GETTING GLOBAL MONETARY POLICY ON TRACK

EDITED BY

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POLICY PANEL

INTRODUCTORY REMARKS

John B. Taylor

I'm always very pleased to chair our panels of policymakers. There's nothing like hearing from the people who have their hands on the tiller, making the decisions. So it's really a privilege for me to have Amir Yaron, the governor of the Bank of Israel; Austan Goolsbee, president of the Federal Reserve Bank of Chicago; and John Williams, president of the Federal Reserve Bank of New York. So thank you very much for being here. Anyway, the title is "Policy Panel," which means you can talk about whatever you want, and I know that Amir is going to start by talking a little bit about Israel, so please proceed. Thank you.

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Monetary Policy in Small Open Economies

Amir Yaron

The Federal Reserve's monetary policy significantly affects small open economies' (SOEs') inflation, yet its monetary policy exhibits significant variations in the strength and timing with respect to the Fed. The variation in SOEs' policy reactions is influenced by factors such as the economy's exposure to global shocks, the effectiveness of monetary policy transmission, the central bank's policy objectives, and the exchange rate position.

Synchronization and Divergence in Monetary Policy Response

Despite the diversity in economic structures, there is a notable commonality in business, inflation, and interest rate cycles across both large and small economies. However, the strength and timing of monetary policy responses among SOEs vary significantly. Some economies choose to raise interest rates proactively relative to the major central banks, while others adopt a more cautious approach and delay rate hikes. This variation is influenced by factors such as the economy's exposure to global shocks, the effectiveness of monetary policy transmission, the central bank's policy objectives, and the exchange rate position.

Figure 21.1 illustrates this variation by showing a particular notion for the restrictiveness of monetary policy during the current interest rate cycle. The graph in the figure illustrates the central bank's

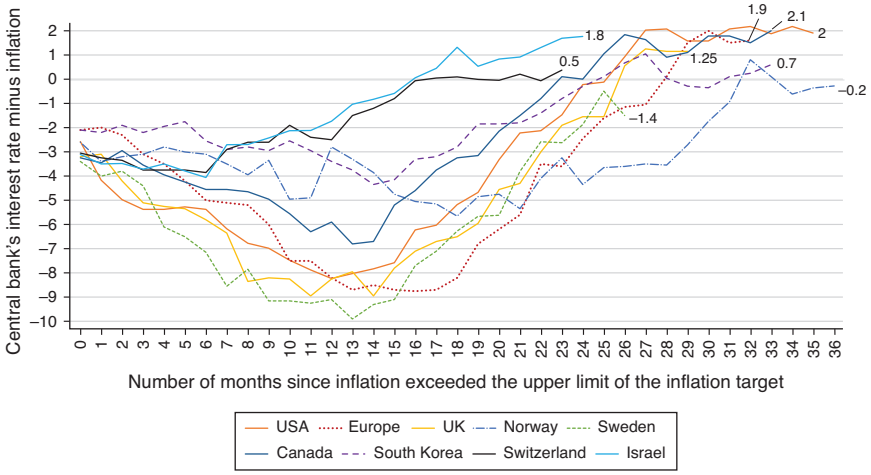

FIGURE 21.1. The central bank's interest rate minus inflation (*y*-axis) and the duration of deviation of inflation from its target (*x*-axis) for nine countries.
Source: Governor's Office at the Bank of Israel based on data from OECD and Bloomberg.

interest rate minus inflation versus the duration of deviation of inflation from its target across different economies.

This variation is also reflected in the timing of interest rate increases relative to the Federal Reserve's raise. Some SOEs raised rates before the Fed did, while others waited and adjusted their rates afterward.

In the current cycle, economies that raised their rates after the Fed did experienced a faster decline in inflation, as can be seen in figure 21.2.

We first investigate the impact of US monetary policy on the inflation of SOEs. To do so, we employ a widely accepted method in the current literature, building on the work of Gürkaynak, Sack, and Swanson (2005) and Gertler and Karadi (2015). We examine the change in US one-year-forward bonds within a narrow window around the Federal Reserve's interest rate announcements. The underlying assumption is that this change

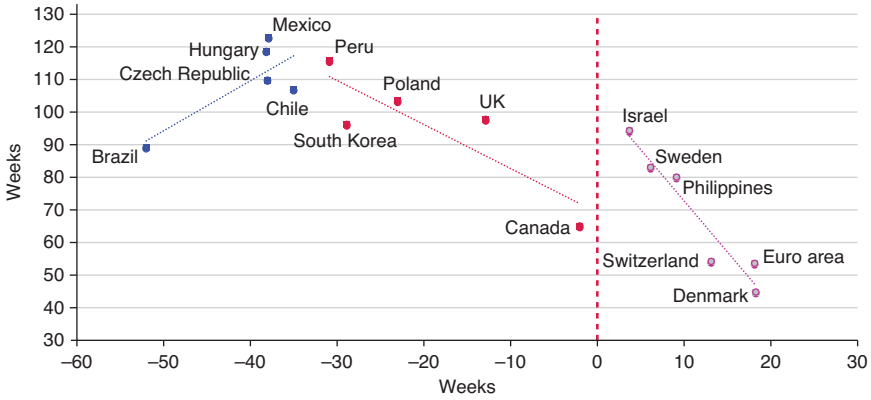

FIGURE 21.2. Date of the start of the interest rate hike (*x*-axis, weeks) in relation to that of the United States (0) and the time until inflation fell to half its peak (*y*-axis, weeks).

Source: Governor's Office at the Bank of Israel based on data from OECD and Bloomberg.

captures the surprise element in the Fed's policy decision, as it represents the difference between the market's expectations before and after the announcement. The outcome variable is the average inflation of small, open, and advanced economies. Our empirical strategy follows the local projections approach, as introduced by Jordà (2005), which allows for a flexible estimation of the dynamic responses to policy shocks, using monthly data from January 1995 to July 2023.

Figure 21.3 shows that US monetary policy has significant influence over SOEs' inflation. The effect is also quantitatively strong—a 100-basis-point rise in the Fed's interest rates lowers average inflation in SOEs by 4% over twenty months. This effect is present even after controlling for countries' own interest rates, and thus the Fed policy can be viewed as providing a headwind in driving inflation in SOEs.

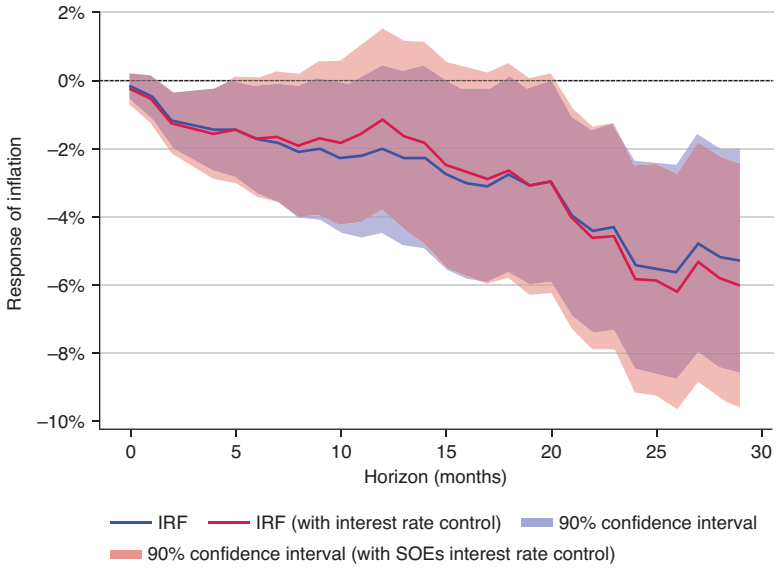

FIGURE 21.3. Impact of a 100-basis-point fed rate shock on average inflation in SOEs.

