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Monetary Policy Responses to Shocks

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Most countercyclical monetary policy research has focused on the Fed's responses to fluctuations in the business cycle. The benchmark for countercyclical analysis is whether monetary policy adjusts appropriately to smooth economic fluctuations and achieves the Fed's dual mandate of low inflation and maximum employment. In addition to cyclical fluctuations, history is replete with an array of shocks and disturbances that have jarred economic activity. This paper analyzes the modern history of various types of shocks and how the Fed has responded to them.

Study of economic shocks and policy responses to them is a natural complement to business cycle fluctuations and countercyclical policy analysis. Some shocks are truly exogenous, generated by a natural disaster or pandemic or a dramatic shift in oil prices. Some are generated by shifts in fiscal and nonmonetary economic policies. Others are a blend of traditional business cycles and shocks, generated by the Fed's own monetary policy that resulted from themes and misperceptions that influence its thinking and policymaking.

Research provides valuable guidelines for considering how monetary policy should respond to shocks. In general, a shock to aggregate demand much like a demand-driven cycle fluctuation should be countered by offsetting monetary policy that smooths demand. The Fed should ease monetary policy in response to a negative demand shock, just as it would respond countercyclically to an economic downturn; if a demand shock is positive, the Fed should lean against it with monetary tightening.

In contrast, the Fed should “look through” and not adjust monetary policy in response to a supply shock (Rasche and Tatom 1981 and Gordon 1978). The general rule is that monetary policy is an aggregate demand tool and cannot solve supply-side disturbances. Moreover, supply shocks tend to have short-lived impacts while monetary policy works with a lag. Easing monetary policy in response to a negative shock may be counterproductive by unhinging inflationary expectations and elongating the impact and “scarring” of the shock (Ramey 2016). Although a more persistent shock may require the Fed to modify its monetary policy, it must be remembered that monetary policy may manage aggregate demand but is incapable of smoothing supply disturbances.

Our analysis of various exogenous and nonmonetary policy-induced shocks and disturbances to the economic system finds that in general, the Fed’s monetary policy responses to them have been suboptimal. The Fed seems to treat each shock unsystematically; that its judgment on the impacts of the external disturbances to supply and demand, as well as the impacts of its policy responses, have been unreliable; and its policy responses do not seem to learn the lessons of history. As a result, monetary policy responses to shocks have often generated lagged ripple effects and have extended the harm the initial shock imposed on economic and inflation conditions.

Types of shocks. Each major shock in modern history—Covid, the Great Financial Crisis and the 1970s oil price spikes—has been different and has unfolded under different circumstances. The Covid pandemic that hit in early 2020 was a true exogenous shock that was accentuated by government shutdown of large portions of the economy. Both supply and demand abruptly shifted inward in an alarming fashion. In contrast, the factors underlying the Great Financial Crisis had been brewing for several years, and the Fed and general public was well-aware of the debt-financed housing bubble and proliferation of mortgage debt and complex mortgage-backed derivatives.

The first and second oil price shocks of the 1970s—in November 1973 and July 1979—occurred after misguided monetary and economic policies had already generated high inflation and disrupted economic and financial performance. Thus, the monetary policy responses to these oil price shocks must be considered in the context of these other policy mistakes and how they distorted economic performance.

Currently, President Trump’s aggressive imposition of tariffs and immigration policies are shocking economic activity, temporarily lifting inflation, and lowering employment. How should the Fed respond to negative nonmonetary policy shocks that run counter to the Fed’s dual mandate?

Over the years, the Fed has been confronted by other disturbances, policy-induced constraints, and smaller shocks. Its responses provide valuable insights into the Fed’s perspectives on economic conditions and how it should respond to achieve its objectives. These episodes include Regulation Q that prevailed in the 1960-1982 period, President Nixon’s wage and price controls, Y2K and the turn of the millennium, and 9/11.

In addition, the Fed has occasionally adjusted monetary policy in response to foreign trends that were perceived as threats to U.S. Each of these episodes have generated policies that have resulted in deviations from the Fed’s dual mandate. Japan’s “lost decade of the 1990s” that involved several bouts of deflation clearly influenced the Fed’s monetary policy in the early 2000s. Should it have?

Table I summarizes the characteristics, policy responses and consequences of the three big shocks and also includes minor episodes that involved either disturbances or policy constraints that the Fed has had to face. Sections I, II and III of the paper assess the Great Inflation, GFC and Covid pandemic and the Fed’s responses. Section IV considers the Fed’s responses to an array of smaller disturbances and how they have shaped modern monetary policy.

