

Pablo:

-my city. She's the regional representative on the FMC in Washington, where she provides a perspective based on more than four decades of experience as a banking regulator.

In 2022, President George serves as a voting member of the FMC, and in addition, she holds the Annual Jackson Hole Economic Policy Symposium in Wyoming, which brings together international Central Bankers, researchers, and policy makers to discuss issues affecting the global economy.

And finally, we have Claudio Borio. He's the head of the Monetary and Economic Department at the Bank of International Settlement since November, 2013. He has been at the BIS since 1987 covering various responsibilities in the Monetary and Economic Department. He has been the deputy head and Director of Research and Statistics. He has also held the position of head of Secretariat for the Committee on the Global Financial System and the Gold and Foreign Exchange Committee. He has worked as an economist at the OECD and a lecturer and research fellow at Brasenose College, Oxford University. He holds a doctor of philosophy and a master of philosophy in economics and BA in politics philosophy and economics from the same university.

So I'm very happy to have this very nice panel here where they will illuminate us on policy implications from the topics that we've been discussing over these two days.

The idea is to have two rounds of interventions on topics related to heterogeneity. The first round is related to how heterogeneity affects in the view of the members of the panel, the transmission mechanism of monetary policy, how this heterogeneity in the transmission mechanism is considered within the design of monetary policy and how does it relate if in any way to also the mandates that central banks might have. Each of us will have 10 minutes for the first round and we will start in the same order. So Jim, please the floor is yours.

James Bullard:

Okay. Thanks very much and thanks for having this lovely conference. I'm learning a lot and I appreciated the opportunity to be here. I thought I'd use my time to talk about this deck here about Classic Policy Benchmarks for Economies with Substantial Inequality. This is part of a broader research agenda, which I'm going to summarize briefly here with Riccardo DiCecio known under the rubric of optimal monetary policy for the masses.

So, I see some slides are fake, see, so it's not actually 30. So this is an academic talk that I've presented before in 2021 if you want to see more detail. And some of you techy people here are going to want more detail than what I'm going to give you here. But the dial lecture in particular has the most detail on it. And that's on my webpage if you search for it. So this conference is about the topic of Heterogeneity in Macroeconomics: Implications for Monetary Policy. And these remarks are going to give the idea that the optimal monetary policy may not be particularly affected by the presence of heterogeneous households and in particular that the Central Bank should still strive to achieve the Wicksellian natural real rate of interest just as in the standard New Keynesian model. So let's see if you believe my argument here.

So we're going to have a heterogeneous agent economy. It's going to have three aggregate shocks: Total factor productivity growth, labor supply growth, and aggregate demand growth. So it's a growing economy and it grows stochastically according to these three shocks. There's going to be both permanent and temporary idiosyncratic risk at the household level. It's going to have either an oversimplified if you're unkind or an ingenious symmetric structure if you're kind to me, that is going to allow for us to answer these questions very clearly in this particular model, despite the presence of lots

of aggregate uncertainty and idiosyncratic uncertainty. And they're going to be income, wealth and consumption equality on the same scale as in observed economies.

And then we're going to allow four policy making authorities in this economy; a monetary authority, a fiscal authority, a labor authority, and most controversially, an education authority. And we'll describe a competitive equilibrium for this system in which the four policy makers, the four horsemen of this story, combine to achieve the first best allocation of resources.

So what's interesting is that the policymaker roles are classic. The monetary authority achieves the Wicksellian natural real rate of interest, fiscal authority raises revenue via non-state contingent linear labor income tax on all households, labor market authority runs an unemployment insurance program and the education authority minimizes the variance of beginning of economic life, human capital endowments. So the main result is that if the other guys, the other authorities are doing what they're supposed to do, then the monetary authority can concentrate on its duties and what it's well suited to do.

So I like this benchmark because we can figure out what the benchmark is and then you could put complications into this economy knowing what the optimum is, and you could see how far you deviate from this optimum in other versions of this. So I'm proposing this as a benchmark. So there are some surprising findings in this. One is that if you take this literally it looks like most countries are trying to do all these things. So in broad terms, there's similar to actual policies in place in many economies, the monetary authority for instance, meets often and tries to react to current developments. Current shocks in the economy, fiscal authority is not listed here, will set taxes for the long-run, at least the medium term, and doesn't change them on a, let's say monthly or quarterly basis. Here, the linear labor income taxes will not distort labor supply. So it's a Heckman-type economy in that sense.

And the best policy combination, sorry, will drive the consumption genie all the way to zero, but will leave income and financial wealth genie substantially positive. Something I don't think is well understood because some of the observed income and financial wealth inequality is going to be due to life cycle effects alone. Even in the social optimum. There are also asset rich and asset poor agents with high marginal propensity to consume something because it's been talked about at length at this conference. So I'll show you a picture of that here.

And finally, this has a pencil and paper solution, partly because we chose assumptions to get that result, but despite the aggregate shocks and the idiosyncratic risk, so that makes it a helpful benchmark as well.

So I'm just going to use the model in one slide, but it is a lifecycle economy and it has these special symmetry assumptions. Those can be relaxed in other papers that we're writing in this family. We don't use the symmetry assumptions anymore, but for this talk it's going to be very helpful. This is overlapping generations, so you have a cohort of agents that are coming into economic life at age 20. They're living for 241 quarters until they leave the model at age 80. So I think the spirit of it is that these are the people we're going to track. And if we track these people, we'll have a good idea about how the macro economy works. It's not that there aren't other people, but these are the ones we're going to track.

