



A November 2020 Commentary from: Greg Miller CPA, Founder, Chairman and CEO, Michael Miller, President and CIO, Howard Needle, Portfolio Manager and Jim Buckham CFA, Portfolio Manager

CONVERTIBLE BONDS AND RISING INTEREST RATES: A HAPPY MARRIAGE

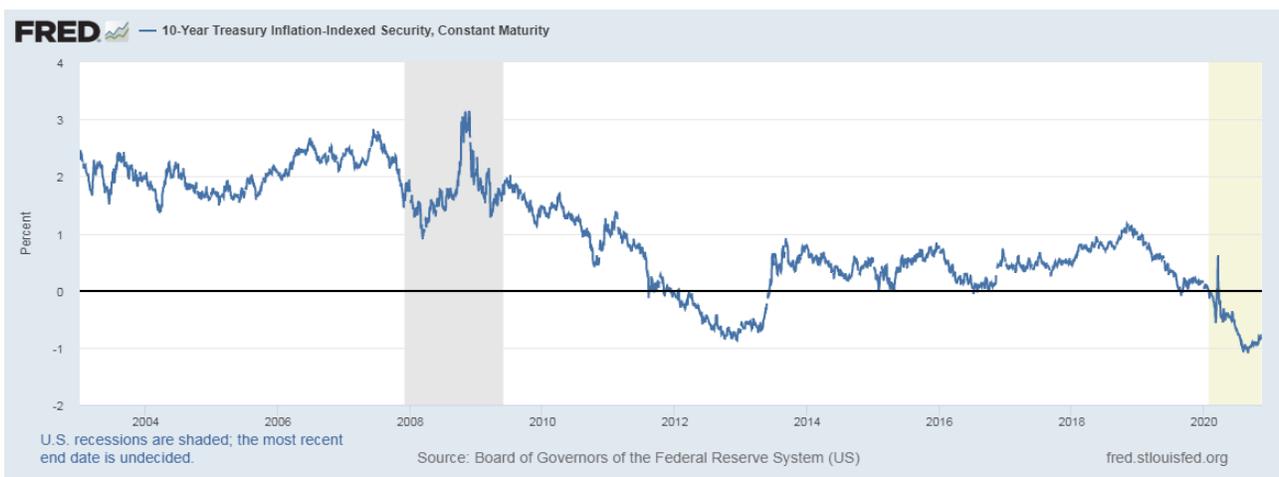
INTEREST RATES ARE LOW!!!

For the better part of the past 40 years interest rates have been trending lower ⁽¹⁾ (display #1 below). Ten-year U.S. Treasury bond yields peaked at 15.84% on September, 30, 1981. More recently, the trend of lower rates accelerated beginning November 8, 2018 when 10-year U.S. Treasury bond yields began a descent that saw their yield drop from 3.23% to a recent jaw-dropping all-time low of 0.40% on March 9, 2020. Although the recent bond sell-off beginning in August, 2020 saw yields jump to 0.95% on November, 10, 2020, **interest rates remain at historically and incredibly low levels.**



Display #1 -- 10 Year Treasury Rate - 54 Year Historical Chart, from Macrotrends.net

Even with the very recent uptick in yields, real 10-year interest rates (10-year nominal interest rates less inflation) remain negative at about -0.83% ⁽²⁾ (display #2 below). To state that nominal or real interest rates are low by any measure is an understatement.



Display #2 – Real Interest Rates, 2003 to present, Federal Reserve Bank of St. Louis

ZERO INTEREST RATE BOUND

No one knows where interest rates are headed, and pundits have been calling for higher interest rates for years⁽³⁾. But, if one is to believe the Federal Reserve’s Chairman, Jerome Powell, in multiple communications with the public during 2020, he has repeatedly indicated that unlike many other developed economies the U.S. will not embark on a campaign of negative nominal interest rates or “NIRP”⁽⁴⁾. Given that message, it would appear that there is a lower bound of zero in terms of where nominal interest rates may be headed. That is not to say that interest rates are headed higher, but just that **it is unlikely that they have much lower to go given a zero bound; and therefore, may be asymmetrical in their path forward.**

