MEKETA

# Is the worst of both worlds returning? Understanding stagflation risk – a stagflation primer

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**The Trump administration is giving every indication that its trade policies will be a departure from those that have been favored by the US in the post-World War II era. For example, the sweeping tariffs thus far announced (and subsequently delayed) by President Trump are unprecedented in their scale and breadth. As a result, many economists have downgraded their outlook for economic growth in the US and increased the probability of higher inflation. The combination has led to some whispers about the possibility of stagflation.**

**Few things scare economists like the prospect of stagflation, given its potential to do lasting harm to the economy and living standards. Many investors likewise fear stagflation, as it has historically led to losses for most major asset classes. In this research note, we describe stagflation, provide historical context and discuss its causes. We focus on the impact stagflation has had on capital markets, and we analyze the assets classes that may serve as a hedge during a stagflationary period.**


## Key takeaways

- Stagflation is characterized by high inflation combined with stagnant or declining economic growth, often accompanied by rising unemployment.
- Stagflation gained prominence in the US in the 1970s, due to oil supply shocks and the cessation of gold-convertibility of the US dollar.
- Addressing stagflation poses a dilemma for policymakers, as measures to curb inflation may further suppress growth, while strategies to stimulate growth risk exacerbating inflation.
- The phenomenon leads to a high 'misery index' (sum of inflation and unemployment rates), negatively affecting living standards and portfolio returns.
- There are a limited number of asset classes that may provide a hedge during a stagflationary environment. They tend to offer some combination of either inflation-linkage or provide a kind of tail risk hedge.

## What is stagflation?

Stagflation is an economic condition in which inflation is high even as economic growth stagnates or declines. In essence, the term combines stagnant economic performance with high inflation, describing a period of rising prices alongside weakening or negligible GDP growth. This painful mix is typically accompanied by rising unemployment and underutilized capacity. During stagflation, inflation expectations can become unanchored and keep climbing even as output stalls and joblessness increases. This scenario defies the usual economic pattern where strong growth and low unemployment tend to coincide with higher inflation. Instead, an economy may experience a "misery index" (the sum of inflation and unemployment rates) that is extremely high.[1]

[1] For example, around 1980 the US misery index hit record levels as inflation of ~13% plus unemployment of ~7% delivered a one-two punch to households.

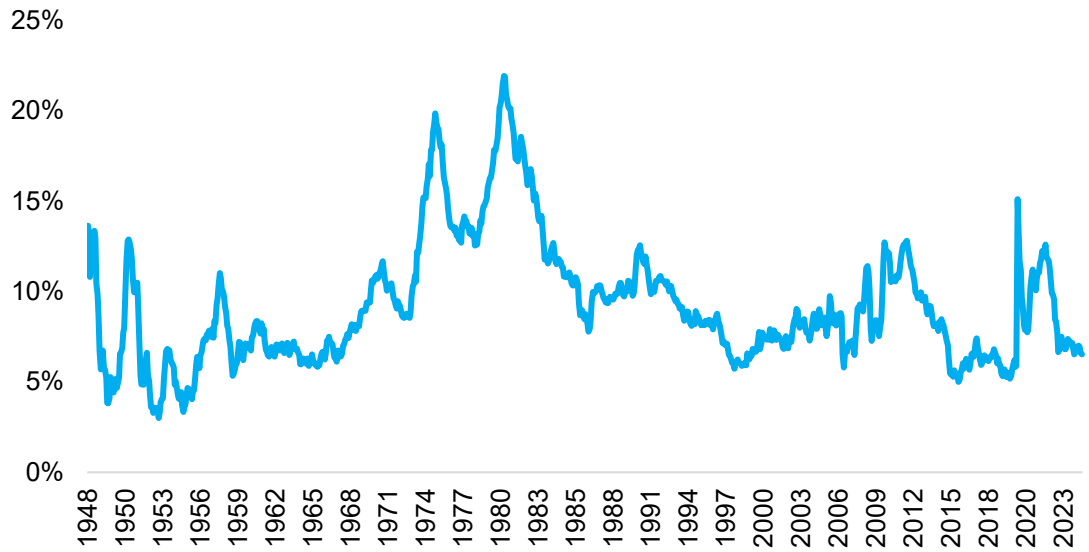


**FIGURE 1**
**Misery Index (Inflation Rate plus Unemployment Rate)**

Source: Meketa. Index is calculated based on unemployment and inflation data from FRED.

Stagflation is a rare phenomenon in advanced economies, with few historical precedents. It gained notoriety in the 1970s when major economies like the United States faced simultaneous recessions and inflation surges. Economists often point to supply-side shocks as a key trigger – sudden disruptions that drive up costs (and thus prices) while weighing on output. The result is a dilemma for policy makers: traditional policy tools to curb inflation (like raising interest rates or tightening fiscal belts) risk further suppressing growth and employment, while stimulus to boost growth can exacerbate inflation.

