Alternatives Update
4th Quarter 2019

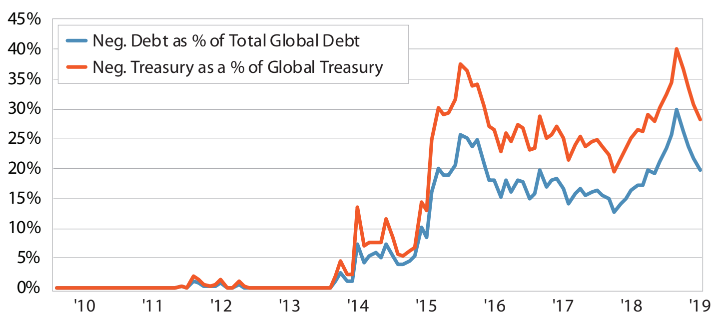
What a difference a year makes. It was a short time ago in the fourth quarter of 2018 that stocks and other risk assets rapidly declined in the face of the Federal Reserve (Fed) raising rates and reducing its balance sheet. Clearly shaken by the result, Fed Chairman Jerome Powell grabbed his boatswain whistle, called the capital markets to attention, and announced reverse course/full power to the engines. The stock market has been cheering ever since. In the fourth quarter of 2019, rate cuts and large amounts of liquidity injections by the world's largest central banks continued. President Trump being impeached was met with a collective yawn. Chances of a conviction are remote given a Republican controlled Senate. The markets remained more focused on the U.S. and China agreeing to a "Phase I" trade agreement or "Trade deal lite." While the details are still in flux, the overall direction of negotiations boosted investor sentiment and helped reduce concerns about a global recession.

Sentiment was also helped by a strong dovish narrative from most players on the financial stage. President Trump continued to lobby for lowering of interest rates and the Fed all but promised easy monetary policy for the foreseeable future. Some members even set forth arguments for significant fiscal stimulus, despite a deficit of over $1 trillion and growing. In general, there seems to be a "do whatever it takes to keep a recession at bay" mentality in both the financial and governmental sectors, with conservatism and fiscal discipline relegated to the status of quaint notions of a time long since passed. The view that the central banks will save us seems to be canon, and the germane topic of discussion is not "will" but "how" they will save us.

The amount of negative-yielding debt shrank, as a sizable amount crossed the 0% threshold thanks to trade war de-escalation and receding concerns of a global slowdown. That said, there is still over $12 trillion of debt paying below 0% interest (see Figure 1). Central banks are openly espousing easy money policies, loath to raise rates and chatting up preemptive rate moves. Given their disposition, it does seem that sizable quantities of negative-yielding debt will be around for some time. The Fed's balance sheet increased considerably as they purchased T-bills and were forced to inject billions into the repo market (overnight repurchase agreements) during the fourth quarter in an effort to maintain its smooth functioning (see Figures 2 & 3). This repo action drew concern as the Fed had not been involved in the repo market in any material manner since 2008. Spikes in repo activity of such magnitude most recently occurred in late 2001 and late 2008. Jerome Powell quickly refuted any suggestions that there was anything wrong with the repo market or that this was another round of quantitative easing (QE). Some skeptics sarcastically dubbed the initiative "Not QE."

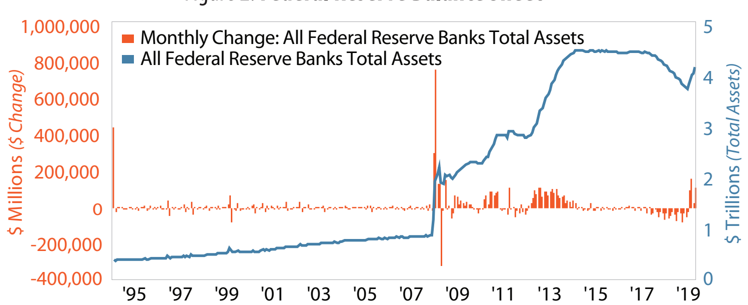
Asset class returns were strong in the fourth quarter. Equities rallied sharply in most major markets. Commodities also posted a healthy return during the quarter. U.S. Treasuries and the U.S. Dollar had negative returns as a more risk-seeking sentiment took hold (see Figure 4). Cryptocurrencies continued their decline though this may have been related to issues beyond the global changing risk sentiment. The New York Federal Reserve's recession model moved sharply lower (see Figure 5). Given that the model is based upon the spread between the 10-yr U.S.

