Convertible Securities
June 2017

ADVENT
Capital Management, LLC

Convertibles, Capturing the Upside with Meaningful Downside Protection

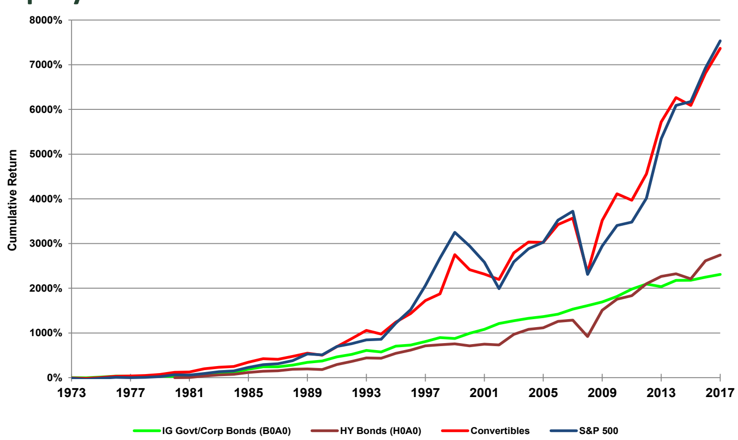
"In the first place, an ounce of prevention is worth a pound of cure." —*Benjamin Franklin (February 4, 1735)*

Before we begin in earnest, please consider the concept of firehouses. After a major fire in Boston in 1631, the first fire regulation, and subsequently the first public fire department, was established in North America. Since that time, the existence of publicly funded and paid fire departments has been an important part of our communities.

We are not aware of an occasion when American citizens have pushed back against the notion of paying for the protection a firehouse affords. Notwithstanding, in most cases, the firefighters and equipment remain idle a majority of the time. We suspect that most believe that this ounce of prevention is worth paying for, even when no smoke or fires are evident. We sleep well at night knowing there is a pound of cure at the ready.

Firehouses are to your community, what convertibles can be to your investment portfolio. They typically capture much of the equity market upside while providing downside protection, with substantially lower risk. In addition, they diversify portfolios while improving efficient frontiers. Yet, despite these potential benefits, they remain underappreciated and infrequently used. That stubborn fact persists. Why? Because, on a risk-adjusted basis convertibles offer superior returns. Over full market cycles, including the past 10 year equity bull market, convertibles have delivered equity-like returns, with lower risk, and a higher Sharpe Ratio than equities. This is not theory, there are decades of data supporting this assertion. Since 1973, through March 2017, convertibles have closely tracked the performance of the S&P 500, with lower risk. During that time, convertibles have also significantly outperformed more frequently used and better appreciated fixed income asset classes *(Exhibit 1).*

Exhibit 1:
Over the last 44 years, convertibles have generated equity-like returns[1]



Upside Participation

During the "Great Recession", beginning in 2007, domestic equity markets collapsed, bottomed, and have not looked back since the 2009 trough. The S&P 500 has risen practically unabated, from a low of 677 on March 9, 2009, to recent highs exceeding 2400.[2]

Reasonably, one might assume that convertible securities lagged equity performance over this time frame, given the defensive nature of the asset class. However, this assumption is incorrect. Since the

1 Source: Bank of America Merrill Lynch and, prior to June 1992, Ibbotson Associates. B0A0 is the Bank of America Merrill Lynch Corporate and Government Master Index. H0A0 is the Bank of America Merrill Lynch High Yield Master II Index. V0A0 is the Bank of America Merrill Lynch All U.S. Convertibles Index excluding Mandatories. From 1973 to 1981, the convertible proxy for these years, referenced in an Ibbotson Associates study, is based on returns of convertible bond mutual funds. From 1982 to 1987, the Ibbotson proxy for convertible performance is the First Boston Convertible Bond Index. From 1988 to present, we reference returns from the V0A0 index, as that benchmark's inception date was 12/31/87. Past performance is not a guarantee of future results. Please see disclosures at the end of this document.
2 Source: Bloomberg.