While the concept of stagflation is generally accepted, it does not have an established technical definition like a recession. Importantly, stagflation does not need to be prolonged or reach record levels to harm investors. Even at moderate levels, stagflationary-like conditions could impact capital market performance.

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## Historical context and causes of stagflation

The term stagflation was first coined as a political term in the United Kingdom in the 1960s,[2] but the most famous economic episode occurred in the United States during the 1970s. In 1971, the US ended the gold-convertibility of the US dollar, thus ending the agreement that had stabilized global currency markets since the end of World War II.[3] In October 1973, Arab OPEC nations imposed an oil embargo that lasted five months – a shock that caused the global price of oil to quadruple (see Figure 2), and those elevated oil prices persisted for years. Stagflation in the US emerged in conjunction with the oil supply shocks of 1973–1974 and 1979–1981.

[2] The term "stagflation" is widely credited to Iain Macleod, a British Conservative Party politician, in a speech he gave in the House of Commons.

[3] The Bretton Woods Agreement, established in 1944, created a system of fixed currency exchange rates pegged to gold.

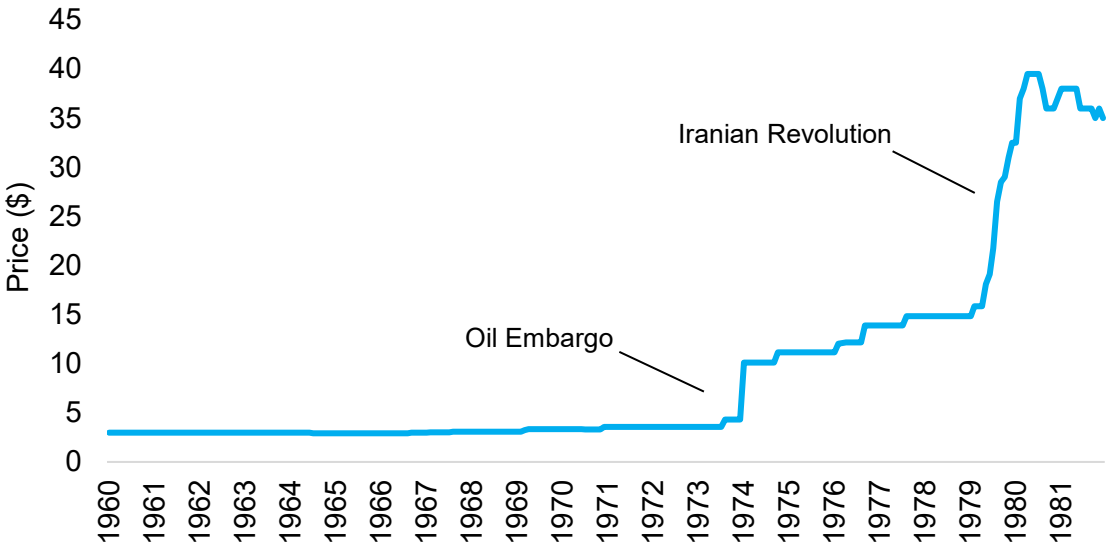


**FIGURE 2**
**Spot Crude Oil Price for West Texas Intermediate per Barrel**

Source: FRED.

It is often a combination of factors that produce full-blown stagflation. In the 1970s, the US economy was heavily reliant on foreign petroleum due to the Nixon-era price control program that limited price increases for domestic oil production. Hence, the spike in energy costs reverberated through nearly every sector, driving up the cost of goods and services broadly. One hallmark of stagflation is that inflation expectations among the public and investors begin to rise in tandem, creating a self-reinforcing cycle. People come to expect continued inflation, which can lead to behaviors that perpetuate it – for instance, demanding higher wages or preemptively raising prices. This wage–price spiral meant inflation became entrenched even as the economy struggled under the weight of higher energy costs and faltering industrial output.

This dynamic made the inflation of the 1970s especially hard to subdue. Notably, inflation during stagflation tends to be of the cost-push variety (originating from supply side or import cost increases) rather than the demand-pull type (originating from overheated demand).[4] Cost-push inflation can coexist with slack in the economy, which precisely defines stagflation.

