Transcript of Pace University's College Fed Challenge Finals Presentation
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JOSEPH DRENNAN: Hi, I'm Joseph Drennan.

MARISSA KLEINBAUER: My name is Marissa Kleinbauer.

SCARLETT BEKUS: I'm Scarlett Bekus.

DYLAN SEALS: I'm Dylan Seals.

SEAN FREDA: I'm Sean Freda.

ANTULIO BOMFIM: Good morning and welcome. I'm Antulio Bomfim. I'm a Senior Adviser here at the board in the Division of Monetary Affairs.

THOMAS LUBIK: Good morning and welcome. My name is Thomas Lubik. I'm Senior Advisor at the Federal Reserve Bank of Richmond.

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

SCARLETT BEKUS: Welcome to our discussion on monetary policy in a time of increased uncertainty. The U.S. economy is in its 11th year of an expansion. However, inflation has been persistently below the Federal Reserve's symmetric 2 percent target despite a strong labor market. In this time of conflicting economic signals and slowing global growth, what should monetary policy be in order to fulfill our dual mandate and sustain our current expansion?

JOSEPH DRENNAN: To address this question we must first analyze trends in GDP growth, labor demand, inflation, financial stability and conditions, and risks surrounding the economic outlook.

DYLAN SEALS: As seen on slide 4, after seeing robust GDP growth in 2018 as a result of fiscal stimulus, growth over the past year has dropped to 2 percent. This is converging to potential GDP which is currently growing at 1.8 percent per year according to the Congressional Budget Office.

MARISSA KLEINBAUER: Growth in GDP is being reduced by declining nonresidential fixed investment. As seen on slide 5, new orders for non-defense capital goods excluding aircraft have declined by 0.8 percent from the prior year. This has historically been a leading indicator of investment spending, suggesting a weakness in future investment demand.

SEAN FREDA: Much of this weakness in investment has been caused by trade policy uncertainty. Research by Caldara and others at the Board of Governors states that this rising uncertainty will subtract percentage point of growth from the period between mid-2019 and mid-2020.

DYLAN SEALS: However Sean, investments' still growing a percentage point higher when excluding volatile energy investment. This means that some of the decline in investment is due to transitory factors affecting oil prices which have fallen by 24 percent from a year ago.

JOSEPH DRENNAN: That's true Dylan, but international factors can pose serious headwinds to U.S. economic growth. As seen on slide 6, according to the IMF, global growth has slowed to 3 percent, the lowest level since the financial crisis as mentioned by Vice Chair Clarida. This decline in foreign incomes will reduce demand for our exports.

SCARLETT BEKUS: Despite international headwinds facing real GDP growth, consumption has remained consistently strong accounting for most all recent growth. As seen on slide 7, consumption is being supported by high levels of household income and wealth, as well as strong consumer sentiment and confidence.

SEAN FREDA: A second factor that is contributing positively to growth is investment in housing which has been supported by the three previous rate cuts. As seen on slide 8, the 30-year fixed mortgage rate decreased to 3.7 percent compared to around 5 percent in 2018. This in turn has led to growth in new housing permits which were declining prior to the rate cuts.

DYLAN SEALS: As seen on slide 9, a leading indicator of GDP growth is real final sales to private domestic purchasers which strips up both the government and volatile aspects of GDP. Although this rate has declined slightly falling the fiscal stimulus, it is still above 2 percent and near its pre-stimulus level.

SEAN FREDA: This supports our outlook that GDP will continue to converge to potential in the medium term. However, we do face downside risk of trade policy uncertainty and slowing global growth.

MARISSA KLEINBAUER: However Sean, despite slowing global growth, the US labor market has remained strong. As seen on slide 11, this year nonfarm payrolls averaged 167,000 new jobs per month. Although this indicator has declined modestly in comparison to previous years, it is still above the rate needed to absorb new entrants into the labor market at 70,000 to 100,000 jobs per month.

