

Systematic Strategies and Inflation: What Works?



This is marketing material. Solely intended for use by institutional/professional investors only.



Yung-Shin Kung
Head and Chief
Investment Officer
of CSAM Quantitative
Investment Strategies

Chin Te Liu
Head of Research
& Technology
CSAM Quantitative
Strategies



For more information on the views expressed here, you can contact us at csam.qis@credit-suisse.com

Executive Summary

In September 2020, we postulated that the combination of macroeconomic measures implemented in reaction to the COVID-19 pandemic and a repositioning of the Federal Open Market Committee's longer run goals and monetary policy strategy¹ risked heightening uncertainty around the path of future inflation. Since then, a shift in the composition of the US expenditure basket has compounded the challenges of meeting consumer demand through the world's increasingly fragile supply chains. Here, we contextualize waxing inflation expectations and consider the implications of higher inflation on the systematic investment strategies we trade.

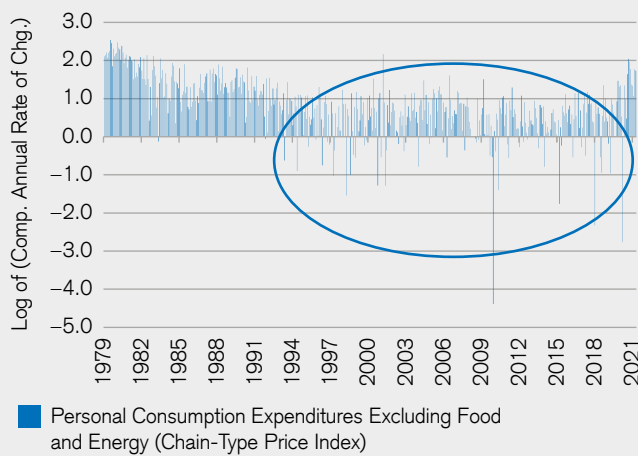
¹ <https://www.federalreserve.gov/monetarypolicy/review-of-monetary-policy-strategy-tools-and-communications-statement-on-longer-run-goals-monetary-policy-strategy.htm>

Distant Memories

One of the central challenges in understanding the impact of rising inflationary pressures lies in the absence of recent formative experiences which would enable investors to establish expectations around inflation scenarios. Rather, over the past several decades, businesses have woven increasingly tight economic linkages, removing unnecessary production lags and

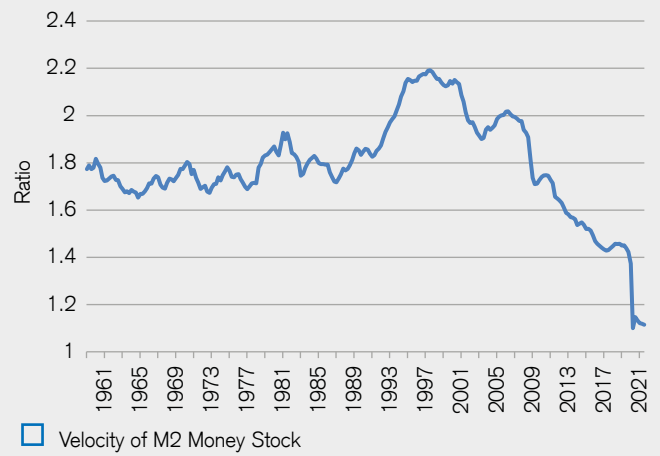
excess inventory, and moving production to geographies offering relatively inexpensive labor and lax regulatory standards. Globalization, technological advancement in production and logistics, and a focus on just-in-time manufacturing, have exerted meaningful disinflationary pressures for the last four decades.

Exhibit 1: Advances in Production and Globalization Have Been Disinflationary Since the 1990's



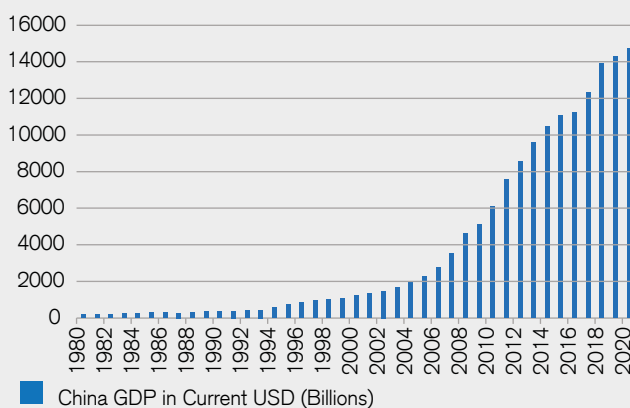
Source Federal Reserve Bank of St. Louis, U.S. Bureau of Economic Analysis

Exhibit 2: The Disinflationary Trend Has Also Been Apparent in the Velocity of Money (M2)



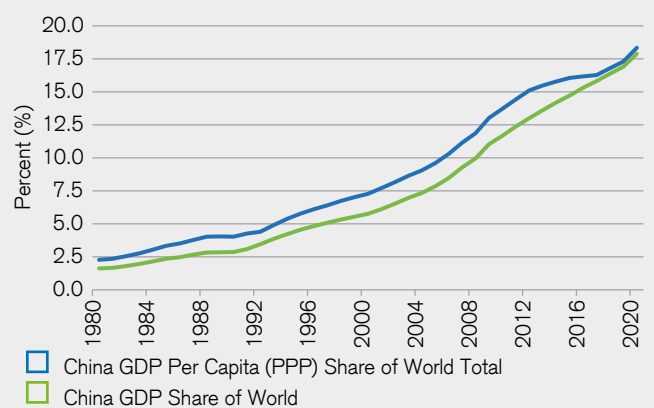
Source Federal Reserve Bank of St. Louis

Exhibit 3: Growth in China's GDP



Source World Bank Group, International Monetary Fund

Exhibit 4: China's Share of Global GDP



Source World Bank Group, International Monetary Fund

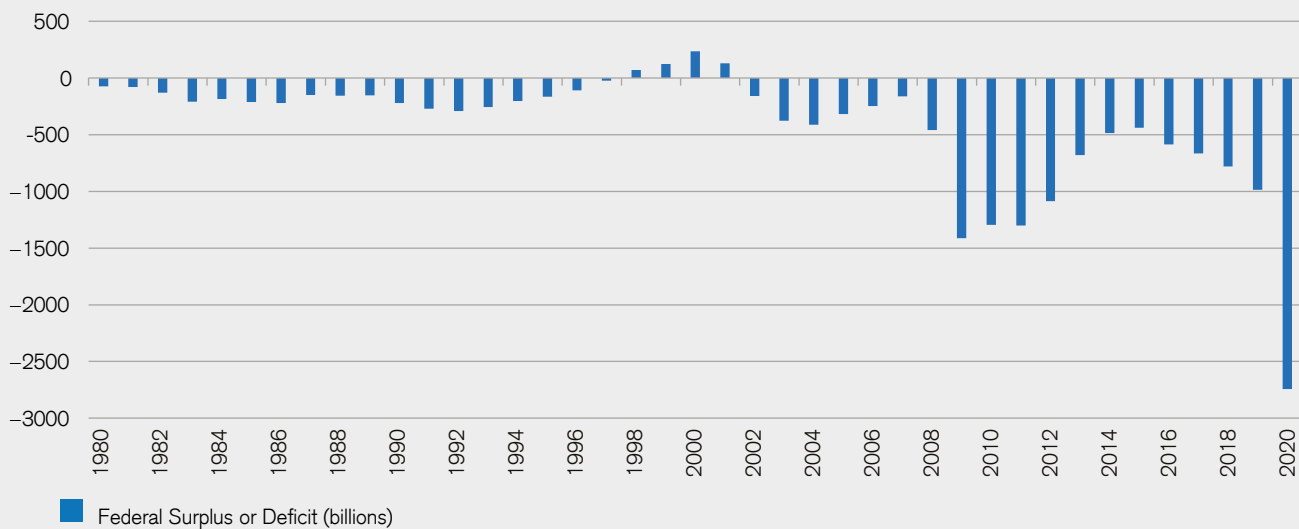
Over this period, China has consistently offered comparative advantage in production cost and, as a consequence, absorbed an increasing share of global GDP, the rate of which has only just begun to slow down.

A Social Tipping Point

To date, the COVID-19 pandemic has catalyzed two interrelated socioeconomic shifts. First, policymakers encouraged joblessness through a combination of non-essential business shut-downs and extended jobless benefits. Even as jobless benefits have receded, many workers

have expressed reluctance to rejoin the workforce citing concerns regarding the ongoing spread of COVID-19 and its variants, all while seeking to test the balance of power between employees and employers in a dynamic dubbed the Great Resignation.²

Exhibit 5: Exceptional Policy Measures Have Supported Labor Market Shortages While Fanning Inflation Fears



Source US Treasury

Second, with higher joblessness and the introduction of novel working arrangements, consumers have changed their purchasing patterns. For many years, the US economy has

comprised roughly 30% goods and 70% services. Consumption has shifted in favor of goods following the outbreak of the pandemic, while demand for services has shrunk.