Table 1: Shocks and Fed Responses

Period / Shock	Type of Shock	Monetary Policy Response	Outcome / Observation
I. The Great Inflation		Accommodation	Ratcheting up inflation & inflationary expectations
a)	Mid-1960s, Fiscal Stimulus	Accommodation	Rising inflation & inflationary expectations
b)	Burns and Labor Strikes	Accommodation	Beginning of excess demand pushes up inflation and interest rates
c)	Nixon Shock	Ease	Discards gold standard; Price stability anchor replaced by expectations of inflation; wage and price controls fail and distort economy
d)	Oil Shocks	Accommodation	Oil price spikes distort production and depresses supply and demand
II. Great Financial Crisis		Zero rates QE I, II, & III	Collapse in stock market, MBS, real estate = slow recovery; Fed's QE III extends unconventional MP to conventional goal of boosting employment
a)	Source: Worries about Japan-style deflation; GSEs	Extended zero rates and QE I, II & III	Debt-finance housing bubble; poor Fed supervision of banks and complex MBS derivatives leads to collapse
III. The Covid Pandemic		Unprecedented ease: extended zero rates and QE	Dramatic rebound, sharply higher inflation
a)	Exogenous Supply & Demand	Fed delays normalizing interest rates and balance sheet	"Transitory supply shock": Fed ignores surge in demand generated by unprecedented fiscal and monetary policy
IV. Other Disturbances			
a) Credit Crunch of 1966	Financial Policy Constraint	Temporary Fed ease	Credit crunch: Fed in a no-win situation
b) President Carter's Credit Controls of 1980	Economic Policy Constraint	Temporary Fed ease	Credit controls interrupt Volcker's disinflationary MP
c) Stock Market Crash, October 1987	Financial Shock	Fed provides liquidity; cuts	Fed provides valuable support
d) The Gulf War, 1991	Disruptions	Fed ease	Responsible Fed policy
e) Productivity surge	Positive shock	Greenspan doesn't raise rates	Wise response
f) Asian Financial Crisis, 1997-1998	External Threat	Fed monitors	Responsible Fed policy
g) Fed blunders on Y2k	Fed misperception	Fed delays rate increase	Excess fine-tuning
h) 9/11	External Shock	Fed provides liquidity; cuts	Responsible Fed policy

I. The Great Inflation and the Oil Price Shocks of the 1970s

The Great Inflation is not a simple story of high inflation generated by the oil price shocks of 1973 and 1979. Such analyses that attribute the upwardly ratcheting inflation primarily to the oil shocks and suggest that the Fed “did what was appropriate at the time” and that monetary policy was acceptable (Blinder and Rudd 2008) overlook a rich history that established the Great Inflation as a poster boy of monetary and nonmonetary policy mismanagement.

Wartime government spending and monetary accommodation. The Great Inflation began in the mid-1960s following a sustained period of moderate inflation that averaged 1.3% following the Korean War from 1953 to 1965. Inflation rose and became a problem when the government’s spending buildups of the Vietnam War and Great Society programs were accommodated by monetary ease that facilitated strong private sector consumption and investment. Rapid growth in aggregate demand exceeded productive capacity and inflation resulted. Government budget deficits were not the problem, as the surge in government spending was nearly matched by rising tax receipts (the tax system was not indexed for inflation). Rather, soaring government purchases for the war effort and spending on the Great Society programs added directly to aggregate demand.

Beginning in the second half of 1965, President Lyndon Baines Johnson exerted intense pressures on Fed Chair William McChesney Martin to not raise rates. Martin complied by raising rates very gradually, less than 1-for-1 with the rise in inflation through 1966 (Chart 1). This accommodative monetary policy generated a sharp acceleration of M2 money stock and nominal GDP growth. Inflation rose from 1.1% in early 1965 to 3.5% by August 1966 (Levin and Taylor 2013). The Fed’s moderate rate increases plus inflation pushed rates above the Regulation Q constraint on yields banks were permitted to pay on deposits, which resulted in

the “credit crunch” of 1966. (This is described more fully in Section IV.) In response, the Fed eased rates and the economy reaccelerated in mid-1967 and inflation reaccelerated with it.

Under political pressures from the White House, the Fed didn’t begin raising rates until after LBJ announced he was not running for re-election in late-1967. Money growth and aggregate demand surged, and inflation rose to 6.4% (Chart 2). The Fed tightened monetary policy aggressively in 1969, raising rates to 9% from 4.5% at year-end 1967, and real money balances declined as M2 growth slowed to 3% year-over-year from 8%. Nominal and real GDP slumped beginning in late 1969.

Inflation, Arthur Burns and Labor Strikes. Arthur Burns replaced Martin as Fed Chair in February 1970. Inflation was 6.4%, the economy was slowing and the Fed’s policy rate was 9%. Inflation since 1965 had significantly outpaced wage gains, and emboldened labor unions were demanding wage catchups. A sizable U.S. Postal System strike in 1970 Q1 compounded the economic slowdown by temporarily compromising national communications and distribution channels, resulting in a quarterly decline in real GDP. The Burns-led Fed began easing interest rates aggressively. The U.S. Postal strike was short and the economy rebounded in Q2 and Q3. The Fed continued easing policy. Beginning in September, a massive GM strike, the largest in U.S. history, generated a severe but temporary economic contraction in Q4, with real GDP declining at a 4.2% annualized rate. The strike quickly ended, and the economy rebounded sharply, with 11.3% annualized growth in 1971 Q1. However, the Fed continued lowering rates through March 1971, to 3.7%, far below the 4.7% inflation.

The Nixon Shock of 1971. In response to a deteriorating trade balance, the widespread perception that the US dollar was overvalued and threats that foreign nations’ gold convertibility would overwhelm the U.S.’s gold holdings, on August 15, 1971, the Nixon Administration ended gold convertibility, ushering in a floating exchange rate system and forcing a collapse of the Bretton Woods system. Ending the gold standard marked a major transition from price stability as the nominal anchor to low inflation. It also imposed a 10%

surcharge on all dutiable imports and imposed wage and price controls on the U.S. (Irwin 2012 and Bordo 2020). This shock to international finance resulted in a significant decline in the US dollar. Both exports and imports accelerated sharply. The tariff surcharge was used as a bargaining tool with foreign nations and was dropped in the December 1971 Smithsonian Agreement.

