CONNECTING POLICY WITH FRONTIER RESEARCH

Economist Interviews from the 38th Annual
Federal Reserve Bank of St. Louis Fall Conference

Oct. 10-11, 2013

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MESSAGE FROM THE PRESIDENT

At the Federal Reserve Bank of St. Louis, we have long tried to provide perspectives on whether the policies adopted in the past still serve us well today and whether recent developments at the frontier of research can be fruitfully applied to improve policy. This agenda has become especially important in the past few years, as the Fed and central banks around the world have struggled to devise appropriate policy responses to the current macroeconomic situation.

In polite economist society, there has long been a distinction between what is known as "frontier" research and what is sometimes called "policy" research. In my view, this has been and continues to be a false dichotomy. There is no such distinction: "Policy" and "frontier" research are two sides of the same coin. We need to understand both how fundamental mechanisms in the economy operate as well as how current data can be interpreted in terms of fundamental theory.

In short, advanced economic theory has to be made more relevant for actual policy, and actual policy has to understand and embrace the difficult ideas advanced in the theoretical world. The St. Louis Fed has long been a leader in supporting research at the intersection of economic theory and economic policy.

At our 2013 fall conference, we were fortunate to have an outstanding group of speakers whose research expands our understanding of key contemporary issues in macroeconomics. The conference covered a wide range of topics: from the labor market to financial markets, from macroeconomic dynamics and monetary policy to the lifecycle behavior of households. The St. Louis Fed was proud to provide this forum for discussion and analysis of the leading issues of the day.

In addition to finding ways to connect the research world with the policy world, the St. Louis Fed strives to connect academic research with a nonacademic audience. Our goal is to explain in lay terms why the research is important, what implications it has for policy and what it means for people and the economy overall.

This volume brings the main findings of the research presented during the conference to a wider audience. We hope that you find the material informative and that it will serve as a resource on important macroeconomic and policy issues.

James Bullard
President and CEO
Federal Reserve Bank of St. Louis

MESSAGE FROM THE RESEARCH DIRECTOR

The Research division of the Federal Reserve Bank of St. Louis has long been renowned for its cutting-edge research, policy analysis and provision of economic information to the public. This tradition dates back to the 1960s, when Homer Jones was the Bank's research director. At that time, the St. Louis Fed took a very contrarian stance on how monetary policy should be conducted, and we backed that stance with top-flight economic research.

We have found that the best policy advice comes from economists who are at the frontier of economic thinking. Academic economists, by definition, work at that level. They are also vocal in their views about policy and are willing to criticize actions taken by the Federal Open Market Committee, the main policymaking body of the Federal Reserve System. To evaluate these academics' arguments and make use of good ideas and research for policy, the Fed has its own economists, who are also working at the frontier. A healthy competition of ideas allows the best ideas and policies to win in the end.

Academic research is valuable, because the thinking about economic issues is unrestricted. It is proactive in that it often focuses on interesting issues long before they come to the attention of policymakers.

Academic research is rigorously vetted before publication in peer-reviewed journals. It is forged in the fires of debate and criticism. Academic research also takes the form of program evaluation (economic autopsies) of major economic events. It can take years to analyze and understand what happened and what policies or regulations need to be changed.

At the St. Louis Fed, we continually look for ways to connect frontier research with policy. Our annual fall conference, which brings together leading academics and economists, does just that. The discussions that follow highlight some of the key contributions of the papers presented at the 2013 fall conference.

Christopher J. Waller
Senior Vice President and Research Director
Federal Reserve Bank of St. Louis

The Federal Reserve Bank of St. Louis hosted its 38th Annual Fall Conference on Oct. 10-11, 2013. **David Andolfatto**, a vice president in the Research division, sat down with each of the conference presenters and discussed their work in plain English. The content in this conference volume is based on those interviews. All interviews have been edited for clarity and length.

For the full conference agenda, please see http://research.stlouisfed.org/conferences/annual/38th.html.

The views expressed in this volume are those of the individuals presenting them and do not necessarily reflect the views of the Federal Reserve Bank of St. Louis or the Federal Reserve System.

ANDREW ATKESON

Stanley M. Zimmerman Professor of Economics and Finance, University of California, Los Angeles

Paper: "Measuring the Financial Soundness of U.S. Firms, 1926–2012" (with Andrea Eisfeldt and Pierre-Olivier Weill)

ANDOLFATTO

Describe kind of the set of questions you're asking in the paper, what your findings are, and what you mean by financial soundness.

ATKESON

Clearly in this last financial crisis, I would say many firms looked like they were financially distressed. What we're trying to do is systematically measure the level of financial distress that firms are facing, then go back through history and ask questions like: How many times has this happened in the past?

The comparison we find most interesting is between 2008 and the Great Depression. There are a lot of theories about the importance of financial distress in business cycles and macroeconomic fluctuations, not only in the Great Depression and 2008, but in other postwar recessions, and we hope to make a contribution in measurement to kind of see how important this factor might have been.

So we have to first start with how we define financial soundness. We're taking a perspective that is rooted in 30-year-old models of the credit risk that firms present to a creditor. And, so, if you're lending to a firm and you're thinking about the credit risk it presents, according to the kind of standard models in corporate finance, you think about two main features of the firm: the leverage it already has and the risk in the firm's underlying line of business in the assets that it has. And if you're evaluating credit risk, you'll be inclined to say that a firm that has a relatively safe line of business can safely sustain a high level of leverage. A firm that has a very risky line of business, you can't lend it very much for fear it will default soon. What we're looking to measure firm by firm for every publicly traded firm in the United States over this time period is their leverage adjusted for the degree of business risk.

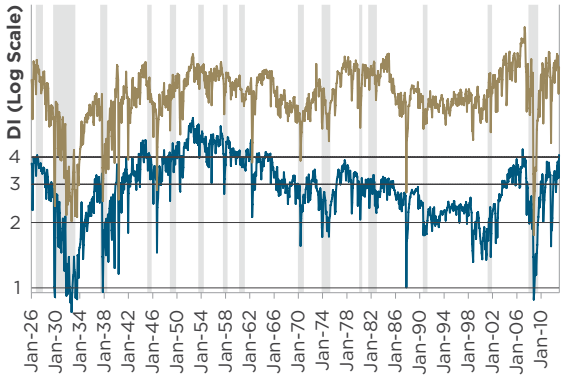
We argue this is something that's done. Moody's Analytics does it. They have a product they sell called Expected Default Frequency. The academic literature does this. But they do it typically with a combination of a sophisticated model and a lot of accounting data. We're trying to find a shortcut so we can go all the way back to the Great Depression, when you don't have accounting data and maybe you're not so sure of your sophisticated model.

Our primary innovation is to say that you can actually do this by looking at the equity volatility of a firm. Once we take that step, we can use the statistic (the inverse of a firm's equity volatility), compute it every month for all the publicly traded firms in the United States, go monthly back to 1926 and ask what the cross-section distribution of leverage adjusted for asset volatility looks like over this whole time period.

The main findings that we have, I would say, are really three. One is there are three what we called distinctive crises in this time period in U.S. history that are roughly the same magnitude: the Great Depression, '32/'33; again in the fall of 1937, which is the second main recession in the Depression; and then 2008.

So when Ben Bernanke says that his impression was that the economy, the financial crisis of 2008, was as bad as the Great Depression, we are finding that. We're finding also, though, that this really is not that big a factor in the other postwar U.S. business cycles. It's not nearly as big as what happens in these three episodes. So our first finding is that something very distinctive is happening in what we would call these kinds of financial crisis-driven recessions.

Deep insolvency crises: median firm hits 1
Broad insolvency crises: 95th perc. hits 2



— 95th percentile
— Median

Notes: DI is Distance to Insolvency. Vertical bars indicate recessions.

The main thing that we're finding—at least it's what the stock market appears to be perceiving—is that the risk of the underlying businesses dramatically increased. In 2008, we have accounting measures of firms' leverage so we can see how much that moved, and we can see although, obviously the S&P 500 fell a lot, it didn't move nearly as much as the risk in firms' underlying businesses.

The second main finding has to do with the main driver of these movements in firms' financial soundness. The standard stories that macroeconomists and many people tell have to do with a combination of creditors getting lax and people building up leverage, then something happening so asset values fall, housing values fall and the stock market falls. And because of the fall in the stock market, house values or the values of underlying businesses, firms all of a sudden look very levered. That's the standard story. And then we're in this situation where the firms look financially very fragile because they raised their borrowing, an asset boom occurs and then the asset prices go down, and now these firms are in trouble.

We're not finding that that's what happened in the Depression or in 2008. The main thing that we're finding—at least it's what the stock market appears to be perceiving—is that the risk of the underlying businesses dramatically increased. In 2008, we have accounting measures of firms' leverage so we can see how much that moved, and we can see although, obviously the S&P 500 fell a lot, it didn't move nearly as much as the risk in firms' underlying businesses.

Even if you look at firms that didn't have any long-term debt, they also look like they're getting in financial distress. And you might ask: How can a firm that doesn't have debt get in distress? I like to use the example of BlackBerry, RIM, right now. If you look at RIM's income statements, they have a lot of fixed costs. They have very high sales and general operating expenses and a very high R&D budget. So the way that they're losing money is that they've got this fixed cost that acts economically as if they had leverage, and so we call that operating leverage. Firms with operating leverage or financial leverage will get in distress either way when the risk of their underlying business goes up.

In the recent crisis, changes in leverage account for about 20 percent of the deterioration in the distribution across firms of their financial soundness. But the majority of the move, about 80 percent of the move, we find is due to changes in underlying business risk.

