

**Transcript of University of Pennsylvania's College Fed Challenge Finals Presentation**  
November 27, 2019

RENAN: Hi, I'm Renan.

CATHERINE: Hi I'm Catherine.

JUSTIN: Justin.

LISA: I'm Lisa.

AMAN: I'm Aman.

ANTULIO BOMFIM: Good morning and welcome. I am Antulio Bomfim, I am a senior advisor here at the board and at the division of monetary affairs.

THOMAS LUBIK: Good morning welcome for me too. I'm Thomas Lubik. I'm Senior Advisor at the Richmond Fed.

TOM KLITGAARD: And I'm Tom Klitgaard from the New York Fed.

CATHERINE: Are you ready?

JUSTIN: Yeah okay. It's a pleasure to be here with you today. In our presentation we'll address the current state of the macro economy, identify risks to growth and prescribe monetary policy along with dual mandate that Congress has provided the Federal Reserve, namely price stability and maximum employment.

RENAN: With the dual mandate our recommendation aims to promote sustainable growth, well managed inflation and financial stability in light of recent overnight volatility. We recommend holding rates at 150 to 175 basis point range and implementing a standing repo facility price at the top of the target range and to systemically important banks in a manner where the Federal Reserve provides transparent and clear guidance in our longer term position.

LISA: Overall, macroeconomic conditions are doing well. There will be [Inaudible] business conditions index pictured on slide three, frames our discussion as a transpose to zero

deviation from your growth signifying that business conditions are doing well. On the next slide we see a potential and real GDP. Although GDP is not explicitly part of the Fed's dual mandate it is directly related both to price stability and maximum sustainable employment. Year over year real GDP rate grew at a rate of 1.9 percent in quarter three of 2019, which is lower from the previous quarter's 2 percent. The output gap, which is the difference between real and potential GDP, is positive but decreasing which suggests that the economy is an expansion. So this is particularly notable as Dr. Robert Gordon from Northwestern University explains that the CBO's estimate of potential GDP should be lower due to overall decreasing productivity growth which would mean that the output gap is even larger than pictured.

AMAN: Moving on, in slide five, we examine the unemployment U3 rate specifically stands at 3.6 percent. A near historic low in half a century, with payrolls increasing by 128,000 in the most recent report, beating expectations. This rate is well below the 4-to-4.3 percent range the Federal Reserve estimates as the natural rate of unemployment. Additionally, the U6, or under employment rate, stands at 7 percent also a near historic low signaling strength in the labor market. Generally these near historic trends are present in all U1 through to U6 rates. Additionally in slide six, we can see that the employment population ratio stands at 61 percent, a high since the 2008 recession, suggesting that employment growth has not lagged behind population growth. Generally, the labor market remains strong. However, we will later discuss risks facing the labor market such as the increasing employment population ratio of the boomer generation.

CATHERINE: As for inflation on slide seven, the Federal Reserve has chosen to use PCE as its preferred measure of inflation because of its revisability and accurate reflection of consumer purchases. Because the inflation rate measured by headline PCE as we can see in the

dotted line tends to be volatile core PCE which excludes food and energy is used to better gauge inflation trends. Recent data on PCE shows core PCE trending at around 1.7 percent, lower than the Fed's symmetric 2 percent objective. Over the past 12 months both headline and core PCE have decreased from December to May and have increased since May.

JUSTIN: To add to Catherine's point as New York Fed president John Williams points out, inflation expectations play an important role in guiding realized inflation. We can look on slide A, where we can see that market based measures of inflation expectations namely the five-year break evens in read calculated as the difference between the nominal and inflation adjusted treasury rates have declined over the last year and continue to remain low. This stands in contrast with internal FOMC projections for PCE which trend back up to 2 percent by 2021. So with regards to the way that we set and communicate our monetary policy, this means that we ought to be considerate in aligning those expectations with our internal forecasts.

