Leaving the Station
The Implications of Rising Inflation & Global Central Bank Tightening

NOV 2021
Global Corporate & Investment Banking
Capital Markets Strategy Team

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If you look at research on things like coffee, egg yolks, red wine, it is actually not clear whether these things are good or bad for you. That’s a good analogy for markets in 2021.

Perhaps the number one question investors need to ask themselves in 2021 will be: Are rising rates good or bad for stocks? It’s not that obvious.

Sebastien Page, Head of Global Multi-Asset, T. Rowe Price
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1 Inflation Pressures Broadening
Growth & Inflation Expectations Diverging

Persistent supply side dislocations have driven inflation expectations higher and growth forecasts lower.

**World 2022**
- GDP growth forecast: 4.4%
- CPI inflation forecast: 3.4%

**US 2022**
- GDP growth forecast: 3.9%
- Core PCE inflation forecast: 3.0%

Source: (1-2) Bloomberg. Data as of November 12, 2021.
In October, headline US inflation surprised markets with a 6.2% year-on-year increase, the fastest annual increase since 1990 and well above consensus expectations of 5.9%. Inflation has now exceeded 5% for five consecutive months.

**Highest US Inflation Since 1990**

**US Headline CPI & Core PCE (y/y)**

Headline CPI increased from 5.4% to 6.2%

Core CPI increased from 4.0% to 4.6%

Core PCE stayed flat at 3.6%

Source: (1) Bloomberg. Data as of November 12, 2021. FRED.

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Near Term Inflation Expectations Rising More Rapidly

University of Michigan short-term inflation expectations increased to 4.9% in November, a 13-year high. While five-year inflation expectations stayed flat at 2.9% in November, they are still significantly higher than pre-pandemic levels.

Source: (1) Bloomberg. Data as of November 12, 2021.

Expected change in US consumer prices

Source: (1) Bloomberg. Data as of November 12, 2021.
Inflation Pressures Broadening

While increases in food and fuel did contribute to October’s surprisingly high inflation print, growth in “core” factors were an even larger driver. Within the “core” component, numerous sectors are facing rising inflationary pressures, not just those directly impacted by the re-opening.

Source: (1) Bloomberg. Data as of November 12, 2021.
Inflation Rising Across Multiple Sectors

US CPI m/m in 2021

<table>
<thead>
<tr>
<th>Category</th>
<th>Jan</th>
<th>Oct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy commodities</td>
<td>11%</td>
<td>6.2%</td>
</tr>
<tr>
<td>Energy services</td>
<td>3.0%</td>
<td></td>
</tr>
<tr>
<td>Used cars and trucks</td>
<td>2.5%</td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td>1.8%</td>
<td></td>
</tr>
<tr>
<td>New cars and trucks</td>
<td></td>
<td>1.4%</td>
</tr>
<tr>
<td>Food at home</td>
<td>2.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Food away from home</td>
<td>0.8%</td>
<td></td>
</tr>
<tr>
<td>Medical care commodities</td>
<td>0.6%</td>
<td></td>
</tr>
<tr>
<td>Medical care services</td>
<td>0.5%</td>
<td></td>
</tr>
<tr>
<td>Shelter</td>
<td></td>
<td>0.5%</td>
</tr>
</tbody>
</table>

US Producer Prices at Decade High

The US producer price index rose 8.6% y/y, the same as September and the highest on record since late 2010. While rising producer prices don’t always translate into higher consumer prices as businesses absorb some of the additional costs, they do indicate the role of supply side dislocations in rising inflationary pressure.

Source: (1) Bloomberg. Data as of November 12, 2021.
Labor Shortages, Wages Rising

At the start of the pandemic, the US labor force participation rate had its largest decline since WWII. While the rate has recovered since April 2020, it remains near the 1970s lows and nearly two points below its February 2020 level. The participation rate decline represents 4.3 million fewer workers employed today relative to pre-pandemic levels. The labor shortage is, in turn, putting upward pressure on wages and contributing to higher inflation.

