

The Burst of High Inflation in 2021–22: How and Why Did We Get Here?

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Abstract: The current institutional arrangements for monetary policy delivered more than two decades of low and stable inflation. Yet, central banks failed to prevent a burst of high inflation in 2021-22. This paper inspects four tentative hypotheses for why this happened. The first is a misdiagnosis of the nature of shocks during a time of great uncertainty leading to an overly long period of expansionary policy. The second is a neglect of expectations data driven by a strong belief that inflation expectations were firmly anchored and so inflation increases would be temporary. The third is an over-reliance on the credibility earned in the past, creating an illusion of too much room to focus on the recovery of real activity and underpredicting the resulting inflation. The fourth is a revision of strategy that made central banks tolerant of higher inflation because of the trend fall in the return on government bonds, even though the return on private capital stayed high.

* This essay grew out of speeches and lectures given at Markus' Academy, the 2022 ECB Watchers conference, the BIS 2022 annual meetings, the 2022 annual Bradesco/BBI conference, the Norges Bank, the Hoover Institution's 2022 Monetary Policy Conference, and the CICC Global Institute. I am grateful to participants at these conferences for many comments, and to Marina Feliciano, Brendan Kehoe, and Borui Zhu for research assistance. Contact: r.a.reis@lse.ac.uk

Inflation in most western advanced economies has been rising at a fast pace since the middle of 2021. It was tempting (and too common) at the time to dismiss this rise in one of two ways. During the first half of 2021, some noted that there was a normal catch up of the price level after its sharp fall in 2020 during the pandemic. But this correction became a persistent acceleration by the second half of 2021, which gained further momentum in the first half of 2022, well beyond any reasonable catchup. Another dismissal came from remembering how central bankers had worried that inflation might be stuck at too low of a level between 2014 and 2019, for instance hovering around 1% and 1.5% in the Eurozone. Maybe a year or so of higher than 2% inflation was to be welcome. But, in April of 2022, the one-year inflation rate was 9.0%, 6.3%, and 7.5% in the United Kingdom, the United States, and the Eurozone, respectively. Quantitatively, inflation is so far above target that concerns of the recent past that inflation was too low seemed trivial.

Policy makers are worried, as they should be. More than a decade ago, Charles Evans, the president of the Federal Reserve Bank of Chicago and the current longest-sitting member of the Federal Open Markets Committee, said in a speech: “Imagine that inflation was running at 5 percent against our inflation objective of 2 percent. Is there a doubt that any central banker worth their salt would be reacting strongly to fight this high inflation rate? No, there isn’t any doubt. They would be acting as if their hair was on fire” (Evans 2011). Today, the reality of inflation is already well beyond Evans’ imagination, and some central bankers are feeling the heat in their heads. How did we get to this dramatic situation?

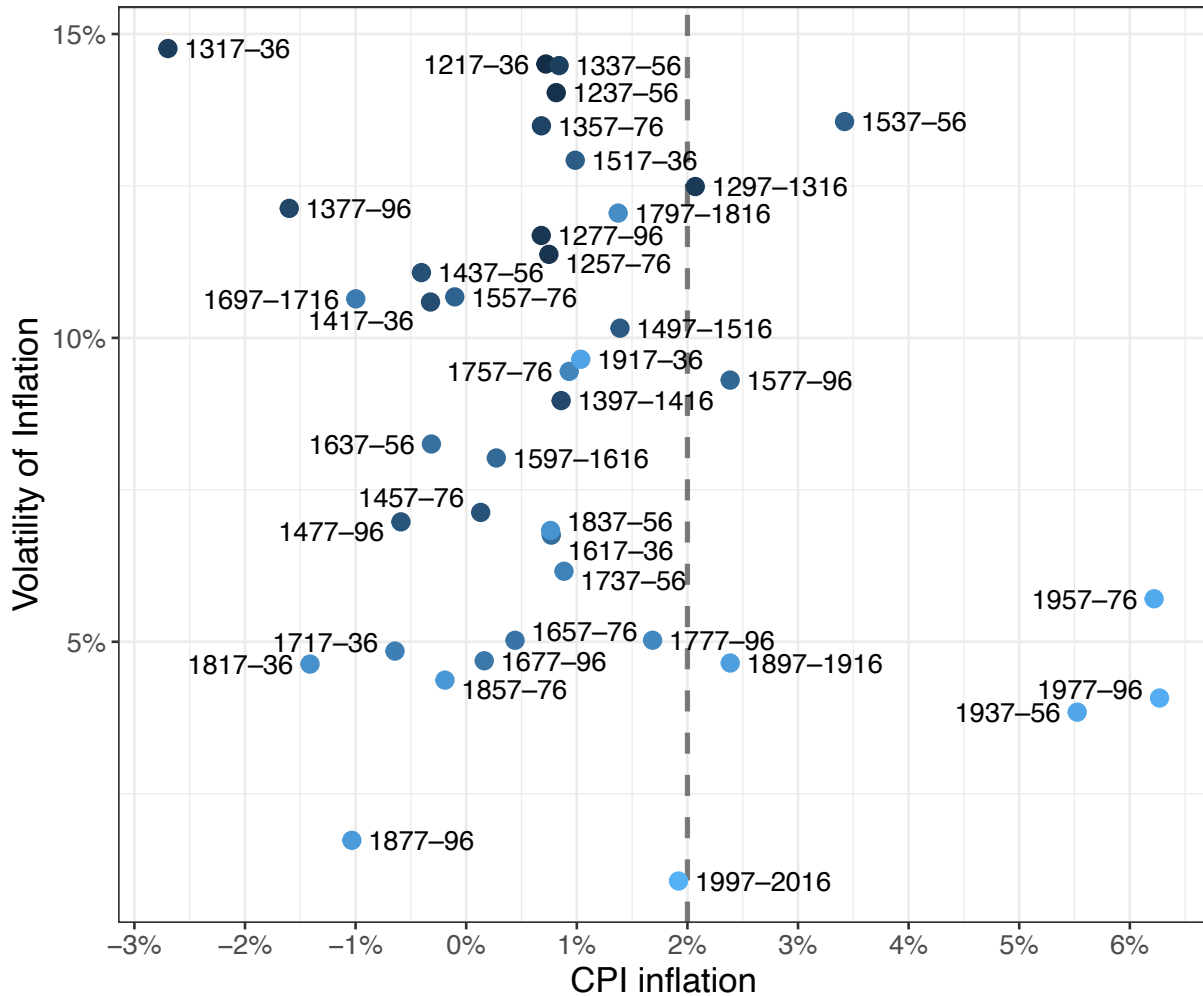
The following discussion puts forward four factors behind the recent rise in inflation. The guiding framework is the principle that, ultimately, monetary policy can control inflation. That control is far from perfect, coming with unavoidable misses, and often it is desirable to let inflation deviate from 2% for some time to try to meet other objectives. But, common to all four factors, is

