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**Charactering Stagflation into Mild, Moderate and  
Severe Episodes: A New Approach**

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**Azhar Iqbal**, Director and Econometrician (*Corresponding author*)

Wells Fargo Corporate & Investment Banking,  
30 Hudson Yards | 14<sup>th</sup> Floor | New York, NY 10001-2170  
Tel: 212 214 2029, [azhar.iqbal@wellsfargo.com](mailto:azhar.iqbal@wellsfargo.com)

**Nicole Cervi**, Economist

Wells Fargo Corporate & Investment Banking,  
550 South Tryon Street, D1086-041  
Charlotte, NC 28202  
Tel: 704 410 3059, [nicole.cervi@wellsfargo.com](mailto:nicole.cervi@wellsfargo.com)

# Charactering Stagflation into Mild, Moderate and Severe Episodes: A New Approach

## *Abstract*

Our study presents a new framework to characterize stagflation into mild, moderate or severe episodes. By categorizing stagflationary cases on a severity scale, the suite of monetary policy actions necessary to combat each case is easier to discern.

The CPI and PCE deflator are employed as measures of inflation, and real GDP acts as a proxy for output growth. We utilize the magnitude and duration of high inflation, along with low output growth, to characterize stagflation into different categories. That said, the evolving nature of the U.S. economy can make one period's high inflation feel too high of a bar to clear for other time periods. Thus, we employ a time-varying benchmark for growth and inflation.

Our work estimates 13 episodes of stagflation taking place from 1947 to present. Five of those episodes are mild, four are moderate and four are severe. Notably, the current episode (Q2-2021 to present) is severe. Furthermore, four episodes took place without a recession, and nine overlapped with recessions.

Additionally, our framework is forward looking, and analysts can utilize their forecasts to project the likely path of a stagflationary episode. That is, when we plug in Bloomberg's consensus projections for real GDP and CPI into our framework, it suggests that the current instance of severe stagflation will end by the first quarter of 2024.

We also discuss lessons from past episodes, and how they may guide future decisions. Particularly, we look at policy decisions that were effective at combating stagflation and how vital they are for the present period. Our analysis suggests that the current episode is the second-longest instance of severe stagflation since 1947 and thereby serves as a caution that the near future (recession) may need different monetary policy actions than the past four recessions, as severe stagflationary episodes were absent from those business cycles.

**Key Words:** Stagflation; Mild; Moderate; Severe; Episodes.

**JEL Classification:** E31; E32; E52.

# **Charactering Stagflation into Mild, Moderate and Severe Episodes: A New Approach**

## **1.0 Introduction and summary**

The door to stagflation has opened. Consumer price inflation has reached a 40-year high and real GDP growth was negative through the first half of 2022. Our study presents a new framework to characterize stagflation into mild, moderate or severe episodes. By categorizing stagflationary cases on a severity scale, the suite of monetary policy actions necessary to combat each case is easier to discern. That is, the framework allows policymakers to review examples of stagflation and determine whether past policy decisions were effective at combatting stagflation. Akin to recessions, the depth and duration of a stagflation episode dictates the appropriate policy action. To the best of our knowledge, we are the first to quantify stagflation into mild, moderate and severe episodes.

Stagflation is broadly defined as periods with low or negative output growth that coincide with historically high inflation (Samuelson 1974). Our framework employs the Consumer Price Index (CPI) as a measure of inflation and real GDP as a proxy for output growth. We also utilize the Personal Consumption Expenditures (PCE) deflator as an additional inflation measure as a robustness check. We evaluate the magnitude and duration of high inflation, along with low output growth, to characterize stagflation into different categories.

Not all stagflationary episodes are alike. The variation creates an opportunity to classify episodes based on depth and duration. That said, the underlying structures of the U.S. economy have evolved over time, which can make one period's high inflation (i.e., the 1970s) feel too high of a bar to clear for other time periods (i.e., the 2000s). To that end, we employ a time-varying benchmark of high inflation and low output growth. Specifically, we utilize the mean and standard deviations of the CPI and real GDP to estimate the magnitude, or severity, of stagflation.

Following the "technical recession" definition of two consecutive quarters of negative real GDP growth, we set a minimum duration of two consecutive quarters of high inflation along with low or negative output growth to classify an episode of stagflation. Sticking with two consecutive quarters as a minimum threshold helps to remove noise from the data and provides more useful signals, in our view.

We organize our findings into two phases. The first phase presents our framework for characterizing episodes of mild, moderate and severe stagflation using data from 1947 to present. The second phase discusses lessons from these past episodes, and how they may guide future decisions. Particularly, we look at policy decisions that were effective at combating stagflation. On the flip side, we consider the actions that may have prolonged or worsened a stagflationary episode. For example, the oil price shocks of the 1970s are widely considered the major driver behind the Great Stagflation of the 1970s to mid-1980s, but some studies have found that monetary expansion during the 1970s explains the bulk of the Great Stagflation (Barsky & Kilian 2000).

Our work estimates 13 episodes of stagflation taking place from 1947 to present. Five of those episodes are mild, four are moderate and four are identified as severe. Notably, the current episode (Q2-2021 to present) falls into the severe category. Furthermore, four episodes took place without a recession and nine overlapped with recessions. Looking ahead, we utilize Blue Chip's and Bloomberg's consensus forecasts for real GDP, the CPI and the PCE deflator to project the depth and duration of the current episode.

