Inflation and Interest Rates: Causes, Implications, and Outlook
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Eric C. Jussaume
SVP, Senior Portfolio Manager & Director of Fixed Income
617.441.1494
Eric.Jussaume@cambridgetrust.com

Ryan M. Hanna
SVP, Senior Portfolio Manager & Director of Equities
617.441.1497
Ryan.Hanna@cambridgetrust.com
The recent surge of inflation has led the media and market pundits to fall back on comparisons to the 1970s, resulting in shrill cries of inflationary panic. While the rise in inflation during that time may invite comparisons to today, its root causes were a decidedly different set of circumstances. A more appropriate corollary from history may be 1946-1948, the post-World War II inflationary episode resulting from supply shortages due to manufacturing disruptions during peace-time retooling, rebounding demand for consumer goods, high levels of savings, and soaring money growth, which sounds a lot like the scenario playing out today. The execution of monetary policy over the coming months will determine whether inflation ends gently or with a serious recession and further market instability.

The Inflation Policy Cycle

Throughout economic history, inflation has proven to be a condition that is caused by, and addressed with, the same dynamics—rising and falling demand as a result of price movement, the market’s adjustment of interest rates, and monetary policy rate-setting. A rational and disciplined approach to inflation recognizes that each of these dynamics plays a vital role.
The Consumer Price Index (CPI) reached the highest levels since the 1980’s driven by excess demand, fiscal stimulus, and supply chain issues. This poses a risk to both consumer wallets and corporate margins, though both have proven resilient so far. The Ukraine war has pushed commodity prices up further.
Global Inflation

Year-over-year headline inflation by country and region, quarterly

Source: Bank of Mexico, DGBAS, Eurostat, FactSet, Federal Reserve, Goskomstat of Russia, IBGE, India Ministry of Statistics & Programme Implementation, Japan Ministry of Internal Affairs & Communications, Korean National Statistical Office, Melbourne Institute, National Bureau of Statistics China, Statistics Canada, Statistics Indonesia, UK Office for National Statistics (ONS), J.P. Morgan Asset Management. Heatmap is based on quarterly averages, with the exception of the two most recent figures, which are single month readings. Colors determined by percentiles of inflation values over the time period shown. Deep blue = lowest value, light blue = median, deep red = highest value. DM and EM represent developed markets and emerging markets, respectively.

Guide to the Markets – U.S. Data are as of May 11, 2022.
Inflation Components

Contributors to headline inflation
Contribution to y/y % change in CPI, non seasonally adjusted

Source: JP Morgan; Data as of 5/11/22
Job openings still far outpace available workers. The “Great Resignation” continues in the competition for talent.
There are nearly 2x as many job openings, as workers available

Source: Bloomberg, U.S. Department of Labor, 5/12/2022
Labor force is smaller and workers haven’t come back, yet.....

Source: JP Morgan: Data as of 3/31/22
Low Unemployment Rate & Rising Wages: Sign of Overheating?

Civilian unemployment rate and year-over-year wage growth
Private production and non-supervisory workers, seasonally adjusted, percent

Source: JP Morgan: Data as of 5/11/22

Legend:
- Unemployment rate
- Wage growth

Key Dates:
- Nov. 1982: 10.8%
- May 1975: 9.0%
- Jun. 1992: 7.8%
- Jun. 2003: 6.3%
- Apr. 2020: 14.7%
- Apr. 2022: 6.4%
- Apr. 2022: 3.6%
Global Supply Chain Pressures

Fed Global Supply Chain Pressure Index

Standard deviation from average value

Dec. 2021: +4.5 Std. dev.
Feb. 2022: +3.3 Std. dev.

Fed Global Supply Chain Pressure Index subcomponents


*The Federal Reserve Bank of New York bases its Global Supply Chain Pressure Index on the 25-year averages of the Baltic Dry Index (benchmark for the price of moving raw materials by sea), Harpex Index (benchmark for the rate liners pay to charter ships), BLS airfreight cost indices (benchmarks for measuring change in rates for air transportation), and 3PM supply chain-related components: delivery times (the amount of time elapsed between the time an order is placed and the time it is shipped), backlogs (the volume of orders that a company has received, but not yet fulfilled) and purchased stocks (the level of inventory of materials purchased in the current month compared to the month prior) for manufacturing firms across seven interconnected economies: China, the euro area, Japan, South Korea, Taiwan, the United Kingdom and the United States. Heatmap colors determined by that month’s level compared to 10-year average. Red = Very slow/constrained, Yellow = Average/moderate, and Green = Fast/least constrained.