AMAN: In slide nine building on the discussion of inflation, we examine the relationship between unemployment and inflation. For years observed trends of low unemployment accompanying rising rates of wages and price inflation has let us deposit the relationship known as the Philips Curve, a long run value of which is known as narrow. However, literature since the 1990s has widely disputed the causal effect between low unemployment and low inflation for various reasons such as changes in aggregate demand and supply as well as imperfect translation of wage inflation into price inflation and many of these markets. For these reasons, we are not immediately concerned with unemployment remaining below narrow, while inflation misses its symmetric 2 percent target.

RENAN: However, while employment is a strong aggregate, it is important to know some potential risks on the right hand. Although recovering, the labor force participation rate

currently stands at 63 percent, lower than the pre-crisis number of 66 percent. For this reason, the low unemployment numbers that Aman mentioned may paint an incomplete picture. This signifies the potential risk for the labor market because as boomers begin to retire, the secular participation rate may decrease over the longer term. Additionally, as you can see on slide 11, the average hourly earnings grew on annual basis by 2 percent, the weakest in more than a year. This range in the labor market brings us a more dovish lining to the headline unemployment picture.

CATHERINE: Slightly separate from its relationship with unemployment there exists some questions over how low inflation has been, especially considering the sub 4 percent unemployment rate. On slide 12, we can see that average core PCE is trending at around 1.7 percent amid relative strength in the broader economy. So on one hand, there does exist a risk such that if inflation does pick up quickly in the near term, we may be inclined to tighten monetary policy in response, which might appear as unstable to the public. But at the same time we can also see that core PCE has missed the Fed's symmetric 2 percent objective for years. So the extent to which we should be concerned, is still too early to tell.

LISA: It's also important to look at the status of growth on slide 13. In terms of investment, real gross private domestic investment is at its all-time high and its growth has remained resilient in recent quarters. However, if we look on the business side graph on the next slide, we see that business investment is not doing as well, perhaps due to business uncertainty as a result of recent trade policy. For example, we see that real nonresidential fixed investment has dipped below 1 percent in quarter 2 of 2019 for the first time since 2015, during the mining and energy crisis, so naturally we should look to policy that aims to improve business confidence.

RENAN: It is nice that you mentioned that Lisa, in fact, the issue of supply management, purchase manufacturers index, plotted in slide 15 remains worrisome. Index values below 50, we know they are declining activity whereas values above 50 represent expansion. The current reading of PMI is in 48.3, indicating a continued decrease in business confidence as a third month of contraction. Although it slightly increased from September to October, sentiment is more cautious and optimistic driven especially by global trade uncertainties. Sustained weakness in manufacturing in the coming months may provide as reason to use the policy depending on the severity of the decline.

LISA: It's also valuable to look at the housing market as indicative of future consumption as we have done on slide 16. Housing starts are up by 1.2 million in the recent data release and housing sales have also increased by 700,000. In the next slide we see that the Case-Shiller price index has also been increasing, which means that housing prices have been increasing since the post-recession low point. However, from this graph, we see there has not been a full recovery yet. This translates into aggregate consumption as buyers use rising housing prices in order to increase the borrowing and their spending and this is a notable trend by Dr. John Campbell from Harvard University. So for this reason, we should aim to maintain this growth in the housing market or maintain the trends that make this growth as it is.

RENAN: As well consumer sentiment, plotted in slide 18 is important to gage how consumption and investment develop. The University of Michigan consumer sentiment index has shown that trade uncertainties have kept consumers cautious. The index are from 100 in May to 89.8 in August followed by a slight rebound to 95.5 by October. Richard Curtin at the University of Michigan explained that this rebound might be seen as consumers anticipating a larger income gains and lower inflation in the year ahead. However, trade uncertainties have

kept consumer sentiment muted. Strong consumer sentiment is a condition that helps us support our recommendation to remain neutral on rates. However, a shorter duration consumer sentiment may provide us cause from our accommodative stance.