Critically, as agents enter the model, they're randomly assigned a life cycle productivity profile. They have to use that particular profile for their entire life. We view that as a proxy for human capital developments that take place before age 20. So there's some unmodeled schooling system, parenting, working, all the things that you would learn up to age 20, that's not in the model, but we're proxying that by this random process. So you have this one shock at the beginning of your life. It's very determinative of your entire life related to Huggett, Ventura, and Yaron who said that you could predict 63% of lifetime earnings with a vector of characteristics on people at age 23.

Speaker 9:

[inaudible 00:10:14].

James Bullard:

Well, I'm going to talk at length about that. So in this version, we're going to use this particular baseline productivity profile here. It's not very special. Other versions, we have more calibrated cases, but for this discussion, you're relatively unproductive in the first part of economic life and the last part of economic life. And you have your peak earning years in the middle of the life cycle. And that's what this is going to say. And you're about 50% more productive according to this one in the middle.

And then you get this random shock when you enter the model and you either scale this up or scale this down. We used a uniform distribution here. So you get this idea that there are some very productive people at the peak here, and they're other people that are close zero here, they're less productive, but the shape of their productivity profile is the same for all of these households. So some people do well in this lottery, some people do poorly in this lottery.

And then you can supply your productivity endowments in a labor market competitively by supplying hours, and you can be unemployed randomly, unemployed is going to be a i.i.d process that's unrelated to the aggregate shocks. You can't turn any income in that period if you show up for work and there's no work that day.

And then there's a friction in the model that motivates monetary policy. The friction is non-state contingent nominal contracting. This means that we sign, when we borrow and lend, we just lend a nominal amount at a stated nominal interest rate. There's no default or anything like that. The Monetary Authority is going to be able to fix this friction by converting the non-state contingent nominal contracts into real state contingent contracts which are optimal under the homothetic preferences that we have here.

And then there are these four policy makers. So I'm not going to tell you anymore about the model. There's technology and other factors here. There's just the one asset in this version. So it's just the middle-aged people are lending to the relatively young in this story. So the monetary guys can observe the growth shocks in the model and set the price level. The fiscal authority can set taxes on labor income or capital income. Labor market authority observes household specific unemployment shocks and can handle that. And then the education authority can control this initial dispersion of productivity that's key to this model.

So the policy mix is that the monetary policy maker follows nominal GDP targeting, the fiscal policymaker sets a linear labor income tax to fund the government, the labor market authority also sets a linear labor income tax to fund the unemployment insurance scheme. And then the education authority wants to minimize the dispersion by setting this to a minimum. And the full social optimum would be get that minimum all the way down to zero. In that case you'd have a perfectly equal economy.

There is a theorem here under this that this is the first best allocation of resources and that the real interest rate equals the output growth rate, the stochastic output growth rate in this economy in the social optimum.

So I'm going to skip the monetary, fiscal and labor market policy. I'll just talk about this education policy. So the education authority is going to try to create this perfectly equal economy. If you don't think that was possible, then they would just want to minimize the amount of dispersion of households as they come into the economy. If you could set this thing all the way to zero, then you would drive the consumption genie all the way to zero and that would be the full social optimum.

So here's just some pictures that give you some idea about what's going on. Here's labor income in this model. The blue line is a basic productivity profile. The households are more productive in the middle of life, but they also work more in the middle of life. And so you get this blue blob here for labor income and if you calculate the genie coefficient of that, you're going to get something in the 0.5 range. So this is where labor income inequality comes from. There are just as many people here vertically as there are in the middle vertically, but the people in the peak earning years are earning more income and are more dispersed.

The consumption mass would be the red box here. So credit markets are going to work beautifully. People are going to be able to spread their uneven labor market income across their whole life cycle. And you get this red box here and this is occurring at all these different levels. Elon Musk is doing that, the doctor is doing that, the manual labor also doing that. All these people are doing that, but they're doing it at different levels.

So in this model, there's just the one asset. So the right hand side is a net asset holders and the left hand side is the borrowers and it's got to integrate to one and it's all very symmetric. So you get this picture here about the borrowing and lending in the economy.

The financial wealth genie will be just the genie coefficient of the right hand side of this picture because this always gets zeroed out when we calculate that in the data. And then there's a marginal propensity to consume, which you guys will love. I didn't introduce this notation, but I'll just show you the picture here. This is the marginal propensity to consume for all households no matter what level they're at as far as income, you could see you're going to get a value like 0.5 for the people that are between about age 35 and age 65. And then you're going to get very high marginal propensities to consume for very young and the older retired agents that are consuming out of their savings.

And then for inequality here, the genie coefficients that you get in this baseline case here, relatively close to the data for wealth, this is if you use a log normal distribution, instead, we like to use the log normal, but it doesn't make that much difference on these calculations. Labor income is about a 0.51 as it is in the data consumption's about a 0.32. So without trying very hard, you're going to get genie coefficients that are in the ballpark and you could do lots of other things in this model.

And then I just want to concentrate on this for just a second, and this is my second to last slide. This is the productivity dispersion parameter. So this is how much, when you come into the model, how much dispersion is there in all those lifecycle productivity profiles. And as that goes higher and higher, these are the genie coefficients. Green is the consumption genie, blue is the labor income genie, and red is the wealth genie. And if you drive that dispersion higher and higher, you're going to drive all those genie coefficients toward one. So that would be like the most unequal society you could ever think of. But then as you have this dispersion come down to zero, the green line comes all the way down to zero. That's the consumption genie coming all the way down to zero. So you'd have everyone consuming exactly the same amount at every date.