Figure 1: **% of Negative Yielding Global Debt**



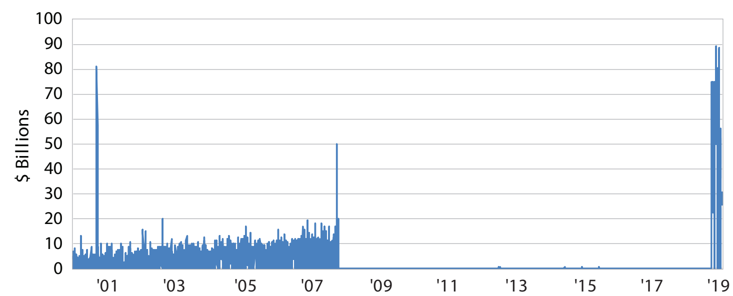
Source: Bloomberg. Data from 7/30/10 - 12/31/19.

Figure 2: **Federal Reserve Balance Sheet**



Source: Bloomberg. Data from 3/31/95 - 12/31/19.

Figure 3: **U.S. Repurchase Agreements Overnight Value Accepted Total**



Source: Bloomberg. Data from 1/1/01 - 12/31/19.

Figure 4: **Asset Class Returns**

	4Q19	2019
U.S. Equities	9.07%	31.49%
International Developed	8.17%	22.01%
Emerging Markets	11.84%	18.42%
U.S. Treasury	-4.24%	15.09%
Real Estate	0.79%	28.92%
Commodities	4.42%	7.69%
High Yield Bonds	2.73%	15.28%
U.S Aggregate Bonds	0.18%	8.72%
Bitcoin	-13.14%	94.83%
U.S. Dollar	-3.01%	0.22%

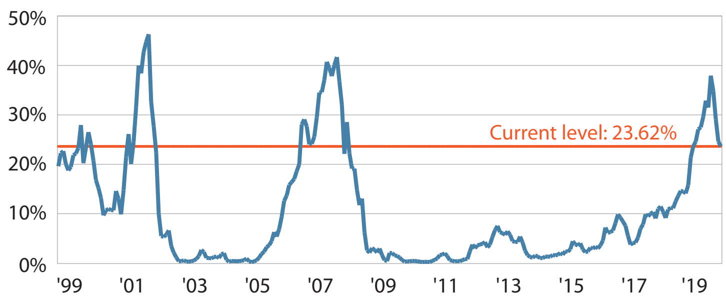
Source: Bloomberg, 12/31/19.

All charts shown herein are for illustrative purposes only and not indicative of any investment. The performance illustrations exclude the effects of taxes and brokerage commissions or other expenses incurred when investing. Past performance is not indicative of future results and there can be no assurance past trends will continue in the future. An investor cannot invest directly in an index. See last page for definitions of asset class indexes and other terms discussed herein.

Treasury and the 3-mo. U.S. T-Bill rate, it is no surprise that as the yield curve has steepened, the forecasted probability of recession declined. However, one does have to question if the forecasting efficacy of this model has been impugned by the Fed committing to buying nearly $60 billion in T-bills per month through at least the second quarter of 2020 as a means of rebuilding reserves in the banking system.

The cryptocurrency sector was down sharply in the fourth quarter (see Figure 6). Bitcoin, the flagship cryptocurrency, fell -13.14%, while the wider universe of cryptocurrencies, as measured by the Bloomberg Galaxy Crypto Index, fell -20.82%. Ethereum fell -27.49%, Litecoin fell -25.59% and Ripple fell -24.78%. These sizable negative returns followed even larger losses incurred in the third quarter. There was speculation that the declines were partially tied to the collapse of a Ponzi scheme known as "Plus Token." Similar to other Ponzi schemes, the perpetrators promised extraordinarily high returns (9%-18% monthly) and used newer incoming deposits into the scheme as a means of masking that there were no actual investments. Eventually $3 billion in cryptocurrencies was stolen and when the scammers began selling their stolen cryptocurrencies in size, it may have depressed market prices as well as shaken confidence in the sector. The Bakkt Bitcoin futures, which are physical settlement contracts and were launched in the third quarter of 2019, has seen its volume continue to grow modestly. The Chicago Mercantile Exchange (CME) is expecting to launch options on its Bitcoin futures contracts in the first quarter of 2020.