The US business cycle in the 1970s seesawed between expansion and recession. After the first oil shock, the mid-1970s saw a sharp recession with high unemployment, followed by a brief recovery. The Federal Government attempted to tame inflation by passing price and wage controls after exiting the Bretton Woods gold convertibility scheme. These programs largely failed as inflation surged when the program expired. By the end of the decade, a second energy crisis struck: the 1979 Iranian Revolution severely disrupted oil supply and sent oil prices tripling once again.[5] Inflation in the US soared to 14% on an annualized basis, and unemployment climbed above 7% – a staggering combination that epitomized stagflation. In response, the Federal Reserve took drastic action: the Fed Funds Rate was hiked to over 19% by 1981 in an effort to crush inflation expectations.[6] These aggressive rate increases pushed the economy back into recession in the early 1980s. Painful as it was, this policy ultimately succeeded in taming inflation by the middle of the decade, illustrating the difficult trade-offs policymakers face when combating stagflation .

[4] Cost-push inflation occurs when the overall prices of goods and services rise due to increased production costs, such as higher wages and raw material prices.

[5] The election of Ronald Reagan in 1980 brought sweeping deregulation of domestic oil production, thereby reducing dependence on imported oil, and energy prices declined.

[6] Source: FRED.

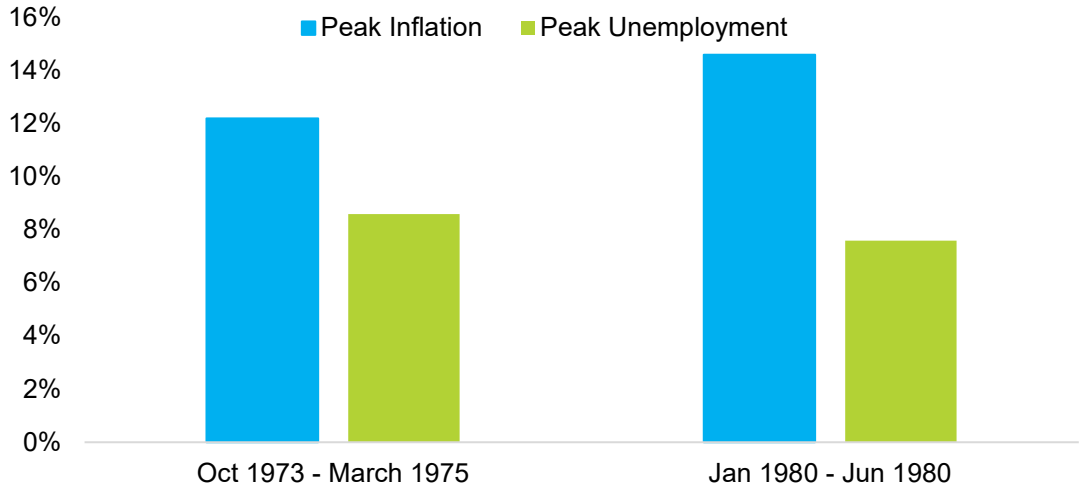


**FIGURE 3**
**Inflation and Unemployment During past Stagflationary Periods**

Source: FRED. Represents year-over-year inflation using the CPI-U. The time periods shown were chosen because they coincide with recessionary periods as defined by the NBER and periods of high inflation.

Several common threads emerge from these historical episodes. Supply shocks are a primary cause of stagflation – for example, the oil embargo and geopolitical turmoil of the 1970s created scarcities that drove prices up independent of demand. But supply shocks are not limited to oil: any major disruption in key inputs or goods (such as a sharp increase in commodity prices, a natural disaster, or a pandemic-related supply chain breakdown) can ignite inflation while stifling production. Trade policies can play a role as well. For instance, broad-based tariffs and trade disruptions can raise the cost of imports and raw materials while suppressing global trade volumes, leading to a stagflationary impulse.

In a recent scenario analysis, economists warned that a sudden escalation in US–China trade barriers – such as imposing 100% + tariffs on imports – could meaningfully increase the risk of stagflation.[7] Federal Reserve Chair Jerome Powell cautioned that such a tariff shock could result in weaker growth coupled with higher prices for US consumers.[8] One pessimistic estimate projected that US GDP growth could fall by up to a full percentage point while consumer prices jump, as tariffs simultaneously depress demand and push up costs.[9] This example underscores how trade conflicts or other policy moves can create stagflationary conditions by generating supply-side inflation pressures in an already slowing economy.

From a policy perspective, stagflation creates a major predicament. Today, central banks usually fight inflation by raising interest rates (which further dampens growth and employment in the short run), whereas they fight unemployment and weak growth by lowering rates or stimulating demand (which can worsen inflation). In stagflation, there is no easy policy solution: any action to improve one metric may worsen the other. In the 1970s, the Fed initially opted to stimulate the economy, which allowed inflation to rise; later, it chose to prioritize reducing inflation, which caused a sharp recession.