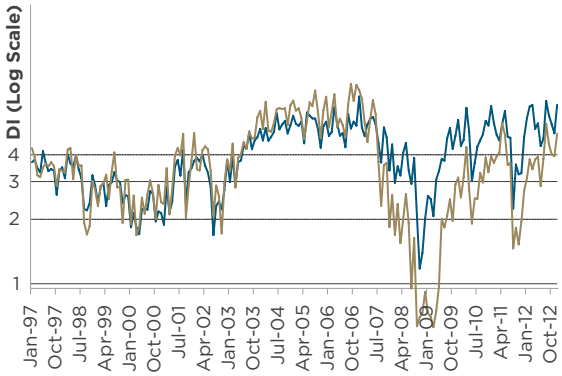
The third main finding is probably the most controversial. With our method, we can ask what was going on with the financial soundness of financial firms, particularly big banks, and with the financial soundness of nonfinancial firms. And we can compare them.

One thing that's certainly talked about a great deal is that in the U.S. we went through a period of deregulation—going back to the '80s—of financial firms. This allowed these firms to take on more leverage relative to the risks that they were taking. This process accelerated with deregulation in the late 1990s. And the story a lot of people tell about this crisis—Lehman, etc.—is that these firms levered up to a dangerous extent by 2006 or 2007.

And what we're finding from data on their equity, from their bond spreads, from their credit default swap spreads is that the market's perception was that even though these firms were levering up, the underlying business risk was reducing so that their credit risk was actually going down. And by the time we get to 2007, the market is saying they're at a level of financial safety that is almost a historical high. So it's exactly the opposite of what we're now saying ex post. And then starting right in August of 2007, bad things began to happen.

But if you compare large financial firms—particularly even the banks that failed or the ones that are the stress-test banks—and you go back to, say, 1962 to July of 2007, the financial soundness of these large financial firms tracks that of, say, the 50 largest nonfinancial firms. They're dead on each other. And it raises in our minds the question: Are the stories that we tell about the impact of changes in financial regulation on financial firms' risk taking actually there in the data? We're not finding that.

GBLFIs and Top 50 Nonfinancials DI 1997-2012



— Top 50 Nonfinancials
— GBLFIs (Government Backed Large Financial Institutions)
Note: DI is Distance to Insolvency.

ANDOLFATTO

Does your theory have anything to say about the desirability of the Fed's emergency lending facility and whether it should be targeted?

ATKESON

Personally, I'm beginning to try to think of financial regulation and the Fed's role in the following context. In California, we face a risk, very infrequent, that a large earthquake will occur. And when that happens, we don't want all the buildings to fall down and kill everybody. So, we put in building codes that in normal times look like they're very severe. And a builder might say this is very expensive for me to comply with these building codes for an event that's going to come every 30, 40 years. But we go ahead with that because we know the event can be very bad. We're seeing these financial crises as being like earthquakes. You can't really predict them. We had two in the Great Depression and one in 2008, so we had three in a century. And when they come, I'll put it this way, all the buildings fall down.

I would see the role of the Fed or the banking regulators as coming in and saying: Can we design building codes that for banks look excessive perhaps in normal times? But the stress test we want to put on the banks is a credit event that's similar to what happened in these three episodes. Bankers will complain the same way I'm sure builders in California complain. But you have to say we're waiting for these very large, unpredictable events. And so I would be curious how that goes if you were to embrace that view of regulation and try it out.

ANDOLFATTO

It's interesting that you used the analogy of earthquakes, which I guess I would take to be acts of nature. Do you believe that this is just the way it is or that these so-called earthquakes are somehow a byproduct of the underlying economic institutions? Or are they just unavoidable consequences of people interacting with each other?

ATKESON

I can't answer that. The reason I emphasize earthquakes is that I would say a lot of what I read about the thrust of financial regulation, even in the Dodd-Frank Act, takes the perspective that the regulators should try to foresee a crisis or a risk building up somewhere and take action in advance to deal with that risk. When you deal with earthquakes and building codes, you accept that you're not going to foresee it. It's going to happen sometime, you don't know when. And so you don't invest a lot of resources in trying to predict a crisis. You invest your resources in figuring out how we can design buildings that don't fall down.

It's a larger, at this stage perhaps, metaphysical question as to whether it's an act of nature or something that could be dealt with. But I just meant in kind of a more practical way. So the example I would give is Canada's banks. If you look at them with this measure and other market measures, they were much healthier than U.S. banks. And so you could ask: What are the Canadians doing with regulation that we're not doing, and could we use some of their ideas to strengthen our banking system?

The paper's main takeaways, according to Atkeson:

- Mechanically, what went on in 2008 and in the Great Depression was what we call kind of an explosion of the market's perception of risk.
- And so if you're a banker or if you're someone regulating a bank, you should think in terms of what will happen to me as a banker if all of my credits get downgraded by eight notches and how will my institution survive.
- That is really kind of fundamentally what you're facing in a crisis as a banker because you've lent all these credit risks. And, as a regulator, you can work with a banker to ask that question.
- I think that's a very different stress test than what's currently being administered.
- Right now, the stress test is you should think in terms of unemployment goes to 8 percent or GDP falls by a certain amount. They're saying what's the implication of that for credit? Usually not much. In a crisis, it's a very distinctive event. Every firm all of a sudden looks like a much riskier credit bet.

To watch the interviews from the conference, visit **www.stlousifed.org/publications/Connecting-Policy-with-Frontier-Research/**.

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MARKUS BRUNNERMEIER

Edwards S. Sanford Professor of Economics, Princeton University

Paper: "The I Theory of Money"
(with Yuliy Sannikov)

ANDOLFATTO
Tell us a little bit about the question that you're pursuing in this paper.

BRUNNERMEIER
Probably I should start by revealing what the "I" stands for. The "I" stands for inside money or intermediation. So it's all about reviving the "money and banking" field using modern tools. It became standard to treat financial stability and price stability separately: Bank supervisors take care of financial stability, and central banks take care of price stability. This paper shows how those two concepts are interlinked.

ANDOLFATTO
So what are the main findings of your research?

BRUNNERMEIER
This line of research is about the interaction between different stability concepts: financial stability, price stability and fiscal debt sustainability. The paper makes the case that credit and money created by the financial sector are key in understanding the amplification mechanism. One main finding is that monetary policy can avoid adverse wealth redistribution due to amplification effects and thereby affects risk premia. After a negative shock, banks try to shrink their balance sheets. This has two effects—one on the asset side of the balance sheet and one on the liability side of the balance sheet. On the asset side, banks cut back on extending new loans and try to fire-sell assets. With it the prices of assets go down, which hits banks' equity. Equally important, by shrinking the balance sheet, banks also reduce their liabilities, i.e., they create less inside money. So total money supply in the economy goes down. A decline in overall money supply causes deflationary pressure. Lower inflation hurts bankers' equity further because the real value of their liabilities rises.

ANDOLFATTO
This sort of story, it's a familiar theme I think in the history of economic thought. I think Irving Fisher's debt deflation theory rings a bit of that, and I'm aware of other people who have written here and there about the subject. Can you elaborate on what your paper does a little bit different? Are there any surprising results that these other authors have missed?

BRUNNERMEIER
Indeed it's related to earlier research. In particular, to the Fisher deflation spiral. It's also related to Friedman and Schwartz who stress the decline of money supply during the Great Depression in the 1930s as banks went bankrupt. We combine the money view and the credit view within a single framework. More importantly, we go beyond a stock-flow analysis. Self-generated endogenous risk and risk premia play a major role in our approach.

So what do I mean by money view versus credit view? If you follow the money view, emphasized by Friedman and Schwartz, you try to offset the deflationary pressure that arises from financial instability. By doing so, you help the banks because they would lose out from this deflation. If you follow the credit view, which was, among others, pushed by Jim Tobin, you would like to restore the total credit flow to the real economy. So you try not only to offset the deflationary spiral, a la Fisher, but also the liquidity spiral on the asset side of banks' balance sheets. Banks' behavior is to a large extent governed by risk, and not only by the risk-free interest rate.

ANDOLFATTO
Imagine a policymaker was armed with either the Friedman and Schwartz model or the competing view, the Tobin view. Do you think that the policymaker might misjudge how to optimally intervene in a time of crisis without your comprehensive view of the way these things interact?

BRUNNERMEIER
To answer this question, I have to stress one distinguishing feature that I didn't highlight so far. Our analysis suggests a "bottleneck economic perspective." As a monetary policymaker you have to ask yourself: Where is the bottleneck? Which sector is financially impaired? Can monetary policy be used to address these financial impairments? If so, does it reduce overall risk?

Typically, the financial sector is always hit by a financial crisis, but other sectors are, too. For example, in Japan the corporate sector suffered from a debt-overhang problem in the 1990s when the two lost decades started. So you would like to conduct some ex-post monetary policy that helps the corporate sector. In contrast in the U.S. now, parts of

the household sector are overly indebted. In that case, one would like to support the mortgage market—and with it the housing market—in order to repair the balance sheets of the certain households.

ANDOLFATTO

You're not suggesting, for example, that the Fed should explicitly target certain hard-hit sectors of the economy. You're suggesting that the policies that they undertake naturally in a crisis—lowering the interest rate, quantitative easing—will naturally affect or help the most distressed sectors? What would be an example of a Fed policy in the present context that would, say, help the household sector?

BRUNNERMEIER

Isn't this what the Fed is intuitively doing? The Fed's buying of mortgage-backed securities targets the housing market, which helps the household sector. In contrast, the corporate sector is not benefitting so much from that. Indeed, the Fed is concerned that the corporate bond market is trading at excessively high levels.