Fed Chair Burns then partnered with President Nixon to support his Presidential 1972 re-election efforts by keeping interest rate increases low, which allowed double-digit M2 growth that fueled strong growth of nominal GDP. The wage and price controls initially helped to constrain inflation, so the rapid growth of nominal spending resulted in robust real GDP growth and job gains of 4.2% in the year before the election.

Amid double digit growth in aggregate demand, the unwieldy wage and price controls generated confusion and distorted price- and wage-setting behavior, and were inadequate to constrain mounting inflation pressures. Even though the Fed raised rates aggressively following President Nixon's November 1972 re-election, inflation accelerated. It reached 8% before the Arab Oil Embargo generated the first oil price shock in November 1973. Following the removal of the wage and price controls in April 1974, inflation rose to 12% despite deep recession. This oil shock combined with the Fed's monetary tightening resulted in the deep recession that lasted into 1975Q1.

Assessing Burns' motivations. The Burn's-led Fed eased aggressively in response to both the U.S. Postal strike and the GM strike, which were temporary supply shocks. Burns had always been skeptical of the ability of monetary policy to achieve low inflation. These labor union strikes likely fueled Burns' beliefs that inflation was generated by an array of non-monetary factors that are best addressed by direct intervention rather than monetary policy. As such, they likely contributed to his advocacy of the wage and price controls that were imposed in August 1971.

Burns' politically motivated and undisciplined monetary policies reduced the Fed's credibility, fueled inflationary expectations and extended the negative impacts of the external shocks. Inflation fell to a low of 5% following the 1973-1975 recession and then reaccelerated in early 1977. The Fed was slow responding to the rise in inflation in 1977. Burns' term as Fed Chair ended in February 1978 and he was not reappointed by President Carter.

New Fed Chair G. William Miller raised rates as inflation rose 1-for-1 in 1978-1979, but nominal GDP growth continued to grow at a double-digit pace and inflation and inflationary expectations continued both rose. The perceived lack of a viable solution to rising inflation culminated in a US dollar crisis in mid-1978, well before the second oil price shock in mid-1979 (Meltzer 1978). By that time, inflation had reached 11% and the oil shock lifted it to a peak of 14.5% in Spring 1980.

Volcker's successful disinflation. New Fed Chair Paul Volcker successfully reduced inflation through aggressive monetary tightening. Under the guise of monetarism Volcker let interest rates rise dramatically to tighten monetary policy. This was temporarily interrupted by President Carter's credit controls (these will be discussed in more detail in Section IV). But regaining inflation-fighting credibility proved costly, and the economy suffered through two back-to-back recessions in 1980-1982 with high unemployment and large losses in wealth.

II. The Great Financial Crisis: Lead Up, Impacts and Monetary Policy Responses

The GFC was not just an exogenous shock that came out of the blue. As described below, its origins were a confluence of a debt-financed housing bubble that was facilitated by a sustained period of low interest rates and lax credit conditions, a proliferation of complex mortgage-backed derivatives that were extraordinarily difficult to understand, and poor financial oversight and bank supervision.

The Fed's fears about a Japan-style deflation and "too low too long". Following the Bank of Japan's "bursting of the bubble" and collapse of asset prices (the Nikkei and real estate) beginning in 1990, Japan's economy incurred a decade of stagnation and on-and-off bouts with deflation. Each year at the Fed's Jackson Hole symposium, a leading BoJ official would describe the central bank's frustration to stimulate healthy demand and its inability to escape from deflation. These concerns resonated with the Fed, which came to fear that a Japan-style deflation could envelop the U.S. The worries were that once deflation unfolded, expectations of deflation would lead households to save rather than spend, and the downward pressure on aggregate demand would be hard to remedy. Skeptics of this view argued that the U.S.'s economic structure was far different than Japan's and that Japan had never experienced deflationary expectations that reduced the propensity to spend, and that the Fed's worries were illogical (Plosser 1998).

The Fed's worries about the possibility of deflation heightened dramatically following the bursting of the dot-com bubble and the recession of 2001 that culminated in the shock of 9/11. These worries were closely tied to the Fed's concerns about the effective lower bound (ELB) and the potential constraints it posed for conventional monetary policy. Fed Chair Greenspan's deflation concerns were expressed as the need to avoid "low probability, high-cost outcomes" (Greenspan 2002). Fed Governor Ben Bernanke articulated how the Fed could conduct monetary policy at the ELB (quantitative easing) and emphasized that the Fed would go to great lengths to avoid deflation (Bernanke 2002).

These worries about "too low" inflation and the ELB led the Fed to avoid deflation at nearly all costs. These concerns were the bases for the Fed's tilt toward allowing higher inflation. While the Fed continued to articulate the benefits of low inflation, with inflation below 2%, it was decidedly uncomfortable looking up at the 2% inflation target that had been established by New Zealand, Australia, Canada, and most recently, the European Central Bank. Effectively, the Fed adopted an asymmetric interpretation of its dual mandate.

The monetary policies that resulted from the Fed's asymmetric interpretation of its dual mandate spelled the eventual end of the Great Moderation (Bordo and Levy 2024). The Fed's easing and fiscal stimulus in response to 9/11 quickly lifted the economy out of recession and generated a rise in inflation (both the CPI and PCE) back up to 2% in 2002-2003. Nevertheless, the Fed remained fearful of the probability of deflation and lowered its policy rate to 1.25% at year-end 2002 and 1% by mid-2003, and kept it there through mid-2004. During this period of sustained negative real policy interest rates and mortgage rates, economic growth was strong, driven by a boom in housing and residential investment (Taylor 2007). When the Fed began raising rates in mid-2004, it feared a sharp rise in bond yields, like what happened in 1994. Greenspan provided forward guidance that the rate increases would be gradual. Financial markets closely followed Greenspan's comments, and bond yields and mortgage rates stayed low during the Fed's measured rate increases. Greenspan described the sustained bond yields as the Fed gradually raised rates was referred to as a "conundrum" (Greenspan 2005).