In response to the dramatic breakout in inflation over the past few years, the Federal Open Market Committee (FOMC) has hiked its benchmark rate by 500 basis points (bps) since March 2022. The policy pivot amid the stagflationary warning in early 2022 came much quicker relative to the 1970s, when the FOMC kept policy accommodative even with elevated CPI inflation and below-trend real GDP growth. The swiftness and magnitude of the FOMC's recent response suggest that the current stagflationary episode is likely to end within the next few quarters. Indeed, when we plug in Bloomberg's consensus projections for real GDP and CPI into our framework, it signals the current instance of severe stagflation will end by the first quarter of 2024. While real GDP growth is expected to remain below its prior cycle's average of 2.3% growth, the marked improvement in inflation, should that occur, would pull the U.S. economy out of stagflation.

In conclusion, we caution decisionmakers on two important frontiers. First, using realized data along with Bloomberg consensus forecasts, we conclude the current stagflationary episode would be the second-longest episode since 1947. The severity complicates the near-term economic outlook, especially in the event of a recession, which most forecasters believe will occur in the next 12 months. Some deep recessions, such as the Great Recession, were attached to weaker recoveries due to anemic job growth. Layering on an instance of stagflation would likely cause a recession to be more protracted and would increase the potential for economic scarring, in our view.

The second and final caution: do not forget the lessons of the stagflationary episodes of the 1970s and early 1980s. That is, U.S. policymakers should not assume that there is a fully functioning Phillips Curve—a lack of demand (i.e., a recession) does not necessarily put inflation to bed, especially when coinciding with expansionary monetary or fiscal policy. Given the experiences of the past four recessions, an expansionary monetary policy stance is a natural choice to stimulate the economy amid economic contraction, but those four recessions largely occurred without elevated and persistent inflation. Thus, the current severe instance of stagflation suggests a different path for monetary policy.

## **2.0 What is stagflation? Why do we care about it?**

Iain Macleod, a British politician, coined the term stagflation during an address to the House of Commons in 1965. Specifically, he said, “We now have the worst of both worlds—not just inflation on the one side or stagnation on the other, but both of them together. We have a sort of ‘stagflation’ situation. And history, in modern terms, is indeed being made” (Nelson & Nikolov 2002). In other words, stagflation is a period with minimal or low economic growth paired with elevated price growth.

Macleod believed history was being made because the economic literature at the time doubted the existence of stagflation. In a typical cycle, stagnation and inflation move in opposite directions. The Phillips Curve, a tool often used by policymakers and economic observers to analyze the state of the economy, is predicated on this principle (Mankiw & Reis 2002). That is, a rising unemployment rate, which correlates with low or negative output growth, will bring down inflation, while a falling unemployment rate, which correlates with strong output growth, will push inflation higher. The occurrence of stagflation ran in opposition to the logic behind the Phillips Curve, as high prices persisted amid high unemployment and low economic growth.

Stagflation can pose significant stress on the economy and can be a difficult situation to escape. Elevated inflation erodes consumer purchasing power, while weaker economic growth leads to a deterioration in the labor market, thereby limiting the opportunity for real wage gains. Conventional monetary or fiscal policy actions are remedies that often improve stagnation or inflation, but not both. For example, enacting an expansionary policy, such as a fiscal stimulus package for consumers, can promote economic growth during a downturn, but the addition of money in the economy could accelerate inflation, all else equal. On the flip side, in theory, enacting a contractionary policy, such as raising short-term interest rates, can help to rein in inflation, but higher rates also dampen economic growth prospects.

## 2.1 Is the stagflation of 2022 different from the Great Stagflation of the 1970s?

When U.S. central bankers were faced with stagflation in the 1970s, the appropriate monetary policy path was not readily apparent. Inflation was already elevated heading into the decade amid a surge in government spending.<sup>1</sup> Then, the oil price shock of 1973-1974 led to a dramatic rise in oil costs, causing an energy crisis. The crisis tipped the U.S. economy into recession, pressuring real GDP growth into negative territory and pushing unemployment higher. At the same time, inflation was skyrocketing, evident in the CPI averaging 10% year-over-year from 1974 to 1975. The Federal Reserve's dual mandate of full employment and price stability was not yet fully formalized at that time, and policymakers were focused on the employment side of the economy. The Federal Reserve, led by Chair Arthur Burns, thus enacted accommodative policy in the mid-1970s to support employment and stimulate economic growth.<sup>2</sup>

Expansionary policy during a stagflationary episode turned out to be a policy mistake. While the unemployment rate descended over the back half of the 1970s, consumer prices continued to accelerate at a rapid clip. Another oil price shock hit the U.S. economy in 1979-1980, tripling the cost of oil. Since many American factories at the time used petroleum as a primary source of energy, the sharp rise in oil prices pushed up the cost of production of most goods, which were then passed on to consumers via higher prices.