a presumption that inflation rose because monetary policy became used to a state of affairs in the past decade and took too long to shift its stance. Rather than highlighting isolated mistakes in judgment, I point instead to underlying forces that created a tolerance for inflation that persisted even after the deviation from target became large. These factors suggest reforms for the future, as well as ways to put out the fire. Perhaps they are of use to the central bankers proving that they are worth their salt. I focus the discussion and the references on the ECB and the Federal Reserve, although the points apply more broadly to other central banks in advanced economies.

The Context: 25 Years of Price Stability

Before looking at what happened in 2021–22, it is important to step back, and recall how exceptional the previous three decades had been. Between 1995 and 2020, almost every major advanced economy enjoyed a remarkable period of price stability. I first produced a version of figure 1 in 2017 for a conference discussing the twenty years of independence of the Bank of England. It shows eight centuries of inflation in the United Kingdom, split into 20-year periods for which I computed the average and the standard deviation of inflation. Eight hundred years is a long time, and it included many experiments with monetary policy: from the gold standard to floating exchange rates, with monetarism and Bretton Woods thrown in the mix. Some of them got close to the recent past in terms of achieving an average inflation rate near 2%, but they had much higher volatility. A few had low volatility, but those came with persistent deflation. None worked as well in delivering low and stable inflation as the regime of the last twenty years. Never had monetary policy been so successful at controlling inflation as it had been in the two decades before the pandemic (Miles et al, 2017).

Figure 1. Eight Hundred Years of Inflation in the United Kingdom, 1217 to 2016



Notes: Data on the annual change in the Consumer Price Index, from the Millennium dataset of the Bank of England, grouped in twenty-year intervals. Horizontal axis has the absolute value of average inflation during twenty years minus 2%.

What does this successful regime consist of? In my view, it is based on three pillars. The first is granting central banks independence from the Ministry of Finance, so that managing the public debt and helping to balance the public finances is no longer a job for monetary policy, and no longer overrides concerns about inflation. It is also important to have independence from governments seeking re-election so that monetary policy is not systematically used to stimulate

the economy temporarily, a pursuit that often proves fruitless but results in high and volatile inflation.

The second pillar is the required balance to the first: for a public institution to have the power that we confer upon central bankers, then its mandate must be narrow, its actions transparent, and its performance measurable and routinely measured. The public has given central banks an inflation target that satisfies all these criteria.

The third pillar is the primacy of interest rates as the main tool of monetary policy, set in transparent and predictable ways. For most of this time, the interest rate was a short-term rate closely controlled by the central bank, but the period after the great financial crisis saw central banks “go long” by pursuing policies that would temporarily steer long-term interest rates in government bonds. Throughout, central bankers followed clear principles—like the Taylor rule or gradualism—that made their actions rule-like in allowing the private sector to understand where policy was heading and why.

There are endless debates on whether these three pillars are necessary or sufficient to deliver price stability. But it is unlikely it was a coincidence that inflation was so low and stable in a whole host of countries that followed these same three pillars, at different times and in different circumstances. I raise them because I fear that in the near future valid criticisms of central bankers' choices in the last year, or understandable outrages at how high and persistent inflation becomes, can lead to overreactions and entirely new regimes that come with volatility and may fail. The last twenty years showed that independent central banks setting interest rates to hit inflation targets can succeed. The water may need some cleaning or some change, but the baby should stay in it.

The First Factor: Shocks and Misdiagnoses

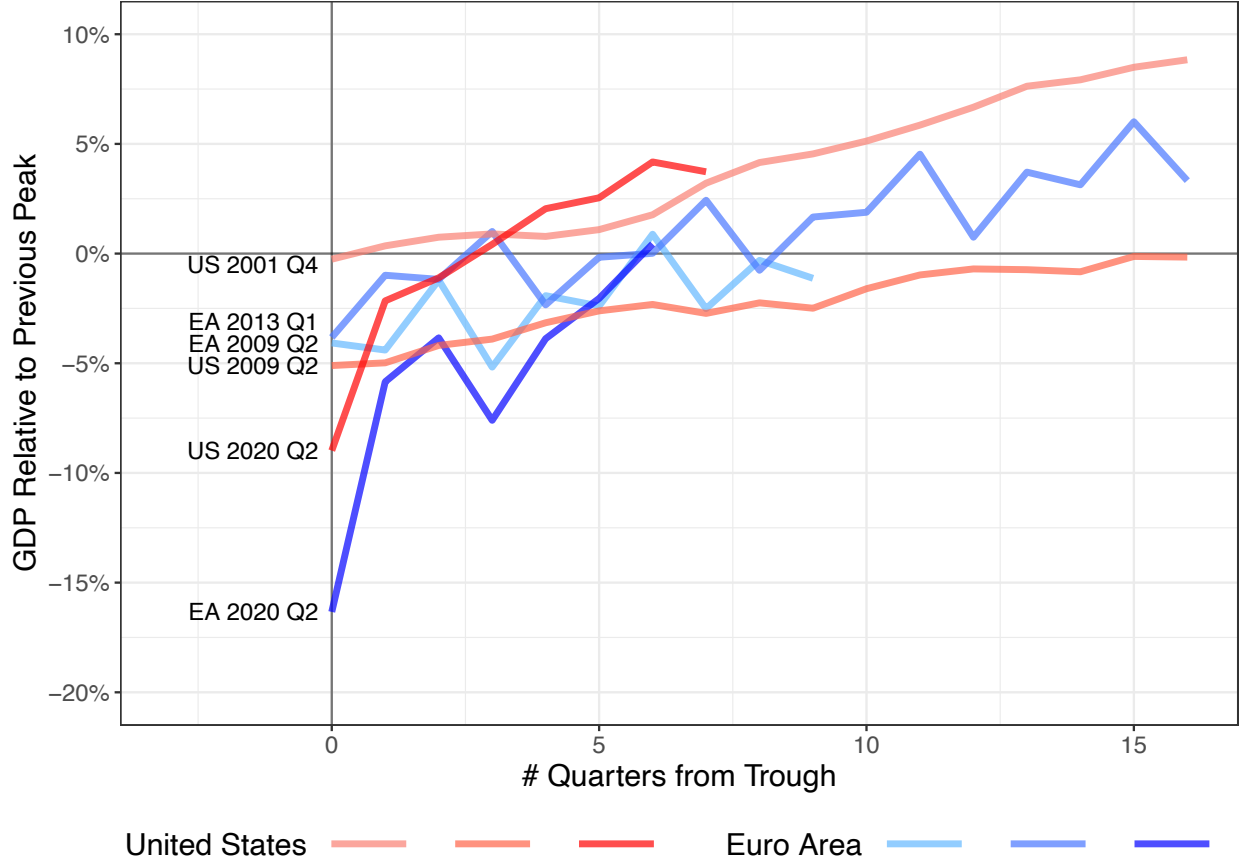
The years 2021 and 2022 saw large and unusual shocks hitting the economy. The job of central banks was especially difficult, and choices were made amidst great uncertainty on what the state of the economy was in real time and what the nature and persistence of the shocks affecting inflation were.