JUSTIN: Many of the points of weakness that Renan and Lisa point out derived from trade uncertainty especially as global growth has been weakened as a result. We can see on slide 19 that just as U.S. PMI's have declined over the last few quarters, Euro area and Chinese manufacturing has also contracted. So a big question for us going forward is the extent to which sustained global weakness would really be able to translate into the domestic picture.

AMAN: To put some numbers on the trade deficit, in slide 20 we see that the deficit decrease in the second quarter of 2019 from a deficit of \$634 billion in the first quarter to a deficit of \$664 billion in the second quarter. Exports have decreased marginally as well. Tensions with China can be cited as one of the main reasons, creating this decrease in exports as China is America's third largest export partner. Additionally, the strength of the U.S. dollar may be causing our exports to decrease. Foreign investors spurred by global economic slowdown have sought U.S. dollars as the U.S. has higher safer yielding dollar denominated assets.

CATHERINE: Although these risks are present, our short term economic forecasts on slide 21 remain favorable and are consistent with the recent summary of economic projections. We expect GDP to grow at around 2 percent in 2019, for growth to continue near this pace next year and for a core PCE to rise gradually back to the symmetric 2 percent objective. Wages have been rising broadly in line with productivity growth and underlying inflation. The unemployment rate at 3.6 percent is at a 50 year low and we expect that it will rise gradually, however, remain within the 3.5 to 4 percent range. Additionally, there's little evidence to date

that is suggesting that the strong labor market is putting excessive cost push pressure on price inflation.

LISA: In light of the forecasts that Catherine mentioned we should look at our rate recommendation. For now at this point in the presentation we have two goals, which is maintaining moderate GDP growth, while at the same time maintaining low inflation and maximum sustainable employment. So for now, we suggest holding rates between 150 to 175 basis points, all in a manner where the Fed provides clear transparent guidance on its longer term positioning, namely that the Fed reiterates its ability and capability to act quickly should the aggregate picture deteriorate and that the recent series of cuts have been done more as a part of an adjustment rather than as part of a deeper easing cycle.

CATHERINE: Our rate recommendation comes in the backdrop of the relatively strong economy with sufficient insurance taken on global downside via our previous rounds of easing. The output gap is positive but decreasing suggesting that the economy has been expanding at a sustainable level. Unemployment is almost at a near historic low and while growth has moderated it has remained largely resilient to developments in trade, with the exception of manufacturing and agriculture. And while inflation is below the 2 percent objective, it has picked up slowly in recent quarters consistent with the Taylor rules guidance of Fed policy. So keeping rates at their current levels could help provide a cushion for future rate cuts in the case of a recession, which is a consideration in the current global economic slowdown.

JUSTIN: Moving away from inflation, growth, and unemployment for a moment we'd also like to address recent volatility in the money markets. While this is more of a technical rather than traditionally macroeconomic topic, we believe that it's important that the Fed ensure that it implements monetary policy in a way such that it really controls the fed funds target range

as well as adjacent short term interest rates. Additionally, with the proposed transition and credit benchmark rates from LIBOR to SOFR we believe that there's an elevated responsibility in maintaining stability in these markets.

AMAN: To further put this slide into context, if you look at the last two months, we can see that the overnight lending markets experienced periods of significant volatility especially with the federal funds rate breaking past its upper bound in late September. In light of this trend, many economists such as former New York Federal Reserve President William Dudley have expressed their concern in the Fed's ability to manage these overnight lending markets. Originally, this spike was attributed to a coincidence of events, such as Japanese holidays, Treasury auction settlement, and corporate tax reasons. However there are deeper reasons for concern here. At its core, such volatility, essentially driven by insufficient reserve supply, is a sign of deeper structural issues in the money markets.

