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NEWTON'S SYSTEMATIC APPROACH TO PREDICTING US INFLATION AND INTEREST RATES: AN UPDATE

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June 2022

WHAT A DIFFERENCE A YEAR MAKES.

NEWTON'S MULTI-ASSET TEAM

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INTRODUCTION

One year ago, we published a paper introducing our approach to predicting inflation and forecasting interest rate moves in the United States. At that time, the US, like much of the rest of the world, was still addressing the economic (as well as the physical) symptoms of the Covid-19 pandemic. At time of publication last year, the 10-year US Treasury yield stood at 1.73% (source: Bloomberg); it had already risen some 80 basis points from the start of 2021. Annual inflation as measured by the Bureau of Labor Statistics (BLS) standard measure[1] to the end of March 2021 came in at 2.7%; we noted in our paper that global central banks, led by the Federal Reserve (Fed) with its new policy of average inflation targeting, had become more inflation tolerant. We also acknowledged the growing consensus that higher inflation and higher interest rates were on the horizon.

What a difference a year makes.

Today, towards the end of the first quarter of 2022, the 10-year US Treasury yield was 2.4% and the most recent print for the Consumer Price Index (CPI) was 8.6% for the 12 months to March 2022 (source: BLS). The Federal Reserve recently raised its federal funds effective (fed funds) rate, with more rate increases expected as soon as the next Fed meeting in May. Compounding the effect of these almost-certain rate increases will be the economic effects stemming from the Fed's decision to reverse the practice of quantitative easing, which it first used during the global financial crisis and, more recently, during the pandemic, to provide stimulus to the US economy.

Newton's Multi-Asset Solutions team uses models developed in-house and refined over time to forecast inflation and interest rate changes. In this paper we review the case for and against higher inflation and its effect on rates. We also revisit our models for inflation and rate changes to see what they tell us today about expectations for inflation and higher bond yields.

"While certain economic effects of the Covid-19 pandemic linger, inflation is increasingly driven by higher wages as well as elevated commodity prices, which were already climbing ahead of Russia's invasion of Ukraine."

Competing Inflation Views

Below are some commonly cited arguments for and against higher inflation:

Case for Higher Inflation	Case against Higher Inflation
Fiscal stimulus	Slow economic growth, leading to an output gap
High government debt	Low employment market, due to high unemployment rate or lack of job openings
Supply-chain disruptions	Global disinflationary pressures including strong US dollar
High aggregate demand, per rising market-based indicators	Low core Consumer Price Index and core Personal Consumption Expenditures levels with no upward trend
Higher input prices, due to pandemic and war in Ukraine	
Steepening yield curve	

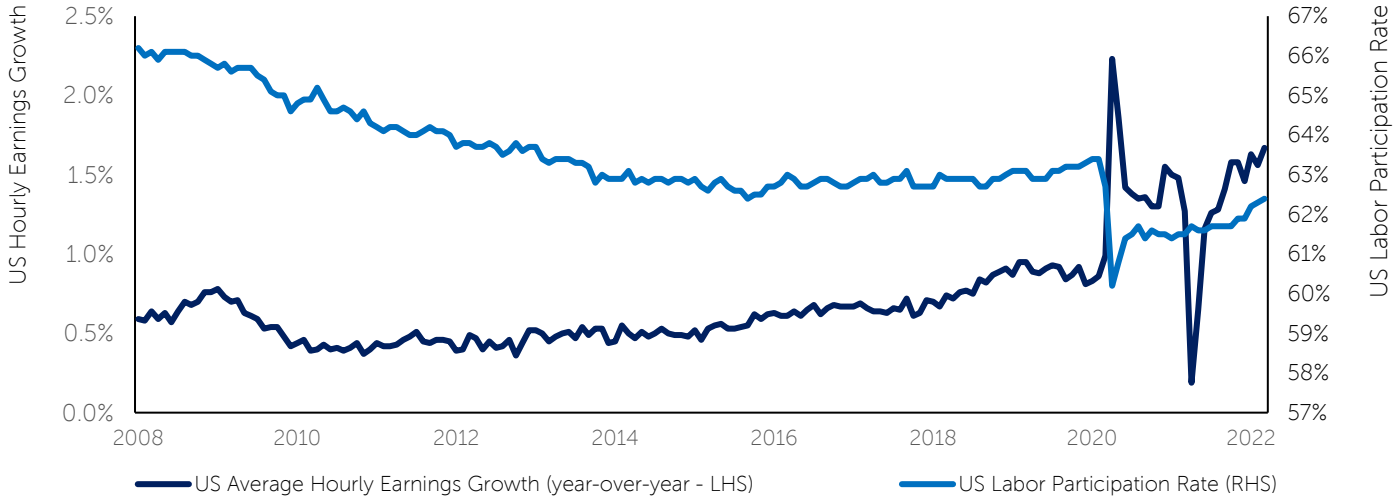
12 months ago, most people remained fixated on the short-term and long-term economic effects of the pandemic, still very much in evidence via new variants of the Covid-19 virus, which continued to disrupt countries' plans to return to some semblance of pre-pandemic normality.