CONVERTIBLE BONDS AND HIGHER INTEREST RATES – A HAPPY MARRIAGE

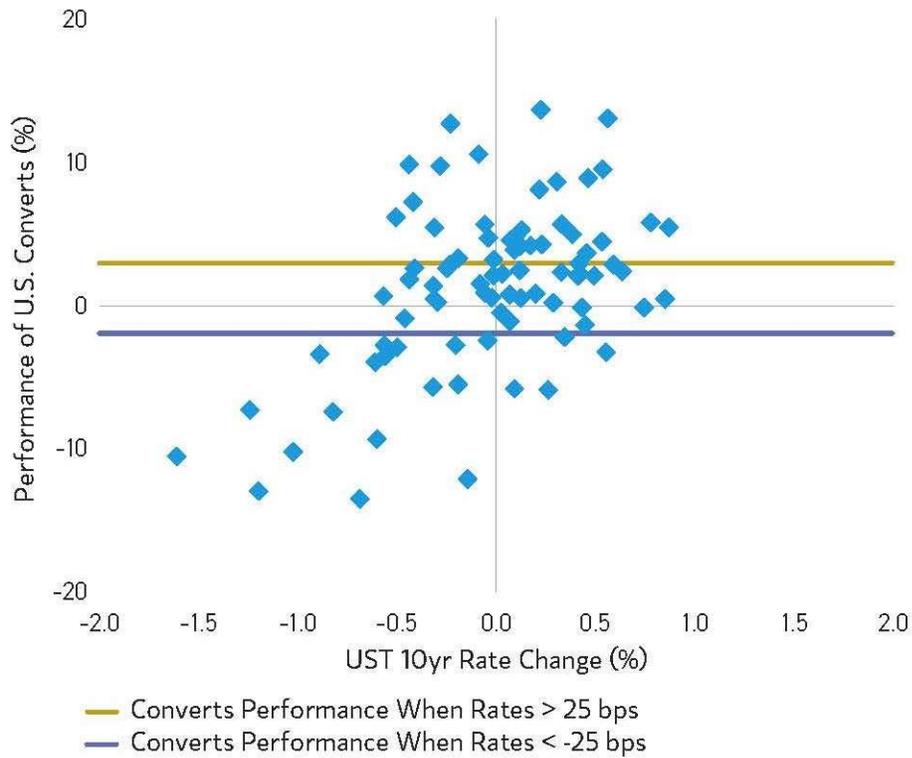
Assuming a zero interest rate bound and some degree of asymmetry, it is imperative to increase exposure to asset classes that have done well in low or rising interest rate environments. **Historically, convertibles bonds have outperformed many fixed income asset classes when interest rates have been rising, and have also delivered positive absolute returns during those same periods.** In fact, over the past 25 years, there have been nine occasions when 10-year U.S. Treasury bond yields have increased by more than 100 bps. **Convertibles as expressed by the ICE BofA Merrill Lynch All U.S. Convertibles Index have outperformed fixed income as expressed by the Bloomberg Barclays U.S. Aggregate Bond Index 100% of the time, and have also delivered positive performance 100% of the time in such scenarios (display #3 below).**

	1/18/96- 6/12/96	10/5/98- 1/21/00	11/7/01 - 4/1/02	6/13/03- 6/14/04	6/1/05- 6/28/06	12/18/08 -6/10/09	10/6/10- 2/8/11	7/25/12- 12/27/13	7/5/16- 12/16/16
Yield Increase (bps)*	150	263	122	176	134	190	134	159	123
Bloomberg Barclays US Aggregate Bond Index	-3.40%	-1.33%	-2.07%	-2.16%	-0.80%	0.27%	-2.67%	-1.27%	-3.81%
ICE BofAML All U.S. Convertibles	9.75%	41.57%	5.00%	12.35%	7.70%	22.11%	11.30%	23.91%	11.29%

Display #3 – History of 100+ bps moves in 10-year U.S. Treasury Bond and Resulting Performance

Further confirmation of convertible’s positive performance during increasing interest rate periods can be seen below in display #4 complements of Bloomberg and Morgan Stanley⁽⁵⁾. Display #4 depicts months when U.S. 10-year Treasury bond yields increased or decreased by 25 bps. The majority of the times rates increased, convertible bonds as expressed by the Thomson Reuters Global Convertibles Focus Index increased in value further demonstrating positive correlation between interest rate moves and convertible bond prices. When U.S. Treasury 10-year interest rates rose by more than 25 bps in a month, convertibles delivered positive 3.05% in performance on average. Conversely, when rates dropped by 25 bps in a month, convertibles delivered negative returns of 1.89% on average.