2009 market bottom, convertibles have demonstrated impressive upside market capture and have essentially matched the performance of the S&P 500. This improved asymmetry can be attributed to the significant positive structural transformation that has taken place. These structural enhancements include, but are not limited to, shorter maturities offering better downside protection and longer call protection offering better upside participation versus the underlying stock.

This upside capture is best illustrated when looking at the S&P 500 between January 1, 2009 and December 31, 2016 when its average annual return was 14.43%.[3] Over the same period, the Bank of America Merrill Lynch All US Convertible Index (VXAO) generated an average annual return of 13.63%.[4] Effectively, the VXA0 (convertibles) captured 95% of the performance of one of the most impressive equity bull markets in history. If the average annual performance dating back to January 1, 2007 (10 years) is considered, convertibles have captured 93% of the S&P 500's upside.

Given the downside protection inherent in the asset class, the risk-adjusted performance of convertibles versus equites is also important to consider. Over the past 10, 15 and 20 years, convertibles have generated returns in-line with equities, with a lower standard deviation and a higher Sharpe Ratio.[3] Over the prior 10 year equity bull market, convertibles had a standard deviation of 12.88% versus 15.28% for the S&P 500 and a Sharpe Ratio that exceeded the S&P 500.[3] While convertibles have demonstrated lower volatility than equities, they have also been uncorrelated to fixed income over the last 15 years as measured by the Barclays Capital U.S. Aggregate *(Exhibit 2)*. By including convertibles as part of a fixed income allocation, investors have historically received equity-like returns with diversification benefits. Yet, including convertibles as part of an equity allocation may also provide a more conservative, risk controlled exposure without sacrificing significant upside performance.

Exhibit 2: Convertibles have exhibited low correlation to multiple fixed income asset classes[5]

	VXA0	Barclays US Aggregate	BAML Corp/Govt Master	BAML Investment Grade	BAML Municipals	S&P 500
VXA0	1.0	0.08	0.15	0.46	0.18	0.87

Considering post-2008 equity market buoyancy, and current market levels, risk management considerations should be a more focused part of any investment regimen. In fact, almost all investors are familiar with the disclaimer required in any publicly traded prospectus: "Past performance does not guarantee future results." Regardless of whether one agrees that the next decade will not be identical to the last, the following discussion begins to explain why and how convertibles provide significant upside equity participation while, owing to the asymmetry of the asset class, also protect on the downside. If this buoyant market experiences a sudden loss of pressure, convertibles are likely to preserve more capital than their underlying common stock and may represent a prudent risk-managed approach to market exposure.

3 Source: Bloomberg.
4 Source: Bank of America Merrill Lynch. VXA0 is the Bank of America Merrill Lynch All U.S. Convertibles Index.
5 BAML Corp/Govt Master is the BofA Merrill Lynch Corporate / Government Master Index (B0A0), BAML Investment Grade is the BofA Merrill Lynch Corporate Master index (COAO), and BAML Municipals is the BofA Merrill Lynch Municipal Index (U0A0). Past performance is not a guarantee of future results.

Historically, during a full market cycle, convertibles have outperformed equities on a risk-adjusted basis. The exceptions have been rapidly rising equity movements over shorter periods of time.[6] Even when equity markets accelerate, convertibles participate, although not as sharply. Alternatively, in flat or moderately positive equity markets, convertible securities' upside equity capture is significant and enhanced by their relatively high income.

Structural Transformation and Downside Protection

The positive structural transformation that has occurred in the convertible market during the past decade has been significant. First and foremost, investors are surprised to learn that the convertible market is more liquid than the $1 trillion+ high yield bond market.[7] Dealers are able to more naturally hedge convertible positions, so sharp market corrections generally do not result in "offer-only" markets typically experienced in high yield market sell-offs. In terms of convertible structures, maturities are now typically 5-7 years, down from 25-30 years and, in our view, shorter maturities materially improve downside protection. Conversely, call protection has been extended from 2-3 years to 5-7 years (life of the security) with the longer protection enhancing upside participation versus the underlying equity. Significantly more equity participation is also available due to lower conversion premiums[8] at issue. These attributes, contributing to the market transformation, enhance the attractiveness of convertible securities. Some of these changes reduce volatility, while others improve equity upside participation. All are unique to convertible securities and can benefit the convertible investor by providing idiosyncratic return potential from a relatively uncrowded investment opportunity – evidenced by the sharp post-2008 rebound and high equity-like absolute returns generated during the same period.