Today, proponents of higher inflation, armed with 12 months of multiple new data points, cite clear evidence that inflation is anything but transitory. Year-on-year inflation climbed steadily during 2021, from 1.4% annualized in January to 7.1% annualized in December. The first few months of 2022 have brought no relief, with the annual rate of CPI climbing 0.4% in both January and February, and a further 0.7% in March, to reach 8.6% (source: BLS).

In the US, the labor market is faring well: according to the BLS, approximately 1.6 million jobs were added to the US economy in February alone and overall employment[2] stands at only 1.3 million below its peak of February 2020.[3] In fact, the labor market looks even better if we consider that in February, approximately one million more workers in the US classified themselves as employed and "usually working full time" than two years previously. The shortfall in labor relative to the pre-pandemic total is almost entirely due to around two million fewer people that describe themselves as in part-time employment. And in certain sectors, such as delivery services, technology and professional services, employment is running well above its pre-pandemic level, while employment in construction, manufacturing and retail has essentially returned to February 2020 levels.

As a result of this, pay for workers has risen significantly in recent months. Two widely followed measures indicate sharp increases across both salaried and hourly employment categories: the Atlanta Fed's Wage Growth Tracker[4] shows the three-month moving average median overall wage growth at 5.8%, above its previous high during the peak of the Technology-Media-Telecom Bubble in 1999; and the 12-month change in the BLS's measure of wages and salaries for private industry workers reached 5% in the fourth quarter of 2021.[5] These dynamics are summarized in the chart on the next page, which shows the year-on-year growth in US average hourly earnings against the US labor participation rate. The shortfall in the participation rate relative to its pre-pandemic level could contribute to sustained wage inflation through the rest of 2022 and into 2023.

