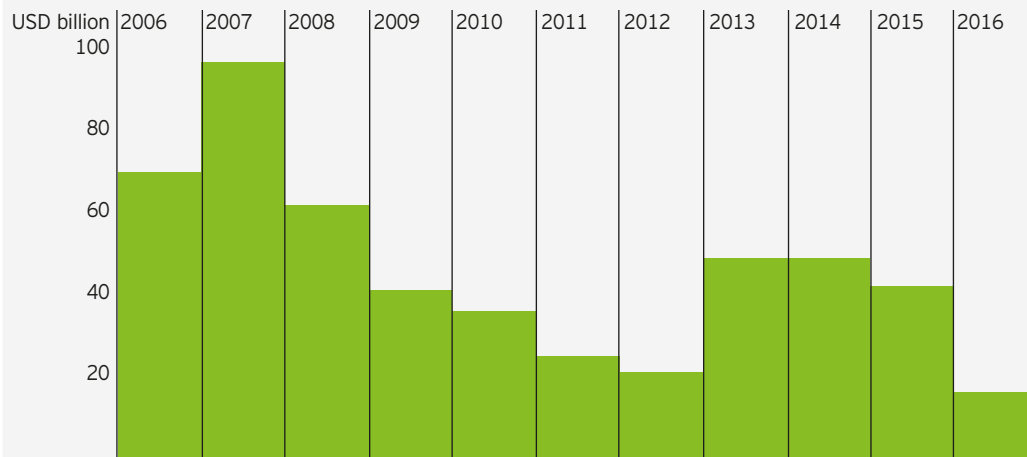
The public convertible market is much smaller than the traditional fixed income markets (market capitalization of USD0.2 trillion versus the market capitalization of USD19.4 trillion for the Barclays Aggregate Index)³ and therefore, liquidity at times can be challenging. The total size of the convertible market was USD170 billion as of the end of June 2016 (see figure 3 below). This compares to USD5.6 trillion for the US investment grade market and USD1.4 trillion for the high yield market.



Sources: BofA Merrill Lynch, Barclays and Bloomberg, as of June 30, 2016.

Structured convertibles allow investors to migrate out of the public convertible market to the broader and more liquid traditional debt and equity markets. This is especially important when the public market is in a contraction phase and new issuance in the convertible market is low, as is currently the case (see figure 4).

Figure 4: Convertible new issuance



Source: Barclays, Dec. 31, 2006 through June 30, 2016 (non-annualized).

It is important to highlight that there are some common misconceptions about the liquidity of structured convertibles. They are frequently confused with “synthetics” which are bank issued convertible-like securities and are very different from structured convertibles in their transparency and liquidity risks. While structures and synthetics share similar economic features, synthetics can realistically only be sold back to the originating bank, which can result in a major liquidity event, especially during periods of market stress.

Conversely, structured convertibles are very liquid, since the fixed income and equity pieces are held separately, and each maintains its own liquidity profile. If a structure is comprised of debt and equity of large, widely traded issuers, each can be sold separately and quickly in the deeper and more liquid traditional fixed income and equity markets. This can occur even during a market disruption event when public convertible bond liquidity can decline materially. Structured convertibles are, therefore, quite often much more liquid than public convertibles.

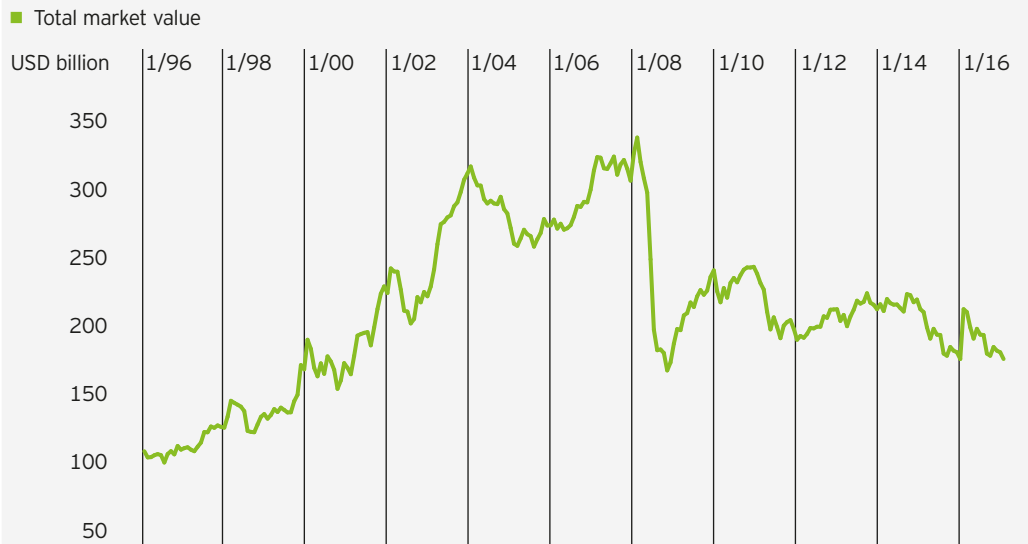
What are the primary challenges in the convertible market that structured convertibles can overcome?

Over the past eight years, and arguably much longer by some measures, the size of the publically traded convertible securities market has contracted meaningfully. As a result, convertible managers have faced a number of challenges, including a reduction in investment opportunities, an increased level of issuer concentration and limited sector exposures.