The first and major shock was, of course, the pandemic of 2020. At first, it justified a remarkable degree of monetary stimulus since there were legitimate fears of a depression. The Federal Reserve announced a schedule of asset purchases that made its balance sheet expand to a record share of GDP. The ECB gave forward guidance that deposit rates would stay negative extending well beyond one year. Perhaps over-influenced by the experience of the great financial crisis, many expected long-lasting scars from the Covid recession. Avoiding a slump demanded a strong response.

Instead, the economy rebounded quickly before 2020 was even over. Between the trough in 2020Q2 and the end of 2021, real GDP rose by 14.9% in the United States and 17.5% in the euro area. The unemployment rate fell by more than 10% in less than twelve months in the United States. Instead of scars and hysteresis, the economy showed an ability to intertemporally substitute production and consumption. After the lockdown of the second quarter of 2020, the economy responded in the third quarter with intense re-opening and economic activity. The private sectors became better at this intertemporal substitution with time, and when a larger health shock came at the end of 2020 with the delta wave (in number of infections, deaths, or any other health indicator) together with new lockdowns, the fall in production was smaller for the euro area, and inexistent for the United States. Figure 2 shows how quick, relative to its depth, the recovery was in comparison with the other recessions since the start of the century. Macroeconomic policy

deserves credit for this fast recovery. The social insurance programs of 2020 likely contributed to minimizing the scars and prevented consumers from becoming persistently pessimistic and unwilling to work or consume. Almost no bank failed during this time, and there was no significant crisis in any relevant financial market.

Figure 2. The Recovery from Recessions in the United States and the Euro Area



Notes: Change in real GDP per capita from trough for 4 years afterwards unless a new peak is reached (or the present is reached) according to the recession dates of the CEPR-EABCN and the NBER.

At the same time, the recovery came with inflation. The framework of the Phillips curve says that deviation from steady state inflation can come from three direct channels. The first is the expected inflation by households and firms. The second is a deviation of real activity from a potential level of output that is determined by technology and costs. The third is a markup shock

that introduces a gap between the potential and efficient levels of output. While different models of price stickiness come with different concrete causes behind each of these three forces, this organizing framework has repeatedly been useful to interpret inflation dynamics arising from shocks.

The fast recovery is an example of the second force driving inflation up. Because tighter monetary policy can work through the same force in the opposite direction, it can stabilize the output gap and inflation with it. However, monetary policy was kept loose in 2021. Additionally, the direct transfers to households and firms in 2020 had led to an accumulation of savings and an explosion in broad monetary aggregates that provided the balances for a boom in spending once the economy re-opened. The fiscal stimulus at the start of 2021 in the United States (the American Rescue Plan of 2021) further raised aggregate demand, likely to a level above the potential output of the economy. The amount of fiscal and monetary stimulus in 2020 was perhaps excessive, although this judgement comes with the benefit of hindsight. A more pertinent criticism is that policy did not reverse course until at least the end of 2021, even as the signs that the fast recovery was leading to overheating became clearer. This slow reversal is perhaps best explained by the forward guidance given in 2020, serving as a constraint in 2021 on what central banks thought was admissible without defrauding expectations.

A second set of shocks compounded the inflation problem in 2021. They had their origin in the supply sector. At different times during the year, ports became clogged, the production of microchips hit capacity constraints, and global value chains broke down as new waves of the pandemic led to a closing of borders. These bottlenecks are shocks to the supply of goods in the economy that reflected themselves differently in different countries. Yet, the diagnosis of central banks was similar across the advanced economies. In terms of the Phillips curve, policy makers

interpreted all these shocks as temporary markup shocks, the third channel. As such, they concluded that they should not reverse the stimulus stance of monetary policy and not jeopardize the recovery. The standard monetary policy prescription against a temporary markup shock is to let inflation rise above target so that, even if actual output rises above potential, it stays close (or slightly below) the efficient level of output.

This diagnosis was suspect, both at the time and in hindsight. Many of these shocks can just as well be interpreted as shocks to the potential level of output. For instance, the problem with global supply chains affects the actual technology used to produce goods, not just the market power of firms. Moreover, if the shape of globalization is going to change, as some have argued, this will most likely affect the productive capacity of the economy. So, if inflation was rising because of the second channel through lower potential output, as opposed to the third through higher deviations from the efficient level of output, the policy prescription would be instead to tighten monetary policy and to keep inflation on target. Simply put, persistent and recurrent negative supply shocks to potential output will make the economy poorer: inflation cannot change this, nor can monetary policy.