Debt-financed housing boom. The sustained period of low interest rates and bond yields was fertile for debt and real estate. The housing boom of the early 2000s was associated with soaring home values and a surge in mortgage debt, loosened credit standards by commercial banks and Fannie and Freddie, and a proliferation of complex mortgage-backed financial derivative products. Home equity loans and loans to small businesses collateralized by real estate also soared. Expansion of the balance sheet of the Government Sponsored Enterprises Fannie Mae and Freddie Mac drew concerns from several Fed members, but the Fed did not materially tighten credit standards (Poole 2005 and Gramlich 2005).

The value of these MBS derivatives relied heavily on continued increases in home values. Residential real estate values began to decline in Spring 2006, generating a pronounced shift in *expectations* that home values would continue to fall. This triggered a collapse in the value of MBSs and related derivative products that violated covenants on capital requirements. Loan delinquencies and defaults soared, and loan-to-value ratios rose sharply.

The Great Moderation is commonly thought to have begun the early 1980s after the Volcker disinflation and extend through 2007. In reality, the unhinging of the Great Moderation began in the early 2000s with the Fed's sustained low interest rates that fueled the debt-financed housing bubble. The Fed was not the source of the proliferation of complex MBS derivatives that were a root cause of the GFC.

Policy responses to the GFC. In 2007-2008, policymakers were on heightened alert as the debt-financed housing bubble began to unravel and credit quality deteriorated. A critical issue facing the Fed was that much of the troubled mortgage-backed assets outstanding were extremely difficult-to-value such that it didn't understand the scope of the problem, including the damage to bank capital. These uncertainties about the value of MBS and bank capital led to jitters in short-term funding markets, generating pockets of illiquidity. The Fed responded when specific crises emerged. In March 2008, when Bear Stearns collapsed, buried by losses on MBS derivatives, the Fed backstopped \$30 billion of troubled assets acquired by JPMorgan. Despite this highly visible collapse, the Fed continued to forecast that the mounting problems facing the mortgage market would be contained in the housing sector, and a recession would not occur (Chart 4, Board of Governors of the Federal Reserve System 2008). In the second half of 2008, the Fed implemented an array of alternative liquidity facilities aimed at pockets of credit problems and illiquidity in the short-term funding market.

When Lehman Brothers lost its short-term funding and collapsed in September, which initiated a market freeze and financial panic, the Fed coordinated closely with the U.S. Treasury. Unfortunately, their communications were unclear, which spiked uncertainty and added to the sharp economic contraction. Several weeks later, amid widespread financial turmoil and a collapsing stock market, the Congress passed the Emergency Economic Stability Act of 2008 that authorized \$700 billion to stabilize private institutions and the economy. It created TARP (Troubled Asset Relief Program) in which the U.S. Treasury purchased \$250 billion of toxic

assets from leading financial institutions and infused capital into AIG and select nonfinancial institutions.

In late November, the Fed engaged in quantitative easing, so-called QEI, purchasing only MBS on the secondary market. Fed Chair Bernanke emphasized that this was credit easing involving purchases of MBS only, aimed directly at the source of the financial crisis, and not quantitative easing, and that the Fed would unwind its MBS holdings on a timely basis (Bernanke 2008).

In January, the new Obama Administration enacted the American Recovery and Reinvestment Act of 2009, which involved \$780 billion of deficit spending that roughly equaled the 4.9% decline in GDP during the sharp GFC economic contraction. The Fed expanded its asset purchases in March 2009 with QEII, which involved purchases of treasury securities as well as MBS.

Based on the fiscal and monetary stimulus (zero interest rates and quantitative easing), Fed members projected a strong economic recovery (Board of Governors of the Federal Reserve System 2009-2011). Instead, the recovery was characterized by modest growth and lingering weak labor markets with high unemployment and a decline in the labor force participation rate. Inflation remained below 2%, the Fed's unofficial objective.

When these conditions persisted, the Fed instituted "operation twist", a program of selling long-dated securities in its portfolio and purchasing short-dated treasuries with the objective of lowering bond yields. In late 2012, it engaged in QEIII, a large and open-ended program of purchasing treasuries and MBS. Bernanke described QEIII as a program aimed at raising employment, consistent with the Fed's dual mandate (Bernanke 2012). The economic recovery and job gains continued through the decade, and following the collapse in oil prices in mid-2014-2015, inflation rose to 2% and stayed there through 2019. It was always characterized as a substandard recovery, even though the expansion persisted for a decade and the unemployment fell to 50-year lows.

Assessment of the Fed's response to the GFC. In 2008, the Fed was creative in rolling out its alternative liquidity facilities and QEI which involved large scale purchases of MBS that attempted to pinpoint the sources of the mounting crisis. Following the GFC, the Fed appropriately heightened its focus on bank capital and clarified its measurement, strengthened its macroprudential risk and tightened bank supervision. But the Fed committed costly errors before the financial panic unfolded, during the severe crisis period of October 2008-March 2009, and in recovery from the GFC.