Source: Governor's Office at the Bank of Israel based on data from OECD and Bloomberg.

Channels of the Fed's "Headwind" on SOEs' Inflation

US Weakened Global Demand

One significant channel through which US monetary policy affects SOEs is by weakening global demand. When the Fed raises rates, it exerts a disinflationary pressure on SOEs through multiple mechanisms. First, higher US interest rates lead to a stronger dollar, making US exports less competitive and dampening global economic activity (Ammer et al. 2016). Second, tighter US monetary policy can lead to a reallocation of capital flows as investors seek higher returns in the US, reducing capital flows to SOEs and constraining their economic activity (Miranda-Agrippino and Rey 2020; Dedola, Rivolta, and Stracca 2017). Finally, higher US rates tighten global financial conditions, as

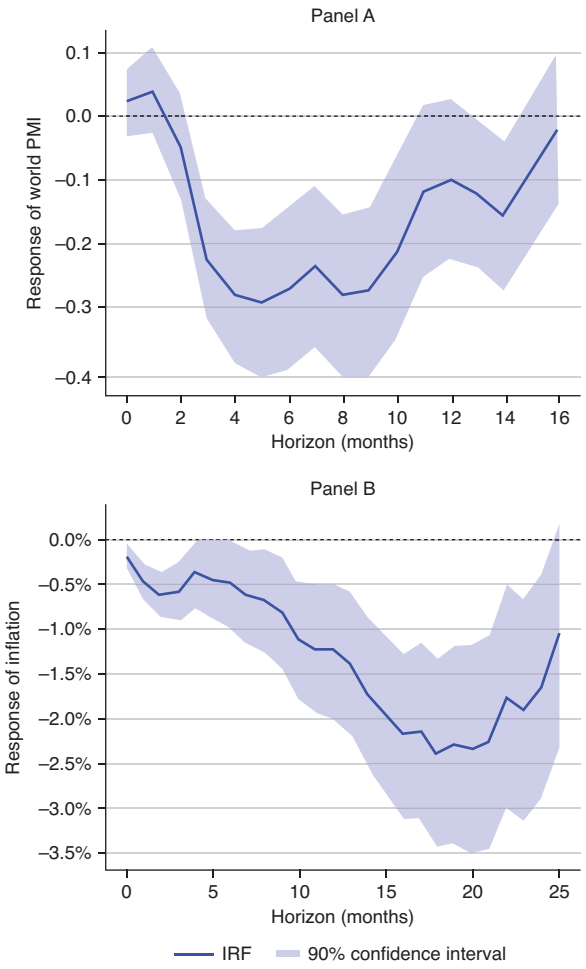

FIGURE 21.4. The impact of a 100-basis-point fed rate shock on world PMI, and the impact of a 1-percentage-point decrease in world PMI on SOEs' inflation.
Source: Governor's Office at the Bank of Israel based on data from OECD and Bloomberg.

many international financial transactions are denominated in US dollars. This increases the cost and reduces the availability of credit globally, further weakening investment and consumption (Rey 2015). The combined effect of these mechanisms can be observed in the graphs in figure 21.4 through the impact on the

global Purchasing Managers' Index (PMI), which subsequently influences inflation in SOEs.

US Weakened Global Commodity Prices

Another critical channel is the effect of US monetary policy on global commodity prices. Higher fed rates tend to lower global commodity prices, which in turn reduce inflation in SOEs. This mechanism is crucial for SOEs that are heavily reliant on commodity imports, as lower prices directly translate into lower inflationary pressures. The relationship between US monetary policy and commodity prices has been well documented in the literature. Frankel (2008) argues that tight monetary policy leads to lower commodity prices through a combination of reduced global demand, a stronger dollar, and the influence of interest rates on inventory holdings. Hammoudeh, Nguyen, and Sousa (2015) provide empirical evidence supporting the impact of US monetary policy on a wide range of commodity prices, including energy and metals. The graphs in figure 21.5 formalize this for our set of SOEs.

Imported Inflation from the United States

US inflation rates directly impact SOEs through imported goods. As the US is a major trading partner for many SOEs, changes in US inflation are transmitted to these economies, affecting their overall price levels. This is particularly relevant for countries with significant trade links to the US, making their inflation dynamics partly dependent on US economic conditions. Auer, Borio, and Filardo (2017) investigate the propagation of global value chains and find that a significant portion of domestic inflation in SOEs can be attributed to changes in the prices of imported intermediate goods. They highlight the role of the US as a key source

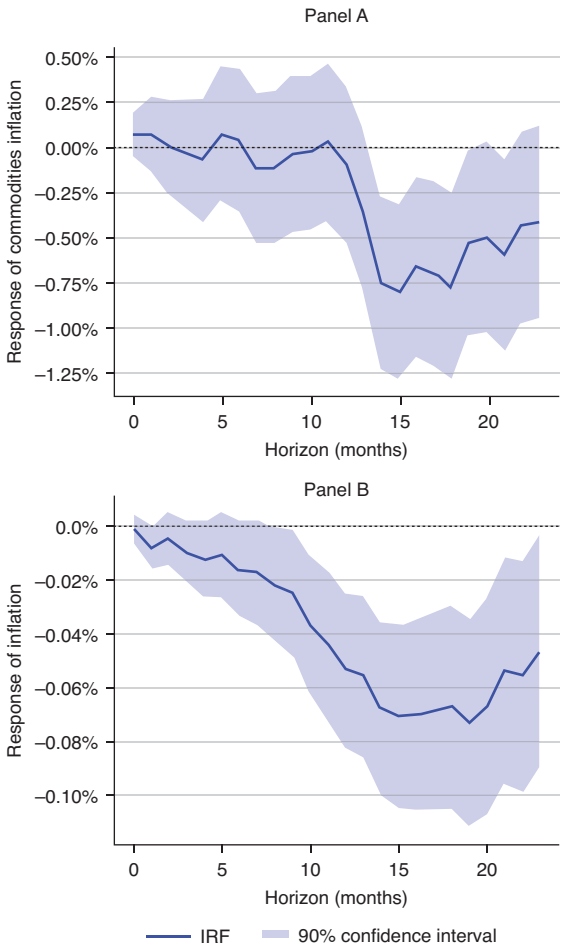

FIGURE 21.5. The impact of a 100-basis-point fed rate shock on world commodity prices, and the impact of a 1-percentage-point decrease in commodity prices on SOEs' inflation.

Source: Governor's Office at the Bank of Israel based on data from OECD and Bloomberg.

of these price fluctuations. Borio and Filardo (2007) also discuss the growing importance of global factors, such as US inflation, in determining domestic inflation in SOEs, emphasizing the need for policymakers to consider these external influences. The graphs

