

Peterson Institute for International Economics

**The worst inflation outbreak in 40 years: Conference on distilling lessons from the
COVID era**

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[00:05:50.07] - Adam S. Posen

Good morning, everyone. Uh, we're about to go live, or are we? We're live. Welcome back live to the Peterson Institute for International Economics, where things are lively. Joking aside, I'm Adam Posen, the president of the Peterson Institute, and it is my genuine pleasure to welcome people back for our first in-person event, hybrid event of the new year. And it is a substantively very exciting one. We have for a while now, with generous support from the Smith Richardson Foundation, been working on distilling lessons from the COVID-era inflation. This project has been led by my distinguished and always relevant colleagues, Karen Dynan and David Wilcox, both of whom are senior fellows here at the Peterson Institute among their other affiliations. Um, this is an important topic for all the obvious reasons. But I want to state before introducing, getting us right into substance, I want to state why we felt and why Smith Richardson and their then board member John Taylor backed this project, I think, and why we were able to get such an outstanding group of people involved as authors and as advisors. Because things aren't that simple. There has become a narrative based around the picture— I should have a slide, I don't— but the picture that I think all of you are familiar that shows US, European, British inflation basically following the same time path.

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And fed in part by our colleague Olivier Blanchard and Ben Bernanke's paper from, I guess 2 years ago now, it has become sort of a set narrative. This was all just supply shocks and the Fed was credible and it went up, it came down. It was the same across countries 'cause ECB was also credible. Nothing to see here. And we fundamentally disagree. We may not all agree on what else there is to see there. And that's actually the subject of the conference and the subject of the papers that Karen and David spent so much intellectual leadership working with our editors and our team and the distinguished authors pulling together. And it remains to be discussed today and to emerge over time, what are the lessons? And we will conclude today with a great panel with not just Karen and David, but Esther George, former Federal Reserve

Bank of Kansas City president, member of our board of directors, and Jason Cummins of Brevin Howard, also member of our board of directors here at Peterson. We will conclude trying to pull together what we think the lessons are. One of the lessons is shut off your phone.

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Do as I say, not as I do. But anyway, just to remind everybody, in inflation space, you can put that picture, but there are two things I would urge you to consider as you think about that picture and as we get in under the hood in so many ways in today's discussion.

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Discussion.

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The first is if you plot in unemployment space or growth space, it's not the same path. It's US unemployment, European unemployment, or it's US growth— whoops, excuse me— European growth. And the idea that you have all the same nominal path when having completely different unemployment and growth paths is actually very striking. And again, you can decide, well, that just shows it's all about monetary credibility. This is all a nominal phenomenon. These real things don't matter. But that's a very profound thing to come to that conclusion. And I don't think you should come to that conclusion casually. And so that's one reason why I would offer why we need to go under the hood. In a similar spirit, there's the fact that sort of by the same token, that implies that all the differences across countries, all the differences across sectors are essentially irrelevant. That Europe, Japan, elsewhere, which had totally different energy structures and totally different energy pricing structures didn't matter. And that again, in certain extreme reductionist forms of monetary theory is plausible. In more realistic forecasting context, that seems highly implausible or at least bears scrutiny. And if at the end of this you come away and you say, "No, Adam was raising a false question.

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It turns out that differences in unemployment, differences in energy pricing, differences across sectoral composition don't matter for inflation," that's also a very profound initiative. Interesting thing. And that is somewhat different than say the Bernanke, Blanchard, or other consensus views. So there is real stuff to be thought about here. And that's why I am so grateful to my colleagues, David and Karen, to the many colleagues and distinguished friends who participated in this project to come here today to share, recap some of their research, all of which is available on the Peterson Institute website.. And we will shortly be releasing a compendium of

the papers from this, again, with thanks to the Smith Richardson Foundation for support, including Karen and David's summary of where they think this has come. So with that, let me turn it over to our first session. One last warning, unfortunately, Cecilia Rouse, former CEA chair and president of our friends across the street, who was to be the luncheon speaker today, had to drop out due to health issues, thankfully not serious, but had to drop out today. Karen is stuck in conversation with me as the lunch speaker, and that will allow you to have fun with me and in virtual form, Peter Orszag, with our inflation forecast if you're interested.

[00:12:18.22]

But with that, let me call upon a dear friend and colleague, Nidhi Bala-Johnson, Executive Vice President of Liberty Mutual Insurance. President of Global Risk Solutions at Liberty Mutual, member of the board of directors of the Peterson Institute, but most importantly, a very thoughtful former CIO of a major insurance company, Liberty Mutual, and someone who brings another perspective on how inflation is affecting all of us. Niti, over to you.

[00:12:56.36] - Nidhi Bala-Johnson

Good morning, everyone. It is such an honor to be here for this exciting capstone project. I want to begin by thanking the Peterson Institute and the project team for this very important body of work that distills the lessons from the COVID-era inflation surge. As Adam said, we need to go under the hood to really deeply better understand and take away the lessons from this. As we move forward because this episode was not just another cyclical fluctuation. It marked a genuine regime break after decades of relative price stability and forced policymakers, businesses, and households to operate under real uncertainty, often at the same time and with imperfect information, with things sort of coming together. My role today is to moderate a discussion across this excellent research. I've also been asked to add one perspective from the seat of a large operating institution, one that had to navigate the inflation surge and uncertainty in real time, not in retrospect. So from the outside, you know, inflation is a headline number, a policy debate, a forecasting error. I'll share with you that from the inside, it looks and feels very different. Uh, we weren't dealing, uh, at Liberty Mutual with inflation as a single phenomenon.

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We were dealing with fast-moving set of relative price changes, capacity constraints, and behavioral responses in real time, which were often moving out of sync with one another and with large lags. And so What's interesting about experiencing this from an insurance inside is that the industry is one where we don't actually know our cost of goods sold on the day that we price and sell our product. And so that is why the lessons from this for us, which I'll share with

you, I think are quite profound. Those dynamics of lags and behavioral changes show up through several concrete channels. The first is replacement costs and claim severity. So the two key insights here are even if the frequency of loss events doesn't change, the cost per claim tends to rise, right? So you've got parts, materials, medical services, and skilled labor inflation. But the most important part is that inflation doesn't just lift the average severity, it changes the nature of the tail. And that is really critical because repair complexity, litigation dynamics, and bottlenecks can materially alter the distribution of outcomes before that shows up in aggregate data. And that is what we have to think about, anticipate, and react to.

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Uh, the pandemic and its aftermath were distinctive in that they combined real resource constraints with rapid demand shifts, altering relative prices in ways that were not captured well. By historical trends or data. Here's the critical part. Prices relevant to any given coverage, like homeowners insurance, are not weighted similarly, right, to an average weighted CPI basket of goods. So as an example, while overall CPI rose 19% during the COVID period, construction labor increased 34%, construction materials jumped 41%, Those are the key drivers of underlying homeowners and property insurance losses. So that's what sort of shows up with a lag. Speaking of lags, the second channel is that the impact of inflation on insurance rates shows up with a lag due to regulatory processes. So the more regulated the line of insurance, the greater the lags tend to be. So let's take personal lines. Personal lines homeowners insurance must file for rate changes with valid forecasts for inflation as it appears. And in states with highly restrictive regulatory approval regimes during periods of abnormally high inflation, like in COVID, insurance rates increases end up significantly lagging underlying inflation. These differential impacts are contributing to a current misperception about the overall state and availability of the homeowners insurance market and the drivers of cost.

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Why is that important? Because again, critical going under the hood clarification matters so that states don't lead to misaligned policy solutions. The third transmission mechanism is labor in two ways, right? The first is we experience tightening competition for critical talent. But secondly, remote work changed the market price for skilled talent in different locations all at the same time. So that combined with networks like healthcare providers, capacity really became the binding constraint, not prices. And that's the third transmission mechanism. And the fourth, cycle times, or what I like to call frictional inflation. And this is very much about when systems slow down. So diagnosis, authorization, scheduling, repairs, courts are closed, settlement costs, costs tend to compound. Duration becomes a multiplier, more rental days, longer business interruption, higher admin touchpoints. So all of that from our perspective made inflation not just

about input costs rising. It made it about systems getting slower. And a slower system can remain expensive even as the headline rate of inflation comes down. The fifth transmission is vendor and service inflation, right? A large share of operating exposure sits in third-party services like IT, data, managed networks, outsourced support. Those often adjust well after the headline rate has started to come down.

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And so that shows up in lags. And then finally, the macro financial overlay, right? Interest rates are a big part of the insurance balance sheets. Higher rates are constructive over time from a net investment income perspective, but the transition introduces volatility in valuations, capital planning, and balance sheet management, raises concerns about solvency. So those were all things that had to be managed in real time. So across all of this, I think what I want to leave you with are 3 things. The first is this episode was especially challenging across 3 shocks. The first, the fact that these were overlapping shocks with shifting dominance, decision-making during a genuine regime break, and asymmetry in timing. So costs moved quickly in some places while pricing and institutional responses were slow. The second is that what struck us as operators is that many institutions—regulatory, financial, and operational—are designed to function extremely well under conditions of incremental change. Under shock scenarios, those same design assumptions surface stress points that unintentionally amplify pressure because regime transitions aren't explicitly planned for. And so I share that as not a criticism, but truly as a learning that we have internalized about design assumptions and therefore how do you build a business for resilience.

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So the takeaway from our seat isn't that anyone got this wrong. It's that shock regime inflation exposes behavioral margins institutional throughput limits, and feedback effects that standard frameworks just don't always anticipate and plan for. So, which brings us to today's discussion. The research you will hear explores fiscal policy, consumer expectations, labor market dynamics, supply chain, and monetary and fiscal policy responses. My goal as the moderator for this first great panel is to help us connect those strands and to keep asking a forward-looking question, what would we design differently the next time knowing what we know now about how inflation actually transmits through systems? So with that, I would like to invite Karen Dynan to start us off with the first working paper on fiscal policy and the lessons for the future. And then I will come up each time to introduce our next speaker. And then after that, we will have a moderated conversation. So with that, Karen.

[00:21:58.08] - Karen Dynan

Thank you. It is a pleasure to be here and to have been part of this important project. Yeah, so this paper is about fiscal policy as a driver of inflation. It is joint work with Doug Elmendorf. So let me get you started with this. US fiscal stimulus was historically large during the COVID era. I have listed the various large fiscal packages that were passed during the Great Recession and the COVID recession. I'm not going to take you through every number on this table. What I mostly want you to see are the circled numbers. For the Great Recession period, fiscal stimulus added up to \$1.3 trillion. That was 10% of pre-crisis GDP. We thought that was a big number at the time. In hindsight, most experts think that fell short of— fell well short of what the economy needed. And so then you get to the COVID period, and perhaps partly because of that regret and those lessons learned, we went big. So we passed \$5.5 trillion \$1 trillion or 23% of pre-crisis GDP to support the economy. So now I want to take you to— the last of those packages was the American Rescue Plan, which was \$1.3 trillion.

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We focused mainly on that in this paper. This chart is illustrating that prior to the passage of the American Rescue Plan, forecasters thought recovery was underway. I'm showing you— I'm showing you 3 sets of forecasts here, CBO, the FOMC, and the Wall Street Journal survey of private forecasters. As you can see, all of the charts are very similar, but basically what I'm showing you here is kind of like an output gap. It is projected, it's where we thought real GDP was and was heading just prior to the passage of the American Rescue Plan relative to where we thought it would have been had COVID not occurred. And what I want you to see here, just looking at the CBO graph is that, yeah, we thought an output gap opened up in 2020, of course, when economic activity slowed so sharply. But as you can see, forecasters thought we were on the road to recovery even without the American Rescue Plan. That output gap was shrinking. Okay, so then you have the American Rescue Plan passed. In here, you can see, forecasters correctly anticipated that the American Rescue Plan would provide a sizable boost to demand.

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So I'm just showing you CBO here. I can tell you the FOMC and the Wall Street Journal forecasts look similar, but I'm showing you, for example, on the left, real GDP growth, and that, that lightly shaded bar, that's pre-American Rescue Plan expectations for GDP growth. That's what I showed you in, uh, it's, it was embedded in the last chart. But then you can see in the dark blue bar, you can see where we thought the economy was headed after the passage, a few months after the passage of the American Rescue Plan. And you can see forecasters got it right. Demand was going to be boosted by this big plan. And in fact, we do back-of-the-envelope calculations that show CBO's forecast is just right on what you would expect if you were passing you know, this plan through using standard multipliers to GDP. The hollow bars are what was

actually realized. It wasn't quite as large as what CBO forecasted, but remember, that's not telling you about demand. That's telling you about demand together with supply. Okay, so they got it right about demand. What they didn't anticipate, of course, was the surge in inflation nor the need for the Fed to tighten sharply.

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I'm showing you CBO's forecast. They did forecast a bit of an increase inflation after the plan was passed, but nothing like what we really got. And of course, they did not anticipate the tightening of Fed policy. Okay, so in the paper, the argument that we make is that the available data point to a key role for strong demand running into supply constraints. So basically, the story is as the economy reopened, households' desire to spend rose sharply, and that fiscal support basically helped enable them to act on that desire. And then we had supply unable to expand fully to fully meet demand, and that's what put the upward pressure on prices. So the way to think about this in your standard aggregate supply, aggregate demand framework is you're just getting the aggregate demand rising enough to push the economy onto the steeper part of the aggregate supply curve. Okay, so it's a broader version of our nonlinear Phillips curve story. So, you know, we're not saying that supply shocks were irrelevant. You know, that's a shift of the supply curve, an inward shift of the aggregate supply curve. We think they contributed, but we think they're only part of the story.

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Okay. So, I should say, you know, the way we approach this is we basically argue it through a collection of evidence that we put together. To support our story. But starting with adverse supply shocks, we take a look at the identifiable one and, you know, we just conclude they are not kind of large enough at all to be kind of the most important story. So to start with the major identifiable adverse supply shocks, they were either easing— those pandemic disruptions, they occurred in 2020. In 2021, they were actually in reverse. So that should have been disinflationary. Or they arrived later. The invasion of Ukraine was of course in early 2022 after inflation had picked up. We also show that the magnitude of observed supply shocks appear to be too small to explain the scale and persistence of the inflation surge. And finally, we show that inflation rose well beyond the sectors that were most directly affected by shocks. So, you know, there are lots of stories around semiconductors, Phil Levy is going to be talking about that, but inflation was much broader than that. So, to that point, let me show you another set of graphs from the paper.

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The timing and breadth of inflation is just much more consistent with a broad demand impulse associated with the American Rescue Plan than it is to a kind of purely supply shock story. What I'm graphing on the left here is just your basic core PCE inflation. It's a 6-month change, so it's picking up things a little faster than a 12-month change would. But I've got a line on the chart showing March 2021 when the American Rescue Plan was passed. And you can see that core PCE and importantly, trimmed mean PCE picked up, you know, right around the time that package was passed. So that trimmed line is kind of important because that's taking out kind of the most, you know, the biggest changes. It's kind of speaking to the fact that this was broader than just a couple of categories. And to that point, I've got measures of PCE inflation dispersion on the right. What these are is just counting the number of categories that are showing unusually large increases, you know, so it's going to kind of components of inflation. And you can just see this big jump in the series again right after the passage of March 2021, just indicating that this inflation was very broad.

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It was not isolated to particular components, which is consistent with a broad impulse to demand. We have other evidence in the paper. We talk about the labor market story. Justin is going to be talking about that in a few minutes, but I think he'll present evidence that's consistent with our view of what happened, you can see labor demand pushing up wage growth. Again, beginning in early 2021, that's what you see in this chart here. I couldn't put the pandemic period on here because there was just too much kind of volatility during that period because of changes in the composition of the labor market force. But if you kind of— what I did plot was I plotted the pre-pandemic average for wages. And you can see again, right in March 2021, you can see it picking up starting then. Job openings rose sharply, indicating tighter labor markets than the unemployment rate alone suggested. Some people will say, oh, you know, the fact that the unemployment rate didn't rise much, you know, is— or as much as one might expect. Sorry, it did not fall. To unusually low levels. That's what I meant to say, you know, as indication that this isn't a tight labor market story.

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I don't think that that one is right. And then, you know, on a separate vein, sometimes you hear like, oh, this wasn't a demand story. It's well explained by shocks because we saw this rapid disinflation and that must be just the aggregate supply curve shifting out again as these temporary supply shocks are dissipating. No, no, no, that's also consistent with this idea that inflation was related to going onto this nonlinear part of the, aggregate supply curve. I mean, basically it's a story about demand easing materially on waning fiscal effects and also importantly, the monetary policy response as monetary policy, you know, tightened sharply in

early 2022. That pulled demand back. You pull demand back a little bit from this very steep part of the aggregate supply curve and what do you get? Yes, you get the pressure on prices being real, uh, uh, you, you get it the pressure on prices going down pretty quickly. So we think that the rapid disinflation is also very consistent with this story. Okay, so this is just my final slide with takeaways from our paper. So first of all, I don't want it— we are not at all arguing that it was a mistake to vigorously fight recessions with fiscal policy.

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We believe that fiscal policy is a powerful tool for stabilizing the economy. Especially when monetary policy is constrained. That's a point that we discuss in the paper. But we do think that policymakers need to be careful because the inflationary consequences of stimulus can be nonlinear when the economy is near capacity. Okay? Now, you know, when it comes to policy mistakes, you know, an important point is that calibration is very difficult in real time under substantial uncertainty. And no doubt that is what we were facing in March 2021. So again, the paper is about taking lessons for the future, not about calling out what may or may not have been mistakes. We will have discussion about that later today. But one point we make in the paper is that automatic stabilizers linked to economic conditions, if we could set a framework up like that, that could really reduce the risk of both under and overshooting in future downturns. And that is an area that I've done kind of further research on, just showing that we could have both done better during the Great Recession period when we didn't do enough, but also avoided the inflationary— some of the inflation that we saw in the COVID era if we had had policy that was more tightly linked to what was actually going on in the economy on an evolving basis.

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So with that, um, thank you very much, and I will turn things back to our moderator.

[00:34:06.01] - Nidhi Bala-Johnson

Thank you, Karen. Um, next up, Joanne Xu. Joanne is the director of the Monthly Surveys of Consumers Tracking Leading Economic Indicators, including consumer expectations and sentiment, and a research associate professor at the Institute for Social Research at the University of Michigan, and she will talk to us about consumer expectations.

[00:34:31.47] - Joanne Hsu

Thank you so much for having me. All right, so to put a backdrop on where consumer expectations have been over the last few years, here are two charts with year-ahead inflation expectations on the left and long-run inflation expectations on the right, with a dotted line with

the onset of COVID and a red box in that post-COVID inflationary period. And what you can see is that short-run inflation expectations and uncertainty began rising in 2021. Um, it hit a bit of a peak in mid-2022, um, and then gradually came down through November, December of 2024. Um, long-run expectations, it's really hard to see here. It did lift a little bit in, um, '22 and '23, and then it more or less recovered at the end of 2024. And so, you know, I'm sure you can all see in 2025, we see a tick up, and that's very much concurrent with the escalation and de-escalation of tariff policy announcements that happened over the last year. And in about half an hour, we'll get new readings on inflation expectations today. So, While inflation expectations didn't rise all that much, especially in the long run, sentiment towards the economy, which includes expectations of business conditions and personal finances, that plunged as inflation peaked.

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And post-pandemic sentiment has consistently remained below pre-pandemic readings. And I'll show some evidence that we see in the survey that consumers are able to distinguish their inflation expectations from their personal experiences, for example, with prices. And as I show in the paper, sentiment and expectations towards the macroeconomy and personal finances are actually much more sensitive to food and gas prices than inflation expectations in this era, which really didn't move all that much with these volatile price categories. One of the key things to note with this post-COVID, COVID inflationary era is that consumers did not really adopt inflation, inflationary psychology in any sort of substantial way. So in the blue line here, we have buy-in advance motives. So we track the share of people who believe it's a good time to preemptively buy large purchases now to avoid future price increases, you know, going all the way back to the '60s. And in the large bar, the large red box on the left, you can see in the '60s to '80s period, buy-in advance motives were very, very high and it, but not constantly. In the first kind of inflationary episode that we see here, it went up, it came back down, it went up, it came back down.

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And you can see it's a leading indicator, right? Like all the proliferation and increase in inflationary psychology precedes each bout of inflation in the '60s, '70s, and early '80s. Meanwhile, look at that little red bar on the right. That is buying advanced motives in the COVID inflationary era. It really did not take off at all.. And in the post-COVID era, we only see kind of a brief uptick in buy-in advance motives at the time that Trump was elected and tariffs were announced. And we actually see the exact same bump in 2016 when Trump was elected at that time. And also in 2018 when those first tariffs were implemented as well. So you see consumers, they are responding to these policies, but at the same time, this inflationary psychology just did not set in, in the modern era. But again, looking at, at history, it took several

bouts of inflation for inflationary psychology to really set in among consumers. So despite the slowdown in CPI inflation since 2022, the pain of high prices really persists. So the blue line here shows the share of consumers who spontaneously tell us on the surveys that high prices are weighing down their personal finances.

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So historically, again, on the left side, and this is overlaid with CPI inflation in the black line, these high price mentions, they rose and fell alongside with CPI inflation. Um, and then when you look to the right, you can see that these high price mentions surged in 2021 and have remained consistently elevated since then. And this has occurred despite the moderation of CPI inflation. So this is something that's a little bit different than what we saw historically, in which as CPI, as inflation slowed down, people started to worry less about the impact of high prices on their personal finances. But in the last 4 years, it's stayed high and stayed at levels that we've only seen in, um, briefly in previous, um, decades. And we actually see a pretty similar pattern when it comes to inflation expectations. So even though consumers are really worried about the pain of high prices, we still see fluctuations in their inflation expectations. So post-COVID, again, in the blue line, a sustained 40-plus percent of consumers spontaneously telling us high prices are eroding their personal finances. And this is at levels comparable to the peaks in the '70s and '80s.