First, as financial turbulence mounted, the Fed fell far short in its understanding of the depth and complexity of the MBS securities held by financial institutions and the extent that they impinged on bank capital. The Fed gets poor marks in its role as bank supervision. Second, the Fed was uneven in its treatment of key businesses. The Fed backstopped JP Morgan's absorption of the Bear Stearns' assets following its collapse; the Fed allowed Lehman Brothers to fail, but backstopped AIG's massive losses and created rules that limited Goldman Sachs' losses. The Fed was carrying out credit policies that more appropriately should have been conducted by the U.S. Treasury. The uneven subsidies added uncertainty and harmed its longer-run credibility.

Third, the recovery from the GFC fell far shy of the Fed's forecasts, and its responses to the lingering high unemployment and low inflation set bad precedents. Based on the fiscal stimulus of the American Recovery and Reinvestment Act of 2009 and the Fed's zero interest rate and QEs, the Fed projected a strong recovery and rising inflation (Board of Governors of the Federal Reserve System 2009). Neither unfolded. In response to the weak labor market and high unemployment, in late 2012 the Fed engaged in QEIII, open-ended asset purchases of treasuries and MBS, in an explicit effort to raise employment. Using QE during an economic expansion in pursuit of its dual mandate made unconventional policy part of the Fed's conventional tool kit. This expanded the Fed's footprint in financial markets and the scope of monetary policy.

The Fed never developed or articulated a consistent rationale for why inflation stayed so low during the post-GFC recovery, attributing it to a flatter-than-presumed Phillips Curve rather than insufficient aggregate demand. The real culprit was the sizable negative wealth effect that dampened consumption and business investment. The wealth loss resulting from the collapse in residential real estate and the stock market and perceived diminished permanent income led households (and small and medium sized businesses) to save rather than spend (Case, Quigley and Shiller 2013). During the extended expansion following the GFC, nominal GDP rose at an average annual growth rate below 4%, despite fiscal and monetary stimulus. This kept a lid on inflation. The Fed's worries about weak labor markets transitioned toward worries about "too low" inflation. The Fed harbored mounting concerns that a potential collapse in inflationary expectations combined with low real interest rates could face the Fed with the effective lower bound, even as inflation was close to its 2% target during 2016-2019 (PCE inflation averaged 1.7% and CPI inflation averaged 2%). These Fed worries led to its misguided Strategic Plan of 2020 that favored higher inflation and prioritized employment.

III. The Covid Pandemic

The Covid pandemic was an exogenous and unique shock that unfolded over a very short period. The government responded quickly and aggressively on several fronts. It ordered widespread shutdowns of large sectors of the economy. The Fed quickly lowered rates to zero and intervened in the US Treasury market with massive purchases of Treasuries aimed at supporting primary dealers that faced disorderly supply-demand flows challenging their capital bases. It also conducted large-scale purchases of MBS. The government enacted several massive income support packages: the CARES Act in March 2020 (\$2.2 trillion), the Consolidated Appropriation Act in December 2020 (\$900 billion) and the American Rescue Act in March 2021 (\$1.9 trillion). These and other programs involved cumulative deficit spending that exceeded 25% of GDP. The Fed continued its large-scale purchases of Treasuries and MBS through 2021. It ended its asset purchase programs in March 2022 and in May began to

gradually unwind some of its asset holdings. The Fed maintained its zero-interest rate anchor until March 2022 then raised rates. Even with aggressive rate increases, the Federal funds rate remained below inflation until February 2023. Following a dramatic economic contraction in the first half of 2020 (real GDP declined 9.1% in the first half of 2020), the economy and labor markets rebound robustly, benefiting from the fiscal and monetary stimulus that generated an unprecedented surge in aggregate demand (nominal GDP accelerated at its fastest pace in history) and reduced supply constraints following the government's reopening of the economy and an easing of global supply chain disruptions.

Assessment. After cutting of rates to zero and intervening into the dysfunctional Treasury market, the Fed's elongated extension of massive purchases of Treasuries and MBS and sustained zero interest rates into spring 2022 amid the robust economic recovery and sharply rising inflation was excessive (Bordo and Levy 2021). The Fed's policies raised the costs and prolonged the distortions of Covid. The general price level rose nearly 25% and high inflation lingered. This reduced real wages. The catchup of wages to the general price level was uneven across industries and demographics and reduced standards of living for many. It forced many households to draw down savings to make financial ends meet. The Fed's MBS purchases were seemingly unnecessary because those markets were orderly and not a source of market or economic distress. The sustained low rates (funding costs and mortgage rates) contributed to the 50% plus appreciation in home prices. The spike in inflation and home values have resulted in a sizable redistribution of wealth from poorer to wealthier households. Homeowners and stockholders have benefited while renters have faced sharp increases in rental costs. The housing market faces lingering distortions from the Fed's policies. The sharply higher home values pose a lingering barrier to younger households looking to purchase homes. The supply of homes for sale have been constrained by the millions of homeowners who financed and refinanced mortgages at very low rates.

The Fed's extension of zero rates and asset purchases stemmed from the Fed's misunderstanding of why inflation rose and its persistently poor projections of inflation and

misguided estimates of interest rates that would be required to lower inflation (Levy 2024). This was based on the Fed's stubborn perception that the rise in inflation was due to "transitory supply shocks". Another factor that likely contributed to the Fed's misguided projections was its perspective that inflation would stay low, just as it had following the GFC. When inflation rose, the Fed naturally thought it was a temporary blip. As inflation continued to rise, in each succeeding quarterly Summary of Economic Projections in 2021, the Fed projected that inflation would quickly fall back to 2%, and estimated that the appropriate Federal funds rate would barely need to be increased.