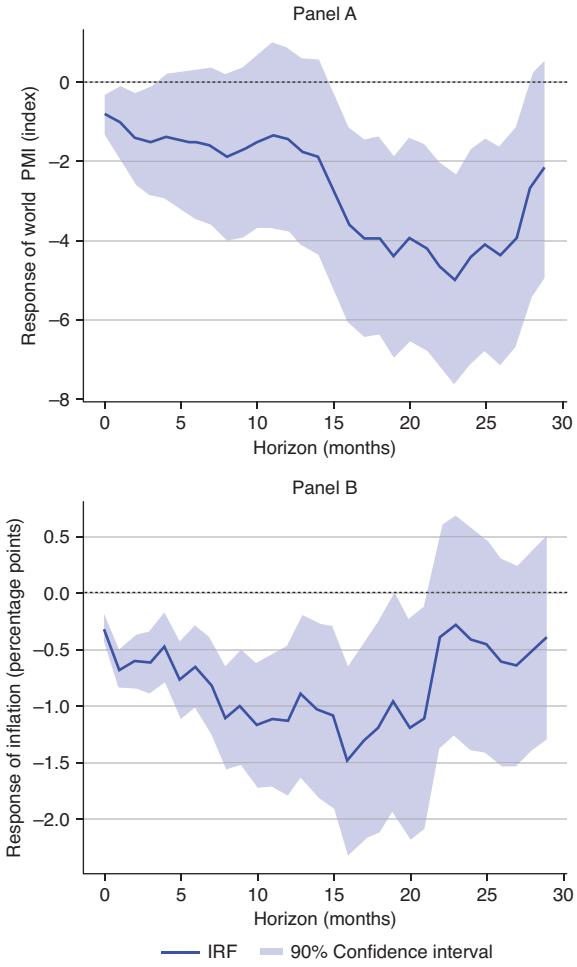

FIGURE 21.6. The impact of a 100-basis-point fed rate shock on US inflation (Panel A) and the impact of a 1-percentage-point decrease in US inflation on SOEs' inflation (controlling for commodity prices and the USD exchange rate).
Source: Governor's Office at the Bank of Israel based on data from OECD and Bloomberg.

in figure 21.6 provide the local projection results for the effects of US inflation on SOEs' inflation.

Given these mechanisms, a natural question arises: why do not all SOEs wait to raise interest rates until after the Fed does so and

utilize its headwind to combat domestic inflation? The reasons for this heterogeneity in monetary policy responses are multifaceted and can be attributed to several key factors.

First, differences in exposure to energy and commodity prices play a significant role in shaping the timing and magnitude of monetary policy actions. SOEs that are more vulnerable to fluctuations in global commodity prices may need to act more swiftly to counteract inflationary pressures.

This has been particularly relevant in the context of the Russia-Ukraine war, which caused a significant rise in energy and commodity prices, particularly in natural gas, as Russia is a major supplier to many European countries. This has resulted in a high variation in inflation rates among European economies, with countries that have a higher dependence on energy, and particularly Russian energy imports, such as Czech Republic, Germany, and Italy, facing greater inflationary pressures.

Consequently, these countries may have been driven to raise interest rates earlier than the Fed to combat the rising inflation. In contrast, economies that are less energy dependent may have more flexibility in their monetary policy decisions.

Second, during the COVID-19 pandemic, there was significant variation across countries in the fiscal stimulus policy, with some implementing much larger stimulus packages than others (e.g., in the US, Germany, and Sweden, the fiscal stimuli in COVID were about 14.9, 6.0, and 2.6% of GDP, respectively). The interaction between fiscal and monetary policy is crucial in determining macroeconomic outcomes and inflation (Sims 2011). Moreover, the composition of fiscal expansions, such as the balance between direct transfers and infrastructure spending, can also influence the inflationary impact and the subsequent monetary policy response (Coenen et al. 2012).

SOEs that implemented more-expansionary fiscal policies, such as direct transfers to households or increased government spending,

may have faced greater inflationary pressures, necessitating an earlier and tighter monetary policy even if they would have preferred to wait for the Fed's lead under different circumstances.

Third, the structure of mortgage markets can significantly affect the transmission of monetary policy. In economies with predominantly fixed-rate mortgages, such as the US, the impact of interest rate changes is primarily felt by new borrowers. However, in SOEs with a higher share of variable-rate mortgages, the effects of monetary policy are more quickly transmitted to the broader economy. These differences in mortgage market structures can therefore influence the timing and extent of monetary policy actions in managing inflation.

Finally, exchange rate dynamics play a crucial role in the monetary policy decisions of small open economies. When the US raises interest rates, it often leads to an appreciation of the US dollar, as higher yields attract capital inflows. Consequently, other currencies, particularly those of small open economies, may experience depreciation pressure. The extent to which an SOE's currency depreciates against the US dollar can have significant implications for its inflation outlook and, subsequently, its monetary policy response (Gagnon and Ihrig 2004). SOEs with currencies that weakened during the COVID-19 pandemic, such as Brazil and South Africa, faced greater inflationary risks due to the exchange rate pass-through effect. As a result, these countries may have been prompted to raise interest rates earlier than the Fed to stabilize their currencies and manage inflationary pressures. In contrast, countries whose currencies appreciated during COVID and before the inflation cycle, such as Switzerland and Israel, had more flexibility in their monetary policy decisions and degrees of freedom to wait for the Fed's headwind. The exchange rate considerations have been particularly relevant in the current global economic environment, where uncertainties surrounding the pandemic and diverging economic recoveries have led to heightened volatility in foreign exchange markets. Figure 21.7 demonstrates the different

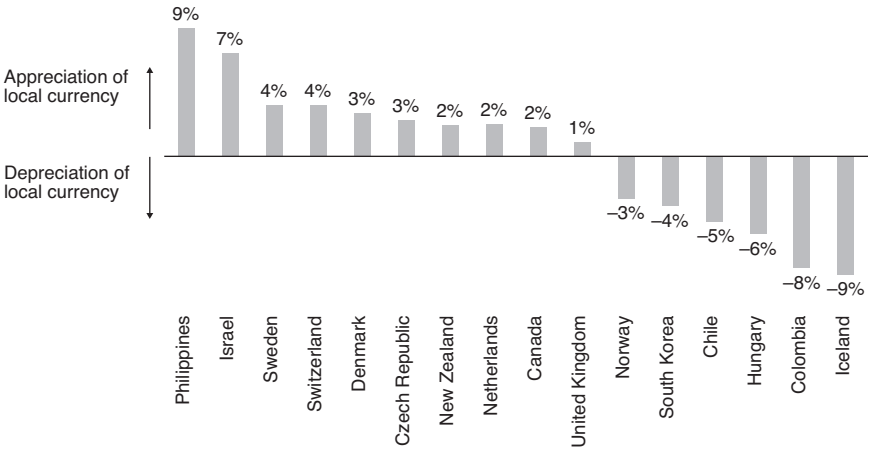

FIGURE 21.7. Real effective exchange rate (REER), 2019 to 2021.
Source: Governor's Office at the Bank of Israel based on data from OECD and Bloomberg.

real effective exchange rate (REER) position leading into the inflation phase of the cycle.

There appears to be a notable correlation between countries in which central banks hiked rates at an early juncture (as shown in figure 21.2) and those countries whose REER depreciated during the initial phase of 2021.

The Taylor Rule in Small Open Economies

The Taylor rule, first introduced by John B. Taylor in 1993, provides a framework for setting interest rates based on inflation and the output gap. However, the application of the Taylor rule in small open economies is more complex due to the influence of additional factors, particularly exchange rates.

In Taylor (2001), he argued that including exchange rates in interest rate policy rules does not necessarily improve macroeconomic performance, and may even lead to suboptimal outcomes. The reasoning behind this is that the exchange rate already

indirectly influences the economy through its impact on GDP and expected inflation, and explicitly incorporating it into the policy rule may lead to redundancy or even policy errors. Despite this, some SOEs still choose to incorporate exchange rate considerations into their monetary policy decisions.

Lubik and Schorfheide (2007) investigated the behavior of central banks in SOEs and found heterogeneity in their approach to exchange rates. Their research revealed that many central banks explicitly account for exchange rate fluctuations in their modified Taylor rules, while others opt not to include this factor directly in their policy formulations.