However, what's interesting here is that the wealth genie is still a 0.65 and the labor income genie is still a 0.44 even at this full social optimum where you have the education authorities doing a brilliant job and giving us all exactly the same skill levels as we go into the economy at age 20. You could calibrate in different ways in order to hit different genie coefficient, the black line hits the labor income genie and the yellow line hits the wealth genie instead.

All right, so I'll stop here. This is my story about how a classic combination of policies could deliver the first best allocation of resources even when there's a lot of in inequality and income, wealth and consumption. So I'm saying that optimal policy doesn't change in the sense that the policymaker still has to provide the Wicksellian natural real rate of interest, which I think is the thing that would continue to hold no matter how you're going to write down your monetary policy and the friction that monetary

policy is trying to solve because it is about the real rate of interest. But you have to have the other parts of the macroeconomic policy handling other aspects of the economy, in particular, unemployment insurance. And in this example here, a perfectly executed education policy which would drive the consumption genie towards zero, but would leave income and wealth genies at positive levels. So I'll stop there. Thank you.

Esther George:

Well, first let me thank you, Governor Costa and to the organizers of this conference for the invitation to participate. This has been two days of really full discussion. These differences around individuals, industries and geographies within an economy is obviously a particularly relevant consideration for policy makers today as central banks around the world are confronting high inflation and tightening policy. And as the depth of the research that we've heard just here at this conference suggests, the study of heterogeneity and macroeconomics is a rich and an active field. And these models that incorporate heterogeneity are necessarily complex as we've seen again in the presentations, but I think as I've watched this literature over the past 10 years, our understanding has progressed in recent years.

That said, and perhaps as a consequence of the complexity of the models, the role of heterogeneity can often appear to be overlooked in macroeconomics. But in my experience as a central banker, regardless of the state of the academic literature, it has long played an important role in policy making and it continues to do so today.

So my comments here are going to depart from the equations and from the modeling, and I am going to turn to this topic as a consumer of this literature and talk about some of the more qualitative aspects of these ideas.

So in the case of the United States, one could argue that the very structure of the Federal Reserve system is a recognition of regional differences across the United States. In establishing 12 distinct regional banks, the Federal Reserve Act recognized that it was important to monitor a variety and diversity of conditions across the nation and to ensure that a range of communications were connected to the Central Bank.

Monetary policy can affect industries and populations differently. And for a country like the United States, which has a history of skepticism surrounding centralized authority, it's critical for diverse regions of the country to have a voice in the making of policy. The benefits of a Central Bank that is engaged with diverse stakeholders is also evident in the Federal Reserve's focus on local and targeted outreach and engagement with communities across the country. For example, at the Kansas City Federal Reserve, and I am sure this is true for Jim Bullard's organization, we hold regular symposiums, round tables, advisory group meetings with representatives from diverse industries, geographies, cultures, and economic backgrounds.

And perhaps most visible around the Federal Reserve has been a program that we call Fed Listens events where the Federal Reserve welcomes voices from a wide range of organizations, unions, small business owners, residents of low and moderate income communities, native American leaders and others so that we can hear how monetary policy affects them and their local communities.

Each of the 12 regional Federal Reserve banks is also governed by a board of directors that is representative of their regions community, business and labor interest. And it's at this regional level where the Central Bank can build trust and enhance communications in ways that resonate across a range of audiences. And in this regard, heterogeneity is very much central to the way the Federal Reserve operates. Through surveys and face to face engagement with a wide range of community members, we gain insight into how our policies can affect different groups in different ways.

I'll close with this example, I think, because it's been one that you hear a lot about. It's very much in the public's eye and it has to do with how our policy may affect housing markets, particularly in the United States. And I'd start by noting of course we are largely constrained to using blunt policy tools, which limits of course our ability to fine tune policies to particular segments of the population.

But still the potential distributional consequences I think cannot be dismissed. And one of those tools that has raised this question has been the use of our balance sheet policies. Even after some recent declines, house prices in the United States remain some 25% above their pre-pandemic trend. This is largely still an issue of supply, a hangover from the 2008 and nine financial crisis. But one could argue it is partly due to the magnitude and duration of quantitative easing implemented by the Fed during the course of the last two years, and especially the purchase of more than a trillion dollars in mortgage back securities.

Though the goal of these purchases was not of course to explicitly support housing prices, it has been argued that those actions had that effect. So how are the benefits of supporting housing prices distributed? Of course, people who already own houses who tend to be wealthier and older certainly gain. However, their gain may be at the expense of others who cannot get their foot in the door when prices are extremely high. Even if interest rates are also low loan to income and loan to value limits on mortgages are more likely to bind for people without large down payments. It's particularly true for young people at the beginning of their careers and others with relatively low incomes. So to the question Pablo that you asked earlier, heterogeneity certainly matters for policy design and our understanding of its effects are important. Thank you.

Pablo:

Thank you, Esther. Now we have a Claudio.

Claudio Borio:

Can you hear me?

Pablo:

Yes.

Claudio Borio:

Okay. Well, first of all, thank you. Thank you so much for a very kind invitation. It's a pleasure for me to be back at this event and I'm so sorry that I have to do it only remotely, actually, not even from Basel I'm here in Mexico, another event that we have organized here, 20th anniversary of the opening of the office. So what I thought I would do, I get an echo, but I hope that you can hear me well. What I thought I would do would be to say a few words about something which we have been looking at quite closely at the BIS and something that was highlighted in the background paper that you sent around, which is the nexus between monetary policy and inequality.