Figure 5: **Federal Reserve Bank of New York Probability of Recession in U.S. 12 Months Ahead**



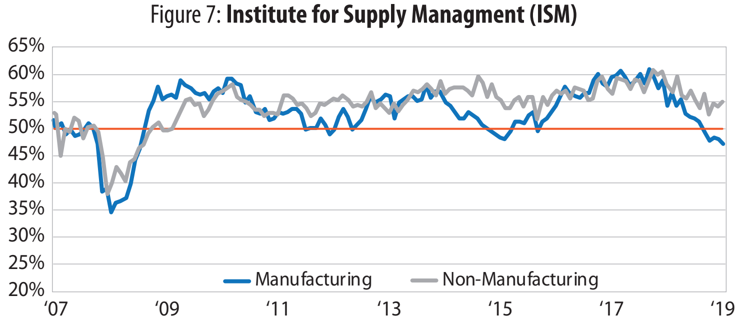
Source: Bloomberg, 12/31/98 - 12/31/20. Orange line is current level, shown for comparison.

Figure 6: **Cryptocurrency Returns**

	4Q19	3Q19	2019
BB Galaxy Crypto Index	-20.82%	-40.39%	7.08%
Bitcoin	-13.14%	-32.52%	94.83%
Ethereum	-27.49%	-42.20%	-1.25%
Ripple	-24.78%	-39.20%	-44.88%
Litecoin	-25.59%	-53.58%	39.86%

Source: Bloomberg, 12/31/19.

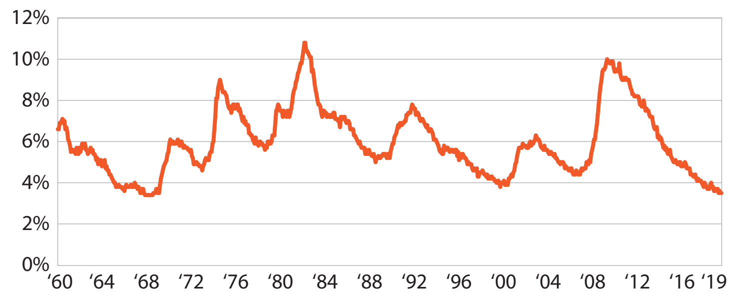
Figure 7: **Institute for Supply Managment (ISM)**



Source: Bloomberg. Data from 12/31/07 - 12/31/19. Seasonally adjusted (SA).
Numbers above 50% indicate an expansion, below 50% indicates a contraction.

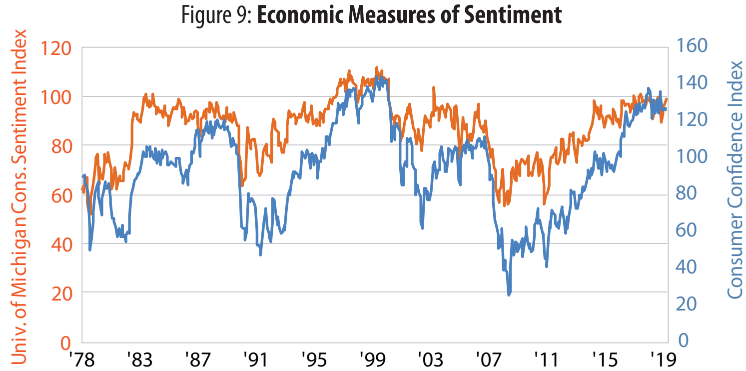
Domestic economic news continues to be upbeat with manufacturing being an exception. The ISM manufacturing indicator declined during the fourth quarter, continuing a trend seen throughout the year. However, the ISM non-manufacturing indicator (services) ended the quarter at 55 and was higher than the beginning of the quarter (see Figure 7). For both indicators, levels below 50 represent a contraction. The Federal Open Market Committee (FOMC) cut the target Fed Funds rate 25 basis points (bps) at the October meeting and left rates unchanged at the December meeting. Unemployment, as measured by the U-3 seasonally adjusted rate, ended the quarter at 3.5% and has been steadily declining throughout the year (see Figure 8). Consumer sentiment, as measured by the University of Michigan Consumer Sentiment Index, ended the quarter at 99.3, up significantly from the third quarter. Another sentiment indicator, the Conference Board Consumer Confidence Index, moved slightly higher to 126.3 (see Figure 9). Both measures are at levels that would be considered strongly positive. The year-over-year (YoY) consumer price index (CPI) ticked up slightly, ending at 2.1% (see Figure 10). CPI running near or below 2% for all of 2019 has been one justification by the FOMC for an accommodative policy.