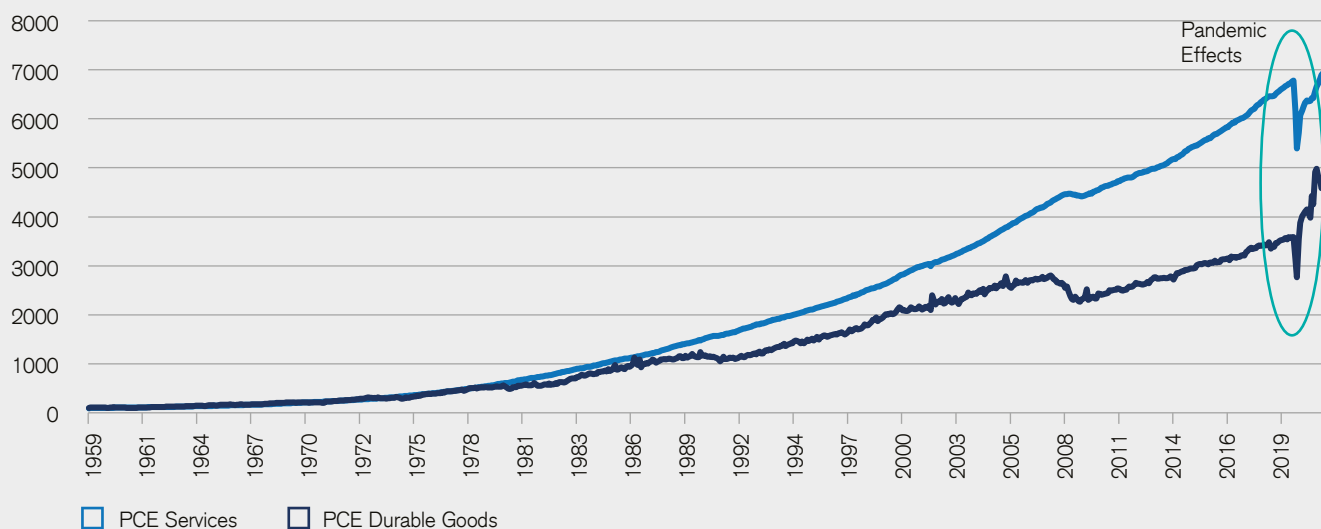
² Labor shortage hits home, giving workers new leverage - CSMonitor.com

A Social Tipping Point

After a multi-decade period of globalization driven disinflation, COVID-19 has ushered in four sources of inflationary pressure: (1) an increase in the money supply to support deficit spending and sustain unemployed workers, (2) a shift in the composition of the consumer expenditure basket towards goods rather than services, (3) rigidities in the labor market exerting upward

pressure on wages, and (4) supply chain fragility. At the same time, two consecutive US presidents have elected to redirect frustration surrounding domestic economic inequalities toward China, imposing protectionist tariffs on \$350 billion of Chinese goods,³ even as retaliatory tariffs imposed by China on US goods reduce US exports.⁴

Exhibit 6: Goods Consumption Has Risen Since Advent of COVID-19 While Services Experienced a Greater Blow



Source US Bureau of Economic Analysis.

Re-Opening and Reorganizing

Changing consumer demand, pandemic-linked business closures, input shortages, and an increasingly unstable Sino-US trade relationship have stressed and, in some cases, fractured highly sensitive global supply chains. For example, the US has migrated nearly \$100 billion of its Chinese imports to Vietnam, Europe, and Mexico, just as China redirected nearly all its US export shortfall to other trading partners.⁵ The combination of pandemic-driven economic shifts and deteriorating Sino-US relations is potentially a Minsky-type moment for just in time manu-

facturing, where a long period of disinflationary integration and optimization has sowed the seeds for supply shortages and an inflationary cycle.

In addition, the logistical challenges across ports and warehouses of adapting to a changing mix of goods imported, shifts in trading partners, and shortages of dock workers and truck drivers is exacerbating supply-demand imbalances in markets and driving many prices higher.

³ China tariffs stay in place as Biden trade chief looks to new talks - POLITICO

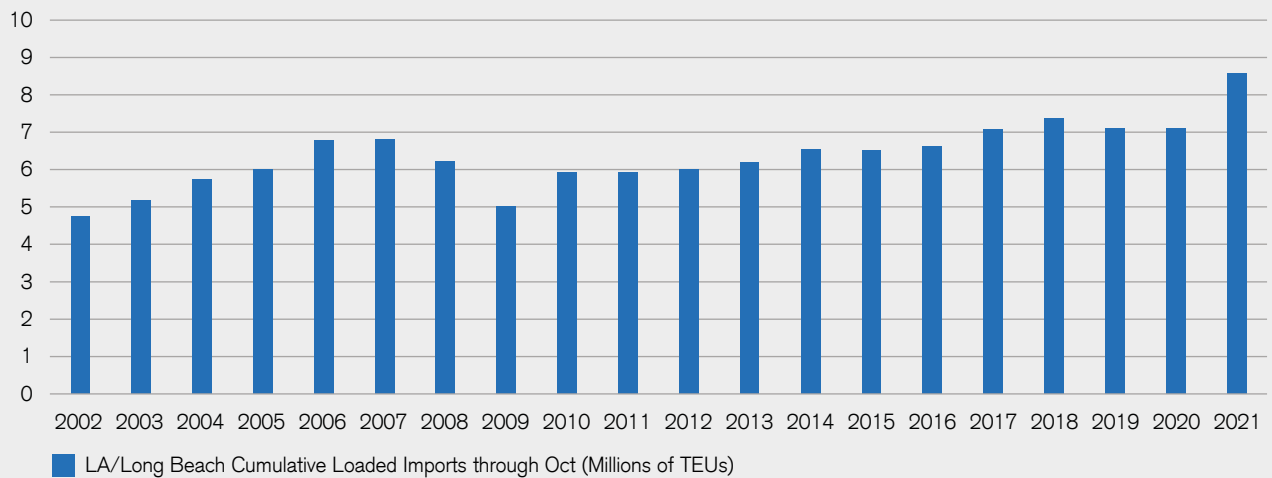
^{4,5} In US-China Trade War, New Supply Chains Rattle Markets - Carnegie Endowment for International Peace

A Supply Chain Example: The Los Angeles/Long Beach Ports

The ports of Los Angeles and Long Beach – which handle approximately 40 percent of the country’s containerized imports – moved 17 percent more containers between January and mid-October of 2021 than they did in 2018,

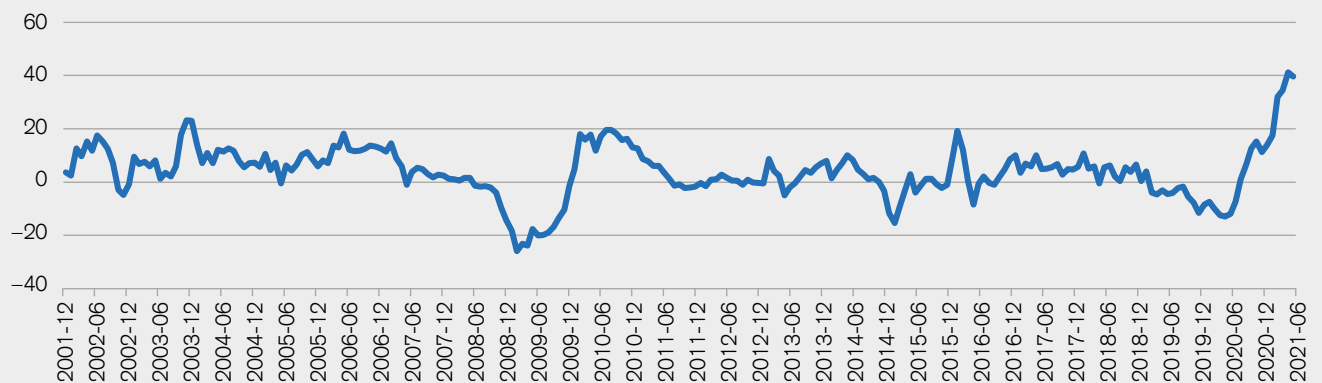
which held the previous record, according to a White House report.⁶ The increase in, and changing composition of, imports have created logistical challenges, which in turn have driven prices higher (see figure below).

Exhibit 7: Increased Imports Have Created Logistical Challenges



Source Port of LA and Port of Long Beach. Note: Every year sum loaded imports from Los Angeles and Long Beach from January to October.

Exhibit 8: Los Angeles Ports’ Activity

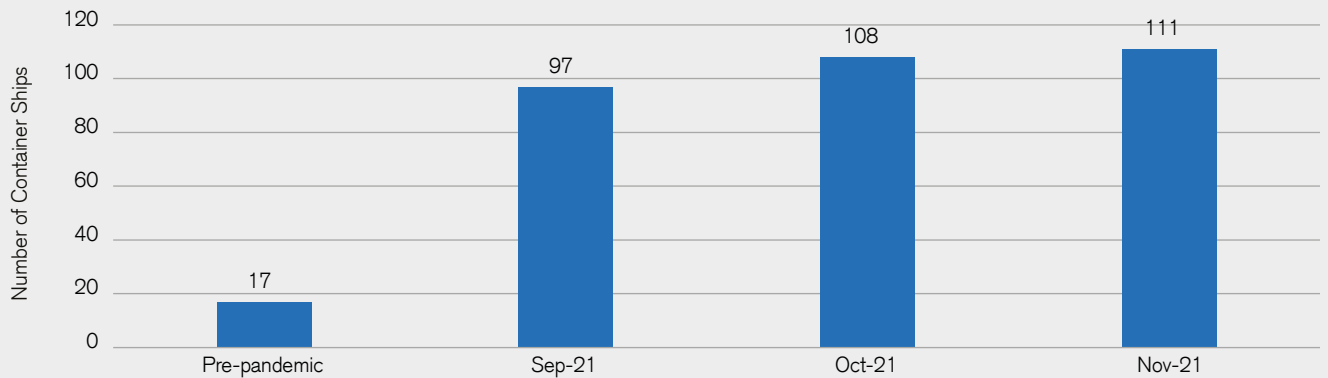


Source Port of LA and Port of Long Beach, Bloomberg

⁶ Recent Progress at Our Ports: Moving Cargo and Filling Shelves | The White House

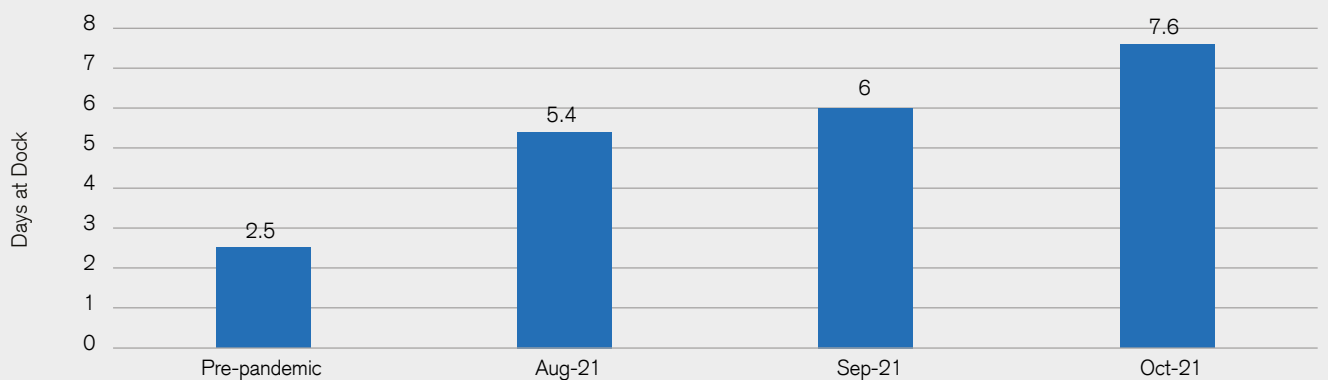
As such, port activity has trended upward. Increased activity and shortages of labor resulted in delivery delays.