SCARLETT BEKUS: That's true Marissa. The unemployment rate is 3.6 percent, near a 50-year low. Additionally, the quits rate is near its highest level ever at 2.3 percent suggesting that workers are confident in their ability to obtain better jobs.

JOSEPH DRENNAN: Exactly Scarlett. Another labor market indicator approaching a 50-year low, as seen on slide 12, is initial jobless claims which shows that fewer people are being laid off. According to Professor James Hamilton, an increase in this measure is a reliable leading indicator of a recession.

MARISSA KLEINBAUER: Other indicators such as the employment to population ratio for prime age workers have recovered to the pre-recessionary levels. This indicator is strongly correlated with growth in wages which have been on an upward trend for the past seven years.

SEAN FREDA: That's true Marissa. As shown on slide 13, both average hourly earnings and the employment cost index have risen 3 percent from a year ago. Therefore accounting for inflation, real wages are grown about a half a percentage point higher than labor productivity.

JOSEPH DRENNAN: As seen on slide 14, we view the risks to the labor market as balanced. Consistent with a maturing expansion, we expect job growth to remain strong and the unemployment rate to rise modestly towards the natural rate as GDP converges on potential.

MARISSA KLEINBAUER: However, the tight labor market does not seem to be translating into inflation. As seen on slide 16, headline PCE, the Federal Reserve's preferred inflation measure, is currently at 1.3 percent, 70 basis points below the Federal Reserve's symmetric 2 percent target. However, core PCE, which has historically been a good predictor of future headline, is approaching this target and stands at 1.7 percent.

DYLAN SEALS: That's true Marissa, and this trend is also apparent in CPI, with headline at 1.8 percent but core at 2.3 percent. Because core measures do not include these volatile energy prices which have fallen by more than 20 percent from a year ago, this suggests that headline measures are being suppressed by transitory factors.

JOSEPH DRENNAN: Another potential cause for low inflation could be due to a changing of the Phillips curve relationship. As mentioned by Governor Brainard, the Phillips curve is flattening putting a greater weight on inflation expectations which may be becoming unanchored. As seen on slide 17, market based measures of inflation expectations have been trending downwards since mid-2018. This reduces the stimulative power of monetary policy through the Fisher equation.

SCARLETT BEKUS: I agree Joe, but surveys of inflation expectations are fairly stable. The University of Michigan survey of consumer inflation expectations is steady at around 2.8 percent. Also, the Atlanta Fed survey of business inflation expectations is steady at around 2 percent.

SEAN FREDA: So as shown on slide 18, despite inflation being below target, once transitory factors subside and previous rate cuts take effect, we believe headline PCE inflation will converge to the Federal Reserve's symmetric 2 percent target.

JOSEPH DRENNAN: In addition to its objectives of price stability and maximum sustainable employment, the Federal Reserve also has a third implicit mandate of financial stability. Financial stability is commonly broken down into four categories; asset evaluations, leverage in the financial sector, borrowing by nonfinancial businesses and households, and funding risks.

DYLAN SEALS: I'm personally concerned about financial stability because, as seen on slide 20, asset evaluations are moderately high. This can be seen through the cyclically adjusted price to earnings ratio which is currently at 31, compare it with its 40-year average of 22. This suggests an increased appetite for risk.

SCARLETT BEKUS: I'm also concerned Dylan, specifically about the growth in business debt, which has outpaced GDP for the past 10 years, and the non-financial corporate debt to GDP ratio is near record highs.

MARISSA KLEINBAUER: I don't think that's the reason to worry Scarlet, because although debt to GDP is high, as seen on slide 21, the interest coverage ratio is actually above pre-crisis levels.

SEAN FREDA: Also, leverage of the financial sector is low, tier one capital as a percentage of risk-weighted assets is 40 percent higher than the historical average. In addition, liquidity is robust, short-term debt at 2 percent of assets is 34 percent lower than the historical average. The high levels of capital and liquidity means that the financial system will be resilient if a downturn occurs.