In addition to capturing a large portion of the underlying equity market upside, convertibles also typically outperformed in equity market sell-offs, as the bond floor provided downside protection and the coupon helped to counter equity market depreciation. During the sharp market correction that spanned November 2007 to February 2009, convertibles also suffered a meaningful decline primarily attributable to the poor performance of the more than 200 overleveraged convertible arbitrage hedge funds. Today, however, the number of relevant convertible arbitrage hedge funds has declined sharply from a peak of over 200 to fewer than 20. In addition, prime brokers no longer provide the same levels of leverage to this dramatically smaller pool of convertible arbitrage hedge fund managers. The pronounced shift in convertible ownership from hedge funds to long-only investors has played another critically important role in the positive structural transformation of the post-2008 era.

While the S&P 500 dropped -50.88% and the VXA0 declined -40.48% between November 2007 and February 2009, the Advent Balanced and Phoenix Convertible Strategies outperformed both, returning -36.12% and -20.51% (net), respectively. Not only did convertibles outperform equities during this dramatic dislocation, but active management and security selection were also differentiators. Moreover, the time required to recover

6 From December 31, 1987 (inception of the VXA0 Index) through April 30, 2017, the BAML All US Convertibles Index (VXA0) returned 9.37% (annualized) with a standard deviation of 11.58%. For the same period, the S&P 500 returned 9.97% (annualized) with a standard deviation of 14.19%; and the Russell 2000 returned 9.93% (annualized) with a standard deviation of 18.50%.
7 Barclays Capital, US Convertibles Outlook 2017 "Ready for Takeoff," November 29, 2016.

from the drawdown is demonstrable evidence of our opening firehouse analogy. Convertibles recovered their high water mark in 20 months, providing a pound of cure, while domestic equities (S&P 500), required over 4 years to recover its high water mark.[9]

Market Volatility

As described above, convertibles have frequently captured equity market upside while they have also provided significant downside protection. Little protection has been required since the market bottom in 2009, and equity valuations are currently near all-time highs. Extended equity markets, interest rates on the rise and increased volatility have historically been environments conducive to convertible outperformance.

The Chicago Board Options Exchange Volatility Index ("VIX") was established to reflect a market estimate of future volatility *(Exhibit 3)*. Also known as the "fear index," the VIX has recently held to persistently low levels notwithstanding a recent six day span when it moved up 57%.[10] Typically, increased volatility portends a market top, or a market bottom.

Exhibit 3: VIX
Will it remain so low amidst global macro uncertainty?[10]

