

# **The Fed: Bad Forecasts and Misguided Monetary Policy**

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## **The Fed: Bad Forecasts and Misguided Monetary Policy**

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The Fed failed to forecast the sharp rise in inflation in 2021-2022 and it significantly underestimated the Federal funds rate necessary to achieve its inflation forecasts. These forecasting mistakes contributed to the biggest monetary policy error and the highest inflation since the 1970s. The Fed's misleading forward guidance on the future course of monetary policy and subsequent aggressive rate increases contributed to the sizable asset-liability mismatch of commercial banks, a key source of the recent banking crisis. The Fed's forecasting errors provide important lessons and suggest corrective action.

This paper details the Fed's projections of inflation and interest rates in its quarterly Summary of Economic Projections (SEPs) and assesses the potential sources of the errors. It then considers the consequences of the Fed's mistakes and concludes with recommendations for improving the Fed's quarterly projections and conduct of monetary policy.

### **The Fed's Summary of Economic Projections (SEPs)**

The Fed began publishing its quarterly Summary of Economic Projections (SEPs) during the Great Financial Crisis in 2009 to improve transparency of the Fed's views of the economy and inflation. In 2012, it introduced its dot plots, the Federal Open Market Committee (FOMC) participants' estimates of the appropriate monetary policy interest rate, along with longer-run estimates of the unemployment rate, real GDP growth and Federal funds rate based on its 2% inflation objective. Prior to 2009, from 1980 to 2008, the Fed provided semi-annual projections for inflation, real GDP and the unemployment rate as mandated by the Full Employment and Balance Growth Act of 1978. Those projections presumed that the Fed followed the appropriate monetary policy but did not include estimates of its policy rate.

Before analyzing the Fed's quarterly inflation projections, it is important to understand how they are developed, their conditionality and their limitations. Each FOMC member projects real GDP (measured from fourth quarter to fourth quarter), the unemployment rate (average for the fourth quarter) and inflation (PCE Price Index, headline and core excluding food and energy, fourth quarter to fourth quarter) conditional on his or her estimate of the "appropriate monetary policy" that would achieve their economic and inflation projections. These conditional aspects of the SEPs are frequently overlooked by the media and financial market participants. The quarterly SEPs show the median

projection of the FOMC participants, the range and the central tendency that eliminates the three outside projections. Compiling the inflation projections of the individual FOMC members who may have different economic forecasts and varying assumptions of appropriate monetary policy involves an aggregation problem. There are similar aggregation problems with the median FOMC estimates of the Fed funds rate.

While these SEP economic and inflation projections are conditional on the FOMC participants' estimates of the Fed funds rate, those rate projections are not binding policy commitments (Bernanke 2016). Nevertheless, the interest rate estimates are widely perceived to be forward guidance on future monetary policy, and the Fed knows the median estimate and the "dots" of all participants are closely scrutinized. This may influence the Fed's projections, particularly as it seeks to steer market expectations and tries to avoid jarring changes in policy or forward guidance. Historically the Fed has projected inflation to glide toward its 2% target, which makes sense since the appropriate monetary policy is supposed to be the interest rate consistent with the Fed achieving its inflation mandate. As inflation rose in 2021, the Fed may have been reticent to project that high inflation would persist because it did not want the public to believe that it may have sent the wrong signal. Nevertheless, one can argue that there was a lapse in the FOMC members' attention to the conditionality of its SEP projections.

Individual FOMC participant projections and interest rate estimates may be influenced by different views of the economy and other factors as well as institutional factors. Historically, projections of the seven Fed governors have not strayed too far from the senior Fed Board staff forecasts, which heavily influences the median projections of the 19 FOMC members. Federal Reserve Bank presidents who historically have expressed more divergent views may also have felt constrained in their projections. In 2021-2022, potential outliers may have shied away from projecting much higher inflation and dots, fearing that it may have reduced their influence and credibility within the FOMC. Consider if FOMC member had estimated in June 2021 that inflation would rise to 5% or that it would be appropriate to raise the Fed funds rate to 5%.

### **The Fed's Inflation projections**

Table 1 displays the Fed's SEP projections for PCE inflation (headline and core excluding food and energy) beginning in September 2020. As reference, Columns 1 and 2 show the year-over-year inflation

that was available at the time when the Fed published its SEP. In each September SEP, the Fed rolls forward its projections another year; Table 1 does not include the Fed's projections for 2025.

The key observation is that as inflation accelerated in 2021, the Fed adjusted up its inflation projection for 2021 to arithmetically reflect its rise to date and projected that inflation would quickly fall back toward the Fed's 2% target in 2022 (Columns 5 and 6) and remain anchored (Columns 7-10).

**Table 1. FOMC's Summary of Economic Projections (SEPs) of Inflation**

	<i>Col 1 &amp; 2</i>		<i>Col 3 &amp; 4</i>		<i>Col 5 &amp; 6</i>		<i>Col 7 &amp; 8</i>		<i>Col 9 &amp; 10</i>	
<i>SEP Projection</i>	<u><i>Actual Inflation</i></u>		<u><i>2021</i></u>		<u><i>2022</i></u>		<u><i>2023</i></u>		<u><i>2024</i></u>	
<i>Made in:</i>	<i>PCE</i>	<i>Core PCE</i>	<i>PCE</i>	<i>Core PCE</i>	<i>PCE</i>	<i>Core PCE</i>	<i>PCE</i>	<i>Core PCE</i>	<i>PCE</i>	<i>Core PCE</i>
<i>September 2020</i>	0.9	1.1	1.7	1.7	1.8	1.9	2.0	2.0	-	-
<i>December 2020</i>	1.1	1.3	1.8	1.8	1.9	1.9	2.0	2.0	-	-
<i>March 2021</i>	1.5	1.6	2.4	2.1	2.0	2.0	2.1	2.1	-	-
<i>June 2021</i>	3.6	3.1	3.4	3.0	2.1	2.1	2.2	2.1	-	-
<i>September 2021</i>	4.4	3.9	4.2	3.7	2.2	2.3	2.2	2.2	2.1	2.1
<i>December 2021</i>	5.2	4.3	5.3	4.4	2.6	2.7	2.3	2.3	2.1	2.1
<i>March 2022</i>	6.1	5.2	-	-	4.3	4.1	2.7	2.6	2.3	2.3
<i>June 2022</i>	6.4	5.0	-	-	5.2	4.3	2.6	2.7	2.2	2.3
<i>September 2022</i>	6.4	4.7	-	-	5.4	4.5	2.8	3.1	2.0	2.1
<i>December 2022</i>	6.0	5.0	-	-	5.6	4.8	3.1	3.5	2.5	2.5
<i>March 2023</i>	5.3	4.7	-	-	-	-	3.3	3.6	2.5	2.6

Sources: Board of Governors of Federal Reserve System, quarterly Summary of Economic Projections.