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And this is happening despite the fact that inflation expectations in the dashed black line have moderated. You know, they peaked again with the tariff announcements of last year and have come down. So ultimately, post-COVID, consumers are in a very different information environment than they used to be. On the Michigan survey, we have a question that asks people what news they have heard about business conditions, business developments. And we've been tracking the share of people who are spontaneously telling us that they've heard unfavorable news about prices. And so you can see this going back all the way to the '60s. So in mid-2022, this peaked at almost 40%. 40% of consumers told us that they heard negative news about prices and inflation. And this is almost double the 20% peak from the 1960s and the 1980s. And, and so when I talk to my colleagues who are professors of communication, this comes as no surprise to them given the evolution of the information environment over the past few decades. So notably, I don't have a line here, but you can see these peaks in unfavorable news about prices during the global financial crisis. And that might seem as a bit of a surprise given that inflation at that time was not particularly severe or it wasn't really the big story of the day.

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But then you consider— and that was— and the rise of cable news is one of the things that really bifurcates the information sets that people might have. And also, it has— has changed news into a product that's searching for customers. And so we start to see a polarization and a proliferation of negative news at that time, or polarizing news at that time. And then, of course, in the late 2010s— this isn't just a social media story. Social media itself really evolved in the 2010s. With the rise of algorithmic social feeds, news feeds. So it's no— social media becomes no longer something that's just what you and your friends are personally posting about. Suddenly you are getting delivered news to you that other people have clicked on. And what a lot of communications research has shown is that algorithms, the way social media companies implement algorithms, the types of posts and news articles that generate the most clicks are the ones that are most emotionally heightened typically in a negative manner. And I remember speaking to reporters in 2022, and one told me that they were under pressure to pump out as many inflation stories as they could, under pressure from their editors to pump out as many inflation stories as they could.

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But at the same time, this isn't, you know, I'm not making a causal statement here, right? Like, if you are worried about prices, you're worried about inflation, you're going to go ahead and click on every single inflation story you see. See. So it becomes a bit of a feedback loop, and this is a loop that was not the case in the 1960s and the 1980s. And to sum up the takeaways, so inflation expectations among consumers only briefly and modestly rose in the post-COVID inflationary period. Critically speaking, and I don't think we talk about this enough, consumers really did not adopt inflationary psychology in this post-COVID inflationary period. But that doesn't mean that we're out of the woods. It took many successive inflationary episodes before the 1980s for consumers to adopt inflationary psychology. And so this highlights the ongoing risk that we have right now. So, so, you know, inflation expectations as of the end of January still have not come down. They've come down quite a bit since the middle of 2025, but they haven't come back to where we were at the end of 2024. So from the consumer's perspective, they're still a little bit worried that inflation could continue.

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They're not expecting it to continue slowing down, but they're no longer bracing for the worst-case scenario that they thought we might be facing May, June of 2025 at the height of inflationary tariff rhetoric. And then finally, despite the moderation in inflation as well as the moderation of inflation expectations, the persistence of high prices weighs really heavily on consumers. It affects how they view their personal finances. It affects how they view their

macro— the macroeconomy, despite the fact that when you ask them specifically about their inflation expectations, those actually have moderated. Thank you very much.

[00:44:40.40] - Nidhi Bala-Johnson

Thank you, Joanne. Thank you. Up next, Justin Bloesch. Justin is an assistant professor in the Cornell Department of Economics and will talk about the labor markets.

[00:44:56.01] - Justin Bloesch

Hey, good morning, everyone. My name is Justin Bloesch. Sorry, I should have said that earlier. And yeah, it's really a privilege to be here. So let's talk about the labor market. So there's two questions that I want to frame these 10 minutes around. One is, what was the labor market's role in contributing to inflation during this period? And two, did COVID permanently change the labor market, particularly around this question about inflation? So first of all, what happened— so it does not— oh, oh, OK— is when COVID hit, lots of people lost their jobs. Unemployment rates spiked. Very quickly, the labor market recovered. So the red dashed line is the job openings rate. Employers were trying to hire very quickly. The orange line is the quit rate from JOLTS, how frequently workers were changing their jobs or leaving their jobs voluntarily. On the right panel, there's 4-quarter growth in the employment cost index of wages. And then the green dashed line is PCE inflation. And so what we saw is during this window, both nominal wage growth and price inflation jumped and then fairly quickly came back down. So a quick overline— outline of what I want to say today.

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So one, the labor market was very tight during the COVID recovery. Second, if we want to predict nominal wage growth, it seems like the rate at which workers quit their jobs is a very good predictor. 3, why do we care about nominal wage growth? It's because nominal wages by and large pass into prices. But there was little evidence of wage-price spiral dynamics. So while we did see the wages to prices, I want to argue that we didn't see a lot of the back direction of prices into wages. The question of did COVID permanently change the labor market, I'm mostly going to say no. While there was the rise of remote work, for the most part, there was temporary mismatch in the labor market between where people wanted to work and where there were jobs. But that largely faded by 2024. OK, so let's talk about the wage Phillips curve. So what is the wage Phillips curve? In the middle there is— on the left-hand side, we have nominal wage growth. On the right-hand side, we have labor market tightness. There could be multiple measures of this and other stuff. And I'll talk about that in a moment.

[00:47:09.00]

So first of all, why do we care about nominal wages? And the reason is that— wages largely pass into prices. First, wages are about 50% to 60% of most employers' costs, at least in the short run. And then also, when wages are higher, that gives households more purchasing power, which can push up the demand— price of inelastically supplied goods, in particular housing. So there's various measures that you can use for the labor market tightness variable. A very common one is the gap between the unemployment rate and the natural rate of unemployment. Another common one is the ratio of vacancies to unemployment. As far as the first one, there's a couple of reasons to not really like the unemployment gap in real time. One, because you have to estimate the natural rate of unemployment, which can change. And second is that, as Karen was mentioning, it might be highly nonlinear. When the unemployment rate is very low, incremental increases in demand can largely push into wages and prices without changing the unemployment rate much because it can't go negative. And so I'm going to focus on the quits rate here, and I'll talk about other stuff in a moment.

[00:48:13.34]

And as for the other stuff, that's when you want to think about things like inflation expectations or even realized inflation. So in favor of quits, so this is a plot. On the x-axis is the 4-quarter moving average of the private quit rate. The y-axis is the 4-quarter growth in employment cost index wages, focusing on private sector workers in the US. That are not unionized because public sector wages and unionized wages were a little sluggish to adjust in response to shocks. So the blue dots are prior to COVID and what the red dots and line trace out is what happened during COVID. So when COVID hit, the labor market got very tight, workers had a lot of opportunities to change jobs and nominal wage growth got very high. So that's to the top right. After spring of 2022, the labor market COVID softened, the rate that workers quit their jobs fell, and nominal wage growth fell. What is so remarkable about this is how stable this relationship is both prior to COVID and during the COVID experience. Okay, so to the question of did prices affect wages, you may have heard many stories about workers going to their employers and saying, hey, my cost of living went up, I'd like a raise.

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And what I want to argue here is that that only worked because the labor market was tight. It was the tight labor market actually that rose wages. So this is figures plotting 4 things. So in black, there's the Indeed posted wage index. And what I like about that, it's going to be moving faster. You can kind of think about this as the spot market, whereas actual wages are kind of the contracted market. What I hope you take away from this is that posted wages rose first. So the red line is Consumer Price Index. We're leaving out shelter because that lags quite a bit. And

then the blue and the purple lines are either consumer or business expectations of inflation. And what I hope you see is that posted wages rose first and peaked first and then declined first. And so I take this to be evidence that firms were responding to— well, they had high demand. Workers had a lot of outside options and wages rose. But it was not inflation itself. That was driving wage growth. And why do we care about that is that the central banks are often very concerned about wage-price spirals, but with a concern that they would need to sort of crush the labor market for an extended period of time to break that inflationary cycle.

[00:50:37.22]

And I think, consistent with what Joanne showed, that's just not really what we saw. This really looks like a labor demand story. OK, as far as mismatch, so did COVID permanently affect the labor market? What I'm plotting here is the path of the employment level across industries relative to sort of pre-COVID trends for about a year and a half prior to COVID. And what is labor market mismatch? Well, that is firms in some industries are trying to hire and workers want to work in different industries. And COVID disrupted lots of things. Lots of people were staying at home. People were buying more goods. People were using more digital services like Zoom. And so what are the industries where we saw a lot of employment growth? Well, the top dark maroon line is transportation and warehousing. And then the orange and the red are information business services. So in delivering goods and coding, there was a big increase of employment. What are the lines at the bottom? Education and health. People were not going to the dentist nearly as much during COVID. And then the blue line of government, government wages were slow to adjust. So workers were leaving this, this workforce.

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Sector that was not raising wages. This all peaked in early 2022, which was also sort of the peak moment of high demand as well. And then as the labor market softened starting from '22 to '24, all these patterns kind of converged back so that by the end of 2024, almost every industry was back to the sort of employment level that you would have expected if you had extrapolated out prior to COVID. So this looks like— people found their way back to both consuming and supplying labor in similar ways as they did prior to COVID. How else can you see mismatch in the labor market? Well, you can look at the Beveridge curve. And so here's the way to— the way to read the Beveridge curve as— so on the x-axis, we have the unemployment rate. On the y-axis, we have the job openings, right? In the top left is a tight labor market. There's lots of job openings and a few unemployed workers. The bottom right is a very slack labor market. There's few job openings, lots of unemployed workers. And if you go to the top right, to the northeast, that's a way of thinking about mismatch.

[00:52:50.52]

So if you're in the top right corner, there's a lot of vacancies and a lot of unemployed workers and firms are having a hard time matching with each other. So the blue dots are prior to COVID. I'm sorry, the red and the— blue dots are in the aughts. The red dots are in the 2010s.. And the green line traces out the path of the Beveridge curve during the first part of this period. So the first thing to see is both vacancies and unemployment increased. So there was a big increase in mismatch. And as time went on, it moved from the bottom right to the top left. So the labor market was getting tighter. Unemployment came down. Vacancies were going up. In April of 2022 is sort of where everything peaks. And this is just when the Fed had just started raising interest rates. It was really the tightest labor market we had ever seen. It was actually at the same time— this is when Blanchard and Summers wrote the bad news for the Beveridge curve for Peterson, concerned that we'd sort of be stuck on this green line for a long time. But two things happened.

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So one, the mismatch started to fade. People came back to work, and employment across industries sort of normalized. So as that mismatch fades, that's a shift in the Beveridge curve, and demand also fell, which means a movement down and to the right. Those two things combined means that vacancies were able to fall without much of a rise in unemployment. And so there was a discussion, for example, Governor Waller sort of anticipated that this might happen, that a decrease in the vacancies and a decrease in quits, nominal wage growth was able to come down, job openings were able to come down, without much of an increase of unemployment. And for the most part, we were able to achieve kind of that soft landing that the Fed was hoping for. Okay, so I think that's— I'm done a little early, so I will pass the next person.

[00:54:49.36] - Nidhi Bala-Johnson

We all get an A+ for staying on time here. This is brilliant. Next up, Phil Levy is the lead trade economist at the World Bank since 2024. Prior to that, he was the chief economist at a logistics startup, Flexport. So really well-placed to answer the question, how much did supply chains contribute to the inflation outcome in COVID?

[00:55:14.32] - Phil Levy

Well, thank you. It's a great pleasure to be here. Yes, this work draws much more on my earlier and does not reflect the views of the World Bank or its board of directors, but really was stuff coming out of of stuff during the pandemic where I was in the logistics industry. The questions

that I want to look at, I think, are very complementary to the discussions we've been having. Which US inflation experience are we talking about when we ask, did supply chains deliver COVID-era inflation? Which inflation? Why do we think that supply chains were a culprit in all of this anyways? We wouldn't think that as much if I always had Karen as my opening act. And then distinguishing between demand and supply shocks. And then trying to think a little bit at the end that one thing we really came away from this era was we need resilience. We're not quite sure what it means, but we know that we need it. So maybe thinking a little bit about what is it to have resilient supply chains? What are reasonable expectations? And how might one do that? I'm going to do all this in 12 minutes.

[00:56:22.52]

All right, so you've seen a number of charts like this, and I think there'll be more to come, sort of tracking out different measures of what we had with inflation. There's really only two points that I want you to take with this one. This has headline CPI in blue, PCE goods inflation in red, PCE services in black, and then the dashed line is the trimmed mean PCE. So the two things that I would like you to get from this one are, that the goods inflation, the spikes preceded the services inflation, that it came first. It sort of spiked and then receded quickly. It was also a lot less durable than the services inflation. So when I was talking about which thing we're talking about, that's what I'm getting at. Is that we're talking about supply chains, it's really a goods experience. So the other thing, of course, is the general shape, which should be quite familiar by now, but where you're getting the sort of peaking in mid-'22. And this is getting at this question that I posed, why would we think that supply chains were a culprit? Well, one thing, of course, is we all saw some of these pictures outside the port of LA Long Beach where the ships were queued up.

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And that doesn't seem like a supply chain that's functioning very well. Or store shelves that are bare, again, not usually a characteristic of a well-functioning supply chain. There's also, you know, that rough pattern looks something like this. Now, this one I have to explain a little bit more what it is. It won't be as familiar. This was an indicator that we put out when I was at Flexport, which was tracking on average how long did it take to get a container from the origin port to pick up at its destination port. So tracking that over time. And the reason there's two lines is we would measure this by different trade lanes. So people in logistics tend to look at maritime trade, which is the bulk of moving goods around the world. That one is, so the dark line is the Far East westbound, so from Asia to Europe, and the red line is Trans-Pacific eastbound, so from Asia to North America. The TPEB, the Trans-Pacific eastbound, is the largest, then the Far East westbound right after that. All right, so what does this thing tell us? This is counting the

number of days that this takes for this journey from picking up at its— from cargo ready date, actually, at origin to pickup from the destination port.

[00:58:48.49]

What you see is that this chart presents about a year before the— deliberately about a year before the onset of the COVID problems. And you're in the ballpark of 50 to 60 days. The numbers may be a bit small, so I'll read them out. You're in the ballpark of 50 to 60 days. There's fluctuations. You know, things move around seasonally, but it gives you an idea of where we are. By the time we were getting into the spring of '22, you were seeing things around 110 days. So that's dramatically slower and very important for businesses that are trying to, you know, have things come up for seasonal, you know, spring gardening or stuff like this. So this would also be part of the sort of prima facie case that supply chains didn't come through. There were real performances in supply chains. It was a very challenging time for supply chains. But now that I've set that up, let me try to convince you that supply chains have been sort of unfairly convicted of either malfeasance or poor performance here. And really, I'm going to do this by just saying, what do we expect supply chains to do?

[00:59:58.26]

And what did they do? There's speed, but there's also what did they deliver? They're supposed to be delivering things. So let me start here by saying we should be able to tell the difference between a demand shock and a supply shock. Both of them can certainly drive up prices, but we think there's a difference in what's going to happen with quantities, right? That if it's a demand shock, then quantity should increase. If it's a supply shock, quantity should decrease if there's a contraction. And you could have both, of course, but we can look and see what the balance is. So what this does is this looks at real personal consumption expenditures. It divides them into durables and nondurables. Durables are the upper red line. And it then normalizes this so that February of 2020 equals 100. So it gives a baseline, sort of right on the eve of the pandemic shock of where are we. You'll note if you move to the left a little bit, it's kind of dull. Dull, not that much happens. There's minimal variation. I could have extended it further, but why extend a dull chart? But then you get sort of two things that happen in sort of fairly rapid succession.

[01:01:07.40]

You get this really sharp downward drop. So why do we care about that? Well, if you're a business, you care about this because this— and this gets to some of the forecasting stuff that Karen presented, which is, uh-oh, wait a second, you know, do I want to be placing orders? Do I

want to be doing all this stuff? Because things are looking really grim. And then look what happens. You get not just a rebound, which would have been pretty dramatic if you had a quick rebound, but a real surge and a persistent surge. So if you look at this for non-durable goods, the darker lower line, you end up settling with about a 12% persistent increase in the consum— this is real— in the consumption of non-durable goods. And it's even more dramatic when you're looking at this for durables. That you're looking at this, you're over 20% heading up towards 30%, and it lasts. It's not a quick recovery, but there's this sort of ongoing demand where you get— but also implicit in this is people were able to consume those things. These are goods that were delivered and that people consumed. That would be evidence of a supply chain performing.

[01:02:16.29]

If you can, in sort of relatively short notice, get 10% to 20% more goods to people, it's hard to say that that's a supply chain failure. Really, the other charts I'm going to show here for a bit are sort of variations on the theme. This is— since durable goods was the most striking outlier in this— here I just sort of break this down to see whether— was this one subcategory that really sort of drove everything? Was it all in one? And the answer is there's certainly differences between categories,. But it doesn't really look like there's a single one that just drove things. So that's the point of this. This chart is addressing this question of if you are a business and if you are making plans, what did you reasonably expect when you're trying to set capacity? And there are lags, as Niti was talking about for insurance, there's lags, very much lags in a capital-intensive industry, like how many ships do you have? How many warehouses? Do you have? Well, so this plots out the log of real personal expenditure— personal consumption expenditures on goods. And what you see is it stayed pretty close to a trend line for a long time.

[01:03:31.41]

There's minimal variation off of that line. So you would have— it would be quite reasonable to expect that that's what would continue. And then this puts in perspective that same pattern that we saw earlier. Where— but it gives an idea of the extent of the deviation from trend. That this was a very sharp deviation, which would have been hard to foresee. And it would have been a very bold and probably many would have thought unwise bet to sort of stock up on capacity beforehand, realizing also, by the way, that the supply chain industry and especially ocean transport had had some very difficult years. I won't delve into that here, but in the lead-up to this. So the norm was not— these were not swings where it's like been good year, bad year, good year, bad year. It had been a whole string of bad years. It was a major carrier left the business. And so that was the setup to this. In that context, they actually delivered more, but it

would have been very hard to predict. So when I say delivered more, up until now, I've been talking about things like what was the actual consumption.

[01:04:33.30]

It was very much US-focused. Here, we take this to international supply chains, the global aspect what actually happened to real US imports of goods. And what we see is they increased. There's obviously that sharp drop immediately. But then as we sort of got through this crunch period, as you're looking into 2021 and 2022, it's a substantial increase. But it's more an increase as a continuation of the earlier trend, an expansion of capacity, but not necessarily an ability to deliver all of the goods that people people seem to want. This last one I'll show on the theme. This is looking at a variety of ports and how much was going through the ports. There were variations here. There certainly were problems at ports. I mean, you did have people getting sick. There was difficulties. But on balance, if you compare the sort of earlier period, which is— so as the dip comes, you can sort of tell that there's that dip coming right with the onset of the pandemic. I am literally waving my hands here, but the latter part is generally higher than the earlier part. You're seeing more stuff move through ports. So that's an argument that basically supply chains did function.

[01:05:46.52]

They increased the amount of stuff, which then leads to the question, all right, so what happened? What went on? Well, of course, that's easier when we've seen the stuff that Karen showed. But here's another angle on the same data that she was showing, which is looking at what was happening to real US household income. And what's striking to me is that the spikes that you see early on, they correspond very well to what Karen showed as these sort of major programs to do stimulus funds. And they moved money into people's pockets, and they correspond very well to the consumption spikes that we saw. But you also note that in terms of just as a baseline, the household income never got back down to where it had been in March of 2020, sort of the lead-up to this. So you had more money in people's pockets. And of course, the thing we all know is that you had a shift where the ability to consume services, normally the bigger part of people's consumption, was seriously constrained because of the pandemic, which then induced a shift into goods. All right, so wrapping this up, I said I would say something about resilience and sort of what lessons we draw from all of this.

[01:07:04.31]

When we think about resilience, we're talking about some kind of ability to respond to a shock. What kind of shock? So that matters. We have to think this through. I believe there's sort of an

open question. I don't have either the time or the answers to do all this right now. Is it independent of shock type? But for the logistics industry, you could say they should be as efficient as they can, but really it's a, what is a reasonable capacity to set and what kind of surge capacity should you have available? And that's difficult because it is costly. As we saw interest rates go up, it gets more costly to do things like have extra warehouse space or to take some of the measures that people had talked about for trying to have more resilient supply chains, such as just-in-case inventory management in lieu of just-in-time inventory management. Having more inventory costs money. And so it's a question of what they will do. I think the general argument that I would make out of all of this is the evidence is that this was largely driven by demand, very much consistent with what Karen said.

[01:08:15.14]

What I'm— you could take my stuff as part of the demonstration where she said, hey, you have a sharply upward sloping aggregate supply curve. This is a component of that and explaining sort of why it's sharply upward sloping. But do we think that it was more a demand shock or a supply shock? I conclude demand shock, exactly because quantities increased both for the amount consumed, for the amount that passed through ports, for overall imports. Why do we care about all of this? So one— so the biggest reason, I think, is that what's the policy conclusion? And I think unfortunately there was some tendency to say supply chains failed us, trade failed us, therefore we need to turn away from trade. And I don't think that this evidence really supports that conclusion. So So let me stop there, and I look forward to our discussion. Thank you. Welcome everyone to the stage.

[01:09:40.22] - Nidhi Bala-Johnson

Sorry, we're missing Joanne. Thank you. Here we are.

[01:09:53.43]

Would you mind sharing, Jo— go ahead, David. Oh. Thank you, David. I appreciate that. So what we thought we'd do is have a bit of a Q&A. As you can see, there are some themes that are quite consistent across all the, um, all the research here. We'll have a bit of a moderated conversation and then open it up to all of you. To ask questions. If I may set that up, there are mic— there's a microphone at the— in the middle of the room, and there are also going to be roving microphones. If you could please line up and state your full name, title, and organization before you ask the question, and then we'll get right into it. So, Karen, perhaps I'll start with you, if that's okay. Inflation surged across all advanced economies pretty much around the same time, even though the size and the composition of the fiscal responses were quite different

across different countries. How would you respond to the argument that this global pattern suggests that fiscal policy could not have played an important role in the US inflation surge?