For instance, in Israel's dynamic stochastic general equilibrium (DSGE) model, the Taylor rule is modified to include a small coefficient of 0.03 for the exchange rate change (ΔS_t):

$$r_t = 0.15\left[R_t^* + \bar{\pi} + 2.26\left(\pi_t - \bar{\pi}\right) + 0.137\,\hat{y}_t^{gap} + \mathbf{0.03}\Delta S_t\right] + 0.85 r_{t-1} + \eta_t^R$$

This modification suggests that Israel's monetary policy does consider exchange rate movements, albeit to a limited extent. The inclusion of the exchange rate term in the rule allows the central bank to respond to currency fluctuations that may have inflationary or deflationary effects not fully captured by the output gap and inflation measures alone. However, the small coefficient indicates that the exchange rate is not the primary driver of Israel's monetary policy decisions.

There are several reasons why central banks in SOEs might directly consider the exchange rate in their policy rules. Timing is a crucial factor, as exchange rate fluctuations can have impacts not adequately reflected in readily available GDP or inflation figures. For example, currency depreciation may affect inflation with a two-year lag, while the Taylor rule typically considers one-year expectations. Additionally, the exchange rate can serve as a valuable informational variable, providing signals about economic conditions that may not be fully captured by output gap and inflation measures.

Furthermore, financial stability considerations play a role. Exchange rate fluctuations can impact financial stability, which may not be fully captured by traditional GDP and inflation metrics. For SOEs, maintaining financial stability is often a key objective of monetary policy, making the exchange rate a relevant factor in their monetary policies.

Conclusion

In summary, the monetary policy landscape in small open economies is shaped by both global influences and domestic conditions. The interplay between global forces, such as US monetary policy, and local policy decisions highlights the nuanced approach required for effective monetary management in SOEs. The variability in policy responses underscores the importance of understanding the unique economic contexts and structural differences that underlie each SOE. As central banks in these economies navigate the challenges posed by an interconnected global economy, further research and policy discussions are important to refine monetary policy frameworks and enhance their effectiveness in promoting price stability and growth.

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22

Central Bank Communications beyond "How Many?"

Austan D. Goolsbee

Thank you so much for the invitation to this conference. It's a special treat for me to see John Cochrane here, my old neighbor from across the street. John and Beth used to keep our emergency house key for us. The alarm company would call him if we were out of town and something went wrong. So, I'm hoping that if things go sideways in my talk today, John, you're still willing to be the emergency contact.

And I should also add now, to the great relief of John Williams and my other colleagues here, that these views are my own. They do not represent the views of the Federal Reserve System or other members of the Federal Open Market Committee.

Today, rather than talk about the economy at a high level, I wanted to narrow the discussion to talk a bit about central bank communications. It's a topic that has received a lot of attention—including on the previous panel today (see section titled The Next Strategy Reviews) and increased public scrutiny recently.

I came to thinking about this in an odd way. When I moved at the beginning of last year from the University of Chicago to the Federal Reserve Bank of Chicago, it felt like we had just lived through a really crazy moment in economic history. We had started a rather historically rapid tightening cycle, and there were a large number of fundamental economic issues that needed discussion and resolution.

This chapter is taken from the transcript of spoken remarks at the conference and retains the character of live speech.

Ready to talk about that, I went to my first appearances where the press was present. And the questions always centered on the same thing: how many rate hikes do you have for the coming year?

Now, I was a little disappointed and a bit dismayed because by itself, with no economic context or rationale or understanding of what a person thinks will be happening with economic conditions, the answer to the question of "how many" is basically just speculation. There's very little economic content in a question like that. Why would they not ask about things that are actually informative about future decision making, say, questions like "What's your reaction function?" "What is your economic worldview?" or "What are your risk assessments?" I puzzled on this and tried to think through why they did not seem as interested in these questions. Why did they seem more interested in context-free numbers than in a description of the economy?

I somewhat concluded that a bit of this is our own fault because some aspects of our current communications, especially in the Summary of Economic Projections (SEP), actually encourage exactly this kind of speculation. So today, I basically would like to make three points: (1) where I think Fed communications and particularly the SEP fail to deliver on the kind of economic information that it could deliver; (2) how we might improve that; and then (3) the important role that I think the Federal Open Market Committee (FOMC) participants' public speaking and writings can play in communicating their reaction functions and conveying their risk-management considerations. And I will conclude with a bit of a defense of the cacophony problem, which is a much-maligned bugaboo. But I will say there are some aspects of it that I think are positive.

So, point one: what is the problem, as I see it, with the SEP?

Now, given the previous panel, I have a little comment about why we should care about this. But it's probably obvious why. Everybody here knows the communications issues of central banks;

they have been important and with us from the beginning. They're closely tied to inflation expectations, to central bank credibility, and even to public trust. I don't know that I'm fully on board with Ben Bernanke's comment that monetary policy is 98% talking and 2% action. But we all understand the importance of people having a clear understanding of central banks' goals and strategies in the transmission of monetary policy.

The Fed and many other central banks' approaches to communications have changed dramatically over the past thirty years. And they have shifted to much greater transparency. One of the leading components of that has been the SEP, especially its "dot plot" of FOMC participants' interest rate projections. In that dot plot, each person on the committee gives an anonymous answer to the "how many" question and does so for the next several years. It is widely followed. It provides a dose of transparency about the diverse collection of views on the committee. And its influence seems to be spreading. It was a subject of discussion in the Bernanke report for the Bank of England, and European Central Bank (ECB) executive board member Isabel Schnabel raised it for consideration in a recent speech.[1]

As a starting point, it is worth noting that in the 2020 Hutchins Center survey of academic and private sector Fed watchers, only about 50% of respondents reported that they find the dot plot useful.[2] Now, I think one of the things that may be pulling that number down is that the SEP is not actually that useful for identifying FOMC participants' monetary policy reaction functions. I'm defining the reaction function broadly as how a person would react to changes in economic conditions, rather than in a technical way, such as what that person's policy function coefficients are in the Taylor rule or something like that.

I find myself mostly in agreement with the old Mervyn King argument that it's a sign of success for the central bank when markets react to the new data releases more than to the statements of central banker opinions.[3] And one of the key ways to achieve that

kind of outcome is to have people understand FOMC participants' reaction functions.

The SEP isn't that helpful in communicating them, partly because each participant's rate path projection is tied to a forecast of economic conditions. But, as you know, the SEP does not report which conditions forecast goes with which rate prediction. And the widely reported median does not give you a coherent observation, because the person making the median rate projection is not likely to be the same person who made the median inflation or the median gross domestic product (GDP) projection. So, without the connection of the forecasts of economic conditions to the rate projections, the dot plot is just a collection of opinions lacking economic content.

So, it's no wonder that the press doesn't ask about anything else, because our own major communications document implicitly says that an economic rationale isn't needed. It says, just tell us how many, and we'll put them on this dot plot and hand it out. And because it can't be connected to those economic conditions of what the participant thinks will justify that rate, there is no way to explain why they're saying what they're doing.

So, point two: how would we improve it?

I think we can make it better in a way that folks have already talked about. Now, I think that it's worth noting that this is actually a cousin to the old debate about time-dependent versus state-dependent forward guidance. I know that there's controversy about forward guidance—some people hate it, and some people like it. But this is like the old Trident gum ad, where four out of five dentists recommend sugarless gum for their patients who chew gum. So, regardless of whether you like or dislike forward guidance, I think we can agree that state-dependent guidance is more useful than time-dependent guidance because it conveys economic content and an implicit reaction function. For example, in 2011, the committee saying it doesn't expect to raise rates for two years is not nearly as helpful as the Evans rule that says the committee will not consider

moving rates until the unemployment rate is below 6.5%, as long as inflation is below 2.5%.[4] The time-based guidance is basically just an opinion. The Evans rule clarifies what the committee is watching, and it conveys information about the reaction function.

So now think about that for the dot plot. The dot plot is a lot like time-dependent guidance. It's not tied to anything, and we would be better off if it could be more like state-dependent guidance in conveying a reaction function.