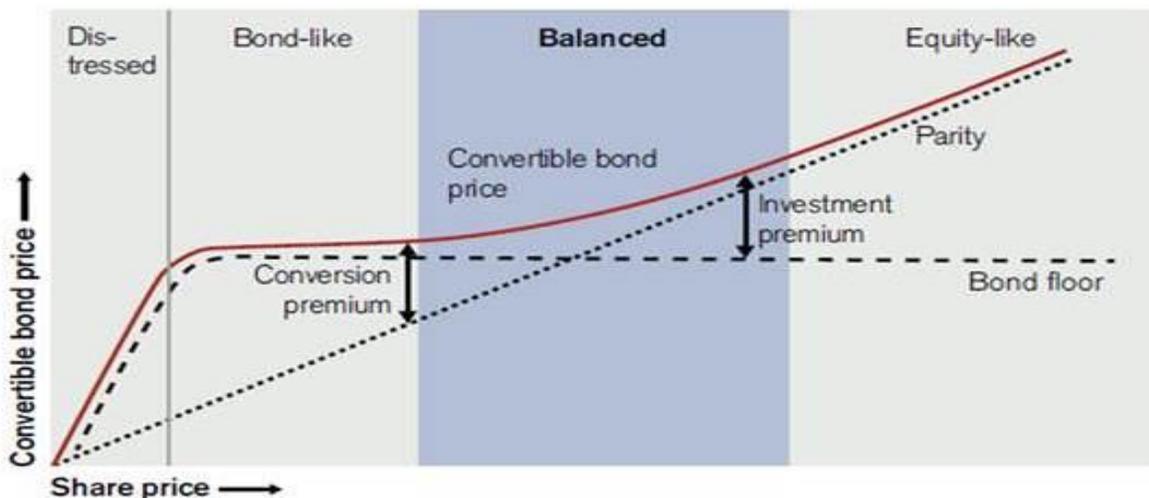
Performance of Convertibles as Rates Rise and Fall



Display #4 – Historical Monthly Performance of Convertibles when Interest Rates Rise or Fall⁽⁶⁾

THE WHY BEHIND CONVERTIBLES PERFORMANCE DURING PERIODS OF RISING INTEREST RATES ECONOMIC SENSITIVITY

There are at least three possible explanations for convertibles' historically strong performance as interest rates have moved higher. Higher interest rates are often associated with an improving economy, increased pricing power, and a stronger job market. These economic tailwinds are often accompanied by higher equity prices. Given a convertible bond's sensitivity to equity prices as a result of a convertible's embedded call option, higher stock prices generally translate into higher convertible bond prices (see display #5 below).



Source: Credit Suisse

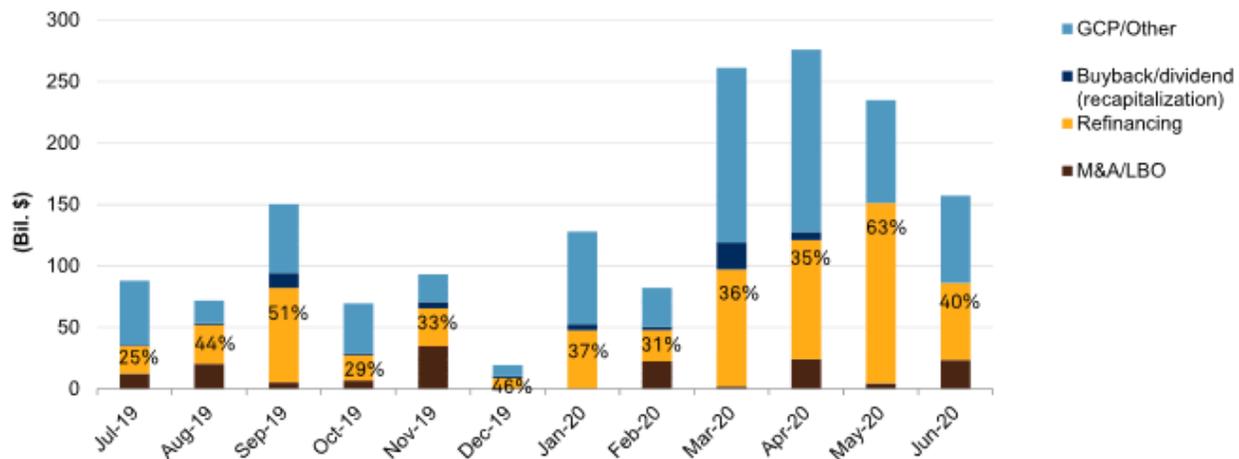
Display #5 – Characteristics of a Convertible Bond and Relationship to Higher Equity Prices

DURATION

In addition, convertible bonds typically have far shorter durations than traditional debt ⁽⁷⁾. There are quite a few reasons why convertible bonds have shorter durations than non-convertible bonds. Corporations avoid selling longer term call options on their underlying equity, longer term options are challenging to price, and issuing companies often want to force conversion into equity sooner rather than later in order to reduce outstanding debt and clean up their balance sheet.