Improvement in ships waiting......
% of PCE on Goods vs. Services

Figure 3: Total Goods & Services Share of PCE

- Services 2019 Avg: 69.0%
- Goods 2019 Avg: 31.0%

Source: BEA
Gasoline prices soar.....

High gas prices are a major “tax” on the consumer but also impacts all sort of price/industries where delivery, logistics and production are energy intensive. This also comes are a time where numerous other hard commodities (nickel and metals) and soft commodities (agriculture, food inputs and fertilizers) have their own high prices from supply shortages colliding with high demand.
... and jet fuel
The war in Ukraine is disrupting the global commodity supply chain, causing shortages in many markets and driving prices higher across metals, oil, and food categories.
Surge in home prices may be peaking amidst higher mortgage rates

**S&P CoreLogic Case-Shiller Home Price Index: US National**

% Change - Year to Year  NSA, Jan-00=100

**FHLMC: 30-Year Fixed-Rate Mortgages: U.S.**

%
Fed's preferred measure

Source: Bloomberg
Market expectations for inflation

Source: Bloomberg
What does yield curve shape mean?

Source: Bloomberg
## Peak in 10-year yields?

### Yields Generally Lower +12 Months Post-Inversion

<table>
<thead>
<tr>
<th>Inversion Date</th>
<th>10-Year Yield at Inversion</th>
<th>+1 Month</th>
<th>+3 Months</th>
<th>+6 Months</th>
<th>+12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/11/1980</td>
<td>11.32%</td>
<td>11.39%</td>
<td>13.28%</td>
<td>12.68%</td>
<td>15.20% X</td>
</tr>
<tr>
<td>1/2/1982</td>
<td>14.19%</td>
<td>14.47%</td>
<td>13.98%</td>
<td>14.48%</td>
<td>10.39% ✓</td>
</tr>
<tr>
<td>12/14/1988</td>
<td>9.16%</td>
<td>9.06%</td>
<td>9.51%</td>
<td>8.31%</td>
<td>7.78% ✓</td>
</tr>
<tr>
<td>3/8/1990</td>
<td>8.55%</td>
<td>8.56%</td>
<td>8.48%</td>
<td>8.83%</td>
<td>8.05% ✓</td>
</tr>
<tr>
<td>4/24/1998</td>
<td>5.66%</td>
<td>5.64%</td>
<td>5.49%</td>
<td>4.62%</td>
<td>5.22% ✓</td>
</tr>
<tr>
<td>2/3/2000</td>
<td>6.49%</td>
<td>6.39%</td>
<td>6.56%</td>
<td>5.98%</td>
<td>5.09% ✓</td>
</tr>
<tr>
<td>12/27/2005</td>
<td>4.34%</td>
<td>4.52%</td>
<td>4.85%</td>
<td>5.20%</td>
<td>4.60% X</td>
</tr>
<tr>
<td>8/22/2019</td>
<td>1.61%</td>
<td>1.72%</td>
<td>1.74%</td>
<td>1.35%</td>
<td>0.63% ✓</td>
</tr>
<tr>
<td>3/31/2022</td>
<td>2.34%</td>
<td>?</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>

1980 and 2005 are exceptions, but generally 10-year yields have been lower +12 months following 2/10 curve inversions.

Source: Strategas
How much higher?

GETTING CLOSER TO LONG-TERM RESISTANCE ON 10's

Structurally, we’re in the camp of regime change re. bonds... but cyclically, resistance in the 2.75% zone isn’t far off. Take note, particularly with the curve inverted and sentiment universally bearish bonds across the Street.

Source: Strategas
Nearing top?

Lots of resistance in the 2.75% to 3.10% on 5-year yields.

Source: Strategas
Market expecting more rate hikes
Bonds recover initial losses

Bond Returns After the Federal Reserve Begins Rate Hikes

In six of the past seven Federal Funds Rate hike cycles, bonds generated positive returns 12 months after the Federal Reserve started to raise rates. In addition, the Fed Funds Rate and 10 Year US Treasury yield tended to end at similar levels in most cases.

