



## THE BENEFITS OF CONVERTIBLE ARBITRAGE

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In October, 2019, one of our portfolio managers, Howard Needle, wrote a white paper titled, [“Why Convertibles Now?”](#) which argued for increased exposure to the convertible bond asset class. It was comprehensive and prescient, discussing attractive convertible valuations, the positive impact of uber-low interest rates, and why new issuance would accelerate. It made a strong secular case for convertible securities. Most of those themes and positive tailwinds remain firmly in place even after 18 months; and will take years as opposed to months to play out.

The belief that convertibles could outperform most asset classes over the medium to longer-term is rooted in fundamental and structural changes in markets, monetary and fiscal policies, how corporations finance themselves, and how investors assess risk. Moreover, convertibles remain undervalued from a historical perspective (1). The thesis of longer term convertible outperformance is secular as opposed to cyclical, although the idea of higher volatility being cyclical in nature is an important factor in potential outperformance. The bottom line is adding convertibles to a portfolio will likely improve risk-adjusted performance (2).

A hedged investment sub-strategy within the convertible asset class that we would like to discuss and which could substantially outperform other “hedged” strategies is the often misunderstood and esoteric strategy called convertible arbitrage. Unfortunately, convertible arbitrage is poorly named given little bona fide “arbitrage” nowadays. It is very difficult to buy a dollar bill for \$0.90 and create a riskless “arbitrage”. It can happen, but genuine “arbitrage” gets “arbed out” quickly, as many investors bid up the \$0.90 investment until it rises to a dollar.

There was time in the late 1980’s and early 1990’s when genuine arbitrage opportunities existed in convertibles as a large swath of the convertible bond market was mispriced. The rapid development of the high yield market in the 1980’s and the disconnect between high yield and convertibles was the primary cause for that mispricing. High yield investors typically ignored converts as the high yield market was being created and garnered the majority of investor attention. High yield trading desks were part of fixed income divisions; whereas, convertible trading desks sat on the equity floor. Furthermore, sophisticated pricing models were

not readily available or understood. At the time, one could purchase similar if not the same credit in the convertible market at spreads far wider (i.e. cheaper) than in the high yield market.

Similarly, the 2008 financial crisis caused a substantial liquidation in convertible securities as illiquidity, structural events, and the implementation of Dodd-Frank presented bona-fide arbitrage opportunities. Buying a dollar for \$0.90 became possible because dealer desks were prohibited from holding convertible positions in inventory; the ability to finance convertible portfolios became challenging, and the ability to short common stock spotty. Investors just wanted liquidity regardless of the valuation of the asset. There was the opportunity to purchase a convertible bond and fully hedge by shorting the same dollar amount of common stock; thereby eliminating most risks, yet ensuring substantial returns.

In today's market, there may be select "arbitrage" opportunities, but they tend to get "arbed out" quickly, and quite frankly is not the appeal of convertible arbitrage currently. Convertible arbitrage has evolved and is attractive currently because of the return/risk dynamics that it provides during volatile equity markets, in an environment of lower interest rates, vastly improved credits due to abundant liquidity, and lofty equity valuations. The strategy has provided relatively uncorrelated returns to traditional asset classes (3) and becomes extremely interesting as traditional asset class correlations approach historically high levels. In its purest sense, it is a market neutral strategy that is most appealing when equity and debt valuations are extreme and asset correlations high.

A short primer on the basics of convertible arbitrage is in order. Basic convertible arbitrage involves purchasing a convertible bond and simultaneously shorting the common stock which the convertible bond is convertible into. There are many variations and strategy subsets within convertible arbitrage, but for this discussion simplicity is best. Convertible arbitrage is a bona-fide hedged strategy far more than equity long/short or many other strategies employed by hedge funds.

In the hedge fund world, many "hedged" or so called market neutral strategies employ a considerable number of longs, a reluctant few shorts, and maybe some out of the money S&P 500 puts or credit hedges (often entailing some basis risk, or mismatch between price movements) in order to justify the moniker "market neutral" or "hedged". Closet indexers abound in the hedge fund world and are probably more numerous than ever given one of the greatest equity and bond bull markets of all time. The idea of uncorrelated returns is appealing but challenging to generate.