JOSEPH DRENNAN: While we are confident in the current stability of the financial system, we remain mindful of the risks posed by high asset evaluations and growing business debt.

SCARLETT BEKUS: Now, let's consider financial conditions. To begin, both short and long-term rates are historically low levels.

MARISSA KLEINBAUER: As seen on slide 23, from May to October 2019, 10-year rates are below three-month rates. This is known as an inverted yield curve and has historically been a good predictor of a recession one year later. Based on this indicator, the New York Fed’s model gives a 29 percent chance of a recession in 2020.

DYLAN SEALS: However Marissa, the inverted yield curve is only a good predictor of recessions if it mainly reflects lower future short-term rates. But today, the low long-term yields reflect mainly negative term premium. This may reflect a higher chance of disinflation rather than inflation in the future.

SEAN FREDA: Also, as shown in slide 24, the BAA treasury spread has increased moderately since its post-recessionary low in 2018. This shows that investors need more compensation for the risk of lending to the private sector.

JOSEPH DRENNAN: That's true Sean. We can also see increased tightness in the current exchange value of the dollar which has risen 13 percent since early 2018. This reflects an increase in tariffs and America's divergence in monetary policy in comparison to the rest of the world.

SCARLETT BEKUS: However Joe, as seen on slide 25, we can observe that financial conditions are moderately accommodative when taking into account the federal funds rate in relation to r-star. That being said, John Williams, President of the Federal Reserve Bank of New York, has recently said that current estimates of r-star are lower today than at any point before the Great Recession.

DYLAN SEALS: In fact, most recent estimates as measured by the Laubach-Williams model, put r-star to be around 0.8 percent. This means as r-star continues to decline, our real effective federal funds rate of -0.4 percent will become less accommodative as the gap between the two rates closes.

MARISSA KLEINBAUER: This is very concerning to me because research by Kiley and Robert states that we will be at the zero lower bound 25 percent of the time in the future. According to former Chair Yellen, we need approximately 550 basis points of room to cut to fight a recession and right now we only have about 160 basis points before reaching the zero lower bound. We need to ensure that monetary policy has the tools necessary to stimulate the economy when this occurs. Therefore, as seen on slide 27, I believe we should communicate now that when we do reach the zero lower bound, we will implement temporary price level targeting as suggested by former Chair Bernanke.

JOSEPH DRENNAN: I agree Marissa, temporary price level targeting seeks to make up for past shortfalls of inflation and aims to average 2 percent over a specified period rather than just reach 2 percent. If we communicate that we won't raise interest rates until we average 2 percent, this will act as a form of forward guidance which can help set expectations for easier monetary policy.

SCARLETT BEKUS: Exactly Joe. This will keep inflation expectations at target over the medium term and allow monetary policy to be more stimulative through the Fisher equation. This will help mitigate declines in output and inflation and reduce the time we spend at the ZLB.

DYLAN SEALS: I would agree except according to Governor Brainard, this could cause inflation expectations to become too high during the makeup period because it requires an overshoot of inflation for an extended time.

SEAN FREDA: That’s a valid concern Dylan, which is why as shown on slide 28, I think we should do temporary price level targeting with a one-year look back as suggested by former Chair Bernanke. This type of temporary price level targeting only seeks to make up for inflation shortfalls from a year ago rather than from the whole period we got the ZLB. This will limit the initial overshoot of inflation, keeping inflation expectations anchored around the Federal Reserve’s symmetric 2 percent target.

MARISSA KLEINBAUER: I agree with more accommodative policy at the zero lower bound. However, the stance of monetary policy is only effective if the Federal Reserve is able to maintain control over its target range. As seen on slide 29, the effective federal funds rate spiked above the upper bound by five basis points in September, showing that reserves are not that ample when taking into account their distribution among banks.