Exhibit 9: Record Numbers of Container Ships Waited to Enter the Ports of LA/Long Beach⁷



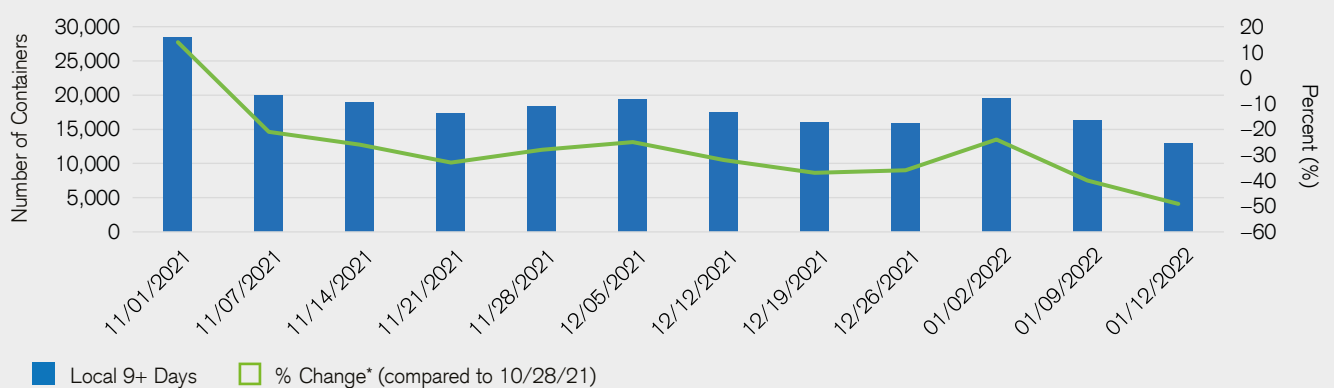
Source Marine Exchange

Exhibit 10: Average Amount of Time Containers Scheduled to Leave on Trucks Stayed at the Docks (Days)



Source Pacific Merchant Shipping Association

Exhibit 11: Number of Containers Dwelling 9 Days or More at Ports of LA/Long Beach



Source Port of Los Angeles and Port of Long Beach

Recent measures, however, have reduced some of the gridlock (see Figure 11).

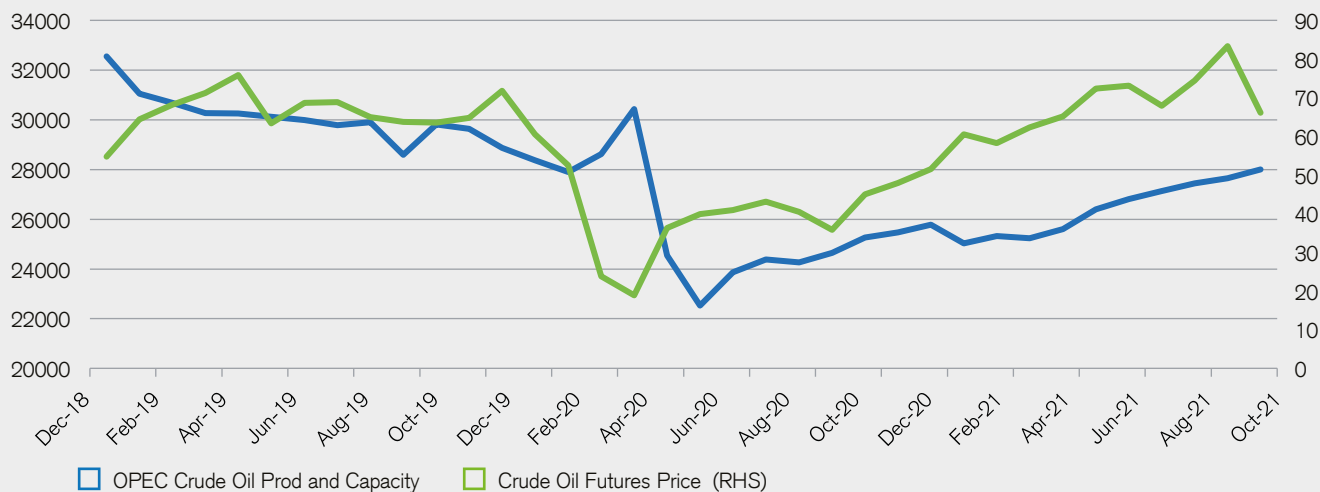
⁷ Supply chain problems and shipping delays aren't getting better. Here are some solutions. - Vox

The Energy Field

All the while, green initiatives and plummeting crude prices in early 2020 capped investment in fossil fuels, leading to high energy input prices

and shortages, necessitating the episodic closure of factories across China and instigating a contraction in manufacturing.⁸

Exhibit 12: OPEC Production Has Remained Below Pre-Pandemic Levels



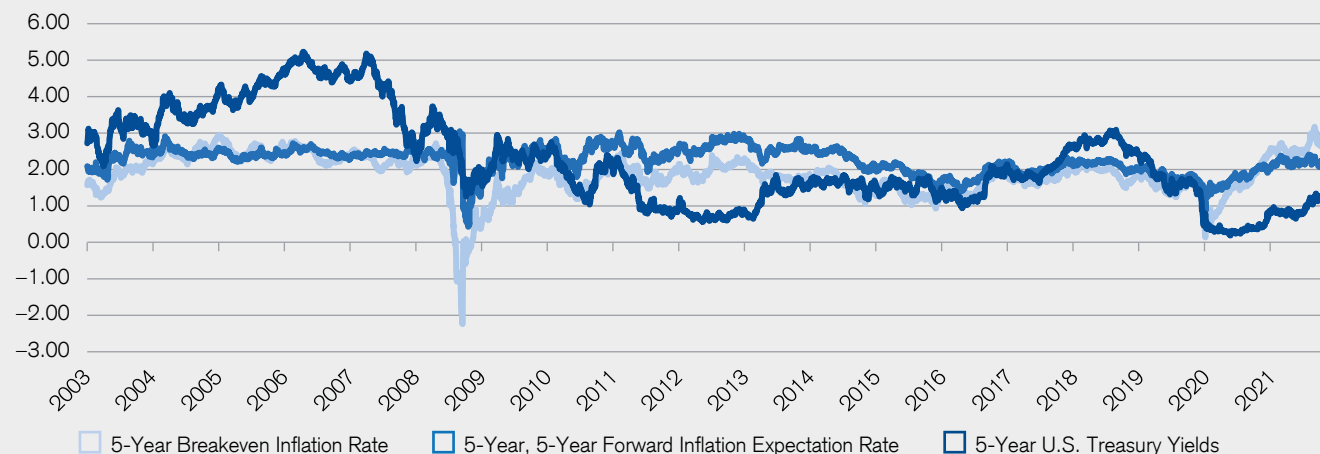
Source Bloomberg

Investor Reactions

Increasing inflation concerns are particularly problematic for investors given the historically

low level of interest rates and the asymmetric risk duration sensitive assets pose.

Exhibit 13: Rates Are at Historically Low Levels



Source St. Louis Fed; Board of Governors

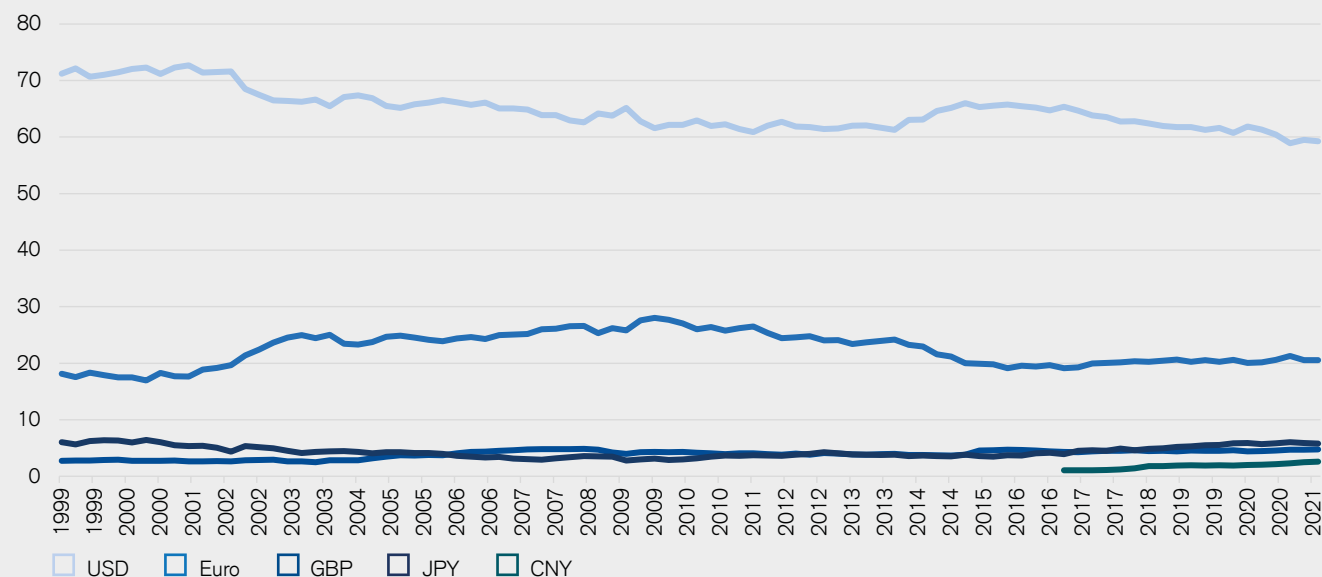
⁸ China Manufacturing Likely Contracted on Energy Crisis, Commodities Prices - Bloomberg

Investor Reactions

This is causing repositioning out of nominal US Dollar assets into other areas, such as crypto

currencies and commodities, which poses the risk of a more significant leg up in inflation.