**Labor force participation rate**

Pre-pandemic: 63.4%

67%
65%
63%
61%
59%

4.3 million fewer workers

**NFIB job openings hard to fill (advanced 12 months) and compensation index**

Job openings hard to fill

Compensation index

Source: (1-2) Bloomberg. Data as of November 12, 2021.
Global Inflation Also Increasing

Global inflation has been rising since the end of 2020. G7 headline inflation is up from less than 1% y/y to 3.6%, and core from 1% to 2.5%. US headlines inflation, at 6.2%, is at its highest level in 30 years.

Source: (1) Oxford Economics, “Rising Inflation is a Demand as well as Supply Issue” (October 26, 2021). (2) BIS.
Global Inflation Expectations Rising

Source: (1) Bloomberg. Data as of November 12, 2021.

UK: 4.0%
US: 2.7%
Australia: 2.3%
Canada: 2.1%
Sweden: 2.0%
Germany: 1.8%
Spain: 1.8%
Italy: 1.8%
Japan: 0.4%

10 year breakeven rate

Jan-2016
Nov-2021
Inflation Moderation in 2H 2022?

In a non-COVID world, supply side gaps can be closed relatively quickly, which raises questions about whether the current rising inflation environment represents a fundamental “regime change” or a short term phenomenon vulnerable to “normalization”. Looking ahead, numerous factors could converge to drive a moderation in inflation pressures as soon as the 2H of 2022.

- More favorable base effects (Y/Y comparisons)
- Continued deceleration in global growth
- Massive global production and supply increases underway
- Global monetary and fiscal stimulus tightening
- Energy prices approaching cyclical highs / demand destruction at higher prices
- Rebalancing of consumer behavior from goods to services (if global pandemic eases)
- Gradual easing of supply chain disruptions
- Pre-COVID disinflationary forces remain intact (aging populations, rising debt, declining productivity)

Source: (1) MUFG Macro Strategy, “November 2021 FOMC Recap” (George Goncalves).
2 The Fed’s Policy Pivot
Balance Sheet Tapering Before Rate Hikes

During the COVID crisis, the Fed more than doubled its balance sheet from $4.2 to $8.6 trillion. Even accounting for the $15 bn (10 bn Treasuries, 5 bn MBS) per month taper in new purchases announced in November, the Fed’s balance sheet is likely to surpass $9 trillion in the first half of 2022.

Key Takeaways from the November FOMC Meeting

1. Tapering balance sheet purchases by $15 bn ($10 bn UST, $5 bn MBS) in November & December (more rapid than 2014 pace of $5 bn and $5 bn, respectively).

2. Tapering likely to conclude by June 2022, but Fed may adjust pace based on economic outlook.

3. If inflation acceleration continues, taper pace could increase to $25 bn per month in January ($15 bn UST, $10 bn MBS).

4. Emphasized “different and more stringent” test for raising rates; MUFG expects first hike in September 2022.

5. Softened stance on transitory nature of inflation & acknowledged role supply chain imbalances have had in causing “sizable price increases in some sectors”.

Source: (1) MUFG Macro Strategy, “November 2021 FOMC Recap” (George Goncalves).
Market Repricing the Pace of Fed Hikes

Markets have rapidly repriced Fed tightening expectations since the first Pfizer vaccine announcement one year ago. While the Fed continues to link inflation to factors that are “expected to be transitory,” the market is taking a comparatively more hawkish view, pricing in 2-3 rate increases by the end of 2022, and 5-6 rate increases by the end of 2023.

Monetary Policy Still Extraordinarily Accommodative

Although Fed accommodation is past peak, monetary policy remains extraordinarily easy, with M2 money supply currently over $5 trillion above its pre-COVID levels. Global monetary and fiscal stimulus has risen by a remarkable $32 trillion over the last 18 months, $13 trillion in the US alone ($5.5 monetary, $7.4 fiscal).