As we know, this issue has come to the fore, in particular following the Great Financial Crisis not least because of the perception that interest rates they were kept low for, unusually low for unusually long in order to nurture the recovery and to boost inflation back to target, we're increasing wealth inequality by boosting asset prices, particularly the prices of equities, and at the same time, the interest rate on the deposits. The issue was further highlighted by the same type of policies that had to be followed in the wake of the COVID crisis, and more recently, they've come to the fore in a slightly different guide, but more familiar, older guys if you like, as a result of the rise in inflation.

I don't think it's controversial to say that fundamentally, inequality and distributional aspects and long trends in inequality in particular are not related to monetary policy. They're way beyond policies reach because they have to do with structural factors. But at the BIS, we have argued that there is a lot that monetary policy can do to foster more equitable distribution over successive business cycles because price macroeconomic and financial stability are essential for ... Which are really what central bank mandates are about, are in fact essential to make sure that inequality does not increase over time.

And at the same time we have also argued that changes in the business that have taken place over time have complicated this task. So let me say a few words about this. Based on, as I said, some work that was put forward in particularly in Annual Economic Report chapter that came out some time ago. So I said that monetary policy has a role to play because the two major sources of inequality over business cycles, which are inflation and recessions or downturns are what Central Bank mandates are all about, which is to deliver price macroeconomic and financial stability. By the way, in a way, I would say that this is probably similar to the point that Jim was making before, because effectively in his model as far as he understood it, the natural rate was a summary statistic for the Central Bank task.

So let me say a few words about inflation and recessions. The impact of inflation and inequality have been studied and I don't think I need to spend too much time on that given that inflation is one of the most aggressive taxes that there can be. But what about recession? Well, intuitively, recessions would increase inequality because for example, then skilled are the first to become employee. And indeed there is plenty of evidence that documents this link between recessions and inequality. But the relationship actually goes further for there is that all else equal higher inequality deepens the deepens recessions. And possibly a reason for this could be that where inequality is higher, the proportion of vulnerable workers is also higher. But importantly and imbalanced, higher inequality tends to reduce the impact of the monetary policy on the economy. A plausible explanation is that richer people have a lower margin of a to consume and that poorer people find it harder to borrow.

Putting these findings together, you can get a certain perverse amplification because on the one hand, recessions increase inequality, on the other hand, inequality deepens recessions and reduces the power of monetary policy, which makes the task of monetary policy harder. What I've just suggested is implies that if monetary policy keeps the economy on uneven keel in the pursuit of its mandate, it will also keep in check the two major sources of inequality over business cycles. That is inflation and recessions. This will also be important to avoid the intertemporal trade-offs that arise when things do go wrong and monetary policy has to bring the economy back on track because this inevitably generates some short term costs in order to reap the longer term benefits that are associated with a non-inflationary and stable growth. Let me say a few words about inflation and recessions in turn.

Bringing inflation under control we know will tend to slow down economic activity may even cause a recession and this will increase inequality in the short-run. But the whole point is that this will allow the Central Bank to reap the longer term benefits of lower unemployment and therefore, on average, lower inequality associated with non-inflationary growth. Fighting the recession, on the other hand raises more subtle trade-offs linked to the need to keep interest rates low in order to nurse a recovery. In this case, there is no trade-off between income inequality because higher employment tends to reduce it. But there is a trade-off in terms of wealth inequality because as I mentioned earlier, low for long will tend to increase asset prices, especially the prices of equities.

To be precise, this is not necessarily a given. It depends on the structure of asset holdings. One can imagine situations in which for example, home ownership is sufficiently dispersed so that it is possible that at least according to some measures, wealth inequality would actually fall when interest rates are kept low. But even then, even if that was the case and according to some measures, very high house prices would still generate some unwelcome distributional consequences like for example, distributional

effects between the old and the young. These trade-offs are always present, but I think they have been exacerbated by changes in the nature of the business cycle that we have seen since the mid 1980s. What do I mean by that? Well, until the mid '80s, the key problem as we know, was inflation and inflation induced recessions. Central bank had to raise in interest rates in order to well inflationary pressures which will slow down the economy.

But from the mid 1980s onwards, COVID recession aside and the recent experience aside, the problem was not with inflation but was financial imbalances, what you might call, we moved from inflation induced recessions to financial cycle induced recessions so that with inflation low and stable there was no need to raise interest rates, but huge financial expansions turned into contractions, leading to recessions like for example, but it's just one example, the Great Financial Crisis.

This in some respects exacerbated trade-offs in two ways. First of all, because recessions became deeper and longer, especially banking crisis took place. So as a result, the Central Bank had to push harder with a bigger impact on wealth and equality. Second, with inflation expectations well anchored and inflation less responsive to economic slack during the economic expansions, the central banks were able to push harder. So that meant that in the short run they were able to raise employment and therefore reduce inequality, but at the expense of facilitating or encouraging risk taking, not leaning against the buildup of financial imbalances and therefore raising the probability of the likelihood of a financial recession further down the road, financial recessions, which have a particular big impact on inequality.

With the recent surge in inflation, we're having a mixture of the two. We have a unique configuration for post war standards, which is the risk of a recession linked to monetary policy tightening, intended to reduce inflation, alongside widespread financial vulnerabilities, particularly in the form of historically high debt levels, both private and public. And as was mentioned before, very high property prices around the world. So this clearly complicates the task for monetary policy, and this is something which maybe we'll come back to in the discussion that we'll follow.