So how could it be done? First, I'm going to echo some of the suggestions that are in Mickey and Charlie's [Levy and Plosser's] paper that we just heard about. I think it would go a long way to simply publish the matrix that matches each participant's dots with their economic forecasts. It doesn't need to be personally attributed to each member. But at least anonymously matching the numbers allows you to answer some clarifying questions. For example, suppose you observe a high-rate dot for the next year's funds rate. You could tell, if we published the matrix, whether that was a person who thinks the economy is overheating and they want to rein in inflation or someone who thinks that faster noninflationary growth implies a higher equilibrium rate. Today, you can't tell the difference between those.

Over time, as we observed changes in the economic environment and the impact that they had on the economic forecasts and projected rates, that would reveal even more about the reaction functions. Another, more direct form of state-contingent information might be to add something like the way we do stress tests for banks or the alternative simulations in the Tealbook. We could do this by asking on the submission form: what would you think would be the appropriate action to take if X happened? Now, it wouldn't be as easy to implement that as publishing the matrix. But it's food for thought as another way we could convey reaction functions through more state-dependent-type guidance.

Finally, I'd like to say something about FOMC participants' public commentary. Since you know my goal, you know I support

participants conveying information about how they might respond to economic developments, rather than just sharing speculative opinions about rates. I find it helpful when my colleagues' speeches and writings explain their thinking and go beyond simply making predictions.

This idea highlights another important piece of communications—which is conveying the implications of unusual circumstances and risk management for setting policy. Especially in times of heightened uncertainty and unusual risk, the policy playbook gets complicated, and it requires more than just dots. And such times, as Larry [Summers] said (see chapter 20), seem to be happening with uncomfortably high frequency these days. The committee has historically communicated unusual circumstances and practiced this kind of risk-management policy for a long time. It shows up in formal voted-on FOMC statements, policy tilts, and other communications over the past thirty years, as when we were faced with the Asian financial crisis, the Russian default, the threat of deflation, the Great Financial Crisis, the Great Recession, and the pandemic. In all of these cases, those communications were an important tool to get us beyond a kind of a context-free "how many?" discussion and provide the public with better state-contingent information.

So, I will conclude with a plea that we try to push our communications, and especially the SEP, to better convey how we respond to economic conditions. I think it does mean a larger number of voices saying a larger number of things. Alan Blinder, in an old paper, and others have called this the cacophony problem.[5] And they will probably view it as a negative to have this much information getting conveyed this frequently to the public before every meeting. But I don't agree with the complaints about there being too many voices. Yes, of course, it would be easier to understand if there was just one voice talking about policy, and it gave just one opinion. But fundamentally, the FOMC is a committee with lots

of views, and policy gets forged in that environment of discussion. Without intentionally trying to offend the US Senate, in my view, in the twenty-first century the FOMC has become the world's greatest deliberative body. And I think having folks on that committee with different worldviews makes for better decision making, not worse. There's nothing wrong with the public knowing these views, because that's reality. There isn't just one dot, and there isn't just one worldview.

So today, I feel like we're conducting policy during a fascinating and uncertain time. How we communicate will be critical. If we put out an SEP-style communication of information, we should endeavor to convey our deliberations and our thinking, not just our opinions. That's why I say that "how many?" is not enough. Thank you.

Notes

1. Isabel Schnabel, "The Future of Inflation (Forecast) Targeting," European Central Bank, April 17, 2024.
2. Tyler Powell and David Wessel, "Federal Reserve Communications: Survey Results," Hutchins Center on Fiscal and Monetary Policy at Brookings, November 2020.
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Connecting Theory and Practice

John C. Williams

It's wonderful to be back at Stanford—especially with John Taylor chairing this panel. John was my advisor during my studies here, and he hired me as his research assistant in the early 1990s. It was an extraordinary privilege to have those two most wanted positions.

Based on some of my past speeches, you may expect me to give a few pop culture references from the 1990s that capture my time at Stanford before I move on to the substance of my remarks. But the truth is, I was so focused on my studies that there wasn't time to rollerblade, listen to R.E.M., or go to the arcade just for fun. Instead, like many in this room, I chose to forsake fun for the study of economics. As a result, I am simply useless when it comes to 1990s trivia.

What brought me to Stanford back then was a sense of purpose. Growing up in the 1970s and 1980s, I witnessed the toll that economic turmoil, high inflation, and slow growth took on families. By the time I arrived at Stanford in the fall of 1989, the Federal Reserve under Paul Volcker had tamed the very high inflation of the late 1960s and 1970s. But the work was far from done. Inflation was around 4%—a level, I should note, that is well above today's 2.7%. And it was not yet clear how the lessons of the past would shape the policies of the future to ensure economic prosperity and stability.

But change was afoot, and it was an exciting time to be thinking about economic policy. With the advent of inflation targeting, the practice of monetary policy was on the cusp of a revolution. The Reserve Bank of New Zealand led the way in December 1989, and

the Bank of Canada and Bank of England soon followed suit. I recall seeing the excitement around this change when I was a student, as I listened to policymakers from New Zealand and Canada describe their new frameworks.

At the same time, economists were reassessing what good policy looks like and how it could make a difference. In particular, John Taylor and others were reexamining the theory and evidence behind the ways policymakers could consistently deliver low and stable inflation in the post–Bretton Woods era. My introduction to this topic was running multicountry model simulations for John's book, *Macroeconomic Policy in a World Economy*, which built on years of research by many experts.[1] The book provided a rigorous analysis of alternative monetary policy regimes in an open-economy context. This line of research culminated in John's seminal paper, "Discretion versus Policy Rules in Practice," which brilliantly synthesized theory and experience to yield clear prescriptions for good policy.[2]

What I learned then and have carried with me these past thirty-five years is the importance of connecting theory and experience. The theories that shape good policy are derived from the experiences of the past, and therefore create lessons for the future. This prepared me well for my career, and it's what I'm going to talk about today.

Before I go further, I need to provide the standard Federal Reserve disclaimer that the views I express today are mine alone and do not necessarily reflect those of the Federal Open Market Committee (FOMC) or others in the Federal Reserve System.

Act I: The Past

Between the time I left Stanford and the onset of the pandemic in 2020, the theory and practice of monetary policy changed dramati-

cally.[3] Policymakers sought to avoid the mistakes of the past and worked hard to create new frameworks for the future. And economists developed and refined theories to guide policy. The result was a prolonged period of price stability that spanned a quarter of a century.

We learned three key lessons from theory and experience. The first is that central banks must own the responsibility for price stability and have the ability to act as needed to achieve it. Policymakers have the tools to attain and maintain low and stable inflation. However, too often in the past—most notably in the 1970s—central banks behaved as if they were powerless to control inflation. Although accountability for price stability is critically important, history also teaches us that central banks that have independence in their actions are more successful at delivering price stability and well-anchored inflation expectations.[4] In short, our job is to be the protector of price stability.

The second lesson is the importance of transparency and, in particular, the clear communication of a goal for price stability in the form of an explicit numerical inflation target. Agreeing on a longer-run target reinforces public accountability for price stability and focuses the internal policy debate on how to best achieve that goal. Central banks that adopted inflation targeting led the way on this. And the FOMC announced its 2% longer-run inflation goal in January 2012 as part of its Statement on Longer-Run Goals and Monetary Policy Strategy.[5]

That leads to the third lesson: the importance of well-anchored inflation expectations. By communicating an explicit inflation target—and then delivering inflation consistent with that target—central banks earn credibility with the public. That helps anchor expectations, which, in turn, contributes to low and stable inflation.[6] This feedback loop between policy actions and communications, expectations, and price stability is now a core tenet of modern

central banking, but it wasn't something that was fully appreciated or accepted thirty years ago.