ANDOLFATTO

So the present Fed policy of purchasing these mortgage-backed securities is, in fact, somewhat justified by your theoretical approach here?

BRUNNERMEIER

It is to some extent justified, even though there is a lot of redistribution going on toward households who don't really need it. So it's probably to some extent not targeted enough. The problem is, the more you target certain sectors, the bigger the moral hazard problem becomes.

ANDOLFATTO

Moral hazard, can you explain that?

BRUNNERMEIER

Moral hazard means that people distort their behavior in an undesirable manner. If you know whenever something goes wrong the Fed will jump in and help you out, then you will not behave prudently anymore. You just buy, buy more expensive houses and drive up house prices. So, as a government or as the Fed, you can't help out too much because otherwise you depress risk premia in a boom phase too much and sow the seeds for the next crisis.

In this analysis, we can distinguish between two forms of risk. One is exogenous risk, risk which comes from outside because fundamentally certain projects are risky, and endogenous risk, risk which is created within the system, so it's self-generated risk. It is this self-generated risk that leads to redistributions. The Fed's aim should be to reduce the self-generated risk in the system due to amplification.

ANDOLFATTO

So there's a little bit of a tradeoff here, to trade off these bad incentive effects owing to this moral hazard effect versus the insurance effect of recapitalizing the household sector, in this case that was really quite shocked—the drop in the real estate prices, these distressed homeowners with the mortgages that are constraining their spending habits.

BRUNNERMEIER

Yes.

ANDOLFATTO

You speak as if this is a policy that the Federal Reserve of the United States or indeed in general central banks around the world might wish to undertake. But the idea of redistributing wealth in the economy is a politically sensitive issue when it comes to a central bank, especially the U.S. Federal Reserve. This sounds like it's a job that at least in principle is ideally suited for the fiscal authority. There's a body of elected representatives and then the fiscal authority redistributes wealth all the time. This is partly what their job is to do. The Fed, to the extent that it likes to maintain independence and be politically detached, refrains from overt acts of redistributing wealth. Is there some reason for why you believe realistically the Fed should be doing this job as opposed to, say, elected members of Congress?

BRUNNERMEIER

I would distinguish between actively redistributing wealth and stopping redistribution that arises from inaction. I don't think the Fed should get into the business of actively redistributing wealth. However, the Fed should not repeat its mistakes from the Great Depression: By not doing enough, large redistribution occurred, which ultimately led to an overall wealth destruction. The aim is to switch off this redistribution rather than actively doing some redistribution. This reduces risk premia and endogenous risk and thereby stimulates the economy.

ANDOLFATTO

So the Fed is there to prevent an unintended redistribution of wealth that if it was left untended would actually have adverse macroeconomic consequences, potentially adversely affect the economy as a whole?

BRUNNERMEIER

Exactly. It's not a zero sum game. It could be that everybody's worse off if the Fed is not intervening, like in the Great Depression.

ANDOLFATTO

You alluded to a notion of an economy where, if in a time of relative tranquility like during the Great Moderation, the overall risk exposure to the economy may not decline because private actors in the economy—banks, financial managers, whatever—might expose themselves naturally to more risk. They become more tolerant of risk so that the overall risk in the economy might not diminish. Elaborate on that a bit, if I've characterized it correctly or not.

BRUNNERMEIER

In this analysis, we can distinguish between two forms of risk. One is exogenous risk, risk which comes from outside because fundamentally certain projects are risky, and endogenous risk, risk which is created within the system, so it's self-generated risk. It is this self-generated risk that leads to redistributions. The Fed's aim should be to reduce the self-generated risk in the system due to amplification.

ANDOLFATTO

Implicit in the statement you just made was the idea that, left to its own devices, the free market economy would generate excessive amounts of risk.

BRUNNERMEIER

That's correct. This is one surprising result we found in our formal analysis. We call it the "volatility paradox." As one lowers exogenous risk, the endogenous risk doesn't decline. Even as exogenous fundamental risk vanishes, endogenous self-generated risk remains high.

ANDOLFATTO

But why can we not rely on the private sector to generate just the right amount of risk? Surely zero risk is also not desirable because there are tradeoffs.

BRUNNERMEIER

Markets are not perfect. The problem is excess liquidity mismatch since long-term risky projects with low market liquidity are financed with short-term debt. In an incomplete markets setting, each individual market participant does not internalize the pecuniary externalities he imposes on others when he levers up more.

ANDOLFATTO

What is causing the banks to overexpose themselves to this type of risk?

BRUNNERMEIER

It is crucial for a functioning economy that the financial sector take on some risk, some fundamental exogenous risk, but one should limit the endogenous risk which is self-generated risk in the system. The latter results from the fact that banks don't fully internalize that their levered risk taking has negative repercussions on others as well. So for example, when the banks lever up too much, they will be forced to de-lever after a large negative shock. They will try to shrink their balance sheet. This depresses the asset prices, which has some negative repercussions on other banks, say you. Importantly, as each individual bank builds up leverage in good times, it doesn't take fully into account the negative externalities in times of crisis on others. These pecuniary externalities lead to inefficiencies in an incomplete markets setting.

ANDOLFATTO

Would this be an argument perhaps for these banks to coalesce, to conglomerate and form one big bank?

BRUNNERMEIER

To some extent you see it in Canada. In Canada you have very few banks, and they didn't shrink their balance sheet so dramatically. In the U.S., you have a competing banking landscape that shrinks the balance sheets much more dramatically. But I would not argue that there should be a collusion among the banks. This comes with severe additional side effects.

The paper's main takeaways, according to Brunnermeier:

- The key takeaway of the paper is essentially that before the crisis we have three stability concepts: financial stability, bank regulators should take care of it; price stability, central banks should take care of it; and fiscal debt sustainability, that it government can pay back its debt, the government should take care of this. And we thought we could treat them independently and in silos.
- This analysis shows that these three stability concepts are highly interconnected.
- Monetary policy can avoid wealth redistribution that is driven by amplification effects and thereby reduce overall risk premia in times of crises.
- Independence for central banks means to be protected from the other parts because there might be some financial dominance argument where the banking sector might make it hard for the Fed to control inflation.

To watch the interviews from the conference, visit **www.stlousifed.org/publications/Connecting-Policy-with-Frontier-Research/**.

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LAWRENCE CHRISTIANO

Alfred W. Chase Chair in Business Institutions, Northwestern University

Paper: "Leverage Restrictions in a Business Cycle Model" (with Daisuke Ikeda)

ANDOLFATTO
Would you like to give us the rundown on your paper?

CHRISTIANO
Well, one of the many things that we learned as a result of this recent crisis is that the banks can be a problem in the economy. Before 2008, 2007, most people thought that all banks are rock solid and that if we're looking for vulnerabilities in the economy, the banks are not part of the picture. But that changed with 2008. And to think about this more, you have to think about what banks do. And so what they do is they borrow short term and they lend long term, and there's something inherently dangerous about that because if short-term interest rates go up a lot, then the banks could be caught, actually could go into bankruptcy. Because the banking system is a lot like the air that we breathe, in the economy if the banks go down, we're not going to be breathing any air. The whole economy will go down.

Virtually every relationship in the economy is mediated somehow by a bank. If you're working for a firm, your pay is going to be transferred to you from that firm by a bank. If you buy something, a bank's involved. A bank is involved everywhere in every economic relationship. And so if we see that the banks are getting risky and vulnerable to going out of business, then we really have to be concerned. Now, as I said, up until recently no one was worried about stuff like this. But people have become increasingly concerned about this possible vulnerability.

So that brings me to this issue about leverage. Leverage has to do with how much banks borrow relative to what they have. And obviously the more a bank borrows, just like an ordinary person, the more they're at risk of being caught short. And so there's been a lot of thinking about how it is that maybe banks borrow more than is good for society as a whole and how we should perhaps rein them in. And this reining in is called leverage restriction. So the question is, from a policy point of view, what kind of leverage restriction should we place on banks? And the answer is complicated, because it has to do with what's healthy for the economy as a whole, which means you have to understand exactly how the banks kind of work in the economy as a whole.

For example, in a recession, there may not be enough credit flowing to the economy, and we may want to take that into account when we restrict how much borrowing banks do. We may be willing to tolerate a little bit of riskiness in the banks because there's a benefit to credit flowing in a recession perhaps. And so to think about what the right amount of restriction on banks should be, we have to balance off the riskiness in the banks on the one hand with the desire to provide a lot of credit to the economy. The fact that the answer to the question—how much leverage restrictions we should have on banks—involves thinking about the economy as a whole, makes it a very complicated problem and requires that we adopt a global perspective. We have to think about the economy as a whole, and that's what gets us to models of the economy as a whole. And the paper that I'm talking about today is such a model.

ANDOLFATTO
Why in your view can the free market not be relied on to generate the correct amount of leverage? I mean, the title suggests that there's a propensity for the private market to overleverage, overexpose?

CHRISTIANO
If anybody is to think about leverage restrictions, they had better do it in a framework where such things are desirable. If I want to think about how many umbrellas we ought to build, it should be in a world where we take into account that there can be rain. And similarly, in the case of the thinking about leverage restrictions, we really need to do it in an environment where we put our fingers on exactly what it is that would make the banking system issue too much leverage if there were no regulation at all.

And so in economics we have many examples of how it is that markets might break down. The obvious example is pollution. If a firm generates pollution when it's producing and no one forces a cost on the firm for that, then we can expect too much of that activity to be happening. So in this paper, for example, we take a very particular position on what it is about the banks that leads them to issue, in the absence of regulation, too much debt, and that's

what people call, in fancy words, financial friction. The idea is that the job of banks is to go out and find good lending opportunities, but that involves efforts that are not observable to people, and that's what gives rise to the market not being necessarily able to deliver the best outcomes.