Furthermore, a major share of American workers had price indexation clauses in their wage contracts. Around 60% of workers under collective bargaining agreements had cost of living clauses in their contracts in the 1970s. Consequently, the oil price's shock to inflation led to an automatic acceleration in wages, which pushed input costs up further. The economy subsequently fell into another recession in 1980, with the CPI topping out at 14.3% year-over-year during Q1-1980. Blinder (1979) famously labeled this period the Great Stagflation (also see Blinder & Rudd 2008).

Taking over the Fed chair position in 1979, Paul Volcker followed a restrictive policy regime—the effective fed funds rate hit an all-time high of over 19% in 1981—even during the downturns of the 1980s. Volcker's policies aimed to combat inflation first, rather than focusing on maximizing employment. The trade-off was difficult, as fighting high inflation caused the unemployment rate to spike higher than its mid-1970s peak, nearing 11% in late 1982. But inflation descended, and the CPI averaged 4.5% year-

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<sup>1</sup> The CPI was below 3% year-over-year in 1967 and then it jumped to over 6% in Q1-1970. Later on, the CPI saw double-digit growth in 1974.

<sup>2</sup> The effective fed funds rate averaged 10.50% in 1974. It dropped to just 5.0% by 1976.

over-year in Q4-1982. Thereafter, the economy entered a period of price stability and sustained economic growth.

In retrospect, the stagflation of the 1970s was a structural break not just for the U.S. economy, but also for decisionmakers and macroeconomists of the era. While the underlying drivers of the Great Stagflation are still debated today (Meltner 2005), it is clear that policy decisions played an integral role. In short, stagflationary episodes require a different set of policies than those suggested by the Phillips Curve.

Since the pandemic-induced recession of 2020, signs of stagflation have emerged. Consumer prices gathered momentum over 2021, with the CPI averaging 6.7% year-over-year in Q4-2021, up from an average of 1.9% year-over-year in Q1-2021. Meanwhile, real GDP growth remained above trend throughout 2021, and the labor market posted heady payroll gains (averaging a monthly addition of 655,000 jobs in the final quarter of 2021) while unemployment fell. When the calendar turned to 2022, real GDP growth downshifted significantly to -1.6% in Q1-2022 and -0.6% in Q2-2022. At the same time, the CPI continued to tear higher in 2022, averaging 8.0% and 8.6% in Q1 and Q2, respectively, on a year-ago basis.

The drivers of inflation have shifted as the aftershocks from the pandemic have unwound. Immediately following the early lockdown days in 2020, businesses faced higher material and labor costs amid gummed up supply chains and limited labor availability. These cost dynamics pushed selling prices higher over the course of 2021. In 2022, pent-up consumer demand continued to pressure prices higher even as supply chain and labor dynamics improved, thereby shifting inflation toward the demand-pull variety.

In response to the dramatic breakout in inflation, the FOMC started hiking the federal funds rate at its March 2022 meeting, raising the target range by 25 bps. Since then, the FOMC has taken the upper bound of its target range to 5.25% in just ten meetings—the fastest pace of rate increases since the early 1980s. For context, the fed funds rate peaked at 2.50% following the Great Recession and 5.25% in the expansion that followed the 2001 recession. The FOMC's recent policy path is indeed reminiscent of the Volker era, when the Federal Reserve was enacting restrictive monetary policy with the primary objective of restoring price stability.

## **2.2 Lessons from recent business cycles**

Since the Volcker era, there have been three business cycles, preceding the COVID pandemic, from which we can draw some lessons. From 1990 through 2019, the annual percent change in the CPI and the

annualized growth rate in real GDP each averaged roughly 2.5%. As inflation was largely stable over that time, monetary policymakers were quick to cut the target range for the federal funds rate when weakness in the jobs market arose. Once through the recession, the FOMC generally kept policy accommodative through the early phases of the recovery as well.

For example, during the early 1990s, the unemployment rate increased 2.6 percentage points from 1990 through 1992. In response, the FOMC cut the upper bound target of the fed funds rate 525 bps to 2.00%, which had been the lowest target on record at the time. The Committee did not raise its target range until 1994, when the unemployment rate had already fallen more than a full percentage point from its peak in 1992. Throughout the easing cycle, the year-over-year change in the CPI trended down to around 2.7%, off a peak of 6.2% in 1990.

Similarly, during the dotcom recession, the unemployment rate rose 2.4 percentage points from late 2000 to 2003. In reaction, the Committee cut the target range by 550 bps from 2001 to 2003 and held it at an upper bound target of 1.00% until June 2004. Price growth over this period averaged 2.5% on an annual basis.

During the Great Recession, the unemployment rate spiked nearly 6 percentage points from 2007 to 2009. The FOMC responded by cutting its benchmark rate to effectively zero and conducting large-scale asset purchases to soothe the dysfunctional financial market. The Committee kept its accommodative stance until late 2015, when real GDP growth gained firmer footing and the unemployment rate had fallen five percentage points from its 10% peak in late 2009. Inflation was quite benign during this cycle, averaging just 1.8% from 2007 to 2015.

The past three business cycles show that accommodative policy has the intended effect of supporting the labor market when inflation is stable. The experiences of the 1970s and 1980s stand in contrast to these cycles, as expansionary policy exacerbated price growth and harmed the overall economy. In short, low and stable inflation seems to be a necessary condition for accommodative policy to work as intended.