Lower Labor Participation and Rising Wages
January 2008 - March 2022



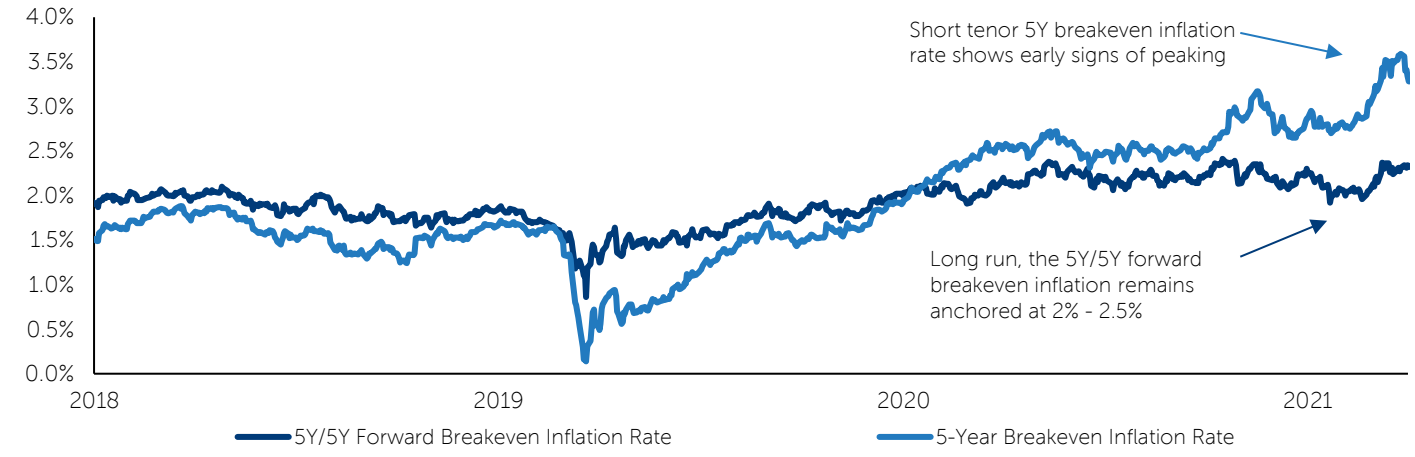
Source: FRED, accessed 4/5/22.

Furthermore, the Russian invasion of Ukraine, and the economic sanctions resulting from it, have led to sharp rises in the prices of widely traded commodities such as crude oil and natural gas, precious and industrial metals, and agricultural staples. This has clearly had an impact on CPI, although we should acknowledge that prices of certain commodities were rising even before the invasion took place; of more concern is evidence that contributions to CPI are broadening. In 2021, most of the increase in CPI came from a narrow set of categories (motor vehicles - both new and used, energy, and so-called reopening categories[6]) that only account for around 30% of the broader CPI index; so far this year, more of the monthly growth in CPI has come from other categories such as housing and groceries, which account for a larger percentage of the Consumer Price Index.

While we accept the clear evidence of higher current inflation, there are several data points that suggest it remains contained. Recent data from the University of Michigan Surveys of Consumers[7] indicates that US consumers are less concerned by inflation with respect to their purchasing activity: the percentage that feel that now is a bad time to buy large household durables, vehicles or houses are all at elevated levels relative to recent years. The same data also suggests that those consumers are delaying purchases because they expect affordability to improve. On the labor front, while unemployment has fallen back almost to pre-pandemic levels, labor participation remains depressed: in February 2020, the civilian labor force participation rate stood at 63.4%. Having recovered from a post-Great Recession low of 62.4%, it then fell to 60.2% in April 2020 and has only recovered to 62.3% in the most recent reading (February 2022).

Finally, market data points to a more sanguine view of inflation, especially over the medium term. The increase in the fed funds rate following the Fed's March board meeting was the first in what is expected to be a series of rate rises: the current fed funds futures curve suggests (with a 65% probability) that there will be eight or nine 25-basis-point increases between now and early 2023; but the curve also suggests that the rate will top out by the middle of 2023, at a level of around 2.75%. Recent readings of the 5-year breakeven inflation rate (a measure of market participants' average expectation of inflation over the next five years) suggest more elevated levels of inflation but, although it has risen in recent months, the longer-term 5-year/5-year forward inflation expectation rate (a measure of average expected inflation over the five-year period starting five years from today) remains within the 2.0% - 2.4% range that it has been in since early 2021, and below its average level pre-2015.[8]

Inflation Expectations
December 2018 – March 2022



Source: FRED, accessed 4/5/22.

Detecting Inflation and/or Rising Rates

Current evidence compels us to consider the potential effects of higher inflation on tightening monetary policy, which could cause both stocks and bonds to sell off simultaneously. We have developed and implemented several models to detect threats to asset prices from macro shocks. In this paper, we focus on two of those proprietary models in particular:

1. Dynamic Model Averaging (DMA) Model

2. Bond Downside Risk (BDR) Model

The DMA model is utilized to forecast a host of macro variables, including inflation. DMA's forecast of inflation is then used as an input to the BDR model to calculate the probability of bond yields rising. Each model, refreshed daily, is discussed in more detail below.