On the other hand, convertible arbitrage by its very nature is a "hedged" strategy. An example of a convertible arbitrage position might involve Lyft (stock symbol, "LYFT"). LYFT issued a convertible bond (LYFT 1.50% '25) which remains outstanding and is convertible into 26.0491 shares of LYFT common stock. A basic convertible arbitrage position would be long one LYFT 1.50% '25 debenture and short a certain number of LYFT common stock shares. The number of LYFT shares to sell short would depend on a variety of factors including the volatility of LYFT, its credit worthiness, the convertible's maturity and coupon, and LYFT's convertible bond price. It is not a simple calculation and there are many moving parts.

But, in a traditional convertible arbitrage or market neutral strategy, the number of shares to short would be such that one is indifferent whether LYFT common stock goes up or down, or in option terminology, "delta neutral" (4). Basically, the bond's profit is equivalent to the common stock's loss or vice-versa for small moves in LYFT's common stock. Knowing the appropriate number of shares to short is critical when establishing and trading a convertible arbitrage position; and the hope that a stock goes either up or down is replaced with the desire that the stock **EITHER** goes up or down. In essence, if one is "delta neutral", one becomes indifferent to the direction of stock's price moves.

One concept of convertibles that is often misunderstood is the optionality imbedded in a convertible bond. Most investors understand the imbedded “call option” – i.e., LYFT common stock goes up and the convertible bond increases in value (for simplicity’s sake assuming no change in interest rates, credit spreads, or volatility). But, less understood, is the “put option” hidden within the convertible bond. It does not make intuitive sense that a convertible bond has **BOTH** an imbedded call and put option. But it does, and in order to “unlock” the put option an investor needs to short the convertible’s underlying common stock, and essentially **transform A PORTION** of the call option into a put option. In other words, by shorting the convertible bond’s underlying common stock an investor is forgoing some profits if the underlying equity appreciates for profits if the underlying equity depreciates. Done correctly, a “delta neutral” convertible arbitrage bond position is one in which you are long BOTH a call and put option.

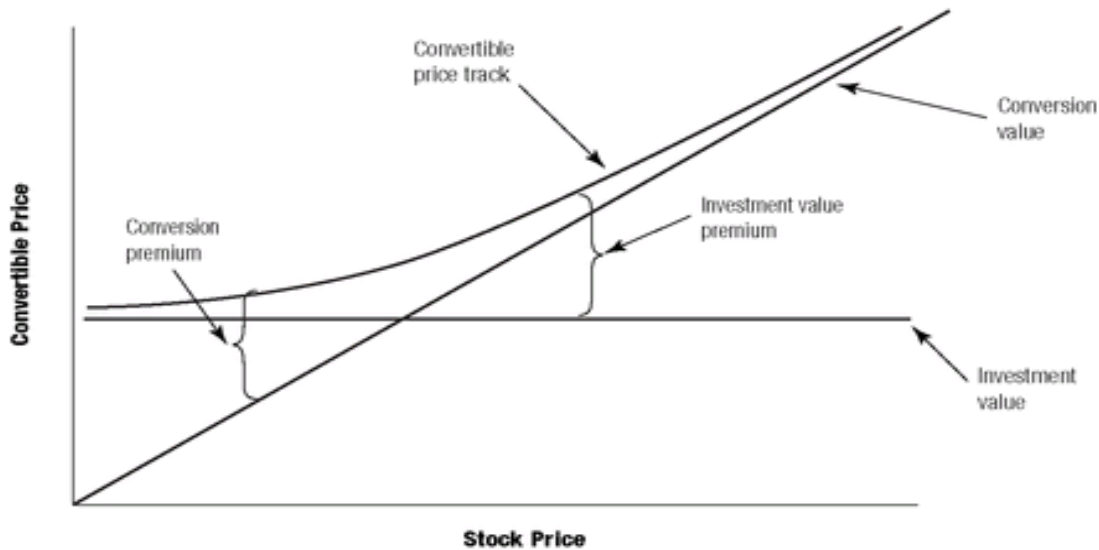
Let’s return to our LYFT 1.50% ’25 example. Based on where LYFT 1.50% ’25 convertibles were trading on 6/17/21, a delta neutral position would be long one convertible bond and short approximately 22 shares of common stock. It is important to note that 22 shares are less than the 26.0491 shares the convertible bond is convertible into. 22 shares of common stock represent an 84% delta. The 22 shares of common stock are derived vis-à-vis a convertible bond pricing model which incorporates Black-Scholes option pricing analysis and which uses a variety of factors to determine the correct amount of stock to short (5). **BUT, SHORTING 22 SHARES OF LYFT COMMON VERSUS OWNING 1 LYFT 1.50% ’25 CONVERTIBLE BOND MAKES AN INVESTOR INDIFFERENT AS TO WHETHER LYFT GOES UP OR DOWN.**

