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As 2022 ended, many capital market participants gladly said adieu. It was a year of horrid returns for traditional portfolios, a stellar year for alternative strategies, and possibly the year that forced regulatory agencies to get more serious about their oversight of the digital investment arena after a string of historic thefts, alleged frauds, and bankruptcies. Inflation remained quite high at 7.1% (CPI YoY) but continued its downward trajectory in the 4th quarter. Risk assets rallied on the hopes that the Federal Reserve (the "Fed") was nearing the end of its tightening cycle. Mortgage rates moved below 7% but are still at levels not seen in over a decade. Concluding that peak inflation is in the rearview mirror presumes many things: well behaved energy markets, resolute Central Banks, less international strife, reasonable environmental regulations, and disciplined government spending. None of these can be taken for granted or even considered probable, in our opinion.

Investor focus seems to have shifted from inflation as a juggernaut to how soon the Fed's pivot on interest rates will come and flash the "all clear" to go all in on risk. The Fed has repeatedly said high rates are here to stay for quite some time and they will not be cutting in 2023. In our view, the long end of the U.S. Treasury market and the outsized positive moves of equities in response to softening economic data convey that the markets don't believe the narrative and think sooner than later, the Fed will fall back on their old ways of priming the economy with easy money. Inflation still exceeds growth in the U.S. by a wide margin, only a robust job market prevents classifying the current economic environment as solidly stagflationary.

The Fed raised the Fed Funds Target rate by a total of 125 basis point (bps), 75 bps in November and 50 bps in December. Notable is that the Fed's estimate of the median rate at the end of 2023 rose from 4.6% in the 3rd quarter to 5.1%, a significant increase. Language from the Fed has been reasonably consistent: it remains in inflation-killing mode and capital markets appear to be underestimating the Fed's resolve just as they underestimated the speed at which the Fed would raise rates. 3-month T-bills ended the quarter at 4.37%, the highest level since 2007.

Alternative Investments ("alternatives") had a solid quarter on an absolute basis, with positive returns in 7 of 10 categories. None of the categories kept pace with the torrid rise of the S&P 500 Index. The average underperformance versus the S&P 500 Index was more than -600 bps for the quarter. For all of 2022, the average outperformance vs the S&P 500 Index is over 1600 bps. Six of 10 categories outperformed the Bloomberg U.S. Aggregate Bond Index for the quarter. Higher correlation/higher beta strategies on average fared substantially better which is expected given the positive returns in stocks and corporate bonds. Real estate was the best performing category (+4.44%). Other notable gainers were hedged equity (+3.99), event driven (+2.92%) and commodities (+2.22%). Managed futures (-4.44%) and volatility arbitrage (-1.29%) were the worst performing categories (Figure 1 and Figure 2).

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 shorting as part of their approach. Strategies that had lower 2-year correlations to U.S. equities (less than 0.60), on average, significantly underperformed those strategies that had a higher correlation with U.S. equities. The spread was -366 bps (Figure 3).

Figure 1 Alternative Category Performance

	Q4 2022	YTD 2022
Hedged Equity	3.99%	-10.37%
Event Driven	2.92%	-5.04%
Equity Market Neutral	1.17%	1.59%
Real Estate	4.44%	-25.17%
Commodities	2.22%	16.09%
Distressed/Restructuring	2.09%	-3.01%
Volatility Arbitrage	-1.29%	4.19%
Credit Arbitrage	2.17%	-3.50%
Macro	-1.04%	9.31%
Managed Futures	-4.44%	3.73%

Source: Bloomberg, data as of 12/30/22.

Figure 2 Alternative Performance (Over/Under) vs S&P 500 Index

	Q4 2022
Hedged Equity	-3.57%
Event Driven	-4.64%
Equity Market Neutral	-6.40%
Real Estate	-3.12%
Commodities	-5.34%
Distressed/Restructuring	-5.47%
Volatility Arbitrage	-8.85%
Credit Arbitrage	-5.39%
Macro	-8.60%
Managed Futures	-12.00%

Source: Bloomberg, data as of 12/30/22.

Figure 3 Correlations (2yr) & Returns

	S&P 500 Index	Q4 2022
Hedged Equity	0.81	3.99%
Event Driven	0.76	2.92%
Equity Market Neutral	0.17	1.17%
Real Estate	0.91	4.44%
Commodities	0.38	2.22%
Distressed/Restructuring	0.52	2.09%
Volatility Arbitrage	-0.14	-1.29%
Credit Arbitrage	0.48	2.17%
Macro	-0.06	-1.04%
Managed Futures	-0.28	-4.44%
Lower Correlation Avg TR (<=0.60)		0.13%
Higher Correlation Avg TR (>0.60)		3.78%

Source: Bloomberg, data as of 12/30/22. Correlation of monthly returns over 24 months.

References to specific companies or securities should not be construed as a recommendation to buy or sell any such security, nor should they be assumed profitable.

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.*

Real asset returns were positive across the board. Commodities benefited from a weaker dollar, gold appeared to be catching a tailwind with the dollar and concerns of a recession and mortgage rates moving off their highs likely helped real estate. (Figure 4 and 5).

Figure 4 Real Assets

	Q4 2022	YTD 2022
Real Estate	4.44%	-25.17%
Commodities	2.22%	16.09%
Gold	9.84%	-0.28%
Average	5.50%	-3.12%

Source: Bloomberg, data as of 12/30/22.