Dynamic Model Averaging (DMA) Model

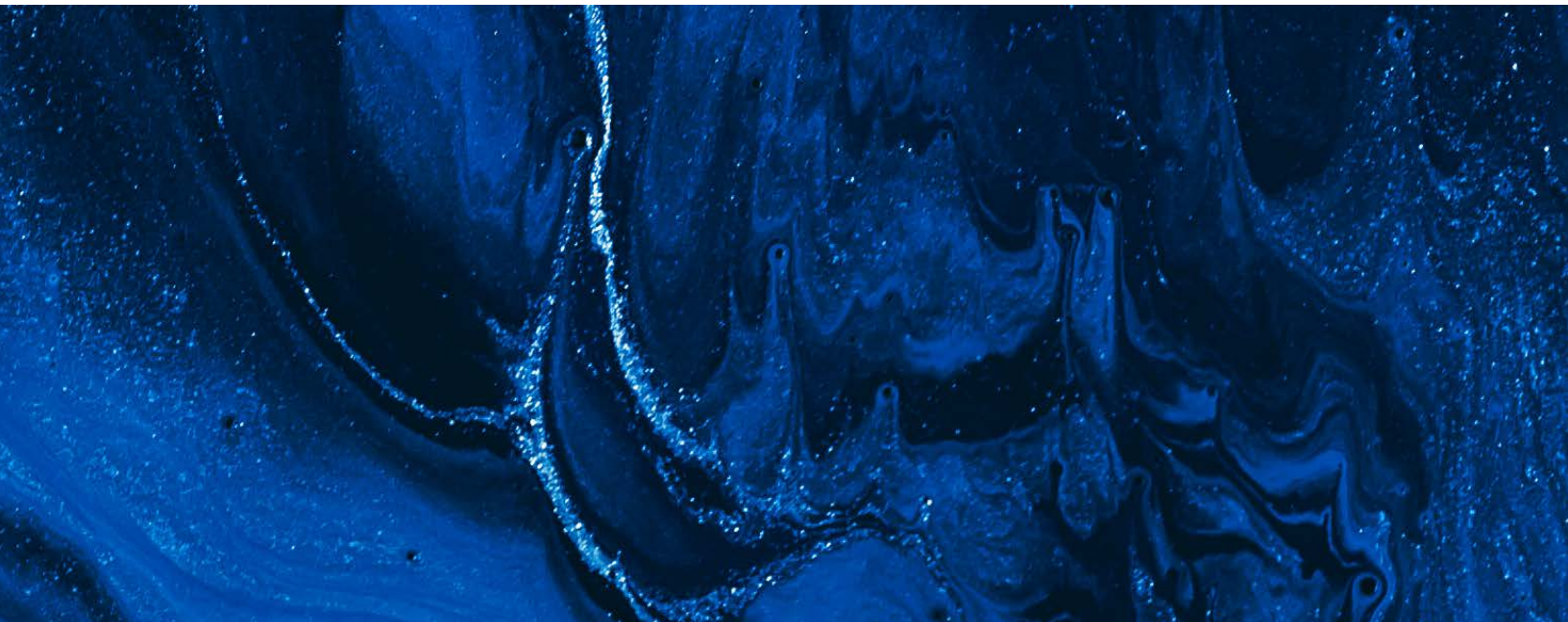
The DMA model employs a proprietary forecasting methodology for forecasting economic variables such as GDP and inflation. The inputs include a wide array of variables classified into three categories, forecast inflation data, macroeconomic data, and market data.