[01:11:17.32] - Karen Dynan

Thank you for that question. Let me just say first, it was very nice of Phil to repeatedly cite my paper in his remarks. But I want to point out Phil's paper was written months before my paper was written. So we should give him some credit there. I'm glad you asked because really our paper was US-focused. And I think that's really important to understand because our narrative is not the one you should apply globally. We'll have a paper in the next session by Asher showing that there are important common patterns. There is kind of a common narrative you can tell globally, and that's because demand and supply was affected in every country. But I think the important thing to recognize was that the relative role of demand and supply was different across economies. So for example, as you mentioned, we had different, very different amounts of fiscal stimulus in different countries. And so in the United States, we had a particularly large amount. And I think that is why we had demand playing this role. But if you go to Europe, that wasn't the case. But what Europe did kind of experience was much more exposure to the supply shocks from the invasion of Ukraine.

[01:12:37.59]

I mean, we are energy independent for the most part in this country, so we don't have to worry about those things as much, but Europe was very, very exposed. And Patrick is giving a nice paper as well in the next session that I'm kind of stealing his thunder here, but you can kind of look at the relative experiences of these different parts of the global economy. And they actually, if you look at the kind of nuances, you can see that they line up quite well with different factors, different roles for demand versus supply. In different economies. So I just think the narrative—and Adam already said this at the beginning of his remarks—which is, I think the narrative that, oh, it's got to be the same driving factors across all these different economies, obviously because we had a surge everywhere, I just think it's, it's wrong. You have to take a more nuanced look at it.

[01:13:28.21] - Nidhi Bala-Johnson

Thank you. Thank you, Phil. Perhaps I'll come to you next, because having lived it real time, do autos not provide a counterexample to where supply constraints did in fact dominate. We saw volumes go up and it seems largely due to shortage of chips. I remember for a long time sitting there going, telematics is a big part of how, right, we think. And there was a real shortage of chips across autos. So wouldn't that be a counterexample to the research?

[01:14:01.34] - Phil Levy

Thank you. Yeah. So the autos case is an interesting one. There was a reason why I put up that chart, which said, if you were a business person and you were trying to forecast this out, what would you have seen as this went along? And I think that's the story in autos, was they had to make some difficult calls. So Karen made the point about what do you have in real-time information as you're doing these things. I think they were making difficult calls about how many cars, vehicles they were going to build, and then how many— chips were going to go into those vehicles at the moment when you were seeing that very sharp downturn, where there was a fairly strong consensus, we're heading into a recession, either bad or a very bad recession. And that's not the time when people buy a lot of vehicles. So they, when the time came to discuss with the semiconductor manufacturers, they said, we don't need very much. Don't put us down for too many of these. The semiconductor manufacturers said, OK. And then they went and filled their order books. And so that meant that this was a very difficult decision to reverse, which they tried to reverse.

[01:15:11.02]

They said, OK, but they were generally low-end chips. They weren't as profitable. They had—the cycle had moved on. So all of a sudden, you have this shortage. It is a very difficult thing to operate when you're having these big swings in ways that is hard to find really good precedence for. So I think this was just simply an instance of a business getting caught out. That looking— something that looked for all the world like a stark recession. And of course, the other thing they probably could not have figured out was what happens to vehicle demand, not in a recession, but in a time when people don't want to take public transport as much or other things. So there was a bunch of— I would say it was a very unfortunate poor forecast, not one you could really hold them responsible for. But that's going to happen. And again, at Retro, we have sort of the flexibility. And you can see they clearly thought it doesn't make sense to order, you know, lots and lots of chips just in case because it's costly.

[01:16:12.50] - Nidhi Bala-Johnson

Thank you, Karen. Justin, anything you would add to, to what Phil said?

[01:16:20.22] - Justin Bloesch

I guess more of a comment on that group is together. And one thing that we we haven't discussed a lot is the position of that sort of markups and higher prices were led by different company pricing strategies. And I think there really is a way to reconcile everything that we're

talking about here. And so unfortunately, we haven't had a graph about an upward sloping or a convex supply curve. But in a world where companies are at their capacity constraints and their competitors are at their capacity constraints, you can kind of charge whatever consumers will demand. And your costs may not have gone up because maybe you contracted before COVID. And so it looks like your costs, at least in the short run, didn't go up. You can kind of charge whatever consumers are going to demand, and it's going to look like a markup. And then corporate profits are going to go up. So I think a combination of a big push out in demand, a pullback in supply, some in more industries than in others, enables that— conditions for companies to charge quite a bit more and then for profits to go up as well.

[01:17:25.23]

So I don't think there's actually so much disagreement as there— there shouldn't be as much disagreement, I think, as there is right now.

[01:17:33.19] - Karen Dynan

I'll just comment. So Justin's making a great point. I mean, there is a literature that is actually looking sector by sector. They say thinking about this aggregate supply curve is not the right way to do it. And it's related to this whole idea that maybe there was a rotation. From services into durables. And you really need to look at industry by industry, both because of the different circumstances or the different inherent natures of the different industries, but also because of the differences in demand. But that literature doesn't really— when you add that all up to aggregate supply, it doesn't negate the story. If anything, it makes it stronger because the industries where it's really binding are going to— you know, it's going to have a lot of influence on what we're seeing in the aggregate.

[01:18:26.34] - Nidhi Bala-Johnson

Yeah, thank you. Thank you, Justin. Actually, that leads to an interesting point about your research clearly showed that there wasn't much evidence of a wage-price spiral. And you're right, living it real time, it was more businesses were responding with the wage increases primarily because of lack of capacity and match of skills. As opposed to a wage-price spiral. But I'm curious, what would it take for a wage-price spiral dynamic to take hold?

[01:18:56.44] - Justin Bloesch

So I think this is in some of Joanne's presentation and actually we were discussing a little before is in the '60s and '70s, I think it took a couple goes at it for inflationary mentalities to take hold. So in the first inflationary burst in the '60s, it wasn't that high and there wasn't that much spiral

dynamic, and people eventually got used to it. The other thing I would say is that the way that wages are set are very different. Almost nobody has a cost of living adjustment baked into a collective bargaining contract anymore. And so if we had a really inflationary burst, like a big demand burst and a big supply shock all at once, like in 2026 or 2027, would we have the same escalating that we had in the '70s? So on one side, you might say, well, people now have a recent memory, and so they're more attuned to it. And they're more likely to go to their employer and say, hey, I would like a wage increase. But what we do have is different is the way that wages are set are still different. And my guess is that you go to employer, and if the labor market is slack, and you say, hey, my cost of living went up, but if that employer's revenue didn't go up, are they going to meet you, or are they going to say, well, that's not really my problem?

[01:20:11.05]

And so I think certainly if you have enough inflation over enough time, at some point that a different norm might set in. But I think that it would take longer even now than it would in the US history.

[01:20:25.01] - Nidhi Bala-Johnson

Sarah, I feel like you want to respond to that.

[01:20:32.02]

No.

[01:20:32.03]

Perhaps Phil, you talked about— resilience and what should resilience mean as we think about from this point forward. So couldn't these supply resilience concerns be addressed through different inventory? You mentioned just-in-case or multi-sourcing practices. What would your sort of advice at this point be based on the research?

[01:20:56.44] - Phil Levy

I think my advice is it's going to be far easier to try and calibrate the the demand stimulation response than it is to do supply. I think on the supply side, there's a number of things that can be done that push for efficiency. And those are just good. And you've seen that. And you did see expansion in port capacity. You can introduce automation. You can do better forecasting of, you know, so you don't have as many people canceling shipping orders. So there's a range of things that one should just do in any case because That's efficiency. The question is, should we

do things that will sort of build capacity just in case? And then will we sort of have how much excess capacity we do? And that's where I put this category of things like the, as I discussed, the, the just-in-case inventory. But then you need warehouses and you need— and it's actually one of the things that I, I sort of discovered, had not been in on this as but talking to businesses that are doing this, that's costly not just for the trying to do inventory well in advance. It's not simply because of sort of the holding costs of goods.

[01:22:07.19]

It's for a number of these firms, if you're retailing, how far out do you have to forecast trends and what consumers are going to want? And the farther that is, the more likely you are to have errors in a bunch of goods that aren't sold. There's a whole range of those things that are just really costly. It was mentioned, it was widely talked about at the time. Ah, this was the problem. Everybody was in this just-in-time mode. But you could easily anticipate that as soon as this pressure passed, this was going to be an area where businesses with tight margins could find a way to save some costs, is don't hold this excess inventory. The multisourcing is another example of this, that this seems to be a reasonable insurance policy. Why get this from one place? Get it from multiple places? The, the short answer is there are fixed costs to setting up relationships and to maintaining relationships. So doing that in multiple places is just harder and more costly. Um, to the extent that one gets volume discounts for operating with somebody, if you divide up your order among different places, then that's costly.

[01:23:12.38]

So all of these things can be seen in a way— and this is back to your world— as sort of buying insurance policies. And but what are you insuring against? And how likely is this event? And at some point, somebody's going to say, well, this doesn't really happen very much. And I'm not expecting a 10% to 20% demand surge. I'm not going to buy the— it's not literally insurance, but de facto insurance against that thing. So I think that's where it's unlikely we're going to see supply get to the point where it can effortlessly handle a demand surge of this magnitude. Magnitude. And that means our focus needs to be in not having a demand surge of that magnitude. I like the automatic stabilizers argument.

[01:23:53.26] - Nidhi Bala-Johnson

Yeah, thank you, Phil.

[01:23:54.35]

You know, another way to sort of— that we've internalized it also is there's the frequency point, right? Because to your point, this is all higher costs. What's the premium you're willing to pay, right, for the opportunity cost of getting this right? There's the frequency— how likely is this event? But depending on the industry you're in, there's also the what's the cost of getting it wrong? And I think that's the other dynamic that's starting to play in conversations in businesses and in boardrooms that say, well, what's the downside to that? And those are the two things that are sort of in some ways driving to your point, this discussion around whether it's nearshoring, whether it's the just in case, whether it's the multi-sourcing, but this dialogue around resilience, would you agree?

[01:24:40.28] - Karen Dynan

I just want to make one quick point on the just in case, which is I was just teaching the Great Moderation to my students, and we were talking about this reduction in the volatility of the macroeconomy that began in the 1980s. And, you know, there are different contributing factors, but one of it was better inventory management. If you're accumulating these inventories and then you're wrong, you're just going to get bigger business cycle swings. That's right. That's in the cost category.

[01:25:06.49] - Nidhi Bala-Johnson

Karen, actually, just staying with you for a minute. Early 2021, clearly fog of uncertainty, right? Extreme uncertainty. Given the limits of what policymakers knew in real time about the pandemic, the output gap, the supply constraints, the labor force participation, do you think materially better choices were feasible?

[01:25:32.27] - Karen Dynan

Yeah, so that's it. I'm glad you brought it up. I mean, I do want to acknowledge there was substantial uncertainty. There was extraordinary uncertainty in early 2021. So I don't envy the people who had to make these decisions. But in our conversations with policymakers, we heard, you know, we had vaccines, yes, in early 2021. We weren't sure they were going to work. We weren't sure what take-up was going to be. We couldn't tell from the available data, which was mostly macro data, how many people had fallen through the cracks. One thing that saddened me, although I don't have the solution, was we knew in the aggregate— Phil showed these graphs— that we had this pandemic savings accumulate in 2020, but we didn't know how they were distributed. We didn't know how much was available to people down in the lower part of the income distribution. There are lots of questions about— about labor supply and whether it would be elastic. So all these things did make it hard. But I want to say, at the same time, and

this is what I showed with my first graph, was we actually, we did have good estimates of— I shouldn't say good, but we did have estimates of how big the hole was in the economy.

[01:26:48.02]

We could see how output at the end of 2020 compared with with pre-pandemic expectations, which you could think of as potential output. So we could see kind of how big the hole was that needed to be filled. And I should say those estimates were an overstatement because that was compared to potential output without a pandemic. We knew that there would also be socially distanced— social distancing implied in the short run a lower potential output, which meant a smaller output gap, a smaller hole to fill before you started— the economy started to overheat. So we had those estimates. CBO did them. The ones from the Fed and from the Wall Street Journal, they're not as clean because they embody some policy expectations, but they looked very similar to what CBO had. So one could look at the size of the American Rescue Plan and say, that is just much bigger than the hole that we have to to fill, and that's going to risk overheating the economy. I can't really explain— again, I don't envy those people, and I'm not here to kind of point out, to say they were making mistakes at the time. Stories that we talk about in the paper that we heard was maybe politics was playing a role.

[01:28:07.40]

But I think also the experience of the late 2010s. I mean, remember— The economy was, at the time we would say it was running hot. I think we don't use that word anymore. But it was running hot. And we didn't see a response of inflation. I mean, it was a good thing that policy was as supportive of the economy as it was in the late 2010s. We saw a lot of benefits, both in terms of the aggregate economy. You could see it in labor force participation. Basically, people did jump in to respond to this strong demand. We saw distributional benefits. So I think maybe also what was playing into it was kind of just thinking about the experience in the late 2010s and assuming that that could repeat as well.

[01:28:55.34] - Justin Bloesch

Justin, please. Yeah, one comment to add to that is back to nonlinear graphs that we are not showing is there was a lot of discussion in the 2010s about a flat Phillips curve. And so what does that mean is that that if the Phillips curve is flat, then you can increase demand a lot, increase output, decrease unemployment without a big increase of inflation. And part of the reason that we probably thought that that was the case was we were in the flat region. So Joe Gagnon at Peterson has been talking about this for a long time, that for the past 30 years prior to COVID, we had really only been in the sort of slack part of the curve in some sense. It was

only maybe 2019 that we're starting to get to the corner, and we just didn't know what was around the corner in some sense. So we found it, but I think we over-indexed on the sort of the flat Phillips curve too much beforehand.

[01:29:48.34] - Nidhi Bala-Johnson

Thank you. Thank you. Well, this is your opportunity now to get in on the conversation. So please, if you could either line up at the microphone in the center or there'll be some microphones going around, please do state your full name, title, and organization before asking your question.

[01:30:03.54] - Audience

Sir. Hi, John Roberts. I work as a consultant for Evercore ISI. So, question for Karen. Does the nonlinearity in the Phillips curve, when folks are thinking about policies, does that sort of change how you think about the policies in terms of risk, right? So that if you thought that it was a nice linear Phillips curve, you wouldn't be too concerned about stimulating too much, whereas now we know that it can be steeply upward sloping. And is that a consideration folks should take account of going forward? What would, what would you advise? Thanks.

[01:30:50.29] - Karen Dynan

Yeah, that is one of the, um, you know, the, the conclusions that, that we have to our paper, which is that— and I don't think— I mean, if you read what the Fed has written ex post, even there was a paper that was released in September by Jeremy Rudd and co-authors saying, we knew that nonlinearity was there. I mean, nobody thought you could expand output infinitely without causing— hitting up against productive capacity and causing inflationary pressures. I think, you know, the tricky part is knowing kind of where that non-linear— non-linearity starts. And it's, you know, the pandemic period was very unusual in that regard. I wouldn't say going forward we would expect kind of the same— the non-linearity to kind of begin at the same point on the aggregate supply curve. Nonetheless, I think, as Justin was saying, we all, in the late 2010s, I mean, I think maybe we got into this mindset that you could go pretty far and the Phillips curve would just be flat. And I think this is a caution against that. And honestly, John, this is why I don't know that it's politically feasible, but this is why I really think we'd be better served by fiscal policy that was tied to economic conditions.

[01:32:20.02] - Justin Bloesch

One thing I would say that it's lower risk than maybe your question would suggest is that we did have the soft landing in the end. Is that if what happened when inflation got kicked off, then we

got into an inflationary spiral that the central bank would have to just absolutely crush afterwards, then that would be very risky. But I think what we found was that the Fed tightened, fiscal policy pulled back, and we were able to normalize. So I think that lowers the risk. Risk of pushing too far in some sense.

[01:32:48.29] - Audience

Just a quick follow-up. Would the demand rotation have affected where that kink would have occurred? In other words, the fact that aggregate demand being what it was, but within aggregate demand, there was a big increase for goods versus services.

[01:33:07.21] - Karen Dynan

Yeah, that— yes, that is a fair point. I think that is what the literature that is thinking about this industry by industry concludes. You know, I think— and I think Justin's point's a good point. Maybe the lesson— I mean, I can't give you a full model of how this should translate into policymaking. But I think part of the lesson is you're looking for these factors, like the rotation, that are the signal that now is the time to kind of jump in and do something to moderate demand.

[01:33:43.26] - Phil Levy

So— Yeah, if I can just add on that last point, and this is the danger sometimes when we talk about sort of aggregate supply, is that we're lumping things together and we're assuming there's a substitutability, and that was exactly what this is. So, if you have a given shock to demand and it's spread evenly across sectors, then that will put a certain level of strain on all the sectors. They may have very different supply elasticities, we'd have to see, But if you take that and then you funnel it into one part of the economy where you cannot then readily take, for example, the service workers and have them all become transportation workers— you did have transportation up at the top of your stuff, but there's real limits to which one can do that— then yes, you're much more likely to get into these sort of difficult parts and less elastic parts of supply.

[01:34:32.41] - Nidhi Bala-Johnson

Thank you, sir.

[01:34:37.50] - Audience

Yes, Bill Klein, senior fellow emeritus here at the Peterson Institute. First, I fully agree with the paper, Karen, and very much as in the paper that I wrote in February of 2023, really

emphasized this huge fiscal demand shock. I'm amused or interested, you seem a little unwilling to say it was a mistake at the time, given what we know at the time, but that's an interesting question. I do wanna ask Phil Levy if we can interpret what happened to autos in this as sort of a real experience of, what's at stake in the trade war with China, since they have used the rare earth magnets and semiconductors as sort of the stranglehold.

[01:35:50.24] - Phil Levy

It's an interesting connection. I guess I'll tread with some caution here. I guess what I would say is the broader lessons that we can take are that we see these industries operating with significant lags and they have to make calls. I believe that's just as true in rare earths as it is in other areas that— and I do not claim expertise in this area, but my understanding is that it's not so much that rare earths are rare, like you can't find any. It's that there's very different production costs in different places. And, and not only that, but you don't start up production overnight. And then immediately have access to rare earths. You need to make calls substantially in advance. And so then who's willing to do that? Who's willing to sort of take on these lags and take on these risks? I'll use this occasion to give a little bit of a follow-up for where one might have thought back to sort of the core industry that I was talking about, say maritime transport. Why didn't they have more ships? Why didn't they have more containers? Right? If you saw prices spike from, you know, \$2,000 to move a container to at some point \$15,000 or more.

[01:36:57.34]

And the answer was, well, they take time. It takes 2 or 3 years to get chips. The order books were full and they did order them. And now you have a glut. And now you have very, very low prices in the industry. And they're living with this because you order all these things. And so I think This is really what we saw with autos. I think it applies also in the sort of access to minerals, but it certainly applied in this sector, which is you can get caught in either direction, right? If you overdo it with this, very costly for your business. If you underdo it, it's costly for your business because you're missing out on the sales. And so it's hard to run a business.

[01:37:41.23] - Nidhi Bala-Johnson

Amen to that.

[01:37:46.05] - Audience

Alan. Thank you very much. I'm Alan Blinder of Princeton University. First, very nice presentations by everybody, so my compliments. This is actually most germane to Joanne's, but

not directly, because it's much more germane to a very, very old question in macroeconomics, which is when we think about the disutility of rising prices, should we be thinking about the inflation rate or the change in the price level? Virtually all academic work takes it to be the inflation rate. And much more importantly than that, central banks' targets are always for the inflation rate and never for the price level. So if the academics were getting it all wrong, but the central bankers were getting it all right, we wouldn't worry about that. But there— I'm not sure which is right or which is wrong. But the central banks are all on the inflation rate. What brought it to mind was that one of the charts she showed showed the difference between the early times when we all got used to saying, "Oh, the bad thing is inflation." And when Paul Volcker brought the inflation rate down from 10% to 6%, that was great. Nobody— I shouldn't say nobody, there's always somebody, but virtually nobody was saying, oh, that's not so great because the price level is still 35% higher than it was 3.5 years ago.

[01:39:21.33]

And I just, I'm just raising that as a question. One final codicil to that, Karen was teaching yesterday, I was teaching yesterday, and by coincidence In talking about the cost of business cycles, I put up Ray Fair's presidential election equation, and it reminded me, I knew this, but I forgot, that the inflation variable— so, he's got growth and inflation. The economy drives the vote. Everybody knows that. But the inflation measure that he puts in, and Ray did many experiments with this over many was the 15 quarters of the presidency that just ended, excluding, of course, the one you're living in, because you don't have— that comes pretty close to the price level. Thinking about the price level, it's not the inflation rate of the last quarter or the last 2 quarters. On growth, it's the short term. The evidence from Ray Fair and many others is people don't look very far. But on inflation, it just makes you wonder whether they're looking a lot further back than our models or our central banks seem to believe.

[01:40:51.38] - Joanne Hsu

Thanks. So when we think about consumers making budget decisions, they're putting prices and quantities on one side, they're putting incomes on the other. They're not They're not putting the inflation rate anywhere in this situation. And so when consumers are telling us about their personal finances, you know, whether now or in the future, they're really concerned about the price level. That's what's really eating into their living standards now. And so that is one of the reasons why consumer sentiment is so low right now. Consumers are very, very— they feel very weighed down. They feel like their living standards have been eroded. I think one of the things that is interesting is that consumers seem to have gotten accustomed to the low inflation, low interest rate environment of the 2010s, you know, that very long period of uninterrupted growth that historically speaking is not really that common, right? But I think a lot of people

internalize that as the new normal. And then you have the pandemic and the trauma from the pandemic and people keep thinking about it's like, oh, it was so much better before the pandemic, before the pandemic. And so when you can— making that comparison, I think, really drives home this idea that people are really worried about this price level.