Note: \*PCE inflation (yr/yr) is the unrevised measure available at time of quarterly FOMC meeting.

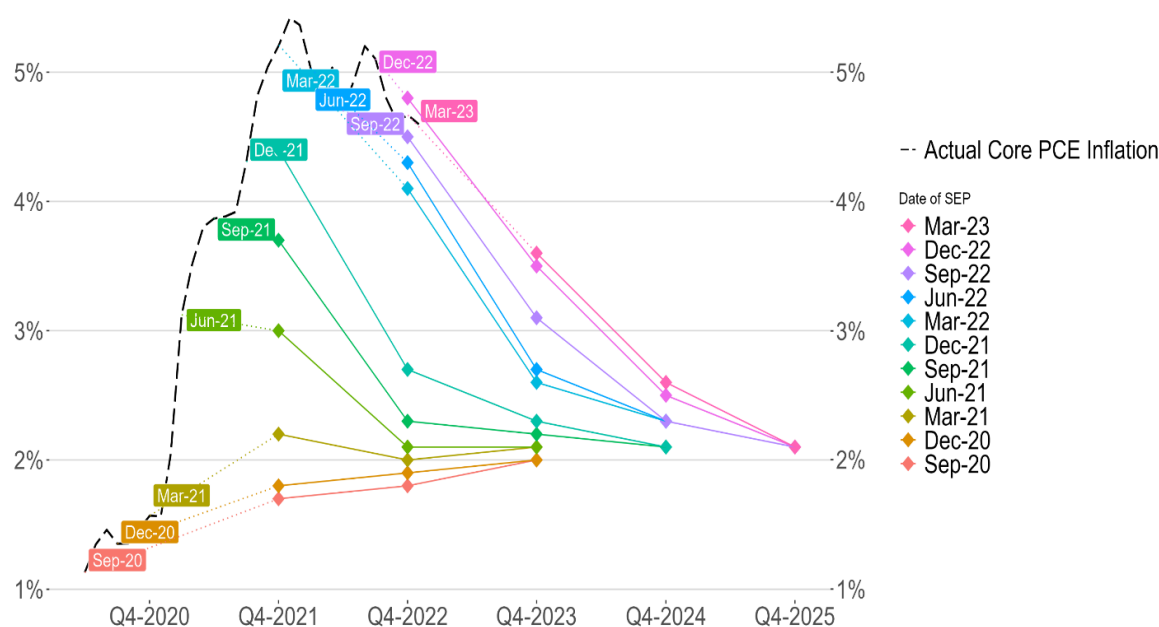
Through the June 2021 SEP, when inflation had already accelerated to 3.6% (3.1% on core inflation), the Fed projected core inflation to fall back to 2.1% in 2022 and 2023. In September 2021 the Fed acknowledged mild persistence of inflation, projecting core PCE inflation would be 2.3% in 2022 and 2.2% in 2023. In December 2021, facing an acceleration of inflation (to 5.0% and 4.1% on core), the Fed

raised its 2022 projection of core inflation to 2.7% in 2022 and 2.3% in 2023. As described below, it is striking that throughout 2021 the Fed projected the appropriate Fed funds rate to remain at zero, which involved an increasingly negative real policy rate.

The quarterly SEPs in 2022 beginning in March highlight how the Fed acknowledged that inflation would persist and that it was in catch-up mode. The Fed continued to project rapid declines in inflation by year-end 2022 (compare Columns 5-6 with Columns 1-2) while acknowledging that inflation would persist significantly above its 2% target in 2023 and 2024 (Columns 7-10), and it projected increasingly higher interest rates.

Chart 1 illustrates the sequencing of the Fed's SEP projections from September 2020 through March 2023, with each quarterly estimate (horizontal axis) shown from the level of inflation (vertical axis) at the time of the projection. It highlights the Fed's stubborn assessment that inflation would fall sharply as inflation rose higher and higher. Note that the projections are for Q4 year-over-year inflation and the lines connecting the observations are for visual purposes.

**Chart 1. The Fed's Projections of Core PCE Inflation**



Sources: Board of Governors of Federal Reserve System, Quarterly Summary of Economic Projections  
 Notes: Forecasts are for Q4/Q4 percentage change in core PCE inflation for years ending 2021, 2022, 2023, 2024, and 2025; lines between forecasts of annual inflation are for visual convenience and not part of Fed's forecasts; dotted line is from last inflation observation available to Fed at time of SEP; full data set available on request

The range of inflation projections for 2021 and 2022 of the FOMC participants was surprisingly narrow. As inflation rose in 2021, all FOMC members continued to project that inflation would fall sharply toward 2% in 2022, and the outliers were far too optimistic. In the September 2021 SEP, the highest FOMC participant projected inflation would be 3% in 2022 (2.8% for core inflation). Actual PCE inflation ended out 5.7% and 4.8% on core. As inflation pressures mounted into 2022, the range of FOMC participant projections widened, but the highest projection did not catch up to actual Q4/Q4 2022 inflation until the December 2022 SEP.

### **The FOMC's interest rate projections**

The Fed's projections of the Fed funds rate are the FOMC participants' year-end estimates of the policy rate they think is appropriate to achieve their projection of inflation and economic conditions (unemployment rate and real GDP). Each quarterly SEP also includes a chart showing the "dots" of each participant's year-end estimate and charts of the participants' perceived risks around the median projections of inflation, real GDP and the unemployment rate.

While the dot plots illustrate the array of interest rate estimates of the FOMC participants, each member's dot is not linked to his or her projections of the economy and inflation. While the median dot in each quarterly SEP involves an aggregation problem, the dots provide an assessment of the participants' estimates of the appropriate monetary policy and how the Fed expects it will have to adjust interest rates.

Table 2 shows the Fed's projections of Q4/Q4 inflation and the median and range of estimates of the year-end Fed funds rate for 2021-2024. Columns 1, 4 and 7 are the Fed's quarterly projections of inflation, while Columns 2, 5 and 8 show the median dot of the FOMC participants. Columns 3, 6 and 9 show the ranges of the participants' estimates. Columns 2 and 3 highlight how the Fed persistently estimated an appropriate Fed funds rate of zero throughout 2021 and 2022, even as inflation surged and the Fed's projections of inflation in 2022 and 2023 edged up. In the June 2021 SEP, when core inflation had risen to 3.1%, the Fed estimated the policy rate of zero through 2022 and 0.6% by year-end 2023. In December 2021, when inflation had risen to 5.0%, the Fed edged up its estimate of the appropriate policy rate to 0.9% at year-end 2022 and 1.6% in 2023. ***That is, the Fed estimated that maintaining the Fed funds rate well below the inflation it projected would reduce inflation sharply in 2022 and 2023.***

In its March 2022 SEPs, in response to mounting inflation pressures, the Fed dramatically raised its projections of inflation and interest rates. Although it raised its estimated policy rate to 1.9% for year-

end 2022, this was still well below the 4.4% inflation that it projected. However, it raised its policy rate estimate to 2.8% for year-end 2023, a touch above its 2023 inflation forecast of 2.7%. In subsequent SEPs the Fed dramatically raised its estimates of the Fed funds rate, signaling that it would be appropriate to maintain a positive real interest rate.