Shorter duration debt by definition equals reduced interest rate sensitivity. A bond with duration of 1 year will be far less sensitive to moves in interest rates than a bond with duration of 10 years.

Historically, convertible bonds are most often issued with maturities of 5 years whereas high yield debt is typically issued with maturities of 7-10 years ⁽⁷⁾. In addition, although coupons are lower in convertible bonds than high yield, the duration of convertibles is generally less than high yield given the potential of convertibles' forced conversion into equity. More recently, there has been a wave of non-convertible (high yield and investment grade debt) refinancing activity pushing out the duration of the high yield and investment grade debt market (display #6 below). Further, the duration of a 10-year Treasury bond with a modest coupon is about 8.5 years ⁽⁸⁾, and the duration of the iShares Core U.S. Aggregate Bond ETF ("AGG") is 5.92 years ⁽⁹⁾.



Sources: LCD, an offering of S&P Global Market Intelligence, and S&P Global Ratings Research. Copyright © 2020 by Standard & Poor's Financial Services LLC. All rights reserved.

Display #6 – Recent Refinancing Activity, S&P Global Ratings, Credit Trends: Global Financing Conditions: Bond Issuance Is Expected To Finish 2020 Up 6% After A Strong Second Quarter, 7/27/2020.

To further illustrate the shorter duration characteristics of convertible bonds relative to many other fixed income asset classes, the effective duration of the iShares Convertible Bond ETF ("ICVT") is 1.21 years, the effective duration of the iShares iBoxx \$ High Yield Corporate Bond ETF ("HYG") is 3.32 years, and the iShares iBoxx \$ Investment Grade Corporate Bond ETF ("LQD") is 9.66 years. Theoretically, given their far shorter duration, convertible bonds should have far less sensitivity to changes in interest rates especially relative to Investment Grade debt or certain portions of the U.S. Treasury market especially longer maturity paper.

BLACK-SCHOLES AND VALUING A CALL OPTION

Finally, the value of a convertible bond's call option per a Black-Scholes pricing model will increase with higher interest rates ⁽⁸⁾. All else equal, higher rates make the call option and therefore the convertible bond more valuable and very much mitigate the decrease in value associated with the bond-characteristics of a convertible bond.

SUMMARY

Interest rates have been going down for a very long time as the U.S. has been in the midst of a 40 year bond market rally. Where they are headed is anyone's guess and it would be foolish to suggest otherwise. But, given the Federal Reserve's desire to avoid negative rates and with rates close to historic lows and near zero, the forward path of rates is likely not much lower. Adding fixed income asset classes such as convertible bonds which have historically been able to weather higher interest rates could be prudent, help performance and at a minimum improve the diversification of a fixed income portfolio.

Disclosures:

Past performance is no guarantee of future results.

The information in this presentation is for illustration and discussion purposes only. The reader should not rely on this information for investment purposes. An investment in convertible securities involves a risk of loss and may not be suitable for all investors.

Convertible Bond Risk. Convertible bonds, like all fixed income securities, are subject to increased loss of principal during periods of rising interest rates and are subject to various other risks including changes in credit quality, market valuations, liquidity, prepayments, early redemption, corporate events, tax ramifications and other factors. Lower-rated securities are subject to greater credit risk, default risk, and liquidity risk. Convertible bonds will fluctuate in value with the price changes of the company's underlying stock. Before purchasing convertible bonds, investors should carefully review the bond prospectus and consult with a financial advisor who has experience in investing in and trading convertible bonds. Individual convertible bonds should be purchased based on risk tolerance, time horizons and other factors in concert with an investment professional.

Footnotes:

(1) <https://www.macrotrends.net/2016/10-year-treasury-bond-rate-yield-chart>

(2) <https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=realyield>

(3) <https://www.knoxnews.com/story/money/columnists/paul-fain/2020/01/23/hear-out-market-pundits-but-proceed-caution-paul-fain/4531852002/>

(4) <https://www.marketwatch.com/story/powell-rejects-using-negative-rates-as-a-policy-tool-2020-05-13#:~:text=Federal%20Reserve%20Chairman%20Jerome%20Powell,rates%20really%20has%20not%20changed.&text=Instead%20he%20Fed%20would%20use,and%20asset%20purchases%2C%20he%20said.>

(5) Source: Morgan Stanley, 2019 Market Outlook: Convertibles.