[01:42:09.44]

But again, if you ask them about inflation expectations, now that it's after 10 o'clock, I can tell you it's down to 3.5% for the year ahead. Consumers know that inflation has slowed and they expect it, 3.5% for the year ahead. But that doesn't take away from the pain that they're feeling and when they're doing their financial planning.

[01:42:30.50] - Nidhi Bala-Johnson

Alan, one of the things that, you know, I've been also thinking about in that context of price level versus rate is also how the dollar behaves and how that behaved the last time around during the pandemic as opposed to how it's likely to behave the next time around. I think there's the currency fluctuations likely to matter as well in that context. I think we have time for one more question before we wrap up this brilliant panel. David.

[01:43:03.22] - David Wilcox

Question mainly for Justin. You make a compelling case— oh, I'm David Wilcox, senior fellow here at Peterson and also affiliated with Bloomberg Economics. You make a compelling case that the quits rate in your estimation was the best indicator of labor market tightness. Is that something you expect to endure another— it's like choosing my favorite child. I have 12 favorite papers in this project that we accumulated with Karen. Another one of my favorite papers is by the brilliant David Reichsneider, and he shows— he has a remarkable graph that shows that various indicators of labor market tightness diverged dramatically and then have reconverged substantially. Does that mean econometrically it's just going to be impossible going forward to distinguish? Or do you advise us all to continue keeping our focus on the quits rate? Quits have now come down below their pre-pandemic typical level, but nominal wage increases as measured, for example, by the ECI remain above. So ruminate on all of those things for a minute.

[01:44:20.54] - Justin Bloesch

Yeah, and I don't want to convey that there's sort of one true indicator. And I think there was a lot of times people are looking for one true indicator. And one of the things that was in the paper that I didn't have time to talk about is the divergence between job openings and other measures

of hires. So whether it's quits or separations or just hires, and there may have been Ben, just divergence between these two. I mean, the way that the BLS collects vacancies, it hasn't changed, but the way that firms report if they have a vacancy may have changed. The challenge is that labor market indicators can mean different things at different times. I mean, if you want a good single indicator of like how good is the economy right now, I would say the unemployment rate is hard to beat. It's a very long series. It's very reliable. If unemployment rate is under 5%, OK, the labor market's doing pretty well. Then there's a question of, do we want to forecast nominal wage growth? And then the unemployment rate might not be as good for that. But the JOLTS response rate is falling.

[01:45:28.29]

There might be good reasons why you wouldn't want to use the quit rate. So on average, you'd want to probably put a lot of labor market indicators together. Some folks— one of my co-authors at the New York Times, New York Fed made an index that combines quits and vacancies per searcher. So yeah, you probably want to hedge your bets and do some averaging. But there's theoretical reasons— and I have a more academic paper about this— like why sort of that job-to-job competition for workers probably makes sense for wage growth because turnover is costly and firms want to raise wages in response to threats to turnover.

[01:46:07.17] - Nidhi Bala-Johnson

Please join me in thanking Karen, Joanne, Justin, and Phil for this remarkable body of work and the lessons that we will hold true for, for a while. So please, thank you. And I think we're going to take a 10-minute break now. Thank you.

[01:57:53.17] - David Wilcox

emergencies. So therefore, I do not have sage framing remarks. What I do have for you is 3 more, 3 additional compelling papers, the first of which will be presented by Patrick Connaughan, who is known to many of you both as a senior fellow here at the Peterson Institute and as the former governor of the Central Bank of Ireland. Patrick, the podium is yours.

[01:58:26.43] - Patrick Honohan

Thanks, thanks very much, David. Um, I do— I want to talk about the inflation surge in Europe, and I, I just want to give you a number of data points which I think you should find interesting and maybe in some cases surprising. Um, the inflation surge in European countries and the United States did share broad similarities in causes, in timing, and in policy response. But I want to show some instructive and in some ways intriguing differences between the different

countries in Europe and between Europe and the United States. We could look at the rest of the world as well, but I'm going to confine myself to Europe. After all, the euro area alone— well, it now has 21 countries. And I'm going to add in the pound sterling, Swiss franc, Swedish krona. They're the biggest advanced economies. So if— I hope Alan will be pleased that this is not inflation rates. This is the cumulative price level change from— I just put it to the last— the last observation before the pandemic and right up to the end of 2025. By the way, the definition of consumer prices throughout this presentation for all of the countries, including the United States, is the European Harmonized Index.

[02:00:02.40]

So people would say, oh, that's the wrong number. I know, but this is the Harmonized Index, HICP, which you would recall largely excludes owner-occupied housing. And we could have a whole day on how to put owner-occupied housing into. But anyway, that's what these are. I want to tell you 3 things and point out 3 things about this chart, about the timing, about the rates of inflation, and about the cumulative price change. Timing— inflation took off first in the United States for these, these countries, this group of countries, big European advanced economies and the United States. It was followed after an interval of several months by the United Kingdom and the euro area. So that's an important difference. And it starts to say, well, if the causes were the same, how come they're all that different? Rate. The peak annual inflation in the euro area, that's the slope of the curve,— it's just under 11% November 2022. It was slightly higher than the United States but much higher than Switzerland, which is the bottom curve. So that's the first— second thing to notice and pay attention to. It's quite, quite an important distinction. Cumulative inflation was not all that different between the three biggest countries, UK, United States, Euro area.

[02:01:36.30]

It's 20%, 24% UK, 22% US, 20% Euro area. Now, you might say, well, yeah, that's obvious. But actually, I think this is more surprising than it might seem to you at first sight. It's not obvious. Nothing in the models tells you that that a particular trigger is going to give you with the working out of the inflation dynamics distinctive in each country and the policy responses that they'll end up with the same cumulative inflation rate. But they did for those three big countries. However, not for Switzerland, which is in the same part of the world as the euro area and the United Kingdom. Hardly had a surge at all. OK, we'll come back to these big countries. But I want to dig now into the euro area. This is inflation rates within the euro area. Single currency, inflation rate, yes, no. There was a remarkable cross-country variation in the amplitude of the inflation surge. So to take the extreme, Estonia— annual inflation in Estonia reached 25% in the 12 months to August 2022, whereas the other end at that time, France, never exceeded 7.5%. And Estonia is

not the only outlier. Its Baltic neighbors Lithuania and Latvia show that the law of one price is not closely observed in this data.

[02:03:18.17]

Slovakia and the Netherlands, Netherlands also conspicuous. And even in what we might call the peloton, if we take the terminology from bicycle racing, there's quite a range despite these countries all using the same currency and all being within the single European market. And you might say, well, they might have got a bad few months and then they converged, the cumulative inflation price differentials, price change differentials across the euro area persisted. So by end 2024, Estonia's index was 42% above the level 5 years earlier, whereas just across the Gulf in Finland, the corresponding cumulative increase was only 16%.— these are very substantial price change differences. Now, it's possible but complicated to excavate the country-level institutional, geographical, and policy differences that have resulted in the wide discrepancies between national inflation rates in the euro area. For example, some countries relied more heavily than others on administered consumer prices for some consumer prices. And on subsidization of the surging energy prices. Institutional arrangements in wage setting slowed the pass-through to wages in some countries, not in others. And then the impact of Ukraine invasion on energy and food prices, which is at the heart of the euro area inflation, uh, and the high inflation Baltic states where much more dependent on fossil fuels and in particular on imported gas from Russia.

[02:05:08.18]

And so these contrasting experiences, I think, raise interesting questions about the potential policy role of administered prices and subsidies for taking the edge off the price impact of a sudden and potentially reversible supply shock, thereby speeding the adjustment and potentially doing so with a more favorable distributional impact. Now, one worry, especially for a region such as Europe hit by a negative terms of trade shock— recall, there wasn't a big negative terms of trade shock in the United States— one worry is that real wage resistance would result in a destructive wage-price spiral, as happened in the 1970s. We heard from Justin this morning about the absence of a wage price spiral in the United States. So that worry is there, especially with the supply shock concentrated on goods that are highly salient in household spending on a weekly basis— your energy costs, your fuel, your food. So this chart Here just contributes one hint. And data on wages, pretty complicated. Not sure I'd want to examine very closely on the data, but it does look as if real wage increases could have been a significant contributing factor to the overall— the outlying overall inflation performance in— two of the Baltic states there, you see Latvia and Lithuania right over there on the right-hand side.

[02:06:59.01]

Admittedly, these countries and Slovakia are among the lowest per capita income countries in the euro area, and therefore they might be experiencing Velázquez-Samuelsón effects, but the wage increases do look somewhat exceptional. Okay, I want to move on from labor market to exchange rates. To what extent were inflation rate differences between the major countries reflected in exchange rate movements? Has purchasing power parity— these major currencies prevailed? So I'm moving away back now to the big countries, not just within the euro area. This chart shows that even though Swiss inflation was much lower than that of the euro area and the UK. Exchange rate movements fully offset the differences. All three move together against the US dollar, up and down, even though Switzerland has hardly any inflation and the others have high inflation. In nominal terms, the Swiss franc was much stronger than the other two, and that both helped and offset the lower Swiss inflation. —also reflects the low Swiss dependence on fossil fuels and the inertia built into the many administered prices, including retail electricity and gas, that prevails in that country. The Swiss inflation performance, I think, is really worth thinking about and looking at.

[02:08:26.29]

It has, of course, outperformed others in decades past. And we know there's a certain amount of hysteresis in the way inflation develops. And one can argue that this owes much to the Swiss franc's status among investors as a safe haven. But on this occasion, the appreciation of the Swiss franc was helped along a lot by intervention actions of the Swiss National Bank. And the scale of this intervention is indicated by this chart, which shows the Swiss National Bank's reserves— I mean, grown by \$1 trillion from the global financial crisis to early 2021— and went into reverse during '22-'23 to the tune of a quarter of a trillion dollars. Not peanuts. So the Swiss authorities were intervening to add to the safe haven pressure, upward pressure on the Swiss franc, preventing the inflation from taking under control. So what about interest rate policy? Central banks are supposed to be in charge of keeping inflation low. So they use interest rate policy. This chart shows you some interesting contrasts in the shape of the hump. There's a hump, not the hump of inflation, but the hump of interest rates. We see three— the five currencies fall into three groups.

[02:09:52.24]

It's a question of speed of the policy response, speed of the easing, and the amplitude of the policy increases. Well, this group of central banks— the Bank of England was first off the blocks, followed by the Fed. ECB was later by half a year. But this needs to be put in the context of the fact I showed you a minute ago that euro area inflation also took off about half a year after US inflation. The first wave post-pandemic shocks that we heard about in the first session, the

fiscal impetus the supply chain issues were much less pronounced in Europe. The second wave, Ukraine-linked energy and food price increases represented a much bigger supply shock in Europe than they did to the United States. So even if the ECB was a bit late, they were arguably no later relative to euro area inflation trends than was the Fed relative to US inflation trends. And maybe it's a cheap point, but worth remembering that despite its speed of response, themselves. Bank of England was the first, the red line. Bank of England still ended up with a bigger overall inflation surge than the others. Speed of easing, the Swiss having seen off the threat of an inflation surge were the first of these countries to start lowering rates.

[02:11:09.04]

Began in March 2024. Not far behind them were the Riksbank and the ECB followed the Bank of England in August and eventually the Fed bringing up the rear in September 2024. So these two, the Fed and the Bank of England, were first in and last out. Amplitude of the monetary policy response. Why was the ECB able to bring inflation under control with a shorter period and lower interest rates than the Bank of England or the Fed? There are several candidates. A weaker conjunctural position in the euro area, the more modest fiscal expansion during the pandemic, like a wider use of subsidy policies to slice the peak of the inflation surge. And you could talk about structural differences such as the degree to which residential mortgages carry fixed or floating rates. That also implies different optimal Taylor rule coefficients probably. And then again, I notice, and I can't avoid saying it, some widely cited recent models of inflation don't include an explicit interest rate term at all. Notably, these interest rate differentials have not narrowed much to date. The range between them has widened from about 100 basis points—exactly 100 basis points, uh, before the inflation—to now 400 basis points.

[02:12:34.32]

Has the difference between equilibrium real interest rate in these countries jumped that much? Of course, expected inflation is relevant here. It's a little bit there. And there is a longer history of such differentials to be taken into account. Okay, I haven't mentioned asset purchase dimension, QE, QT. All of the central banks had ceased net asset purchases by mid-2022, but I don't have time to go into that in detail. But let me finish with a slide on central bank forecasting and surprises.. The poor quality of inflation forecasts during 2021 is often discussed. This chart I think is very interesting, even though it's—since idiosyncratic comes from one country—comes from the Riksbank. And the reason I choose it is because unlike others, Riksbank publishes its forecast of where its own policy rate will be over the coming 3 years. And as So, so this chart shows you situation at June 2022, shortly after tightening has started, and it shows you the Riksbank's published forecast. They say, uh, we're going to have the rates going to go up a little bit and then get to about 2 and stop there. And the market did not believe them.

[02:13:53.14]

So this is the market forecast at the same date, the red one. The market says much more pessimistic about the extent and duration of policy tightening, expecting rates to go almost 150 basis points higher. Look at the outcome. Well, the market was right for the short run, but the central bank was right for the medium term. So let me conclude on this point. Market pessimism— and this is more, more general, not just Sweden— market pessimism about the authority's ability to bring inflation quickly under control without a crippling degree of tightening proved to be wrong, and that was partly because long-term inflation expectations were not significantly destabilized.

[02:14:51.32] - David Wilcox

Our next speaker, Asher Rose, probably considers two of his, uh, important accomplishments thus far in his career to be that he's a student in the master's program at the Harvard Kennedy School and that he's an alum of the staff of the Peterson Institute. But I will always regard his most, uh, luminary accomplishment that he's implicated in more of the papers for this project than any other individual. Asher, the podium is yours.

[02:15:25.53] - Asher Rose

I disagree with David. I think my affiliation here is the thing I'm most proud of. So thank you so much to the Peterson Institute and Adam Posen for hosting this incredibly important conference. I'm honored to be here speaking about such an important topic, and I'm also honored to be dragging down the, the average age of the speakers by, uh, by quite a bit here. Uh, so happy to be here. So the key question that we asked here is not only why did inflation surge both here in the United States and around the world, but why did it dissipate? So here's a graph of inflation broken down by the three key consumption categories. In the black line, we have overall inflation. That's the headline. In the blue, there's durable inflation. That's the one that peaks in 2021. In green, it's non-durables inflation that peaks in 2022, and services inflation in the orange dotted, which peaks a little later. So Joe and I were interested not just in modeling this, but looking at why the three consumption categories surge at different points. What's happening under the hood here? So the puzzle is not just why inflation rose, but why it rose differently across different sectors and then fell so quickly.

[02:16:35.08]

But critically, it didn't fall back to its original level. You can see that overall inflation is elevated relative to what it was pre-pandemic. So what we do here is we decompose into the three

categories and then we model it. So the answer that we found to be the most compelling was a trinity of components. This is the core contribution of the paper. First, there was a surge in durables inflation. Surging durables demand strained supply chains. I confess that Phil, stole much of my thunder here, but essentially people moved from consuming, consuming services to consuming durable goods. There were also supply chain snarls as he talked about. This was a transitory shock. Eventually supply chains fixed themselves, things went back to normal, and durables account for about 10% of the CPI basket weight. Separately, but relatedly, there was a shock in non-durables. Patrick talked about this quite a bit with the commodity shock after the Russian invasion of Ukraine. This was also a transitory shock, and non-durables account for about 25% of the CPI basket weight. Separately, there's a condition in services. This has been talked about extensively in the first panel. A tight labor market has caused a rise in services inflation.

[02:17:47.00]

This is a persistent condition and is significant for the Peterson Institute's outlook even today for 2026. Services account for around two-thirds of the overall CPI basket weight. So even though the CPI basket weights are written here, durables were overrepresented in the shock during the COVID era. Non-durables were also crucial, particularly in European countries. This is the key slide to take away. Everything else is just gonna be elaboration on this and showing why it's the model that we think to be the most accurate. So first, what does our dataset look like? Here we have overall inflation between 1995 and 2024 in the black line. We also break it down into durables, non-durables, and services. So if you look only at headline inflation, you miss the fact that different forces were operating at different times. Notice how the common— how common the timing is of the 2022 surge in inflation is to all G7 economies. Overall, over the time period that we studied, it was essentially the only time there was the— that there was a common inflation shock to all members of the G7. Services inflation counts for the largest component here but isn't actually that substantial for 2022 relative to the other ones.

[02:18:57.20]

Durable inflation is negative for much of the period but critically is large and positive during the 2022 shock. Non-durables is also a large component of this surge in inflation, particularly in European economies. So what we do here is we create a model over the entire period, but for the rest of the presentation, I'm going to focus on 2021 through 2024. So first, durables inflation. If you try to explain durables inflation with unemployment or slack, it mostly doesn't work. So as Phil talked about earlier, pandemic shifts and bottlenecks explain durables. This is the model where the standard inflation model fails most clearly. So what are we doing here? We're taking durables inflation, we're regressing it on the lag of itself, imports of goods and services, and

food and energy, And we're also looking at chip shortages. The way we measured chip shortages was US search results from Google. So how frequently are people looking up the term chip shortage here in the United States and around the world? And we also looked at real spending on consumer durables. This is a pretty standard model of supply. So focusing on the last 4 years here, this slide shows how our model explained durables goods inflation with the beginning of the COVID pandemic in the first quarter of 2022.

[02:20:12.19]

The blue bars represent the initial conditions, that is the effect of previous values of all variables, assuming that their explanatory variables remain fixed at the historical averages moving forward. So the blue bars are essentially what would've happened if things had remained constant, if the COVID pandemic hadn't happened at all. The gray bar represents the average of deviation of consumer durable spending from their historical average. And the pink bar shows the effect of deviation of a chip shortage variable from Mr. Historical average. I note that chip shortage search results were essentially zero prior to the pandemic. The dotted line shows our fitted model and the, and the solid line shows actual Durables inflation. So our model seems to be pretty accurate and we have, you know, we're pretty good at our explanatory power here. This was the first driver peaking in late 2021. So what's happening here? There's a sudden shift in consumer behavior. People are buying stuff instead of experiences like travel, leading to supply chain bottlenecks. So as a common example, airplanes and ships stopped moving during lockdowns, causing supply chain snarls, and people stopped buying restaurant meals and started consuming Peloton bikes or things like that.

[02:21:21.26]

So what's the upshot here? Even without fiscal stimulus, the massive shift in demand towards durables wouldn't have caused significant price spikes. Unemployment is mostly irrelevant for durables inflation. And demand shifts and supply chain bottlenecks matter. What about non-durables inflation? So here, standard models work reasonably well. This is much the same as before, but with unemployment, change in unemployment, and a term that captures the nonlinear effect, nonlinear effect of unemployment on inflation. The trigger here is Russia's invasion of Ukraine in early 2022, changing commodity prices. We might expect that European countries, as Patrick talked about, felt this more acutely than the US due to, due to the natural gas dependency they have on Russia. The same shock was common to all G7 economies, but a different propagation mechanism. And this ultimately pushed inflation to its peak in mid-2022. So what we add here is showing how dominant this channel is when you isolate non-durables. So here's the data. Again, the blue bar represents the initial conditions as if nothing happened.

The green bar shows the effects of the deviation of commodity import prices from their historical averages. And the pink bar represents the effect of deviations of unemployment.

[02:22:35.28]

So as you can see here, the green bars are massive. Commodity import prices represent the overwhelming majority of the surge in non-durables inflation. Critically, non-durables inflation surged in European economies. The United Kingdom reached almost 35% and Italy reached almost 40%. So those countries that were most exposed to Russia are those that suffered the most durables— non-durables inflation. The energy and food prices dominate, and the Ukraine shock is central and necessarily common to all economies. Labor, however, plays a secondary role here. So we also looked at services inflation. This is much the same as before and follows a pretty standard macroeconomic theory. Fiscal and monetary stimulus led to overheating in a pretty standard Phillips curve model. We use unemployment here. I don't want to touch on the, the different ways to measure labor market tightness, but we did use vacancies instead of unemployment where available. But I don't want to get into that literature because there are many people who know a lot more about it than I do. So what we want to show here is that labor market tightness primarily drove services inflation. So because unemployment is near historic lows, This is the part of inflation that hasn't fully normalized and explains why inflation feels sticky even after goods prices normalize.

[02:23:50.13]

Unlike shocks 1 and 2, the durables and non-durables respectively, which mostly faded by 2023, labor market tightness remains a persistent condition and has affected the Peterson Institute's outlook for inflation even to this day. Vacancies continue to be very high in the United States and Canada, which explains why those pink bars continue to be the largest contributors. The labor market terms dominate. Commodity pass-through is smaller, and inflation remains elevated where the labor market is tight. So to answer the original question, why did inflation rise and fall so sharply but remain elevated? There were 3 mostly unrelated phenomena that hit the 3 different key consumption categories. First, there was in 2021 and 2022, there was a shock in durables inflation. This was transitory and caused by supply chain disruptions. Secondly, there was a shock in non-durables inflation caused by the Russian invasion of Ukraine, significantly affecting commodity prices. Third, there's a persistent condition in services inflation caused by a tight labor market. So because shocks 1 and 2 were transitory, supply chains healed and commodity prices stabilized, a large chunk of inflation vanished automatically as those shocks ran their course. But if you look under the hood, But it's critical to note that headline inflation obscures sectoral mechanisms.

[02:25:08.50]

While we do find it unlikely that the particular combination of events, the invasion, the supply chain snarls, the large fiscal stimulus, are unlikely to be repeated anytime soon, it's critical to not just look at headline inflation, but to look at the drivers. Thank you.

[02:25:32.23] - David Wilcox

Our next speaker is Stephen Cayman, who is a senior fellow at the American Enterprise Institute on the north side of Massachusetts Avenue. But I will always count it as an honor that Steve was colleague and fellow leader at the Federal Reserve Board. Steve was division director of the International Finance Division. Steve, podium is yours.