Let’s say LYFT common rallies 40%. As the common stock rallies, the number of shares long associated with the LYFT convertible begins to increase. Like a call option, as LYFT moves higher the convertible’s call option delta increases. The delta goes from 84% to 93%. The **GREATER and FASTER** LYFT rallies, the better for the convertible arbitrage position. So, even though the position starts off short 22 shares of LYFT common stock and delta neutral, the position begins to get less short (i.e., long) RELATIVE to the initial delta neutral convertible bond position.

Conversely, let’s say LYFT common drops 40%. As the common stock drops, the number of shares long associated with the LYFT convertible begins to decrease. Like a call option, as LYFT moves lower the convertible’s call option delta decreases. The delta goes from 84% to 65%. The **GREATER and FASTER** LYFT drops, the better for the convertible arbitrage position. So, even though the position starts off short 22 shares of LYFT common stock and delta neutral, the position begins to get less long (i.e., short) RELATIVE to the initial delta neutral convertible bond position.

As described above, as LYFT common stock rallies the convertible arbitrage position is getting long additional LYFT common stock, and as it drops, it is getting short additional LYFT common stock. Since the goal is to remain delta neutral, however, the convertible arbitrage position would be required to sell short additional LYFT common stock as the stock rallies (i.e., selling high) and buy additional LYFT common stock as the stock drops (i.e., buying low). It is this constant activity of buying low and selling high of the underlying common stock which is the fundamental driver of returns in a convertible bond arbitrage position.

One last thought on the idea of an imbedded “put” option in a convertible arbitrage position. In the Lyft example, we are long 1 convertible bond and short 22 shares of common stock. Let’s assume that LYFT common drops 40%. That’s great for our short stock position, but what happens to the convertible bond’s price? Given the decreasing delta, the convertible bond price starts to drop slower and slower.



It starts to act more like a bond and less like a stock. Assuming credit worthiness of LYFT, the convertible bonds will mature at par in 2025 regardless of the magnitude of the drop in stock price. Without the short stock position, the drop in LYFT common stock would have led to a loss in the LYFT convertible bond position. Shorting stock on a “delta neutral” basis turns what would have been a loss into a gain as LYFT common stock drops and the convertible bonds ultimately mature at par.

**So, why is convertible arbitrage attractive now and what are some of the BENEFITS of the strategy?** First, the strategy becomes more appealing as correlations between major asset classes increase. The current correlation between the Vanguard Total Stock Market ETF (“VTI”) and the Vanguard Total Bond Market ETF (“BND”) is about +0.87 over the past 50 days meaning the two securities are highly correlated (6). Stocks go up, bonds go up. Stocks go down, bonds go down. This makes intuitive sense as “a rising tide lifts all ships” comes to mind. The massive increase in central bank balance sheets and the acceleration of federal stimulus and increases in federal deficits are fueling the appreciation of all asset classes regardless of their riskiness. Basically, money is falling from the sky and it needs to go somewhere.

Convertible arbitrage is far less correlated to traditional assets than most other strategies. For example, since 2005 the R-squared, a measure of the percentage of an asset’s performance as a result of a benchmark, of the HFRI convertible arbitrage index (ticker, “HFRI5RVC”) to the S&P 500 Index Total Return is 0.35 (7). Remember, a convertible arb is long and short and indifferent to whether stocks go up or down. **Convertible arbitrage doesn’t care what happens...it just wants something to happen. The return profile is more an absolute than relative value in nature.**

**By definition, adding less correlated strategies to a highly correlated portfolio is appealing given the diversification benefits of the less correlated strategy. As a result, the demand for less correlated strategies such as convertible arbitrage should increase as correlations between major asset classes remain high.**

In some ways convertible arbitrage is similar to an insurance policy where the payoff of convertible arbitrage is realized during periods of heightened risk. Adding less correlated assets to a highly correlated portfolio will improve risk-adjusted returns by decreasing portfolio volatility especially during periods of increased asset volatility. You hate to pay the insurance premium, but you're very happy if disaster strikes.