This trade-off highlights why stagflation is so feared: it poses painful choices and can require a prolonged period of economic weakness to finally wrestle inflation down. The Fed's strict anti-inflation stance of the 1980s eventually brought inflation under control by the mid-1980s, but at the cost of back-to-back recessions. Hence, once a stagflationary cycle is established, bringing the economy back into balance is exceedingly costly. It is preferable to avoid stagflation in the first place.

Stagflation is fortunately rare, and post-1980s, many developed countries have not experienced a prolonged stagflationary period. Even in the aftermath of the COVID-19 pandemic (2020–2022), when inflation spiked to multi-decade highs and growth temporarily contracted, the US arguably did not meet all the criteria for stagflation. While inflation rose to levels not seen in forty years, it was accompanied by a rapid economic rebound and low unemployment rather than a stagnant economy. Strong growth and low joblessness kept the situation from devolving into true stagflation, although concerns grew about persistent supply bottlenecks and commodity shocks. These recent events serve as a reminder that stagflation could re-emerge if adverse supply shocks coincide with a faltering economy. Investors and policymakers must remain vigilant, even if such an outcome is not the baseline expectation .

## Impact on capital markets

Stagflation creates a punishing environment for most traditional asset classes. In past stagflationary periods, both stocks and bonds have performed poorly. This is intuitive, as the twin conditions that define stagflation – weak growth and high inflation – are each bad for a major asset category.

[7] Source: TS Lombard, F. Bremish, "Little Bear, Big Bear," April 2, 2025.

[8] Source: Wall Street Journal, N.Timiraos, " Powell Warns of Higher Prices, Weaker Growth After Tariff Plan," April 4, 2025.

[9] Bridgewater, G. Jensen et al., "Modern Mercantilism Chaos: What We Make of Liberation Day," April 3, 2025.

Equities suffer because slowing growth and recessions hurt corporate earnings, and investor confidence in future profits falters. At the same time, rising inflation and interest rates reduce the present value of those future earnings (via a higher discount rate), putting downward pressure on stock valuations. The result is often a bear market in equities.

For instance, during the 1973-74 stagflation episode, the S&P 500 Index fell nearly 50% from peak to trough.[10] Slowing growth weighs on corporate earnings and equity valuations in stagflation. Investors typically rotate out of stocks due to the grim economic outlook, and while some sectors may perform better than others, there are few sectors that are spared. Even typically defensive sectors can decline if inflation drives input costs up faster than they can raise prices. Traditional diversification within equities (e.g., holding both cyclical and defensive stocks) offers limited protection when the entire market is declining.

[10] Source: Reuters, E. Chancellor, " A Warning From History About Large Cap Stock Booms," June 21, 2024.

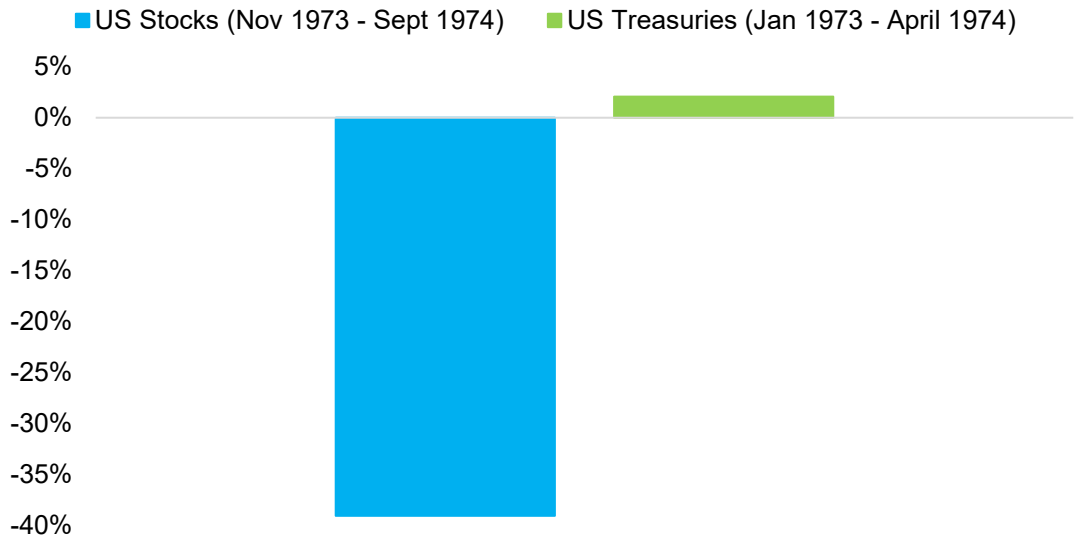


**FIGURE 4**
**Peak-to-trough Performance of US Stocks & Bonds during Stagflation**

Data source: InvestmentMetrics. US Stocks represent the S&P 500 index and US Treasuries represent the Bloomberg US Treasury index. Note that the peak-to-trough periods for stocks and bonds do not necessarily line up with each other, nor with the periods of peak stagflation, as markets often move in anticipation of such events.