We have a number of examples of this. You know, for example, health care is much in the news these days. As an example, for various interesting reasons that have colorful names like the death spiral, we have various discussions about how wide is it the market might not generate the right amount of health care. And similar examples are used to think about why banks in an unregulated market might issue too much debt.

We've been trying to think what kind of a framework would be useful for thinking about this. And, in particular, we're interested in answering the question: What kind of framework has the property that you would have the banks issuing too much leverage? And then we're asking more related questions like: Does this framework that we have in some loose sense look like the data? But in terms of really digging in yet, we're very hopeful that we can use this model to do that.

ANDOLFATTO

When you say look at the data and when you use the term banks, do you mean literally banks? Or do you think more broadly to include those activities that occurred in the so-called shadow banking system?

CHRISTIANO

Not all of them, but a lot of the problems that we talk about are not so big in the context of the commercial banking system. So we really do have in mind the shadow banking system when we're talking about that stuff. And that's exactly the place that was thought to be the source of the problem in 2008. In actual fact, if you look at the commercial banks in 2008, they look beautiful. It was actually the rest of the banking system that was performing very badly and doing damage to the economy. But it was hard to see that because, since they're not heavily regulated, there's not much data on them, and so you didn't see them very much.

ANDOLFATTO

Well, the commercial banks had the federal deposit insurance as well to protect the downside.

CHRISTIANO

And the deposit insurance to a large extent gets rid of the problems that we're talking about, although, not entirely. Because there are stockholders who look like ordinary lenders in the real world, namely people who hold preferred stock. People who hold preferred stock, from the point of view of our model, look like ordinary lenders.

ANDOLFATTO

Does your model have anything to say then in terms of the most recent crisis? If we had had more severe leverage restrictions in place, would much of the worst impact of the most recent recession have been avoided or mitigated in some manner?

CHRISTIANO

One of the problems that the model highlights is that if banks have too little net worth, if the assets that belong to the bank get too small, then that interferes with the ability of the bank to do its job, which is to send funds from savers to investors. And in the case of the 2008 crisis, what it looks like is that what made 2008 actually different from, say, 2001 is precisely that the wealth of the banks themselves went down with the collapse in housing prices. This is different from 2001, for example, where we had the dot-com bust, and banks were not heavily invested in that so they did not suffer a big reduction in their own resources. But 2008 is very different because they were heavily invested in houses. That is, they had bought a lot of mortgage-backed securities, those dropped in value, and that interfered with their ability to conduct their business: to move the funds from savers to investors.

ANDOLFATTO

What would have been the costs, if any, of having these leverage restrictions in place? Can you quantify it in terms of would it have reduced growth over the period?

CHRISTIANO

In our analysis, the leverage restrictions actually make the economy stronger. It's like pollution. So from a point of view of the individual bank, they don't internalize all the costs of issuing all this debt.

And actually for an individual bank there are not big costs. But if they all do that simultaneously, it does damage to the economy. That's why the market doesn't work because the banks are not getting all the right signals themselves, just like the polluter is not. There's no market mechanism for a polluter to get a signal about what costs they're imposing on other people. Similarly, in an unregulated market, banks are not getting all the signals about the consequences of all the borrowing that they're doing. There's no market mechanism for warning them that they're issuing too much debt or something like that.

ANDOLFATTO

Does your model speak to the role that these leverage restrictions might have had, say, in terms of the evolution of real estate prices or the real estate price bubble?

One of the problems that the model highlights is that if banks have too little net worth, if the assets that belong to the bank get too small, then that interferes with the ability of the bank to do its job, which is to send funds from savers to investors. And in the case of the 2008 crisis, what it looks like is that what made 2008 actually different from, say, 2001 is precisely that the wealth of the banks themselves went down with the collapse in housing prices.

CHRISTIANO

Well, this is stretching it. But in the model what happens is that if the economy does go into a collapse, it can be self-reinforcing. As the economy goes down, the value of assets go down, that makes the banks worse, that makes the economy go down more, and so on. So, I mean, this is an example of why banks are so important because they're right at the heart of the economy. If something goes wrong with those things, bad stuff can happen. And the model does capture that idea.

ANDOLFATTO

Apart from policies that determine leverage restrictions, does your model have anything to say about what the fiscal authority or the monetary authority might do in an emergency situation?

CHRISTIANO

Well, so far the way the model works is, in some respects, it falls into a general pattern of models that says that recessions can be excessive. The economy in a recession may go down too much. The 2008/2009 episode in the United States, I think there's general agreement that things went down too much. And so what the model says is that anything you can do to stop that from happening is a good idea. So for example, in terms of monetary policy, what it would say is that under circumstances where there's a recession developing, it's a good idea to cut interest rates. And that's roughly what the policy actually is. Right now that policy, of course, has been short circuited by the lower bound on the interest rate. But my guess is that all that this will do is add to the reasons why monetary authorities ought to be stabilizing the economy.

The paper's main takeaway, according to Christiano:

- Regulating the banks is probably a good idea, and a completely free market when it comes to banking is probably a bad idea.

To watch the interviews from the conference, visit **www.stlousifed.org/publications/Connecting-Policy-with-Frontier-Research/**.

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MARTIN EICHENBAUM

Charles Moskos Professor of Economics, Northwestern University

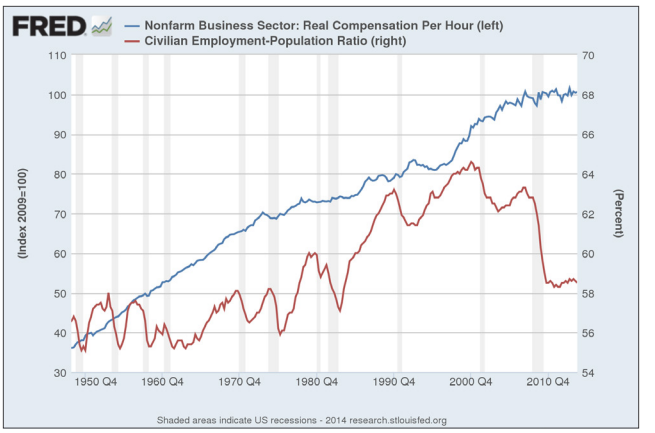
Paper: "Unemployment and Business Cycles"
(with Lawrence Christiano and Mathias Trabandt)

ANDOLFATTO

I was wondering if you wouldn't mind telling us a little bit about the question that you're addressing in this paper and what sort of findings you have.

EICHENBAUM

The paper is part of a larger project trying to develop richer models of labor markets that can be used to understand events like the Great Recession. Why did the labor force participation rate and the employment rate drop by so much? Why did unemployment rise so dramatically and what can we do about it?



A central puzzle that goes back to the beginning of modern macro, which I date with a paper by Bob Lucas and Leonard Rapping, is the observation that employment is incredibly volatile and real wages aren't. That fact has been a basic roadblock for lots of theories, including Real Business Cycle and New Keynesian models.

The basic problem is that in those models, real wages rise dramatically after an expansionary shock to the economy. That rise chokes off or mutes the expansionary forces associated with the shock. The prediction that real wages rise a lot after expansionary shocks is just counterfactual. The kind of models that are very popular in policy circles, including those that Larry Christiano and I, along with coauthors, have developed, solve the problem but in a very mechanical way. We just say, "Look, wages are sticky. We don't know why. But it's better to be shallow and right than deep and wrong. So let's just assume that wages are sticky and get to work."

That's fine for some purposes, but it means that we can't address many interesting questions. For example, what happens if you raise unemployment benefits? In standard DSGE models, the answer is nothing. Those models are just silent on the question. Wages are sticky, workers work, and that's that. But of course reality is more complicated.

Given those limitations, you might ask why do we trust the answers to other policy-related questions that we can address. Questions like what are the effects of a change in the federal funds rate, the effects of increasing government spending or the effects of quantitative easing? The answer is we trust our model more than the existing alternatives because of its relative empirical performance. But we won't really know if the answers that our model gives us are reliable until we develop better models that explain why wages appear to be so sticky—rather than just assume that they're sticky. And that's what we're up to now.

ANDOLFATTO

Does your model have any advice to offer to central bankers in terms of the effects of programs like quantitative easing in times of a recession, a deep recession like what we've witnessed recently?

EICHENBAUM

At this stage, we're more focused on fiscal rather than monetary policy. For example, we're currently analyzing the costs and benefits of unemployment benefits. Our model suggests that extending the duration of unemployment benefits has some beneficial effects in terms of stimulating aggregate demand. But it has another effect that's a much less obvious feature: a high level of unemployment benefits increases the sensitivity of the economy to other types of shocks. So it's like you're driving faster. If nothing goes wrong, you get where you're going more quickly. But if you get into an accident, then the damage will be worse.

ANDOLFATTO

What sort of interpretation of the most recent recession and lackluster recovery does your model offer?

EICHENBAUM

That's a great question. Simple New Keynesian models predict that inflation should have fallen by much more than

Please note that the content in this section is based on the interview but should not be considered a transcript.

Our model suggests that extending the duration of unemployment benefits has some beneficial effects in terms of stimulating aggregate demand. But it has another effect that's a much less obvious feature: a high level of unemployment benefits increases the sensitivity of the economy to other types of shocks. So it's like you're driving faster. If nothing goes wrong, you get where you're going more quickly. But if you get into an accident, then the damage will be worse.

it actually did during the recent recession. The data and our model suggest two explanations. First, in this recession, the financial market disruptions caused large rises in the cost of working capital. Second, the growth rate of total factor productivity (TFP) slowed down a great deal. Both factors caused persistent rises in firms' marginal costs. In our model, these rises generate an increase in the rate of inflation. There's a lot of independent empirical evidence that suggests that these forces are real and important.