Second, the idea of increased volatility and its positive impact on convertible bonds and especially convertible arbitrage is self-evident, but underappreciated given the 10+ year bull market and many major equity indices trading close to all-time highs. Increased market volatility will increase the value of the imbedded options within a convertible arbitrage position per a traditional Black-Scholes option pricing model (8). That is partially what happened in 2020 with the increase in market volatility associated with the COVID-19 pandemic. When volatility is high convertible arbitrage has the wind at its back.

By definition, increased volatility not only increases the value of convertible's imbedded option, but it also provides countless opportunities to adjust the embedded option's respective delta (as discussed above). Such a situation allows the convertible arbitrageur to continuously buy the convertible's underlying equity low and sell high always staying indifferent with respect to the convertible's underlying equity price movement.

Convertible arbitrage also becomes attractive with lower interest rates. Interest rates have a muted effect on the convertible's imbedded call and put options (higher interest rates help a call option whereas they hurt a put option). But remember, a convertible bond is a bond, so lower rates increase the value of the bond. But that's obvious...as rates go lower, bonds improve in price. Let's say, however, interest rates just stay low. Low interest rates are good for many asset classes, but when rates get too low the appeal of fixed income securities especially high yield corporate bonds may decrease. When high yield becomes "low or no yield", the audience or potential investors may shrink, and those same high yield investors will look toward other fixed income assets to supplement low interest rates. This is sometimes referred to as style drift – if a high yield investor can't make money owning high yield (or enough to justify management fees or to live comfortably as a retiree) they may begin to explore other similar, but potentially more rewarding asset classes. Convertible bonds and tangentially convertible arbitrage is a likely beneficiary of style drift from traditional high yield investors.

Further, if one assumes a 0% boundary for interest rates (assuming no negative rates in the U.S.), then the reward/risk dynamic of traditional fixed income securities becomes unattractive. That's not to say traditional bonds can't move up in price; but that there is far more risk owning pure fixed income assets as interest rates approach a 0% boundary. If you own a high yield bond trading at 115 where is it going if rates can't move much lower? There's very little upside and far more downside in that 115 high yield bond. So, if solely interested in reducing risk, a migration from high yield toward convertible securities and in particular to convertible arbitrage might make sense.

Low interest rates are a windfall for levered strategies. Because convertible arbitrage is inherently a hedged strategy, the ability to apply modest leverage is readily available, and lower financing rates greatly improve the potential returns of a convertible arbitrage position. The ability to purchase a portfolio of convertible arbitrage positions and finance at historically low levels is extremely appealing.

The past 10 years has seen a “termining out” of corporate America’s balance sheets. Many companies have refinanced short term debt with long term debt. Given uber-low interest rates, it’s made sense for corporations to “lock in” cheap financing for a very long time. Convertible securities on the other hand tend to have far shorter durations and as a result far less exposure to changes in interest rates. In many ways, they offer a hedge against rising interest rates (9).

A brief discussion of credit worthiness is warranted. A convertible arbitrage position needs to be confident that a company is “money good”. As the common stock drops, the convertible arbitrage position needs to purchase common stock to remain delta neutral. This can only happen if there is faith the convertible will mature or be able to be put at par on a particular put date. Because convertible bonds are most often shorter duration debt, many convertible bonds mature or are able to be put at par well before the majority of maturing debt of many companies. The recent ability of many companies to refinance or extend capital structures and improve their balance sheets is a benefit for convertible arbitrage positions.

Finally, given the substantial rally in equity markets, many convertible bonds are trading well above their conversion prices and with little premium. Lesser premium convertible bonds are hedged with heavier deltas and provide far greater protection than convertibles trading on lighter deltas. Obviously, if a position is short more common stock, it will provide a better hedge if the common stock moves lower. Moreover, heavy delta convertibles hedged delta neutral act more like “puts” than “calls”, and are extremely appealing on a risk-adjusted basis given the asymmetric pay-off. In some ways purchasing heavy delta convertible bonds “delta neutral” is akin to purchasing “out of the money” put options.

Further, the potential correlation between equity prices and credit spreads is greatly reduced in heavy delta convertible bond positions substantially mitigating one of the historical risks associated with convertible arbitrage. A heavy delta convertible bond position is far more sensitive to moves in the convertible bond’s underlying common stock than its credit worthiness. It is never wise to own a convertible arbitrage position where a company’s credit worthiness is deteriorating faster than its share price. In the case of a delta neutral heavy delta convertible bond position that concern is greatly reduced.