Energy prices were the third shock. They had been rising since 2021, and sharply increased in 2022 with the Russian invasion of Ukraine. The ECB responded again as if this was a temporary markup shock, as opposed to a shock to potential output. Policy tolerated a sharp increase in inflation, predicting it to be short-lived. It was a defensible priority to strive to avoid mistakes of the past, when hikes in oil prices would raise inflation, trigger tighter monetary policy, and cause a recession.

Yet this “see through the shock” policy is a prescription of the literature only if inflation expectations are anchored. Otherwise, the sharp increase in the prices of energy will have an over-

sized impact on household expectations as the first channel of the Phillips curve becomes operative, further pushing inflation up. Not only did central banks again interpret a supply shock as being a shock to markups, as opposed to potential output, but they relied on expectations being anchored. Yet, large changes in household costs of energy are salient to households and can easily unsettle their expectations.

Three times in a row in a short period of time, a set of shocks pushed inflation up. Three times in a row, monetary policy interpreted them using the lenses of the Phillips curve in the direction that concluded that monetary policy should be kept loose. Three times in a row, this diagnosis was plausibly right but disputable, and the risk was that inflation would rise too much and too persistently. After the fact, in all three cases this risk became reality. A policy framework should be robust to shocks, and it should correct misdiagnoses. So many successive errors in the same direction indicate more systematic problems. The next three factors point to three such problems.

The Second Factor: Expectations

No central banker would deny the importance of inflation expectations for the control of inflation. Over the last decade, expected inflation was very sticky, so that its measurements reflected mostly noise with little signal. Household surveys of inflation expectations invariably returned an answer of 2%, which in every wave was polluted by measurement error. Only through careful econometric work were researchers able to uncover interesting patterns that allowed for scientific progress in understanding expectations and inflation. In turn, data from financial markets likewise reflected mostly changes in risk attitudes as well as financial shocks which introduced noise beyond the expected inflation signal. Inflation expectations were solidly anchored because

of the success of the past. Staffers at the forecasting team of central banks were justified in ignoring expectations data in their econometric models (Coibion et al., 2018).

The experience of 2020 confirmed this view. Despite a few months of sharp deflation, followed by sharp month-to-month inflation, expectations of inflation stayed remarkably stable. The trust that central banks placed in the anchor is evident in the speech by Jerome Powell at the August 2021 Jackson Hole Economic Policy Symposium. The speech discusses data from inflation expectations and concludes that: “Households, businesses, and market participants also believe that current high inflation readings are likely to prove transitory and that, in any case, the Fed will keep inflation close to our 2 percent objective over time” (Powell 2021). There was nothing to see, and the anchor was firmly in the seabed.

In fact, before inflation started rising, central bankers were mostly worried about the possibility that expectations might be anchored at levels of inflation that were too low. In the presentation of the Federal Reserve’s new framework in the 2020 Jackson Hole speech, Powell discussed the problem of an “adverse cycle of ever-lower inflation and inflation expectations” (Powell 2020). The ECB, in its revised monetary policy statement wrote: “In particular, when the economy is close to the lower bound, this requires especially forceful or persistent monetary policy measures to avoid negative deviations from the inflation target becoming entrenched” (European Central Bank 2021).

Relying on anchored inflation expectations and focusing on the downside risk has consequences for monetary policy. First, with expected inflation equal to a constant in the Phillips curve framework, one of the main drivers of inflation is absent. Second, a temporary rise in inflation expectations is welcome. If the fear is that of a deflation trap, then a rise in inflation expectations is a way to escape the adverse cycle in the Powell quote above. Third, a rise in actual

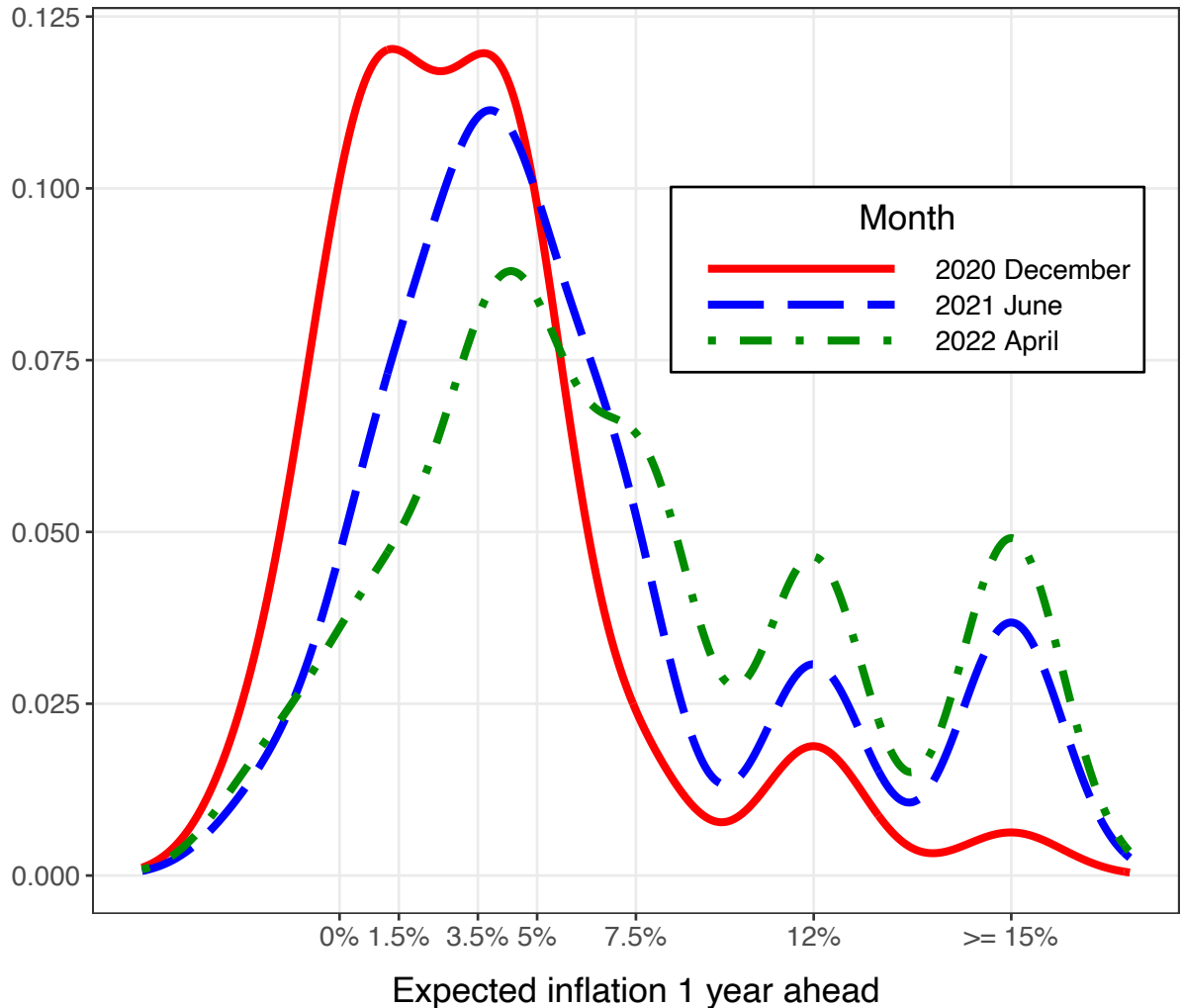
inflation is likely to be transitory. If expectations stay anchored, they pull inflation towards them, making most inflation shocks temporary. These three consequences are interlinked: if expectations are solidly anchored, then even sharp rises in inflation will only move them up a little, with no risk that the anchor would go adrift.