(6) Source: Bloomberg. Data from January 1990 through October 2018. Complements of Morgan Stanley, 2019 Market Outlook: Convertibles.

(7) <https://www.fa-mag.com/news/lush-times-for-convertibles-57577.html>

<https://www.barrons.com/articles/junk-rated-high-yield-bonds-duration-more-sensitive-to-rates-51586276682>

<https://www.spglobal.com/marketintelligence/en/pages/toc-primer/hyd-primer#sec6>

<https://www.spglobal.com/ratings/en/research/articles/200727-credit-trends-global-financing-conditions-bond-issuance-is-expected-to-finish-2020-up-6-after-a-strong-sec-11584612>

(8)

$$\text{Duration Formula} = \frac{\sum_i^{n-1} \frac{i \times C_i}{(1+r)^i} + \frac{n \times M}{(1+r)^n}}{\sum_i^{n-1} \frac{c_i}{(1+r)^i} + \frac{M}{(1+r)^n}}$$

(9) <https://www.ishares.com/us/products/239458/ishares-core-total-us-bond-market-etf>

Definitions:

ICE BofA Merrill Lynch All U.S. Convertibles Index is an index consists of convertible bonds traded in the U.S. dollar denominated investment grade and non-investment grade convertible securities sold into the U.S. market and publicly traded in the United States. The Index constituents are market value weighted based on the convertible securities prices and outstanding shares, and the underlying index is rebalanced daily.

The Bloomberg Barclays U.S. Aggregate Bond Index is a broad based benchmark that measures the investment grade, U.S. dollar-denominated, fixed-rate taxable bond market. This includes Treasuries, government-related and corporate securities, mortgage backed securities, asset-backed securities and collateralized mortgage-backed securities.

iShares Core U.S. Aggregate Bond ETF is an ETF which seeks to track the investment results of the Bloomberg Barclays U.S. Aggregate Bond Index. The index measures the performance of the total U.S. investment-grade bond market. The fund generally invests at least 90% of its net assets in component securities of its underlying index and in investments that have economic characteristics that are substantially identical to the economic characteristics of the component securities of its underlying index.

Thomson Reuters Global Convertibles Focus Index serves to represent the active convertible market. The index was previously known as the UBS Global Convertible Index prior to the acquisition of the index by Thomson Reuters in June 2014. The Index family is comprised of the Global ('broad') Index and a number of sub-indices that are derived from the Global ('broad') Index based on a set of specific criteria defined for each Sub-Index family. The composition of the Global ('broad') Index is determined on a continuous basis. Additions to and deletions from the Index can happen at any time.

ICVT is an ETF which tracks an index of USD-denominated convertible bonds weighted by market value. The index contains only cash-pay convertibles and excludes mandatory and preferred convertibles.

HYG is the iShares iBoxx \$ High Yield Corporate Bond ETF which seeks to track the investment results of an index composed of U.S. dollar-denominated, high yield corporate bonds.

LQD is an ETF that tracks the investment results of the Market iBoxx® USD Liquid Investment Grade Index. The fund generally invests at least 90% of its assets in component securities of the underlying index and at least 95% of its assets in investment-grade corporate bonds. The underlying index is designed to provide a broad representation of the U.S. dollar-denominated liquid investment-grade corporate bond market.

Duration or Effective Duration is a measure of the sensitivity of the price of a bond or other debt instrument to a change in interest rates. Duration is a way of measuring how much bond prices are likely to change if and when interest rates move. In more technical terms, bond duration is measurement of interest rate risk. Understanding bond duration can help investors determine how bonds fit in to a broader investment portfolio.

The **Black Scholes model**, also known as the Black-Scholes-Merton (BSM) model, is a mathematical model for pricing an options contract. In particular, the model estimates the variation over time of financial instruments. It assumes these instruments (such as stocks or futures) will have a lognormal distribution of prices. Using this assumption and factoring in other important variables, the equation derives the price of a call option.

Black-Scholes model / Formula

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

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

$$\text{and } d_2 = d_1 - \sigma\sqrt{t}$$

C = call option price

N = CDF of the normal distribution

S_t = spot price of an asset

K = strike price

r = risk-free interest rate

t = time to maturity

σ = volatility of the asset

DB11232020-1-431