Figure 5 Bankrate.com 30Y Mortgage Rates

Source: Bloomberg, data as of 12/30/22.

Cryptocurrencies endured a rough 4th quarter to top off a brutal 2022. Centralized cryptocurrency exchange FTX, once valued at over $30 billion collapsed and its founders have been accused of fraud on the scale of billions of dollars. The bankruptcy of FTX shook the digital markets and triggered the collapse of cryptocurrency lending platform BlockFi, which as recently as 2021 was valued at $3 billion. Digital assets had just begun to regroup from the spectacular implosions of the Terra Luna cryptocurrency, multibillion dollar hedge fund Three Arrows Capital (3AC) and cryptocurrency lender Celsius Network earlier in the year. These events, as well as continuing multimillion dollar thefts/hacks, make broader and deeper regulatory reach likely on the table for 2023. The Bloomberg Galaxy Crypto Index was down nearly 20%, and the bellwether Bitcoin was down nearly 15%. Ethereum and Ripple were both down sharply in the 4th quarter. Litecoin rebounded, up +31.3% but was still down almost -52% for the year (Figure 6).

Returns for major asset classes were sharply positive in the 4th quarter of 2022, exceptions being the U.S. Dollar, long U.S. Treasuries, and Bitcoin. International developed led the move (+17.34%) followed by emerging markets (+9.70%), and U.S. equities (+7.56%).

Commodities lagged equities but still posted a positive return for the quarter (+2.22%) and was by far and away the best performing asset class in 2022. U.S economic data started to show flashes of weakness, but the labor markets remain robust as ever. Long-dated U.S. Treasuries fell (-1.37%) while high yield bonds rallied (+4.34%). U.S. inflation looks to have peaked, and there are hopes the Fed is near its rate endpoint perhaps contributing to the sharp selloff in the U.S. Dollar Index (-7.67%) (Figure 7). Nominal yields moved mostly higher and the curve pushed more into inversion as short rates rose. 5-year yields were an exception and fell 9 bps. Although real yields remained negative (Figure 8) spread to zero has narrowed as inflation moved down and yields rose. If the current trajectory is unaltered, 0% real yields may be reached sometime in 2023, in our opinion.

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. **Please Note: Alternative investments may employ complex strategies, have unique investment, and risk characteristics that may not be suitable for all investors. Diversification does not guarantee a profit or protect against loss.**

Figure 6 Cryptocurrency Returns

	Q4 2022	YTD 2022
BB Galaxy Crypto Index	-19.72%	-70.19%
Bitcoin	-14.86%	-64.30%
Ethereum	-9.94%	-67.48%
XRP (Ripple Dig.Asst)	-29.15%	-58.72%
Litecoin	31.32%	-51.99%

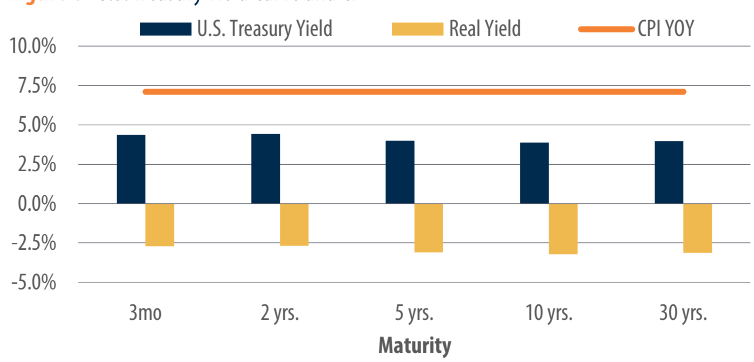
Source: Bloomberg, data as of 12/30/22.

Figure 7 Asset Class Returns

	Q4 2022	YTD 2022
U.S. Equities	7.56%	-18.11%
International Developed	17.34%	-14.45%
Emerging Markets	9.70%	-20.09%
U.S. Treasury	-1.37%	-31.04%
Real Estate	4.44%	-25.17%
Commodities	2.22%	16.09%
High Yield Bonds	4.34%	-11.88%
U.S Aggregate Bonds	1.87%	-13.01%
Bitcoin	-14.86%	-64.30%
U.S. Dollar	-7.67%	8.21%

Source: Bloomberg, data as of 12/30/22.

Figure 8 U.S. Treasury Yield Curve and CPI



Source: Bloomberg. U.S. Treasury Yields as of 12/30/22. CPI YoY as of 12/30/22.

Definitions

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

30-Yr Mortgage Rate: is a fixed interest rate home loan that will be paid off completely in 30 years if you make every payment as scheduled.

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

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

Central Bank: A central bank is a financial institution given privileged control over the production and distribution of money and credit for a nation or a group of nations.

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.

Cryptocurrency is a digital or virtual currency that is secured by cryptography, which makes it nearly impossible to counterfeit or double-spend.

Distressed/Restructuring: 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 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.

Inflation is the decline of purchasing power of a given currency over time.

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.

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.

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.

Nominal yield of a bond, depicted as a percentage, is calculated by dividing total interest paid annually by the face, or par, value of a bond**.**

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.

Real Yield or Real Interest Rate has been adjusted to remove the effects of inflation to reflect the real cost of funds to the borrower and the real yield to the lender or to an investor.

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.

Stagflation: A term used to describe a stagnant economy hampered not only by slow growth but by high inflation as well.

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.

Year-over-Year (YoY): is a calculation that helps compare growth over the previous 12 months and automatically negates the effect of seasonality.

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.