**Table 2. FOMC Participant Median Fed funds Rate Projections and Range of “Dots”**

	<i>Col 1</i>	<i>Col 2</i>	<i>Col 3</i>	<i>Col 4</i>	<i>Col 5</i>	<i>Col 6</i>	<i>Col 7</i>	<i>Col 8</i>	<i>Col 9</i>
	<u><b>2021</b></u>			<u><b>2022</b></u>			<u><b>2023</b></u>		
<i>SEP forecast Made in:</i>	<i>Fed Infl Project*</i>	<i>Median "Dot"***</i>	<i>FOMC Range**</i>	<i>Fed Infl Project</i>	<i>Median "Dot"***</i>	<i>FOMC Range**</i>	<i>Fed Infl Project</i>	<i>Median "Dot"***</i>	<i>FOMC Range**</i>
<i>Sept 2020</i>	1.7	0.1	0.1-0.1	1.8	0.1	0.1-0.6	2.0	0.1	0.1-1.4
<i>Dec 2020</i>	1.8	0.1	0.1-0.1	1.9	0.1	0.1-0.4	2.0	0.1	0.1-1.1
<i>March 2021</i>	2.4	0.1	0.1-0.1	2.0	0.1	0.1-0.6	2.1	0.1	0.1-1.1
<i>June 2021</i>	3.4	0.1	0.1-0.1	2.1	0.1	0.1-0.6	2.2	0.6	0.1-1.6
<i>Sept 2021</i>	4.2	0.1	0.1-0.1	2.2	0.3	0.1-0.6	2.2	1.0	0.1-1.6
<i>Dec 2021</i>	5.3	0.1	0.1-0.1	2.6	0.9	0.4-1.1	2.3	1.6	1.1-2.1
<i>Mar 2022</i>	-	-	-	4.3	1.9	1.4-3.1	2.7	2.8	2.1-3.6
<i>June 2022</i>	-	-	-	5.2	3.4	3.1-3.9	2.6	3.8	2.9-4.4
<i>Sept 2022</i>	-	-	-	5.4	4.4	3.9-4.6	2.8	4.6	3.9-4.9
<i>Dec 2022</i>	-	-	-	5.6	4.4	4.4	3.1	5.1	4.9-5.6
<i>Mar 2023</i>	-	-	-	-	-	-	3.3	5.1	4.9-5.9

Sources: Board of Governors of Federal Reserve System, quarterly Summary of Economic Forecasts.

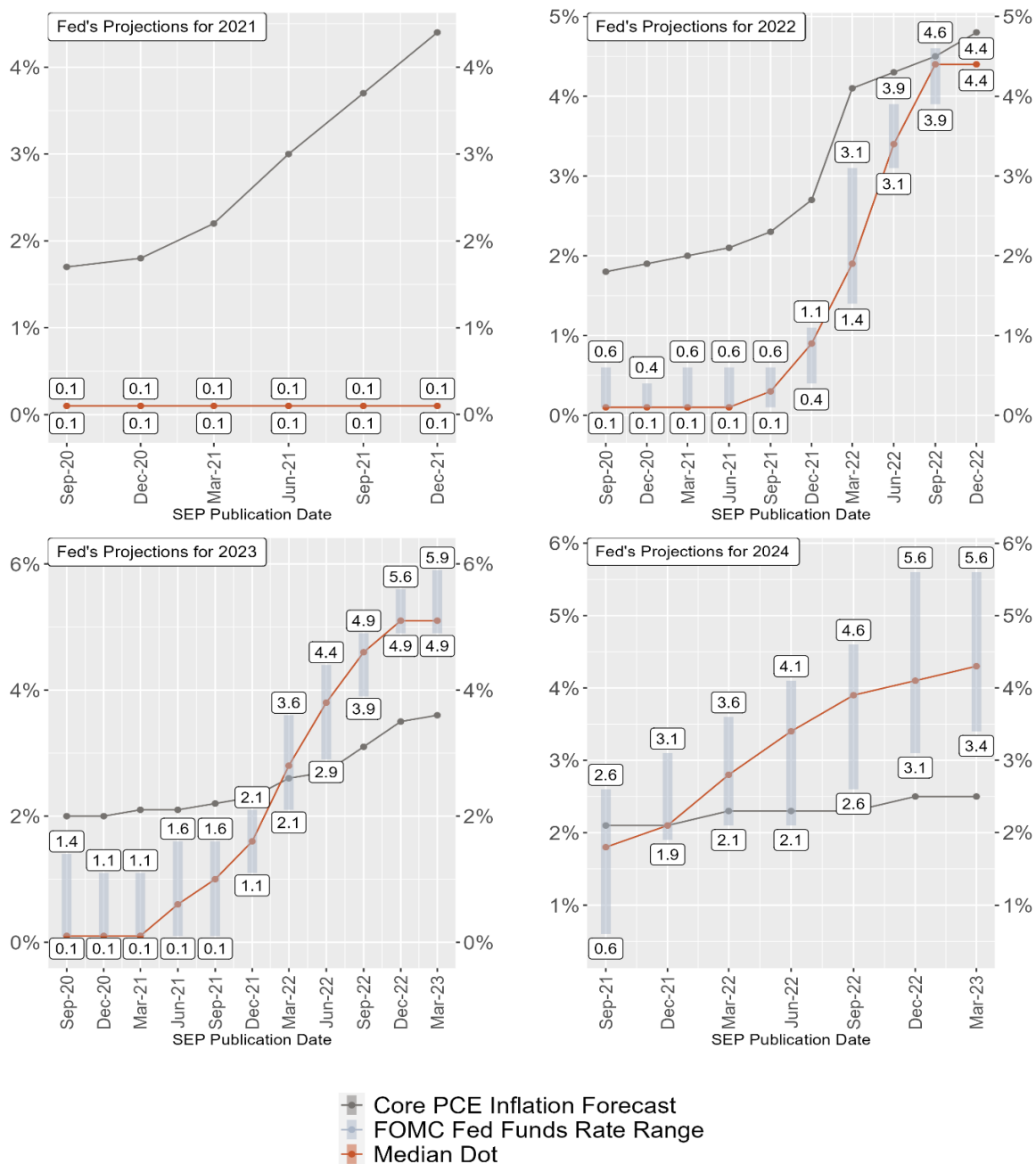
Notes: \*PCE inflation forecast is % chg Q4/Q4 for the year indicated.