It's important to note that anchoring inflation expectations at the target level is symmetric. Very low inflation—or, worse, deflation—can be as problematic as high inflation, presenting challenges for policymakers and harming the economy.[7]

Act II: The Present

As a result of the linkages between theory and experience, our three lessons became three principles. And they helped us achieve a quarter century of low and stable inflation and well-anchored expectations.

Then came the pandemic, which dealt the most dramatic shocks to the economy in generations. Severe imbalances between supply and demand, exacerbated by Russia's war in Ukraine, caused inflation to skyrocket in most countries across the globe. In 2022, inflation peaked at 7% in the United States, rose to 8% in Canada, and exceeded 10% in the euro area.

How did we, along with other central banks, address these spikes in inflation? In the United States, we stuck to our three key principles. First, the FOMC owned the responsibility for reining in inflation.[8] Achieving price stability and maximum employment is part of the FOMC's dual mandate, and we took strong, decisive actions to bring inflation down.

Second, we have been unequivocal and transparent in our commitment to achieving our 2% target on a sustained basis. This message has been emphasized over and over in the FOMC's post-meeting statements and policymaker communications.

Third, we have paid close attention to inflation expectations, and our actions and credibility built up over the preceding quarter century helped keep inflation expectations anchored.[9] Although medium- and especially short-term inflation expectations rose notably starting in 2021, they retraced those gains over 2022 and 2023.[10] Indeed,

three-year-ahead expectations returned to prepandemic levels by late 2022, and short-term expectations did so in late 2023.

Act III: The Future

What do the lessons of the past mean for the future of monetary policy? I believe they prove, once again, the importance of theory and experience.

Years of experience—and years of careful analysis—have taught us that, first and foremost, central banks must own the responsibility for maintaining low and stable inflation and have the independence of action to achieve that goal. Price stability is absolutely essential for economic prosperity, and it's crucial for achieving and sustaining maximum employment over the longer run.

Theory and experience have also shown the importance of transparency and clear communication, including setting an explicit, numerical longer-run inflation target, and of taking appropriate actions to support the achievement of that goal. These are critical in anchoring inflation expectations—which, in turn, help keep inflation at its target level.

The future is uncertain. But as we continue to move closer to our 2% longer-run inflation goal, I'm confident that we have the foundation of theory and experience to guide us in restoring price stability and to set the stage for sustained economic prosperity. We are committed to getting the job done.

Notes

1. John B. Taylor, *Macroeconomic Policy in a World Economy: From Econometric Design to Practical Operation* (New York: W. W. Norton, 1993).
2. John B. Taylor, "Discretion versus Policy Rules in Practice," *Carnegie-Rochester Conference Series on Public Policy* 39 (1993): 195–214.
3. John C. Williams, "The Dual Transformation of R&S and Monetary Policy," remarks at Research and Statistics at 100: A Look at the Past,

Present, and Future, Board of Governors of the Federal Reserve System, Washington, DC (November 8, 2023).

4. Luis I. Jácome and Samuel Pienknagura, "Central Bank Independence and Inflation in Latin America—Through the Lens of History," International Monetary Fund Working Paper No. 2022/186 (September 2022); and D. Filiz Unsal and Chris Papageorgiou, "Monetary Policy Frameworks: An Index and New Evidence" (November 7, 2023), https://data.imf.org/api/document/download?key=74044185.
5. Board of Governors of the Federal Reserve System, "Statement on Longer-Run Goals and Monetary Policy Strategy," as adopted effective January 24, 2012, https://www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals_201201.pdf.
6. John C. Williams, "Inflation Targeting and the Global Financial Crisis: Successes and Challenges," essay presentation to the South African Reserve Bank Conference on Fourteen Years of Inflation Targeting in South Africa and the Challenge of a Changing Mandate, Pretoria, South Africa (October 30–31, 2014). See also Athanasios Orphanides and John C. Williams, "Imperfect Knowledge, Inflation Expectations, and Monetary Policy," in *The Inflation-Targeting Debate*, ed. Ben S. Bernanke and Michael Woodford (Chicago: University of Chicago Press, 2004); Athanasios Orphanides and John C. Williams, "Inflation Scares and Forecast-Based Monetary Policy," *Review of Economic Dynamics* 8, no. 2 (April 2005): 498–527; and Athanasios Orphanides and John C. Williams, "Inflation Targeting under Imperfect Knowledge," *Federal Reserve Bank of San Francisco Economic Review* (2007): 1–23. There is a large amount of theoretical and empirical literature on the formation of expectations. See, for example, George W. Evans and Seppo Honkapohja, *Learning and Expectations in Macroeconomics* (Princeton, NJ: Princeton University Press, 2001); Ulrike Malmendier and Stefan Nagel, "Learning from Inflation Experiences," *Quarterly Journal of Economics* 131, no. 1 (February 2016): 53–87; and Michael Weber, Francesco D'Acunto, Yuriy Gorodnichenko, and Olivier Coiboin, "The Subjective Inflation Expectations of Households and Firms: Measurement, Determinants, and Implications," *Journal of Economic Perspectives* 36, no. 3 (Summer 2022): 157–84, and references therein.
7. David Reifschneider and John C. Williams, "Three Lessons for Monetary Policy in a Low-Inflation Era," *Journal of Money, Credit and Banking* 32, no. 4 (November 2000): 936–66.

8. For example, see Jerome H. Powell, "Monetary Policy and Price Stability," remarks at Reassessing Constraints on the Economy and Policy, Federal Reserve Bank of Kansas City, Jackson Hole, WY (August 26, 2022).
9. John C. Williams, "A Steady Anchor in a Stormy Sea," remarks at SNB-FRB-BIS High-Level Conference on Global Risk, Uncertainty, and Volatility, Zurich, Switzerland (November 9, 2022).
10. Survey of Consumer Expectations, Federal Reserve Bank of New York, Center for Microeconomic Data (April 2024 survey).

GENERAL DISCUSSION

JOHN TAYLOR: Okay, we have a lot of time for some good questions if anyone wants to raise their hand. If not, I guess I . . . oh, there's Andy [Levin], then John [Cochrane].

ANDREW LEVIN: First of all, many thanks to John [Cochrane] and John [Taylor] and Mike [Bordo]; it's been a really amazing conference today, and I'm looking forward to Ed Nelson's talk this evening. I'd just like to raise one question for President [Austan] Goolsbee. When Don Kohn was a leader at the Fed, one of his favorite sayings (which he repeated many times when I was a staffer there) was that "communication is a work in progress." So, when the dot plot was created in 2011, everyone involved in that initiative (including Charlie Plosser and Loretta Mester) viewed it as just a single step on a trajectory toward further improvements in communication. Over the past few decades, the FOMC [Federal Open Market Committee] had been producing economic projections under the assumption of appropriate policy, but didn't publish any information about what those assumptions were. Thus, the dot plot was simply an effort to inform the public about committee participants' assessments of appropriate policy.

Now it's great to hear about the ideas that you've mentioned about publishing a matrix and identifying alternative scenarios. Moreover, each participant could be asked to write down their own policy benchmark, which could be a variant of the Taylor rule or a nominal GDP–targeting rule or some other simple benchmark. Indeed, it's notable that the FOMC's previous framework renewal in 2019–20 was solely focused on adjusting the wording of the Statement on Longer-Run Goals and Policy Strategy. As you and your colleagues are looking ahead to the

next framework renewal, is it feasible for you to consider that perhaps the Summary of Economic Projections may be the "low-hanging fruit" in terms of enhancing the Fed's communications?

AUSTAN GOOLSBEE: Okay. Thank you for that. There's some interesting ideas, and there's a couple of questions in that. I wasn't thinking of the strategy review. And I was thinking more narrowly about communication.