SCARLETT BEKUS: That's true Marissa, and even though Chair Powell has recently announced that the Federal Reserve will address this issue by increasing the size of their balance sheet, this solution does not solve the problem of small banks not having access to reserves. Therefore, as seen on slide 30, I believe we should implement a standing repo facility, as suggested by Andolfatto and Ihrig, as a more permanent solution because it allows all banks access in the federal funds market.

SEAN FREDA: That's a good idea Scarlett. Banks will feel comfortable holding Treasury securities knowing that they can do a repo with the Fed at a specified price. This will decrease the volatility of the federal funds rate, keeping the EFFR within the Federal Reserve's control.

DYLAN SEALS: This would also reduce the demand for reserves and allow the Fed to operate with a minimally ample balance sheet which is a goal sign in their 2019 balance sheet normalization principles and plans. The standing repo facility along with temporary price level targeting with a one-year look back provides the Fed with an effective risk management framework to conduct monetary policy in the future.

MARISSA KLEINBAUER: I agree that the solution should be implemented. However, we still face other downside risks that must be addressed by our current framework. Inflation is below our 2 percent target and investment remains weak, should we consider the option of lowering rates by 25 basis points?

SCARLETT BEKUS: I don't think so. Considering the tight labor market and high asset valuations, I'm worried if our rate were to go any lower we could become too accommodative. It's too early to tell if our three previous rate cuts have had the desired effect because monetary policy acts on a one to two-year lag.

DYLAN SEALS: That's true Scarlett. That's why it's important to remain forward-looking. Shown on slide 31, under current policy by 2022, we project we’ll reach 2 percent PCE inflation, a 3.9 percent unemployment rate and 1.8 percent GDP growth as supported by the SEP forecast. Our forecast is based on continually strong job growth and sustained consumer demand.

JOSEPH DRENNAN: However, there are risks to this forecast, Dylan. Due to increase trade policy uncertainty and slowing global growth, the economy is currently experiencing increased downside risk. However, I believe the three previous rate cuts provide ample insurance against these risks, so I think we should maintain the current range.

MARISSA KLEINBAUER: I agree, Joe, we've already seen the stimulus play into the housing market, which has contributed to GDP for the first time in seven quarters, and I believe the stimulus will continue to affect other sectors of the economy.

SEAN FREDA: I also agree Marissa. As Chair Powell and Vice Chair Clarida both mentioned, monetary policy is currently in a good place. The unemployment rate is near 50-year low and job growth remains strong. Also, investment is still growing about a percentage point higher when excluding volatile energy investment.

DYLAN SEALS: Additionally, with business debt near record highs, a further rate cut could exacerbate this problem. Therefore, I believe our current stance is appropriate.

SCARLETT BEKUS: Reviewing our discussion thus far, our two options for monetary policy as seen on slide 32 are, A. lower the target range by 25 basis points or, B. maintain the current range at 1.5 percent to 1.75 percent. Our challenge today is to fulfill our dual mandate in a time of increased uncertainty. Therefore, as seen on the next slide, we as a committee agree to maintain the current range at 1.5 percent to 1.75 percent in conjunction with the implementation of a standing repo facility as well as announcing the framework for temporary price level targeting with a one-year look back at the zero lower bound. Thank you. We're now open for any questions you may have.

ANTULIO BOMFIM: Thanks very much. So we'll start with a couple of broader questions and then after those questions then we'll follow up with a-- dig a little deeper into some of the issues that you've all brought up. So as you know, the Federal Reserve has been conducting a review of its monetary policy strategy, tools and communication practices. This review has included a series of meetings, of events called Fed Listens events around the country, and which in turn have included getting feedback from community leaders on how Federal Reserve monetary policy decisions affect their constituencies. So with that in mind, here comes the first question which is the following; could you please 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?