However, already halfway through the year 2021, the data showed that expectations were not so well-anchored. In line with modern research, the key was to look beyond the measure of central tendency from household surveys and to focus on measures of disagreement. Figure 3 shows three snapshots of the distribution of one-year ahead inflation expectations in the University of Michigan Surveys of Consumers household expectations. In the first half of 2021, the skewness started rising. That is, a rising share of households started expecting that inflation would be higher, even as the median changed little. Then, it was the standard deviation that rose decisively as more and more households joined the group of pessimists. By 2022, the shift of the distribution to the right was such that the median was rising quickly as well.

This three-stage movement in the distribution of expectations is not unique to 2021–22. Looking back to the end of the 1960s in the United States, again the distribution of survey inflation expectations shifted slowly to the right, and this was seen first through an increase in skewness, then a rise in standard deviation, and finally the rise in the median (Reis, 2022a). This process took a few years back then, as opposed to less than one year in 2021–22, but qualitatively it was similar. In the other direction, between 1980 and 1985, as inflation sharply came down, again it was first skewness, then standard deviation, and finally median that moved as the distribution shifted to its new anchor. Another common feature of these three episodes is that the surveys of professionals lagged those of households, and after the fact turned out to be the more sluggish and less informative source of data. In normal times, the opposite happens, as household survey data lags

professional surveys and is less accurate, but during these three past large changes in inflation, household data were more informative.

Figure 3. The Distribution of U.S Household Survey Inflation Expectations Through 2021–22



Notes: Data from the University of Michigan Surveys of Consumers household expectations for 1-year ahead expected inflation.

The data in 2021 revealed that a large change in expectations was under way. The expectations anchor had left the seabed after a couple of decades during which it had barely moved. Perhaps this was the result of the shocks that hit the economy, or perhaps it was a result of the loose monetary policy that accompanied them. Bad luck played a role, as some of the relative

prices that moved the most in 2021 (like gas prices or cars) were among those most visible to consumers, who will tend to overreact to them when forming their expectations. Once central banks allowed inflation to rise, those realizations themselves fed into households anticipating higher expected future inflation. A temporary inflation shock becomes persistent if the expectations anchor moves with it.

The Third Factor: Credibility

Sharp movements in expected inflation over the next year are alarming for the persistence of the shock. But if expectations of the distant future continue to be stable, the damage for inflation will be limited. The credibility of an inflation-targeting central bank is ultimately measured by whether expected long-run inflation is equal to its target. In the long run, money is neutral, the Phillips curve is (nearly) vertical, and expected inflation matches actual inflation. If the central bank manages to convince economic agents that inflation in the long run will be on target, then most of the work of keeping its actual value on target in the long run will have been done.

In 2021, it was justified to rely on having significant credibility. After all, such credibility had been earned after more than 20 years of inflation very close to 2%. Central banks can enjoy a “capital of inattention” in that people do not pay much attention to what the central bank is doing, trusting it will deliver inflation on target over the next few years. One important consequence of this credibility is that it will make the negative relation between inflation and real activity appear to be flatter. As people and firms are inattentive, and update their wages and prices less often, the extent of nominal rigidities in the economy rises, making monetary policy more powerful in affecting real activity. Relying on this credibility, the central bank can exploit short-run tradeoffs between inflation and real activity to try to improve welfare. Policy makers will appear more

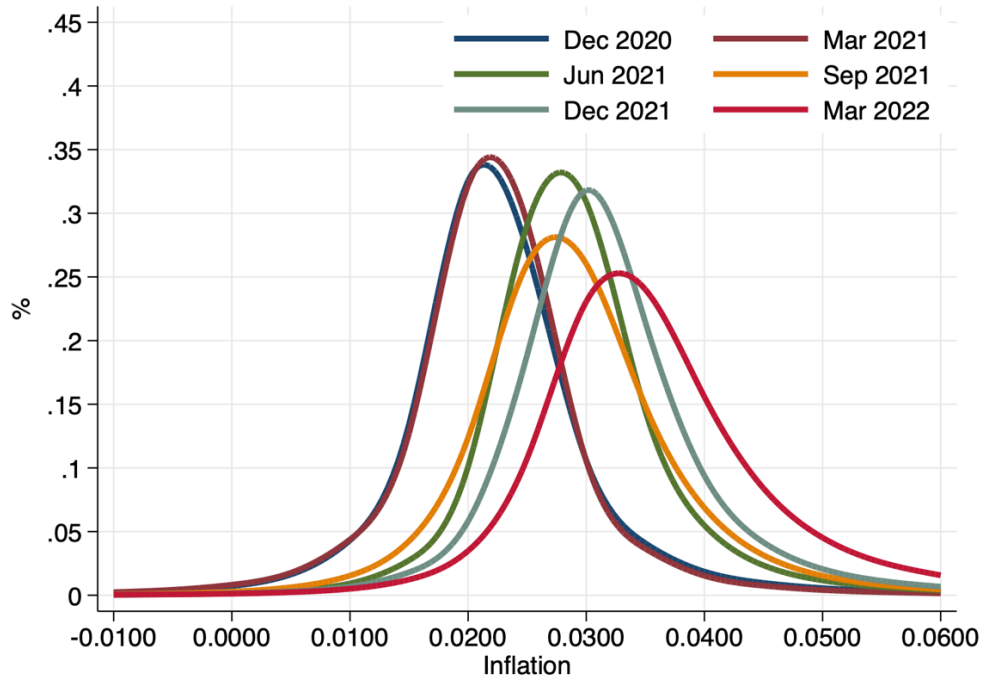
“dovish” because mistakes in policies are more likely to cause recessions than to cause high inflation. In 2021, facing an unusual amount of uncertainty about the shocks hitting the economy and their ability to measure fast-moving indicators, central banks leaned heavily on their credibility by allowing inflation to rise above target to offset the impact of these shocks on real activity. As long as they had credibility, inflation would only rise moderately.