Figure 8: **U.S. Unemployment (U-3)**



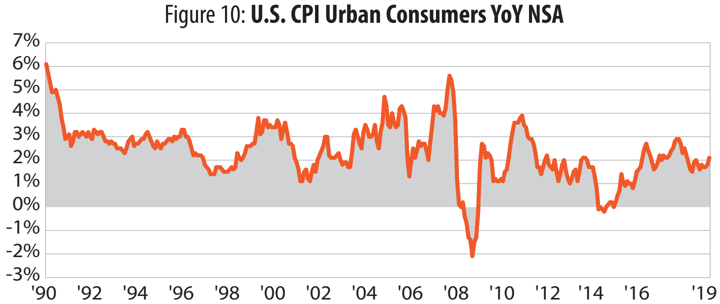
Source: Bloomberg. Data from 12/31/60 - 12/31/19. Seasonally adjusted (SA).

Figure 9: **Economic Measures of Sentiment**



Source: Bloomberg, 1/31/78 - 12/31/19.

Figure 10: **U.S. CPI Urban Consumers YoY NSA**



Source: Bloomberg, 12/31/90 - 11/30/19 (most recent data available), not seasonally adjusted (NSA).

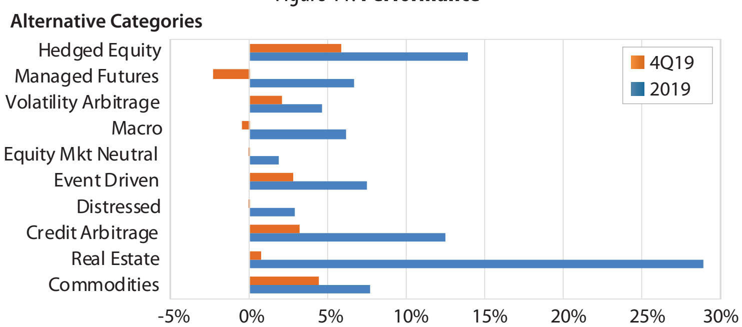
With a significant softening of tone in the ongoing trade disputes between China and the United States, and large injections of liquidity by both the Fed and the People's Bank of China into their respective economies, global stocks soared. The S&P 500 Index was up 9.07%, the MSCI EAFE Index was up 8.17% and the MSCI Emerging Markets Index was up 11.84%. Long-term 20+ year U.S. Treasuries fell (-4.24%) as investors unwound flight to quality trades and positively revised growth expectations. Alternative Investment ("alternatives") returns were muted on an absolute basis as investors sought out more potent "risk-on" trades. Six of the ten categories achieved positive returns (see Figure 11). Hedged equity was the best performing category (+5.86%) followed by commodities (+4.42%) and event driven strategies (+2.79%). Managed futures (-2.26%) along with macro strategies (-0.50%) were the worst performing categories.

Traditionally, managed futures and macro strategies are viewed as having lower correlations to equities because they are generally diversified across a variety of markets and often employ short-selling as part of their approach. Strategies that had higher 2-year correlations to U.S. equities (greater than 0.60), on average, significantly outperformed those strategies that had a lower correlation with U.S. equities (see Figure 12). Real assets were positive in all categories for the fourth quarter. Commodities was the highest returning category (+4.42%), followed closely by gold (+3.04%). Year-to-date, all three real asset categories have had strong positive returns (see Figure 13).

Managed futures, commodities, and macro strategies have historically shown low correlation and beta to stocks and bonds over the course of a market cycle, thus they may serve as potentially strong portfolio diversifiers. Strategies such as credit arbitrage, event driven, hedged equity, et al., which have historically had higher correlations with equities and bonds, may provide attractive risk/return profiles through lower volatility. These characteristics may allow investors to broaden their investment choices and create more efficient portfolios.

While yields in both the corporate and treasury bond sectors rose during the third quarter on an absolute basis, Baa/BBB rated corporate bonds outperformed 10-year U.S. Treasuries by a wide margin. Baa/BBB over 10-year U.S. Treasuries yields tightened 23 bps during the fourth quarter (see Figure 14). Spreads are now in the 35th percentile of historical rankings (see Figure 15). The spread between below investment grade corporate bonds (B/CA rated) and BBB rated

Figure 11: **Performance**



Source: Bloomberg, 12/31/19.