Source: (1-2) Bloomberg. Data of November 12, 2021.
The Fed Not Alone This Time
The Fed Was Alone in 2015, **Not** this Time

In most tightening cycles over the last 50 years, Fed tightening has been accompanied by concurrent policy shifts from numerous other G10 central banks, with one exception in particular. In 2015, the Fed was alone for the vast majority of its tightening cycle (until late 2017), which in turn, contributed to a powerful tightening in global financial market conditions.

Central Banks Conditioned by Decades of Low Inflation

More often than not, advanced economy Central Banks are managing inflation that is below target. While Central Banks have a vast toolkit for managing higher inflation, policy risk remains elevated given that so many central banks find themselves in “new territory” as COVID-related supply-side dislocations continue to accelerate.

Percentage of time inflation below the central bank’s target since 2008

Global Monetary Growth Normalizing

Global broad money supply growth soared in 2020 but has started to normalize over recent months. In advanced economies, broad money growth is down from a peak of 25.6% y/y to 8.1% y/y – still higher than the average of the past decade. In EM, broad money growth has returned to pre-crisis norms.

Broad money growth, 6 month annualized change

Source: (1) Oxford Economics “Normalizing Money Growth is Reducing Inflation Risks” (November 9, 2021). Advanced economies include US, Eurozone, UK, Canada, Australia & Japan. EM includes China, India, Brazil, Russia, South Africa, Nigeria, Indonesia, Turkey & Mexico. Excess money growth is 6m annualized broad money growth minus a target rate consisting of the inflation target, trend GDP growth and trend velocity growth.
Global Rate Hike Expectations Rising

Major bond markets globally have begun to reprice as inflation and expectations for central bank tightening spike around the world.

Source: (1) Bloomberg. Data as of November 12, 2021.
Global Central Banks Becoming More Hawkish

Source: Global Central Banks. Bloomberg.

*Turkey has hiked and cut policy rate this year and is now net lower than start of the year, recent move was a policy rate cut of 200 bps. Data as of November 8, 2021.*
Breakdown of Global Central Bank Activity

Over the last six months, as inflation and inflation expectations have risen globally, over a dozen major central banks have increased policy rates. Numerous other large central banks (i.e., US, UK, Canada) are increasingly pivoting to more hawkish policies, though have not yet increased policy rates.

Central bank policy moves over the last 6 months (since May 1, 2021)

<table>
<thead>
<tr>
<th>Policy Rate Hike</th>
<th>Policy Rate Unchanged</th>
<th>Policy Rate Cut</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Brazil</td>
<td>• Argentina</td>
<td>• Denmark</td>
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<td>• Chile</td>
<td>• Australia</td>
<td>• Turkey</td>
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<td>• Colombia</td>
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<td>• US</td>
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<td></td>
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<tr>
<td>• Euro Area</td>
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</tbody>
</table>

Source: (1) Bloomberg, BIS Central Bank Policy Rates. Turkey has hiked and cut policy rate this year and is now net lower than start of the year. Recent move was a policy rate cut of 200 bps. Data as of November 8, 2021. Denmark is benchmark deposit rate.
Desynchronized Global Growth Story

2022 GDP growth forecasts

Financial Market Conditions Remain Easy
Financial Conditions Remain Easy

Even as the Fed pivots policy in a more hawkish direction, financial market conditions remain at historically easy levels with equities high, rates low, credit spreads tight, and the USD index stabilizing at more accommodative levels.

Financial conditions index

Tightening

Loosening

Equity markets near record highs
S&P 500

Rates near multi-century lows
10 yr UST

Credit spreads near post GFC tights
USD IG OAS

US dollar stabilizing
DXY index

Source: (1-5) Bloomberg. Data as of November 12, 2021. Financial conditions index is Goldman Sachs FCI.
Negative Real Yields Supporting Risk Assets

Despite the Fed’s taper announcement in November, real yields remain near historic lows. To be sure, Chair Powell has been cautious to avoid the bond market meltdown (and near EM crisis) that accompanied Chair Bernanke’s unexpected policy pivot in 2013. Persistent and deeply negative real yields also increase investor demand for risk assets (i.e., equities, HY, EM).