So simple New Keynesian models suggest that the recession should have unleashed powerful deflationary forces. But the rise in the cost of working capital and the slowdown in the growth rate of TFP provided important countervailing forces on the inflation rate. The net effect is the inflation rate hasn't moved very much. Those forces, along with contractionary fiscal policy and ongoing weak aggregate demand, have combined to generate a very slow recovery.

ANDOLFATTO

Many commentators have pointed to external forces as either causing or exacerbating the recession or the slowdown in the recovery. Does your model have anything to say about that?

EICHENBAUM

Open economy variants of the model predict that a decline in exports has a contractionary impact on the U.S. economy and that those effects are particularly powerful when the zero lower bound is binding. But the model also has a lot to say about labor market exposure to developments in countries like China and South Korea. Standard sticky wage macro models have little to say about how U.S. wages respond to firms' potential to offshore production. In contrast, in our setup where workers and firms are bargaining with each other, firms' option to offshore puts labor in a weaker bargaining position.

ANDOLFATTO

So let's say this weaker bargaining position, owing to the competition offered by China, might manifest itself how exactly?

EICHENBAUM

In a bad way: lower wages and higher short-run unemployment rates.

The paper's main takeaway, according to Eichenbaum:

- The key takeaway is that wages are sticky and the reason they're really sticky matters. It's not innocuous to just assume it.

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LARRY JONES

Professor of Economics, University of Minnesota

Paper: "Is There 'Too Much' Inequality in Health Spending Across Income Groups?"
(with Laurence Ales and Roozbeh Hosseini)

ANDOLFATTO
Would you like to start off by describing your work to us?

JONES
What we're trying to do is to come to a little bit better understanding. We felt we didn't know or have a good enough sense about what health spending should look like for the difference between rich people and poor people. This problem is handled in different ways in different countries. In some countries, basically rich and poor people get the same kind of health care coverage. Canada is the prime example. Many countries in Europe have this sort of dual system where pretty much everybody is enrolled in a sort of single-payer, government-run system, but very wealthy people typically opt out of that system voluntarily and pay for additional higher-quality care for themselves out of their own funds. In poor countries, basically you're on your own. So this is handled in a lot of different ways in a lot of different countries. And the U.S. has had a unique system where mostly it's been handled through private insurance through people's jobs for a large fraction of the population. With this system, a large fraction of the population, once they turned 65, reached retirement age, were covered by a government-provided generally funded system. So we felt like we didn't have a good understanding of why these different systems exist at the same time. Is it true that in certain circumstances one is the best system or a better system, in other circumstances the other kinds are a better system? What is it that determines which one is a good system or a better system than the other? So we wanted to get some sort of idea about that.

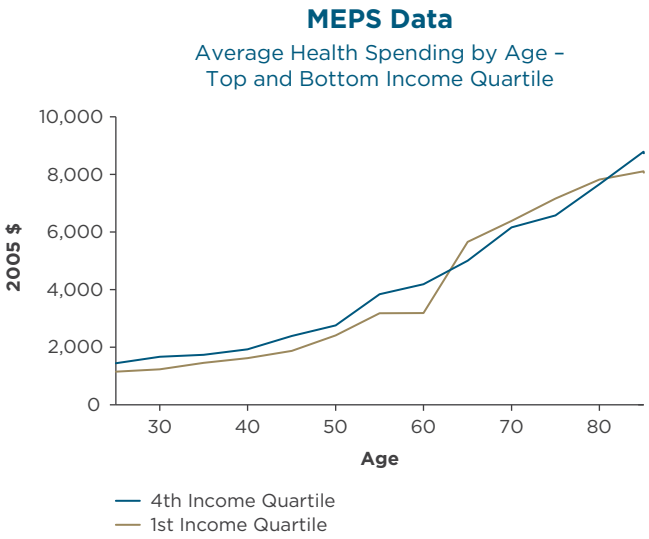
And, in particular, since we're going through a big change in the U.S., a lot of the discussion about these systems has been: Do people at the bottom of the income distribution get enough health care? Economists have buzzwords that they use to describe these things. They describe something called the social safety net, which is a series of social programs which make sure that if you're particularly unlucky, that you don't get hit too hard. So there are different kinds of programs like food stamps, housing programs, some medical care programs like Medicaid for poor people. So we wanted to know how big should that social safety net be on the medical care part. That's what we were interested in.

ANDOLFATTO
And so how does one go about trying to ascertain how much is the right amount for people?

JONES
It's kind of two parts to the question. First is to ask: How much is there? So like I said, some people seem to have this idea that there's no health care for poor people, and that's just not true. There are several different methods that it gets delivered, and maybe it's just that those systems are good or not. There's the Medicaid system, which some people are eligible for. There's also the emergency room care system, which is something's wrong with you, you show up in the emergency room. They're required by law to treat you. And there's some other issue about whether you pay for it or how it gets paid for, if it gets paid for at all.

So the first thing is to just get some idea about the magnitudes of the amount of money that that system is spending currently. And so we analyzed this data set called MEPS data set, Medical Expenditure Panel Survey, which collects data on individuals about how much is spent on their medical care and what it's for and what the source of funding for it is. So did they pay for it out of their own pocket, did they have an insurance company pay for it, did Medicaid pay for it, did Medicare pay for it? So it's a rich data set which has a lot of information about medical expenditures.

So that's the first thing is to look in the data and see what this thing looks like. How do medical expenditures differ for rich and poor people? And it turns out total expenditures don't differ that much for rich and poor people in the U.S. If you looked at the top 25 percent of the income distribution relative to the bottom 25 percent of the income distribution, the ratio of total expenditures across those two groups is about 1.2. So one would say that it's the same. I think most people would guess that it's much bigger than that. They would think it's like three or five or something.



For example, if you look at other kinds of consumption expenditures, you get numbers like five or seven for that ratio. So it's quite a bit less. So that tells you that there's quite a bit of insurance going on already in the U.S., even though it doesn't have a formal system like Canada does. So it's quite a bit more than what people think. So that's the first thing.

There are other issues about the way that money is being spent. For example, for poor people, a lot of the way they get medical care delivered is to go to the emergency room. And one of the things that people are concerned about when they're talking about changing the way the health care system in the U.S. works is the fact that if you're poor, you have to go to an emergency room in order to get medical care. Going to the emergency room is a miserable experience for anybody. It's a hassle. You have to wait a long time. So what people worry about is maybe people put off getting taken care of for too long, so that when they do get treatment, they're in worse shape. So maybe if we had a different kind of system, we could get them treated early, they would be healthier, and it would cost us less. So that's the kind of thing that people talk about. But unfortunately this MEPS data set doesn't have the distinction between preventive and curative kind of care.

ANDOLFATTO

What you just reported about the differences in health care spending across income classes, that's quite astounding. Did you control for people of different ages or sex or other demographic characteristics?

JONES

Yes. That number depends on age. And so we've got it conditional on age. It's about the same until you get to post-retirement years. Then it goes up a little bit. So it doesn't depend that much on age.

That's the first thing is to look in the data and see what this thing looks like. How do medical expenditures differ for rich and poor people? And it turns out total expenditures don't differ that much for rich and poor people in the U.S. If you looked at the top 25 percent of the income distribution relative to the bottom 25 percent of the income distribution, the ratio of total expenditures across those two groups is about 1.2. So one would say that it's the same. I think most people would guess that it's much bigger than that. They would think it's like three or five or something.

ANDOLFATTO

Now, you've also in the paper written down a theoretical model, as economists are prone to do. Explain what that part is for.

JONES

Well, the next thing we want to do is get some sort of idea about, is 1.2 too big, too small? And that's a really difficult question, but that doesn't scare economists. So how do we handle it? You just make a bunch of outrageous assumptions and try to get a start at figuring out whether that number is too big or too small. We know that not everybody can get the same health care. Everybody can't get treated as well as President Obama does. I know that I'm not going to get treated as well as he does and we all sort of accept that. So some amount of inequality is acceptable. My take on the reason he gets treated better than I do is he's more valuable than I am in some sort of fundamental sense. The world would keep on working just fine if I didn't go to work tomorrow or if I got sick. It's a much more difficult situation if he has some sort of serious medical problem. So we try and use an economic model which takes into account that fact. It sort of gives some idea of what that difference "should be" like.

ANDOLFATTO

I see here actually a line from your paper. You say: We show that under the efficient allocation—so under an efficient delivery of health care—health care spending should increase with labor productivity. So more productive members of society should receive more health care. Among other things, it prolongs their longevity, I suppose, and keeps them healthier.

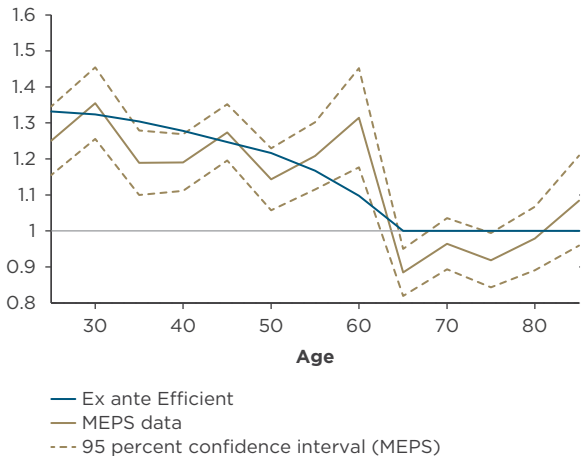
But this recommendation that comes out as a byproduct of the assumptions your model makes says also that this should only be true during the working years, that once people retire this is no longer the case, that everybody should more or less be treated equally.