DMA Inputs:

CPI Forecasts	Macro Data	Market Data
Michigan Survey	Employment/wages	S&P 500® price
Professional Investor Survey	Housing	10-year Treasury yield
Consensus CPI	Purchasing manager indices (PMI)	Cash curve
	Capacity utilization	Commodity prices

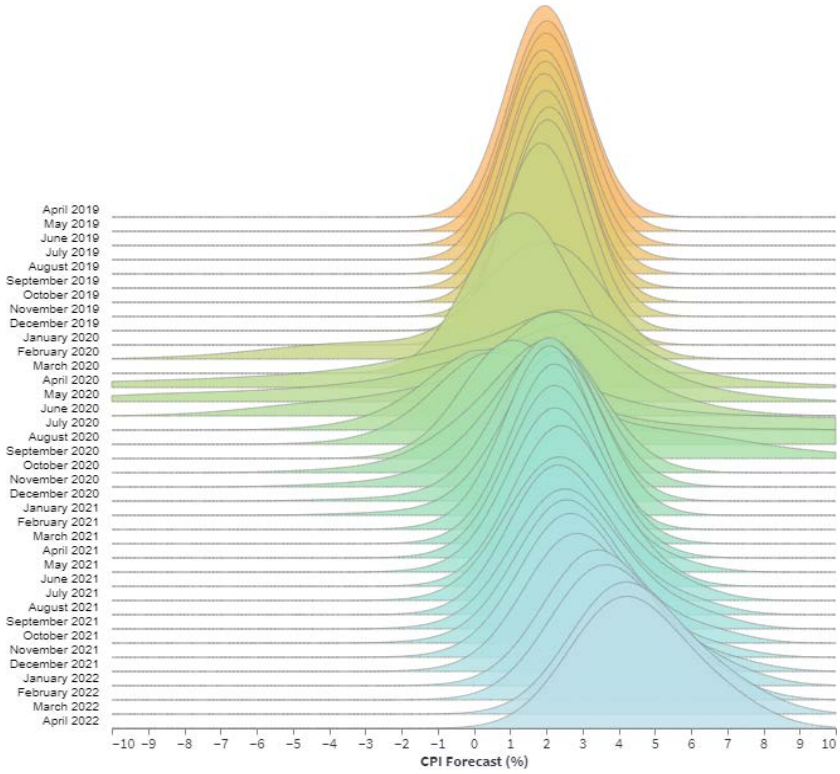
Through a proprietary regression-based methodology, our DMA model generates not just point forecasts of major economic and financial variables but also produces a distribution around the point estimates.

The charts on the following page are generated by our DMA model for forecasting CPI; the first chart shows the distribution of the 12-month forecasts, month by month over the last three years. The trend of recent forecasts is clear as the center of the distribution has moved from around 2.2% one year ago to 4.1% in the latest monthly forecast; also, the skew of the distribution has become more positive as the model detects upside risks to our forecast of inflation. The second chart shows the same set of forecasts divided into four bins and over the last 13 months, and the probability of CPI falling within one of the ranges covered by the bins. Again, the trend in terms of probabilities is clear: the probability of inflation being above 3% over the next 12 months has risen markedly, from 30% a year ago to over 70% today, although there is evidence in the last set of bars (for April 2022) that forecast inflation may have stabilized and even fallen marginally.