<table>
<thead>
<tr>
<th>Date of First Hike</th>
<th>Date of Last Hike</th>
<th>Fed Funds Rate</th>
<th>10 Year US Yield</th>
<th>Cumulative Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Start</td>
<td>End</td>
<td>Start</td>
</tr>
<tr>
<td>3/31/83</td>
<td>8/9/84</td>
<td>8.50</td>
<td>11.50</td>
<td>10.62</td>
</tr>
<tr>
<td>1/5/87</td>
<td>9/4/87</td>
<td>5.88</td>
<td>9.75</td>
<td>7.08</td>
</tr>
<tr>
<td>2/4/94</td>
<td>2/1/95</td>
<td>3.00</td>
<td>6.00</td>
<td>5.94</td>
</tr>
<tr>
<td>6/30/99</td>
<td>5/16/00</td>
<td>4.75</td>
<td>6.50</td>
<td>5.81</td>
</tr>
<tr>
<td>6/30/04</td>
<td>6/29/06</td>
<td>1.00</td>
<td>5.25</td>
<td>4.62</td>
</tr>
<tr>
<td>12/16/15</td>
<td>12/19/18</td>
<td>0.00</td>
<td>2.50</td>
<td>2.30</td>
</tr>
</tbody>
</table>

Bloomberg US Aggregate Bond Performance Before/After First Rate

Source: Bloomberg and Morningstar Direct. Past performance is no guarantee of future results. Not intended to represent the performance of any Fidelity fund. Diversification does not ensure a profit or guarantee against a loss.
Case for bonds post tightening

Bonds Have Tended to Recover Strongly After Rate Increases

The year that followed a period of rising rates brought improved returns for the bond index. In all instances below, returns were positive in both the subsequent one year and cumulative periods.

<table>
<thead>
<tr>
<th>Period of rising rates</th>
<th>Length of period (in Months)</th>
<th>Change in 10 year treasury yield (bps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/29/1986 - 10/15/1987</td>
<td>13</td>
<td>332</td>
</tr>
<tr>
<td>8/01/1990 - 5/2/1990</td>
<td>9</td>
<td>134</td>
</tr>
<tr>
<td>1/18/1996 - 7/5/1996</td>
<td>5</td>
<td>154</td>
</tr>
<tr>
<td>10/05/1998 - 1/21/2000</td>
<td>15</td>
<td>263</td>
</tr>
<tr>
<td>11/07/2001 - 4/1/2002</td>
<td>4</td>
<td>122</td>
</tr>
<tr>
<td>6/13/2003 - 6/14/2004</td>
<td>12</td>
<td>176</td>
</tr>
<tr>
<td>6/2/2005 - 6/12/2007</td>
<td>24</td>
<td>141</td>
</tr>
<tr>
<td>12/31/2008 - 4/20/2010</td>
<td>15</td>
<td>193</td>
</tr>
<tr>
<td>10/8/2010 - 2/6/2011</td>
<td>4</td>
<td>134</td>
</tr>
<tr>
<td>7/24/2012 - 12/31/2013</td>
<td>17</td>
<td>164</td>
</tr>
<tr>
<td>8/4/20 - 2/16/22</td>
<td>18</td>
<td>154</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Period</th>
<th>Length of period (in Months)</th>
<th>Change in 10 year treasury yield (bps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>15</td>
<td>259</td>
</tr>
<tr>
<td>Median</td>
<td>14</td>
<td>182</td>
</tr>
<tr>
<td>Minimum</td>
<td>4</td>
<td>122</td>
</tr>
<tr>
<td>Maximum</td>
<td>37</td>
<td>685</td>
</tr>
</tbody>
</table>

Past performance is no guarantee of future results.

Source: Factset, as of 2/28/2022; Monthly returns for Aggregate Bond Index from 1976 to 1988; Daily returns from 1989 onwards.

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Bond returns not as negative as thought

The Durability of Bonds: Worst Case Scenario?
Over the 40-year period between 1941 and 1981 during which rates rose by ~1200 bps, the worst annual loss for bonds was -3.2%.