SCARLETT BEKUS: Of course. So we can see that actually those with the low income bracket and low income individuals are actually those who feel an expansion at its latest moments. So we see that the Federal Reserve, when we've experienced a financial crisis, they actually kept rates at the zero lower bound for several years up until 2015 when we began raising rates again by a total of 225 basis points and this was extremely important for the Federal Reserve to make sure they had their monetary policy so low for so long because we do want to make sure that our low income individuals, who have the highest marginal propensity to consume, therefore can add more to GDP growth once the expansion does reach them. We saw that by keeping these rates lower it actually allowed them to feel the benefits of the expansion and allowed them to as well be pulled back into the labor market.

SEAN FREDA: Another way that the Federal Reserve policies affected the distribution of income is through large scale asset purchases, this mainly works by buying long-term Treasury's and agency's securities which decreases the term premium, so this decreases the long-term Treasury rate which increases investment, but it also works a lot to the wealth effect, this increases the value of bonds and stocks and, as we know, a lot of the owners of bonds and stocks tend to be more wealthier individuals, so just because of who owns the stocks and the bonds that are increasing in value this has some implications for possibly increasing the disparity of income.

MARISSA KLEINBAUER: Exactly, and also President Loretta Mester at a recent event in Brookings actually cited one of her experiences go into the Fed Listens event, actually finding out that many of the employers are finding that very hard to find workers and this can actually directly tie into the tight labor market and how the Federal Reserve is directly achieving their goal of maximum sustainable employment. We are currently seeing the unemployment rate at near 50-year low at 3.6 percent, so this tight labor market is very beneficial as my colleague said, especially to individuals who are typically finding it very hard to find jobs through this increased job matching and tight labor market, it is definitely benefiting the people as a whole.

THOMAS LUBIK: So, since we're already on a topic of labor markets, let's continue there a little bit. So as you pointed out during the recovery of-- the labor market has been very strong and we fit a 50-year low in the unemployment rate. At the same time, inflation hasn't increased as much towards our 2 percent target, so how would you explain the behavior of inflation over the last several years in light of these labor market developments and how it relates to the FOMC's inflation objective?

DYLAN SEALS: So the relationship between unemployment and inflation is what is known as the Phillips curve relationship, and we can see, as mentioned by Governor Brainard, the Phillips curve is flattening putting a greater weight on inflation expectations. So, what that means is because the Federal Reserve has done such a good job at announcing explicit nominal anchor of 2 percent inflation, market participants expect inflation to be 2 percent in the long-term. Therefore, instead of reacting to lagged inflation, as mentioned by Janet Yellen, they're more inclined to just react to what the current inflation expectation is of 2 percent, so they're not as reactive to the labor market as a whole.

However, there're also other structural changes we can see; research by Stock and Watson actually shows that if you take the cyclical sensitive parts of inflation, those are actually still very responsive to the Phillips curve and are changing with the current changes in the labor market. However, we have seen an expanding part of the, what, the total index that makes up inflation be uncyclical such as health care, or goods that are exported, they do not react as much to changes in the domestic labor market because there are other factors affecting those.

SCARLETT BEKUS: Exactly. We said there are some other factors that are pulling down inflation. So even though, as you've mentioned, through several different indicators we see signs of an extremely strong labor market, we can see that one of the reasons as cited by former Chair Yellen at a conference what is not up with inflation, she cited that one reason could be the increase in price discovery.

So we see due to the increase in e-commerce, consumers actually have a much greater ability to find lower prices because instead of going to a brick and mortar store for good they may need and just having to purchase what they see in front of them, they now have the ability to compare up to thousands of prices all at once through the internet, and so this allows consumers all over the country to actually purchase goods at what they perceive to be the lowest price possible. So this could be one reason why we're not seeing the tight labor market translate into inflation reaching our symmetric 2 percent target.

JOSEPH DRENNAN: Exactly, Scarlett. Another reason that we could potentially be seeing low inflation could actually be due to the rise of globalization in our current economy. So as cited by the IMF, globalization has caused a great increase in the amount of labor slack that's in the economy because in the event in which that for multinational firms need to hire domestic workers, instead of having to pay them higher wages they can instead outsource this labor to countries that have lower incomes, thus keeping down inflation because they will not have to incur a cost push inflation on their consumers in order to make up for these increase in wages and increases in unemployment.