But the implication of all this, going back to what I said at the beginning, is that we need a more balanced policy approach, a policy approach that will also relieve some of the pressure on monetary policy to do the job. And that means having a holistic framework in which prudential fiscal, but also structural policies have a role to play in what the BIS we call a macro financial stability framework, which will allow authorities to improve the intertemporal trade-offs in central banks phase and better reconcile price financial and macroeconomic stability, and therefore, in the process also reducing inequality over business fluctuations. But let me stop here.

Pablo:

So let's do a second round of interventions and more related now to communication. The fact that inequality is part of the everyday political debate, as we've seen it can affect the transmission mechanism. It would be very interesting to get the views of the panelists on how they see the communication of the issues surrounding inequality and how it interacts with the fulfillment of the mandate. So Jim.

James Bullard:

I think on this question, and one of the things that conference like this is really doing is making macroeconomics conversant and by extension monetary policy conversant on the questions around inequality. And the representative household idea as useful as it was left us, macro economists stuttering when issues about inequality came up and we didn't really have a clear answer. I do think the earlier generation from which we learned everything that we know did have something in their minds about inequality and it had to do, even if they didn't say it this way, had to do with Gorman Aggregation

somehow that you could write down a model and then it would have a representative household and it would have an analog, heterogeneous agent household, but everything would be shared out in the appropriate way. I think that has broken down now you have a lot of micro data that you want to be able to attack and you want to be able to say with a straight face that, "The policy I'm recommending is also a good policy even when I take into account the many dimensions of heterogeneity that we'd like to take into account."

But this is a long process that involves very difficult research and we're seeing a lot of it at this conference and a lot of progress is being made. But to me, the big goal is to be able to be conversant and to be able to say that you can't just bring up heterogeneity and say, "Well, therefore, all kinds of macroeconomic policies must be wrong." I don't think that's the right way to think about it. The right way to think about it is if you had these various frictions in the economy and then you want to think about the right tools to address the right frictions, including market frictions, the way I drew it up here. And then somehow you get this group of macroeconomic policies to come together and then that's what's going to get you to the best allocation of resources. So I do think it's this conversion, this is a critical part of agenda here.

Esther George:

I think I'll use the podium again.

So I think Jim is right, the ability to communicate clearly, whether it's to the markets, whether it's to the public about what policy's doing is particularly important. And I think about this in the context of some of the dynamics of the economy in the US today. When we think about what happened during the pandemic, the US of course adopted extraordinary fiscal policy, a response to the pandemic, to the tune of roughly \$6 trillion, a large portion of that which went directly to households and to businesses. And I think relative to previous programs, previous responses that we'd seen, this pandemic stimulus of course was distributed widely across the economy. And consequently you saw a sharp improvement in household balance sheets with households estimated to have some \$2.3 trillion in excess savings relative to their pre-pandemic levels.

So as the Federal Reserve tightens monetary policy with the aim of closing the imbalances between demand and supply, that's pushed up inflation, the dynamics of this excess saving and the distribution of those savings is going to be a key factor, I think shaping the outlook for output for inflation, and certainly for interest rates.

Higher saving of course provides an important buffer to households that can ease the adjustment to economic disruptions. However, as we look today, these higher savings could also provide a further impetus to consumption. As the Central Bank slows the pace of demand growth and higher saving, of course, can lessen a precautionary pullback and consumption. It could well take a higher interest rate for some time to convince households to hold onto their savings rather than spend it down. And that of course, adding to inflationary pressure.

So house saving affects the outlook is going to be particularly and importantly affected by the distribution of those excess savings across households. Heterogeneity here, of course, is going to matter and we heard some of that over the past two days. If these savings are concentrated in the upper brackets of the wealth distribution, a group that tends to spend a smaller share of their wealth and income, the higher savings might provide little additional momentum to consumption.

However, if those savings are spread more evenly across the population, including households with a higher propensity to spend out of their wealth then the effect on the persistence of consumption is likely to be larger. When we look currently at the data, it suggests that this savings remains elevated across the wealth distribution, but I think more recently, we've seen signs that suggest that lower

income households are running down their buffers quickly. So monitoring the distribution of that savings is likely to be important as we think about the course of the economy and of course the path for policy.

So while high savings is likely to provide momentum to consumption and require higher interest rates, it's certainly positive that we see that these households are wealthier, less financially constrained and better insured. But that said, reduced inflation will mean we have to incent saving over consumption. And the short run pain from monetary traction is lowest when demand moderation is progressive across the income distribution. And moderating that demand growth by encouraging high income households to save more with higher interest rates would certainly be preferable to crashing the consumption of lower income households.

Acknowledging heterogeneity can also improve our understanding of the forces contributing to elevated inflation. Overall, wage growth remains strong in the US reflecting what by many measures has been historically tight labor market with inflation recently rotating from goods to services prices as supply chain disruptions ease and the labor market remains tight. Understanding this wage growth is likely to be important for understanding the overall path of inflation. When we look at nominal wage growth for the median worker, it's tracking at 6% when you look at the Atlanta Fed's wage tracker. But this aggregate number mask, I think an important difference between job stagers and job movers. The median worker who switches jobs sees more than 7% wage growth, which is substantially higher than those that stay put at their current job.

And the rate at which people switch jobs has increased significantly, especially for prime age workers whose average tenure at their current job fell by about three months from 2020 to 2022. So with labor markets historically tight, a calmer labor market with fewer quits and less churn could lower this job switching and reduce inflationary pressures by lowering nominal wage growth.

The last thing I'd want to say about this is related to labor productivity, which of course is going to also affect inflation dynamics. And in this regard, of course, we saw in the first half of this year a substantial reduction in average labor productivity. If weaker labor markets force people to stay put longer, then they may become more proficient and labor productivity growth may provide some inflationary relief in the near term.