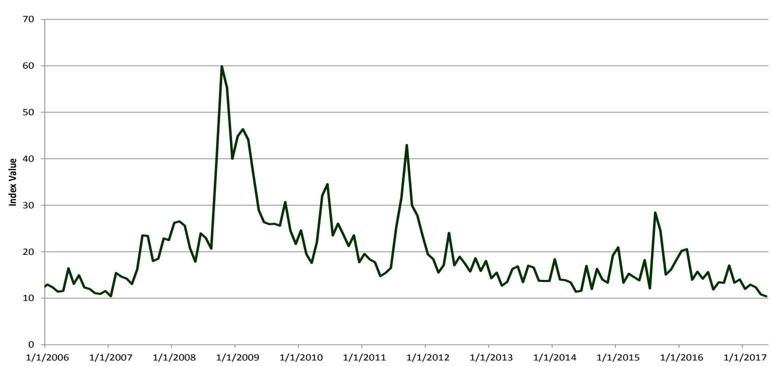
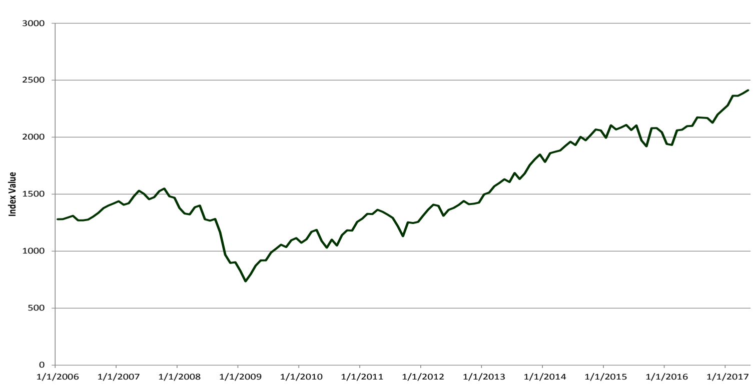


Exhibit 4: S&P 500 - How long will this bull market last?[10]



Considering the current S&P 500 levels *(Exhibit 4)*, the greatest current risks appear to be heavily skewed towards a downside scenario. Either way the market moves, recent price action of the VIX may be indicative of increased future volatility. If equity markets are at an inflection point, a convertible allocation is likely to provide an ounce of prevention in a diversified portfolio. When volatility rises above current historically low levels, the embedded option in convertible securities should also increase in value, thereby providing an opportunity to capitalize on the increased volatility.

Interest Rates

Eight years of global central bank stimulus has fueled markets to recent highs. Rational or not, global financial markets have been on a strong upward trajectory and the United States Federal Reserve Bank (Fed) has taken notice. Although the Fed already incrementally raised rates at the March and June 2017 Federal Open Market Committee meetings, Fed bankers have penciled in at least one additional rate hike into their 2017 forecasts. In *Exhibit 5*, we analyze how

9 Source: Advent, Bloomberg, Bank of America Merrill Lynch.
10 Source: Bloomberg.

convertibles have historically performed in various macroeconomic conditions. Should these prior trends and relationships hold, investors would be wise to carefully consider initiating or increasing their convertible allocations in order to diversify their traditional fixed income exposure.

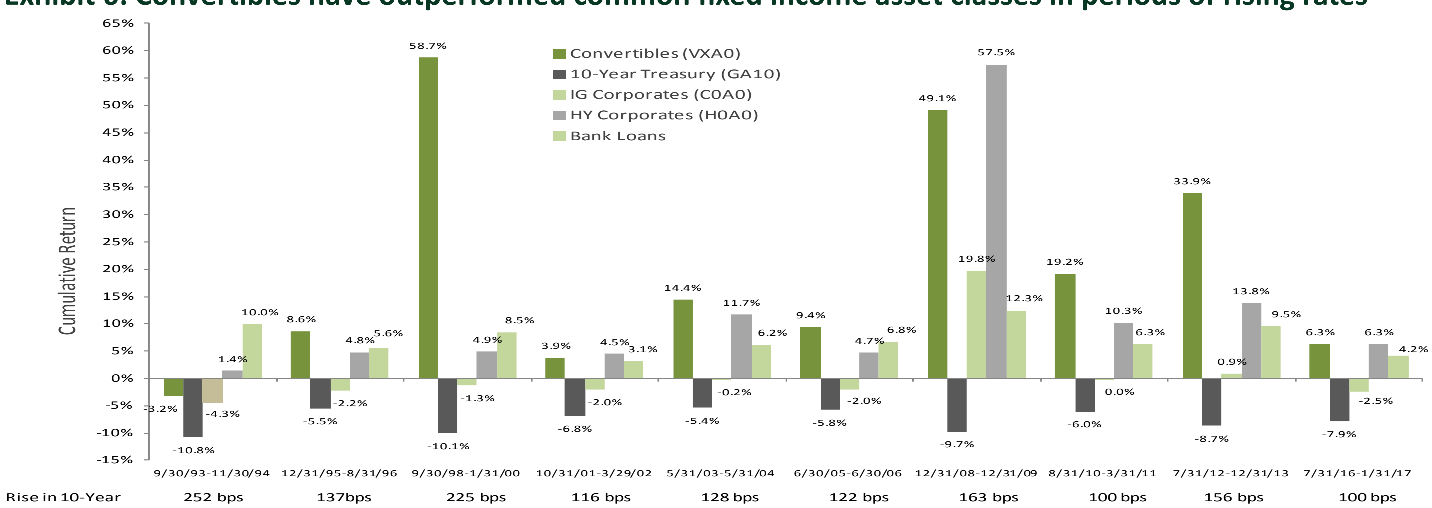
Exhibit 5: Median index performance by macro environment