JUSTIN: We can look to slide 24 for illustration where we can see that dealer inventories of treasury holdings have skyrocketed over the last year, while excess reserves at banks have gone down. So this means that as dealers have been overextended with this collateral, short term money markets built around those dealers have been more susceptible to funding stress in periods where cash demand surges. In response to this, the FOMC has committed to short term asset purchases as well as term and overnight repo operations through the first half of 2020 in order to combat this issue. While we believe that to be a strong medium term solution, we believe that a longer term solution also exists. Namely, we set up a standing repo facility to enforce the upper bound of the target range, just as we've implemented a reverse repo facility in the past to enforce the lower bound of the target range. We propose setting up this facility to be priced at the top of the target range and accessible only to the biggest systemically important and

most importantly, best regulated banks. We believe that this should allow liquidity to flow more freely through the system in times of stress and mitigate funding pressures from arising in the future.

RENAN: In conclusion, we understand the potential short term risks like trade escalation and weaknesses that have been recently actualized, such as weak manufacturing data. Analyzing weakness begins to show signs of greater translation into the aggregate picture, we feel as though the current rate is as an appropriate level and we are now open to questions.

ANTULIO BOMFIM: Thank you. We'll start with a couple of a few general questions and then we'll have some follow up questions to dig a little deeper into some of the issues that you're brought up. Now as you know, the Federal Reserve has been conducting a review of its monetary policy strategy, tools and communications practices. As part of this review, the Fed has held several meetings across the country called the Fed Listen events and which have included getting perceptions from community leaders on how monetary policy decisions affect their constituencies. So with that in mind, we'll jump into the first question. Could you discuss how, if at all, the FOMC's monetary policy decisions over the past decade may have affected the distribution of income or wealth in the United States?

JUSTIN: I guess I could kick it off in the sense that one of the main mechanisms by which income and wealth inequality is kind of perpetuated is the distribution of assets across the population. So if we look at the distributional financial accounts that the Fed put out recently, we can see that essentially the top 10 percent of the U.S. control a very large proportion of the assets, particularly assets that are sensitive to rate decisions like the equity markets. So in some sense if you have decision making over the last 10 years that have essentially had a downward bias on rates and easier monetary policy staying near the lower bound, having large scale asset

purchases, this could increase the value of those assets. And we've seen that actually benefit the top 10 percent in particular, quite strongly, if you see their asset valuations, their net worth has gone up very much in connection to the equity markets and corporate markets.

AMAN: Additionally, I'd just like to bring a short note on that. When these rate cuts were announced the intention is or the mechanism is, is that it goes through the entire economy and it goes through businesses as well but there's been a recent trend in terms of originally businesses were investing in new infrastructure, passing down the wages for quite a bit. However, these changes, where this money is being spent now is on corporate, share buybacks, which don't necessarily fall in or which aren't necessarily owned by the lower income of workers. So that could explain why income inequality to some extent is widening.

LISA: To the extent that the Fed influences longer term policy, we have seen that the difference between productivity and wage growth has also been drastically increasing since about the 1980s until now, whereas before the two were growing approximately together now, which productivity exceeds earnings by over 250 percent. So this is part of a longer term trend that the Fed has been, I guess, contributing to the implementation of monetary policy. However, right now, as we've seen year over year, productivity and wage trends, balancing out the extent to which the Fed can conduct sweeping policy to bring productivity and wage growth together is uncertain and yeah.

TOM KLITGAARD: Is there any way that Fed policy has decreased income inequality?

JUSTIN: So one of the main, I guess, transmission mechanisms for that to occur would be having easier monetary policy in spurring investment and growth within companies. And so if, as I'm kind of adding on to Aman's point, if that extra cash and extra liquidity isn't being used to issue debt for share buybacks, if it's used towards investment that can increase the amount of

jobs that we've seen in the economy and we have seen a lot of growth in the job markets, in the labor markets especially as it impacts lower income communities and generally underrepresented communities in the past. However, that is also contingent on the level of wage growth that comes with that as well. So it's not necessarily sufficient to have a job but also to have a job that pays better and better over time. And we've also seen some moderate wage growth over the last few years as well.