Exhibit 14: Central Banks Are Reducing Their US Dollar Exposure, Posing a Risk to US Dollar Hegemony



Source International Monetary Fund. Note: 'USD' refers to Foreign Exchange Holdings in US Dollars as a Percentage of Total Allocated.

Inflation Scenarios

We see three potential inflation scenarios over the next 12-24 months.

1. Transitory

Recent inflation data proves temporary. Monetary and fiscal policy are effective in moving the economy back in line with long-term trend growth as interest rates remain stable.

2. Accelerating

Inflation psychology takes hold, reflected in higher longer-term inflation breakeven levels. Investors continue to reposition away from nominal, duration sensitive assets and a cycle of hoarding takes grip. Central banks seek to reassert price stability through more aggressive monetary policy. Depending upon the policy mix and the extent to which finished good price increases pass through to wages, this could result in stagflation.

3. Deflation

Lower labor force participation and supply shocks impact economic growth. Logistical bottlenecks limit the effectiveness of fiscal policy and there is limited scope to stimulate through monetary policy.

Inflation Scenarios

Until recently, the Fed has contended, and markets have thus far discounted, that we are experiencing a transitory inflation episode, where high inflation prints attributable to pandemic-driven base effects (economic lockdowns) are essentially one-off in nature. This scenario assumed that businesses facing rising input costs would absorb temporary profit compression without feeding price pressure back into the economy through increasing wages and/or raising prices.

Nonetheless, markets are highly sensitive to the risk that high debt levels could induce businesses to attempt to pass along price increases, thereby instigating a wage-price spiral. For various structural reasons, including demographics, we anticipate a tight, low-end of the labor market for many years, putting upward pressure on wages, and therefore inflation. Furthermore, the liquidity within the system stemming from low interest rates, combined with central bank stimulus tends to make consumers and businesses more likely to spend. While some elements of inflation may be transitory, there may be other aspects, such as wage growth, that will likely be more permanent. As such, the Fed may need to increase the pace of asset purchase tapering and hiking interest rates. President Biden's appointment of Jerome Powell to a second term as US Federal Reserve Chair signaled that this is a serious risk,⁹ and one of concern to policymakers.

Several interactive variables impact the path of inflation. These include:

- **Consumption Demand** (Demographics, Preference)
- **Changes in Productivity** (Technology, Logistics)
- **Market Expectations** (Price Anchoring, Inventory Management)
- **Policy** (Fiscal Policy, Protectionism)
- **Nominaire Effects** (Monetary Policy, Money Supply)

Impact to Systematic Strategies

Investors react to meaningful changes in inflation through security selection and asset allocation shifts. We focus on understanding the risks embedded in factor strategies through the prism of specific economic and market conditions, also known as regimes, which coincide with variations in the performance characteristics of these strategies. Changing inflation expectations naturally coincide with shifting regimes, and unsurprisingly 2021 witnessed meaningful factor rotations.

We are keenly interested in the question of how changes in inflation expectations impact various systematic investment strategies, and we see a good degree of variability in the magnitude and directionality of systematic strategies' inflation sensitivity.

⁹ Dollar Up, Powell's Re-nomination Drives Bets on Hawkish Fed (yahoo.com)

Sensitivity of Systematic Strategies to Inflation

Strategy Type

Description

Inflation Sensitivity

I. Fundamental – Valuation

Fundamental strategies express a view that market pricing is inefficient on the basis of an alternative appraisal methodology and seek to profit from that inefficiency, implicitly taking appraisal risk.

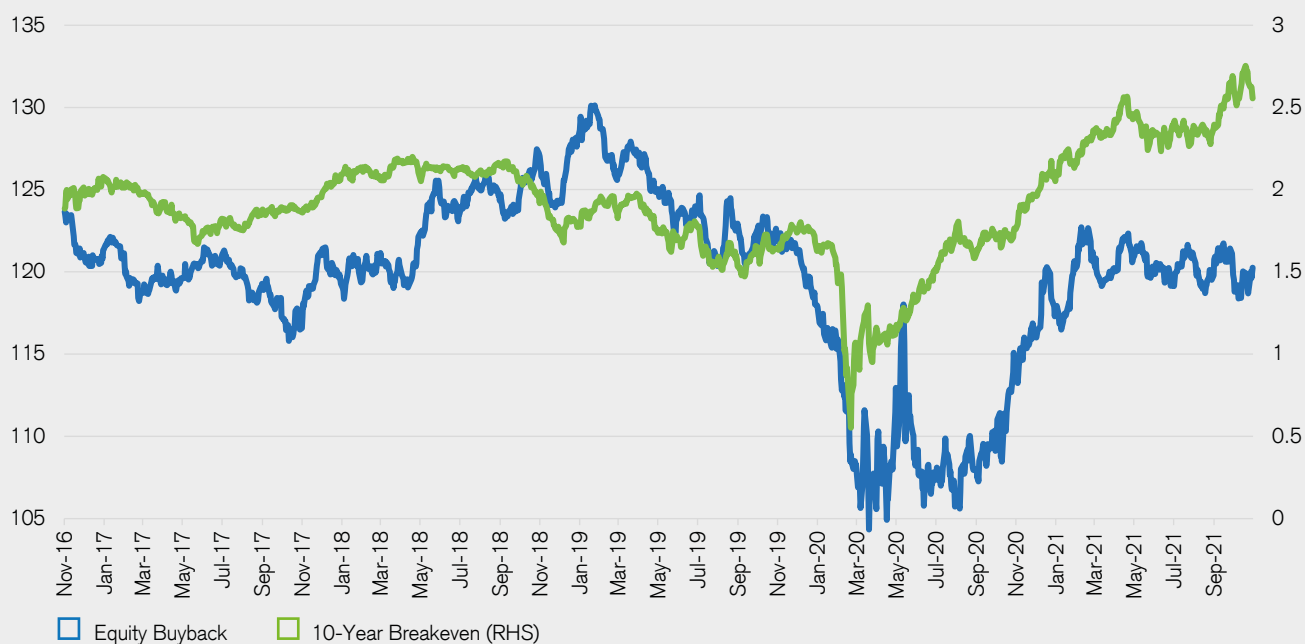
Many valuation strategies favor near-term cash flows over long-term cash flows, and are implicitly short duration/synthetic steepeners. The performance of these strategies often correlates positively with inflation changes and levels.

Example: Equity Buyback

Equity Buyback seeks to capture the tendency of stocks of companies in developed markets buying back their shares to outperform their counterparts. The strategy seeks to exploit inefficiencies in the valuation of equities by observing corporate buyback activity. Corporate decision makers, who inherently possess differentiated information on

their companies' prospects relative to the marketplace, tend to buy back their stock because they believe their stock offers a better return on investment than other projects they could undertake or acquisitions they could make, thus signaling undervaluation.