Index Performance (Total Return)	Rising Inflation Breakevens	Rising 10yr US Treasury Yields	Rising 2yr Treasury Yields	Rising US Dollar	Rising Oil
S&P 500 Total Return (SPXT)	10.00%	8.20%	5.50%	6.70%	3.60%
BAML US Convertible Index (VXA0)	11.20%	8.80%	5.90%	5.90%	5.50%
BAML US Corp Master (C0A0)	1.80%	(0.20%)	0.00%	2.80%	2.00%
BAML US High Yield (H0A0)	7.60%	4.00%	2.90%	3.00%	2.40%

Source: Bloomberg, BofA Merrill Lynch, Federal Reserve Bank of St. Louis, Goldman Sachs Group Inc.
Rising Inflation Breakevens column includes all rolling 6-month periods from Aug-1998 through May-2017 during which 10yr US Breakeven Inflation rose by 25bps or more, which is roughly a top-quartile move.
Rising 10yr US Treasury Yields column includes all rolling 6-month periods from Jan-1990 through May-2017 during which 10yr US Treasury Yields rose by 30bps or more, which is roughly a top-quartile move.
Rising 2yr Treasury Yields column includes all rolling 6-month periods from Jan-1990 through May-2017 during which 2yr US Treasury Yields rose by 30bps or more, which is roughly a top-quartile move.
Rising US Dollar column includes all rolling 6-month periods from Jan-1990 through May-2017 during which the US Dollar Index (DXY) rose by 5% or more, which is roughly a top-quartile move.
Rising Oil column includes all rolling 6-month periods from Jan-1990 through May-2017 during which the West Texas Intermediate (WTI) Crude Oil prices 20% or more, which is roughly a top-quartile move.
Past performance is not a guarantee of future results.

In *Exhibit 6*, we illustrate how convertibles have outperformed other fixed income asset classes in periods of rising interest rates. In fact, when looking back to 1992 during periods when 10 year interest rates rose at least 100 basis points (9 such periods) convertibles outperformed all other fixed income securities 6 out of 9 times. There are several factors driving this outperformance. Rising rates historically accompany generally improving macroeconomic conditions, stronger corporate profits, and upward trending equity markets. As a result of strengthening equity markets, the embedded equity option appreciates and drives the relative outperformance of convertibles versus other common fixed income securities. Convertibles also benefit from having shorter duration relative to straight bonds, thereby reducing interest rate sensitivity.

Exhibit 6: Convertibles have outperformed common fixed income asset classes in periods of rising rates[11]