[02:26:03.04] - Steven B. Kamin

Thank you, David and Adam and Peterson, for inviting me. This is a real pleasure and an honor. So this is going to be the second paper co-authored with Joe Gagnon. All mistakes, of course, are his. And another connection is that Asher was not only a co-author in the previous paper, but a research assistant on this paper. So we have a very connected panel here. All right, let's dive right into it. So as we discussed, there is what I thought was a consensus on explanations for the global COVID-era inflation surge, although apparently there's some disagreement about the relative weight you put on all these explanations. Conditions— supply chain disruptions, shifts in demand, surges in commodity prices, and support for aggregate demand from mainly fiscal policy. So I think all those are in the mix, and different folks put different emphasis on them. Now, one thing that people generally agree on is that inflation expectations remained contained over that period, and that helped to kind restrain how bad the inflationary surge could be, as evidenced by this quote a couple of years ago by our outgoing Fed chair. Now, what has received a little bit less attention in the literature is that inflation expectations around the world did more than just remain anchored, restraining inflationary impulses.

[02:27:42.48]

Our research shows actually that pre-pandemic inflation histories were a key factor explaining why some countries had higher inflation than others during the surge. And we interpret that as that inflation histories were a key determinant of actual inflation patterns across countries, kind of working through what, as the buzz phrase goes, the lived experiences of households and firms which influence their inflationary psychology. And I'll show that the effects of those inflation histories on actual inflation were really quite long-lived. All right. I'm now showing my favorite and most sophisticated econometric device, the scatter plot. The x-axis is inflation on average during the 2000 to 2009 period. And the y-axis for both advanced and developing countries,

COVID-era inflation 2023. As you can see, super impressive correlations between the two. And you can see here that— it's a little hard to see that, but for Japan and Hong Kong, they had super low inflation during that earlier decade, super low inflation during the COVID surge. And similarly, Slovakia and Latvia, high inflation in both periods. By the way, I didn't put a circle around it, but on the bottom left, CHF, I believe, is Switzerland. Is that right, Asher? Great.

[02:29:17.52]

And so that shows up in Patrick's presentation as another proof, if you will, of why Switzerland had such low inflation. Now, of course, what I could be showing here is just the fact that some kind of underlying steady-state inflation kind of remained the same throughout the last 25 years. And so that might really not mean all that much in terms of the implication of this for inflation expectations. But here's a chart where the x-axis remains the same, but the y-axis now shows the change in inflation from the 4 years preceding the pandemic to the COVID era. Pandemic. And what you can see is that the higher was the rate of inflation during the earlier 2000-2009 period, the more inflation went up during the COVID surge. The correlation is not as great as in the previous chart, but I'll show you evidence that it is moderately significant. Okay, so what I'm going to do in the rest of the talk is just describe some regression results. Results to substantiate this message. And if memory serves, this will be the first regressions actually shown to you, first estimates at this conference today. And I'll show that this— what I'm calling long-past inflation histories, that's that earlier decades inflation histories— remain significant determinants of COVID-era inflation in terms of their cross-country pattern, controlling for immediate pre-pandemic inflation from 2016 to '19, output gaps, and even central bank inflation targets.

[02:30:56.26]

We'll show that that impact of long-ago inflation history was actually more important in the COVID era than in the preceding more normal pre-pandemic inflation era. And finally, I'll show you that looking at a couple of proxies for inflation expectations, bond yields seem to behave a bit more like actual inflation than the inflation expectations of professional economists. So with that, here's the very sophisticated regression that we ran. Each observation, okay, is inflation in a particular country, okay, or is a particular country during the 2023 COVID era. So the left-hand side is inflation on average from 2020 to 2022. 2023. The right-hand side is a constant, inflation in the immediately preceding 4 years, 2016 to '19, what I'll call long-past inflation from 2000 to 2015, an output gap, and an error term. So if you think about the lags of inflation as proxying for inflation expectations, this is really a sort of a simple cross-sectional version of an expectations-augmented Phillips curve. And I don't have time to go through it now in this talk, but we did a lot of robustness checks, and the inflation results were largely robust to many different alternatives

and explanatory variables. Okay, so we ran these regressions both for all our countries and then the advanced and developing separately.

[02:32:39.47]

Let's focus on the all-country results. The intercept, 2.58, that represents the average percentage point of inflation during the COVID era that country shared after you account for lags of inflation and output gaps. Immediately preceding inflation, 2016 to 2019, has a super significant coefficient of 0.4. But even controlling for that, long past inflation from 2000 to 2015 has, again, an even larger coefficient, 0.47, very significant, as is the output gap. And I should note that the equation explains about 60% of the variation in inflation across countries in our very large sample, most of that attributable to the inflation lags, not to output gaps. Okay. Now, I want to look at actual inflation targets. The first column is just the regression I showed you before. The one in yellow basically adds the inflation target specified by central banks to that regression. And as you can see, it is insignificant and leaves the coefficients on immediate lags and long-lagged inflation still quite significant. Now I'm switching from the COVID-era inflation to inflation in the pre-pandemic era from 2016 to 2019 as the dependent variable. And what you can see here is that the immediate pre-pandemic inflation now— excuse me— before previous years to the pre-pandemic era, which is inflation 2012 to 2015, has a significant coefficient, so it's important.

[02:34:35.26]

Okay? But long-lagged inflation, now 1996 to 2011, no longer influential or important. So basically, during this period, long-pass inflation doesn't matter. And if we add— central bank inflation targets to this explanation for pre-pandemic inflation, only the inflation target seems to matter in explaining the pattern of inflation across countries. So bottom line, during the tranquil pre-COVID period, central banks were pretty successful in meeting their targets. And inflation history, not so important. But in the face of these the huge shocks of the COVID era, which pushed inflation well past central bank targets. Those targets lost traction, and the kind of ingrained inflationary history came to the fore. All right, so far I've talked about actual inflation, not inflation expectations. Hard to find good measures that are consistent across countries. We chose two— 10-year bond yields and surveys of professional economists. Economists, and we use those as proxies for inflation expectations, put them on the left-hand side. Bottom line, 10-year bond yields kind of act a bit like actual inflation with a dependence on long past histories. And conversely, professional economists, the impact of long history is much less so. They really seem to care about those inflation targets.

[02:36:14.33]

So, like, the professional economists are more in thrall to central banks. So to summarize, as I've just said, during normal periods, inflation's driven by some combination of central bank actions, central bank targets, very recent inflation that itself will be close to target. But on the other hand, during these chaotic times like the COVID era, when inflation deviates from those targets, kind of like the inflationary psychology owing to many previous decades of inflation kick in. That's a bit similar to what Joanne had described as the process by which inflation expectations move. So, central banks can't rely just on their targets and communications to get inflation down if it's above target. The way they operate— in fact, the way inflation targets seem to operate— is they guide the central bank to keep inflation low and steady. And that results later on in more anchored inflation expectations. All right, last bonus slide just for our further discussion. I am comparing the red line, the Michigan Survey of 5-Year Inflation Expectations, which popped up a lot during the Trump COVID era— excuse me, during the Trump tariff era. And that compares to the relative steadiness of breakeven inflation rates from the bond market in green, which didn't move much.

[02:37:48.26]

Now, as we've talked about, I think that the Michigan survey might be a better measure of what ordinary folks who determine inflation are really expecting. And my hypothesis is that the fact that the red line moved up so much may owe to that earlier COVID surge, but we can talk about that. Thank you.

[02:38:42.21] - David Wilcox

Thank you for three really interesting papers and presentations. Patrick. I want to start with you. Um, forecasting errors were a first-order aspect of the landscape through this period. Um, my former institution had a massive one. I was on the record out in public basically, uh, agreeing with their forecast the consensus of professional forecasters didn't anticipate the full extent of it. There were others who did, including Olivier Blanchard. But my question for you is, are forecast errors just an irreducible fact of life from the perspective of a monetary policymaker? And if so, what lesson do you take away from that given your experience at the head of the Central Bank of Ireland?

[02:39:49.52] - Patrick Honohan

I think it's just amazing that you weren't able to forecast the crisis, the COVID pandemic. That's— this is such a complex question. I think you could say in broad terms shock like this unpredictable. But there are triggers and there's the transmission process. And I think one could fault the analysis of the transmission process even as soon as the triggers were, had been, you

know, had hit the system. I think the forecasting of the consequences of that running through the system were flawed in ways that could have been fixed. There's a very interesting paper by David Hendry, which analyzes the Bank of England's forecasts. And David is a big man for time series analysis. And he feels that, and shows evidence, that a very, very simple time series model correcting, correcting always, saying, oops, we're going on a trend here that we haven't taken account of, we should build that back into the next forecast, could have improved dramatically and could have resulted in much better interest rate decisions. I think not enough work was done on how to model an evolving situation. A lot of work was done on modeling the economy in normal times, but not enough was done to say, how can we— it's a little bit like resilience— how can we have a modeling method that adapts to a regime change?

[02:41:31.39]

And so that's where you see a lot of people talking this morning about the slope of the Phillips curve. Well, if you haven't been on that part of the slope of the Phillips curve for a long time, you need to learn that as you're going along. And you should need to be changing your models from month to month and week to week. So it seems to me that that's where the distinction should be made between triggers— you couldn't have forecast the trigger. You probably couldn't forecast very much the invasion of Ukraine, maybe a little bit more forecastable. But you could have had a better method of working, understanding how the process is working through the economy and the wage-price spiral, if any. That's something that needs to be improved and could have been improved.

[02:42:22.36] - David Wilcox

You seem to believe that there's hope for the future, that we're not consigned to a world of massively incorrect forecasts.

[02:42:38.10] - Patrick Honohan

I think part of the problem has been a degree of complacency in the policy community generally. That includes fiscal policy saying, OK, we're going to spend a lot of money. We're going to splash out. We did not make the mistake we did in the great financial crisis, splash out. It's all right. The central banks are going to be able to control the inflation consequence. And the central banks are saying expectations are well anchored.

[02:43:04.05]

I think that was oversold.

[02:43:05.50]

The ability of central banks to control inflation was oversold. They believed their own propaganda and said, oh, OK, but this is a supply shock. So that's a small detail, supply shock, but we're all right because the Expectations have not become disanchored, but the consequences are a price level, we talked earlier, much higher than anybody expected and people feel aggrieved.

[02:43:31.01] - David Wilcox

Asher, there's no rule in the rule book that says that a moderator has to play fair, so I'm going to play unfair and ask you a question about yet a different paper that you're implicated in. Steve is as well, but I'm going to pose this question to you. And if you want to— what, what's the game show where you get a lifeline? You can tap the person to your left. Um, you did— you were also involved in a paper that did some really interesting historical investigation comparing the COVID experience to the Korean War inflation. Tell us a little bit about that, what you found, what lessons you took away. What were the headline elements of that paper that this audience ought to be aware of?

[02:44:17.52] - Asher Rose

So thank you for speaking about the paper that I'm speaking about today. But off the top of my head, there were 3 significant periods in American history in which there have been— there's been high inflation. The first is the Korean War paper, the Korean War, which was the primary focus of the paper. And the second 2 were during the oil shock. So I think 1973 and 1979, respectively. And when there was inflation in 2022, a lot of people were pointing to the oil shocks and saying, you know, there was persistent inflation then, there was, you know, the only way that there was disinflation was high unemployment. And as Patrick just alluded to, the role of lived history is really significant. Now, Joe and I take a slightly different tack, which is that we think that the 2022 episode is closest to the Korean War one, partly because there was disinflation there without a significant rise in unemployment, but also it matches the COVID pandemic in a critical way, which is that both had large surges in consumer durable spending. That's the only other time that there's been a surge in consumer durable spending in the United States.

[02:45:30.13]

So our pa— our paper essentially said there is a soft landing, it was possible, And not only that, but there was a previous instance of this happening.

[02:45:45.45] - David Wilcox

Steve, staying on the theme of history, you and Joe show in your paper that history matters, to reuse the phrase now that's become the stock phrase of this this panel, lived experience is important. Now the COVID era is part of the lived experience of the U.S. public, the European public, in most economies across the world. How much have we put at jeopardy the ability of central banks to deliver low and stable inflation as a result as a result of the lived experience of the COVID era. You touched a little bit on this topic in your presentation, but I'd like you to reiterate what you see as the key points in this regard. What are the risks that we've created by having this extraordinary surge in inflation? Sure.

[02:46:49.01] - Steven B. Kamin

Well, to start with, so what the research makes clear is that a very long period of inflation quite a long time ago can have these lingering impacts on inflationary psychology. And that's the same point that Joanne made in her presentation. And then those can basically kind of rise to the fore during shocks. When central banks don't seem as well under control. Now, the question is, what— how much of an impact did the COVID-era surge have in terms of affecting that inflationary psychology going forward? And I posed the possibility at the end of my presentation that probably the experience of having gone through that surge just a few years ago made consumers or households more attentive to the inflationary impact of tariffs than they otherwise would be. And that seems plausible. That said, let's put this— there's nothing in the research that we did that would indicate that a kind of a one-time surge lasting 2 or 3 years is likely to kind of permanently impact that inflationary psychology going far forward. So it would be my guess that assuming no other shocks, 5 or 10 years down the road, the COVID-era surge doesn't end up having much imprint on future inflationary responses to shocks.

[02:48:37.42]

But that remains unclear.

[02:48:42.16] - Patrick Honohan

Yeah, take the opportunity to ask Steve to— a puzzle that's been in my mind since I read the paper is, is history destiny? Or put it another way, are these structural relationships or reduced-form relationships in the sense that I could imagine— you've told a story which sort of says that consumers and businesses say, well, we've had inflation before. This could be bad. But another interpretation could be that the countries with high inflation have been systematically poorly run with policy structures that are not well suited to managing inflation. And that caused inflation to be high the last time there was a problem, and it causes inflation to be high this time. And in that

case, the solution is much more satisfactory. Just get better policy. Whereas in your interpretation, they will need to work much harder to get things under control.

[02:49:39.40] - Steven B. Kamin

So you touch on an interesting issue, and my co-author Jill and I might have slightly different views about that. I'm sympathetic to the view that what we're picking up might have a little bit more of the flavor of structural factors in the economy. Or maybe very ingrained price-setting behaviors that persist over time. So just to give you a concrete example, in Argentina, people know that when the peso falls against the dollar, it's time for price rises to increase. And so no matter how well-run the economy is going to be, 15 years from now, if the peso falls against the dollar, prices will shoot up and inflation expectations. So I'm sympathetic to the fact that there might be some of these structural factors built into the economy. But I think that the simplest explanation goes more to the inflationary psychology point. And I guess my view would be, if you had a history of high inflation, and then you had a central bank a central bank that worked conscientiously to keep inflation around target, and it succeeded in doing so for a period of decades, I think that could extinguish the effect of the earlier inflationary period on inflationary psychology and reactions to shocks.

[02:51:09.51]

But it's an open question.

[02:51:15.01] - David Wilcox

As a result of the fascinating presentations, I'm equipped with approximately 4.5 hours' worth questions here, but I'm interested in hearing from the audience. I'm going to pose one more to Steve. Please formulate your questions and be ready to pop up. I believe Jessica will have a roving mic. There's a microphone stand in the middle of the room that'll be ready for your questions. Steve, let's turn to a topic of current relevance, namely the importance of central bank independence. I was a little unclear listening to your presentation about whether you're downplaying the importance of central banks. Do I need to renounce my faith in that core tenet?

[02:52:04.55] - Steven B. Kamin

I think your faith can remain intact. So let me expand on that. Please do. OK, so in the paper, we actually do include central bank independence, an index of that, as an explanatory variable. And we expected that, you know, where the index is higher, levels of the index give you higher levels— you know, lower levels of inflation, because they're more independent. So we put that index as an explanatory variable, and it came up with— and it had the wrong, that is to say,

positive sign. This was an index drawn from research by David Romelli, which I guess some of you might be familiar with. And I looked at the actual index numbers, and they didn't really grab me as being all that reliable. I didn't like the fact that the United States, for example, was in the middle of the central bank independence, you know, kind of spectrum, all right? And so I've decided that it wasn't a very good index, and since I didn't trust the results, okay, I would not share them with you, which seems reasonable. Okay, so that said, I would not be surprised if even if I had an index of central bank independence that seemed perfectly reliable, I would not be surprised if it also ended up being insignificant in an explanation for the cross-country pattern of COVID-era inflation, just like inflation targets.

[02:53:45.59]

And for the same reason, which is during the surge when inflation takes off well above central bank targets, you know, the average person on the street is not only paying that much attention to the central bank target but paying even less attention to central bank independence. So, does that mean central bank independence is irrelevant? No. Central bank independence along with targets are important for central banks to keep inflation— you know, to keep inflation low and stable. And if they do that long enough, that then filters into inflation history and inflation psychology. So, it's just that independence along with central bank targets don't have immediate impacts. They work through long periods of successful work.

[02:54:37.26] - David Wilcox

Questions from the audience? Please state your name and institutional affiliation. Sure. Jerry Caprio, most recently from Williams College, where I'm now an emeritus professor. Go Purple Cows, right?

[02:54:53.20] - Audience

And David too. Just a brief comment, Steve. I hope you're sending your paper to the Supreme Court justices. For Asher, a question. So, you mentioned two previous inflation episodes. By the Korean War one, if you literally meant what took place during the Korean War, my question is, what about the— what is it— mid to late '46 to '48 burst of inflation? Which was more than double, I think, what we experienced post-COVID. Um, was it limitations of data that you didn't look at that one? Because it had so many similarities in the sense that there was, uh, a switch in production from tanks and bullets to washing machines and other consumer goods. Uh, there were pent-up savings that occurred, uh, during World War II. And I think there was an easing of policy. So wouldn't that have been relevant to the most recent experience?

[02:55:53.26] - Asher Rose

That's a great question and one that we were thinking about a lot when we were writing the paper. But ultimately, it did come down to two issues, I think, both of which you touched on. The first was simple data availability. There was not stuff at very high frequency. We were unsure of the trustworthiness. And secondly, the shock associated with the Second World War was sufficiently large and esoteric that we thought it would be inaccurate to compare to what's happening.

[02:56:25.28] - Patrick Honohan

Gerry is mentioning the built-up savings during the Second World War. It reminds me of a point that occurred to me in the course of the morning. It used to be stocks and flows. Some people study flows, and we haven't had much talk about stocks. And I think one of the big questions about this inflation is there's a stock of savings accumulated just after the fiscal expansion, and there's a huge stock of liquidity created by QE in all of the countries that we're talking about here. And one of the big questions in my mind has always been which of these has been the most important factor facilitating the speed and amplitude of the inflation. Which was caused by the various shocks. My money is on the fiscal, but I think it's an open question. A lot of people, maybe in this room, who think this was always going to happen once the central bank started QE and started implicitly supporting the fiscal authorities, even though in full independence they were doing it, but—

[02:57:31.04] - Steven B. Kamin

Well, I think I'd note that— So QE after the GFC, Global Financial, was not very inflationary. In fact, was not inflationary. The lesson I take from it is that if all you do is flood the markets with money by buying Treasuries, buying bonds, that by itself doesn't seem all that inflationary or demand stimulating. If the mechanism by which the liquidity is increased is fiscal, giving people money and then combining that with the creation of money. That seems to have a lot more impact.

[02:58:14.37] - Audience

John Roberts, consultant at Evercore ISI. So I kind of got a different, I'll say, vibe from this panel than from the first panel on the relative roles of supply and demand. Asher's paper seemed to suggest an important role for supply, whereas the morning's panels— most of the papers, I think, suggested no, no, no, it was mostly demand. I guess for the panel as a whole, if folks could opine on— am I reading that wrong? Um, thanks.

[02:59:01.40] - Patrick Honohan

I think I like the more detailed breakdown that Asher and Joe's paper has in segmenting this. I think it— was it demand, was it supply— is not exact. It's too broad brush a question. I, and I would prefer to look at this in terms of triggers and transmission mechanisms. Mechanisms. And some things, for example, the stock of savings, the stock of liquidity, are part of the transmission mechanism, which made supply shocks like the shortage of chips and the shortage of ships— those had consequences, bigger consequences than they would have if the other things hadn't been there.

[02:59:39.49] - Phil Levy

So I look at it in that way.

[02:59:41.11] - Patrick Honohan

I don't think there's too much of a consequence— contradiction between the early morning session and this session. Dimension. There's, of course, an international dimension. I think when it comes to the international dimension, if we want to make supply and demand, I think supply is more important in Europe than it was in the United States. So I think that's part of the difference.

[02:59:59.01] - Asher Rose

Yeah, I totally agree. I mean, I think that even within durables goods, durable consumption, there was both a shock in demand, as in people wanted to consume more durable goods than services, and there was a shock on supply because of the supply chain bottlenecks. So I wouldn't quite have the characterization that you did. And I'd also agree with Patrick that particularly within non-durables, there was this large supply shock associated with the Russian invasion of Ukraine. So I don't think that you can easily say it was either supply or demand shock. There were certainly propagation mechanisms within both.

[03:00:31.26] - Steven B. Kamin

My paper with Joe doesn't address or contradict that. I mean, it's quite consistent that inflation histories are an additional explanatory variable. Consistent with other factors. But I have to say, I'm a little bit skeptical that the US inflation surge could have been largely attributable to the fiscal stimulus, just because the COVID surge was not only prominent in countries like in Europe that were exceptionally dependent on what ended up being scarce energy supplies. But it was true throughout many other parts of the world, particularly Latin America, that

experienced large surges in inflation without a particular dependence on energy and certainly without a particular amount of fiscal stimulus. So the thought experiment that people could think about is, what if during 2021 we had the exact same amount of fiscal stimulus but no pandemic, so a normally operating economy just with monster fiscal stimulus. And the question is, what would have happened to inflation? My guess is it would have been somewhat less than we saw, but that's up for debate.