Fixed income investments fare little better. Normally, high-quality bonds act as a safe haven during recessions, but stagflation is a nightmare for bondholders because inflation erodes the real value of fixed payments, and interest rate hikes can lead to losses in bond prices. As inflation rises, nominal yields tend to climb in compensation and/or as a result of Fed intervention, which means bond prices fall. In the 1970s, US Treasury yields shot upwards to levels never seen before (the 10 -year Treasury yield exceeded 15% by 1981), inflicting significant losses on anyone holding longer-term bonds.

If inflation is also unexpected by the market, the damage is worse: most publicly traded bonds and stocks exhibit a negative correlation to unexpected inflation, meaning a surprise jump in inflation causes both to drop in price together. This was evident in the 1970s, and again in 2021–2022 when a surge in unexpected inflation caused simultaneous declines in equities and bonds, producing negative returns for balanced stock/bond portfolios.

Indeed, in stagflation, the usual negative correlation between stocks and bonds can turn positive. This breaks the traditional diversification benefit of a stock/bond mix. As a result, many investors may struggle to meet their return and risk objectives in a stagflationary period.

Indeed, there are few places to hide in a stagflationary market. Figure 5 displays the historical returns under stagflationary scenarios for major asset classes. It shows that the vast majority of asset classes produce flat or negative returns. On the bond side, the more sensitive the asset is to interest rates, the worse it tends to fare. Even bank loans and high yield debt would likely struggle as credit spreads widen in a weak economy. Cash tends to outperform most assets simply by virtue of not losing nominal value. Likewise, short-term TIPS will likely fare better than most other bonds. But relative to stocks plunging and bonds losing value, a near-zero return can look attractive. Stock markets struggle regardless of geography. Traditional inflation-sensitive sectors within equities (like energy or natural resource stocks) also tend to struggle. If the overall economy is in recession, even many commodity-producing companies can see share prices decline due to falling demand.

Most private market assets may produce flat returns. However, this comes with two caveats. First, history has shown that General Partners (GPs) tend not to mark their assets down to market pricing during recessionary scenarios. Consequently, these assets often do not experience the kind of rebound seen in public markets when the recovery eventually occurs. Second, the longer the period of stagflation, the more challenging it becomes for GPs to avoid marking their assets down. Therefore, private markets may not provide as much of a hedge during a prolonged stagflationary environment.

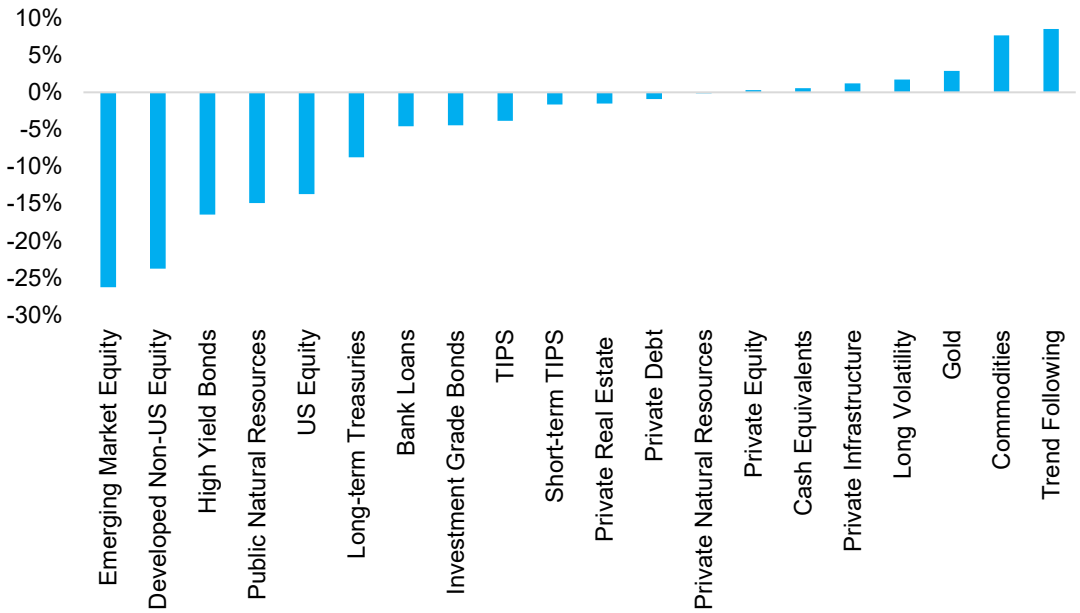


**FIGURE 5**
**Historical Annualized Returns Under High Inflation & Low Growth Scenarios**

Source: Meketa Investment Group analysis of the period 1973-2024. See appendix for methodology and benchmarks used. Note that Stagflation scenario includes monthly economic data where inflation and growth are below rolling averages in a probability scenario threshold. Other Meketa inflation scenarios include inflation shocks, surprises and duration of inflationary periods.