It is hard to survey households on what they expect inflation to be in the distant future. Instead, the dominant measure of credibility comes from financial markets. The most used measure is the 5-year, 5-year forward inflation expected rate. Using either inflation swaps or nominal and inflation-indexed bonds over 5- and 10-year horizons, it computes what the expected inflation will be starting in 5 years, on average over the succeeding 5 years. Looking at April 21, 2020, 2021, and 2022, this measure increased from 1.34% to 2.13% and then to 2.67%, respectively, in the United States. Since market measures include a premium for inflation risk, even the more recent number is maybe only slightly above a 2% inflation target.

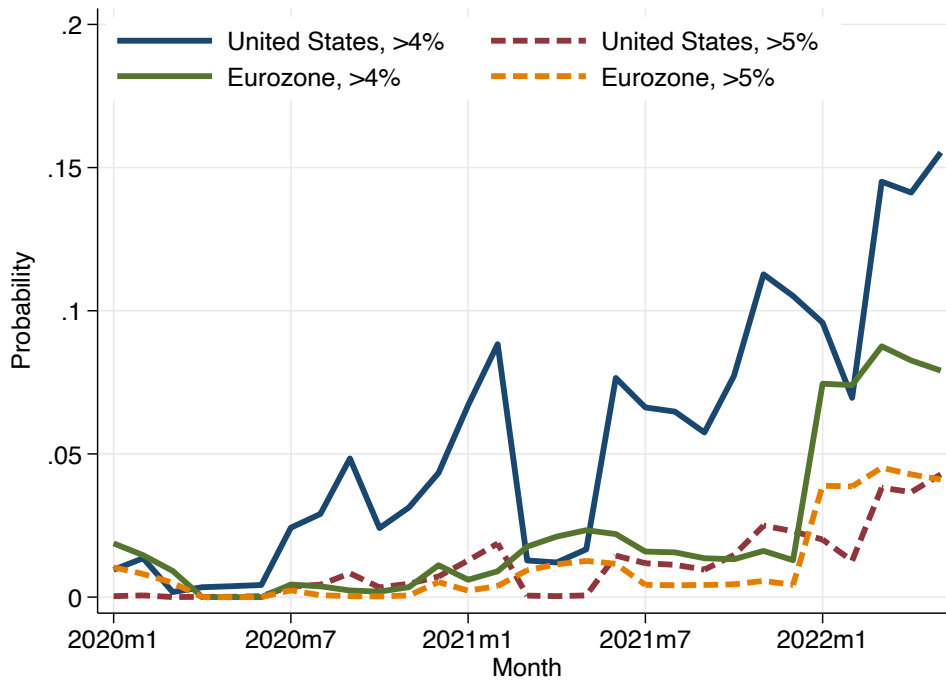
However, again the average hides what is behind it in the distribution. Looking beyond the mean gives more cause for alarm. Recent research has developed methods to use option prices to inspect these distributions and, especially, to accurately capture the probabilities of the tails (Hilscher et al, 2022). The top panel of figure 4 shows these distributions for the 10-year horizon in the United States throughout 2021. While the average rose little, there was a clear shift to the right. Especially during the second half of the year, this shift came with a quick accumulation of mass on the right tail. The distributions became increasingly asymmetric as upside risks to inflation became dominant.

Figure 4. Measurements of Credibility of the Federal Reserve from Options Markets

a. Probability densities for average risk-adjusted inflation over the next ten years



b. Tail probabilities of a 5-year, 5-year inflation disaster in US and EZ inflation



Notes: Estimates using the methods in Hilscher et al (2022). The top panel shows 10-year distributions including risk premia. The bottom panel shows actual forward probabilities over a 5-year, 5-year horizon.

The bottom panel of figure 4 focuses on that right tail by presenting probabilities that reflect how much market participants are willing to pay to insure themselves against an “inflation disaster,” a scenario where inflation is persistently higher. To do so, these estimates adjust the tails from the top panel to take out the compensation for risk, and they set the horizon to 5-year, 5-year so as to focus on credibility, as opposed to pessimism about the immediate few years. The numbers therefore measure the current date market-perceived probability that average inflation will be more than 4% starting in 5 years, over the following 5 years. If central bankers are risk managers, they should care more about these disasters than about the average outcome that was so often cited in 2021.

In the United States, this probability rose steadily from the middle of 2021 onwards. By the last date in this sample, April of 2022, it was 16%. Investors were paying a high price to insure against the chance that the Federal Reserve would, considerably and persistently, miss its inflation target between 2027 and 2032. This reveals a lack of credibility of the Federal Reserve. Credibility in the inflation target of the ECB stayed high until the end of 2021. But then, the perceived disaster probability jumped up very quickly to 8%. This is less than in the United States, but it still puts a considerable dent into the faith that credibility has remained intact.

Seeing these numbers, relying on credibility of the inflation target to offset policy shocks by letting inflation rise is a bold and risky move.

The Fourth Factor: R-star and the Tolerance of Inflation

In 2019, both the Federal Reserve and the ECB announced they would be revising the framework that guides their monetary policies. When presenting the result of this work at the 2020 Jackson Hole conference, Jerome Powell cited as one of its important motivations the “...fall in

the equilibrium real interest rate, or ‘r-star.’” In turn, in the overview document that the ECB released presenting its own reviews, the first justification offered for why it was needed was that “structural developments have lowered the equilibrium real rate of interest.”