[03:01:50.03] - Audience

Hi, Archie Hall from The Economist. I'm sort of interested from Patrick's presentation.

[03:01:56.33] - Asher Rose

Switzerland is a really, really striking outlier in almost all the charts you had.—

[03:02:01.20] - Justin Bloesch

and there's a way to read that, that it's a sort of unusual country. There's a way to read that, that there's a set of policy responses to COVID that wouldn't have induced what Europe and America saw. And I'm curious what the panel makes of that.

[03:02:17.04] - Patrick Honohan

Switzerland, though an important economy and a very important financial sector, is a small economy. And I think that it can do things that would not be available to the euro area as a whole,— United States as a whole— massive currency intervention or something like this would not be available. But I think it does indicate that you do have some choices if you have an institutional structure that is able to adapt quickly to changing circumstances. You don't have to just ride the global inflation surge.. And it is, I think it's quite interesting to look at the way inflation transmits through other small economies. And Iceland is a great one to study. They're still 7.5% interest rates. Why? Possibly because they've had a long history of inflation surges. But so looking at this comparative analysis of other small economies on this inflation, I think this project isn't really over until we have sorted out.

[03:03:28.46] - David Wilcox

Patrick, I'm going to ask you to close us out before lunch. For many years, there was an ethos that the science of inflation control had been solved, that central banks could deliver low and stable inflation. This— the experience of the COVID era is a jarring counterexample, apparently. To what extent do central banks need to adopt a more humble message in terms of their ability

to control inflation? What would you advise central banks here in the United States, Europe, and elsewhere to be telling their publics about their ability to provide low and stable inflation.

[03:04:24.21] - Patrick Honohan

Yeah, I'm surprised that when you look at surveys of trust in central banks, that the trust in central banks has not apparently declined that much as a consequence of this inflation. I would have expected it to have more, but I think there is a— if they're to maintain that position, the communication needs to be a lot more subtle but also directed to the general public because it's all very well to say actually what matters happens in the corporate sector and in the financial sector. But the consequences of high inflation and the consequences of a big change in relative prices and in the nominal price level are political and spread right across society. So it's very important for society as a whole to understand what can and cannot be done by central banks. Otherwise, they will start to blame central banks as being just looking after an elite and disreputable— which they're not. I mean, they are looking after— every central banker that I know at least gives lip service, but I think also believe that it's the consequences for society at large, but they need to communicate that carefully to the general public.

[03:05:40.11] - David Wilcox

With that, please join me in thanking our panelists for an extraordinarily interesting session. I believe lunch is served, and after a few minutes we will reconvene for what I anticipate will— sorry, in a half hour we will reconvene for a conversation moderated by Karen Dynan and in conversation with Adam Posen.

[03:35:37.28] - Karen Dynan

That would be fantastic. As our lunchtime entertainment, we have a chat with PIIIE President Adam Posen. I'm pleased to be moderating it. I have lots of good questions for Adam. Yes, you do. In addition to being PIIIE President and a driving force behind this project, Adam was also, for those of you who don't know, he was a member of the UK Monetary Policy Committee from 2009 through— '12. Through 2012. So we've been kind of very fortunate to have a few former central bankers on this program. But Adam is one of those groups. So I think he is particularly well-equipped to speak to these questions. So Adam. Erin. OK. OK. So I want to start you with kind of backward-looking questions about what happened in the early 2020s. And the one I'm going to start with was you were just one of a handful of economists who were warning about high inflation in early 2021. I remember this so well because we had a Global Economic Prospects event in April 2021. And I think you said to me— I was speaking, but I think you said to me, oh, can I just say a few words before we get started?

[03:37:02.51]

And sure enough, Adam gets up there.. And he starts talking about how he thinks that the economy is at risk of seeing really high inflation because of the aggressive stance of policy and other factors. And I showed before in my presentation, I showed you that the median Wall Street Journal private forecaster forecast But I've also looked at the distribution. You can get the distribution off their website. And even if you look across the distribution, there were a couple people up there saying inflation might get as high as 3%. But really, most of them just didn't see this coming. But you did. So what is it? What spidey sense did you have? What were you looking at? What were you thinking?

[03:37:55.16] - Adam S. Posen

What were you thinking about when you made this call? I'm very grateful, Karen, you remember that. And all of us at Peterson are very fortunate that for now several years you have been running our semiannual forecast and we benefit greatly from that. I think what I saw, what it was worth in 2021, which is partly political economy performance, informed and partly cross-nationally informed, was the fact that fiscal swings actually matter a lot. And the— what everything you said about in your presentation about, you know, how could you know, and, and what— and given the legacy of the essentially error of insufficient fiscal response in 2008, '09, '10, that was baked in. And the cross-national part, I would say, is from work I and others did, including Kenneth Kuttner, on Japanese fiscal policy in the '90s and early 2000s, was when uncertainty is high, when monetary policy is limited in how far it can go, fiscal policy tends to be even more effective in terms of impact multiplier. But I guess the third thing, and this is one of the reasons I'm excited about the papers that you— genuinely excited about the papers that you and David pulled together— is there is this sense, I think, that got lost that this, notwithstanding what Justin showed about the Beveridge Curve, that this was a very big shock in terms of labor markets in the US and in terms of energy markets in Europe, UK, and abroad.

[03:40:01.08]

And they— you would think, oh, those are very different shocks. But in a sense, I think the common graphs— and this is why some of the work Joe and Asher did breaking down the inflation matters. I think the common graphs kind of hid the fact that these were— that it really was a supply shock, not so much a demand shock on the labor market side. And so it so happened you had this very large energy supply shock in Europe, and you had this very large labor supply shock in the US. And they both moved in the same direction, but that people, I think, were still thinking about it as very much a demand shock in the US. I don't think they—

and again, I don't want to claim perfect foresight by any means or criticize those who didn't see it, but I think there was a reluctance to realize that that was the right way to think about about it. So you had this combination of very large fiscal— the political economy historical sense I saw coming, and obviously it wasn't just me. Jason Furman, Larry Summers, Olivier Blanchard, others affiliated at the time with the Peterson Institute also talked about that.

[03:41:20.52]

But also just that this was a big deal. And so the idea that, as much as I love central bankers, going to some things that Patrick and Steve talked about and others have spoken about and some of the stuff Joanne was talking about, putting a huge amount of faith in central bank anchored expectations was overdoing it. And so that was the other thing I would say. So if you go back and you look at that period, and again, not to— I don't want to talk about colleagues in a bad way, but if you look, some of the things that were being said by some of the people I mentioned were essentially— if you look at it in real time, they were essentially saying the weight on the inflation anchor was zero. And then the people who were overly calm basically said the weight on the inflation anchor is 100%. And I can't remember if I explicitly said it in that presentation, presentation you mentioned, but I did try to say to various people, probably somewhere in between. Probably the Fed's credibility didn't go to zero, but it's also probably the Fed's credibility is not entirely in this situation 100% what it was.

[03:42:45.59]

And so anyway, so that's how I ended up—

[03:42:48.23] - Karen Dynan

So can I poke more about this? So you made a lot of logical arguments here. You're using kind of good economic theory. You were at the Bank of England in what was also a time of great uncertainty. I'm just— I'm curious, you know, people have, you know, the data and also the models. So I'm curious, so Peterson is now taking a big interest in data and supporting the integrity of our, you know, our statistical systems around around the world. I'm curious about, I guess, two things as a member of the committee. One is the question about if you were sending your staff out to kind of go look for indications that your priors were right, what would you point them to? But that's part A. Part B, which is kind of a different question, is about models. Models are a result of historical relationships relationships that we see in the data. And I'm curious about kind of where you stand in the debate over, you know, overreliance on models.

[03:43:56.51] - Adam S. Posen

Yeah, well, as I believe it was Alan Blinder famously said, you know, you can complain about forecasts, but I'm paraphrasing Alan, so forgive me if I get it wrong. You can complain about forecasts, but if you don't have any forecast or any model, the discussion is completely discipline. I think you said something about that in one of your little books of lectures on central banking. And I am, as people may know, I am at the very low end of econometric skill among people in this room. But the idea that you have to have some discipline on what you're saying and sort of picking up on things Patrick was saying or what's implicit in what you were saying, You know, you have to have in your head there's an output gap piece, there's a what are the shocks piece, there's a fiscal policy piece, there's a financial structures piece, and then there is, as Patrick kept saying, there's a transmission issue. There's— yeah, how do you get it? And that gets into monetary credibility and other things.

[03:45:00.42] - Karen Dynan

So what you're saying, we don't need to throw We certainly don't need to throw the framework out. We don't need to throw the Phillips curve out.

[03:45:07.29] - Adam S. Posen

But we need to put these relationships in context. I think we do need to be more humble and aware that the relative importance of these factors is more subject to change over time or is more regime dependent, if you want to use that language. That's one of the reasons I like Joe and Steve's paper and other stuff Joe has done, including with Asher on the Phillips curve, that if you're in a long-time low inflation environment, it behaves one way, and then we all talk about a kink. Mm-hmm. And in a higher inflation environment, it behaves another way. Or putting it differently, we're not always on the cusp of the '70s. If you think we're in the '90s or the early 2000s, you'd think it behaves one way, and if you think we're on the cusp With the '70s, it behaves another way. And so that gets to your point about what would be the things you would be looking at is you want to get the beige book, or at the Bank of England, or called the agents' reports from discussions with actual businesses, small businesses, investors, people in the real world of what's going on.

[03:46:24.01]

And so right now, Well, you know, Governor Chris Waller just issued a statement ahead of the recent data in which he was saying he's hearing a lot about layoffs, and then it turned out we got the latest JOLTS data, seems to be a lot of layoffs. Now, I don't think Governor Waller's actually right. I think the labor market is actually in pretty solid shape, but I do think that's the right kind exercise. That's the right way to be thinking about this. Is the other point I would

make— and I'm sorry if this is going on too long— I, I just, I would stress that the mental frames and errors are very different, in my view, for the 2008 to 10 or 11 crisis, for the COVID response, and for today. And for today, yeah. Um, and, and again, I think you have to be open-minded about that. So in 2008-9, and credit to Bernanke and, and Mervyn King and others who were involved at the time, in 2009, intellectually, there was very little question This was something of a rerun of the '30s. It wasn't exactly the same, but it was a financial system shock amplifying a negative shock, and that the question was, could monetary policy do anything to arrest this while you're trying to clean up the financial system?

[03:48:09.58]

And the uncertainty of information, in my view, and I think was subsequently proved right, was the uncertainty about the specifics of, you know, I joked very bitterly during the crisis that at the Bank of England, even though I wasn't on the financial supervision stability side, you know, every day you'd open a new desk drawer and Barclays or somebody had stuffed in there another couple billion of, of bad loans. And the same thing was happening here. I see Esther George, I see others here who lived through this, and Patrick, of course. The information problem wasn't conceptual. It was about figuring out where the financial problems were. And then, again, with credit to our ever-invoked today, luckily on vacation, Joe Gagnon, who worked for Ben Bernanke and others on designing in the first round of QE. It was technical problems about what was the best way to transmit policy when the financial transmission was broken down. But it wasn't conceptually hard. Whereas COVID, I think I'm much more sympathetic to those who got it wrong, quote unquote, because it was conceptually hard. We hadn't seen a pandemic, thank God, in forever. And all these subtleties like Phil was talking about with the shipping, or the fact that there was ex post, again, Joe Gannon, that you figured out that in the Korean War boom, there was this shift from durables to services, or from what you were spending on.

[03:49:49.17]

These were things that you had to really think hard. And so just to flag one more example, Asher Rose and I have a paper that we were doing for this conference that, for my fault, we didn't get done in deadline— time for deadline for this conference. But one of the points we start with is, again, the comparison of unemployment. And ex ante, a number of people, not just here, but including our colleagues Olivier Blanchard and Jean Pisani-Ferry, published papers saying, you know, the Europeans and Japanese probably have it right. In the US, we're gonna have a problem because we're not making sure people are linked to their jobs. Yeah, yeah. You know, there was this whole question of subsidies or job fairs or anti-firing incentives, and that Europe, and Stan Feiger over at AEI since worked on this, that Europe in advance said, we're gonna do

this because we think there's all this firm-specific, job-specific human capital, and they're just gonna hire people back, and so what's the point of having that destroyed? And in the US, despite including Chair Powell and others at the Fed saying this is really important, we didn't set up anything like that because basically our system just couldn't do it in a short amount of time.

[03:51:12.07]

But it turned out ex post, and this is what Asher and I have in development, but we'll see how the paper comes out. Turns out ex post, it looks like there was actually a lot of really good churn in the US.

[03:51:23.28] - Karen Dynan

Yeah, which is what labor economists kind of always say.

[03:51:28.10] - Adam S. Posen

Yeah. And I think nobody ex ante, certainly not I, saw that except possibly some very ideological people who were like, we're dynamic in the US, it must be good. I think ex ante, the right guess.

[03:51:43.15] - Karen Dynan

So anyway, I think— So would you argue that that's a positive supply shock that in addition to anchored expectations, in addition to monetary policy, gets credit for that—

[03:51:53.35] - Adam S. Posen

Yeah, I think— —for that— Thank you for pushing that. You're absolutely right. And again, I think part of our argument and the point I would make, again, with this, you can make the comparative inflation graph and that misses the point. I mean, you had this huge shift in where people were employed. You had this large acceleration in productivity growth that I would argue was in large part due to this labor market. So it lasted a few years and is now petering out and being— the baton is being handed elsewhere. And you didn't have that in Europe or Japan. And so to say, oh, they had the same inflation outcome is actually missing the point. The reasons for the inflation outcomes were very different. Yeah, okay.

[03:52:38.54] - Karen Dynan

So actually, so I had more backward-looking questions, but I do— let's go to forward-looking because, you know, we've seen strong productivity growth in the first half of the 2020s. There is

this period where you can see, you know, productivity, the level going well above trend. I think you and Asher together have this kind of nice story about better math matching. Yes, probably in the rearview mirror at this point. And yet this year we're again seeing strong productivity growth. People think maybe this is the beginnings of AI showing up in productivity growth. So I know you are— I want you to talk about kind of— you've been out there saying, you know, I got to watch the risks of inflation now for a variety of reasons. I would like I'd like you to talk about that research, but let me just say, one could counter that story by saying, oh no, we're repeating the late 1990s. We've got a big positive productivity shock. That's going to save us from inflation. So please talk about all that.

[03:53:45.43] - Adam S. Posen

Yeah, no, thank you. I mean, I think this is, as opposed to some other things, again, in 2008, '09, '10, there were disagreements But I really feel like the vast majority of mainstream economists were all in one place and should have all been in one place. And there were debates about implementation issues or things or about what information on the financial system. But broadly, people were in the same place. I think right now there is— and I was talking about this with someone earlier today, and I keep talking about this— there's basically a cloud. Of mainstream expectations about the current impact of AI. And so, you know, imagine I'm gonna be extra nerdy without a chart. You have a 3-dimensional graph, right? You have how soon AI kicks in, how much productivity growth it does, and how much job displacement it does. And you know, you can find David Autor and Daron Acemoglu towards the origin that it's not going to have much job, it's not going to have much productivity growth, or it's not effective yet, and maybe there'll be job displacement. And you can have experts like Erik Jørgensen out here saying there's going to be huge productivity growth and it's already here.

[03:55:07.01]

And we just— Anton Korneck, one of the world's leading experts on this, just joined us here at Peterson talking about these issues. He's still at Virginia. I mean, like Karen, a contributing part-time. But anyway, you can basically create a cloud. We honestly don't know. We don't know. We don't know. And so when I look at this, but if you're a central banker or if you're a central banker former wannabe like me who has to make forecasts, you have to make a call. You have to make a call. And to me, the way I would interpret the current situation is partly there is this baton handoff that the productivity— part of the large part of the productivity growth over the last few years in the US is still the working out, working through this labor market churn. But now what's happening is you're getting the product— you're starting to get the productivity growth from AI. But the twist, I would say— and I'm not alone in this, but everybody's a minority wherever they are in this cloud. I and other people would say, I think if you look at past episodes

of general-purpose technology, you know, go back to Bob Gordon, Robert Gordon's work, what you often get is the surge in real income comes before the surge in labor market restructuring and other forms of productivity growth.

[03:56:33.24]

So think of it like the radio. Radio comes in 100, 120, 10 years ago, 105 years ago, and suddenly everybody's got radios. And for my grandmother, an immigrant out of the shtetl, this was an entirely different world. And the number of yoodles that she and her family got through the magic of the radio was enormous. But it took time before that translated into changes in consumption patterns, changes in production patterns, changes in corporate behavior. Similarly with the internet, if we think about the '90s, right, and this goes to the ever famous, ever rightly cited Bob Solow on it's not in the statistics yet. People started playing with the internet, enjoying things, enjoying the sound of the modem going, you know, all this stuff, playing Civilization, long before corporate America and elsewhere figured out how to change their production processes and reallocate labor. So my guess— and I'll bring it back to inflation in one second.

[03:57:42.53] - Karen Dynan

Yeah, I do. Yeah.

[03:57:44.21] - Adam S. Posen

And so my guess is we're in the start of a cycle, and I can't tell you exactly how long it is, but that the— we're in the part of the cycle where this is a positive real supply shock, but most of it's the form of positive real income and very little of it is the form of disinflation. It's the mirror image of what Nomi Warsh or Governor Waller or others say about tariffs or migration. They say, oh, that's a one-off supply shock. It doesn't have to be nominal. And I think they've got it exactly wrong.

[03:58:25.24] - Karen Dynan

Okay, so tell me why you are. Yeah, so the— Please elaborate on your kind of bearish views about, I don't know if bearish is the right word.

[03:58:33.16] - Adam S. Posen

So finishing on the productivity, thank you, is that they're right in theory that it's just as with the negative supply shock, with the positive supply shock, it's to be determined how much of that at any given moment is felt as a disinflationary force and how much of that is a real growth force.

But I think when you look at technologies and the necessary processes of corporate learning and adaptation and labor market learning and adaptation, we're at the real income part and the nominal disinflation part is still to come. They're premature on that. And then by the same token, and this is something I argued in an essay in Businessweek recently, and it's picked up in some stuff I've written with Peter Orszag, There is a decision-making adaptation process for businesses on when and how they pass through inflation, for migrant workers on when and how they decide to leave, when the risk is enough, when, when. And so the idea that there's a lag from when these policies changed roughly 10 months ago. To when you start seeing it in the nominal inflation, I think is very logical. And it goes back to what you were saying earlier, Karen, about what are the things you look at?

[03:59:52.07] - Karen Dynan

Are you willing to put a number on inflation for this year?

[03:59:55.11] - Adam S. Posen

I think I'm way out there. I think it's going to be close to 4% on headline CPI by the end of the year. I have had friends say to me, Adam, you could be out there enough just by saying 3.5%. And probably it would be the wiser part of valor to say that. But it's like, so I did a piece internally for community at PIE, and then Peter and I went back and forth, and we did this slightly longer piece. But basically, it's like at the end of The Maltese Falcon when Sam Spade— Sam Spade basically says to Bridget O'Shaughnessy, you know, there are so many reasons why I can't trust you. There are so many reasons why inflation should be high at this point. We got expanding fiscal policy, and I'll very confidently make a call that fiscal policy, for reasons you and I have talked about, is going to be much looser than people have built into their forecast. You're going to have delayed but real coming in now in 2026 inflation, first round effects, but inflation from anti-migrant tariff policies. You're going to have, frankly, going back to Joe and Steve's paper and going back to the Volcker experience of '82 versus '85, you're going to have whatever inflation shocks take place now.

[04:01:24.43]

Take place in the context of lower anchoring and credibility than they did as a result of it being a few years since 2021, 2022. So you got this whole bunch of things. And basically, the alternative is— and I think you have a— we don't need to go into it, but I think you have a very tight, arguably very tight labor market because, again, going back to stuff Asher and I are working on, and it's not published yet, So don't take it seriously until we get it out there. But that labor force participation is still very high for prime-age workers. Some of the things pushing up

on unemployment, like African-American unemployment, is probably in large part attributable to anti-DEI, anti-government reallocation of government spending against government contracting, which is heavily pro-African-American, I think for good reasons, but just empirically is that rising youth unemployment is a very slow rise over 3 years, partly AI, partly other COVID things. But it's not like suddenly, ooh, we had a demand deficiency and suddenly unemployment among young people spiked. So to me, the idea that we had this huge set of hiring and reallocation after COVID, that there's an overhang and that businesses are not hiring a lot at the moment but also not firing to me is perfectly sensible but doesn't tell you you got a weak labor market.

[04:02:57.40] - Karen Dynan

We only have a few minutes left. Good. I want to see if people— do people have— I have many more interesting questions for you. But are there— do people out there have questions? If so, please come to the mic. Challenges? All right.

[04:03:15.40] - Adam S. Posen

Karen's questions are more interesting than the comments. So let's go back to Karen's questions.

[04:03:19.15] - Karen Dynan

I want you to talk about the— What about the fiscal theory of the price level? You know, the theory that inflation is ultimately anchored by fiscal credibility rather than monetary policy alone. Do you find that— there's a lot of talk about it these days.

[04:03:32.31] - Adam S. Posen

Do you find it credible? I always had a problem with this when it was abstract. You know, when whether it was Willem Boudier or Chris Sims or other brilliant people would sort of talk about it in generic terms about fiscal theory of the price level. But when you start putting it in a more concrete political economy context, that the regimes that tend to run these kinds of repeated deficits also tend to be the populist regimes that attack central bank independence, that also tend to be the ones that get concerned about resorting to financial repression, and the BIS just had a, I would call it, night nice but depressing piece about how even at current levels of debt, the Federal Reserve and other major central banks are potentially in trouble because their transmission is constrained by the swings in interest rate payments in these kinds of circumstances. You know, then the fiscal theory of the price level starts to kick in. And this is why things that you and Doug Elmendorf have written on automatic stabilizers. We had, some of

you will remember, I guess about 3 or 4 years ago, we had a major joint conference on fiscal policy with the IMF here.