After the successful administration of the Covid vaccine and the robust reopening of the economy, large uncertainties remained, and cautious policymaking was appropriate. The Fed should have considered alternative scenarios and appropriate monetary responses to them (Bordo, Levin and Levy 2020). Instead, the Fed ignored the dramatic acceleration in aggregate demand and instead put all of its eggs in the "transitory supply shock" basket. This point was acknowledged by Fed Governor Waller (Waller 2024).

The Fed significantly under-estimated the impact of the massive fiscal and monetary stimulus, even after the reopening of the economy (Levy 2024). The unprecedented 40% surge in M2, which reflected the excessive income support packages that were saved and the Fed's accommodation, was ignored by the Fed. The Fed's projections also estimated that the unprecedented fiscal stimulus would have little if any economic impact. In its June 2021 SEPs, months after President Biden's American Rescue Plan (10% of GDP in deficit spending) was enacted and income support checks were distributed, the median FOMC members' projections of inflation and economic growth were barely changed (CPI inflation was raised a tenth for 2022 and 2023 and real GDP was unchanged in 2022 and raised two-tenths for 2023).

The Fed's very narrow focus and lack of perspective was reflected in the glaring lack of diversity of economic and inflation projections of SOMC members—however high inflation rose, the FOMC members uniformly projected it would fall back to 2%—and their estimates that only

minor increases in rates hinged critically on the transitory argument (Levy 2024). In addition, when the Fed finally acknowledged that it would need to tighten monetary policy, the Fed's confusion about how to sequence the timing of tapering of its asset purchases and raising rates led to a delay in tightening monetary policy. The Fed likely allowed its concerns about financial market responses to influence its monetary policymaking.

The Fed's mistakes and high inflation have had marked lingering economic effects and have also influenced the political landscape. Based on its strategic plan of "letting bygones be bygones, the large rise in the general price level is permanent, suggesting that the costs and distortions of the Covid pandemic persist.

IV. Fed responses to other disruptions and policy constraints

Besides the three large shocks, the Fed has faced other non-cyclical disturbances. This section describes them.

Regulation Q and the 1966 credit crunch. Among other requirements, the Banking Act of 1933 prohibited the payment of interest on bank deposits and imposed interest rate ceilings on other types of bank deposits. Reg Q did not bind when inflation was anchored to zero, but it became a constraint when inflation and inflationary expectations began rising in the mid-1960s. This placed the Fed in a no-win situation: if it raised rates to constrain inflation, the mandated interest rate cap would be breached; if the Fed had held rates constant, inflation and inflationary expectations would have risen (Bordo and Haubrich 2010). President LBJ exerted pressure on the Fed to not raise rates. When the Fed raised rates modestly, the Regulation Q cap on yields was breached and a credit crunch ensued (Berger 1969). Depositors withdrew money from banks, which constrained banks' supply of credit. The disintermediation and credit crunch resulted in a disruption to finance and a sharp slump in economic growth. The Fed quickly lowered rates in response, and the economy and even higher inflation resumed. While

the 1966 credit crunch was not a shock—it was a disruption generated by a policy constraint, it nevertheless merits attention as an obstacle that the Fed’s monetary policy had to deal with.

President Carter’s credit controls of 1980. The Volcker-led Fed’s aggressively restrictive monetary policies that successfully lowered inflation was interrupted by President Carter’s credit controls that generated a short but severe recession in Spring 1980 (Schreft 1990). The Carter Administration, frustrated with the continued acceleration in inflation and its perception that credit was growing excessively, even after the Fed began raising rates, invoked the Credit Control Act of 1969 and forced the Fed to enforce an array of credit-dampening rules. This included a special deposit requirement of 15% on all lenders, higher reserve requirements, a discount rate surcharge of 3 percentage points and a voluntary credit restraint program).

Volcker opposed these credit control actions, but complied with the President (Board of Governors of the Federal Reserve System 2010). There was significant confusion with the announcement of the credit controls. Credit supply and demand fell abruptly and the economic contracted sharply in April 1980, but only briefly. The Fed dramatically eased interest rates, from 17.6% in April to 9.0% in July. The economy rebounded rapidly in the second half of 1980, and the Fed resumed its sharp rate increases in July, boosting them to 19% by year-end and into 1981. The second recession unfolded in mid-1981 and lasted through year-end 1982. The back-to-back recessions successfully reduced inflation and inflationary expectations with a lengthy lag, and involved high unemployment and sizable losses in wealth.

The credit controls temporarily disrupted economic activity and the Fed temporarily reversed its monetary tightening in response. This episode is not at all a typical shock; the Fed was under orders to enforce the controls. While the Fed lowered rates aggressively in response to the negative economic fallout from the controls, it began reversing the cuts immediately after some of the controls were eased and the first indications of economic stabilization. The credit controls increased the cost of the disinflationary process that the Fed had embarked on.