In summary, stagflation historically meant concurrent bear markets in both equities and bonds, a rare and unpleasant combination for investors. This underscores why protecting portfolios against stagflation requires thinking beyond the usual stock-bond toolkit.

## Portfolio strategies for a stagflationary environment

A stagflation scenario is difficult terrain for investors to navigate, but there may be ways to help build resilience. A first line of defense is recognizing that no single asset class offers a perfect refuge. In a severe stagflationary environment, being well-diversified may mitigate – but not eliminate – losses. That said, certain asset classes have historically shown more resilience or even positive returns during stagflationary periods. Investors can tilt portfolios toward these inflation hedges and defensive assets to better withstand stagflation. Below, we discuss strategies and asset categories that institutional investors might consider:

- **Treasury Inflation-Protected Securities (TIPS):** TIPS are government bonds indexed to inflation, which means their principal and interest payments adjust upward with the Consumer Price Index (CPI). This feature directly hedges against inflation, ensuring the bond's real value is preserved. In a stagflation scenario, TIPS should outperform nominal bonds that suffer from inflation erosion. While TIPS can still experience short-term price volatility if real interest rates rise, they are likely to provide an important insurance policy for long-term investors by delivering inflation-adjusted returns.

  Short-term TIPS are expected to be a better inflation hedge than traditional TIPS primarily due to their lower sensitivity to interest rate changes and higher sensitivity to inflation fluctuations. Short-term TIPS have less exposure to interest rate risk, making them more effective in preserving principal when rates are rising. The reduced duration of short-term TIPS should minimize the impact of interest rate movements, leaving inflation as the primary driver of their performance, which is particularly advantageous during periods of unexpected inflation. Furthermore, short-term TIPS exhibit higher correlations to the more volatile aspects of the CPI, such as energy prices, which enhances their efficacy as an inflation hedge.

- **Commodities and natural resources:** Broad commodity exposure (via commodity futures or indexes) has a strong record as an inflation hedge. When inflation is driven by rising commodity prices (e.g., oil, metals, agricultural goods), holding those commodities in a portfolio should translate into gains that can mitigate losses elsewhere. Historically, commodities and natural resource-related assets have exhibited positive sensitivity to inflation surprises. In the 1970s, commodities were among the best-performing asset classes. For instance, when oil prices quadrupled during the 1973 embargo and again surged in 1979, many commodities experienced windfall gains, particularly in the energy sector. A diversified commodity index would likely produce gains in a stagflation scenario where inflation is driven by commodity scarcity.

Public and private natural resources encompass ownership in firms extracting and processing commodities, offering a blend of inflation hedging and economic growth. Historically, public natural resources have been a reliable hedge during periods of high inflation, particularly when the economy was closely tied to oil prices and there were inefficiencies in the energy market. From 1973 to 1991, public natural resources showed strong positive returns during high inflation months, but this weakened post-1991 due to changes in the economic environment and energy market structure. Both public and private natural resources are expected to fare better in a purely inflationary environment than in a stagflationary environment due to their sensitivity to economic growth.

- **Real assets (real estate and infrastructure):** Real assets are physical or tangible assets that often have an inherent link to inflation. Real estate properties, for instance, generate rental income that landlords can often increase over time – typically in line with inflation or with explicit CPI-linked rent escalations. Thus, core real estate (high-quality, income-producing properties) can act as a partial inflation hedge. During stagflation, while real estate values might face headwinds from higher interest rates, the ongoing cash flows (rent) tend to rise with prices, helping preserve real returns. In the 1970s stagflation, commercial real estate in many regions managed to keep pace with inflation, especially where leases had inflation clauses.

  Similarly, infrastructure assets (e.g., utilities, transportation assets, energy pipelines) often have revenues tied to usage and inflation; for example, regulated utility rates or toll road fees can be inflation-linked. These assets are typically less sensitive to economic cycles (as people still need electricity, water, transport), making them more resilient during low-growth periods, and their inflation pass-through characteristics make them valuable when prices are rising. Institutional investors may access real assets through direct ownership, real estate investment trusts (REITs), or infrastructure funds. Note, however, that publicly traded REITs and infrastructure can behave more like equities in the short run, so private real assets may provide a better stagflation buffer.