Exhibit 15: Equity Buyback's Relationship to Inflation¹⁰

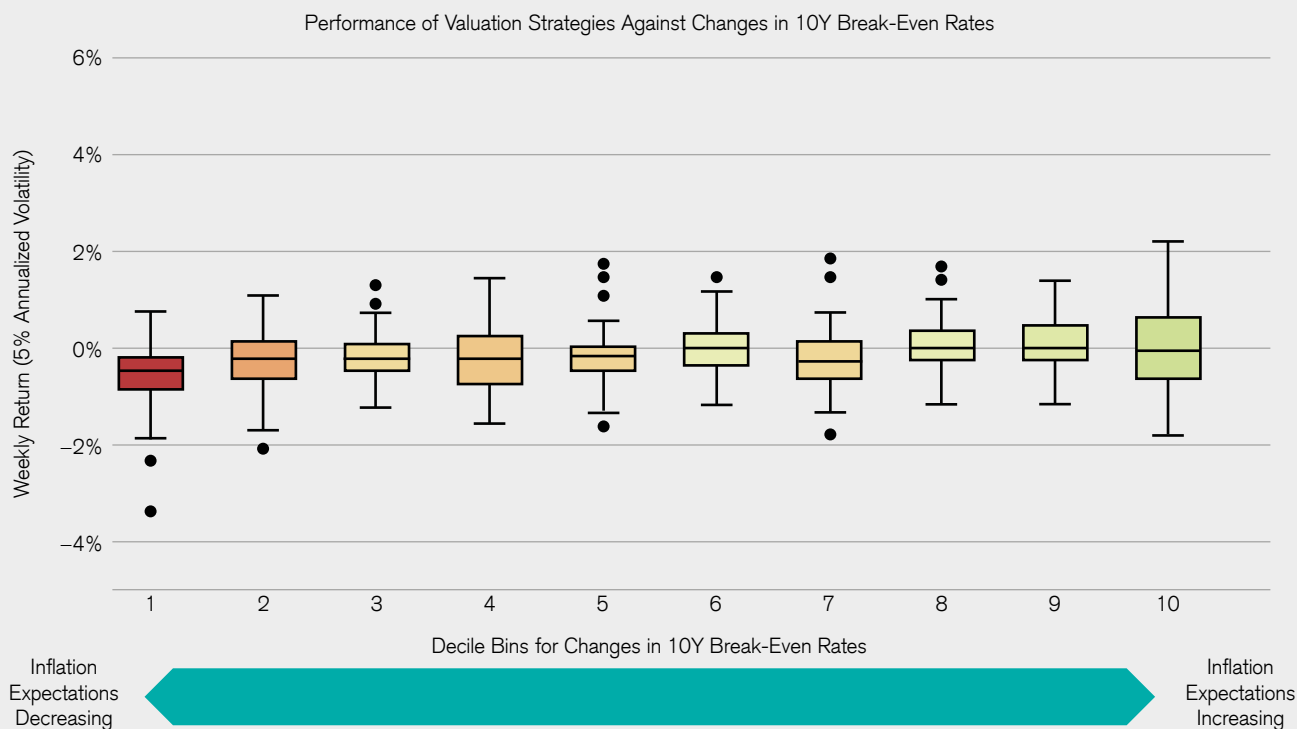


Source Bloomberg, CSAM

¹⁰ In the figure, the 10 Year Breakeven represents a measure of expected inflation derived from the difference between rates in 10-Year Treasury bonds and inflation protected 10-Year TIPS bonds. The value implies what market participants expect inflation to be in the next 10 years, on average.

Example: Equity Buyback

Exhibit 16: Valuation Strategies: Perform Better in Neutral to Higher Inflation Regimes



Source Bloomberg, CSAM

Note: The line in the center of the box plot square represents the median value. The bottom of each box represents the lower quartile, while the top of the box represents the upper quartile. The end of the whiskers represent the maximums and minimums of the range, excluding outliers which are shown as individual dots.

Example: Merger Arbitrage

Strategy Type

II. Fundamental – Carry

Description

Carry strategies assume market pricing is efficient and accept absolute or relative price risk for a return if pricing remains consistent.

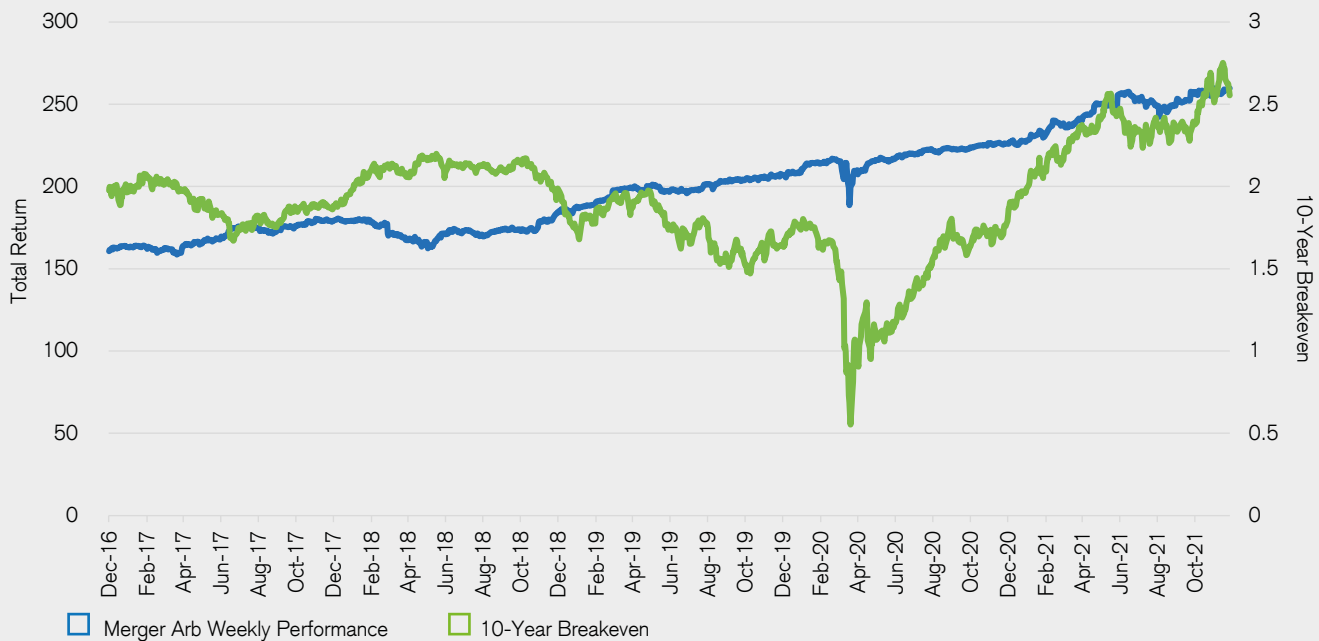
Inflation Sensitivity

Changes in inflation expectations are directly at odds with pricing efficiency, and carry strategies can be susceptible to loss as inflation expectations increase both outright and via substitution effects, particularly fixed income and commodity carry strategies.

Merger Arbitrage seeks to capture the return associated with the risk that announced merger transactions fail to consummate by providing liquidity to a group of investors unwilling or uninterested in holding deal risk. The spread

between the share price of the company being acquired in advance of merger consummation and the price being offered at consummation offers a well-defined carry to investors willing to assume that the deal will not break.

Exhibit 17: Merger Arbitrage Relationship to Inflation



Source Bloomberg, CSAM

Example: Merger Arbitrage

Exhibit 18: Carry (Merger Arb) Is Generally Neutral

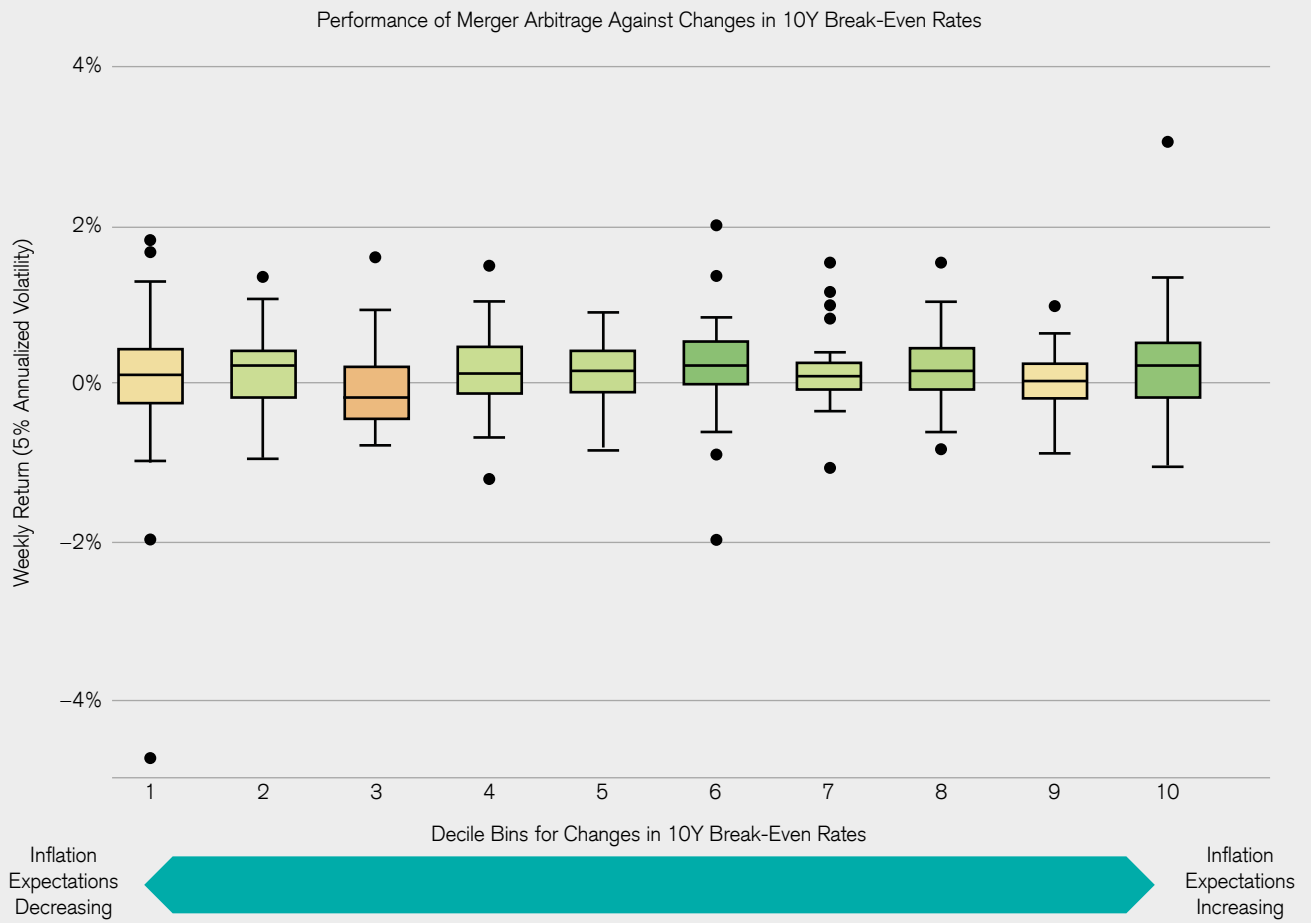
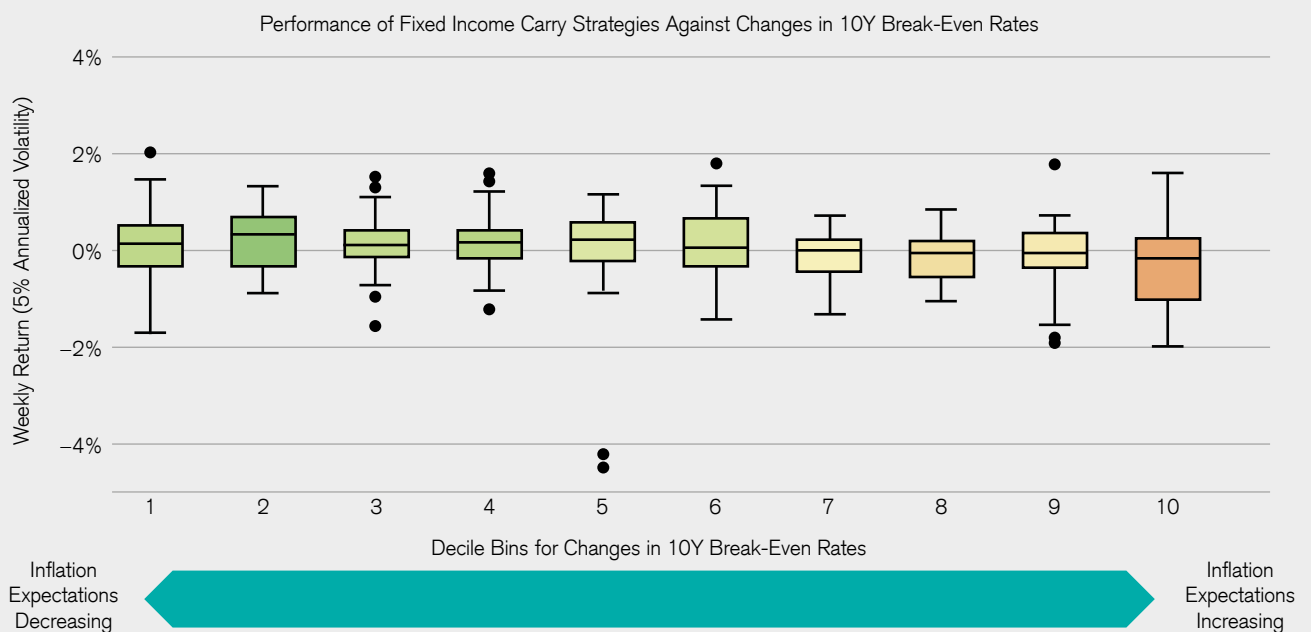