The stock market crash of October 1987. Following the strong 80% appreciation of the US dollar during President Reagan's first term, the dollar fell sharply beginning in February 1985 and continued to fall, facilitated by the Plaza Accord of September 1985 that officially instituted coordinated intervention efforts among France, West Germany, Japan, the United Kingdom and the United States. Beginning in early 1987, Fed Chair Volcker expressed concerns about the weakness in the dollar, and particularly the strength of the German Dmark and Japanese yen, suggesting the Fed may need to raise rates to support the dollar. Greenspan succeeded Volcker in July 1987 and echoed those remarks, saying the Fed would have to raise rates substantially if the goal was to support the US dollar. Bond yields were rising dramatically—to 9.5%--and the stock market was appreciating dramatically. The stock market crashed in October 1987, falling 22% in one day, reflecting concerns about falling profits, higher interest rates and equity overvaluations.

The Fed responded responsibly in response to this financial shock: it quickly lowered rates and extended support to the fragile financial markets, but didn't ease monetary policy further. The economy stabilized and didn't fall into recession, and the Fed commenced raising rates in December to rein in inflation.

The Gulf War. The Fed raised rates aggressively in 1988 and through early 1989 to contain inflation that had risen to 4.7%. It began easing rates throughout 1990 in response to weaker growth and falling employment (in the second half of the year) and decelerating inflation. Mild recession began in 1990Q4 and extended into the short Gulf War in 1991Q1. The Fed cut rates to 3.25%, just above inflation, setting the stage for the slow but lengthy economic expansion of the 1990s. The Fed's policies around the 1990 recession and Gulf War were responsible. The recession was mild and the decline in inflation to 3% set the stage for the sustained economic expansion of the 1990s.¹

¹ **The Fed's soft-landing tightening of 1994.** In response to the overheating economy in 1993 and the fear that inflation would rise, the Fed aggressively tightened monetary policy in 1994, raising rates from 3% to 6%, following the preemptive monetary tightening prescription of Marvin Goodfriend (1993). This successfully dampened inflationary expectations and

Greenspan and the Positive Productivity Shock. Following the Fed's soft-landing, the economy gathered significant strength, hitting it on all cylinders with strong gains in employment and a marked acceleration of productivity which contributed to lower inflation. Employment gains averaged 2.8% annually, labor force participation rates rose and the unemployment rate fell sharply. Labor productivity gains surged from an average of 1% pace toward 3%. Consensus economists who steadfastly relied on the Phillips Curve argued that the falling unemployment rate required that the Fed raise rates and tighten monetary policy to constrain inflation. But Fed Chair Greenspan, based on close attention to data and deep understanding of the economy, recognized the strong acceleration of productivity as a positive productivity shock resulting from technological innovations (Greenspan 1997). Based on these instincts, Greenspan rejected arguments to raise rates (including from within the Fed), instead steering the Fed to keep rates unchanged that would allow productivity-driven growth to constrain inflation (Greenspan 1999). This proved to be a picture-perfect monetary policy response to a positive shock.

The Asian financial crisis of 1997-1998. The Asian financial crisis, following years of dramatic growth and asset appreciation of the "Asian economic miracle", poised a financial and economic shock to global economies (Bordo, Mizrach and Schwartz 1998). Thailand's sizable capital outflows and deteriorating finances forced a de-pegging of its currency from the US dollar in July 1997, resulting in a steep devaluation. Capital outflows and severe financial stresses soon spread to Malaysia, the Philippines, Indonesia and South Korea. Jarring capital

temporarily slowed economic growth without causing recession (Levy 1995). The soft-landing reinforced the Fed's credibility and paved the way to robust economic and financial performance of the second half of the 1990s. The Fed's decisive policy tightening was a blueprint for effective disinflationary monetary policy, but Fed Chair Greenspan was concerned with the short-run impacts of the disinflationary policy: a significant rise in bond yields resulted in several bankruptcies, most notably, Orange County, California that was overweighted in mortgage-backed securities.

outflows and balance of payments pressures, soaring debt ratios, steep devaluations and sharp economic contractions elicited sizable IMF bailouts.

Fed was worried about contagion and monitored the situation closely and was in close contact with large U.S. banks on their exposures, but did not materially change monetary policy in response to the crisis. During this period, U.S. economic growth remained rapid, benefiting from strong productivity gains, and inflation declined. The Fed lowered interest rates beginning in mid-1998, but only after inflation had fallen below 2% (Chart 3).

The Fed blunders in anticipation of Y2K. Although Y2K was not a shock, the Fed adjusted monetary policy because it was worried that the turnover into the new millennium would become a shock. Its excessive fine-tuning of monetary policy in anticipation of a shock proved costly. Between mid-1998 and year-end 1999, inflation had accelerated significantly to 2.7%, real GDP expanded at a robust 4.7% rate and the stock market was red-hot, highlighted by the dot.com bubble. As year-end 1999 approached, the Fed was concerned that households would hoard cash in anticipation of computer disruptions around the changeover to the millennium. This worry about a possible shock led the Fed to purposely delay raising rates until after year-end 1999 because it didn't want to jar financial markets ahead of Y2K. The Fed's less than 1-for-1 rate increases in 1999 amid sharply accelerating nominal GDP, rising inflation and the dot.com bubble required aggressive catch-up monetary tightening beginning in 2000. This contributed to a pronounced stock market sell off and tipped the economy into mild recession in early 2001.

The shock of 9/11. The 9/11 attacks were a true exogenous shock that temporarily paralyzed the nation's economic activity, transportation and distribution lines and closed the stock market. The Fed initially maintained its 3.5% Fed funds rate target but provided ample liquidity on demand to all commercial banks and financial institutions. The Fed lowered its target rate to 3.0% the following Monday, September 17, in coordination with the reopening of the stock market. Reserves and the monetary base temporarily surged and quickly reversed. The Fed's

actions were critically important in responding to the shock and helped to facilitate financial transactions and commerce without undue disruption. Following 9/11, concerns of an extended recession led to quick enactment of fiscal stimulus in early 2002, with some key provisions (that incentivized capital spending) applied retroactively to capital investments. The Fed's attention turned to "too low" inflation and concerns about the low probability but very high costs of deflation.