\*\*The median Dot is the median FOMC member estimate of the Fed funds rate at year-end that would achieve the member's forecasts of the economy and inflation. The Range is the low and high estimate of all FOMC members.

Chart 2 illustrates the evolution of the FOMC's median projections of inflation and estimates of the Fed funds rate (median and range) for each year 2021-2024. Each quarterly SEP is shown in horizontal axis and the FOMC's projections of inflation and interest rate estimates are in the vertical axis. (Note that the Fed's projections are discrete quarterly observations and the lines connecting them are visual aids.)

This highlights the seeming inconsistencies between the Fed's estimates of the appropriate Fed funds rate and its projections of sharply declining inflation.

**Chart 2. Fed Projections of Core PCE Inflation and Estimated Dots, 2021-2014**



Sources: Board of Governors of Federal Reserve System, Quarterly Summary of Economic Projections, Bureau of Economic Analysis  
 Notes: Projections of inflation are Q4/Q4 percentage change for year indicated while Fed funds rate estimate is for year-end



## **Assessing the Fed's Projections**

The Fed was caught flat-footed by the rise in inflation. It presumed inflation would stay low as it did in the decade following the Great Financial Crisis, even though it never adequately explained why inflation had remained subdued. Based on the earlier sustained low inflation, the Fed over-estimated its inflation-fighting credibility and relied too much on its ability to manage inflationary expectations.

Mirroring its projections prior to the pandemic, throughout 2020 the Fed projected that inflation would rise gradually to 2% and stay there. In 2021, when inflation rose and inflationary expectations became unanchored from 2%, the Fed's focus was on the economic recovery and health-related concerns, and it brushed aside the rise in inflation and kept rates at zero and continued its purchases of Treasuries and mortgage-backed securities (MBS) even though the housing market was booming. Its projections in 2020 and 2021 were largely invariant to the massive fiscal and monetary policy responses to the pandemic or the rise in inflationary expectations.

During the period analyzed, the Fed's projections of the real economy were much more accurate than its projections of inflation. Although the rebound from the pandemic contraction was much faster than the Fed projected in its 2020 SEPs, beginning in March 2021, the Fed overestimated real GDP growth and appropriately revised down its projections as the pace of growth ebbed. The unemployment rate fell significantly faster than the Fed projected in 2020, but its unemployment rate projections beginning in March 2021 were reasonably close to conditions that unfolded. This makes the Fed's inflation projection errors more puzzling.

The Fed's delayed policy response to the rising inflation resulted in the Fed funds rate reaching its largest negative real value in modern history and one of the largest deviations from the Taylor Rule. The inconsistencies between the Fed's projections of inflation and its estimates of the appropriate interest rate suggests that the Fed mistakenly attributed all of the rise in inflation to a temporary negative supply shock, which proved incorrect. This led to confusing communications, misleading forward guidance and a loss of credibility.

The Fed's forecasting failures stemmed from a confluence of modeling and analytical errors, human and institutional errors, and a striking absence of risk management. Many of the Fed's errors are a blend of these categories of errors. Of note, the Fed did not heed important lessons from history.

**Modeling and analytical errors.** The Fed's large FRB-US macromodel failed to forecast the inflationary impacts of the unprecedented fiscal and monetary policy stimulus responses to the pandemic. The Fed's heavy reliance on managing inflationary expectations and forward guidance were flawed analytically and implemented poorly. The Fed's monetary policy focus was nominal rather than real interest rates. It continued to rely on a Phillips Curve framework, which also contributed to misguided forecasts. Its new strategic framework also contributed to misguided policies.

The FRB-US is basically a DSGE model of the economy with neo-Keynesian features, Phillips Curve influences, and influenced heavily by inflationary expectations. In the model, monetary policy affects aggregate demand through interest rates and financial conditions. Money supply indirectly affects financial conditions but is not explicit or central. The model presumes that inflationary expectations are anchored to the Fed's 2% longer-run inflation target, such that increases in inflation above 2% naturally tend to regress back to 2%. The magnitude and duration of fiscal stimulus impulses are muted by model specifications.

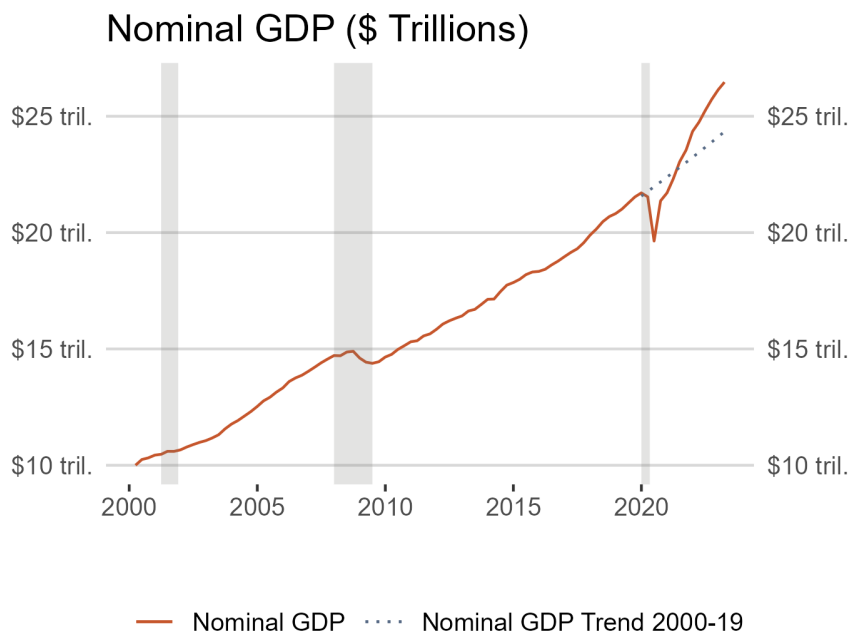
The failure of the FRB-US to forecast the inflationary impacts of the unprecedented fiscal stimulus and excessive monetary accommodation is striking. The fiscal responses to the pandemic—the CARES Act (\$2.3 trillion, enacted March 2020), the Coronavirus Response and Relief Supplemental Appropriations Act (\$900 billion, December 2020) and the American Rescue Act (\$1.9 trillion, March 2021)—totaled \$5.1 trillion in additional deficit spending, over 27% of real GDP. This was three times higher than the 9% decline in real GDP. In comparison, President Obama's fiscal response to the GFC, the American Recovery and Reinvestment Act (\$831 billion, January 2009), increased deficit spending by close to the same amount as the decline in real GDP.