[04:04:54.49]

And then the closing panel was very striking. Jason Furman and Christina Romer, two other former CEA chairs, both came out very strongly against discretionary fiscal policy and in for—you can go back and read the video, see the videos on the Peterson website.

[04:05:11.19] - Karen Dynan

Yeah, I remember it well.

[04:05:12.57] - Adam S. Posen

For greater automatic stabilizers and fiscal rules. And that was before we got to the current political situation in the US. So fiscal theory of the price level in the very academic sense, I'm not a huge fan, but fiscal theory of the price level going again to you have to be realistic about what regime you're in. And then that takes place against a context with a little bit less political, but just the fact that as we've discussed, you and I and others on this stage many times with Peterson affiliates, we're in a world where arguably our star is going up. And to cite Summers on Hanson on secular stagnation, if you have a system sustained erosion in fiscal discipline, desirable or not, that pushes up your R^* . And we're in a world where you're spending more on defense, more on demographics, more on pandering in the populist sense. And frankly, and this is something I've flagged that I think people are becoming more aware of, less capital flowing directly from East Asia, particularly China, into the US and into the West. All of these things push up on R^* . All of these things push up on the fiscal issues.

[04:06:37.58]

And additionally, let me stop there. I just see a world— oh, yeah, and then, of course, as you've written about, about in the past and our colleague, former colleague, Jeremy Zentelmeier has written about, if you have a sustained productivity rise, it's generally neutral for fiscal policy to a first approximation because revenues and costs and growth go up in tandem and the return on capital goes up roughly one for one with the return on the growth rate. So that doesn't save you from this.

[04:07:19.02] - Karen Dynan

Yeah, well, we are out of time. We need to break so we can get ready for the next panel. We're going to reconvene at, let's see, 1:10. But I want everyone to please join me in thanking Adam for sharing his wisdom about these issues. Thank you.

[04:15:17.38] - David Wilcox

Introduce Alan Blinder. I am not going to recite, give a complete recitation of Alan's vita because that would take us through the rest of the afternoon. Just very briefly, he is the Gordon S. Rentschler Memorial Professor of Economics and Public Affairs at Princeton University, formerly Vice Chair of the Federal Reserve Board, and also formerly member of the Council of Economic Advisers. I think you will agree, uniquely positioned to offer salient observations about the predicament in which we find ourselves today. And through which we have just recently come. Alan, the podium is yours.

[04:16:06.16] - Alan S. Blinder

Thank you, David, and I'm glad you didn't mention probably the oldest person in the room. I want to say two things about the title page. I'm not going to be on the title— usually I skip right by the title page. First is the verb was. This is looking backwards to the COVID period, which was my assignment. I have a strong hunch based on what David told me yesterday, there'll be some questions in the Q&A about the current situation, which is fine. I'm answering questions like that for the media about 4 times a day, so I'm used to it. But that's not the assignment for today. So the 15 minutes is going to be about was. And the title was more or less given to me by David. When he called me up some months ago and asked me to write a paper, first I groaned. How am I going to find the time to write a paper? Then he basically gave me the title. This is your assignment if you take it. What's that TV, that old TV show? Mission Impossible? This was mission possible. If you take it, I'd like you to write on whether something was structurally wrong at the FOMC, with the emphasis on structural.

[04:17:26.22]

So I will elaborate on that in a second. And my answer to that, my answer to that question is no, if you read the paper. That the problem was basically, and this has come up 18 times already in this conference, a very bad forecast of inflation. That was the root of the problem. So that's getting to the end. Now let me get to the end by starting on the next slide. So the issue is this, and I like to call these things the inflation hill. I'm— in my career, I've done a lot of inflation hill diagrams having to do mostly with the '70s and '80s and things like that. This is the one for the COVID period. And I've highlighted the years 2021 and 2022 because 2021 is when the post-COVID inflation really started ripping. And 2022 is when it peaked. The middle— for the United

States, it was the middle of 2022. You've seen the diagrams like this in earlier presentations for a variety of countries. So what went wrong in 2021, 2022 that led to this quite terrible forecast? So before I'm going to answer that sort of by process of elimination, taking up first explanations that you hear sometimes from people that are not very well informed, but also from people that are very well informed about why this might have happened.

[04:19:18.39]

And these are explanations I reject. First, there was an unusually dovish FOMC. Remember, my assignment is, was there something structurally wrong that led to this policy error? Was there an unusually dovish Federal Open Market Committee at the time? My answer to that is no. I name a few names in the paper. One of the names is right here, Esther George. I think Esther will verify that this was not a super dovish committee that was just so soft on inflation that they didn't care, and who cares if inflation goes to 9% or something like that. That was by no means the case for the Federal Reserve in 2021. A second explanation, which you do hear, was the economy got overheated. That it got too hot, overshooting full employment, and that gives you this sort of Phillips curve-ish explanation. What do you expect when the economy runs that hot? You expect there to be an acceleration of inflation. I don't believe that happened, and I believe the previous looks at that question in this conference and elsewhere are on that side of the debate, that that's not really what happened. I mean, there was a recovery, a big recovery, and that's important, but there was not a big overshoot of full employment.

[04:20:53.08]

Third thing that you hear even more, I think, is the Fed's— what was then the new framework adopted in August 2020 by the FOMC, pushed the Fed in a dovish direction relative to where they were before. So this would be structural. This is part of the framework that they decide to live with. I think there's a little bit of truth here. I said a moment ago, I'm going to deny all of these. I'm going to mostly deny this, but there is a little bit of truth here. And I'll just remind you, in case you've forgotten, because the Fed has now revamped that framework. The two ideas in the 2020 framework were not to make up for periods of high inflation. So if you overshoot the 2% PCE target, you don't keep a computation of how much disinflation we owe you to get back. To the 2% trend. This is related, by the way, to the comment I made from the floor earlier about is it the price level or the rate of inflation? So the Fed 2020 framework was not going to make up for high inflation. And it was focused on shortfalls on the other part of the dual mandate, on the employment part.

[04:22:23.38]

Was focused on shortfalls rather than symmetry. I teach a course in central banking, and for up teen years, the term having to do with the employment or output part of the dual mandate has always been the squared deviation of the output gap. Say, the framework in 2020 moved away from that and focused the Fed on the downside. And that's gotten some blame for the dovish, putatively dovish attitude at the Fed. And the fourth thing that you hear is that inflationary expectations became unhinged or unanchored. That's just wrong. Here's a graph. This is from the TIPS market, not from Michigan inflation survey. Joanne and I were speaking a moment ago about the differences between those two. This is the 5-year breakeven inflation rate from the TIPS market. And what you see— I don't have a point. Is this a pointer? Well, you can see it without a point. Is that it peaks, if you can read the scale, at around 3.5. Remember inflation— let me back up one second. The TIPS breakeven is about the CPI. That's the way the contract is written. And the CPI peaked around 9%. And the 5-year breakeven inflation rate peaked around 3.5% and then retreated back to where it should be.

[04:24:08.35]

Another thing most people— probably most people in this room know, but most people generically don't know, is that the CPI historically runs higher than the PCE inflation rate. The Fed has targeted 2% PCE, which if you roughly translate the CPI is 2.5% CPI. So that's where this goes back to, 2.5%. So this looks miles and miles away from from unhinged inflationary expectations, at least as measured in the TIPS market.

[04:24:48.40]

The next.

[04:24:50.43]

So it was a forecasting error. And the next point, which has come out several times already in this conference, is the Fed was far from alone in this forecasting error. Mainstream forecasters all over the lot private sector, academics, the Fed, and others, all made a big forecasting error. As an illustration of this, I pick on a quotation from the Federal Reserve Bank of St. Louis. Note the date, August 2022. That's important. CPI is peaking like in June 2022. So we're sort of we didn't know it in August, but we're sort of getting over the worst of the inflation surge. And the other thing I want to say by way of preface, probably all of you know, the St. Louis Bank is not exactly the dovish extreme on the Federal Open Market Committee. In the old days, it was the monetarist crowd. They're not monetarists. Nobody's a monetarist. Interest anymore. But the St. Louis Fed remains pretty hawkish in its general attitude about inflation. So they're not biased in the wrong, in the other direction. And the words say, according to the August Blue Chip

Consensus, that's what I said before, this is not just the Federal Reserve, this is reference to the Blue Chip Consensus.

[04:26:25.24]

Real GDP growth will average less than 1% annualized over the second half of this year, that's 2022, and into the first half of 2023. Risks to the macroeconomy remain tilted to the downside. This is one of the reasons for the error. The Federal Reserve, with its dual mandate, which it takes seriously, was substantially worried as late as August 2022 and after that the economy was weak and weakening rather than enjoying a robust recovery from the catastrophe. Most people have forgotten now, but I'll remind you that the first two quarters of 2022 were printed by the BEA showing negative growth, actually. So, there was reason to be worried about the strength of the economy going forward. And if you have a dual mandate and you're worried about weakness in the economy, you may not want to be raising interest rates. So, what was the real culprit? I call it here supply disruptions. I keep wrestling with the right thing to say. It wasn't a It wasn't a supply shock. It was, as Phil said, surging demand pushing against a supply that couldn't supply, that wasn't elastic enough to accommodate this surge in demand. Here's one picture of it.

[04:28:01.34]

This is the New York Fed's Global Supply Chain Pressure Index. Please don't ask me what's in there. There's a lot of things in there. And you can read it on the New York Fed's website. But this is one measure. And what I want to show you is that there was this peak right when COVID was hitting and then it went away and then we had this tremendous climb. You probably can't read the scale. This is in standard deviation units to over 4 standard deviations above the mean in this particular index. I don't think you should take that number religiously, but it's an indication that there was a tremendous there were tremendous problems on the supply side. And that I might add, Team Transitory, of which I'm an ashamed member, was right actually, except for the timing. It's a bad nickname, I mean, if you call something that's going to last 2 years or something transitory. But the point that Team Transitory was making is that there were these things going on on the supply side, and they would go away. It wasn't up to the Fed to make them to go away. They just would go away.

[04:29:30.02]

And they did go away. And that was another reason that holding the Fed back from tightening monetary policy. So to finish up, what were the reasons then for the big forecasting error? So I've gone over the non-reasons. One I just mentioned, the size and durability of the supply

disruptions, which the Fed, like everybody else, did not foresee. The mainstream forecasts of inflation were pretty benign, having to do with not a very exuberant real side forecasts. This third point I already made, look at the time that there was negative growth in the first half of 2022. The Fed had adopted flexible average inflation targeting in August of 2020. And that new framework basically called for some overshooting of 2%. Now, certainly not the 7% where the PCE went, but for some overshooting, which would not have been the case before. The headline inflation, if you remember that first hill that I showed, was running well above core inflation. History suggests that when that happened, headline inflation generally converged back to core. That was part of what normally happens. And in addition, there was this there was some confusion about what was the real inflation rate when there was such a big deviation between CPI inflation and PCE inflation.

[04:31:05.22]

So, I think those were some of the reasons why the Fed, and everybody else just about, made this big error in forecasting. So, the conclusion briefly is, yes, the Fed did make a big error in monetary policy. The error was based on a bad forecast. If you think inflation is going to be much more benign and the economy is going to be weaker, you're going to be softer on monetary policy if you have a dual mandate that you're taking seriously, and they were. And then finally, the bullet points that I just went over on the last slide said to me that the bad forecast was understandable in addition to being widely shared. And this is the controversial part, and hence forgivable. Many people will never forgive the Fed for this era. It was an era. But to me, when there are reasons like this behind it, and everybody is making this— virtually everybody's making the same error at the same time— you can forgive, you could understand and forgive the error. Okay, I think I went over my 15 minutes by a minute or something. Not by much.

[04:32:22.17] - David Wilcox

Going up, you going up there?

[04:32:24.52] - Alan S. Blinder

Yeah.

[04:32:40.27] - David Wilcox

Alan, if Abraham Lincoln in 1863 had been writing about your paper, he would not have written, "The world will little note nor long remember." Your paper is going to become part of the legacy of thought in this area, and I'm really grateful for your contribution. That said, I don't want to talk

about your paper. I want to turn to the current situation where we are right now. You are uniquely positioned. We have a nominee for Federal Reserve Chair, Kevin Warsh. You've nearly— you've been adjacent, literally, to that position. What advice would you offer to nominee Warsh?

[04:33:26.26] - Alan S. Blinder

I'll give you two quick answers to that. I'll start with the one that he can't possibly follow. Which is don't adhere to the promise you must have made to Donald Trump to get the nomination. He can't do that. I can say I wish he would do that, but that would be very hard. The first piece of advice I would give him is while he's Fed chair-in-waiting, he should eschew, the possibilities for opining on what the Fed is doing. He'll have plenty of opportunity to do that when he's in the chair. He will be confirmed. There is a delay caused, among other things, by this ridiculous criminal prosecution of Jay Powell, which Tom Tillis has said he's not letting anybody through until that's over. So, I don't know how long that will take. It may happen before May. It may not happen before May. But he's going to be asked by every member of the press that has anything to do with the Federal Reserve many times a variety of things, and he should say as little as possible. We don't want the Fed to look like a two-headed monster for this period of time. There's this old saying, we have one president at a time.

[04:35:03.05]

We also have one chair of the Fed at a time. And it is Jay Powell. The other thing I would say, this is a— maybe lead to a more complicated answer with subheads. But let me just be brief, is to realize that some of the ideas that he has enunciated either can't happen or can only happen very slowly. Let me just give one example that you're all familiar with, probably. He wants the Fed to have a much smaller balance sheet. And that's all right, but slowly. Going too fast on that is going to cause problems. I was going to say in the money market. It depends exactly on the details of what you're doing. We already got a glimpse of that in 2019 when the Fed was shrinking the balance sheet, a reasonable thing to do, and accidentally went a little too fast, and short rates just shot up. Banks can live with much smaller reserves than they have today. There are many sources of liquidity, but they can't do it by tomorrow. It's going to take some time for them to adjust their portfolios in a variety of, uh, and so to the extent that this this much smaller balance sheet objective of his is reasonable, and I don't have a big objection to that.

[04:36:48.14]

You just need to moderate it. The second thing I might say on the same thing is he's talked about communications a lot, overhauling the communications. As probably a lot of you know,

I've been a communications hawk for decades, including when Alan Greenspan was in the chair, and I was mainly banging my head against a brick wall. But I kept banging. I think it was a marble wall. Marble wall. Yeah, that's right. A lust— very expensive marble. That's right. So I'm a big believer in a lot of communication I'm not chairman of the Fed. I'm not going to be chairman of the Fed. He will be chairman of the Fed. His opinion on that is going to matter much more. But again, I would give him the same kind of advice that, euphemistically speaking, changing from 1 to 0 in a week is a bad idea. He can adjust the way the Fed communicates, the statement, the dot plot, a whole lot of things with the agreement of the FOMC. But not all that— not too fast, because that will certainly cause volatility in markets for no good reason. I mean, sometimes you welcome volatility in the market, but this would be for no good reason.

[04:38:26.07] - David Wilcox

Assuming the criminal investigation is resolved and Senator Tillis withdraws his objection to proceeding with consideration of the nomination, Warsh will come before the Senate Committee with Jurisdiction Over the Fed for his confirmation hearing. What questions would you like to hear senators pose to Kevin Warsh as they deliberate over his qualifications to become Fed Chair?

[04:38:57.46] - Alan S. Blinder

Well, I think they should ask him about his view of the dual mandate and to what extent that's different from what came before. I mean, the dual mandate is not new. We've had the dual mandate since the '70s. If it is new, I think if they want to be just slightly impolite, So he's going to get different sorts of questions from Republicans and Democrats. If they want to be somewhat slightly impolite, they could ask him about his change in views. One way to look at this is when he started campaigning in earnest for the job, which he now has been nominated for, somehow he stopped being a hawk and became a dove. Probably wasn't a coincidence, but some questions around that I think are appropriate. And importantly, this comes back to something I said before that would be good to hear, but we won't hear, the independence of the Federal Reserve. His general view on that, what that means concretely. And some senator, a Democrat I'm sure, will probably ask him some more pointed question about, suppose Donald Trump calls you up and tells you to do blah, blah, blah. What are you gonna do?

[04:40:26.38]

He won't answer that. But we might learn a little bit about what he says Thank you for inserting the question. Just a footnote to that. I think that is the biggest hazard facing the country now as

Kevin Warsh eventually replaces Jay Powell, who I think has done a great job on that. How much, if at all, is Federal Reserve independence it's going to be diminished.

[04:41:03.09] - David Wilcox

So let's stay on that topic for a moment. I suspect that in this room— I'm not going to claim unanimity. Among thinking people, there's always room for disagreement. But there's, I suspect, a preponderance of views in favor of an independent central bank. —and presumably online as well—how would you make the case on behalf of an independent central bank to a broader audience, not the people in this room, not the ones watching online, but to the American public, to the constituents of the senators who will vote on Warsh's confirmation, that an independent central bank is an important thing and ought to be upheld Yeah, I think it's easy.

[04:41:55.37] - Alan S. Blinder

I mean, I think the answer that should be promulgated is easy. It can be much more complicated than this. But the main answer which people can understand is for lower inflation. You can look at across nations when central banks have not been independent, have lost it or have gained it. And how the inflation rate in the following years evolved, up or down. You can even find it in the United States. The most egregious example of lack of federal independence was Richard Nixon telling Arthur Burns what he had to make the FOMC do. And we know how that turned out. So, there aren't that many instances, incidences in the United States, but there are some. But if you open the lens and look at Argentina, and Turkey, and Brazil, and many, many other countries, you find a lot more, and a lot more dramatic incidents of bad inflation outcomes coming from a lack of independence. And it's no mystery. I'm going to assert the following empirical regularity. I can't prove it because a lot of this is private. Every single president of the United States has thought interest rates should be lower than the Fed thought.

[04:43:24.17]

I'm pretty confident in that. That's Democrats or Republicans. I worked for Bill Clinton, who was probably the most Fed-friendly president in modern history. And I was in the Council of Economic Advisers when the first rate hike came in 1994. And Clinton was livid. He wasn't throwing lamps around the room, but he was livid. What did he say in public about against the Fed? Nothing at all. He told us all that the mantra of the Clinton administration spokesman was, we don't comment on the Fed. And we didn't comment on the Fed. And that included the President of the United States. It's one thing for the President of the United States to tell his staff, don't ever do this. It's another thing for him to never do this. But that's just an extreme example. So he wanted interest rates lower, but he didn't try to browbeat the Fed to do it. And

every president wants interest rates lower, just like the monarchs of old used to clip the currency.

[04:44:46.28] - David Wilcox

Alan, I'm afraid the clock has accelerated during our time on the stage, and we've come to the end of our allotted period. But thank you so much for giving us your wisdom.

[04:44:57.38] - Alan S. Blinder

Very welcome. Thank you.

[04:45:02.54] - David Wilcox

With that, we will transition immediately into the final segment where Karen and I will tag team on presenting our synthesis of the lessons here, and then we'll be followed by Esther George and Jason Cummins. Thank you very much, Helen. You're welcome. The most important thing I have to say is to thank the presenters, the authors who made this project what it has become. Uh, when Adam and Karen approached me about participating in this, uh, I didn't have the clarity of vision to see what it could become. Uh, I'm so happy that we undertook it. It would not be what it is without the amazing intellectual contributions of our authors. Uh, I'm going to be very brief give you a quick sketch of what we hoped to accomplish, and then Karen's actually going to— after I've set the table, Karen's going to give you the meal of what we think we've taken away from this collection of scholarship. It's worth pausing for just a moment about what our goal was in undertaking this project. We wanted to begin by establishing a narrative of what happened I think that's important for historical purposes because inevitably there will be disagreements.

[04:46:52.25]

I have my set of facts, what somebody else has a different set of facts. We thought it was important to put a common set of facts on the table. We thought it was important to identify the key factors that as best as we could discern drove the inflation surge. You've heard disagreement today about what those key factors are. That reflects a philosophy or a determination on our part that we were not going to enforce an orthodoxy or uniformity of view, but we thought that there was benefit in the intellectual discourse. We wanted to compare the U.S. experience with that of other countries because we thought there was value to be gained from the differences in forces acting on economies in the institutional structures. We wanted to try to estimate the extent to which monetary and fiscal policy contributed to these developments and to assess what fiscal and monetary policymakers could have done differently and how

much of a difference that would have made.— we wanted to try to do that from the perspective of real time, not so much with the benefit of hindsight, because that's, I think, unduly harsh toward people who were in the policy arena.

[04:48:18.50]

But I would highlight one of my 12 favorite children in this project is the aforementioned paper by David Reichneider, who attempts to undertake that exercise with regard to monetary policy. We wanted to evaluate the adequacy of the measurement system in the United States for gauging what was happening, for guiding monetary policy, informing their decision-making in real time. And another one of my 12 favorite children is a paper by Dan Sickles and Chris Mackey, that I think provides a wonderful overview of the health of the measurement system and some of the urgent reforms that are needed. And lastly, the part that Caren will undertake is we wanted to distill the lessons that will be relevant in the future regardless if the circumstances are exactly the same as they were. I would caution that's probably not going to happen. It's been 100 years since my grandfather coming home from Europe on a troop ship in 1919, and he experienced a higher mortality rate on the troop ship than had happened in the front lines where he was a deeply scared Army private in France. Pray that we have the next pandemic at least 100 years into the future.

[04:49:51.07]

Who did we want to get to do the research? You've seen a fantastic display of that today. We wanted to hear from the foremost experts in their areas, people who could bring to bear their special expertise to take a fresh and importantly an independent look at what had happened. What was the charge we gave to them? We wanted them to write accessible versions of their views that could be heavily derivative of what they had done previously. It might involve new research, but importantly, we wanted it to be comprehensible to an informed but not specialist audience. What was our contribution as co-managers of this? It was, we hoped, Karen and I, to synthesize the lessons that all this work put on the table and to make it maximally useful for policymakers in the future. It's impossible for us to do justice to the authors who've contributed their work, but that was our ambition. And lastly, I want to say what a privilege it's been to work with Karen in co-managing this project. And to you now, I turn over the podium to actually deliver the meat of the presentation.