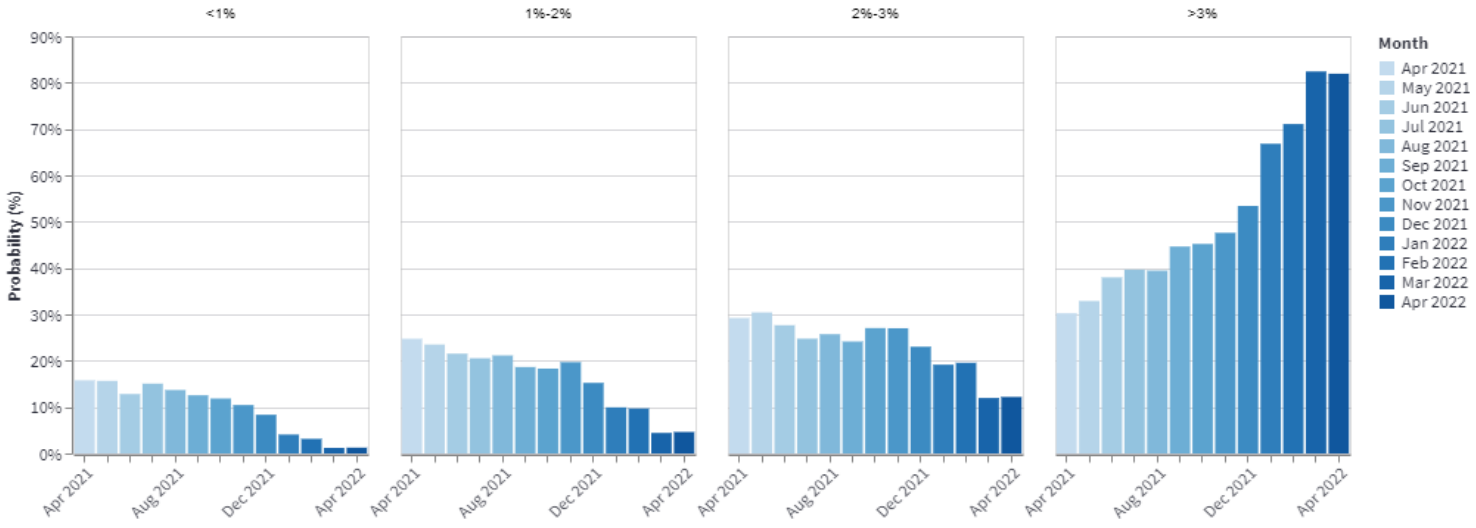
We believe that much of this inflation is attributable to the lingering effects of Covid-19, including new and used vehicle prices as well as certain categories adversely affected by the pandemic that are now returning, but we also recognize that a larger contribution to monthly increases in the rate of inflation has come from other categories such as groceries and housing in recent months. Higher CPI forecasts can affect our multi-asset strategies that incorporate real assets: for example, higher unexpected inflation, defined as the excess of realized over forecast inflation, typically results in a larger allocation to real assets in the portfolio.

CPI Forecast Distribution
April 2019 – April 2022



Source: Newton, as of April 30, 2022.

Forecast Bins
August 2021 – April 2022



Source: Newton, as of April 30, 2022.

Bond Downside Risk (BDR) Model

From a portfolio management view, the inflation estimates from the DMA model have a trickle-down effect: higher inflation expectations typically lead to higher terminal cash rates, which can result in lower bond term premia. Thus, bonds become less attractive and our model, all else equal, will move to reduce its bond allocation.

We use our proprietary BDR model to forecast the likelihood of bonds selling off due to repricing of monetary policy expectations and/or macro fundamentals that imply tighter labor markets, stronger growth, or inflation surprises. The BDR model tracks the key drivers of inflation including:

- Forward overnight index swap dynamics to capture tighter monetary-policy expectations
- Short-term stock/bond correlation dynamics
- Growth dynamics (leading economic indicators, PMI, etc.)
- Unemployment
- Newton's DMA CPI forecast

These variables are standardized and combined (based on a proprietary weighting scheme) to produce an aggregate BDR score in the range of 0.0 to 1.0. The output of the model seeks to determine the probability of lower bond prices. A score of 0.5 represents a mild likelihood of rising rates. Any score above 0.75 is a strong indication that bonds are likely to underperform in the short term (3-6 months). In multi-asset portfolios, the BDR model affects our asset-allocation decisions by adjusting the stock/bond (S/B) correlation to reflect bonds' reduced hedging benefits. A less-negative S/B correlation would typically lead to a lower bond allocation in multi-asset portfolios (along with more modest leverage, when permitted).