Larry Summers highlighted this forecasting failure at last year's Hoover Monetary Policy Conference (Summers 2023). Summers simulated the FRB-US model and found that a \$2 trillion deficit spending shock raised inflation by 0.7 percentage points, far below what he argued a simple output-gap framework would have predicted. The FRB-US forecasts are also inconsistent with outcomes generated with standard estimates of the fiscal policy multipliers (Tulip 2014), particularly with the Fed's highly accommodative zero interest rates and asset purchases, including the purchase of approximately one-half of all new Treasury bonds issued. The Fed's modeling did not reflect the historical link between budget deficits accommodated by easy monetary policy and inflation (Bordo and Levy 2020).

The fiscal stimulus primarily involved the government's transfer payments that generated spikes in disposable personal income and financial cushions for businesses that boosted spending and retained labor. This supported spending but households saved a sizable portion, which generated a surge in personal savings that was estimated to be \$2.5 trillion, or 13.4% of disposable personal income above pre-pandemic levels. At the same time, M2 surged 40%.

By Q4 2020, nominal GDP had rebounded back to its pre-pandemic level while real GDP was modestly below. Fueled further by the \$1.9 trillion American Rescue Plan of March 2021, nominal GDP rose 12.2% in the next year through Q4 2021, well above its pre-pandemic path (Chart 3), and real GDP also handily exceeded its pre-pandemic level.

**Chart 3. Nominal GDP**



Source: Bureau of Economic Analysis, Haver Analytics, Berenberg Capital Markets

The fiscal stimulus and surge in aggregate demand seemed to receive inadequate attention at the Fed. The enactment of President Biden's \$1.9 trillion deficit spending legislation (10% of GDP) in March had little impact on the Fed's projections. In its June SEPs, the Fed revised up its inflation projections for 2021 (but not 2022), but this was primarily to reflect the inflation that had already occurred. Real GDP growth was revised up for Q4/Q4 2021, but that primarily reflected the unanticipated strong 6.3% annualized growth in Q1, while the unemployment rate projection was unchanged. The minutes of the

June 2021 FOMC meeting barely mentioned the fiscal stimulus (the word count of “fiscal” in the lengthy minutes was 3). In the Staff Economic Outlook section, the only mention of fiscal policy was that “the effects of the fiscal stimulus on economic growth were starting to unwind” and there was no mention of fiscal policy in the “Participants’ Views” section (Board of Governors of the Federal Reserve System 2021). The minutes did not include any mention of the surge in bank deposits, money supply or other indicators of the monetary policy transmission mechanism.

The Fed acknowledged the pickup in aggregate demand in its June 2021 semi-annual report to Congress, but emphasized supply bottlenecks as the source of inflation (Board of Governors of the Federal Reserve System 2021). Two observations are appropriate. Even if the FRB-US model was unable to capture the magnitudes of the negative pandemic shock and unprecedented fiscal and monetary stimulus, the historical link between episodes of high deficits accommodated with monetary ease and inflation should have provided ample warning.

Second, the Fed was too quick to attribute the rise in inflation to transitory supply shocks and presume that the bottlenecks in supply would reverse quicker than the positive shock to demand. The Fed’s first used the term “transitory” in referring to base effect of the year-over-year inflation in Spring 2021 measured from the monthly declines in the PCE price index in March-April 2020. The transitory argument quickly shifted to insufficient supply as product demand surged and anecdotal evidence of supply chain bottlenecks became apparent. The over-emphasis on supply shortages was a shift in interpretation from the post-GFC period when the Fed attributed the low inflation to insufficient aggregate demand and prescribed more monetary stimulus. This asymmetric view that downplayed monetary stimulus of demand delayed the Fed’s interest rate increases, following a long history of falling behind the curve (Bordo and Levy 2023).

The role of the Phillips Curve in the Fed’s projections and policy decisions seemed inconsistent. By June 2021, the unemployment rate had declined dramatically from its 14.7% peak in May 2020, but was 5.9%, well above the Fed’s 4.0% estimate of the longer-run natural rate of unemployment. This supported the Fed’s assessment that labor market slack was consistent with low inflation. (Summers and others argued that different labor market measures indicated that the NAIRU had increased significantly, suggesting tight labor markets.) However, at the same time the FOMC projected that the unemployment rate would fall to 3.8% in 2022 and 3.5% in 2023, and inflation would decline to 2.1%, and it was appropriate for the Fed to keep inflation below the inflation it was projecting (Table 3). The Staff Economic Outlook

section of the FOMC meeting minutes mentioned the pickup in demand but concluded by saying “a flat Phillips Curve would cause inflation to revert to relatively low levels despite strengthening economy”. The Fed continued to estimate its policy rate below the inflation it projected in its December 2021 SEPs, even though the unemployment rate had fallen to 4% and anecdotal evidence of tight labor markets had become widespread.

**Table 3. Summary of Economic Projections in June and December 2021**

	June 2021 SEP					December 2021 SEP				
	2021	2022	2023	Long Run		2021	2022	2023	2024	Long Run
Unemployment Rate	4.5	3.8	3.5	4.0	Unemployment Rate	4.3	3.5	3.5	3.5	4.0
PCE Inflation	3.4	2.1	2.2	2.0	PCE Inflation	5.3	2.6	2.3	2.1	2.0
Fed Funds Rate	0.1	0.1	0.6	2.5	Fed Funds Rate	0.1	0.9	1.6	2.1	2.5
Ex-Ante Real Funds Rate*	-3.3	-2.0	-1.6	0.5	Ex-Ante Real Funds Rate*	-5.2	-1.7	-0.7	0.0	2.0

Sources: Board of Governors of Federal Reserve System, Summary of Economic Projections

The Fed’s reliance on managing inflationary expectations was flawed and not adhered to with appropriate consistency. The importance of managing inflationary expectations was elevated in the post-GFC decade as the Fed acknowledged the Phillips Curve had flattened and that it had become a less reliable predictor of inflation. As former Fed Vice Chair Rich Clarida stated in his assessment of the Fed’s new strategic plan in August 2020, “With regard to inflation expectations, there is a broad agreement among academics and policymakers that achieving price stability on a sustained basis requires that inflationary expectations be well anchored at the rate of inflation consistent with the price stability goal. This is especially true in the world that prevails today, with flat Phillips Curves in which the primary determinant of actual inflation is expected inflation” (Clarida 2020).

The Fed’s presumption that it can manage inflationary expectations requires that it have a credible framework for predicting inflation and reducing it to its 2% target, and that it will take appropriate steps to reinforce its inflation-fighting credibility. Mervyn King and others have been critical of central bankers’ heavy reliance on managing inflationary expectations (King 2021). Financial markets will question the Fed’s expectations if they are not well-grounded and supported by appropriate monetary policy. That is what happened in 2021-2022. The Fed’s framework for keeping inflation and inflationary expectations anchored to zero was not well grounded or supported by policies, and both market and

survey-based expectations of inflation rose above 2%, defying the Fed's projections and public statements.