[04:51:14.07] - Karen Dynan

Thank you, David. Yeah, I guess I will start as well by saying it's been such a pleasure to work with David. And I do also appreciate just our authors, because boy, have I learned a lot. And

boy, do I feel lucky that this group agreed to write for us. And I also thank the members of our advisory committee, I'm going to be followed by Esther George and Jason Cummins, but our advisory committee has also been very important to us. So, you know, when we embarked on this project, you know, I don't think there was consensus at all about kind of this post-pandemic inflation, what caused it and what to take away. And I have to say, you know, these papers came together in a way that I didn't expect. I felt like it might be tough to kind of write some takeaways. And I should emphasize, these are, these are my takeaways and David's takeaways. They're not kind of speaking for every paper author, but I think we felt like everything came together to tell a story. So with that, I will just kind of run you through 8 lessons that I think we learned from these papers.

[04:52:18.00]

So first lesson is inflation is deeply unpopular. You know, this is something that, you know, Joanne's work has spoken to. But, you know, beyond it being unpopular, the social and political costs, I think, you know, have been large even when the labor market damage is limited. So I think that is just kind of really important for future central bankers to take on board when they're thinking about the relative, you know, costs of infla— the tradeoffs between inflation and unemployment. And how that should inform their actions. Second lesson, we talked a lot about this this morning. The inflation surge was global in slope. We all know that, but its specific underlying drivers differed across countries in important ways. And that is not just an academic exercise. This has real implications for policy because if you're a central banker, it's going to be very different. And you have this tool that can influence aggregate demand. You're going to think differently about something that is primarily driven by demand versus something that is driven by a temporary supply shock that you expect to pass. Lesson number 3, I think this won't surprise you that this is my view, but I think it's supported by a lot of the other evidence we saw.

[04:53:43.38]

In the United States, the evidence points to a central role for excess demand interacting with inelastic supply. The nonlinearities in the aggregate supply curve or the narrower Phillips curve framework, those turn out to be very important. Lesson 4, while— and this is how should we apply the lessons from number 3— while the specific circumstances of the COVID error are unlikely to recur, the episode does highlight a more general lesson about nonlinearities in aggregate supply. So, we don't know where the kinks are going to be in the future. I mean, this has been a very unique episode, as I said this, this morning, and we're not going to see kind of an identical episode in the future. I do think, you know, as we're setting policy, this is something that's going to be important to keep in mind, that there is a point at which at which supply becomes inelastic. On the fiscal side, the difficulty of identifying real-time capacity constraints

strengthens the case for policy frameworks with greater automatic adjustment features. It was nice of Adam at lunchtime to cite my second paper with Doug Elmendorf, where we actually do a simulation that asks if we had had, instead of having discretionary fiscal policy, both in the Great Recession era and in the COVID era, what if we had had a system of automatic stabilizers that kind of every month went and looked at the state of the economy as the labor market was evolving, as inflation was evolving, and then that informed what kind of stimulus you were going to put into the economy that month.

[04:55:32.40]

We keep kind of working that out dynamically. And I want to say we don't find that there would be no inflation during the COVID era. We find we'd have maybe half as much excess inflation kind of consistent with this literature saying, yeah, those supply shocks, they were important. They did drive a material share of inflation. It wasn't all demand. But our conclusion is if we'd had the system in place, we could have avoided some of the very high inflation. Likewise, for monetary policy, monetary policy flexibility is critical in environments where inflation risks are outsized and forecasting errors are likely. This is speaking to kind of Alan's work that, you know, that there was a forecasting error by central banks and many others early on in this period. But, you know, it was a good thing that this error was recognized and central bankers didn't feel like they had to stick to, you know, what they had, you know, said they were going to do earlier, that they did pivot, they did respond very nimbly, you know, in early 2022. And that did play a central role in terms of the rapid disinflation. OK, so just two more lessons.

[04:56:55.34]

Anchored inflation expectations played a critical role in enabling rapid disinflation in the early 2020s. We cannot take this for granted. The world would be in a very different place today if inflation expectations had become unanchored in this early 2020s period, you know, we could have ended up with a spiral like we saw in the 1970s. So we— that's a really important point, and we can't take these anchored inflation expectations for granted going forward. I think that various papers we saw this morning talking about the importance of lived experience, you know, speak to that, that now that we've been through kind of this period of strong inflation, as well as Justin's point about labor market contracts may change if we're in an environment where we see more spikes in inflation. This could kind of lead us to be more predisposed to spirals going forward. And then the last thing I will talk about, and this hits on something that David said, which is we had this excellent paper by Dan Sickle and Chris Mackey in the series, and neither of them could be here today to present it, but it really is a terrific evaluation of the performance of economic statistics.

[04:58:17.48]

I think I heard a lot of complaints about inflation measurement in this period of high inflation. A lot of people saying, you know, these statistics, we don't capture things right. You know, as we've all been discussing for years now, there are all sorts of biases. Mackie and Sick will really take a hard look at this. And their conclusion is, yeah, There are biases. There are some areas in which official statistics are not so good at capturing what's going on. But overall, they served us very well, especially considering that in this period, we had all sorts of disruption to the source data for these official statistics. So yes, they served us well. But continued investment in measurement capacity is essential. And I think that is— is more relevant today than ever, given that we've seen these kind of big cuts in resources for our statistical agencies. Okay, so that's our 8 lessons. And with that, I'm going to turn things back to David to introduce our remaining speakers.

[04:59:26.53] - David Wilcox

We are literally going to give the last word to 2 people who've served on the advisory committee for this project. First up is Esther George. Esther served as She was president of the Federal Reserve Bank of Kansas City from October 2011 through January of 2023. But my favorite item on her resume is that she's the 2023 recipient of the Harry S. Truman Public Service Award, which I think is ultra cool for somebody who served from Harry Truman's hometown. Esther, the podium is yours.

[05:00:07.23] - Esther George

Well, thank you. And I want to just say, as a member of the advisory committee, really the heavy lifting, David, that you and Karen did, and to see your principles outlined here, because we didn't start with, I think, a direction of where this should go, but really open-minded about it. So this has been terrific, I think. I want to just take a few minutes and talk about my perspective on this and a bit bit going forward for the Federal Reserve in particular, given my time as a policymaker on this committee, because I think this period in particular you have to put in perspective going back to 2018. And David, you'll remember in January of 2018, the FOMC undertook a number of staff presentations to talk about inflation. So inflation had been on the minds of policymakers for some time. And of course, it wasn't because inflation was too high, but because inflation had remained stubbornly below the 2% inflation target that the Fed had set and actually been below that since 2012. You would have heard in public comments policymakers saying things like low inflation is the major challenge of our time, and some even considered it a policy failure.

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That it was running below target for so long. Ultimately, the antidote that the FOMC chose was flexible average inflation targeting as part of its 2020 policy framework. And I should be clear here, just as Alan Blinder was, that did not bind this committee to accept high inflation. I think perhaps its motivation, though, in the history that preceded was maybe to allow a bit more patience as we watched the landscape unfold at a time of really tremendous uncertainty. I think back to even in early 2021, we began to look at a forecast that showed the medium-term outlook for GDP growth and employment looked better, but still acknowledging how much uncertainty surrounded that. And because if you remember at the time, we were still trying to figure out what progress would be made on vaccinations. We were beginning to see these new variants come out, which looked like they were going to be even more problematic. And you'll also remember, this is when people began to get a little stir-crazy with, uh, social distancing and wearing masks. And so all of that, I think, I think gave the committee a sense that we were not out of the woods yet when it came to a policy prescription of understanding that even as we saw inflation begin to pick up and even its components broaden.

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But of course now we know it's well established that the FOMC erred in its assumptions about inflation. Again, as did most mainstream analysts and advanced economy central bankers. I think the expectation that these shocks, whether you call them supply or demand, were going to be short-lived really underestimated the amount of aggressive monetary and fiscal policy that had come to the rescue. I would also say policy errors always come with a great deal of good intention here, and I think I remember my good friend Raghuram Rajan saying something along the lines of policymaking invariably involves taking risk in the face of uncertainty, for one has neither a prior template nor the luxury of indecision. And clearly, as I recall around that table, the error of doing too much seemed a risk worth taking at the time on behalf of the American public. So again, although the Good Ship Transitory was a crowded one, as we've heard before, the voyage ultimately led us to the worst inflation in four decades. And I think the cost to the Federal Reserve's credibility and to millions of American households has been significant. Even as we look now, 5 years later, despite the aggressive tightening that the committee did to arrest that inflation, the FOMC's inflation target has yet to be secured, and Americans clearly remain frustrated with their higher cost of living.

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So I found these papers to be really important in helping us understand what— went wrong, but I think for the Federal Reserve also to begin to think about this essential role of accountability as being core to its independence. This is a good time to look around, and I think again, Karen, the,

the lessons you laid out there can help us leave this episode a little wiser, and I think with the humility to look critically at the frameworks that we use to set monetary policy. So I'm just going to go through 3 of these really quickly that I think would be important. One, to enhance credibility for this committee, the accountability that I think is essential to our independence, and transparency and communication. And let me just go quickly because I know we want to get Jason up here. In terms of the inflation forecasting process, one of the things I do keep my eye on is the FOMC, while they have been very careful not to unseat the economy, have continued to push out the point at which they will achieve their inflation target. I think the most recent dots showed that going out to 2028.

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And of course, trying to figure out where inflation is going is unknown. We can look at the assumptions that underlie that forecast. And I think there is a growing consensus that we will get back to that 2% inflation target. But I think now is a good time to look at the question of how likely is that outcome and how much we might see inflation uncertainty and even volatility begin to affect assumptions about inflation. There was a paper that came out last summer out of NYU that constructed a composite inflation uncertainty index. Economics. And they do that by looking both at market prices. They have some algorithmic analysis of the daily news. But they've noted that we're in an inflation uncertainty period that's only been surpassed twice in the last 40 years, one around the financial crisis, the other around Russia's invasion of Ukraine. And when you think about the forces between uncertainty and volatility, I think now's a time to be really alert to what might unfold. You think about the challenges that have come to Federal Reserve monetary policy independence and how those have intensified over the past year. You think about where we are with fiscal policy that's been highlighted here.

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You have everything from geopolitical concerns, trade policies, immigration policies coming to bear all at the same time that we are seeing these really massive investments in technology that are raising questions about the future of productivity and economic growth. And so with that backdrop of inflation uncertainty and volatility, I am really reminded, Karen, of the point you make about the outsized welfare and political consequences of inflation as we look ahead and how we should be mindful of that. I think the Fed, in revising its 2020 framework, took the right step, taking flexible average inflation targeting out was right, but it may be a time to think more deeply about the inflation target. Some people have raised the idea of doing a range. We've heard here today talking about the price level. Wherever they come out, I think important to constantly challenge the assumption about where inflation is going to be. I think also it's a time to think about the welfare and political consequences that have been associated with the Fed's

past crisis intervention practices. We know that when monetary policy is called on to intervene, that central banks face a very uncomfortable reality, and that is their footprint in financial markets and the broader economy has dramatically expanded over the past two decades.

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However well-intentioned and necessary, I think you have to take into account the consequences, and of course we hear a lot about that today. Quantitative easing, for example, which is seen as boosting asset prices, has brought a lot of attention, and I think this is more than just merely a communication challenge for the Fed. I think it reflects genuine tensions between aggregate macroeconomic objectives and individual welfare. Those tensions, of course, become politically salient when they persist for years rather than months. We've also seen these large-scale asset purchases experience exit problems. So the idea that it creates a sort of ratchet effect each time you do this, making it harder to reverse, is something that I think is going to have to be taken into account. And let me just say here, although I've had concerns about QE, this is I don't want to suggest that extraordinary measures taken during crisis were wrong or aren't necessary. They absolutely are. But I think exploring frameworks that will allow for crisis intervention while creating stronger presumptions toward exit and normalization could be something helpful to look at in the, in the months ahead. And I will close with some thoughts about communication and transparency, because I think we're in a time now a premium will be placed on communications as they become more difficult and at the same time, I think, ever more important.

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Central banks now speak to multiple audiences simultaneously. We know this from the rise of social media, and the politics surrounding central banking means these messages can be amplified and frankly distorted. In ways that can undermine credibility. And high inflation has made monetary policy more tangible, I would argue, to ordinary citizens in ways that it was not during the long period of price stability. So finding ways to explain these complex tradeoffs honestly without either talking past the general public or sacrificing the precision that markets need is going to be important. What will the Fed do in this regard? I think now more than ever. The FOMC has long been dedicated, I think, to better communication and transparency, and you've seen this over the years. I think as I look around the central bank community though, we are beginning to see ways that central banks might communicate, for example, a baseline forecast and how it sits amid different scenarios for the economy. Those scenarios, as I think back, are already part of the FOMC's deliberations, and I think could be developed more for public communication. I think also thinking about policy rules and how they guide policy

decisions could be made more public without constraining the central bank, both in how it makes its decisions, but I think also when it has to deviate.

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State could be important for its own accountability. So I will close with this thought, because I am always reminded, and he says it frequently, when Chairman Powell concludes his remarks, he will often say, "Everything we do is in service to our public mission." And that certainly was my experience serving on the FOMC. I think now is a time to really build on that commitment. For the Federal Reserve with fresh thinking about how transparency, how credibility, how accountability can be brought to bear to build public trust, or rebuild if you think that's the case, and to really secure the valued independence to make long-run policy decisions in service to that public. Thank you both, Karen and David.

[05:12:59.42] - David Wilcox

Our final speaker is Jason Cummins. Jason is Head of Research and Chief U.S. Economist at Brevan Howard Asset Management. Like Esther, he is a member of the advisory committee that has guided this project. And again, like Esther, he's also a member of the Peterson Board of Directors. Uh, I mentioned one resume item that was my favorite for Esther. I'm going to mention one for you. My favorite on your resume, it should be obvious, is that you are a former member of the staff, like so many of us here at the Federal Reserve Board. Jason, for the final installation, the podium is yours.

[05:13:36.16] - Jason Cummins

Thanks so much, David. At the end of a big inflation conference, you may be wondering, did you get the wrong Jason to wrap this up? Maybe Jason Furman should be here instead of Jason Cummins. But in fact, I think I do bring one perhaps unique thing to this group today, which is I was the only person on the front lines in the financial markets during this period. So I bring that perspective to you today, and I'll try and weave it back into what David just referred to in terms of my own experience having been on the staff. But first, let me say it's terrific to be here. I really appreciate it, having had the opportunity to do the pre-read of some of the papers and also to be playing some small part in the conference. This kind of conference is really special. We are going to be here today providing something that no other institution really can do. Same thing over at Brookings in the post-GFC period where they provided all of the coverage there. And so I just want to, in addition obviously to thanking you, Karen, and David, and Adam for shepherding this through, really recognize that the institution is a special place where only this could— only this could get done.

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So, let me try and give you my perspective by drawing on a decade of my experience as a researcher and 20 years or so as a financial market participant. Let me start at a very meta high level, though. What I'm struck by most about the Federal Reserve from when I was there and looking at it from the outside is the power of ideas. Ideas in the institution. Ideas are incredibly important in shaping the actual decision-making in the institution. So, I start out here— you probably don't want to see any more slides— but I start out here with a little research project I did, which is, this is taking all of the Federal Reserve working papers from the Fed Series and the International Finance Discussion Paper Series, and I plotted here a 3-year average going all the way back to the start of the century of what the Fed actually does research. And you can see in the main, it does research on banking issues. After the GFC, you see banking issues become very prominent. There's a lot of monetary policy, which almost has a cyclical flavor to it, and some on fiscal policy. So, all of what you'd expect in terms of Federal Reserve priorities in terms of research.

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Other areas that have gotten a lot of attention: labor inequality, climate, household finance. Household finance and labor markets are really an important part of the idea process at the Federal Reserve. But the thing I'm going to highlight for you is the following: if you go to the supply side of the economy, work on investment, productivity, and inflation. But I ask you in advance, what is the percent of research done on inflation in the Federal Reserve board, it's 5%. 1/20th of the work, 1/20th of the ideas are about inflation. On the investment side of things, I'll take small credit from David's reminder. I and my colleagues earlier in the century increased the productivity in the investment side of things by pushing up the working papers from 2.5% to 5%. Of the research output on investment. And there's a little boomlet there, Steve Ahlener, Dan Sickle at the start of the century on productivity and technology. You ask yourself, what is it going to be like if you have a central bank that doesn't study inflation? It's moved up, to be sure, but I want to ask you in the spirit of what Alan Blinder was saying, What is the root cause of the why that you were asking?

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If you keep asking the whys, why is it the case that we made this forecast here? It was a belief that the inflation wouldn't be there. It was essentially induction. And induction is at the heart of every financial crisis, every complacent belief, and the kinds of errors that we've seen in a unique event, like, uh, with the COVID area surge in inflation. So why do we have that at the

Board at least? I know the Board history fairly well. You can go all the way back to Alan Greenspan's work in 1997 and 1998 thinking about the constraints of the zero lower bound to know that the DNA of the institution as a research shop was not worried about inflation. It was more worried about disinflation or deflation and the constraints of the zero lower bound. And many of the people who will be watching this and are important parts in this research environment made their bones as researchers and policymakers by studying deflation, not inflation. So I ask you to just think about that for a moment in terms of what the potential implications are. It doesn't surprise me that if you are inductively worrying about the world, and the world is pretty much today what it was yesterday, and you think the same, And you have all this DNA floating around the institution which was worried about disinflation.

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Esther referred to it as well. In the framework review, and also very nicely treated in Alan's paper, in the framework review what you saw is that there was a lot of focus on makeup strategies even as you were going through this period of potential inflationary dry tinder. So what was going on in the private sector at this time? I don't feel like we made the same transitory mistake. Uh, the Good Ship Transitory was filled with lots of people, but there were lots of people in financial markets who were able to quickly pivot in real time to appreciate the, at least the risk premium potential of inflation. They made a lot of money on it. So 2022 was a very good year for macro funds like ourselves. Because, I mean, I hadn't thought about inflation in a long time as well. I was in the Bay across the way from the Inflation Guild. So I didn't know about inflation like I should have either. But we quickly pivoted, and it may sound like a glib remark, but nobody at the Fed ever got fired because of a bad forecast. But people in the private sector do.

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And so I think they very quickly pivoted after the big fiscal stimulus in March of 2021. To say this is a highly inflationary environment. And you didn't need to go very far. Go to your local library and pick out any New Keynesian textbook, any monetarist textbook, any fiscal theory of the price level textbook, they all would have told you that you would have gotten a lot of inflation. Every single one of them. So we thought, OK, let's think in a little more structural fashion, go back to first principles in theory. And that's why other Jason and Larry Summers and Adam Posen, I think, got it right, which is they went back to the first principles and said, "This is an environment that looks very much like one where you'd get a lot of inflation." One interesting thing is all those theories have different implications for what happens after. One has anchored inflation, one has deflation, and one has much more inflation. So, you can get some identification if you keep going on and thinking about this era as it plays out. But certainly, at the

start, anybody with a textbook and first principles would have given you a lot of inflation, and yet we saw as a forecasting process, because the belief that you wouldn't have inflation was widely shared in this community.

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So you might ask, are we better forecasters? I think the answer is yes. And the reason why is because of a word that was occasionally used during the conference, is because of that accountability. So we were able to pivot. We junked ideas that didn't work. Sometimes we went to some pretty bad ideas. It's not as if we didn't make mistakes. We made all kinds of mistakes along the way. But I do think that we had significant accountability. And as a consequence, we were able to pivot much more quickly to understanding the environment that we found ourselves in. I think there's a cultural issue here at work as well. I'll give you a couple just more personal observations about it. I think that the Fed has done a lot to— in communications and to open itself up to scrutiny. But it could do more. I think the Fed almost has, if you can generalize, a fear of the private sector or reluctance to engage with the private sector. I certainly saw this as my colleague Joe Bolieu and I left in 2004. There were even some people in program direction who discouraged their colleagues from talking with people who had moved into the private sector, like myself and Brian Sack and so forth.

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Hybrids. By their very nature are going to be stronger than the sum of their parts. So that kind of reluctance to engage, I think, had a real cost. And post-GFC, for a variety of ethical reasons, the senior Federal Reserve officials adopted an almost commissar-like structure when they met with the outside world. You'd have an official and then somebody else sitting next to them. That's straight from the USSR. Now, I understand why it was done. But it reached its nadir when you would have, for example, Vice Chair Brainard going around New York talking to all the financial market participants with a minder, and she would introduce every meeting and say, "I'm not going to say anything in this meeting. I'm just going to let you talk to me." And certainly for people like me who are public service-minded, we would talk to her, but that's not an environment that promotes the kind of robust hybrid that I'm talking about. So, I'd encourage the Fed to not only adopt the scrutiny that Esther is talking about of its kind of culture and intangible capital in the way she suggested, but even do it on a more micro level.

[05:23:23.38]

Mark Summerlin had a wonderful suggestion about trying to get people from Wall Street in on kind of 2-year stints into the Federal Reserve System. There was some illusion today about

releasing the staff forecast. Greenspan, of course, never wanted to release the staff forecast because he didn't. We wouldn't want it to be scrutinized. But what are we afraid of? Why are we afraid to release the staff forecast? Why are we afraid to have practitioners come through the institution in order to challenge it? So what I'd leave you today with is the great news that I think we have in some ways with this conference and all this research helped reset our Bayesian priors, but that we can do more and do a better job of that if we stretch the intangible and cultural capital of the institution. Do more research on inflation. Talk to people who are actually on the front lines who did change their mind. And I think in that way, what could come out of this is entirely positive. Thank you.