China slowdown, supply side dislocations and rising inflation have raised concerns around global growth deceleration in the year ahead. The related yield curve flattening across global bond markets also suggests that the market believes the economy cannot handle too much policy tightening without a disruptive impact to growth.
Structurally Higher Volatility

Historically, as the economy transitions to mid-cycle, with decelerating growth, rising asset prices and policy tightening, volatility in markets moves structurally higher. COVID-related supply side dislocations and inflationary pressures further exacerbate the uncertainty and volatility typical in this stage of the cycle.

Source: (1-2) Bloomberg. Data as of November 12, 2021.
US Dollar Strengthening Continues

As noted by MUFG FX Strategist, Derek Halpenny, the USD Index has risen to a 16 month high as the market reprices the timing and pace of Fed QE tapering and tightening. Looking ahead, the US dollar is likely to be supported by higher UST bond yields and UST bond yield volatility, which recently reached new highs for the year.

Below Consensus US Rates Forecast

MUFG’s Head of Macro US Strategy, George Goncalves, has a below consensus forecast for US rates over the year ahead

MUFG and consensus 10 year UST forecasts

<table>
<thead>
<tr>
<th></th>
<th>MUFG: 1.63%</th>
<th>Consensus: 1.65%</th>
<th>1.75%</th>
<th>1.79%</th>
<th>1.75%</th>
<th>1.87%</th>
<th>1.88%</th>
<th>1.95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4 2021</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Q1 2022</td>
<td></td>
<td></td>
<td>1.75%</td>
<td>1.79%</td>
<td></td>
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<tr>
<td>Q2 2022</td>
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<td></td>
<td></td>
<td></td>
<td>1.75%</td>
<td>1.87%</td>
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<tr>
<td>Q3 2022</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.88%</td>
<td>1.95%</td>
</tr>
</tbody>
</table>

Source: (1) MUFG US Desk Strategy “Key Events in the Month Ahead - November 2021” (George Goncalves). Consensus data as of November 12, 2021.
Market Performance During Tightening Cycles
**Tightening Cycles Pose Risks for Markets**

Monetary policy tightening and credit cycle turns have accounted for nearly half of G7 recessions since 1960. While recession risk remains low near term, policy risk nonetheless remains high, with potentially adverse economic and market consequences at a time when risk asset-valuations are already at late cycle levels.

### Factors contributing to 46 recessions in G7 economies since 1960

<table>
<thead>
<tr>
<th>Factor</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monetary policy tightening</td>
<td>29</td>
</tr>
<tr>
<td>Burst credit bubble</td>
<td>19</td>
</tr>
<tr>
<td>Oil price shock</td>
<td>13</td>
</tr>
<tr>
<td>Burst housing bubble</td>
<td>13</td>
</tr>
<tr>
<td>Banking crisis</td>
<td>11</td>
</tr>
<tr>
<td>Tight fiscal policy</td>
<td>10</td>
</tr>
<tr>
<td>External demand shock</td>
<td>9</td>
</tr>
<tr>
<td>Exchange rate shock</td>
<td>8</td>
</tr>
</tbody>
</table>

*Source: (1) WSJ. Capital Economics. Factors contributing to 46 recessions in G7 economies since 1960. Bars do not sum to 46 due to multiple factors for specific recessions.*
Every Fed tightening cycle of the last 40 years has claimed a large financial casualty, and this cycle (though gradual) should be monitored closely. While the Fed may not have been the primary cause of the market dislocations noted below (i.e., the preconditions), Fed tightening cycles have nonetheless been a precipitant for numerous global market shocks given the impact of US monetary policy on rates, currency markets and risk assets globally.

Casualties of Fed Tightening

- Early 1980s: LatAm Debt Crisis
- Late 1980s: US Commercial Real Estate
- 1994: G10 Bond Turmoil
- Late 1990s: Asia Financial Crisis
- 2008: Global Financial Crisis
- 2014-2016: Commodities Super Cycle Bust
Communication Critical for Markets

Though conventional wisdom suggests that risk assets and bonds perform poorly during Fed tightening cycles; historical evidence suggests otherwise. Tightening typically accompanies strong underlying fundamentals which are supportive of risk assets. 1994, however, offers a case study on the importance of clear and advance communication on Fed policy pivots.