### **2.3 Are we going to see the 1970s practice again?**

Views on the economic outlook are mixed, but many forecasters look for a slowdown in economic growth and inflation in the coming year. According to Blue Chip, the consensus forecast for real GDP growth in 2023 is 1.2% and 0.7% in 2024. At the same time, the CPI is expected to average 4.0% annual growth in 2023 and 2.6% in 2024. Due to the expected slowdown in economic output, Blue Chip forecasters report a 57% probability of a recession this year, compared to a 65% estimate from the Bloomberg consensus.

With recession more likely than not within the next year, many forecasters project the FOMC to cut its target range in 2023 and into 2024. The Blue Chip consensus looks for the effective fed funds rate to top out at 5.1% in Q3-2023 and then fall to 3.9% by Q3-2024. Meanwhile, the Bloomberg average looks for the upper bound target of the fed funds rate to hold at 5.25% through 2023, before falling to 4.75% in Q1-2024 and subsiding to 3.50% by the end of 2024.

The principles of the Phillips Curve likely inform these forecasts (i.e., a rising unemployment rate leads to lower inflation) as do the lessons from the past three recessions—accommodative monetary policy during slowdowns stimulates aggregate demand. However, some analysts worry there is a chance that the FOMC could repeat the policy error of the mid-1970s. That is, the momentum in price growth might be too strong at present, making a shift to an accommodative policy stance potentially detrimental for the economy in the medium to longer term.

At such a pivotal time in monetary policy, we developed a practical approach to characterize historical instances of stagflation into mild, moderate and severe episodes. This framework allows policymakers to review examples of stagflation and determine whether policy decisions were effective at combatting stagflation. Akin to recessions, the depth and duration of a stagflationary episode dictates the appropriate policy action. By categorizing stagflation on a severity scale, the suite of monetary policy actions necessary to combat each case is easier to discern.

### **3.0 Laying the groundwork: Quantifying stagflationary episodes**

To the best of our knowledge, we are the first to quantify stagflation into mild, moderate and severe episodes. Following Samuelson’s theoretical definition of stagflation, our definition of a stagflation episode is a period of at least two consecutive quarters with elevated inflation and low output growth. We use two consecutive quarters as a minimum threshold to follow the “technical recession” rule (i.e., two consecutive quarters of negative real GDP growth) and avoid noisy data from a single quarter.

We use the CPI and PCE deflator as measures of inflation and real GDP as a proxy for output growth. Specifically, we use the year-over-year percent change (YoY) of the CPI and PCE deflator, and the compound annual growth rate (CAGR) of real GDP. We employ the CAGR for real GDP because it is a widely utilized gauge of the current run-rate of the economy. For example, when the National Bureau of Economic Research determines U.S. business cycle dates, it uses the CAGR transformation of real GDP, in addition to other variables, to determine a given recession’s peak and trough.

We readily acknowledge that the FOMC’s current preferred measure of inflation is the PCE deflator. However, the FOMC formerly used the CPI as its primary inflation gauge and forecasted the CPI in the Greenbook until 2000. (The Greenbook forecasts switched to the PCE deflator in 2001.) Still today, the FOMC pays close attention to the CPI, as it is timelier than the PCE deflator. Indeed, Chair Powell mentioned the higher-than-expected CPI print for June 2022 was one of the reasons the FOMC opted for a “surprise” 75 bps hike at the July 2022 FOMC meeting. In short, we use the CPI as our primary inflation measure and employ the PCE deflator as a robustness check in our analysis.

*Table 1*

### Inflation and Output Growth

<b>Expansion Dates</b>	<b>CPI*</b>		<b>Real GDP**</b>	
	<i>Mean</i>	<i>S.D.</i>	<i>Mean</i>	<i>S.D.</i>
Q1-1950:Q2-1953	3.34	3.4	7.75	5.4
Q3-1954:Q2-1957	0.94	1.6	4.09	4.0
Q3-1958:Q1-1960	1.40	0.6	6.75	4.2
Q2-1961:Q3-1969	2.36	1.4	5.14	2.9
Q1-1971:Q3-1973	4.24	1.2	5.28	4.2
Q2-1975:Q4-1979	7.90	2.2	4.50	4.0
Q4-1980:Q2-1981	11.22	1.4	4.50	4.0
Q1-1983:Q2-1990	3.73	1.0	4.42	2.2
Q2-1991:Q4-2000	2.74	0.7	3.75	1.8
Q1-2002:Q3-2007	2.61	0.8	2.93	1.6
Q3-2009:Q3-2019	1.68	1.0	2.31	1.5

\*Year-over-Year Percent Change

\*\*Compound Annual Growth Rate

We outline average real GDP and CPI growth for each business cycle since 1950 in Table 1. The largest average real GDP growth of 7.75% followed the 1953-1954 recession, while the smallest growth of 2.31% reflects the post-Great Recession era. If we used 7.75% as a benchmark for real GDP throughout our entire sample, then most of the GDP series would be below average. By the same token, using 2.3% as the

benchmark for output growth would render most periods as above average. Consequently, we employ the prior cycle’s average of real GDP growth as a benchmark to determine periods of “low” output growth. The logic behind using the prior cycle’s average as a benchmark for the current cycle is that analysts typically compare the current pace of recovery or expansion with the prior cycle’s experience, as economic data from that period are readily available for comparison. Put differently, the current period’s pace of growth is usually determined based on the past cycle’s performance.