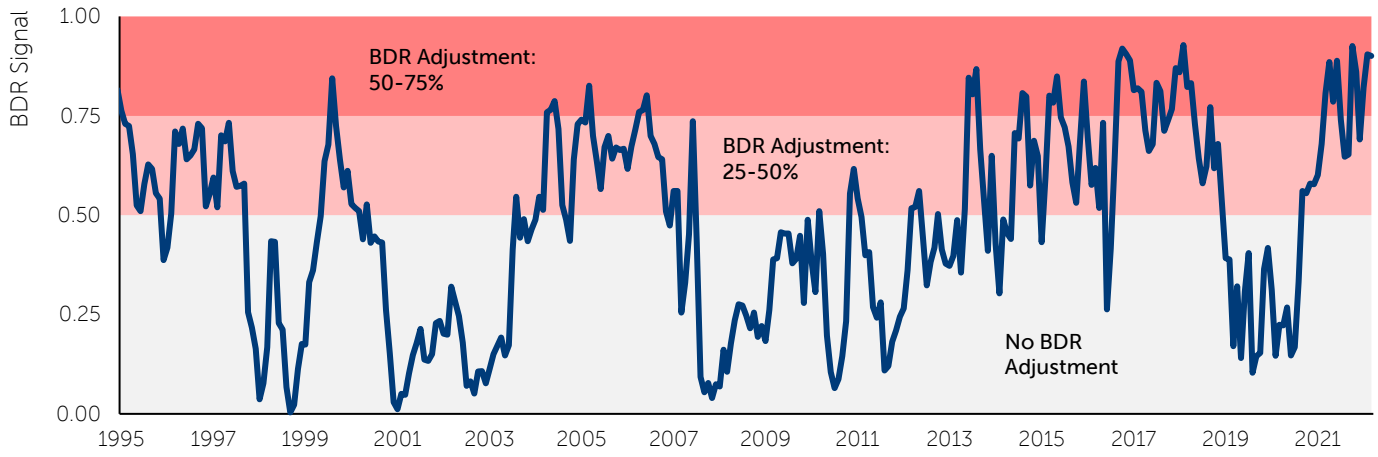
We first start with an historical estimate of the S/B correlation based on an exponentially weighted moving average (EWMA) that captures medium-term dynamics. From that starting point, we apply the BDR signal to adjust the medium-term correlation towards a short-term correlation estimate, to reflect the reduced diversification benefits in environments where bonds are likely to underperform. The correlation shrinkage can be categorized as follows:

BDR Standardized Score	Correlation Shrinkage
< 0.50	0%
0.50 - 0.75	25-50%
0.75 - 1.0	50-75%

The charts on the next page show our BDR signal as well as the correlation adjustment since 1995. A few takeaways from the chart are:

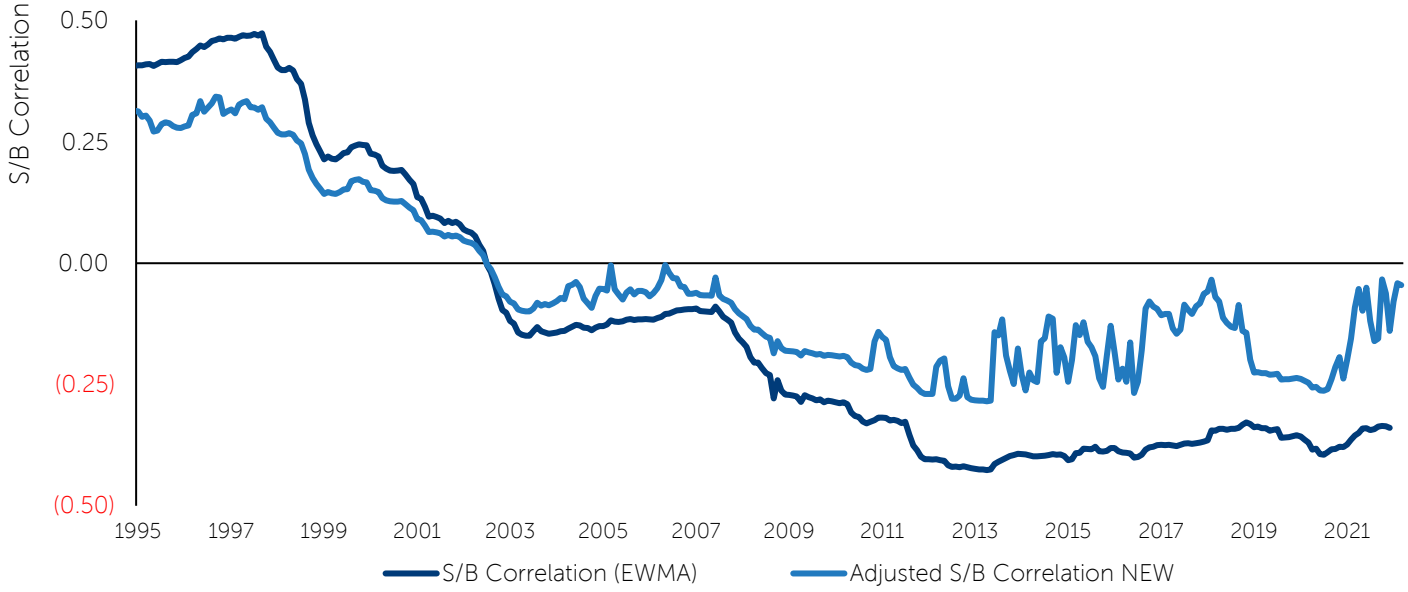
- The BDR signal has suggested an elevated risk of rates rising over the last 7-8 years.
- Even with a correlation adjustment, the overall S/B correlation has been negative throughout this period.
- At the end of March 2022, the BDR signal was 0.90 and is significantly more elevated than at the start of 2021.
- This has had a clear knock-on effect on our estimate of the S/B correlation, which has trended much closer to zero in recent months.