**Average returns in first 12 months of Fed tightening cycles since 1983**

- EM Equities: 15%
- Global Equities: 13%
- Commodities: 11%
- US Equities: 9%
- US IG Bonds: 3%

**Average returns in 12 months after poorly communicated 1994 tightening**

- EM Equities: (-19%)
- Global Equities: (-2%)
- US IG Bonds: (-1%)
- US Equities: 2%
- Commodities: 6%

Source: (1-2) FRED, Data as of October 1, 2021. Bloomberg. Average returns based on 7 tightening cycles dating back to 1983 except for EM equities & IG bonds where data availability is limited to 5 cycles.
Magnitude of Fed Tightening

Since 1980, Fed tightening cycles have averaged just around 300 bps, with nearly 200 bps in the first year alone (equivalent to one rate hike in each of the 8 FOMC meetings in a year). The most recent tightening cycle (2015) was longer and slower by comparison, and was ultimately interrupted by the US-China trade wars.

<table>
<thead>
<tr>
<th>Tightening cycle</th>
<th>Duration (months)</th>
<th>Start rate</th>
<th>Magnitude of tightening, bps (entire cycle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>36 months</td>
<td>0.25%</td>
<td>225 bps</td>
</tr>
<tr>
<td>2004</td>
<td>24 months</td>
<td>1.00%</td>
<td>425 bps</td>
</tr>
<tr>
<td>1999</td>
<td>11 months</td>
<td>4.75%</td>
<td>175 bps</td>
</tr>
<tr>
<td>1994</td>
<td>12 months</td>
<td>3.00%</td>
<td>300 bps</td>
</tr>
<tr>
<td>1988</td>
<td>11 months</td>
<td>6.50%</td>
<td>325 bps</td>
</tr>
<tr>
<td>1986</td>
<td>9 months</td>
<td>5.88%</td>
<td>137 bps</td>
</tr>
<tr>
<td>1983</td>
<td>15 months</td>
<td>8.50%</td>
<td>325 bps</td>
</tr>
</tbody>
</table>

Median: 300 bps

**US Equities During Fed Tightening Cycles**

US equities have performed well in 6 of the 7 Fed tightening cycles since 1986, with median 12 month returns in the 7% area. While initial equity returns can be poor immediately following the policy pivot, the market has typically regained losses and generated positive returns in the 12 months following the transition.

<table>
<thead>
<tr>
<th>Tightening Cycle</th>
<th>Start Fed Funds Rate</th>
<th>S&amp;P 500 Total Return After Tightening</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>6.50%</td>
<td>7% 18%</td>
</tr>
<tr>
<td>2015</td>
<td>0.25%</td>
<td>3% 15%</td>
</tr>
<tr>
<td>1983</td>
<td>8.50%</td>
<td>-6% 14% 13%</td>
</tr>
<tr>
<td>1999</td>
<td>4.75%</td>
<td>7%</td>
</tr>
<tr>
<td>2004</td>
<td>1.00%</td>
<td>-2% 6%</td>
</tr>
<tr>
<td>1986</td>
<td>5.88%</td>
<td>5% 21%</td>
</tr>
<tr>
<td>1994</td>
<td>3.00%</td>
<td>-6% 1% 7.2%</td>
</tr>
</tbody>
</table>

**Source:** (1) Bloomberg. Data as of September 10, 2021. Calculated from start of Fed tightening cycle. Total returns. Start rate is upper bound.

Comprehensive tax reform became law in 1986.
USD Credit During Fed Tightening Cycles

Historically, HY spreads have generally outperformed IG in tightening cycles, though both can perform well. Generally speaking, both IG and HY spreads have widened in the early stages of a tightening cycle (on the policy transition), but then grind tighter over the course of the tightening cycle (so long as volatility remains in check).