Figure 12: **Correlations (2-Year) & Returns**

	S&P 500	Q419
Hedged Equity	0.94	5.86%
Event Driven	0.90	2.79%
Volatility Arbitrage	0.86	2.05%
Credit Arbitrage	0.76	3.19%
Distressed	0.69	-0.10%
Commodities	0.69	4.42%
Real Estate	0.55	0.79%
Macro	0.48	-0.50%
Equity Market Neutral	0.46	-0.10%
Managed Futures	0.28	-2.26%
Lower Correlation Avg TR (≤.60)		**-0.52%**
Higher Correlation Avg TR (>.60)		**3.04%**

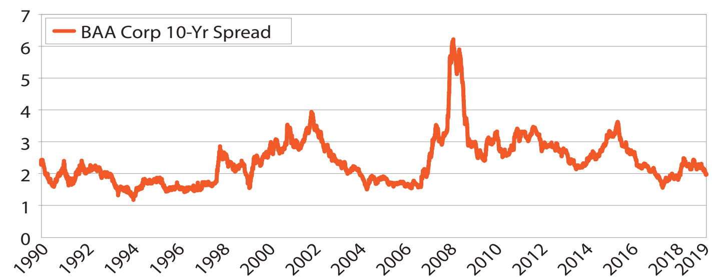
Source: Bloomberg, 12/31/19. Monthly returns over 24 months.

Figure 13: **Real Assets**

	Q4 2019	Q3 2019	Q2 2019	Q1 2019	2019
Real Estate	0.79%	7.30%	1.82%	17.08%	28.92%
Commodities	4.42%	-1.84%	-1.19%	6.32%	7.69%
Gold	3.04%	4.47%	9.07%	0.77%	18.31%
Average	***2.75%***	***3.31%***	***3.23%***	***8.06%***	***18.31%***

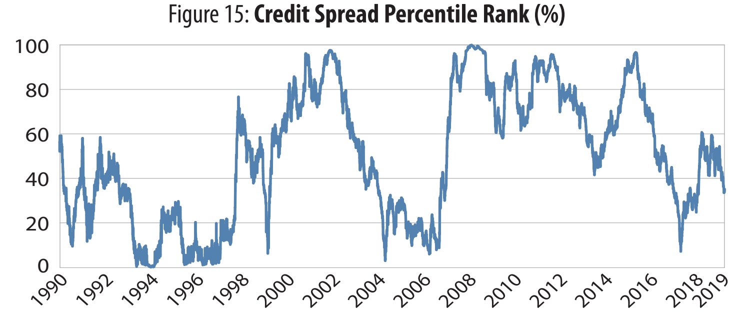
Source: Bloomberg, 12/31/19.

Figure 14: **BAA Corp Credit Spread over 10-Yr U.S. Treasury (%)**



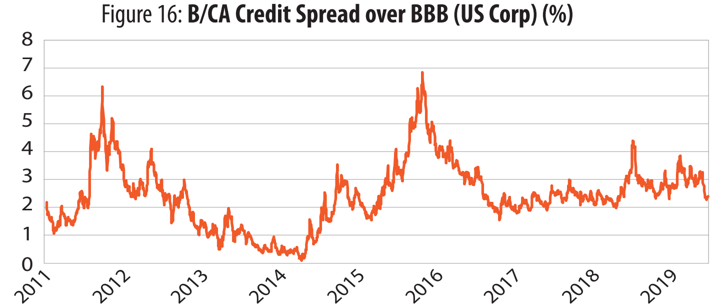
Source: Bloomberg, 12/31/90 - 12/31/19.

Figure 15: **Credit Spread Percentile Rank (%)**



Source: Bloomberg,12/31/90 - 12/31/19.

Figure 16: **B/CA Credit Spread over BBB (US Corp) (%)**



Source: Bloomberg. Data from 12/31/10 - 12/31/19.

corporate bonds (investment grade) tightened 62 bps during the quarter. 60 bps of that tightening was due to the decline in yields of B/CA rated bonds, reflecting a strong desire to buy risk assets by investors (see Figure 16).

The Fed cut rates by 25 bps once in the fourth quarter and announced a new treasury bill buying program aimed at making sure the banking system had sufficient reserves. U.S. Treasury 10-yr yields rose 25 bps to 1.81%. The long-end of the U.S. Treasury curve (30-yr maturity) rose 28 bps to a yield of 2.29%. The yield spread between 30-yr to 10-yr U.S. Treasuries widen nearly 3 bps to a spread of just under 48 bps. Overall, the Treasury yield curve has steepened as the yield spread between 30-yr Treasuries and T-bills (3mo maturity) widened out sharply and ended the quarter at 76 bps (see Figure 17). Since the financial crisis, yields have fallen dramatically on an absolute basis across the entire curve. In recent years, the curve has flattened, occasionally inverting (see Figure 18). With the exception of the 30-yr bond, all Treasuries have a negative real yield (nominal yield lower than year-over-year CPI). Historically, one might conclude the government bond market is forecasting lower inflation, but with the heavy involvement of the Fed on both the long and short end of the curve, it's hard to determine what the investment signal might be (see Figure 19).