- **Gold:** Gold has by far the longest history of serving as a safe-haven asset that keeps up with inflation over the long term. Gold is perceived as a hedge against inflation, largely based on the average inflation adjusted price remaining relatively stable over time. Historically, inflation and gold prices have moved in ways that imply a significant relationship (i.e., a positive correlation) over multi-year periods. That said, it is also the case that gold has experienced extended periods where the price changed only marginally and counter to the overall inflation trend. Additionally, because of the significant structural changes in the gold market over the last century, a historical comparison of gold and inflation to future environments is fraught with caveats and unique situations.[11]

[11] As examples, the gold standard and the Bretton Woods exchange rate agreement both contributed to unique gold market regimes that are unlikely to occur in the future.

- **Cash:** As simple as it sounds, holding cash can be a prudent strategy in stagflationary times. While cash (and short-term Treasuries) will not produce outsized gains, it also will not produce losses, thereby preserving capital. Cash also provides dry powder to reinvest when asset prices become depressed. In an environment where most asset classes are falling, a 0-4% nominal return on cash is a relatively good outcome.

  Historically, money market rates have risen with inflation, reaching double-digits in the early 1980s. Short-term bonds (e.g., 1-3 year Treasuries) similarly have low duration risk, meaning their prices will not fall much when rates rise. They can be quickly rolled over into new issues at higher yields as inflation pushes rates upward. Thus, maintaining an allocation to cash and short maturities is a way to stay defensive. It also affords flexibility, as investors can redeploy cash into undervalued assets once the stagflationary phase passes or policy responses begin to take hold.

- **Alternative strategies (global macro, long volatility, and trend-following strategies):** Beyond the traditional asset classes above, investors might consider certain alternative strategies that have the potential to profit from macro dislocations like rising commodity prices or currency shifts due to inflation. Global macro strategies are designed to dynamically adapt to changing macroeconomic conditions. During periods of inflation, global macro strategies may be able to capitalize on expected changes in interest rates and currency valuations, which are often influenced by inflationary pressures. Global macro strategies often thrive in times of disequilibrium and market disruptions, which are characteristic of stagflation.

  Trend following strategies focus on capturing price trends or momentum in various markets, such as equities, interest rates, currencies, and commodities, by systematically investing based on the direction of these trends. During periods of inflation or stagflation, trend following strategies may be beneficial due to their ability to profit from both upward and downward price trends without a structural bias towards long or short positions. Long volatility strategies often generate positive returns during periods of high market volatility when traditional assets might struggle. They should be particularly effective in environments where volatility is expected to rise or remain elevated, as may happen during a stagflationary environment.

A diversified basket of inflation-sensitive assets may provide a more robust hedge against stagflation than any single asset alone. The performance of each asset will depend in part on the drivers of inflation, which are typically unknowable in advance. Depending on the exact nature of the stagflationary shock, some of these assets may even deliver positive returns amidst the turmoil. A key for investors is to identify and include diversifiers before stagflation hits. Once inflation is high and growth has stalled, it is often too late (and expensive) to reposition.

It is also important to size portfolio hedges appropriately. A meaningful allocation to inflation-sensitive assets may be required to materially offset stagflation's impact at the total portfolio level. Investors may want to consider strategic allocations to these asset classes as part of a long-term policy mix. The optimal allocation will depend on an investor's objectives, liquidity needs, and tolerance for stagflation risk. Scenario analysis and stress testing are useful tools to determine how a given portfolio might fare under stagflation and how much of each hedge asset would be needed to achieve a target level of protection.

## Conclusion

Stagflation represents an "uncomfortable middle ground" for the economy and markets – a scenario of dual threats that demands careful preparation. Because it is impossible to predict exactly if or when stagflation will occur, it is prudent to adopt a stance of preparation over prediction. This means contemplating ways to build a resilient portfolio that can adapt across a range of scenarios, including the rare but consequential risk of stagflation. Such resilience likely comes from diversification beyond the traditional 60/40 paradigm. For example, investors may want to consider inflation-linked assets such as TIPS, real assets, commodities, as well as other alternative return streams that may hold value when equities and nominal bonds are struggling.

Investors should regularly stress-test their portfolios under stagflation-like conditions, asking "what if" and identifying vulnerabilities. Importantly, hedging stagflation should be weighed against long-term objectives. Stagflation protection should be considered as part of a broader risk management framework rather than an all-in bet on a single scenario.

While full-blown stagflation is not a common occurrence, its likely impact on portfolios is severe enough that it cannot be ignored. Fortunately, there are strategies that may allow an investor to confront the specter of stagflation with confidence that their portfolio is as prepared as possible for "the worst of both worlds." In the end, maintaining discipline and a long-term perspective – focusing on preparation, not prediction – is the best way to navigate the uncertain waters that stagflation presents.