JONES

Right. It captures exactly that idea, that somehow President Obama is doing more important stuff than I am, so we want to make sure that he gets to keep doing it. It's more important to make sure that he gets to keep doing it than I do. Now, that means maybe I'm going to be sick or maybe I'm going to die younger than he is, that kind of stuff is just part of that. But we sort of all accept that that's part of it. Once he's not doing anything important anymore and I'm not doing anything important anymore, then that distinction goes away and the model says we should get the same kind of health care.

Data vs. Ex Ante Efficient

Ratio of Health Spending by Age – Top to Bottom Income Quartile



ANDOLFATTO

I realize that this is, like you said, a first approach. But in reality, productivity differences might be a bit difficult to observe. They might have to be inferred indirectly by their salary, for example, which we know that in reality your salary might not fully reflect your productivity per se but other factors. Is that a concern?

JONES

Sure. I guess I would say it's a little nuanced version of what you said which is: Salary and wages are imperfect indicators of what some sort of underlying social productivity is. President Obama is also not the highest paid person in the country. So there are imperfections like that. We inherit that imperfection. I don't think that means you shouldn't do it at all. It just means that you do this as a first cut, and if somebody comes along with something better, then I'm all for it.

ANDOLFATTO

So your theoretical setup kind of allows you to ascertain what a desirable allocation of health care spending should be in a society and you try to match that up with the data to kind of evaluate?

JONES

We don't try to match it. We try to do what economists call a quantitative or calibrated version of that model to see what that 1.2 number, how does that compare to what we get out of what the model says we should get. And one of the things which is interesting is the model said it should be about 1.2. You know, it's not exact but it's very close.

ANDOLFATTO

So we have to be careful though, I guess. This is not a statement about insurance or anything like this. The Affordable Care Act, does this have any repercussions? Does your model have anything to say about that? Is it desirable in general?

JONES

It doesn't really say much about that, other than be a little bit careful. To the extent that that law is directed at trying to get more health care to the lower part of the income distribution, it doesn't look like we need to do too much on that dimension. To the extent that it's to try and get to redistribute the payments for that care, maybe we could do some of that. Because, of course, one big part of the plan—and, as you know, the Canadian plan, for example—is the health care delivery part, another part is the payment part.

And let's just take Canada as an extreme. Roughly speaking, everybody gets the same health care coverage in Canada. But how much you pay is proportional to your income. So that makes it a very unusual kind of good provision.

ANDOLFATTO

So I guess what I was getting at was: It could very well be the case that people by and large in America are getting the right level of health care at the end of the day, more or less. But that in some cases those who are uninsured, those who lose their jobs, those who have pre-existing conditions, they lose their insurance, and if they have any assets, they might lose their house, for example, in the event they get sick. They'll still get their optimal amount of health care, it's just that they're going to lose their house. And your model doesn't speak to that part.

JONES

No. And also the other thing which we mentioned, which came up briefly before, that maybe because of those effects they put off getting treated. And that makes their health worse, it makes it more costly to cure them or improve their health once they actually do get treated. That's going to be hopefully one of the big benefits of the new system is if you're insured, then you don't wait until you have to go to the emergency room.

The paper's main takeaways, according to Jones:

- The first one would be: There's already quite a bit of health care insurance provided in the U.S. in the current system for people who are needy.
- Because of that, maybe we want to be a little bit careful about exactly how far we try to push things when we're making policy changes. We should be informed about that stuff.
- Maybe what that first thing tells us is the focus should be on the delivery system and not kind of the overall quantity so much.

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RICARDO LAGOS

Professor of Economics, New York University

Paper: "Trade Dynamics in the Market for Federal Funds" (with Gara Afonso)

ANDOLFATTO
What is your paper about, what questions are you asking, and what sort of answers have you received?

LAGOS
Maybe I should start with the fed funds market. So what are fed funds? Fed funds are basically loans of reserve balances, which is cash that commercial banks typically hold at the Federal Reserve.

ANDOLFATTO
To operate in this market, do you need an account at the Federal Reserve? And these Federal Reserve funds are credits in your account that you can lend or borrow?

LAGOS
That's right. So the way to think about it is that you have a cash account. If you were a commercial bank, the bank you bank with is the Federal Reserve, and that's where you keep your cash. And then sometimes you may want to borrow cash from another bank. And the way that happens is the other bank will also have a cash account at the Fed, so he will credit to your account whatever you're borrowing and then you promise to repay. Those things that you're borrowing and lending, they're called fed funds. It's actually loans. There are different maturities, mostly it's overnight, and it's uncollateralized.

ANDOLFATTO
Why do banks do this? Why do they borrow and lend overnight in such short term in this market?

LAGOS
One way to phrase the question is: Why do banks hold cash? And then we may have to think about why sometimes you feel your cash is very low and you need to borrow some. These reserve balances, which is basically the cash that the banks hold at the Fed, they're used between banks as means of payment. So if you want to buy some assets from another bank, that's how you pay. In this case, it's not physical cash. It's just entries at the Fed, computer entries. But, of course, they could become cash with just a phone call and they get shipped to your bank.

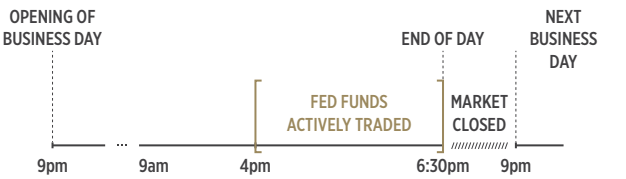
So you hold them as a means of payment. You also hold them because you have to. There's something called reserve requirements, which is a fraction of the deposits that you issue in your bank you have to keep to make sure that you're financially sound. It's an imposed demand of cash that the regulator imposes on the bank to make sure you have enough cash to satisfy reserve requirements.

ANDOLFATTO
So what sort of question are you asking then in your research paper?

LAGOS
This market is almost like ground zero of monetary policy implementation because it's the place in which monetary policy is conducted. So every six weeks the FOMC, the Federal Open Market Committee, would get together in Washington and they would vote on a reference interest rate, which is the fed funds rate that makes the newspapers. And that's the way they change their stance on monetary policy. So sometimes they want to increase the fed funds rate, sometimes they want to reduce it.

Now, what is the fed funds rate? It's actually the interest rate on these fed funds loans. The FOMC will send a memo to the fed funds trading desk at the New York Fed, and they will say please make sure that these fed funds are trading at target. And often in the academic literature there's a gap there. We all understand that this memo is sent, and we all understand that somehow what the memo said should happen happens. But there's a gap in terms of how it is that it happens. So what this paper is about is looking at the plumbing of this market to see exactly how it is that these bilateral loans between banks happen to trade at target or not.

The Market for Federal Funds



ANDOLFATTO

So why would it be important to understand the details of the plumbing as you say, as to the determination of this federal funds rate, this key policy rate in normal times for the Fed? Why is that plumbing important to understand?

LAGOS

So that's the reason why I used "plumbing." When things are working well, plumbing doesn't matter. You never look. And when things are clogging up, then you're really interested to know exactly where everything goes to find the problem. And there are instances where these markets clog up, and then you're concerned because if some bank cannot get the loan that it needs, that might get passed on as curtailing credit to its clients, and then it affects the real economy.

ANDOLFATTO

One basic question that you ask in your paper is: What are the determinants of the federal funds rate? And how does your answer differ from, say, standard treatments of that question? I mean, most people would say, well, something like supply and demand, but it's something more involved than that.

LAGOS

That's always the right answer. I would say the differences are more operational. At some level, it's supply/demand. But if I ask you for a number, like if the Fed increased the interest on reserves by 25 basis points, then your answer can't just be supply/demand. And what this model does is it allows you to quantify. Basically it tells you how to go to data and try to estimate what the demand would be.

ANDOLFATTO

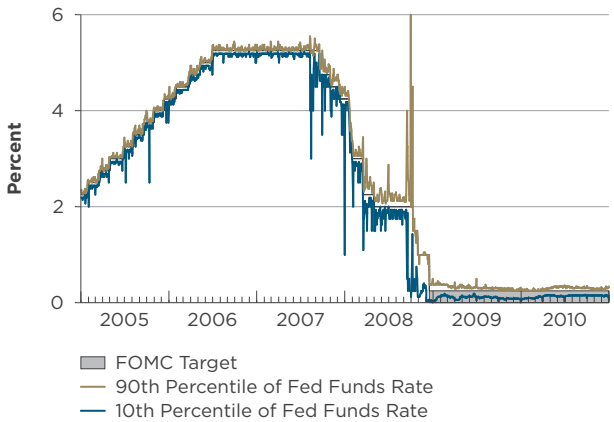
One thing I recall in the paper you pointed out was many people have the idea when they think of supply and demand that there's a unique federal funds rate, but indeed there's a distribution of rates that this market isn't as well connected as one typically thinks. It's what they call over the counter, where you have these bilateral meetings and negotiations and so indeed there's a distribution of federal funds rates? And this distribution evolves over time possibly, over the day? And that's important?

LAGOS

So the standard view of this market is that it's a standard textbook, supply/demand cross. So it's completely static and competitive. And like you were saying, that doesn't seem to be the way the market works. Supply/demand requires some kind of auction or some frictionless marketplace where everybody gets together and trades without any impediment. This market does not look like that, like you were saying. It's bilateral.