When inflation and inflationary expectations rose decidedly above 2% in 2021, the Fed did not take appropriate monetary policy action. Market-based expectations based on 10-year treasury TIPS remained reasonably anchored to 2% and gave the Fed confidence that it maintained inflation-fighting credibility, but shorter-duration break-evens and market-based surveys indicated much higher inflationary expectations. The Fed became concerned in the second half of 2021 when market-based expectations rose from 2.5% to 3% and survey-based inflationary expectations (University of Michigan Consumer Sentiment and Federal Reserve Bank of New York Survey of Consumer Expectations) shot above 5%, suggesting that expectations had become unanchored. Yet despite these signals that challenged the Fed's inflation-fighting credibility, the Fed delayed tapering its asset purchases and raising rates and continued to rely on forward guidance to manage expectations. Both market-based and survey-based measures of inflation rose further in early 2022.

Inflationary expectations receded in the second half of 2022 only when the Fed aggressively raised rates and supported them with public statements that it would raise rates further to achieve its 2% inflation target (Powell 2022). This highlighted the ineffectiveness of the Fed's efforts to manage inflationary expectations through forward guidance rather than actual adjustments in monetary policy. Policy actions speak louder than words, revealing a serious flaw in the Fed's analytical framework.

**Human and institutional errors.** Poor judgment, misguided assessments of data, and a failure to heed the lessons of history have contributed to the Fed's errors. The Fed's *presumption* that inflation would stay low drove its thinking and policies. Fed members and staffers had become influenced by the post-GFC decade when inflation stayed low even as the Fed maintained low rates and an enlarged balance sheet. These perceptions were incorporated into the Fed's modeling of inflation, were the basis for Fed staff research, and underpinned the Fed's new strategic plan.

Increases in inflation above 2% were treated as temporary anomalies that would unwind naturally or could readily be unwound. The notion that *inflation should have stayed low* likely contributed to the Fed's misinterpretation of the data in 2021. The Fed "leaned against the data" and allowed its interpretation of the rising inflation to be influenced by its forward guidance (Doh, Gruber and Song 2022). Even as aggregate demand accelerated sharply and detailed Bureau of Labor Statistics data showed that price increases had become pervasive across a broad array of goods and services, the Fed

stuck with its transitory supply shortage argument and suggested that the inflation was primarily due to sharp price increases of select goods (Levy 2021).

Once the Fed came around to acknowledge that high inflation would persist, its estimates that it could lower inflation through maintaining a negative real Fed funds rate seemed to rely on the transitory argument and were puzzling. The Fed funds futures began pricing in Fed rate increases well above the Fed's estimates, challenging the Fed's forecasts and they proved correct. There are concerns that this dented the Fed's credibility (Reis 2022).

As the Fed's forecasting errors persisted, it did not seem to seriously consider alternative outcomes. Finally, after being renominated to a second term as Fed Chair, Powell stated in testimony to the Senate Banking Committee on November 30, 2021 that "it is time to retire the term transitory," and acknowledged that inflation had been more persistent than earlier presumed, and suggested that the Fed should speed up the tapering of its asset purchases and move up its anticipated rate increases (Powell 2021). Other FOMC members quickly supported this notion, distanced themselves from the "transitory" rationale, suggesting that inflation would remain higher in 2022 than they had projected earlier and that rate increases would be forthcoming.

In keeping with tradition, the Fed has been reticent to admit mistakes, but Fed Governor Waller's refreshing candor in a recent interview with CNBC economics anchor Steve Liesman provides important insights (Council on Foreign Affairs 2023):

LIESMAN: Are you at all humbled in your certainty about the trajectory of inflation by what happened a year ago?

WALLER: Yeah...2022 really was—it was a humbling experience. When you sat in April or May of 2021 and you saw this inflation you said...it can't persist for very long...and inflation will come right back down. And that story held from April until September of 2021. Inflation was mostly coming down. It looked transitory. And then October, November, December of 2021, it just exploded. So once that happened, we had to quickly change pace and say, you know, this story, this belief, it's just not there. So, you know, it was a mistake.

LIESMAN: But what was the mistake? Was the mistake being too, you know, locked into your view? Or was the mistake that you were simply low in terms of your trajectory on inflation?

WALLER: *The mistake in my mind, that we made, was we bet the farm on the transitory story.* And any risk management model, you would have said, what if it doesn't go away? What should you be doing to get ready for that event, if it doesn't go away?

These comments highlight the Fed's poor judgment and risk management. Facing significant uncertainties and high inflation that rose further above its expectations, the Fed was remiss not to consider alternative scenarios, and how monetary policy would respond to outcomes that differed from its baseline projections. Earlier, in 2012, the Fed conducted an internal exercise that considered participant views on appropriate monetary policy responses under alternative economic scenarios. Some Fed members provided constructive follow up comments, but the Fed did not conduct further scenario analysis exercises (Federal Reserve Board 2012). That is unfortunate, as uncertainties have persisted and evolved. Formally incorporating scenario analysis into its quarterly forecasting exercises and policy deliberations would have improved the Fed's risk management, monetary policy responses and communications (Bordo, Levin and Levy 2020).

The lack of dispersion of forecasts among FOMC members suggests that the Fed's institutional nature and structure may have influenced and constrained the FOMC participant projections and contributed to the policy errors. The range of projections in the SEPs shows that no participant came anywhere close to anticipating the rise in inflation. The Fed's estimates of the appropriate interest rate were equally off the mark. Through December 2021, not one Fed member projected that a positive real Fed funds rate would be necessary to reduce inflation through 2023, and through the December 2022 SEP, no Fed member projected that a positive real Fed funds rate was appropriate for 2022. Such projected outcomes were inconsistent with historical experience: every time the Fed has raised rates to reduce inflation pressures in modern history, it raised its policy rate above inflation (Bordo and Levy 2023). No Fed member dissented from the FOMC's policy decisions to keep rates anchored to zero in 2021. Of the several dissents in 2022, one that argued to raise rates more slowly and one to raise rates more quickly.

The Fed's organizational and governance skews power toward the Chair and the Board of Governors, away from the Federal Reserve Bank Presidents. The economic and financial forecasts developed by the Board's large and well-trained economics staff carry substantial weight. This institutional centrifugal force leads the governors to align their forecasts to the staff forecasts. Historically, the Reserve Banks have been the sources of important ideas and research innovations and some Federal Reserve Bank Presidents have been outliers (Bordo and Prescott 2019). In recent years, outlier positions taken by Federal Reserve Bank presidents seem to have diminished. Why have Federal Reserve Bank presidents



been so *reserved*? To what extent do internal pressures discourage them from articulating alternative views and analytical frameworks?