Convertible arbitrage always deserves a place in a diversified portfolio, but more so today than at any time in recent years. Merely adding it to a portfolio will likely improve the portfolio’s overall risk adjusted returns given convertible arbitrage’s reduced correlation to traditional asset classes. More importantly, a very strong case can be made given recent events surrounding volatility, interest rates, equity valuations and credit spreads, that convertible arbitrage may be a leading asset class when considering both genuinely hedged strategies and traditional asset classes.

Footnotes:

(1) According to KYNEX, a leading convertible bond modeling and portfolio management system. As of 6/18/21, KYNEX calculates the cheapness of the U.S. convertible market to be approximately 1.1% cheap with a historical range of 4% cheap in October, 2008 and 2% rich in May, 2004.

(2) According to MacroAxis, <https://www.macroaxis.com/etf/ICVT/Convertible-Bond-Ishares>, and Real Investment Advice, <https://realinvestmentadvice.com/widening-your-investment-spectrum-convertible-securities/>

(3) According to HFRI 500 RV: Fixed Income – Convertible Arbitrage Index which shows a correlation to the S&P 500 Index of 0.59 and an R-Squared of 0.35.

(4) Delta neutral (delta is the ratio of the change in price of an option to the change in price of the underlying asset; also called the hedge ratio) is a portfolio strategy utilizing multiple positions with balancing positive and negative deltas so that the overall delta of the assets in question totals zero. A delta-neutral portfolio evens out the response to market movements for a certain range to bring the net change of the position to zero.

(5) Black-Scholes is a pricing model used to determine the fair price or theoretical value for a call or a put option based on six variables such as volatility, type of option, underlying stock price, time, strike price, and risk-free rate. The quantum of speculation is more in case of stock market derivatives, and hence proper pricing of options eliminates the opportunity for any arbitrage. There are two important models for option pricing – Binomial Model and Black-Scholes Model. The model is used to determine the price of a European call option, which simply means that the option can only be exercised on the expiration date.

Black-Scholes pricing model is largely used by option traders who buy options that are priced under the formula calculated value, and sell options that are priced higher than the Black-Scholes calculated value.

The formula for computing option price is:

$$\text{Call Option Premium } C = SN(d1) - Xe^{-rt} N(d2)$$

$$\text{Put Option Premium } P = Xe^{-rt} N(-d2) - S0 N(-d1)$$

$$d1 = \frac{[\ln(S/X) + (r + s^2/2) \times t]}{s \sqrt{t}}$$

$$d2 = \frac{[\ln(S/X) + (r - s^2/2) \times t]}{s \sqrt{t}}$$

$s \sqrt{t}$

C = price of a call option

P = price of a put option

S = price of the underlying asset

X = strike price of the option

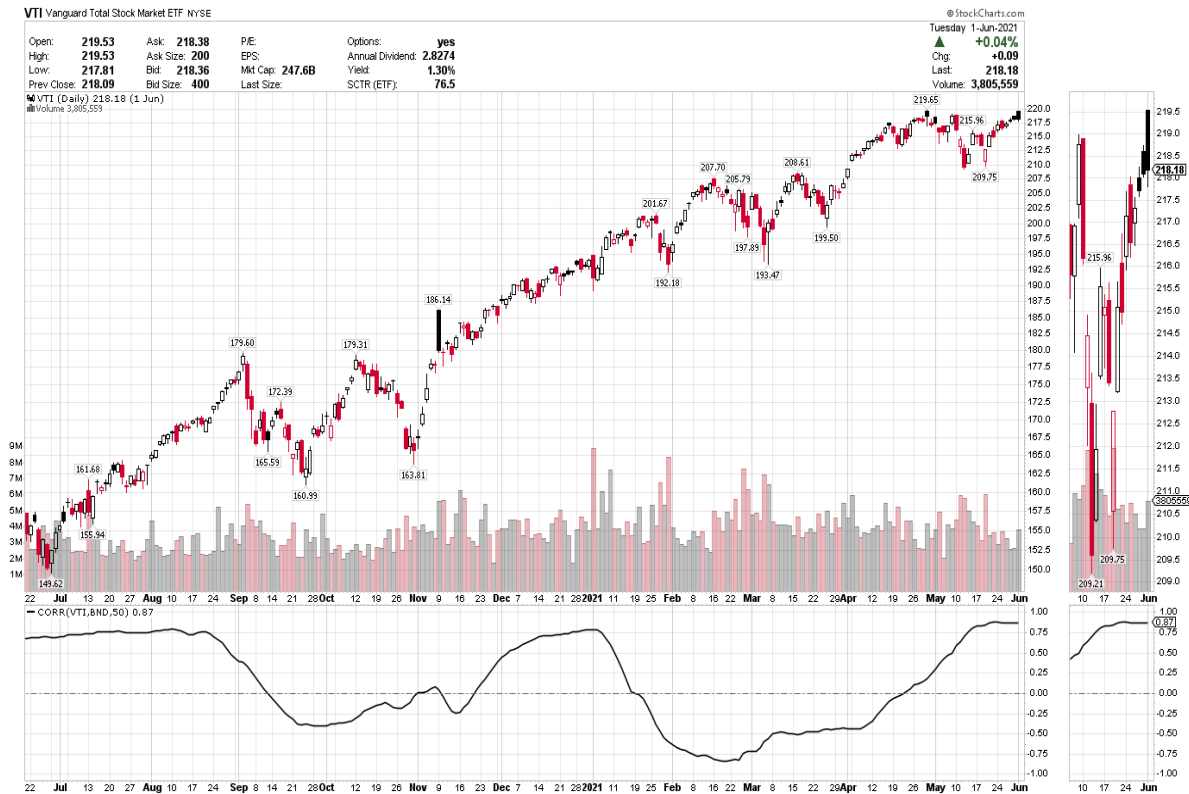
r = rate of interest

t = time to expiration

s = volatility of the underlying

N represents a standard normal distribution with mean = 0 and standard deviation = 1

(6) From Stockcharts.com:



“VTI” seeks to track the performance of the US Total Market Equity Index including large, mid, and small-cap equity diversified across growth and value styles. “VTI” employs a passively managed, index-sampling strategy.

“BND” seeks to track the performance of a broad, market-weighted bond index. The fund generally provides broad exposure to the taxable investment-grade U.S. dollar-denominated bond market, excluding inflation-protected and tax-exempt bonds.

(7) From Hedge Fund Research (HFR). As of June 1, 2021.

HFRI is a convertible arbitrage index which includes strategies in which the investment thesis is predicated on realization of a spread between related instruments in which one or multiple components of the spread is a convertible fixed income instrument. Strategies employ an investment process designed to isolate attractive opportunities between the price of a convertible security and the price of a nonconvertible security, typically of the same issuer. Convertible arbitrage positions maintain characteristic sensitivities to credit quality the issuer, implied and realized volatility of the underlying instruments, levels of interest rates and the valuation of the issuer's equity, among other more general market and idiosyncratic sensitivities. The HFRI 500 Indices are global, equal-weighted indices comprised of the largest hedge funds that report to the HFR Database which are open to new investment and offer quarterly liquidity or better. The S&P 500 Total Return Index is the investment return received each year, including dividends, when holding the S&P 500 index. The S&P 500 index is a basket of 500 large US stocks, weighted by market cap, and is the most widely followed index representing the US stock market.

(8)

$$C = N(d_1)S_t - N(d_2)Ke^{-rt}$$

where  $d_1 = \frac{\ln \frac{S_t}{K} + (r + \frac{\sigma^2}{2})t}{\sigma\sqrt{t}}$   
and  $d_2 = d_1 - \sigma\sqrt{t}$

(9) According to Morgan Stanley, 2019 Market Outlook: Convertibles It's All Relative

**Past performance is no guarantee of future results.**

Investments in convertible securities are subject to the risks associated with both fixed-income securities and common stocks. All fixed-income securities are subject to two types of risk: credit risk and interest rate risk. Lower rated fixed-income securities are subject to greater risk of loss of income and principal than higher-rated securities. When the general level of interest rates goes up, the prices of most fixed-income securities go down. When the general level of interest rates goes down, the prices of most fixed income securities go up. In general, stock and other equity security values fluctuate, and sometimes widely fluctuate, in response to activities specific to the company as well as general market, economic and political conditions.

This presentation is meant for broad discussion purposes only, and is not intended as a recommendation to buy or sell any security.

No representation is made that the investor will obtain similar results to those shown.

The reader should not rely on this information for investment purposes. An investment in convertible securities involves a risk of loss. The value of an investment in convertible securities may decrease as well as increase.

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