To quantify “low” output growth, we first consider the average growth rate of real GDP over the expansionary phases of the past 11 U.S. business cycles (Table 1). If real GDP growth comes in below the prior cycle’s average for at least two consecutive quarters, we assign that period with low output growth. For example, real GDP growth averaged 2.9% between Q1-2002 and Q3-2007. In the expansionary phase following the Great Recession in 2007-2009, the U.S. economy expanded at rates below 2.9% from Q4-2010 through Q3-2011, so we designate this period with low output growth.

On the inflation side, our benchmarks are more fluid. The evolving nature of the U.S. economy has made one period’s high inflation feel too high of a bar to clear for other time periods. For example, the CPI averaged 7% throughout the 1970s, compared to its 1990s average of 3%. Several structural changes took place between these two decades, such as a transition away from price indexation in wage contracts and less reliance on petroleum imports. Thus, we employ a time-varying benchmark for inflation. To start, we first calculate the average annual growth rate of CPI over the expansionary phases of the past 11 business cycles, as well as the standard deviations of those periods (Table 1). We then use these inputs to build four different criteria to determine “elevated” inflation over the past 70 years (Table 2).

Table 2

**"Elevated" Inflation Criteria**

<b>Time Period</b>	<b>Benchmark Comparison</b>	<b>Standard Deviation (S.D.)</b>
Q3-1954:Q1-1975	Prior Cycle's CPI Average	Prior Cycle's CPI S.D.
Q2-1975:Q1-1991	1960's CPI Average	1960s CPI S.D.
Q2-1991:Q2-2009	FOMC's 2% Target	1990's CPI S.D.
Q3-2009:Present	FOMC's 2% Target	Prior Cycle's CPI S.D.

We find that the 2% target is a reasonable benchmark for the 1990s onwards, as inflation trended around that rate and policy decisions were guided by that target. Indeed, the FOMC started to explicitly publish its 2% inflation target in post-meeting statements in the early 1990s. Prior to 1990, the inflation picture

was mixed. As suggested in Table 1, inflation was elevated and volatile during the 1970s and 1980s. To parse through the variation, we use the CPI's average growth over the expansionary phase of the 1960s (2.36%) as the watermark for "normal inflation" from 1975 to 1991. Prior to 1975, we return to using the prior cycle's average CPI growth as the benchmark.

### **3.1 Characterizing episodes of stagflation into mild, moderate or severe categories**

We utilize the magnitude and duration of high inflation alongside low output growth to characterize stagflation into different categories. If a period is determined to have low output growth relative to the prior cycle, we then evaluate the inflationary pulse of that period to determine if stagflation occurred. Should inflation be elevated relative to the criteria outlined in Table 2, we then categorize the episode of stagflation as mild, moderate or severe.

Given real GDP growth is below the prior cycle's average for at least two straight quarters, we define a "mild" episode of stagflation as two consecutive quarters where the CPI is above the inflation benchmark by one standard deviation. A "moderate" episode is three or four consecutive quarters where the CPI is above the benchmark by one to three standard deviations. Finally, a "severe" episode is at least six consecutive quarters where the CPI is above the inflation benchmark by three standard deviations or more.

Since 1947, we have identified 13 instances of stagflation and outline them in Table 3. Specifically, we determined that five episodes are mild, four are moderate and four are severe. The shortest episode duration was two quarters, which occurred in 1977-1978 and again in 1995, and the longest duration (16 quarters) occurred from 1979 to 1982. In addition, four stagflation episodes did not overlap with recessions, while nine episodes occurred during or near a recession.

Table 3

Stagflation Episodes

Episode Dates	Characterization	Duration (in quarters)
Q1-1957:Q2-1958*	Moderate	6
Q2-1969:Q4-1970*	Severe	7
Q2-1971:Q4-1971*	Mild	3
Q3-1973:Q2-1975*	Severe	8
Q2-1976:Q4-1976**	Mild	3
Q4-1977:Q1-1978**	Mild	2
Q1-1979:Q4-1982*	Severe	16
Q4-1989:Q1-1991*	Moderate	6
Q1-1995:Q2-1995**	Mild	2
Q3-2000:Q3-2001*	Moderate	5
Q2-2006:Q4-2006**	Mild	3
Q1-2008:Q3-2008*	Moderate	3
Q2-2021:Present	Severe	?

\*Episode with recession

\*\*Episode without recession

a) Mild = 2 consecutive quarters where the CPI is above average by 1 S.D. of the mean, and GDP growth is below the prior cycle's average.