Currently, many of my contacts in the Kansas City Fed region report problems with low worker engagement, which is a drag on productivity. If workers who no longer see their current job as replaceable, become more engaged, they may also over time become more productive. So again, understanding these effects at this juncture in the cycle I think is particularly important and certainly as Jim just said, an important aspect of our communication from the Central Bank. Thank you.

Pablo:

Claudio.

Claudio Borio:

Okay, well, thank you, Pablo. I thought that I would talk a little bit about an aspect of heterogeneity, which I think is quite important at the current juncture, which is heterogeneity in expectations. And I think here it's important to distinguish the expectations of professional forecasters from those of financial markets and from those of workers and firms. And the key point here is that these types of agents typically form their expectations quite differently and their expectations have a very different impact on inflation.

So for example, professional forecasters, they're the closest to central banks. They largely use the same type of forecasting methods so that there's very little independent information that the Central Bank can get by looking at what the, say the IMF or the consensus forecast basically tell us. Financial markets actually rely quite a lot on the forecast made by professional forecasters and they're strongly influenced by what central banks say the future is going to look like.

But of course they blend these assessments with their own view. You can think of financial markets as a huge machinery to process information and to reflect that into our surprises. In contrast to the expectations of say, professional forecasting, those financial markets do have an important impact on inflation. They have it through financial conditions, financial conditions that can affect not just the transmission of monetary policy, but have a first order impact on inflation through, for example, what happens to the exchange rate. And this is something which is quite important in emerging market economies.

Finally, we get to work in firms. And to simplify all the evidence that we have suggest that their expectations are much more backward looking based on the behavior of inflation itself. But they have a much more direct impact on inflation because it is wage earners and price setters that basically roughly decide what inflation is going to look like because wages and prices are at the core of the inflation process.

These differences in the way in which people form expectations has informed a view of the inflation process that we have put forward in the latest Annual Economic Report documented there, but it would be further documented in a monograph that will be coming out soon, which is complimentary to that which is implicit or explicit in the traditional say, Phillips curve. And this is a view of the inflation process which sees it as two regimes, a high and a low inflation regime with self-reinforcing transitions from low to high.

Why two regimes? Well, first of all, because if you actually look at the data, the behavior of inflation is very different in the two. In a low inflation regime, what we measure as inflation in fact, simply largely reflects and correlated price changes in a myriad of sector specific prices which leave only a temporary imprint on the inflation rate itself. And moreover, wages and prices are only rather loosely linked so that a low inflation regime has a certain self stabilizing properties. A high inflation regime by contrast is quite different. A common component of price changes is much higher, wages and prices are most much more closely linked and therefore, this regime doesn't have the same self stabilizing properties as a low inflation regime does. And for example, inflation rate is much more sensitive to one off large changes in say, energy prices, food prices or indeed the exchange rate.

Arguably, a key reason why the low inflation regime has self-stabilizing properties is, that when inflation is low households, workers and firms hardly notice it. So that inflation has little impact on their day-to-day behavior. If you recall, the very definition of price stability that Volcker and then Greenspan gave, is precisely a situation in which inflation has no material effect on the behavior of agents.

And this also helps explain why transitions from low to high inflation regimes can be self-reinforcing. First of all, inflation snaps out of the zone of rational inattention into the region of sharp focus. Secondly, becomes more representative of the price indices that are relevant for individual firms or individual households because price increases become more synchronized and similar across different categories. So that inflation can act as a better coordinating device for agents decisions, therefore, increasing the likelihood of wage and price piles. And finally, of course we know that through a number of mechanisms, once inflation becomes high and persistent enough, then an inflation psychologist sets in which accelerates the process.

So this bring me to the implications for communication. Well, we know that communication is key for policy effectiveness and for policy accountability. And it's especially important when inflation is fairing

up and you want avoid this transition from a low to a high inflation regime because you want to steer expectations and because you want to justify your costly actions so that they're better and understood and therefore better accepted. Remember this short versus long run trade-offs that I discussed earlier.

The fact that the audiences are heterogeneous raises a number of challenges. First of all, take communication with professional forecasters of financial markets. This communication is important, especially to the extent that it affects financial markets because of the reasons that I mentioned earlier. Financial markets indirectly can have an important impact on inflation. This communication is facilitated at the same time by the fact that central banks, financial market participants and professional forecasters use very much the same language. The challenge here is not to be lured into a full sense of security because central banks, professional forecasters, and to some extent, financial markets, tend to see the future in very, very similar ways because they use the same information very much in the same way.

But at the same time, they don't have a direct impact on wages and prices. Therefore, the Central Bank may, if you like, look itself in the mirror, think that it is particularly credible, but from the perspective of wages and price setters, that is not that particularly important at that point in time because their own expectations are such that they see higher inflation in the pipeline or indeed they're already trying to catch up with losses in purchasing power of compression in profit margins that they have seen as a result of big and persistent increases in prices.

So communication with the households or particular wage owners and firms is particularly important. But at the same time, their expectations are harder to measure reliably. Surveys can take us only that far. These audiences are harder to read and of course their expectations are also harder to influence because they're very much backward looking.

The extent to which you can influence these expectations and you can influence these decisions will also partly be determined by institutional arrangements. For example, in context in which you have rather centralized wage bargaining, that's a precisely situation in which the Central Bank can have a more direct impact that could otherwise be the case if you have an economy which is very dispersed and wage bargaining is largely decentralized.