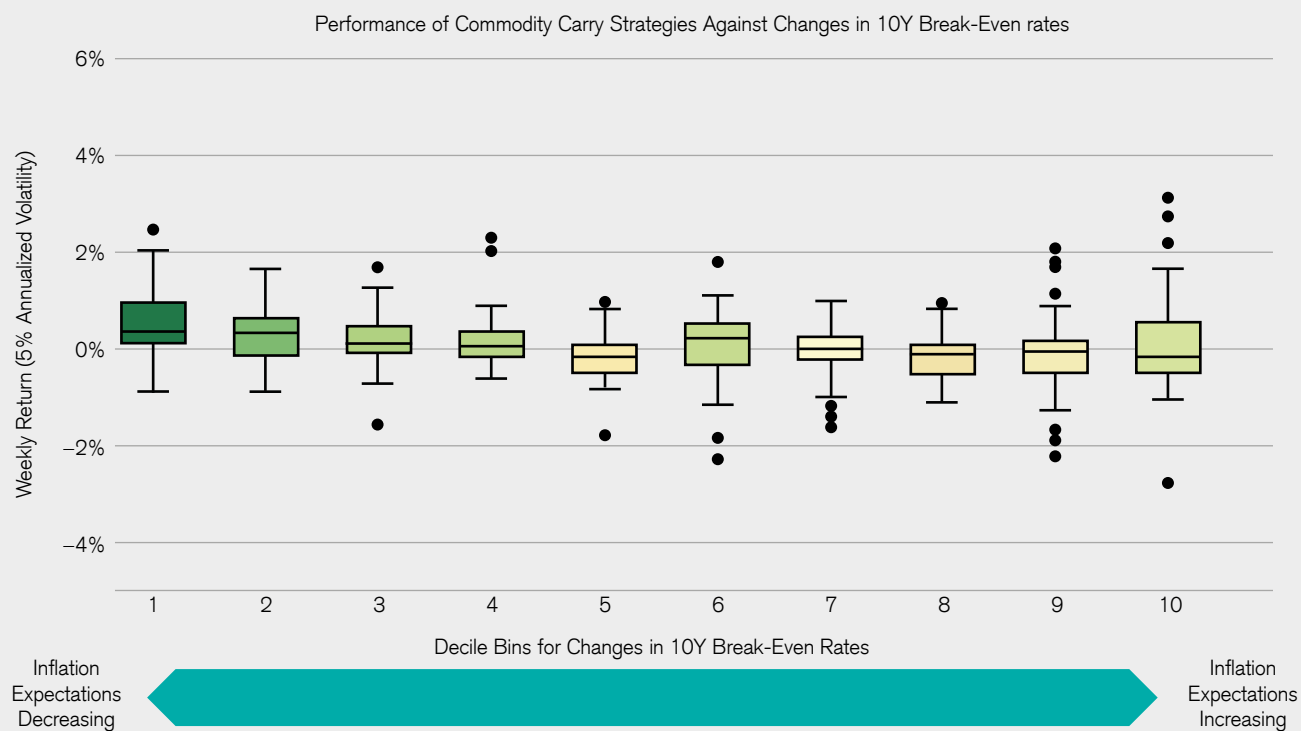
Exhibit 19: Carry (Fixed Income) Performs Better in Neutral and Deflationary Expectations



Source Bloomberg, CSAM

Example: Merger Arbitrage

Exhibit 20: Carry (Commodity) Shows Variability at the Extremes, Positive in Deflationary Regimes



Source Bloomberg, CSAM

Strategy Type

III. Tactical – Intermediation

Description

Intermediation strategies take inventory risk and extract economic rent for supplying balance sheet to the market and bridging temporal gaps in supply and demand.

Inflation Sensitivity

Intermediation strategies can benefit from an expansion in trading activity catalyzed by changing inflation expectations. The flipside is that inflation can present a greater degree of inventory price risk, which these strategies tend to accept.

Example: Duration Extension

Duration Extension seeks to capture returns from the periodic rebalancing activity of duration benchmarked investors in the US interest rate markets. The

strategy takes short-term inventory risk in exploiting liquidity/congestion dynamics associated with the rolling of securities in fixed income benchmarks.

Exhibit 21: Duration Extension and Inflation

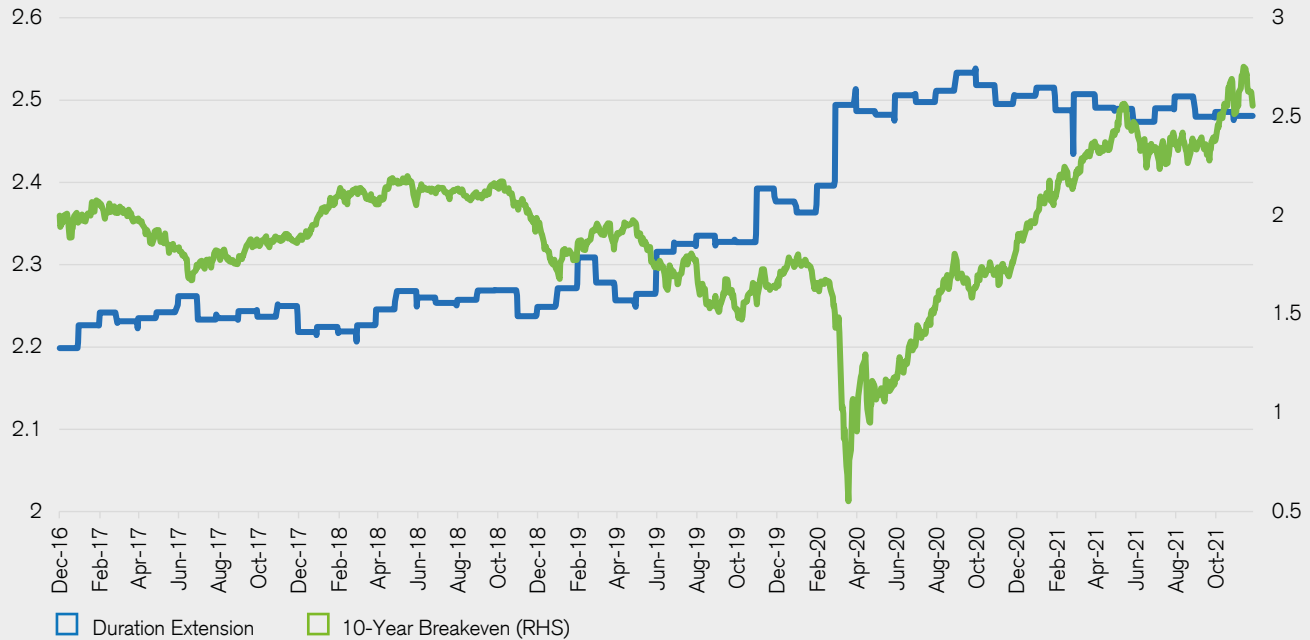
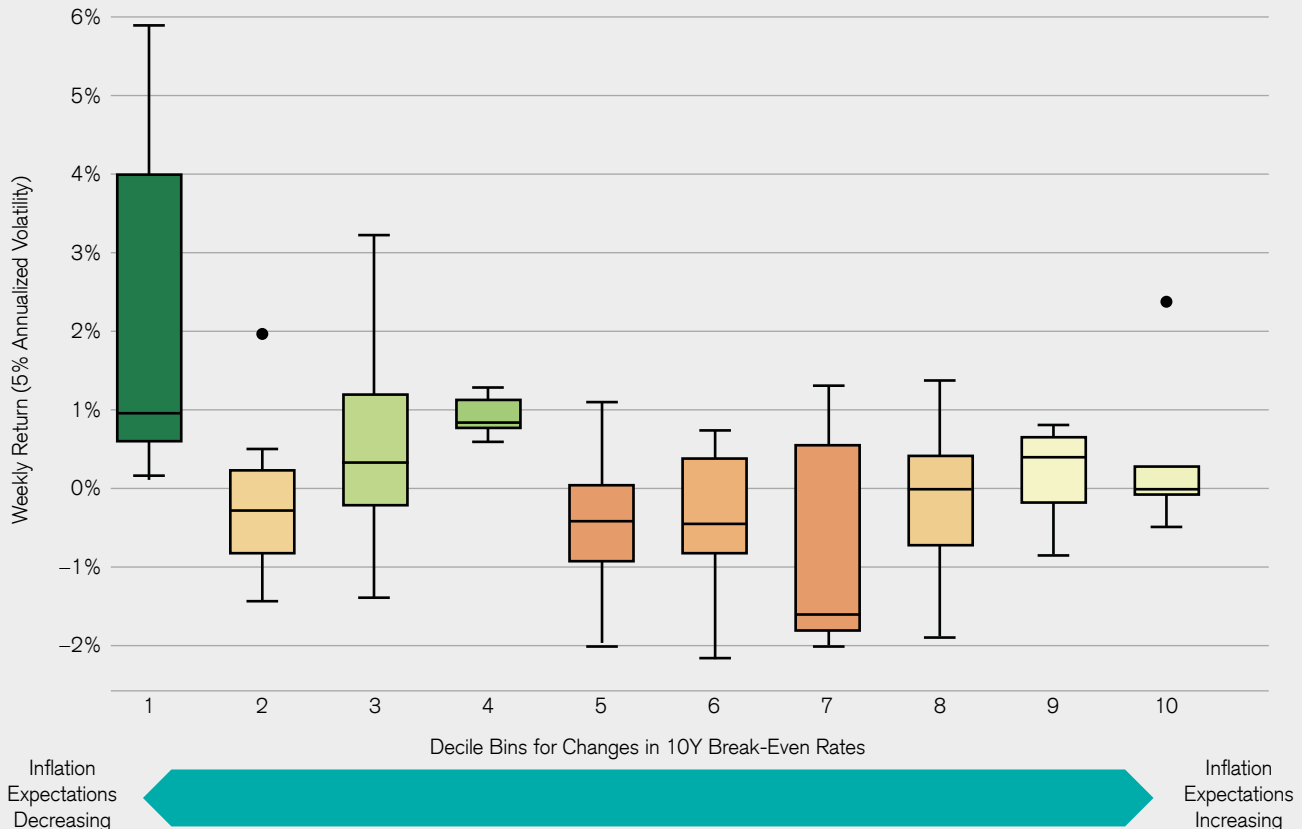