A related issue is how the anecdotal evidence gathered by the Federal Reserve Banks affects the FOMC projections and policy deliberations. When inflation accelerated sharply in mid-2021, the Fed's Beige Book prepared for the July 2021 FOMC meeting reported: "Pricing pressures were broad-based...While some contacts felt that pricing pressures were transitory, the majority expected further increases in input costs and selling prices in the coming months." (Board of Governors of the Federal Reserve System 2021). As noted earlier, in contrast to this assessment of stronger demand and broadening inflation pressures, the Fed chose to emphasize supply chain bottlenecks (Board of Governors of the Federal Reserve 2021). Did Reserve Bank Presidents express views that were different from the Board consensus, and if so, did they receive proper attention?

Like so many organizations, the Fed has a "circle the wagons" mentality in which FOMC members are encouraged (feel pressure) to support the views of the institution and not deviate very much. Certainly, policy deliberations include outlying views, but the Fed discourages official dissents.

Certainly, the Fed was not alone in its overly optimistic inflation forecast, as most private sector forecasters were also caught by surprise (Waller 2022). The Blue Chip Economic Indicators and the Survey of Professional Forecasters missed with forecasts that were similar to the Fed's SEPs. This is not surprising, since many private sector forecasters take their cues from the Fed (and many of them have been trained at the Fed). Financial markets were also slow to forecast higher inflation in 2021, as reflected in market-based measures such as break-evens on the TIPS and sustained low bond yields, but survey-based inflationary expectations (University of Michigan Consumer Sentiment and Federal Reserve Bank of New York Survey of Consumer Expectations) were much more accurate. Some alternative measures, such as the Federal Reserve Bank of New York's Underlying Inflation Gauge, also projected that high inflation would persist. The Fed's projection misses were consistent with its history of being fairly accurate when real growth and inflation remain in narrow ranges but inaccurate when conditions change rapidly. Analogously, in periods of stable inflation, professional forecasters have a better track record of forecasting inflation than consumer surveys, while consumer surveys have better track records when inflation is changing rapidly (Goodspeed 2022).

**The Fed's new strategic plan.** The new strategic framework contributed to and reinforced the Fed's misguided projections and delayed its response to the rise in inflation (Levy and Plosser 2022). The Fed's

presumption that inflation would stay low like it did following the GFC fueled its concern of the risk of a collapse in inflationary expectations that would drive interest rates to the effective lower bound and constrain monetary policy. The contractionary impact of the pandemic accentuated these concerns. The Fed's new strategic plan, rolled out in August 2020, institutionalized asymmetries into its interpretation of its inflation and employment mandate and its conduct of policy. The new plan involved an overly complex flexible average inflation targeting (FAIT) plan that favored higher inflation as a make up for earlier sub-2% inflation but was absent any numeric range of acceptable inflation, and it prioritized its employment mandate and enhanced it to "maximum inclusive employment." While these provisions encouraged discretionary activist policy, the plan eschewed preemptive tightening in response to anticipated higher inflation. By de-emphasizing preemptive monetary policy, the Fed was rejecting a key strategy that had been instrumental in keeping inflation low during The Great Moderation (Taylor 1993 and Goodfriend 1997).

When inflation rose above 2% in 2021, the Fed viewed it as a positive step associated with the economic recovery from the pandemic. As the robust recovery in employment and supply shortages tightened labor markets, the Fed said it would delay tapering its asset purchases, and thereby delay raising of interest rates, until it saw "substantial progress" toward its employment mandate. The Fed did not provide any guidance for how to evaluate substantial progress. The Fed's new strategy of de-emphasizing preemptive monetary tightening contributed to the delays in raising interest rates.

**Misreading history.** Among the Fed's key misreads of history, the presumption that inflation would stay low failed to take into consideration the stark differences between the pandemic and the GFC. The economic recovery from the GFC was sluggish, despite monetary and fiscal stimulus. Nominal GDP did not accelerate materially beyond 4%, averaging below 4% during the 2009-2019 expansion, which resulted in 2.25% real growth and 1.75% inflation. The Fed's primary explanation for the persistently low inflation—that the Phillips Curve was flatter than it had earlier presumed—seemed more of an *ex post* observation that provided little insight into why aggregate demand and inflation may have stayed low. In contrast, aggregate demand surged following its sharp but brief pandemic contraction.

Besides the much larger magnitude of the fiscal response to the pandemic, several other factors may explain the sizable differences between the economic responses during the GFC and pandemic. First, the Fed changed its operating procedures during the GFC that may have dampened the monetary policy transmission channels and constrained aggregate demand. The Fed began paying interest on excess

reserves (IOER) and tightened capital and liquidity standards for banks, which may have encouraged banks to hold reserves created by the Fed's quantitative easing rather than make loans (Plosser 2018 and Ireland 2019). Bank lending may have also been deterred by heightened regulatory scrutiny and the Fed's imposition of rigorous stress tests. Second, following the GFC, weak financial conditions constrained the economic recovery. The banking system was crippled and undercapitalized. Household finances were impaired and the housing sector was severely damaged. The Fed's QE post-GFC generated a spike in bank reserves, but no lasting impact on the growth of M2. For years into the recovery, bank credit to households or businesses fell and mortgage debt outstanding receded. These factors, not the flatter Phillips Curve, explain the post-GFC weak demand and low inflation.

The Fed adjusted far too slowly to the starkly different post-pandemic conditions. Banks remained well capitalized and were not impaired. Consumer balance sheets were healthy, supported by government transfer payments, and businesses were flush with cash. There was pent up demand. The private sector responded strongly to the artificially low rates and excessive fiscal and monetary stimulus, housing boomed and aggregate demand rebounded strongly.

The Fed understated the importance of other valuable benchmarks from history. Major wars have typically involved deficit financing accommodated by monetary ease that subsequently resulted in inflation, and the government's pandemic spending were very war-like (Hall and Sargent 2023). There are interesting parallels between the post-WWII inflation period and the pandemic. In 2021, the Fed disparaged any parallels to the inflation of the 1970s, even though some lessons were instructive. Understating the unprecedented fiscal stimulus, sustaining a negative policy rate, and allowing a wide shortfall from Taylor Rule estimates proved costly (Bordo and Levy 2023).