This r-star refers to the real interest rate at which savings are equal to investment and output is at its potential. It is often interpreted and measured as the long-run steady state for real returns in the economy. Sometimes it is called the neutral rate of interest because, in New Keynesian models, having the nominal interest rate of the central bank above r-star plus the inflation target captures contractionary policy. Conversely, if the policy rate is below r-star plus 2%, then policy is understood to be expansionary, putting upwards pressure on inflation. R-star is difficult to estimate because it is observed in an equilibrium that is never reached but estimates that it has fallen make it more likely that monetary policy is contractionary for any given level of the policy rate.

If r-star is indeed lower, it is more likely that when the central bank needs to lower policy rates aggressively to push up inflation, it will find itself unable to do so. It would require policy rates that are below their “effective lower bound” (ELB). Therefore, monetary policy will sometimes be insufficiently expansionary. In principle, this would lead to too little inflation. The central bank can “go long,” trying to affect longer-term interest rates by using forward guidance and quantitative easing to provide further expansion, but this may not be enough.

Matters can get worse. If agents start expecting deflation, and the central bank cannot lower interest rates, then this breakdown of the Taylor principle because of the ELB makes deflation self-fulfilling. As Powell’s 2020 speech noted, in that case, the economy may enter an “adverse cycle of ever-lower inflation and inflation expectations,” leading the economy to become stuck in a deflation trap. A long academic literature suggests that, to escape this trap, central banks must

find a way to commit to delivering high inflation, above the target, in the future. Future higher inflation would boost current inflation, and on average deliver inflation on target.

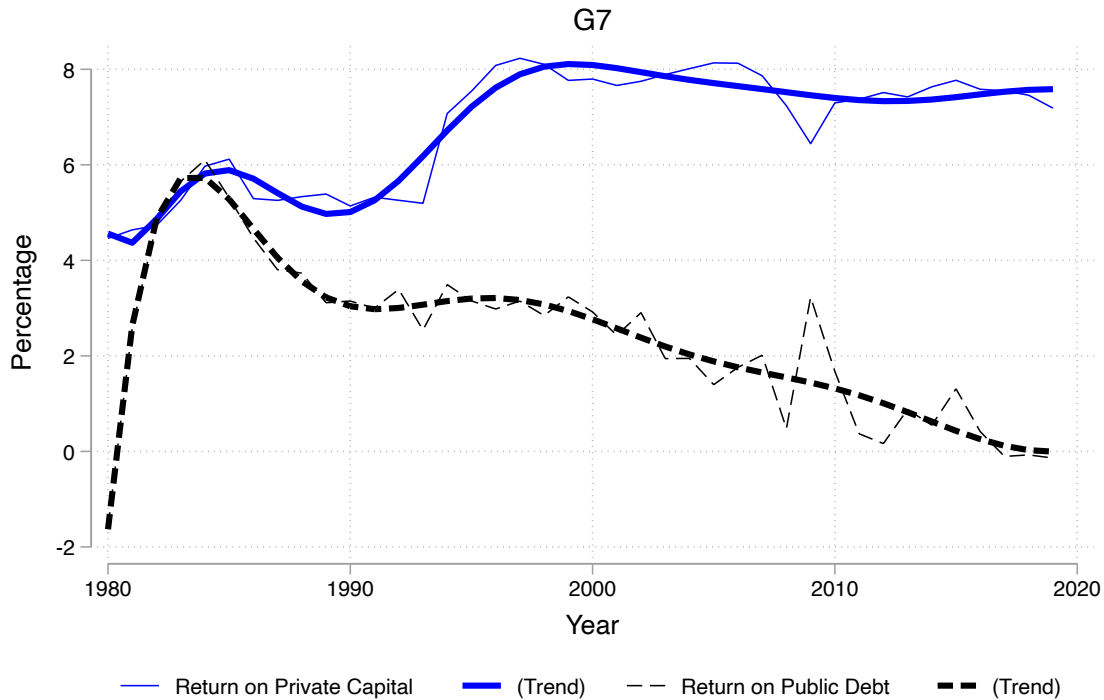
An emphasis on a low r -star also leads to a focus on providing stimulus to aggregate demand. In economies at the ELB, aggregate demand is too low. The economy is persistently operating below capacity, so that the looser monetary policy can be, the better. This logic extends to fiscal policy, and thus to embracing large deficits and to not worrying about the public debt (which, anyway, now pays a lower interest rate). Policies based on supply, in contrast, are less important. At the ELB, the opportunity cost of liquidity is close to zero, so firms should have access to abundant liquidity and credit. Improvements in aggregate productivity may even backfire and lower output if they lower inflation expectations.

Putting it all together, if r -star has fallen, then central banks increasingly start to worry about deflation because of inevitably tight monetary policy even with interest rates near zero. They welcome inflation rising above target, and they focus on perpetually boosting real activity and providing more and more stimulus. Both the Federal Reserve and the ECB's mission reviews moved in this direction. But has r -star fallen?

Figure 5 shows that the ex-post return on long-term government bonds has fallen in the G-7 countries over the last twenty or thirty years. Short-term government bond yields were close to the ELB for many years including 2021. Monetary policy was certainly constrained in providing more stimulus. But the theoretical concept of r -star refers to an equilibrium between savings and investment in the overall economy. Why would this happen in the government bond market? In fact, in the standard neoclassical growth model that defines the output potential in many modern macroeconomic models, the interest rate on government bonds is irrelevant, as government bonds are not net wealth. It is the marginal product of capital (and time preferences) that determine where

savings equal investment. The return on government bonds is only useful because with efficient and complete capital markets, it provides a risk-free measure of the relevant r-star, which conceptually is the return to capital in the economy.

Figure 5. Estimates of R-star from Returns on Government Bonds and on Private Capital



Notes: Estimates from Reis (2022b).