Exhibit 22: Duration Extension Outperforms in Highly Deflationary Regimes, Underperforms in Middle Deciles

Performance of Duration Extension Against Changes in 10Y Break-Even Rates



Example: Managed Futures

Strategy Type

IV. Tactical – Flow

Description

Flow strategies take price discovery process risk and seek to exploit lead-lag effects attributable to the heterogeneity of physical and informational resource constraints among market participants.

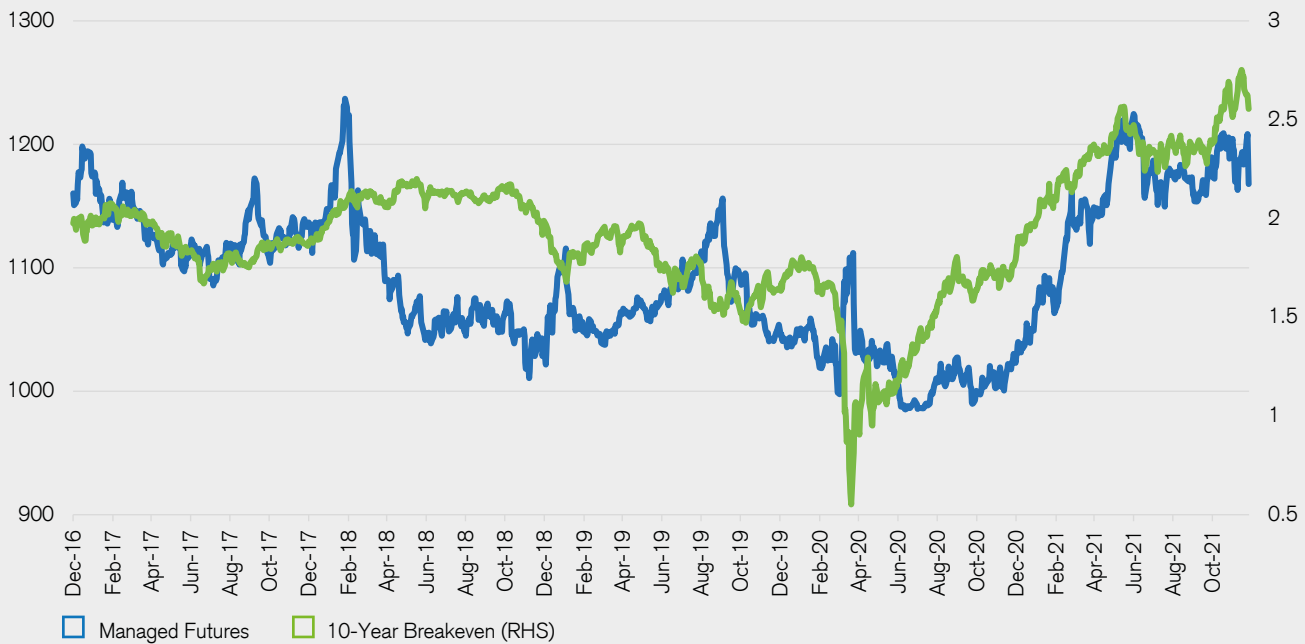
Inflation Sensitivity

Flow strategies benefit meaningfully from lead-lags in investor rebalancing activity both as inflationary pressures grow and as they recede.

Managed Futures seeks to capture autocorrelation dynamics in benchmark instruments across asset classes through a range of price-trend signals. The strategy is predicated on the notion that the

absorption of and reaction to market-sensitive information differs across investors, creating lead-lag effects and price trends.

Exhibit 23: Managed Futures and Inflation



Source Bloomberg, CSAM

Example: Managed Futures

Exhibit 24: Flow: Performs Relatively Well Across Deflationary and Inflationary Regimes



Source Bloomberg, CSAM

Strategy Type

V. Tactical – Positioning

Description

Positioning strategies take price elasticity risk and express a view that market positioning imbalances engender skews in the probability distributions of assets price returns.

Inflation Sensitivity

Positioning strategies generally benefit from the unwinding of consensus/crowded positions as what were formerly considered lower probability outcomes are recast as higher probability outcomes.

Tactical Positioning Example: Intraday Breakout in Energy

Intraday Breakout in Energy seeks to exploit agency constraints and risk aversion inherent in the structure of energy markets which result in time-varying market liquidity depth. The strategy is designed to capture

the tendency of markets to gap over the course of a trading day in the face of short-term supply-demand imbalances and takes a position consistent with the direction of large intraday market moves.