Returns for "Risk On" assets (+4.74% average return) outperformed the returns for "Risk Off" assets (+0.32% average return). U.S. stocks had the best return in the fourth quarter and U.S. Treasuries had the most negative return (see Figure 19). Focusing on non-currencies, Gold and long-dated (20-yr +) U.S. Treasuries underperformed equities and high yield bonds by an average of over 590 bps. Gold did quite well in the quarter, but U.S. Treasuries were down significantly. Alternatives have historically provided significant diversification benefits when paired with a portfolio of traditional assets, in addition to both competitive absolute returns and attractive risk-adjusted returns.

Figure 17: **U.S. Treasury Yield Curve**

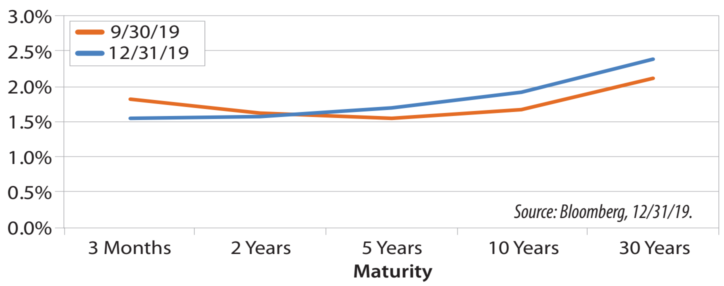


Figure 19 : **U.S Treasury Yield Curve and CPI**

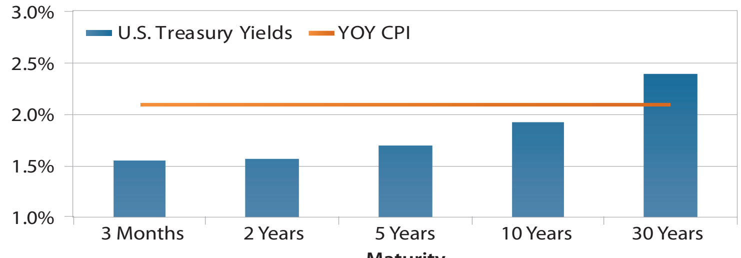


Figure 18: **U.S. Treasury Yield Curve**

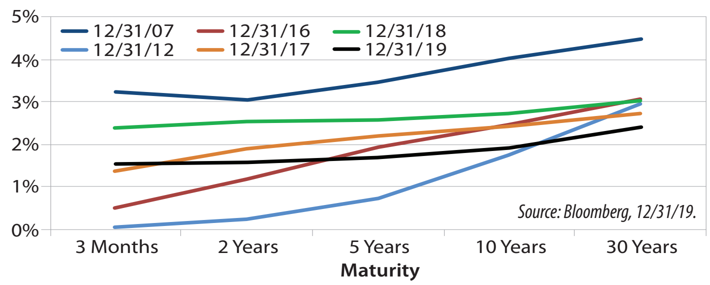
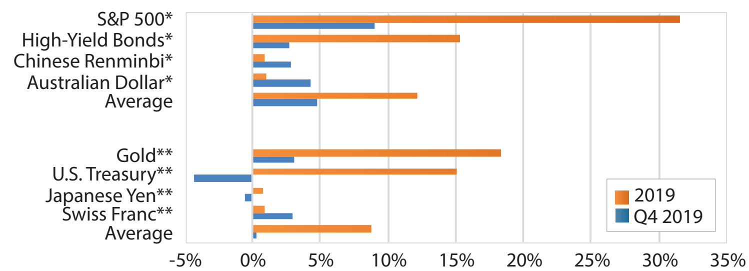


Figure 20: **Risk Off vs. Risk On Asset Returns**



*Source: Bloomberg, 12/31/19. * Considered to be "Risk On" asset class. ** Considered to be "Risk Off" asset class.*

Definitions

10-Yr Treasury: Yield of U.S. Treasury securities maturing in approximately 10 years.