It's worth—each of the things you're describing, like that participants would write down what rules they're following, what data they're watching—that's exactly in the spirit of what I think would be useful. I could see that, as compared to nothing, the SEP [Summary of Economic Projections] conveys a lot more information.

I will say, I have unease with making projections so far out—one, two, three years—that people might come back, if you're putting names on them, and then they'll say, oh, you're the dummy who thought this was going to happen in 2026.

But all of those, I think, are worth thinking about. Because I do think there is a little bit of the element of low-hanging fruit. We're so close to being able to convey information that would really be about individual members' reaction functions. And the public could get a sense of if X happened, here's how they might react.

TAYLOR: John, go up ahead.

JOHN COCHRANE: I'll address this to John Williams, but it's a larger question which anyone might take, because we've been talking about it all day. John said a 2% numerical target is great because it gives accountability. Yet the target was 2%; we hit 8%. Cumulatively, inflation is 15% or 20% over what it was supposed to be. You can correct me on the cumulative number. More than 8, because 8 was the one year. But that is a major miss, and I don't see any sign of accountability. Internally, I don't see at least a "What the hell went wrong? What are we going to going to do about it?" Externally, I don't see anyone holding

the Fed accountable, including Congress, the administration, or the media.

GOOLSBEE: Never change, John. Never change.

COCHRANE: Other central banks are not having at least any sort of public inquiry about what went wrong either, or suffering any inquiries or repercussions. As you know, formal accountability was part of the initial inflation-targeting regimes.

"Accountable" usually means some repercussion for failing a task. Perhaps you define accountability in a different way than "The target is 2% and we expect to have to explain what went wrong if there is a major miss." If so, I'd love to hear it.

JOHN WILLIAMS: Yeah, well, first of all, other countries have been doing various legislature-mandated kinds of reviews and things like that. So that actually is happening in some places. And of course the Bank of England just had the Bernanke report themselves. I think accountability—obviously the chair testifies to Congress regularly and explains the decisions we make and where we've missed on our goal. I think the accountability is really about, we got hit by enormous shocks, we made our own decisions, which obviously added monetary stimulus during 2020 into 2021. And then the point of the accountability is, we're absolutely clear that 7%—PCE [personal consumption expenditures] inflation peaked at 7.1%, our target is based on PCE inflation—this is totally unacceptable, and we have to use the strongest measures we have to get the inflation back to 2% and act every single day towards that goal.

So there's no question that we missed our target by something like five percentage points in one year. And then we acted decisively, and so far have been helping—a lot of factors are bringing inflation down—but I think restrictive monetary policy is one of the reasons we've gone from 7% inflation to five to three, and now at 2.7 and ultimately get back to two.

I think the important thing on the accountability here is also to make sure that inflation expectations are well anchored, so that

when you look at households—I'm talking about households, not just financial markets, and not just economists—they are expecting now because of the Fed's actions and, I think, our communications, they expect inflation will be over the next one, three, five years similar to the inflation they saw before the pandemic. I think that is a remarkable statement about the relationship between accountability, obviously the actions after the extraordinary period of the pandemic, and the war—which again, I agree with Yuriy's [Gorodnichenko] comments, it's not just the pandemic, there were a lot of huge shocks—to bring inflation down decisively, as quickly as we can, and get it on a sustained base back to 2%. So I think that's a part of accountability too, not just going back and saying, "Who's holding us accountable?"

I do think that one of the things that—we're not doing the framework review now—but to me, just speaking for myself, I think to fully understand what the lessons of the past four years are, we need to see how this plays out. If you asked me—or you, John, because we've talked over the years—two years ago, "What were the lessons of the pandemic and monetary policy?" we would've come up with some tentative answers. If you asked a year ago, if you asked in December of last year, you might've come up with a very different answer. If you asked today, I think you come with a different answer. What that teaches me is that we need to really learn what happened, how did monetary policy—fiscal policy, supply and demand shocks, shutting down economies, reopening them around the world—how did that affect inflation or economies, and what are the real lessons from that?

I think I've learned not to say what inning of the game we're in or what quarter we're in, but we still don't know the answer to these questions. I know that one of the themes is to show humility, but this is the one thing that we have to be humble about. We really

don't know all the lessons from this, and I think it's important for all of us to take some time and get all the evidence, not just from the United States, but from the other advanced economies. And having worked closely through my role in the BIS [Bank for International Settlements] with the central banks around the world, learning from their experiences too. Because some of them moved aggressively early—as, Amir, you talked about—and some waited longer. Let's get all of that evidence before we really come to firm conclusions.

GOOLSBEE: In a way, if I could add one last thing.

WILLIAMS: Sure.

GOOLSBEE: The thing about a 2% target is that I feel like it implicitly says, whose job is it to uphold accountability? And it's that the market and it's expectations that are the judge of accountability. The frustration in your voice is like, well, I saw that the inflation rate was way higher than 2%, so I want them to be punished. But it lays out that the market is the one to decide that.

And the market decided that the Fed did not do a bad job, that even as—if you think of Emi's graph—in the earlier periods, when headline inflation went up, expectations went up. The fact that the market did not expect that the inflation would last says, I think, you've got to cut a little slack too. I wasn't on the committee at that time, but I think you've got to cut it a little slack.

TAYLOR: Amir, you want to comment?

AMIR YARON: I'm not going to get into the Fed accountability issue here. I just want to actually follow what I think John is trying to say. I think this was a period with huge shocks. And it's one of the issues—now I'm talking with maybe the more academic hat—we've got to figure out. These seem to arrive more frequently perhaps than they used to. We've got to find a way to put these things into our models in a more salient way than just our usual, the way we usually treat them. And that could be one important tool to at least deal with these things as we go forward.

CHRIS CROWE: Hi, Chris Crowe from Capula. I think that a lot of the arguments for central bank transparency are sort of unanswerable, but one paper that always gave me pause in this debate was Morris and Shin's work arguing that central bank communications become a kind of focal point for the market and lead to market participants putting too much weight on what the central bank says.

And now, working in financial markets and talking to colleagues who trade and listening to central banks speaking, I think that kind of argument seems quite relevant to me in my current role. It's sort of reminiscent of the joke complaining about the quality of the food, but also saying that the portions are so small: I think there's an element of that when markets listen to central bankers. So I was wondering if there's something that central banks can do to get the markets to maybe listen to them a little less?

GOOLSBEE: I was going to say, on the Morris and Shin paper, and there are a few papers, they're fun papers. I think they're quite important. The idea, in a way, is the market stops finding out information for itself, and it grows addicted and dependent on the central bank to give it the information. The only thing that I'll observe is, if you plot what the committee has been saying, and then you plot what the market implies, it's the opposite dynamic.

We've been very steady, and the market is like—if the SEP says the Fed anticipates three rate cuts for the year, then that must mean seven! And then Jay [Powell] has a press conference and they leap to "Well then, it must be down to one." And so that, in spirit, is the opposite of the implication of that theory, I guess I would say.

WILLIAMS: Yeah, I'll get very geeky, nerdy on this. Lars Svensson had this brilliant counterargument, which was published in the *ER* [*Economic Review*] as well. And you know, Morris and Shin, if you can get in that model, that one particular model, if you can get better and better communication, that result is turned around. The more communication is better. But of course we all want for

the world to understand our reaction function for when whatever data comes out, the markets respond to that. And that's kind of the way a good central bank monetary policy would work.

And actually that is the way it happens most of the time. You get a strong employment report, you get a high CPI [consumer price index], the market adjusts to that. So I think that's what happens most of the time. Again, going back to this theme of the past few years, can you expect that to happen in a pandemic or afterwards with all the other things that are going around? Well, no, I think these are uncharted waters, and so I think that the forward guidance and more communication are helpful. But again, the hope is that in normal times, whatever that reaction function is, is kind of embedded in how markets respond. And I think that that is true.