There are a variety of ways to measure the size and health of the convertible market, but all of the most commonly followed metrics began to show signs of deterioration in mid-2008.

The Convertible Index peaked in terms of market value in May 2008 at approximately USD333 billion. That compares to USD170 billion as of June 30, 2016, representing a 48.8% reduction in size (see figure 5 below). The market over this time has lost a large number of securities to investor puts, corporate calls, conversions, buybacks and maturities, with a lack of new supply to replace them. 2014 was the first year in the last seven years when the convertible market experienced positive net new issuance.

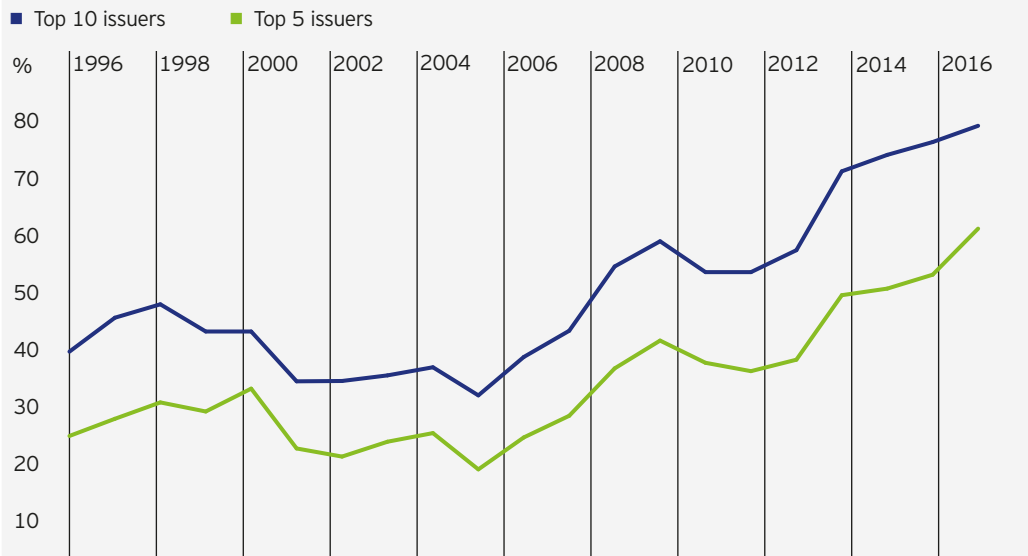
Figure 5: BofA Merrill Lynch All Convertibles All Qualities Index market value



Source: BofA Merrill Lynch, data from Jan. 1, 1996 to June 30, 2016.

A significant consequence of the reduction in the size of the asset class has been an increasing level of issuer concentration, particularly in the investment grade segment. In the investment grade universe, the largest five and largest ten issuer concentration levels have been growing materially as the market has become smaller. The investment grade bond market's concentration began to increase in 2005, and the market is now essentially comprised of just the top ten issuers. Remarkably, as of the end of June 2016, these issuers now make up more than 78% of the total market value of this portion of the market (see figure 6 below), rendering the traditional index definition nearly useless as a benchmark for measuring portfolio performance.

Figure 6: Issuer concentration of investment grade convertible universe



Source and date: BofA Merrill Lynch, 1996 to 2016. 2016 is as of June 30th. Index is BofA Merrill Lynch US Convertible Bonds-Investment Grade.

What is causing the contraction in the convertible market?

A combination of factors has caused the market to shrink over the past eight years. Most convertible bonds have a fairly short life in the marketplace, typically three-to-five years. Many bonds have an embedded put that allows investors to sell the securities back to the issuer at par if the price of the underlying stock drops. Frequently, there is also a corporate call that allows companies to call their bonds and force conversion into their underlying

stock if the stock price rises. Some convertible securities, called mandatorily convertible preferreds, are specifically designed with a short three-to- five-year maturity. With multiple securities naturally exiting the universe, new issues are needed to replace those that are leaving to maintain market size.

New issuance has not been sufficient to keep up with the securities leaving the universe from puts, calls and maturities. One of the primary causes of the lack of new issue activity is the low level of interest rates. However, in a higher interest rate environment, the lower financing costs associated with convertibles will likely be more attractive to issuers, which should lead to a greater use of the convertible market for capital-raising initiatives.

Conclusion

Including convertibles in traditional fixed income portfolios has, historically, led to a reduction in portfolio risk and an increase in return. Managers can custom design a tailored convertible profile rather than be limited by the public convertible market. Managers can use fixed income instruments that they believe will outperform, selecting the credit quality, industry and duration that meets their objectives. They can include attractive equity investments and custom design the equity option strategy that is most appropriate to meet the risk profile and return objectives of their portfolios.

Structured convertibles have demonstrated benefits during multiple historical time periods and offer a potential solution to overcoming the current challenges in the publically traded convertible market. They are highly versatile tools, are unique and underutilized in the marketplace, and, we believe, may help provide a portfolio manager with a competitive advantage.

1 Source: Invesco, data from Dec. 31, 2008 to June 30, 2016.

2 Source: Bloomberg L.P., data from Dec. 31, 2008 to June 30, 2016 average annual returns.

3 Source: BofA Merrill Lynch All Convertibles All Qualities Index, Barclays, June 30, 2016.

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