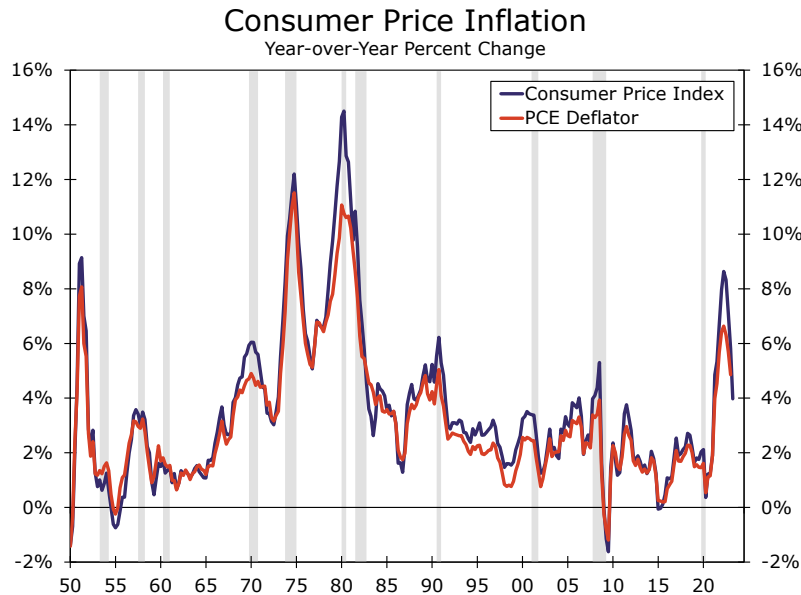
b) Moderate = 3 or 4 consecutive quarters where the CPI is above average within 1 to 3 S.D., and GDP growth is below the prior cycle's average.

c) Severe = At least 6 consecutive quarters where the CPI is above average by 3 S.D. or more, and GDP growth is below the prior cycle's average.

**4.0 Robustness check: The PCE deflator**

While the CPI is a timely indicator for inflation, the PCE deflator is a more comprehensive and accurate measure, which is why the FOMC prefers it (Chart 1). The three key differences between the CPI and the PCE deflator are variations in formula, category weights and scope. The PCE deflator controls for substitution effects, whereas the CPI does not. In addition, the CPI weights are determined by the Consumer Expenditure Survey, while the PCE deflator weights are derived from various business surveys. Lastly, the CPI measures price changes in out-of-pocket expenses, while the PCE deflator measures price changes in all goods and services consumed by households.

Chart 1



To account for the different price level gauges, we repeated the same analysis outlined in Sections 3 and 4 with the PCE deflator (on a year-over-year percent change basis) and arrived at a similar result. That is, a majority of the stagflationary episodes as determined by the CPI still hold true with the PCE deflator. The only exceptions are the mild episode in 1995 and the moderate episode in 2000-01.

In 1995, PCE inflation averaged just 2.1%, which is well within the target range of the FOMC. So, while real GDP growth slipped below its prior cycle's growth trend, inflation proved to be stable at 2% during the middle of the 1990s—ruling out stagflation. Furthermore, PCE inflation averaged 2.4% from Q3-2000 to Q3-2001, with a peak rate of just 2.6% year-over-year. The muted price growth amid sluggish real GDP growth suggests stagflation likely did not occur during the start of the millennium.

Beyond these two episodes, our analysis remains largely the same when using the PCE deflator. Since 1947, the U.S. economy has seen three mild instances of stagflation, three moderate and four severe. Stagflation remained the most severe in the late 1970s and early 1980s, and the present day has seen seven straight quarters of PCE inflation that is three standard deviations above the FOMC's 2% inflation target.

## **5.0 Not all stagflation episodes are created equal: Mild cases**

Returning to our primary CPI-based sample, the first mild episode occurred from Q2-1971 to Q4-1971. The U.S. economy had just emerged from a recession that ended in the final quarter of 1970. Real GDP growth was sluggish, unemployment was elevated, and inflation was persistent. Federal Reserve Chair Burns, keen on supporting the labor market (the unemployment rate sat at roughly 6%), moved forward with expansionary policy in late 1971 by cutting the target range of the fed funds rate by 200 bps. Around the same time, President Nixon ordered that the gold standard be abandoned and authorized a 90-day freeze on wages and prices to dampen inflation. The bold fiscal approach squashed inflation shortly after its implementation and output growth quickly picked back up in 1972. The reprieve was short-lived, however, as the following instance of stagflation in 1973-1975 saw the year-over-year change in the CPI rise to its highest since 1947.

The next two mild episodes occurred in 1976 and 1977-1978, both in the absence of a recession. As mentioned in Section 2.1, the oil price shock of 1973-1974 dramatically lifted oil prices, which passed through to higher wages via price indexation clauses in union workers' wage contracts. The CPI continued to rise well after the oil shock, pressured by higher input costs and expansion of the money supply. The consensus among economists during the 1970s was that the Fed's monetary policy tools were not effective at remedying exogenous shocks (Bryan 2013). Consequently, the FOMC primarily enacted accommodative policy during the 1970s to support the employment side of the economy, which saw the unemployment rate hovering between 6% and 8%. Expansionary policy amid elevated and volatile price growth led to choppy real GDP growth, and these two mild instances of stagflation occurred when real GDP growth dipped below its prior cycle's average of 5.3% for at least two straight quarters.