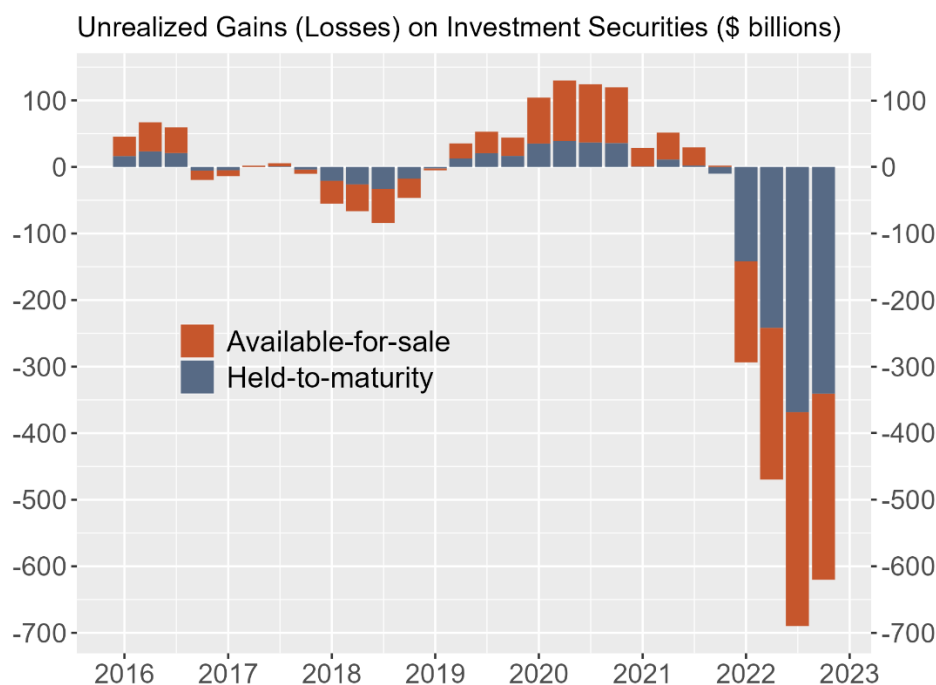
### **Observations on the Recent Bank Stresses**

The recent bank failures and financial stresses naturally followed the Fed's projections, forward guidance and monetary policy. Banks' poor risk management is to blame, but the Fed's actions were complicit. Its extended zero rate policy and ultra-low bond yields fueled a surge in asset prices and risk-taking. The government's excessive fiscal transfer payments and personal and business savings inundated banks with deposits. The Fed's projections and forward guidance that it would not need to raise rates very much likely encouraged commercial banks to extend the duration of their asset portfolios. This generated high profits in 2020-2021, but realities hit in 2022 as the Fed raised rates aggressively and bond yields rose sharply.

Commercial banks' asset-liability mismatches proved costly. The failure of Silicon Valley Bank stemmed from its uniquely concentrated exposure of its deposits (and its startlingly high portion of uninsured deposits) and assets to high tech and venture capital, and it was a poster-boy for bad risk management. However, its asset-liability mismanagement was not unique, as banks hedged only a very minor portion of their long-duration asset holdings against higher interest rates (Jiang, et al 2023). The FDIC estimated that at year-end 2022 commercial banks faced a cumulative \$620 billion in losses stemming from their asset-liability mismatches (FDIC, 2023; Chart 4). History shows that periods of Fed tightening following delayed exits from easing always have jarring financial effects and should not have been a surprise (Bordo and Levy 2023).

The Fed's failures to appropriately supervise banks in an important sense were an extension of the Fed's own poor risk management. Why did the Fed's bank supervisors overlook the risks of sharply higher interest rates and bond yields following a period when the Fed maintained artificially low interest rates and purchased assets that had kept that bond yields hovering near record lows and then raised rates rapidly? Data were readily available showing that banks had extended the duration of their portfolios and carried sizable asset-liability mismatches. Fed supervisors seemed to have conducted their jobs

**Chart 4. FDIC Estimates of Losses on Commercial Banks Investment Securities**



Source: FDIC, Haver Analytics

using the same perspective as the FOMC, ignoring simple rules of risk management. This is perplexing since scenario analysis is a critical element of bank stress-testing.

The Fed supervisors should have uncovered the risks, regardless of banks' asset size or whether they were designated as Systematically Important Financial Institutions (SIFIs) and subject to stress tests. Some observers argue that if the stress tests had been performed on a wider array of medium-sized banks, SVB's problems would have been identified and addressed. That may be the case, but it seems unlikely. The Fed's annual stress tests have involved the same themes as when they were introduced in 2009, involving severely negative scenarios *of the real economy* and *lower* interest rates. In its 2022 stress tests, the Fed's severe adverse scenario of February 2022 involved severe global recession, heightened stress on commercial real estate and corporate debt markets, and interest rates falling to zero. Whether SVB would have failed this stress test or its faulty risk management revealed is uncertain. Like the FOMC, the Fed's supervisors were fighting the last battle. Finally, in 2023, the Fed introduced an "experimental scenario" that involved higher rates (Board of Governors of the Federal Reserve System 2022 and 2023). The Fed's recent review of its supervision and regulation of SVB stated that it will enhance future stress tests and include tests of interest rate sensitivity (Board of Governors of the Federal Reserve System 2023).

The bottom line is that if the Fed had more experience with risk management and had incorporated scenario analysis in its conduct of monetary policy, its supervision of banks would improve.

### **Concluding remarks**

The Fed's aggressive interest rate increases since mid-2022 and sizable upward revisions to its projections have been necessary and positive steps, and inflation has begun to recede from its peak. However, the magnitude and persistence of the forecasting and policy errors raise many questions and suggest room for improvement. It would be insufficient for the Fed to now say "we're on top of the issue now so don't worry about it."

The Fed must assess the sources of its errors and establish a plan for corrective action. The Fed would benefit from a formal internal introspection—an "after action review"—that includes outside participants with diverse perspectives. Shortfalls in the FRB-US model must be addressed, particularly its failure to adequately capture the fiscal stimulus and the failure of its financial conditions parameters

to capture the extent of the Fed's monetary accommodation and the surge in money. The Fed must re-establish symmetry in its mindset about its 2% inflation target and correct the flaws and eliminate the asymmetries in its strategic framework. Its FAIT must be replaced with a simpler, symmetric low inflation objective with numeric guidelines around it. Preemptive monetary policy must be reinstituted. The assessment held by some Fed members that the strategic plan is sound, but it was implemented incorrectly in 2021-2022 is clearly inconsistent with the outcome. The shortcomings Fed's heavy reliance on managing inflationary expectations through forward guidance requires scrutiny. The Fed must improve the quarterly SEPs. This involves clarifying the conditionality of the inflation projections and establishing a consistency with the Fed's interest rate estimates using the Taylor Rule and other guidelines. The SEPs should include alternative scenarios to improve risk management. They should also include estimates of its balance sheet changes, which the Fed identifies as important components in its monetary policy tool kit. The Fed also needs to encourage diverse views among FOMC participants and take steps to avoid inadvertent institutional dampening of alternative views on the economy, inflation and appropriate policies. It must also consider ways to make better use of anecdotal evidence gathered by district banks. The Fed needs to address its unhealthy relationship with financial markets, which may improve its communications strategy. The objective is to improve the Fed's conduct of monetary policy.

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