MARISSA KLEINBAUER: Exactly, and just to bring it back to the second half of your question regarding what the FOMC should do in response to this, we did see the three previous rate cuts were made in respect to the persistently low inflation as cited by Chair Powell. However, we should always keep in mind that since the business marketplace is changing as both my colleagues cited, and in globalization and e-commerce, we should definitely be mindful that we could potentially face low inflation in the future. It actually plays into our policy recommendation of temporary price level targeting, if we're in a period of a recession and struggling to get inflation up.

However, in addition to this, the Federal Reserve should definitely consistently monitor the continuing developments in inflation, but as we mentioned in our presentation, need to be wary that transitory factors may be keeping this down, the Federal Reserve should not inherently react to these. So it is definitely something to keep in mind but, as we stated, there are other reasons outside of the FOMC’s control that could be causing low inflation.

THOMAS LUBIK: So you accept wages are going up with the tight labor market?

SCARLETT BEKUS: Yeah.

THOMAS LUBIK: Yet you don't think that's going to translate or hasn't translated so far onto higher prices? Is the gap or wage, wedge between prices and wages temporary? Permanent?, Structural? How do you want to argue that?

SEAN FREDA: So as Stock and Watson mentioned, the same paper that my colleague had mentioned, there's a possibility that we see a nonlinear linear Phillips curve over here, so what that could mean is, so currently wages are around 3 percent but inflation is still low. But once we get to levels about a percentage point or percentage and a half below the estimated natural rate of unemployment, that's when we tend to see inflation shoot up quite drastically. So at these extreme unemployment gaps, that is when we could see perhaps the nonlinearity nature of the Phillips curve as you mentioned, and then at that point we could see inflation raise excessively and this might be bad because then we have to increase interest rates excessively, this could actually cause a recession.

TOM KLITGAARD: But the Phillips curve might be easier seen as between wages and unemployment, right? So then you translate that to unemployment and prices because you're assuming the wage, the gap between wage inflation and price inflation is stable. Is it stable? Has it changed?

SCARLETT BEKUS: So we do see that though wages right now are growing about 0.5 percentage points above productivity, so that means that workers are being-- they are being compensated for a level above what their productivity meets. So I do believe that this will translate into inflation, which is why we as long as the SEP projects that we will see inflation reach its symmetric 2 percent target, it shows that this may take some time for this to happen because, as you mentioned, there may be a gap between this because even though we did to this tight labor market, we do see a wage inflation increasing. However, producers have been reluctant to increase their prices in order to sell more goods.

DYLAN SEALS: Exactly, and also we've seen that although the relationship between wages and unemployment is still strong, we see wages are just now catching up to productivity and they're actually going below productivity last year. At the same point, as by mentioned by Governor Clarida, productivity in the first half of the year was actually higher than we have seen over the long run. It was estimated to be about 2 percent. So even though this is a volatile number, we can see that if productivity was actually higher in the first half of this year, then this increase in wages might just be these laborers getting compensated for the work that they're actually doing and that extra output they're producing. So this could be one reason why we're not necessarily seeing the wage Phillips curve translating into the price Phillips curve.

SEAN FREDA: Just to build upon my colleague’s point, from about 2013 to about recently, about 2018, we actually saw that wages were growing below productivity. Now only recently we see that the wage growth is our productivity growth, but the wage growth is still below the level of productivity. So once the wage growth gets back to that level to make up for all the times that the wages were below productivity, then at that point is where we would expect to see inflationary pressures.

THOMAS LUBIK: So you're talking about labor share growing without that being translated into higher inflation?

SEAN FREDA: Yeah, and it's only once that we see that the level of wages catches up to the level of productivity because it's been below productivity for so long, at that point it’s where we expect to see inflationary pressures.

THOMAS LUBIK: What would happen to profits?