The final two mild episodes took place in 1995 and 2006. For the most part, inflation was modest during the 1990s and 2000s. In the mild episode that occurred in the first half of 1995, CPI inflation was above the 2% benchmark, and real GDP growth was roughly three percentage points below its prior cycle's average of 4.4%. An aggressive monetary policy tightening the year prior likely contributed to the slowdown in output growth—the FOMC had just wrapped up its 1994 tightening cycle, where it lifted the upper bound target by 300 bps in just 12 months. A similar situation played out in the back half of 2006, where real GDP growth slowed to a crawl for two straight quarters, and the CPI edged up to 3% to 4%. The FOMC had been gradually tightening policy at a 25-bps pace from 1.00% in mid-2004 to 5.25% by

mid-2006. In both instances, the CPI fell back close to or below the FOMC's 2% target within one quarter of the stagflation episode ending.

### **5.1 Moderate episodes and their stories**

In the first instance of moderate stagflation, CPI inflation picked up to above 3% in 1957 after averaging just 0.6% the prior two years. William McChesney Martin, the Fed chair at the time, responded with tight policy that led to a sharp recession that year. For context, the Fed primarily conducted monetary policy via quantitative controls on bank reserves during the 1950s. The credit crunch, as well as a marked decline in U.S. exports amid a global recession that coincided with the 1957 influenza pandemic, led to a sharp 4% contraction in real GDP from Q3-1957 to Q1-1958. The activity slowdown helped to significantly cool inflation, however, and the CPI returned to its prior cycle's average of 0.9% by Q1-1959.

The second moderate stagflation episode occurred from 1989 to 1991. Inflation was gaining momentum as the new decade rolled around, and the FOMC was incrementally increasing the fed funds rate from 1988 through early 1989. Yet, economic activity started to wobble in 1989, causing the FOMC to pivot to an accommodative stance by mid-1989. An energy spike during the Gulf War led to higher food and energy prices in late 1990, causing the CPI to peak at 6.22% in Q4-1990. The energy price shock amid accommodative monetary policy led to elevated inflation and real GDP growth that averaged roughly four percentage points below the prior cycle's average.

The final two episodes of moderate stagflation took place from Q3-2000 to Q3-2001 and Q1-2008 to Q3-2008. In the early 2000s, higher energy prices, largely due to tight natural gas supplies and elevated medical care costs, were strong underlying drivers of elevated inflation. The FOMC was on hold at an upper bound target of 6.50% through most of 2000 and decided to cut rates as the calendar turned to 2001 amid a rise in the unemployment rate and the collapse of several technology companies. Real GDP declined mildly over the episode but remained well below its prior cycle's average of 3.75%. In the final instance of moderate stagflation, skyrocketing gasoline prices in 2008 drove the pickup in the CPI. The FOMC started to cut rates in the second half of 2008 in response to a rising unemployment rate. Real GDP growth was choppy during this episode as the shocks of the financial crisis developed gradually. In short, the recessions during these two moderate episodes of stagflation, while vastly different in scope and protractedness, dampened inflation quickly. In fact, the CPI fell below 2% year-over-year before each recession ended.



## 5.2 The saga of severe episodes

In our sample, the first severe episode of stagflation took place from 1969 through 1970, coinciding with a recession. During the 1960s, President Johnson's Great Society programs led to significant amounts of fiscal stimulus being injected in the economy while the federal government was also ramping up military spending amid the Vietnam War. The unemployment rate was below 4% at the time, signaling that the labor market was tight. Over this time, the Federal Reserve followed an "even-keel" policy where it would hold interest rates steady between the announcement of a Treasury issuance and the eventual bond sale. As government spending ramped up, Treasury issuances occurred frequently and limited the Fed's ability to conduct monetary policy. Ultimately, the expansionary fiscal policy, combined with an economy near full employment, was the primary culprit of this episode's high inflation. The CPI was more than three standard deviations above the prior cycle's average of 1.4% for seven consecutive quarters, while real GDP growth trended well below the prior cycle's average of 6.7%.

The next two episodes of stagflation occurred in 1973 to 1975 (7 quarters) and 1979 to 1982 (16 quarters). As mentioned previously, two major oil price surges sent shockwaves through the economy, leading to elevated inflation of the cost-push variety. The consensus among economists during the 1970s was that the Fed's monetary policy tools were not effective at remedying exogenous inflationary shocks. Consequently, the FOMC primarily enacted accommodative policy during the 1970s to support the employment side of the economy, which was struggling underneath the weight of sluggish output growth amid elevated input costs (Nelson 2022).

With the Fed on an accommodative stance, the federal government instituted policies to halt price growth. As mentioned in Section 4.0, President Nixon enacted price and wage controls in 1971 to slow inflation. The Ford Administration introduced the Whip Inflation Now (WIN) program in 1974, which encouraged consumers to voluntarily cut back on spending. Both programs were largely unsuccessful at stopping inflation's underlying strength, especially as the Fed was enacting expansionary monetary policy at the same time. Momentum in prices pushed the CPI higher through the back half of the 1970s, and the year-over-year rate peaked at around 14.5% in 1980. The 1973-1975 and 1979-1982 stagflation episodes are broken up into two separate instances because inflation slowed in the middle of the decade closer to 5% to 6% while real GDP growth treaded water at around a 2% average.