So there's not a grand marketplace where we all go and bid for loans. In fact, it's a disorganized market. We have brokers or dealers or people working at banks calling each other up, having conversations like, "I need 10 million. How much will you charge me for it?" And then they bargain. If you have a guy who's very desperate meeting a guy who's not so desperate but can help him a little bit, then, probably, if the loan occurs, there will be a very high interest rate. So like you were saying, depending on who happens to call whom and what time of the day, there's going to be a whole distribution of interest rates that get quoted. And then what the newspaper reports as the fed funds rate is basically an average of those.

Daily Dispersion of Fed Funds Rate



Now, presumably, we're interested about the financing costs of banks. We like to understand exactly what the bank is facing, and the average may not be representative for everybody. So that's why it's important to look at the plumbing.

ANDOLFATTO

You say that you use the model for quantitative analyses of policy issues facing modern central banks. So what's an example of the way you use your model for a policy issue facing central banks today?

LAGOS

Let me give you two facts and the motivation. In 2007, for example, if you looked at the whole banking sector in the U.S. on a typical day and you added up all their reserve balances—this cash that they hold at the Fed—they would be holding something on the order of $50 billion, of which over 90 percent or over 95 percent, depending on the day, would have been required reserves, meaning that cash they had to hold at the Fed to satisfy the reserve requirements. So the banking sector as a whole was running very lean on cash. It was only at 5 percent or whatever the holding was excess for precautionary reasons or whatever.

Now, take a postcrisis example. Early 2008, 2009, even today, if you look at the total amount of cash held by the banking sector in their Federal Reserve accounts, it's multiplied by 20 or now by 25 or 30. So it's trillions of dollars now as opposed to $50 billion. If you ask what proportion of those trillions of dollars are required reserves, it's only on the order of 5 percent. So most of it is excess reserves, a huge amount of excess reserves.

Now, that poses a challenge in the following sense. Right now, for the fed funds rate they quote a target: It is between zero and a quarter percent. Suppose that in a year from now or two years from now for whatever reason the FOMC decides to increase the fed funds rate. How will they do it? Now, the traditional way to do it would be to make liquidity or make cash scarce. And the way you do that is by, for example, doing a sale of Treasuries. So you give the private sector (the banks) Treasuries and then that reduces the amount of reserves. And that would naturally mean in these bilateral phone calls, since cash is more scarce, the loans would go at a higher rate. And that's how you manage the rate up.

The concern with that is, that worked well in a situation where the open market operation is relatively big relative to the reserves in the system. So you can have enough traction by selling these Treasuries. Now, with only excess cash of like 5 percent or $50 billion, that's doable. Today when you have trillions of excess reserves, how big would the open market sale of Treasuries have to be to make the rate go up any meaningful amount? It is probably not practical, aside from debt limits which is another issue. So the concern with that is, if for whatever reason the Chairman or the Board decides they want to increase the reference rate, they might have their hands tied.

Now, there's an extra tool that they've introduced since 2008, which is they've been paying interest on reserves. Interest on reserves is when you're parking your money as a bank overnight at the Fed, how much you get paid for it. Before the crisis it was zero and now they pay 25 basis points. So the hope now is that even if there is still that excess cash out there, maybe the Fed can still increase the fed funds rate by increasing the interest on reserves. And what we do with the model is we basically estimate some parameters and we use the model as a laboratory to perform those exercises and see if the Fed today increased by, say, 25 basis points, the interest they pay on reserves, by how much would the equilibrium fed funds rate increase?

Chairman Bernanke in several speeches has said that if the Fed wants to increase the fed funds rate before these excess reserves have been drained out, one natural way to do it would be the interest on reserves, so we can't claim authorship to that idea. But what we do is we can offer Chairman Bernanke a number. If you wanted to increase the interest rate by 1 percent, by how much would you have to increase or announce you're going to increase the interest on reserves?

ANDOLFATTO

Suppose that the Fed is interested for whatever reason in putting upward pressure on the federal funds rate, this policy rate that's been a key policy rate for a long time. A traditional way to do it is to engage in some sort of open market operation, but this would potentially have to be so humongous as to render it impractical. Your model suggests that the alternative method of using the interest on reserve tool might be a more conducive way of achieving that goal. That's what your model suggests?

LAGOS

Chairman Bernanke in several speeches has said that if the Fed wants to increase the fed funds rate before these excess reserves have been drained out, one natural way to do it would be the interest on reserves, so we can't claim authorship to that idea. But what we do is we can offer Chairman Bernanke a number. If you wanted to increase the interest rate by 1 percent, by how much would you have to increase or announce you're going to increase the interest on reserves?

The paper's main takeaways, according to Lagos:

- The fed funds market is something that most people who look at the macroeconomy seem to care about.
- And I would say we know surprisingly little about how it actually works, about the plumbing of the fed funds market. And I think it can be important in cases where the plumbing doesn't work so well.
- I would say the main takeaway of the paper is that we're trying to provide this model that one could estimate and simulate and use in a lab to see if things go wrong somewhere, what impact that would have on the rest of the system.
- And, in cases where, for example, the Fed is trying out new policy tools, such as increasing the interest on reserves, it may be a good idea to try it out in this controlled environment and see what you might expect.

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RICHARD ROGERSON

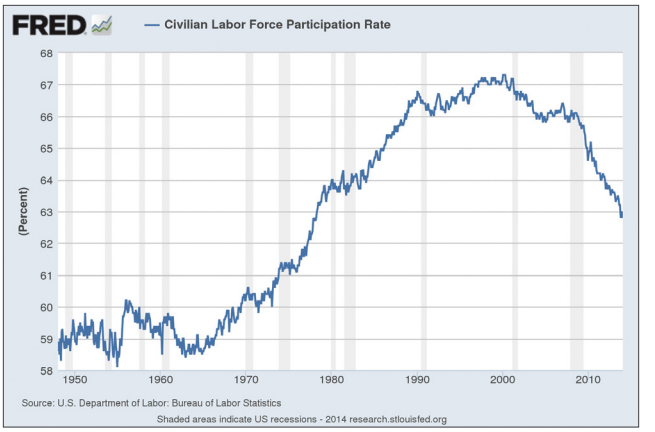
Professor of Economics and Public Affairs, Princeton University

Paper: "Retirement, Home Production and Labor Supply Elasticities" (with Johanna Wallenius)

ANDOLFATTO
Tell us what the main question is here, what you're pursuing.

ROGERSON
Well, the main question that we are addressing in this paper is to understand the preferences that individuals have for some of the key things that guide their decisions. People value consumption. People value leisure. And as things change over the lifecycle or in the economy, that causes people to make changes in terms of what they do there.

So one of the important places where this shows up is in the amount of time that people devote to market work. In the United States, for example, we know there's been in the recent recession a huge drop in the participation rate. There's a lot of discussion about what might be behind that drop in the participation rate. One possibility is that the participation rate has dropped because people think it's too hard to find jobs, and therefore they've given up the search. But another idea which is out there is that in the face of very minimal wage growth, there are many people whose situations in life are such that when they look at the options facing them, the wage opportunities in the market are such that they prefer to actually stay at home. For families that might have young children, if they go to work they might need to pay for child care. Wages are a very important factor in terms of whether it's best to seek work in the market or stay at home.



And so this paper is trying to estimate some of what economists call the features of preferences. But it's the way people feel about those choices, which helps us understand how they respond in different situations.

ANDOLFATTO
When you say preferences, you mean things like the willingness of people to substitute into different activities or different commodities?

ROGERSON
Yes. For example, people have some money to spend and they need to decide what types of goods to spend that money on. And we know that that is influenced both by the things they like and possibly by the prices of those things that they like. As the prices change, that may influence their choices. But how they feel about different things also influences. And another setting where this matters is: How do they value leisure versus consumption?

ANDOLFATTO
So estimating these parameters that dictate individuals' preferences is important for economists, for example, to predict the effects of changes in the economy or the effects of government policy?

ROGERSON
Yes, absolutely. When wages change, that will have an influence on the choices that people seek to make. If we have a change in retirement programs, the extent of benefits, the age of retirement, that can influence people's choices. When health care benefits change, that can influence people's choices.

ANDOLFATTO
So tell me what do you find in your work here? What have you discovered? Have you discovered something that people out there might find surprising that the people in the literature have missed? I mean, what have you added to the debate?

ROGERSON
For people in the economics profession, it's no surprise that there's been some controversy over the years about some of the, what we call, preference parameters that

we're estimating. But, again, what this amounts to is how responsive is the time that people devote to market work to things like wages and tax rates. And one view is that people have a certain amount of time they want to work in the market and that's kind of fixed. And that's influenced relatively little by changes in wage rates or tax rates, that people just have for some reason, some amount of time that they want to work. And the opposite view is that people are actually quite responsive to changes, incentives in terms of the time they devote to market work. And so that's a long controversy in the economics profession. And this particular paper comes down, I would say, on the side of saying that people are quite responsive to incentives in terms of those choices.

ANDOLFATTO

And how did you discover this? I understand you used a particular type of data to weed out this information.

ROGERSON

Yes. In all of these, any exercise of this sort, the idea, of course, is to look at the choices that individuals make in different settings. And the idea is that if you see the choices that people make in certain settings, that's a way for you to learn something about what motivated those choices. And here, what we look at is what happens to the way people allocate their time when they retire. So for a person who retires, if they were working full time, this means counting the commuting time to work, they're working something like 45 hours a week. So when you move into retirement you basically have this extra 45 hours a week freed up. And the question is what do people do with that?