SEAN FREDA: Profits would have to decrease or they'd have to increase prices; those are the two options.

DYLAN SEALS: Exactly, and just going off of profits, we've seen that over the past couple years businesses have had higher profit margins than they haven't had had in the past. So although we are seeing higher wages, we can see that perhaps businesses are not as willing to increase their prices because they're just willing to let the increase in wages eat into their profit margins.

ANTULIO BOMFIM: So you have an outlook for the economy that’s pretty benign. As we know, I mean, we can all be wrong, and let's think about a scenario where we do turn out to be wrong and we find ourselves then with a very weak economy with rates already at zero, you mentioned the temporary price level targeting, but I wanted to ask your views on something else related to that particular scenario, cutting nominal rates into negative territory, what would be the costs and the benefits of doing that if we do find ourselves in a scenario like the one I just described?

JOSEPH DRENNAN: So when looking at the possibility of negative interest rates in the United States, it's important to note the sort of operational difficulties that come with actually implementing them here. As mentioned by Ben Bernanke in his Brookings blog about negative interest rates, there's actually the way that negative interest rates would be applied in the U.S. and the way that they're being applied in the EU is that interest on excess reserves would have to be charged at a negative rate.

But because of the legal system that we have in the United States in which Federal Home Loan Banks and GSEs don't earn IOER, this could cause a potential issue as a result that financial institutions could actually just park their reserves at Federal Home Loan Banks, keeping the effective lower bound of effectively at 0 percent. So in order for us to actually look into implementing negative interest rates, there would have to be congressional change which actually would be a very long process as Congress has very long internal lags when it comes to policymaking.

MARISSA KLEINBAUER: Exactly, we can actually look at where negative interest rate policy is being implemented in other parts of the world. For example, if you look at the Bank of Japan, they started implementing negative interest rates in January of 2016 to combat their persistently low inflation in order to provide more stimulation within the economy. However, they have not seen inflation actually tick up to their 2 percent target the same that the US has. So we need to make sure we're constantly gathering more data that these negative interest rates could actually produce higher inflation and therefore more stimulation through the Fisher equation because higher inflation expectations will result in further accommodative policy when we're already at the zero lower bound.

SEAN FREDA: Yeah, and as mentioned, the most recent Financial Stability Report lower interest rates tend to decrease net interest margins and this could decrease bank profitability, and a research by Summers, Eggertsson, and others at the Bank of Norway, they show using Swiss level data that when interest rates go into negative territory, the deposit rate stays fixed at zero because if deposits were given negative rates, they would just take the money out the bank.

So because the deposit rate is fixed at zero, but the interest rate that the bank receives goes down, this compresses the net interest margin, it could actually have negative effects in the bank lending channel, so as banks make less loans because their net interest margin decreases.

This is a one of the main transmission mechanism of monetary policy and this could have a lot of negative effects on monetary policy.

TOM KLITGAARD: You mentioned several times that monetary policy can be stimulative through the Fisher equation, so I'm not quite sure I fully understand the chain of causation here. So can you lead me through that?

SCARLETT BEKUS: Of course, so we know that the Fisher equation is real rates equals nominal rates minus inflation expectations, and so we know that if we have our inflation expectations anchored at our 2 percent symmetric target, and we have our nominal rate set at 0 percent, if we are believing we have a zero lower bound, that means that we can allow through our inflation expectations at 2 percent, we can then have negative 2 percent real rates.

We know that the gap between r-star which is the neutral rate of interest, and is the equilibrium point between the demand for investment and the supply of savings at full employment, the gap between r-star and the real effective federal funds rate is what determines how accommodative or contractionary monetary policy is. Since the most recent Laubach-Williams estimates of r-star are at around 0.8 percent. If we were at the zero lower bound, and we had this, the Fisher equation of allowing us to having negative 2 percent real rates, then that would allow us to be stimulative.

ANTULIO BOMFIM: Thank you very much.

[Applause]