TAYLOR: Okay. You're up, Mike.

MICHAEL BORDO: My question is for Amir Yaron. When you were telling us yesterday and today what you did in early October 2023 to prevent a financial crisis and stabilize the Israeli economy after the Hamas attack, I was remembering what Vice Chairman Roger Ferguson told us what he did at the Fed after 9/11 when Alan Greenspan was trapped in Europe. My question is: How much preparation did you do? How did you do it? Was your experience sort of conditioned by the fact that Israel is virtually always in a war, and did you use scenario analysis? Did you do war games? It would be very nice to know about how you prepared.

YARON: All right, you expect a lot of questions, not that one.

So, look, we have a large toolbox. And like many central banks and us, in particular, we always like to make sure we know what our toolbox is, expand it. Definitely, COVID also got us experience on the other side. But we never sold reserves, for example. And there's a lot of operational issues before this event.

So yeah, you want to have these tools around. You want to think about them. You do a lot of preparations. But then when

the time comes, you do have to make the judgment call of Which one of these is the appropriate one? And how much of it is to use?

So as I mentioned, we announced we were going to use up to 30 billion. But in fact, we used only 8. So as I mentioned, the market thought—we tend to—there's a lot about transparency here. Sometimes I don't like it. But we tend to announce what our reserves are. That goes back to Stanley.

The beginning of every month, the market was waiting to see, How much did we actually utilize it? And the market thought we were intervening even more or selling more than we actually had to. And how you do all of that is also an issue.

But the bottom line: we've used 8. Once the market saw, we only used 8. Some of the issues in the north border got settled. And as I showed you, the exchange rate actually went down to a level that was even lower. It appreciated more than the starting point. And that had a periphery effect on a lot of things.

So to answer your question, it's a combination of preparation. It's a combination of prior experience. And then, when it comes, you can't be on autopilot.

JAMES BULLARD: Jim Bullard. So there's been a lot of talk about possible reforms to the SEP. So one way to look at the SEP is just that it's a sort of immature form of communication with the public that's interested in monetary policy. Why not just produce a quarterly monetary policy report like other central banks do? Shouldn't that be the international standard? If you produce a report, it can be many pages long; you can address peripheral issues and give a fulsome discussion of the state of the economy and the state of monetary policy. And then individual members can go out and refer to the monetary policy report and say how their views differ from what is presented in the report. So it seems like this might be a better way to go than to take the flawed and sort of fragmentary information that's

given in the dot plot and start to color the dots different colors and put stripes in there, and stuff like that.

GOOLSBEE: Maybe, I guess I'd say. You were there, and John was around when they were coming up with the dot plot. And I know that if you go back and look at the transcripts, there also was discussion and debate about "Can we have a consensus forecast?" And they decided no.

And I can see why they would not be able to come up with a consensus forecast. It depends on what would be in your monetary policy report. If the monetary policy report would have to get a quite diverse committee to agree on a thing, I feel like we might spend a lot of time writing that report, and that could be spent doing otherwise.

So in spirit, your comment sounds right. People can explain how they think. That goes in my space of what to do.

WILLIAMS: Because I was there, a part of that, and there was an effort to try to figure out how to do that. We have nineteen participants on the FOMC. One of the things we all believe is that's a strength. It's a range of views, a range of backgrounds, different perspectives. And trying to find a way that conveys kind of a center of the committee, and at the same time the diverse views that change over time, is challenging. I think when you go to the consensus forecast and model, you are basically assigning the problem to everybody—let's all agree to something—rather than assigning the problem of "tell me what you really think." So I think it's a trade-off. I mean, I would love it if we could do all these things, but I think this is optimization under constraints. That's what economics is, and that's what policymaking is.

But I would also emphasize something that's important: that the SEP is not a decision of the committee. It represents the nineteen views. You're asked questions like "What's GDP going to be in 2026?" The committee is focused on the monetary policy

decisions and how to communicate them. And that's a different thing than just coming into the room, talking to your economists, and saying, "Here's where I think inflation and unemployment and GDP and interest rates are most likely going to be." And I think, if anything, that there is probably too much attention on the SEP as a committee thing rather than the FOMC statement, and obviously the chair's press conference and our communication.

TAYLOR: Amir.

YARON: I'll just say, the international standard board that you—I mean, it's just infeasible for many central banks, just because there'll be three people. I mean, the minute—well, obviously, for the big central banks, where there's a large enough board, that's feasible.

EMI NAKAMURA: Emi Nakamura. One of the challenges with banking regulation is that if you do a really great job in banking regulation and there are never any bank runs, then there's always this cost of the bank regulation and people can see it very clearly, and you try to tell them, well, if we hadn't done this bank regulation, there would've been terrible bank runs. Now to draw the analogy here, when you look back in time and you ask yourself with the benefit of hindsight, what would we have done? Suppose that you had, suppose in your mind you would've hit the 2% target. So that may have involved much larger interest rate increases and certainly would've had an impact on the stock market. Certainly if there'd been any change in employment growth, there would've been a question as to whether that was a consequence of the Fed's interest rate increases. And then I guess you may have said, well, had we not done it, inflation would've gone up to 8%. But it might've been a tough sell. Anyway, I'm curious to know how you think about that with the benefit of hindsight, how you think about that trade-off.

WILLIAMS: Well, John just said we're out of time, Emi, so I don't know if we can do this.

TAYLOR: You've got one minute.

WILLIAMS: Darn. It didn't work.

You know, I get it. I understand your question. I'm going to give you an unsatisfactory answer. It's that, as a policymaker, that's not the problem that we do; the problem is what you knew at the time, what were the trade-offs you thought you were facing. Ex post, going back, clearly the risks of economic weakness in 2021 were much less than they actually were, because the economy responded much differently. So I think that, the way I tend to think about 2020 and 2021—especially, like I said, the first half of 2021—is that the uncertainty was just enormous. And you're basically doing—I'm a student of Tom Sargent as well—you're trying to defend against the really bad outcomes. That's what we were doing in March of 2020. What's the really bad outcome is if the Treasury market stops functioning; that's what's a really bad outcome.

So I think the trade-offs were really about the tail risks. The tail risks clearly, having lived through all of this, went from a severe economic downturn that lasted for a long time to very high inflation. And so we had to go from risk management on one side, to guard against one set of risks, to very strongly, decisively on the other. It's not really the Phillips curve or the sacrifice ratio, but more of, I'd say, managing those risks. And I was obviously a very strong supporter of switching monetary policy in that direction and moving very strongly given the risks of unanchoring inflation expectations.

TAYLOR: So we have to have a last question. John Gunn.

JOHN GUNN: Hi. John Gunn, retired from Dodge and Cox investment. Anyway, they're always great sessions, but I just have one quick question. The Bureau of Labor produces an inflation number that's never restated, and it is never restated because it's keyed to Social Security and all kinds of stuff. And so that number comes into your offices and you react and figure out what you're going to do. Do you ever investigate how that number is arrived at?

GOOLSBEE: Yes, in the sense that we look at a lot of measures. That's the most important. It's the gold standard worldwide of price measurement.

GUNN: So you look at other inflation measures.

GOOLSBEE: Absolutely, all different kinds of price measures. And there has been an explosion of private sector measures. I was involved with one with Pete Klenow, who's here at Stanford. He and I got this online data with prices and quantities from Adobe for millions of online transactions, and Adobe now compiles an online inflation price index. And sometimes, it can look very different from the CPI. The New York Fed puts out a lot of data on various price measures, and we look at all of it.

GUNN: Great.

TAYLOR: Thank you so much. This is great.