Average Annual Return: 5.3%

Source: Bloomberg, as of 12/31/21. Bond returns from 1940 to 1975 are based on Fidelity Investments’ “Synthetic Aggregate” represented by 67% intermediate government bonds and 33% long-term corporate bonds. Investment-grade bond returns are represented by the Bloomberg U.S. Aggregate Bond Index from January 1976 and by a composite of the IA SSBi U.S. Intermediate-Term Government Bond Index (67%) and the IA SSBi U.S. Long-Term Corporate Bond Index (33%) from January 1926 through December 1975. Past performance is no guarantee of future results. It is not possible to invest directly in an index. All market indices are unmanaged. Not intended to represent the performance of any Fidelity fund.
Why own bonds...

A Case for Bonds—Bonds Tend to Stabilize Portfolio Returns
Since 1926, bonds have experienced 13 down years, versus 25 for stocks. In all but 2 periods, equities were up and often by a large magnitude in years when bonds sold-off.

BOND RETURNS IN YEARS WHEN STOCKS WERE DOWN, 1926—2021

STOCK RETURNS IN YEARS WHEN BONDS WERE DOWN, 1926—2021

Source: Morningstar EnCorr and Fidelity Asset Allocation Research Team (AART), as of 12/31/21. Investment-grade bond returns are represented by the Bloomberg U.S. Aggregate Bond Index from January 1976 and by a composite of the IA SSBi U.S. Intermediate-Term Government Bond Index (67%) and the IA SSBi U.S. Long-Term Corporate Bond Index (33%) from January 1926 through December 1975. Stock returns are represented by the performance of the S&P 500 Index. Past performance is no guarantee of future results. It is not possible to invest directly in an index. All market indices are unmanaged. Not intended to represent the performance of any Fidelity fund.
Markets decide rates...

Rates Are Difficult to Predict
The Philadelphia Fed surveys economists quarterly asking them to predict rates for the next five quarters. There has been a consistent negative correlation between forecasts and actual yields. These forecasts have been habitually wrong.

PROFESSIONAL FORECASTS VS. ACTUAL 10-YEAR YIELD (2001–2020)

Source: Federal Reserve Bank of Philadelphia Quarterly Survey of Professional Forecasters as of 3/31/2021. The black line represents the actual rolling 10-year note yield while the colored lines represent forecasted numbers. Each colored line represents rolling 5-quarter forecasts by the professional forecasters (median).

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Conclusions:

1. Current inflationary pressures have revolved around supply/demand mismatch for products (autos/semiconductors), transportation bottlenecks, tight labor markets, high energy/food costs, surging commodity and feedstock, and loose monetary policies.

2. Headline inflation may be approaching peak levels and is likely to fall in 2H’22 and 2023. It will stay higher for longer as a result of elevated food and commodity prices, partially due to the Russia-Ukraine war.

3. Inflation is likely to ‘normalize’ at higher levels than experienced during the last 10+ years.

4. Focus on companies with pricing power and the ability to pass through higher input costs to customers.

5. Federal Reserve playing catch-up and will have to move faster and higher with rate increases and balance sheet roll-off.

6. Bond market pricing in higher likelihood of policy error.

7. Rising mortgage rates will have an impact on housing value and turnover.

8. A benefit of rising rates: savers will earn more interest. Cash may become a short-term strategic position within asset allocation framework.

9. Recent actions: trimmed commodity exposure, increased fixed income to narrow underweight, maintained neutral equity exposure.
Cash account returns
Rate hikes do NOT mean stocks automatically go down

S&P Rallies Despite Hikes In Fed Funds

Over the last four Fed tightening cycles, fed funds have increased roughly +300bp on average. Despite that, the S&P has rallied roughly +90%.

<table>
<thead>
<tr>
<th>Fed Tightening Cycle</th>
<th>Fed Funds</th>
<th>S&amp;P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985 to 1990</td>
<td>+325bp</td>
<td>+45%</td>
</tr>
<tr>
<td>1993 to 2000</td>
<td>+325bp</td>
<td>+225%</td>
</tr>
<tr>
<td>2003 to 2007</td>
<td>+375bp</td>
<td>+30%</td>
</tr>
<tr>
<td>2015 to 2020</td>
<td>+200bp</td>
<td>+65%</td>
</tr>
<tr>
<td>Average</td>
<td>+300bp ✓</td>
<td>+90% ✓</td>
</tr>
</tbody>
</table>