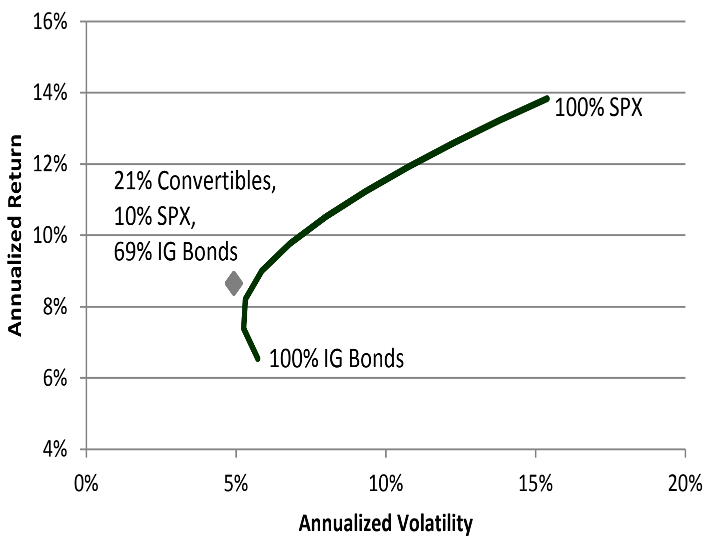
11 Sources: Bank of America Merrill Lynch Convertible Research; www.federalreserve.gov; Bloomberg, Credit Suisse. VXA0 is the Bank of America Merrill Lynch All U.S. Convertibles Index. GA10 is the Bank of America Merrill Lynch Current 10-Year U.S. Treasury Index. C0A0 is the Bank of America Merrill Lynch Corporate Master Index. H0A0 is the Bank of America Merrill Lynch High Yield Master II Index. Bank loan performance is represented by the Credit Suisse Institutional Leveraged Loan Index (CSILL). Periods of rising interest rates are defined as an increase in the 10-year Treasury Yield of 100 basis points (1%) or more. Information is shown for the periods since the inception of CSILL on January 1, 1992. Past performance is not a guarantee of future results. Please see the disclosures at the end of this document.

In the past, periods of rising rates have been accompanied by strong convertible new issuance. In fact, year-to-date through May 2017, corporations raised approximately $35 billion globally through issuing convertible securities. This represents a 50% year-over-year increase, according to UBS/Thomson Reuters.

An Ounce of Prevention?

Over the long run, convertibles have proven to be a useful portfolio diversifier. They typically capture much of the equity market upside while providing downside protection, and low correlation *(Exhibit 2)* to other fixed income asset classes. Over full market cycles, they also typically deliver an equity-like return, a higher Sharpe Ratio and a lower standard deviation as compared to common stock. The addition of convertible securities provides the potential to improve most portfolios' efficient frontiers by offering highly compelling risk-adjusted returns *(Exhibit 7)*.

Exhibit 7:
Convertibles may expand a portfolio's efficient frontier[12]



While convertibles have historically provided very strong risk/return characteristics for investors, the convertible market has undergone a significant positive structural transformation during the past decade, which provides an even more compelling risk-return profile for the future. Shorter maturities have improved downside protection, longer call protection has helped to increase equity market participation, and the ownership shift from levered hedge funds to more stable long-only investors have all contributed to make the asset class even more attractive.

Since 1973, the broad convertible market has closely tracked the performance of the S&P 500 with lower risk and has become a portfolio's "firehouse" asset class by providing downside protection and the ability to allow investors to sleep calmly at night. Whether markets continue to move up, or start to sell off, convertibles represent the capital markets' ounce of prevention in anticipation of more challenging markets, and its pound of cure during periods of high turbulence and distress.

12 Source: Goldman Sachs Convertibles Research. "IG Bonds" represents the iBoxx IG Index. "SPX" represents the S&P 500 Index. "Convertibles" represents the Bloomberg Barclays Convertibles Index. The optimal portfolio (the most efficient allocation of assets in terms of annualized return divided by annualized standard deviation) depicts a 21% allocation to the Bloomberg Barclays Convertibles Index, a 10% allocation to the S&P 500 Index, and a 69% allocation to the iBoxx IG Index. The optimal portfolio generated and annual return of 8.35% with an annualized standard deviation of 5.20% from 5/21/2009 to 5/19/2017. Past or hypothetical performance does not guarantee future results. It should not be assumed that results for past or hypothetical portfolio investments or investment strategies will be achieved for other investments or in the future. No guarantee or representation is made that any investment strategy, fund or account will achieve its investment objective or have positive returns. Please see the disclosures at the end of this document.

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