THOMAS LUBIK: Since we are already at the topic of wage growth. So let's continue in that direction a little bit. So you pointed out that the labor market has been exceptionally strong during, well in the last few years and the unemployment rate is at a 50 year low. Against the strong labor market performance however, we have not seen inflation rising as much. So how would you explain the behavior of inflation over the past several years and especially how it relates to the FOMC's inflation objective?

AMAN: I can kick off this discussion. I'll just go off one technicality in terms of how inflation is measured. The San Francisco Federal Reserve has seen that the index that the Fed uses of the subcategories in that index 58 percent of those goods are prices that they measure are in acyclical industries which could to some extent be distorting the values of inflation that we're seeing.

LISA: So I can give another reason for why inflation has been especially low and this has been firstly documented by a lesson in 1993, and more recently by Henry Bone from University of Santa Barbara in March of this year, which is that banks that are independent are better at enforcing their inflation targets. So what we're seeing with this low inflation is actually evidence that independence of the bank is working and in targeting and maintaining market expectations. So and actually a research by Merkins and Williams from 2016 explains that often

consumers see that the 2 percent symmetric target as an upper bound, which might explain the reason why it looked through survey systems, which might explain the reason why the average expectation for inflation has been below 2 percent and realization thereof.

CATHERINE: Exactly. And just to add on to Lisa's point about how the Chicago Fed pointed out that having this symmetric 2 percent objective the Fed doesn't necessarily want the public to perceive that as a ceiling and that could have been one thing that had led to kind of the indication of expectations of inflation being lower. As we pointed out in our presentation as well the five-year, five year break evens have been trending downwards, very, at like very historical levels, low levels. And by being more clear with forward guidance, for example, using outcome based forward guidance, we could potentially be able to better target that range.

RENAN: Also to complement, since the Fed has established since 2012 a 2 percent explicit objective as a target range, it anchors expectations. So as we discussed in our presentation expectation is really important to determine actual inflation. So it anchors this inflation which does not allow inflation to go there. Also there is this is a thing that economists debate a lot, this relationship between inflation and employment and where the few that it suggests is that because of globalization and how America's economy is connected with other economies nowadays and especially because how the way inflation is measured also comes for foreign goods. We can maybe have a, we can have like this, the thing that since we have been suffering in global economic slowdown and their currencies are devaluating compared to the U.S. dollar, therefore, their products come in a cheaper way to the United States, which may be one of the reasons why you're not seeing such other massive impacts like low unemployment numbers affecting the United States inflation.

JUSTIN: I wanted to add one last point to round out. There's also an idea of having sticky wages essentially through union contracts and different union dynamics that can sometimes have wage inflation react relatively slowly to things like lower unemployment and additionally I think Jerome Powell actually cited the prevalence of automation as well I mean at his recent house hearing as another possible explanation for why wages have gone down or not – sorry, well not wages have gone down.

TOM KLITGAARD: Because you were saying unemployment low, wages are rising and that you don't really see inflation rising. So is there a growing gap between wages and price inflation? Is that temporary or permanent?

LISA: So I guess this can be explained via the numerous criticisms of the Phillips Curve which, as you know, relates unemployment to inflation. So one of these major criticisms is outlined by Dr. Petra Todd, who writes for the University of Pennsylvania and what she writes explicitly is that there's several factors that affect inflation that are not realized in unemployment numbers. So for example the fringe benefits that Justin just mentioned as part of union contracts, this is one of the things that contributes to slower translation of unemployment numbers into inflation. Similarly, fringe benefits like – there's also open arguments by like say, Dr. Derek Kruger from also, this is in another paper where there's nominal factors that affect the setting of an inflation rate. So less so unemployment and more so other factors from the economy like shocks in labor supply or labor demand, which might not come immediately as realization of unemployment and –

TOM KLITGAARD: But are you saying union, high unionization leads to less wage growth or more wage growth?

LISA: Yes, yeah.

TOM KLITGAARD: Less wage growth?