Concluding Observations

This review of Fed responses to an array of shocks finds a predictable pattern in which the Fed's first inclination has been to adjust monetary policy to offset the short-term impacts of the shock, largely without regard to the type of shock or the intermediate or longer-run impacts of its monetary responses to shocks. The pattern of responses also has been consistent with the Fed's historical tendency to respond more quickly to weakness in employment and labor markets than to higher inflation. Overall, the Fed has not heeded the advice that monetary policy should respond to demand shocks to smooth aggregate demand, but "pass on" supply shocks that temporarily constrain supply, and instead had tilted toward activist monetary policy and fine-tuning. Most glaringly, the Fed's elongated monetary ease in response to Covid based on the persistent view of "team transitory" is exactly what economics says the Fed should avoid. The Fed's responses to exogenous supply shocks and stocks stemming from misguided economic policies have contributed to an expansion of the Fed's monetary policy toolkit and the scope of monetary policy. In many cases, the Fed's monetary policy has generated unintended effects that have lengthened the negative impacts of the shocks and harmed economic performance.

Chart 1. The Great Inflation: Federal Funds Rate and Inflation

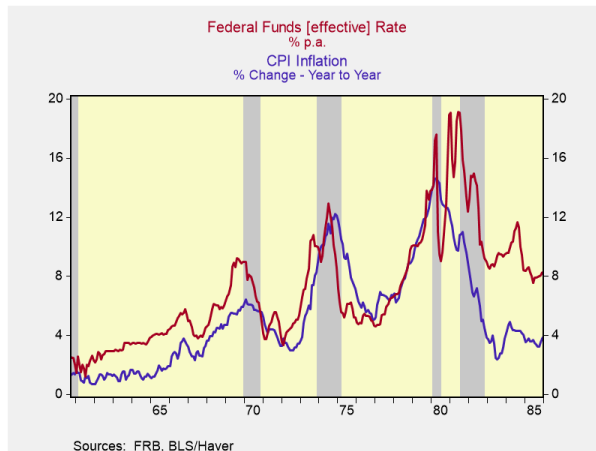


Chart 2. The Great Inflation: Nominal GDP and M2 Growth

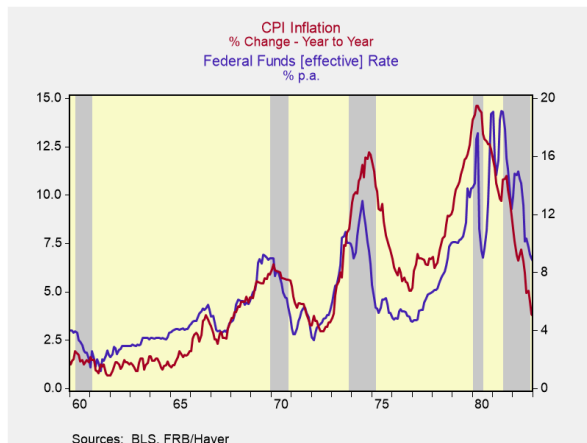


Chart 3. Fed Funds Rate and CPI and PCE Inflation

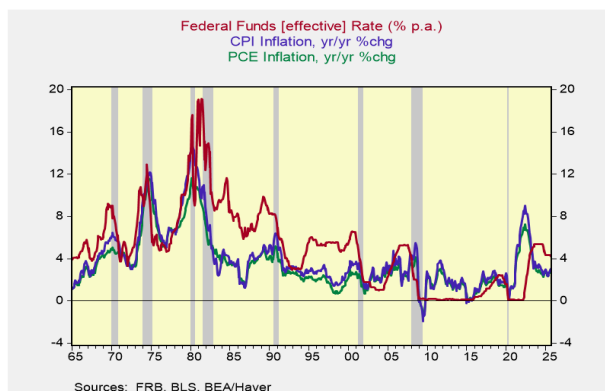
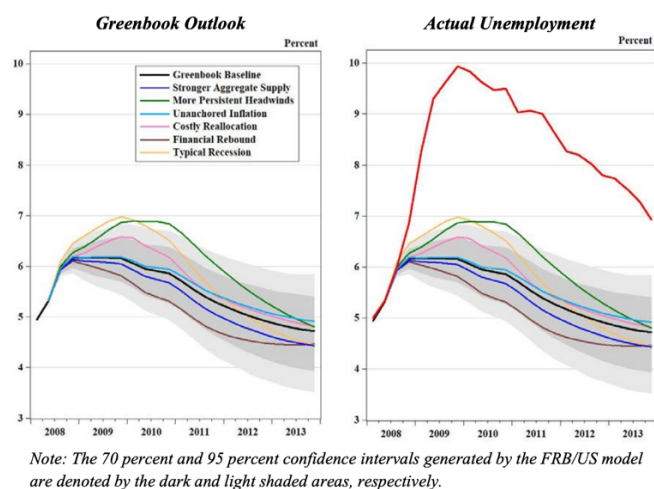


Figure 4: The Federal Reserve Staff's Assessment of Risks to the Economic Outlook as of September 10, 2008



Source: Bordo, Levin and Levy (2020).

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