Exhibit 25: Intraday Breakout in Energy and Inflation

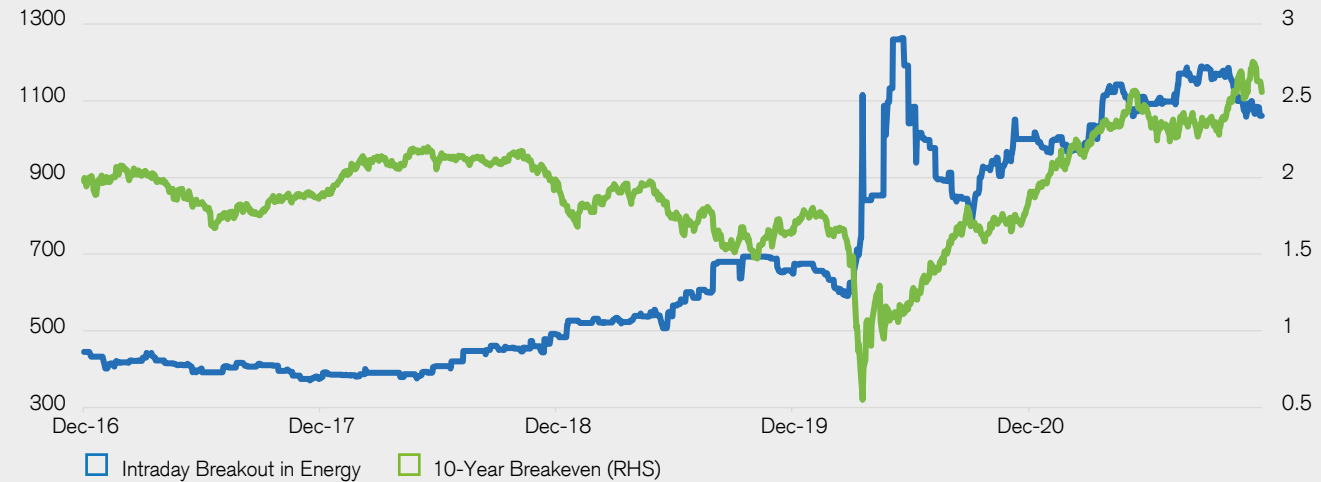
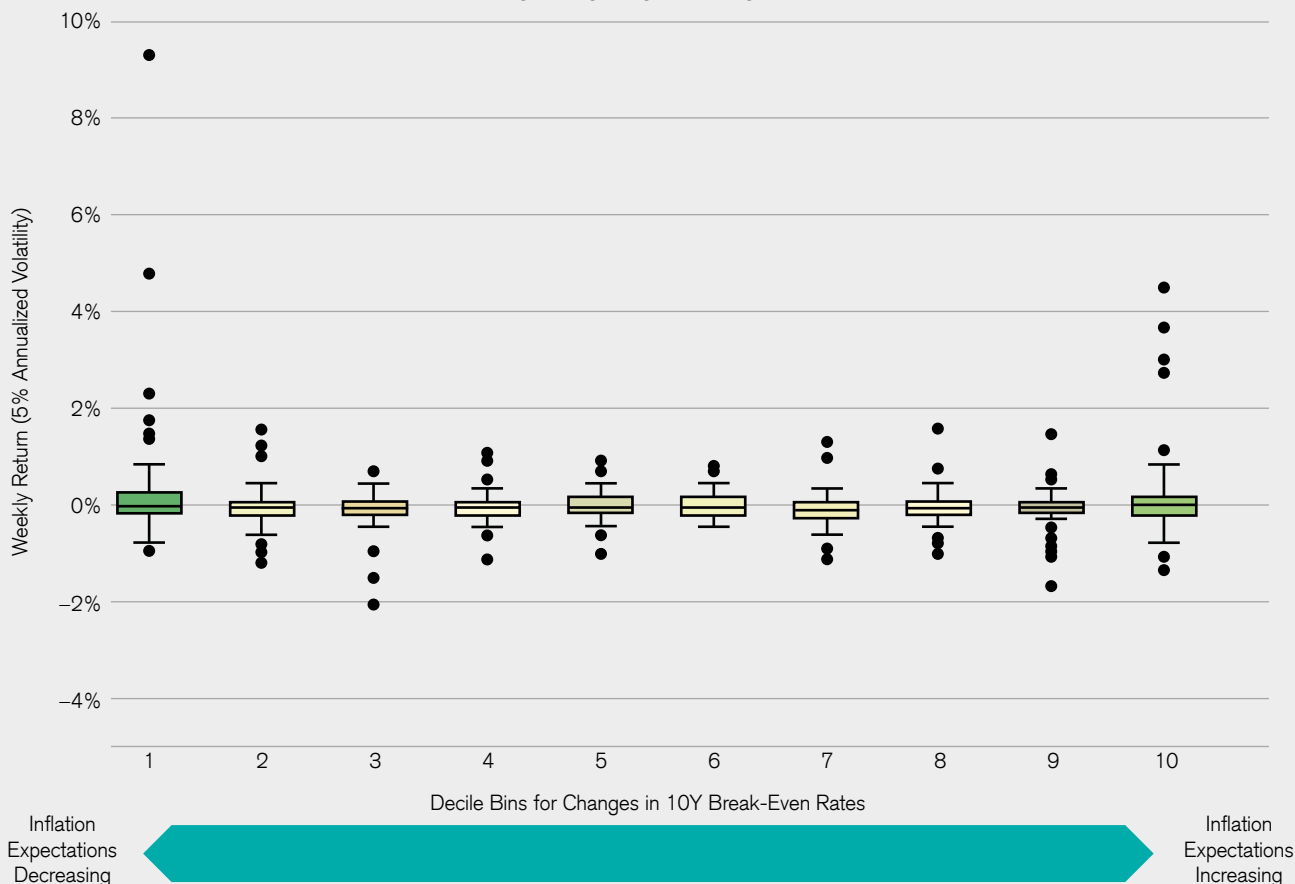


Exhibit 26: Tactical Positioning - Positive and High Dispersion at the Extremes

Performance of Positioning Strategies Against Changes in 10Y Break-Even Rates



Conclusion

Over the past several decades, both consumers and investors have grown accustomed to limited volatility in the prices of goods and services in developed market economies. COVID-19 has brought forth multiple potential sources of inflationary pressure. This has coincided with an increasingly bipartisan dismantling of US economic ties to China, which introduces both a source of upward price pressure on a variety of goods and heightens the complexity of reinvigorating the world's already strained supply chains. An

investment landscape with heightened inflation risk is an interesting one for systematic strategies. Depending upon the particularities of their underlying economics, these trading strategies may see changes in inflation expectations as a potential headwind or a tailwind. At CSAM QIS, we seek to understand and account for the ways in which shifts in economic and market regimes impact both our expectations for systematic strategy performance and the ways in which various systematic strategies relate to one another.

End Notes

Bloomberg Barclays Global Agg Govt TR Index: Bloomberg Barclays Global Agg Government Total Return Index is a measure of investment grade rated debt from 25 local currency markets. This multi-currency benchmark includes treasury and government-related fixed-rate bonds from both developed and emerging markets issuers.

Bloomberg Commodities Index: The Bloomberg Commodity Index (BCOM) is a highly liquid and diversified benchmark for commodity investments. The principal potential benefits of including commodities in a diversified financial portfolio include positive returns over time and low correlation with equities and fixed income.

MSCI World: The MSCI World Index captures large and mid-cap representation across 23 Developed Markets (DM) countries. With 1,646 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.

US Dollar Index Spot Rate: The U.S. Dollar Index is an index of the value of the United States dollar relative to a basket of foreign currencies, often referred to as a basket of U.S. trade partners' currencies. The Index goes up when the U.S. dollar gains "strength" when compared to other currencies.

The Credit Suisse Managed Futures Liquid Index: The Credit Suisse Managed Futures Liquid Index seeks to gain broad exposure to the Managed Futures strategy using a pre-defined quantitative methodology to invest in a range of asset classes including: equities, fixed income, commodities and currencies such that the target risk allocation for each is 25%.

Fed Total Assets: These assets include: holdings of Treasury, agency, and mortgage-backed securities; discount window lending; lending to other institutions; assets of limited liability companies (LLCs) that have been consolidated onto the Federal Reserve's balance sheet, and foreign currency holdings associated with reciprocal currency arrangements with other central banks (foreign central bank liquidity swaps).

Big Mac Index: The Big Mac Index is published by The Economist as an informal way of measuring the purchasing power parity (PPP) between two currencies and provides a test of the extent to which market exchange rates result in goods costing the same in different countries. It "seeks to make exchange-rate theory a bit more digestible."

Money Velocity: Velocity is a ratio of nominal GDP to a measure of the money supply (M1 or M2). It can be thought of as the rate of turnover in the money supply--that is, the number of times one dollar is used to purchase final goods and services included in GDP.

US Treasury Notes: United States Treasury securities are government debt instruments issued by the United States Department of the Treasury to finance government spending as an alternative to taxation. Treasury securities are often referred to simply as Treasuries.

CPI: The Consumer Price Index (CPI) is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services. Indexes are available for the U.S. and various geographic areas. Average price data for select utility, automotive fuel, and food items are also available.

Money Supply M2: M2 includes a broader set of financial assets held principally by households. M2 consists of M1 plus: (1) savings deposits (which include money market deposit accounts, or MMDAs); (2) small-denomination time deposits (time deposits in amounts of less than \$100,000); and (3) balances in retail money market mutual funds (MMMMFs). Seasonally adjusted M2 is computed by summing savings deposits, small-denomination time deposits, and retail MMMFs, each seasonally adjusted separately, and adding this result to seasonally adjusted M1.

Breakeven inflation: The breakeven inflation rate is a market-based measure of expected inflation.



This material has been prepared by CREDIT SUISSE GROUP AG and/or its affiliates ("Credit Suisse").

It is provided for informational and illustrative purposes only, does not constitute an advertisement, appraisal, investment research, research recommendations, investment recommendations or information recommending or suggesting an investment strategy, and it does not contain financial analysis. Moreover it does not constitute an invitation or an offer to the public or on a private basis to subscribe for or purchase products or services. Benchmarks, to the extent mentioned, are used solely for purposes of comparison. The information contained in this document has been provided as a general commentary only and does not constitute any form of personal recommendation, investment advice, legal, tax, accounting or other advice or recommendation or any other financial service. It does not take into account the investment objectives, financial situation or needs, or knowledge and experience of any persons. The information provided is not intended to constitute any kind of basis on which to make an investment, divestment or retention decision. Credit Suisse recommends that any person potentially interested in the elements described in this document shall seek to obtain relevant information and advice (including but not limited to risks) prior to taking any investment decision.

The information contained herein was provided as at the date of writing, and may no longer be up to date on the date on which the reader may receive or access the information. It may change at any time without notice and with no obligation to update.

To the extent that this material contains statements about future performance, such statements are forward looking and subject to a number of risks and uncertainties. It should be noted that historical returns, past performance and financial market scenarios are no reliable indicator of future performance. Significant losses are always possible.

This material is not directed to, or intended for distribution to or use by, any person or entity who is a citizen or resident of, or is located in, any jurisdiction where such distribution, publication, availability or use would be contrary to applicable law or regulation, or which would subject Credit Suisse to any registration or licensing requirement within such jurisdiction.

The recipient is informed that a possible business connection may exist between a legal entity referenced in the present document and an entity part of Credit Suisse and that it may not be excluded that potential conflict of interests may result from such connection.

This document has been prepared from sources Credit Suisse believes to be reliable but does not guarantee its accuracy or completeness.

Credit Suisse may be providing, or have provided within the previous 12 months, significant advice or investment services in relation to any company or issuer mentioned.

This document may provide the addresses of, or contain hyperlinks to, websites. Credit Suisse has not reviewed the linked site and takes no responsibility for the content contained therein. Such address or hyperlink (including addresses or hyperlinks to Credit Suisse's own website material) is provided solely for your convenience and information and the content of the linked site does not in any way form part of this document. Accessing such website or following such link through this document or Credit Suisse's website shall be at your own risk.

This document is intended only for the person to whom it is issued by Credit Suisse. It may not be reproduced either in whole, or in part, without Credit Suisse's prior written permission.

Copyright © 2022. CREDIT SUISSE GROUP AG and/or its affiliates. All rights reserved.