### **5.3 Where is stagflation headed from here?**

The final instance of severe stagflation in our sample is the present day. As discussed earlier, the CPI skyrocketed coming out of the pandemic, as ample fiscal stimulus supported household spending while supply chains were out of sync. Researchers at the Federal Reserve Bank of San Francisco found that the direct transfers to households could explain about three percentage points of inflation's rapid rise during 2021 in the United States (Jordà et al. 2022). The FOMC likely underestimated the extent of this inflationary pulse, as suggested by its commentary throughout 2021 that characterized inflation as "transitory".

Russia's initial invasion of Ukraine in late February 2022 alongside the subsequent trade embargoes further complicated the inflation picture, as global crude oil and natural gas prices surged in the summer of 2022 (Dario et al. 2022). More recently, still-strong consumer demand has helped to keep price growth firm, even as the supply picture has materially improved. Over the past eight quarters, the CPI has come in more than three standard deviations above the 2% benchmark for seven straight quarters, while real GDP growth dipped below its prior cycle's average of 2.3% through the first half of 2022 and during the first quarter of 2023.

As mentioned in Section 2.1, the FOMC responded to elevated inflation by hiking its target range by 500 bps since March 2022. In the Federal Reserve's semiannual monetary policy report to Congress in June 2023, Chair Powell pointed to the strong labor market and said the FOMC has "overachieved" on its maximum employment mandate while it has underachieved at maintaining low and stable inflation (Powell 2023). When asked about balancing the Fed's dual mandate, Chair Powell underscored that heightened policy focus on inflation is now needed to achieve a sustained period of strong labor market conditions in the longer run.

Looking ahead, economic forecasters look for real GDP growth to slow this year and next. At the same time, the CPI is expected to continue downshifting, ending this year around 3% and ending 2024 around 2.5%. Forecasts for the PCE deflator follow the same pattern, with the Bloomberg composite calling for the index to settle at 2.3% year-over-year by the end of 2024.

## **6.0 Conclusion: Historical lessons guide future decisions**

As stagflation has come back into the fore, a historical review of stagflationary episodes is imperative to avoid repeating policy mistakes. Inflation was largely in check over the past 20 years and many thought stagflation was behind us. Yet, as shown over the past few years, decisionmakers did not understand the nature of inflation and underestimated the lasting economic effects of the pandemic's shock. By developing a quantitative framework that categorizes instances of stagflation in mild, moderate or severe categories, economic agents are better equipped to establish appropriate monetary policy settings.

For instance, the FOMC started hiking interest rates in March 2022 in its current tightening cycle, which aligned with the first quarter that CPI inflation was greater than three standard deviations above the Committee's 2% goal and when real GDP fell below its prior cycle's average growth. The policy pivot amid the stagflationary warning came much quicker relative to the 1970s, when the FOMC kept policy accommodative even with elevated CPI inflation and below-trend real GDP growth. The swiftness and magnitude of the FOMC's current response suggests that the current stagflationary episode is likely to end within the next year or so.

To put that assumption to the test, we use input forecasts into our stagflation framework. As mentioned previously, economic forecasters essentially look for the cooldown in economic output in the coming quarters to help dampen inflationary pressures. If we plug in Bloomberg's quarterly consensus projections for real GDP (CAGR) and CPI (year-over-year) into our framework, then the current instance of severe stagflation would end by the first quarter of 2024. Since the prior cycle's (2009-2019) standard deviation in the CPI was 0.98 percentage points and the inflation benchmark is 2%, our framework dictates that low inflation in the current cycle is achieved when the CPI falls below 2.98% year-over-year. The Bloomberg consensus looks for the CPI to fall to 2.8% by Q1-2024 and incrementally fall from there throughout 2024. At the same time, the Bloomberg consensus looks for real GDP growth to average 1.3% in 2023 and 0.7% in 2024. While real GDP growth is expected to remain below its prior cycle's trend of 2.3% growth, the marked improvement in inflation, should that occur, would pull the U.S. economy out of stagflation. Should this scenario come to fruition, the current stagflationary episode would be the second-longest episode since 1947.

The conclusion of the above paragraph brings us to our first caution to decisionmakers. The presence of stagflation complicates the near-term economic outlook, especially in the event of a recession, which most forecasters believe to occur in the next 12 months. Some deep recessions, such as the Great Recession,

were attached to weaker recoveries due to anemic job growth. Layering on an instance of stagflation would likely cause a recession to be more protracted and would increase the potential for economic scarring, in our view.

The second caution: do not forget the lesson of the 1970s and early 1980s. Namely, U.S. policymakers should not assume there is a fully functioning Phillips Curve. A pullback in demand does not necessarily quell inflationary pressures, especially when coinciding with expansionary monetary or fiscal policy. Given the experiences of the past four recessions, we understand that an expansionary monetary policy stance is a natural choice to stimulate the economy amid economic contraction. That said, those four recessions largely occurred in the absence of persistent inflation. Thus, the current severe instance of stagflation suggests a different path for monetary policy.

In short, our framework characterizes stagflation into mild, moderate and severe instances to help inform policymakers on the appropriate path of monetary policy. By reviewing historical instances of stagflation within the lens of this framework, policymakers can easily draw connections between the current economic environment and past episodes to better discern the appropriate path of policy. The framework is forward-looking, in the sense that decisionmakers can plug in their forecasts for real GDP and CPI or the PCE deflator to get a sense of the potential for stagflation in the coming quarters.

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