<table>
<thead>
<tr>
<th>Year</th>
<th>Change in IG OAS 12 months after Fed tightening</th>
<th>Change in HY OAS 12 months after Fed tightening</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>(-13 bps)</td>
<td>(-0.5 bps)</td>
</tr>
<tr>
<td>1999</td>
<td></td>
<td>135 bps</td>
</tr>
<tr>
<td>2004</td>
<td>(-13 bps)</td>
<td>(-38 bps)</td>
</tr>
<tr>
<td>2015</td>
<td>(-37 bps)</td>
<td>(-249 bps)</td>
</tr>
</tbody>
</table>

Source: (1-2) FRED. Data as of September 10, 2021. Bloomberg.
US Treasuries During Fed Tightening Cycles

In prior tightening cycles, UST rates generally rose across the curve by 50 - 150 bps, with the front end more sensitive to monetary policy transition, and the long end generally more driven by economic fundamentals. This, in turn, drives a general “bear flattening” trend in most cycles, with much of the rate move occurring early. In the current cycle, rates have remained lower than prior tightening cycles as a result of decelerating growth, elevated tail risk and strong global technical factors.

Source: (1-2) Bloomberg. Data as of September 10, 2021. Average across duration based on same seven cycles shown on right.

### Average UST yield change 12 months after Fed tightening

<table>
<thead>
<tr>
<th>Duration</th>
<th>Short End: More sensitive to monetary policy</th>
<th>Long End: More sensitive to economic fundamentals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2Yr</td>
<td>129 bps</td>
<td>94 bps</td>
</tr>
<tr>
<td>5Yr</td>
<td></td>
<td>67 bps</td>
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<tr>
<td>10Yr</td>
<td></td>
<td>54 bps</td>
</tr>
<tr>
<td>30Yr</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 10yr UST yield change 12 months after Fed tightening

<table>
<thead>
<tr>
<th>Year</th>
<th>Yield Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>+253 bps</td>
</tr>
<tr>
<td>1994</td>
<td>+166 bps</td>
</tr>
<tr>
<td>1986</td>
<td>+87 bps</td>
</tr>
<tr>
<td>2015</td>
<td>+33 bps</td>
</tr>
<tr>
<td>1999</td>
<td>+17 bps</td>
</tr>
<tr>
<td>1988</td>
<td>(-21 bps)</td>
</tr>
<tr>
<td>2004</td>
<td>(-67 bps)</td>
</tr>
</tbody>
</table>

Median: 33 bps
US Dollar During Fed Tightening Cycles

Historically, the US Dollar has had high variance in its performance during tightening cycles. Looking more closely at the recent 2015-18 tightening cycle, this was the first time since the 1970s that the Fed was the only major central bank tightening, and as such, the strong USD gains were more front-loaded going into the cycle than in prior pre-Fed tightening periods.

<table>
<thead>
<tr>
<th>Tightening Cycle</th>
<th>Start Fed Funds Rate</th>
<th>US Dollar Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>8.50%</td>
<td>11.9%</td>
</tr>
<tr>
<td>1988</td>
<td>6.50%</td>
<td>11.1%</td>
</tr>
<tr>
<td>2015</td>
<td>0.25%</td>
<td>4.5%</td>
</tr>
<tr>
<td>1994</td>
<td>3.00%</td>
<td>3.8%</td>
</tr>
<tr>
<td>1999</td>
<td>4.75%</td>
<td>1.3%</td>
</tr>
<tr>
<td>1986</td>
<td>5.88%</td>
<td>(-2.5%)</td>
</tr>
<tr>
<td>2004</td>
<td>1.00%</td>
<td>(-3.4%)</td>
</tr>
</tbody>
</table>

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Tom Joyce is a Managing Director and Capital Markets Strategist within MUFG’s global capital markets and investment banking business. Based in New York, Tom heads a team that creates customized analytical content for multi-national S&P 500 companies. His team provides in depth analysis on the impact of economic, political, public policy and regulatory dynamics on the US credit, foreign exchange, rates and commodities markets.

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