Aggregate Bonds: The Bloomberg Barclays US Aggregate Bond Index is a broad-based benchmark that measures the investment grade, US dollar-denominated, fixed-rate taxable bond market.

Australian Dollar: The return from selling the short currency (USD) to buy the long currency (AUD) and earning interest. The return is calculated by adding the spot return to the interest earned from the long currency position. It is designed to measure the performance of the Australian dollar vs. the U.S. dollar.

BAA Corp: Moody's Bond Indices Corporate BAA. Moody's Long-Term Corporate Bond Yield Averages are derived from pricing data on a regularly replenished population of corporate bonds in the U.S. market, each with current outstandings over $100 million. The bonds have maturities as close as possible to 30 years; they are dropped from the list if their remaining life falls below 20 years, if they are susceptible to redemption, or if their ratings change. All yields are yield-to- maturity calculated on a semi-annual basis.

Beta: A measure of price variability relative to the market.

Bitcoin: A digital currency using encryption techniques created for use in peer-to-peer online transactions Introduced in 2008 by a person or group using the name Satoshi Nakamoto.

Bloomberg Barclays US Corp B-Ca Capped Index: The Bloomberg Barclays index measures the performance of the taxable B1 – Ca rated range of the fixed-rate U.S. dollar-denominated corporate bond market. The index is market capitalization weighted and caps individual issuers at 3% of the total market value.

Bloomberg Galaxy Crypto Index (BGCI): The BGCI is designed to measure the performance of the largest cryptocurrencies traded in USD.

Chinese Renminbi: The S&P Chinese Renminbi Index is designed as a tradable index that replicates the performance of the Chinese Renminbi versus the U.S. Dollar.

Commodities: The Bloomberg Commodity Index is made up of exchange-traded futures on physical commodities and represents 20 commodities, which are weighted to account for economic significance and market liquidity.

Consumer Price Index (CPI): A measure that examines the weighted average of prices of a basket of consumer goods and services, such as transportation, food, and medical care. It is calculated by taking price changes for each item in the predetermined basket of goods and averaging them. Changes in the CPI are used to assess price changes associated with the cost of living.

Correlation: A statistical measure that quantifies the extent to which two or more data series fluctuate together. Values run from -1.0 to +1.0.

Credit Arbitrage: Hedge Fund Research HFRI Event-Driven Credit Arbitrage Index. Credit Arbitrage strategies employ an investment process designed to isolate attractive opportunities in corporate fixed-income securities; these include both senior and subordinated claims as well as bank debt and other outstanding obligations, structuring positions with little of no broad credit market exposure. These may also contain a limited exposure to government, sovereign, equity, convertible or other obligations but the focus of the strategy is primarily on fixed corporate obligations and other securities are held as component of positions within these structures.

Credit Spread: The difference in yield between two fixed-income instruments with differing credit profiles.

Distressed: Hedge Fund Research HFRI Event-Driven Distressed/Restructuring Total Index. Distressed/ Restructuring strategies employ an investment process focused on corporate fixed-income instruments, primarily on corporate credit instruments of companies trading at significant discounts to their value at issuance or obliged (par value) at maturity as a result of either formal bankruptcy proceeding or financial market perception of near term proceedings.

Emerging Markets: The MSCI Emerging Markets Index captures large and mid cap representation across Emerging Markets (EM) countries. The index covers 85% of the free float-adjusted market capitalization in each country.

Equity Market Neutral: Hedge Fund Research HFRI Equity Hedge Equity Market Neutral Index. Equity Market Neutral strategies employ sophisticated quantitative techniques of analyzing price data to ascertain information about future price movement and relationships between securities, select securities for purchase and sale. Equity Market Neutral Strategies typically maintain characteristic net equity market exposure no greater than 10% long or short.

Ethereum: Ethereum is a platform that offers programming code of any decentralized application. It has been linked to payment style transactions. Ether is the cryptocurrency issued through open-source code executed on thousands of nodes.

Event Driven: Hedge Fund Research HFRI Event-Driven (Total) Index. Investment Managers who maintain positions in companies currently or prospectively involved in corporate transactions of a wide variety including but not limited to mergers, restructurings, financial distress, tender offers, shareholder buybacks, debt exchanges, security issuance or other capital structure adjustments.

Gold: The return of the gold spot price as quoted as U.S. dollars per Troy Ounce.

Hedged Equity: Hedge Fund Research HFRI Equity Hedge (Total) Index. Investment Managers who maintain positions both long (positions that are owned) and short (positions that are owed) in primarily equity and equity derivative securities. Hedged Equity managers would typically maintain at least 50%, and may in some cases be substantially entirely invested in equities, both long and short.