Bond Downside Risk Signal
January 1995 – March 2022



Source: Newton, as of March 31, 2022.

Correlation Adjustment
January 1995 – March 2022



Source: Newton, as of March 31, 2022.

Conclusion

In the first quarter of 2021, higher year-on-year prices could be largely attributed to the disinflationary shock in March and April 2020 brought about by the Covid-19 pandemic. One year on, inflation looks both more persistent and broader based. While certain economic effects of the pandemic linger, inflation is increasingly driven by higher wages as well as elevated commodity prices, which were already climbing ahead of Russia's invasion of Ukraine.

Longer-term inflation expectations are more measured. While the Fed is certain to continue tightening rates over the rest of 2022 and into 2023, current implied forecasts call for the fed funds rate to peak at around 2.75%. Further, while the market's measure of expected inflation over the next five years—the 5-year breakeven inflation rate—has moved back above 3% in recent weeks, longer-run expectations (measured via the 5-year/5-year forward inflation expectation rate) remain in the middle of the 2.0%-2.4% range they have occupied since late 2020.

The elevated level of the BDR model reading makes the downside risk to bonds clear and accordingly, we have reduced our multi-asset strategies' bond allocations and leverage (where applicable) relative to our average exposures over the post global financial crisis period. We continue to monitor inflation via our proprietary DMA model and stock/bond correlations in order to size bond exposure appropriately in our portfolios.

Want to find out more?

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Endnotes

[1]As measured by CPI for All Urban Consumers (CPI-U) - All items in US city average, all urban consumers, seasonally adjusted (series CUSR0000SA0), Bureau of Labor Statistics / https://data.bls.gov
[2]As measured by Employment adjusted to CES concepts, seasonally adjusted (series LNS16000000), Bureau of Labor Statistics / https://data.bls.gov
[3]These statistics also exclude those identifying as 'self-employed', the number of which increased because of the pandemic
[4]As measured by the 3-month moving average of median wage growth, hourly data, Federal Reserve Bank of Atlanta / https://atlantafed.org
[5]As measured by the 12-month percent change in wages and salaries for private industry workers in all industries and occupations (series CIU2020000000000A), Bureau of Labor Statistics / https://data.bls.gov
[6]Reopening categories covers a broad range of items, including hotels, airlines, restaurants, school tuition, childcare, recreation services, etc.
[7]Surveys of Consumers, University of Michigan - https://data.sca.isr.umich.edu/
[8]As measured by the 5 year / 5 year Forward Inflation Expectation Rate (not seasonally-adjusted) – T5YIFR from https://fred.stlouisfed.org/. Daily data is available from 01/02/2003

Important information

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