What this suggest to me is that at the end of the day, actions speak louder than words and the best strategy of course is to walk the talk. And given the self-reinforcing nature of transitions, I think it's important to act in a timely and firm way with a steady hand while at the same time, of course being ready to adjust one's decision in light of evolving circumstances until the job is done. Thank you.

Pablo:

Now we have a few minutes for questions from the audience. Yes, Marco.

Marco:

Yes, I have a few questions. One is for Jim and the other is maybe for everybody. The question for Jim is the following. When you started your presentation and you basically described it for us best, I thought you would say, "Well, and now reality is one in which actually not all the four horsemen do their job and therefore a trade-off arises for monetary policy." And then discuss that.

I'm not an expert on inequality by any stretch of the imagination, but my sense is that when people look at say MPCs inequality, the control for age effects, therefore maybe all these differences are not all due to the life cycle. And so maybe the world we live in is one in which the other authorities don't necessarily do fully their job. So I was wondering whether part of your future research agenda goes in that direction.

And then for the second question for all the panels, to me maybe a key question in terms of communication and on inequality, is asking with what extent the central banks should discuss inequality and the possible periods that that entails. The new framework to some extent, goes into that. And, yeah. I was curious to know your thoughts about it. Thank you.

Pablo:

Thank you. Gianluca.

Gianluca:

Yeah. So I want to just build a little bit on what Marco said about the question on whether Central Bank should incorporate inequality more or less explicitly, let's say. So just to frame maybe the debate a little bit, I think there are pros and cons, right? There are clearly advantages of having a very narrowly focused institution mission, which is that the policy goals are very clear, they're very transparent, and speaking of communication, it's much easier to communicate if your policy goals are clear. The risk obviously, I think, and it's maybe one of the reason why the Fed incorporated more explicitly, certainly the DCB, a broader based employment mandate in its goals. It's that the Central Bank could appear completely oblivious to what one may say it's the central issue of the century or at least one of the central issue of the century. The other one is probably climate change, which is in fact, one other if you like temptation of mission creep.

And if it is the case, then the center banks can become the target of political attacks from certain, I think maybe special interest group. And that would put, I think, at risk the very independence of Central Bank. So I think there is a trade-off there and me too, I'm also interested in knowing what you think.

And the other question I have is also big picture question. I'd be curious to know how you think about the interaction between monetary and fiscal policy. I'm thinking of the business cycle frequency obviously, and this goes a little bit beyond the heterogeneity macro because we know since Sargent and Wallace that the effects of monetary policy can be very different depending on whether the fiscal policy follows a more or less active type of fiscal rule. But speaking within the heterogeneous agent framework, in all our models that have been presented in the last couple of days, the fiscal response, the fiscal reaction to monetary policy matters a lot for the transmission, the aggregate effects and so on. How do you think about this interaction in general?

Pablo:

Go on Jim.

James Bullard:

Sure. Okay. So Marco, I understood your first question would be, well what if one of the other policy maker is not doing their job? Yeah, I think that's interesting, but you know what we're going to find. The monetary policy is correcting the credit market friction by moving the price level around in order to influence the real interest rate that's going to get exactly the right interest rate for all these intertemporal trades that have to be made in this economy. It's not well suited for providing unemployment insurance through some other mechanism and it's not well-suited to fixing other kinds of frictions that might arise if one of the other ... Certainly not well suited to try to make up for human capital issues that have accrued as these people were growing up and coming into adulthood. So now you could think about, "Okay, well let's do something else that would actually address that issue." Instead of saying, "Well because of that we're going to have to keep interest rates lower or something." I'm not even sure, you might make things worse if you did it that way.

Speaker 10:

[inaudible 01:03:01]

James Bullard:

Yeah.

Speaker 10:

[inaudible 01:03:06] it was on the table.

James Bullard:

Okay. So I think for this group here, what I wrote down was a model of X anti differences among agents. And I motivated that with this pre-age 20 world where something else is happening. You could put more of a model on that and say, "Well, what's happening in that world?" But here you're just taking that as given and saying, "Look, by the time people are age 23 according to Huggett, Ventura and Yaron, you can basically predict their whole lifetime income. And the shock part doesn't matter that much." So there's an extreme version of that.

On the question of communication and the new framework, I think we definitely tried to make strides in the direction of ... To me it was just, I said this earlier at this conference, was just a recognition that macroeconomics is always about everybody in the whole economy. And it was never intended, I don't think by anybody that has participated in this profession to say that, "We just want to focus on this group or we just want to focus on that group." When you look at the welfare theorems and everything, it's all about whoever you've got in your model, you're trying to do the best you can for everybody in the model. So I thought some of the language that we adopted tried to get to some of that and fight back against critics who would say that this is all about intersecting with Wall Street or the biggest banks and stuff like that.

So there is an element of that because of the way monetary policy is implemented, because it is an interest rate policy and it does affect asset pricing all around the world. So for that reason it's important. But when we're thinking about macroeconomics, we're trying to think about everybody. And I think that that's critical to prevent the political attack that Gianluca just mentioned and the risk to independence that could come with that and probably has come with that in other places in the world, including parts of Latin America. And then finally on this take, my take on the interaction between monetary and fiscal policy. Well, one of the things I said during my talk here, and I try to get on my high horse about this, but why do the monetary policy guys meet so often? Why do we meet so often?

So the notion is that the monetary policy can react quickly to incoming shocks and changes in economic circumstances. And I've become a big believer in that. I think that's true. That is what you want to do and you're spending gobs of time assessing the economy, assessing all the risks that are coming in, then you're trying to make the right monetary policy adjustment, fiscal policy in many ways is probably much more powerful. But I don't think you want to be changing the taxes every six weeks.