Closer to the concept of r-star is to measure the return on investing in the private capital stock. Doing so using financial returns is a thankless task because, as the Modigliani-Miller theorem states, the return on capital can be split in many ways between different financial claims, and these have likely changed over time. Instead, figure 5 shows a measure of the return to capital using the income flows in the aggregate economy. Namely, it starts with value added in the economy, subtracts payments to labor and depreciation, and divides it by the private capital stock. It is therefore a measure of the average return from owning capital in the economy every year,

whether those came from profits or costs of finance, or from the payout of loans, bonds, dividends, or others. This measure of r -star has been remarkably constant over the last twenty years. There is no downward trend in it.

There has been a trend increase in the difference between the return in the private economy and the return on government bonds. Perhaps this is a sign of misallocation of capital away from private investment in the capital stock and towards financial investments. It may also reflect an inability of capital markets to fund enough investment to bring the marginal product of capital down. Or, perhaps it reflects an increasing “specialness” of government bonds in providing safety, liquidity, convenience, or some other service that attracts an excess demand for them and justifies their paying an inferior return. Whichever it is, the data suggests that r -star may have been constant, or it may have fallen, but the difference between private and public returns has definitely risen.

This perspective—non-decreasing return to private capital and an increasing wedge between it and the return on public debt—changes the focus of monetary policy (Reis, 2022b). First, promising to increase inflation in the future to raise inflation expectations becomes less appealing. Doing so still lowers the real interest rate on government bonds and boosts consumption at the ELB, so it is still an effective policy. However, now it only raises investments if it can reduce the real return on the private capital stock, which it may or may not be able to do. Therefore, all else being equal, it is likewise less stimulative. The costs of higher inflation may start offsetting its benefits.

Second, and related, the priority of escaping the ELB is no longer as overwhelming. Policies that raise the r -star measured with government bonds may relax the constraint on monetary policy. But if these policies do not close the gap to the return on private capital, or even raise the

r-star measured with private capital, then they may backfire. They will crowd out investment and potentially lower real activity.

Third, to exit a situation of a persistent deflation trap and accompanying stagnation, lowering the gap between the return on private capital and the return on the public debt is an alternative strategy. This logic points to working on the supply side of the economy, focusing on what is disturbing the allocation of savings. It gives a different focus to the one underlying the recent mission reviews with their focus on aggregate demand. It instead leads to thinking harder about how financial regulation may be helping or hindering an effective allocation of capital, or to what extent asset purchases by central banks have aided or distorted the allocation of capital, to give two examples.

Finally, lower interest payments on the public debt allow for a higher level of public debt to be sustainable. But, if the source of these lower payments is a rising gap between the return on private capital and the return on government debt that is induced by the specialness of public debt, then monetary policy should ask how it contributed to that specialness. In particular, the remarkable achievement in stabilizing inflation over the last twenty years may be related to that rising gap. It has meant that one of the major risks in lending to the government, which is inflation, has disappeared. This suggests that if higher inflation comes with more volatile inflation, and hence higher inflation risk premia, then this may well close the gap between the two rates of return by raising the return that bondholders require on public debt. This would hurt debt sustainability. Delivering on the mandate of price stability becomes even more important (Reis, 2022c).

Conclusion

The rise in inflation in 2021–22 is such a dramatic event that it will likely spur a large literature and a heated debate in trying to explain it over the next many years. Perhaps it may even trigger regime changes in how monetary policy is conducted. In the short run, it is surely leading to changes in policy to bring inflation back on target.

This article made some contributions to this analysis. It started by reminding that the institutional regime that is in place today, based on independent central banks with inflation targets that set interest rates predictably, has served the advanced economies very well over the previous thirty years. It seems unwise to throw it out after one year of high inflation.

Second, it put forward four structural causes for why inflation rose so much. Common to all of them is a presumption that if inflation rises, it is because the central bank allowed it to rise. Every year has its shocks hitting the economy and its challenges for central banks. The past always seems rosier in comparison with the turmoil of the present. But theoretically, the institutional regime described above is predicated on the principle that ultimately the central bank can always use its tools to rein in inflation around its target on average over a few years. When it allows inflation to deviate significantly from target in the short run, it is by choice, in trading-off other objectives. Empirically, over the last two decades, dozens of countries all over the world adopted this institutional regime under all kinds of circumstances and facing all types of shocks. Almost all and almost always they were able to deliver low and stable average inflation.

The first of the causes for the failure this time was that the unusual and large shocks of 2020–22 were almost always diagnosed in a way that justified keeping monetary policy extremely loose. The fast recovery of 2021 was not enough to trigger a quick reversal on previous forward guidance since the focus was on real activity. The succession of supply shocks was all interpreted

as temporary markup shocks as opposed to persistent changes in potential output. As a result, purposely allowing inflation to overshoot its target was seen as optimal and desirable. That is, until it became too large to justify.

The second cause was a steadfast belief that inflation expectations would stay anchored, as they had been for two decades. This belief led to relying on surveys of professionals and on the median expectation of inflation from household surveys to support this strong prior. The distribution of survey inflation expectations and the historical experience with regime shifts pointed elsewhere already in the second half of 2021, and this became clear in 2022. Missing the drift of its anchor, central banks underestimated the persistence that the deviations of inflation from target would have.

The third cause was an over-reliance on the credibility of monetary policy. The capital of inattention that the central bank had earned in the past would have allowed it to focus on real activity or other parts of its mandate during an uncertain time. Yet, either by bad luck or by leaning too hard on this past credibility, some of it was lost, producing an upward spiral of inflation when output rose above potential.

The fourth cause was the influence of estimates of a falling and low r -star in the revision of the frameworks for monetary policy. These led to a determination to fight low inflation, and an increased tolerance for inflation above target, as well as a focus on stimulating the economy through aggregate demand. When inflation started rising, this contributed to not fighting it as vigorously as otherwise might have been the case. The r -star that comes from private returns has been constant, and the rising gap between those returns and those on public debt suggest that a different set of policies might have been warranted.

This paper proposed these causes as hypotheses. While there is a strong case that they played a role, future research will tell if they were quantitatively the most relevant. For now, facing the challenge of bringing down inflation, they suggest that policies in the near term may involve: (i) accepting lower levels of real activity in the future, (ii) acting vigorously and sharply in the near future with raising interest rates to re-anchor expectations, (iii) re-stating as loudly and convincingly as possible the primacy of price stability as the goal that guides policy, and (iv) revising upwards the relative costs of high inflation while re-focusing on aggregate supply policies.

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