High-Yield Bonds: The Bloomberg Barclays US High Yield Very Liquid Index (VLI) is a component of the US Corporate High Yield Index that is designed to track a more liquid component of the USD-denominated, high yield, fixed-rate corporate bond market. The US High Yield VLI uses the same eligibility criteria as the US Corporate High Yield Index, but includes only the three largest bonds from each issuer that have a min amount outstanding of USD500mn and less than five years from issue date.

International Developed: The MSCI EAFE Index is designed to represent the performance of large and mid-cap securities across 21 developed markets, including countries in Europe, Australasia and the Far East, excluding the U.S. and Canada. The index is a free-float weighted equity index.

Japanese Yen: The return from selling the short currency (USD) to buy the long currency (JPY) and earning interest. The return is calculated by adding the spot return to the interest earned from the long currency position. It is designed to measure the performance of the Japanese yen vs. the U.S. dollar.

Litecoin: A peer-to-peer cryptocurrency and open source software project similar to Bitcoin, Litecoin uses blockchain technology to process transactions. Litecoin, referred to as an alt-coin can process blocks faster than Bitcoin, uses a different mining algorithm and has larger supply.

Long/Short: "Long" and "short" are investment terms used to describe ownership of securities. To buy securities is to "go long." The opposite of going long is "selling short." Short selling is an advanced trading strategy that involves selling a borrowed security. Short sellers make a profit if the price of the security goes down and they are able to buy the security at a lower amount than the price at which they sold the security short.

Macro: Hedge Fund Research HFRI Macro (Total) Index. Investment Managers which trade a broad range of strategies in which the investment process is predicated on movements in underlying economic variables and the impact these have on equity, fixed-income, hard currency and commodity markets.

Managed Futures: BarclayHedge US Managed Futures Industry Top 50 (BTop 50) Index. The Index seeks to replicate the overall composition of the managed futures industry with regard to trading style and overall market exposure.

Overnight Repurchase Agreements: A repurchase agreement (repo) is a form of short-term borrowing for dealers in government securities. In the case of a repo, a dealer sells government securities to investors, usually on an overnight basis, and buys them back the following day at a slightly higher price. That small difference in price is the implicit overnight interest rate.

Real Estate: The Dow Jones US Real Estate Index is designed to track the performance of real estate investment trusts (REITs) & other companies that invest directly or indirectly in real estate through development, management or ownership, including property agencies.

Ripple: Known as XRP, Ripple is a cryptocurrency that can be used on open source distributed ledger created by the company Ripple. It is built upon the principles of blockchain as an on-demand option for faster cross border payments.

Swiss Franc: The return from selling the short currency (USD) to buy the long currency (CHF) and earning interest. The return is calculated by adding the spot return to the interest earned from the long currency position. It is designed to measure the performance of the Swiss franc vs. the U.S. dollar.

U.S. Equities: The S&P 500 Index. An unmanaged index of 500 stocks (currently 505) used to measure large-cap U.S. stock market performance.

U.S. 30-Yr Treasury Yield: Yield of U.S. Treasury securities maturing in approximately 30 years.

U.S. Dollar: The U.S. Dollar Index (USDX) indicates the general international value of the U.S. dollar. The USDX does this by averaging the exchange rates between the USD and major world currencies. The ICE US computes this by using the rates supplied by some 500 banks.

U.S. Treasury: The ICE U.S. Treasury 20+ Years Bond Index is part of a series of indices intended to assess U.S. Treasury issued debt. Only U.S. dollar denominated, fixed-rate securities with minimum term to maturity greater than twenty years are included.

Volatility Arbitrage: Hedge Fund Research HFRI Relative Value Volatility Index. Volatility strategies trade volatility as an asset class, employing arbitrage, directional, market neutral or a mix of types of strategies, and include exposures which can be long, short, neutral or variable to the direction of implied volatility, and can include both listed and unlisted instruments. Directional volatility strategies maintain exposure to the direction of implied volatility of a particular asset or, more generally, to the trend of implied volatility in broader asset classes. Arbitrage strategies employ an investment process designed to isolate opportunities between the price of multiple options or instruments. Volatility arbitrage positions typically maintain characteristic sensitivities to levels of implied and realized volatility, levels of interest rates and the valuation of the issuer's equity, among other more general market and idiosyncratic sensitivities.