And so the notion is, at least in what I wrote down, you would want the monetary guys to be meeting all the time and assessing what shocks came in and you could set your fiscal program for the, well, literally forever in this model, but certainly for the medium term in the long term, set the taxes the way you want the taxes set and accomplishing whatever you're trying to accomplish with the tax code and then pretty much leave them alone most of the time. Because it causes a lot of consternation when you try to change taxes. And the political system is not fast at reacting to things.

We did have the pandemic and the pandemic had a big fiscal reaction. So it can be done if there's war-like footing, but probably not on a day-to-day basis. So I don't know, that's an older view maybe of the distinction between monetary and fiscal policy.

Esther George:

I guess I would just add to that thought. So the question about should we be talking about inequality as a Central Bank and tying it to this issue of sticking with your mandate. I think what we heard in 2019 when we did this Fed Listens [inaudible 01:07:39], so this came ahead of adjusting the framework, was how much people cared about jobs, questions they had about how our decision making have affected the households that we engage with.

So I think without suggesting that we would be broadening our mandate using language like broad and inclusive, as Jim said, was designed to say, "We are listening, we understand that there are many dynamics in the economy that land differently on people." And so we have to be completely accountable to the mandate we were given. And I think we have to be very careful to always couch our responses in that context. But I also think in order to be credible with the public to earn their trust, you can't avoid some of the questions I think that that people generally have.

And the only other thing I would add to the monetary fiscal interaction I think for me was watching and comparing and contrasting what happened during the great financial crisis and what happened during the pandemic. I think as I watch those two episodes, the very rapid and the very aggressive and large response that came out of the fiscal authority I think will be interesting as all of you study this and we think about the head, how that might have influenced monetary policy differently at some point, because it was widely dispersed, it was pretty direct in terms of its impact there. And that's different than what I might consider to be normal times waiting for fiscal policy.

And it's also what led, as you know during the Great financial Crisis, to the idea the central banks were the only game in town because of their nimbleness in responding. So you saw two extremes, I think, in both of these episodes.

Pablo:

So Claudio, any closing thoughts?

Claudio Borio:

Well, yes. First of all, Central Bank is much more than just monetary policy. If you look at mandates across, and the mandate has to be the load star of everything that a Central Bank does. But if you look around the world, depending on which country you are, the Central Bank operates in we will have different mandates. But the mandates, and there are many things that central banks can do in order to foster a more equal society in fulfillment of their mandates. And for example, depending on what their specific responsibilities and tools are, they could be, by promoting financial development, inclusion, and literacy, by contributing in some cases even to consumer protection, or even just by making payments more efficient and competitive. The key is that have a mandate. You pursue your mandate and you have to explain whether you like it or not in order to be accountable.

And when people ask you questions, you will have to explain. If people are concerned about their inequality, you will have to explain to them to what extent pursuing your mandate is conducive or not to that specific objective. And basically what I explained before was precisely designed to do that. It was a way of trying to explain what central banks can and what central banks cannot do wearing their monetary policy hat in terms of influencing the distribution of income and wealth.

On fiscal policy, well, this is a very, it's a multifaceted question and issue. For example, most recently, it has come up with the fact that in many countries, fiscal authorities have been trying to shield the population from the impact of higher energy prices, higher food prices. And the question is, to what extent they are targeting, that would be the first best, the people that need most, or what we in fact intend to do, is actually to provide more general subsidies. But there is nothing that Central Bank can do, but to take that into account when it sets policy.

Something that has been complicating this very neat distinction between monetary and fiscal policy is the fact that balance sheet policies themselves have tended to blur the line between the two. And the most obvious example is the fact that large scale asset purchases have a big impact on fiscal positions through remittances from the Central Bank to the government. So for example, while many people say, "Well, very low interest rates have meant that governments have been able to finance themselves at a very low end and very cheaply so that the fiscal positions are not particularly sensitive to higher interest rates." Well, in fact, in those countries in which central banks have been buying a lot of government debt, it turns out that something like 30 to 50% of the consolidated public sector balance sheet, which includes the Central Bank position, has been financed at index to the short term overnight rate because it's taken the form of excess reserves.

So effectively what has happened is it's as if the government had been retiring long-term debt and is doing very short-term debt instead. So anyway, but as I said, there's nothing the Central Bank can do, but take fiscal position as given and try to pursue its mandate.

Pablo:

We're ending the panel and let's give you a round of applause to our panelists. And we have some closing remarks from Gianluca.

Gianluca:

Okay. All right. So it's been another intense and long day. So very quickly I'd like to officially conclude the conference with some acknowledgement. First of all, I want to thank obviously the Bank of Chile and Governor Costa for sponsoring the event. And I'm sure you all agree that the organization of the conference was absolutely spotless. So we need to all thank the all-star team that made this possible; Álvaro Castillo, Constanza Martinelli, María José Reyes, and Daniela Gaete. I hope my pronunciation was good. Thank you very much.

Then I want to personally thank Sophia and Andres, my teammates who came up with the idea of the conference. And as researchers, we know that the idea is everything, so I've been a mere RA, research assistant to their project. So thank you very much for everything.

And then finally, the panel participants, all the presenters and discussants, and the audience obviously, for making this very lively and interesting conference. I think we all learned a lot in every session.

Finally, one last thing. There is a volume to put together. We're going to start working on that and we're going to send you an email with follow up instructions on the timeline. Thanks again, it was great to have you all here. And thanks. And safe travels.

Pablo:

Okay. And we have deadlines.