## Appendix: model approach and methodology

We run a multivariate regression model to estimate the effects of realized and surprise inflation on monthly asset returns, controlling for the economic environment. Quadratic independent variables are added to the regression model to account for potential non-linearity between an asset class and inflation. Estimated returns are then calculated as the expected value of asset class returns, conditional on the inflation scenario.

The reasons for this model approach are detailed below.

***Control for the Economic Environment.*** Meketa wanted to control for the economic environment when looking at an asset's inflation hedging ability. Economic theory holds that inflation and growth are tightly related – low levels of inflation tend to spur economic activity, but when economic activity heats up too quickly, inflation grows. A regression model allowed us to estimate how much an asset's performance is due to the economic environment compared to its actual inflation-hedging ability.

***Avoid Mis-specification.*** An asset class' inflation hedging ability is typically measured through the correlation of asset performance and inflation levels in historical periods. However, the real relationship between inflation and many asset classes is likely non-linear. Hence, inferring the relationship of inflation and asset returns with linear correlations could mis-specify their real relationship.

***Small Sample Size.*** Meketa was limited to using regression models to identify the relationship between inflation and asset performance due to the small sample size. Non-parametric models require large sample sizes to perform well, but our sample size was 578 months.

***Easy Interpretation.*** The estimated coefficients in a regression model are easy to interpret and validate with theory. Linear regression coefficients are interpreted as elasticities – the effect of Y given one unit increase in X holding all else constant.

As with all regression models, the results of our multivariate regressions depend on the following assumptions to be true:

1. The linear functional form represents the true data-generating process.
2. The covariance between the error term and independent variables are 0.
3. The error term is normally distributed around 0 and has a finite variance.
4. The residuals are homoscedastic and are not correlated.

The assumptions need to hold true for our estimators to be unbiased. In addition, by using a model with historical data, Meketa assumes that future asset behavior is similar to past asset behavior.

The model examines the combined effect of inflation and GDP Growth on asset returns:

$$Asset\ Returns = B_0 + B_1\ GDP\ Growth + B_2\ GDP\ Growth^2 + B_3\ Inflation + B_4\ Inflation^2$$

where Asset Returns is the monthly asset return from 1973 to 2020, GDP Growth is the percent change in GDP from the previous quarter, and inflation is the monthly change in CPI from the 3-month rolling average CPI. GDP Growth and inflation data are taken from the St. Louis Federal Reserve Bank's FRED database. Since GDP data is only quarterly, the regression was run on quarterly asset return, GDP and inflation observations.

The estimate is the annualized return of:

$$B_1 * E[GDP\ Growth \mid Scenario] + B_2 * E[GDP\ Growth^2 \mid Scenario] + B_3 * E[Inflation \mid Scenario] + B_4 * E[Inflation^2 \mid Scenario]$$

where the GDP Growth scenarios are high growth rate of 1% (75th percentile) and low growth rate of .3% (25th percentile). The inflation scenarios are low (.07%, 25th percentile), medium (.25%, median), and high (.5%, 75th percentile) realized inflation.

The benchmarks used are as follows:

| Asset Class | Benchmark |
|---|---|
| Emerging Market Equity | MSCI Emerging Markets Index |
| Developed Non-US Equity | MSCI EAFE Index |
| High Yield Bonds | Bloomberg US Corporate High Yield Bond Index |
| Public Natural Resources | S&P Global Natural Resources Index |
| US Equity | Russell 3000 Index |
| Long-term Treasuries | Bloomberg US Treasury: Long Index |
| Bank Loans | S&P UBS Leveraged Loan Index |
| Investment Grade Bonds | Bloomberg US Aggregate Bond Index |
| TIPS | Bloomberg US TIPS Index |
| Short-term TIPS | Bloomberg US TIPS 1-5 Years Index |
| Private Real Estate | NCREIF ODCE |
| Private Debt | Cambridge Associates Private Debt Composite |
| Private Natural Resources | 35% S&P 1500 Energy, 15% NCREIF Farmland, 15% NCREIF Timberland, 15% MSCI World Metals and Mining Index, 20% NASDAQ Clean Edge Green Energy Index |
| Private Equity | Cambridge Associates Private Equity Composite |
| Cash Equivalents | Bloomberg US Treasury Bill Index |
| Private Infrastructure | Cambridge Associates Infrastructure Composite |
| Long Volatility | CBOE Eurekahedge Long Volatility Index |
| Gold Metal | LBMA Gold Price |
| Commodities naïve | Bloomberg Commodity Index |
| Trend Following | BarclayHedge CTA Index |

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