LISA: Yes because yeah –

JUSTIN: At least in the short term.

LISA: Yeah as these, well Todd writes is that means unions enter contracts for long periods of time maybe 20 to 30 years in which maybe a wage is fixed or a wage is fixed to grow at a certain rate that does not match employment, inflation numbers.

THOMAS LUBIK: You mentioned that the 2 percent inflation target should not be seen as an upper bound at 2 percent. So how should it be seen and what would be wrong with seeing it as an upper bound?

CATHERINE: Well with an upper bound on inflation had the Fed or other central banks initially decided to do a higher inflation target then that would greatly anchor expectations for prices to increase. So there's been arguments against having this upper bound or having a 3 or 4 percent inflation target. Having the symmetric 2 percent objective really means that the Fed if it has its tools to be able to increase targeting then it will be able to either go below or under however, again with the symmetric language it doesn't mean that 2 percent should exactly be the upper bound.

THOMAS LUBIK: So in the current environment with inflation having run below 2 percent. So what might this mean for policy?

AMAN: There is a lot of implications in terms of what it could mean for policy, specifically monetary policy in general. This is I guess, the pessimist contrarian view of the effectiveness of monetary policy to some extent. Shigeru Fujita, a visiting scholar at the Philadelphia Federal Reserve Bank, has noted in his literature where he talks about the Phillips Curve and the effectiveness of monetary policy is that there is concern in the community that

monetary policy may not be effective in increasing inflation. If we look in Japan, there has been negative rates and they still fail to hit the 2 percent target. The ECB is having trouble hitting the 2 percent target. Many nations are having trouble hitting this 2 percent target and the United States is one of them. So there definitely are concerns in terms of, is monetary policy doing its -- is it achieving the goals that it sets out to achieve?

JUSTIN: It's also important to note that in terms of inflation targeting, what you could might even argue is more important than the actual number that's being targeted is the stability of the path. So we saw that the average of core PCE over the last 20 years has been 1.7. But there's not that much variance, especially if you're comparing prior to 1995. And so this is important because it anchors expectations in a way where people aren't really changing their consumption investment patterns in a way that's kind of volatile because of their inflation expectations. So a nice example is the University of Michigan one year inflation expectations from consumers have always been kind of wrong in some sense, their expectations are like 3 or 4 percent constantly, but it's been stable. And so that, to us, could be arguably more important as long as we're not trending far away from the target.

ANTULIO BOMFIM: So if you are at the FOMC and you look at different measures of inflation expectations, then you think about – you mentioned importance of an independent central bank and credibility and so on. I mean, what kind of thoughts would come to mind and I mean, how do you feel about inflation expectations now? Are they at an appropriate level and why and why not or why not?

CATHERINE: Well just to start off, the inflation expectations have been declining recently over many quarters, and it does present near historic low of inflation expectations and so in that sense, potentially, it would be better to use like outcome-based for guidance to anchor

expectations a little bit higher and maintain credibility that the Federal Reserve is able to reach the symmetric 2 percent objective.

LISA: And this is actually something corroborated by Michael Woodford, which is the idea that the central bank has the necessity and obligation and an independent central bank to maintain public confidence in what the inflation target is. And so the actual measure of market expectations for inflation are important, but what's more important is that the Federal Reserve can accurately influence them and guide them in the direction that they're supposed to.

AMAN: Just to build on that, we wouldn't necessarily be too worried about inflation expectations because if we think about the history of why the 2 percent target was put into place, originally, the argument was okay, we use Freedman's Rule to some extent and zero percent should be the target. However, if you do go below that zero percent that could be a sign of a slowing down of the economy and it may not be good for consumer sentiment. So in 1996, when they met, Bernanke – or sorry Greenspan, Yellen, they had that 2 percent target more so as a cushion. Yellen, Janet Yellen was, Chairwoman Yellen was okay with the target being around. Can I just finished up my thought or sentence?

ANTULIO BOMFIM: Thank you very much.