And the key margin that we focus on is how do people allocate this time between two categories that we call home production and leisure. So leisure is activities like watching TV, going out to movies, perhaps traveling, just reading a book, relaxing. This other category that I talked about, home production, that's something that economists use to describe activities like doing housework, cooking meals, taking care of children. And the idea is that home production activities are things that people could either do for themselves or there's an opportunity for people to purchase those services in the market. One of the simplest examples is one that I just mentioned: child care. You could either take care of your child or you could hire somebody to take care of your child.

And so one of the key attributes of home production is this substitution. You can either pay for it, or you can do it yourself. And that interacts with the choice of how much you work in the market, because if you work in the market, you've got less time for these things, but you have more money to spend on those things. And our paper is trying to understand how people are willing to substitute among those things.

The fact that in retirement what we find is people take a lot more leisure, suggests that people are quite happy about having additional leisure. And if people are quite happy about having additional leisure, this suggests that they will presumably respond with the amount of leisure to incentives.

ANDOLFATTO

So how do people tend to spend their time upon retirement? They have this 45 hours a week, you say, that's freed up.

ROGERSON

We use a relatively new data set that the Bureau of Labor Statistics collects called the American Time Use Survey, which has people fill out in detail, in various detail how they spend their time during the day. And from these data we can look at people before and after retirement. And what we find is of this 45 hours, roughly 30 percent of it, so approximately 15 hours goes into what I called home production. And the other 30 hours basically goes into leisure. So there's quite a big increase in leisure.

ANDOLFATTO

So the specific way that people divide their time at this point of retirement, between home production and leisure, that number featured prominently in your estimate of this labor supply elasticity, you say, this estimate of the willingness of people to adjust their work effort in response to wages and taxes? What if that number had come in at 90 percent or 10 percent?

ROGERSON

One of the keys to using this type of data to infer preferences is you have some structure for what influences people's choices. You observe the choices and from that you can infer the factors that influenced those choices. If we had found that people devote almost all of the additional time to home production, that would tell us that leisure changes very little when people retire. And if leisure changes very little when people retire, that would suggest that having some extra leisure for people is not very valuable. But the fact that in retirement what we find is people take a lot more leisure, suggests that people are quite happy about having additional leisure. And if people are quite happy about having additional leisure, this suggests that they will presumably respond with the amount of leisure to incentives.

ANDOLFATTO

So it suggests that they are quite a bit willing to substitute into and out of leisure depending on the incentive structure out there. How would you say that your results bear on any policy debate? Any contemporaneous policy implications?

ROGERSON

I think one of the most important settings where these types of labor supply elasticities matter is in the context of arguments about how do taxes on labor income influence the amount of time that individuals devote to market work. And that shows up in lots of different contexts. For example, just in terms of standard reforms to the tax system, that's an important issue. And, of course, this comes up in all the discussions among the different political parties, often very charged in terms of ideology. But these types of estimates are important for that.

Also, if you're going to change features of the retirement program in terms of the replacement rate, it would matter for how changes in retirement policy influence the age at which people retire. So in all of those policy discussions how much labor supply responds turns out to be very important.

The paper's main takeaway, according to Rogerson:

- The main takeaway is that our analysis points to people being quite willing to adjust the amount of market work in response to changes in incentives.

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MARTIN SCHNEIDER

Professor of Economics, Stanford University

Paper: "Banks' Risk Exposures"
(with Juliane Begenau and Monika Piazzesi)

ANDOLFATTO
What is the question that you're pursuing in this body of work?

SCHNEIDER
Broadly, this is about how the value of banks responds to market conditions. What regulators typically require banks to provide is accounting information from which it is difficult to get an idea of what will happen when, say, interest rates change to the value of the bank's portfolio. What the paper tries to do is to take this accounting information and transform it into a measure where we can easily study the changes in value when market conditions move.

ANDOLFATTO
When you're transforming this information from the accounting statements of the bank, are you applying some sort of theory to it? Or is this just purely an empirical exercise?

SCHNEIDER
I would say it's an empirical exercise with minimal structure. What we use, you can think of it as like translating the statements from one language, the one of accounting into the one of economics.

ANDOLFATTO
So you're serving as a translator. You're translating accounting information into a language that regulators and economists can understand. For what purpose?

SCHNEIDER
So I want to get an answer to the question. Suppose there is a change in interest rates. For example, this is quite relevant now where we have very low interest rates, and many people expect perhaps an increase in the near future. So one wonders the uncertainty about that, how is that reflected in the uncertainty that banks face?

ANDOLFATTO
So, generally, surprise changes in the interest rate movements have effects on asset prices and on the portfolios that banks have, and therefore, these surprise movements in interest rates may affect the soundness of the banks' financial positions and increase their risk exposure and risk in some manner?

SCHNEIDER
Yes.

ANDOLFATTO
And so what do you find exactly?

SCHNEIDER
The main part of the paper is kind of the methodology for how to do this translation. A lot of work went into especially looking at positions that are hard to translate, in particular derivatives books which are large for major banks, but for which the accounting information is not very informative.

ANDOLFATTO
What is a derivatives book exactly?

SCHNEIDER
A derivative in general is a security where the payoffs are dependent on the value of some other security. The most important example is an interest rate swap where you and I make a contract where we commit to make interest rate payments to each other where one side, say I, make always the same interest rate payment, whereas you pay a floating rate that we fix to be some market rate.

For example, let's say I'm a bank who has a lot of long-term assets, and I'm financing them with short-term debt. Then my profit margin will depend on what the short-term interest rates are. Suppose I wanted to get rid of this risk. Then I might want to make this contract with you where you give me fixed payments in exchange for the floating.

ANDOLFATTO
So the bank might want to buy insurance against some bad event happening and these derivatives contracts are insurance contracts?

SCHNEIDER
There are two ways that derivatives as any financial instrument can be used. One is to somehow provide insurance or allocate risk differently. And the other is, of course, suppose you and I disagree on what the direction of interest rate is in the future. Then we might take just different sides of a bet, and we might do that because we each think we're smarter than the other. So then one interesting question for looking at this huge volume in derivatives that we see now: Is this basically a big insurance scheme, or is it a big casino where people just trade on market conditions?

ANDOLFATTO
Is that a question that your paper is addressing?

SCHNEIDER
We think that the tools that we provide here can eventually be used to look at all the players that would be needed to answer this question. Right now, we provide results only for the largest banks. So the largest banks, they have their traditional business as well as important business making the market in derivatives. And we find that the derivatives position that they have is not an insurance against fluctuations in the other business, at least not most of the time. Now, that does not mean that, overall, the economy as a whole is not an insurance scheme because, of course, the banks might be the people who insure others. But further research will tell us.

ANDOLFATTO
Suppose we discovered, in fact, that the vast bulk of this activity was strictly for speculative purposes and had very little to do with insurance. Does that necessarily have some bearing on the design of regulation?

SCHNEIDER
So it depends. There are models in which when people disagree they can contract with each other, so let them do it. As long as markets work well, that is fine unless we somehow think that people shouldn't be following their beliefs. However, there is also a class of models that has gained a lot of attention now in the financial crisis where when you have market frictions and then you have people differ in beliefs, then you get inefficient outcomes. And so for those cases, if we were to find that a lot of this derivatives activity comes from heterogeneity in views, people betting, then that might mean that regulation should be increased in order to alleviate the problems.

There are two ways that derivatives as any financial instrument can be used. One is to somehow provide insurance or allocate risk differently. And the other is, of course, suppose you and I disagree on what the direction of interest rate is in the future. Then we might take just different sides of a bet, and we might do that because we each think we're smarter than the other. So then one interesting question for looking at this huge volume in derivatives that we see now: Is this basically a big insurance scheme, or is it a big casino where people just trade on market conditions?

ANDOLFATTO

I guess another way of putting it is: If this speculative behavior was isolated to this group of banks or whatever, then fine. Who cares really? It's just people playing in a casino. But banks, of course, play a major role in the payment system of the economy. Many firms and people are linked through the banking system. They receive their wages through banks. Firms make payments that way. And so to the extent that something goes wrong in the banking sector, this might have ramifications for how activity elsewhere in the economy is conducted. But that I guess is also true whatever banks are doing. The issue is how connected they are to the rest of the economy and whether or not the system takes proper account of this interconnectedness, if you like?

SCHNEIDER

A related aspect for regulation is that we've seen recently banks getting help in, say, bailouts that occurred. And so one hypothesis that one might have is that if you have a set of players in the economy who get bailouts, then those might be willing to take more risks and perhaps insure others. So that is another pattern how sort of policy might be connected with the findings that we have here.

ANDOLFATTO

So policy implications from your work: Do any kind of pop out right immediately? Are there some caveats that regulators or bank supervisors, some sort of lessons they can draw on the work that you have done so far? Or is this really something that is left for the future?

SCHNEIDER

So what I hope where this will go is that right now the way the regulatory framework works is that people look at positions one at a time, and they kind of assign risk weights one position at a time. Our approach combines all the positions and represents them as portfolios.

ANDOLFATTO

By positions you mean positions of individuals' banks?

SCHNEIDER

Securities, loans, derivatives, yes. And we can also do it across institutions if we like. And so I think that expressing things in this language, which is the way that economists think about how a risk is allocated, will help get a better assessment of what the overall risk is than if we just combine these accounting measures.

The paper's main takeaways, according to Schneider:

- The old, traditional view of the bank is that it borrows short term and lends long term.
- One might think the modern bank works differently—the modern bank that's now a lot into security markets—but, in fact, it seems from our findings that it's even more that way: borrow short, lend long.

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MICHAEL WOODFORD

John Bates Clark Professor of Political Economy, Columbia University

Paper: "Conventional and Unconventional Monetary Policy with Endogenous Collateral Constraints"
(with Aloísio Araújo and Susan Schommer)

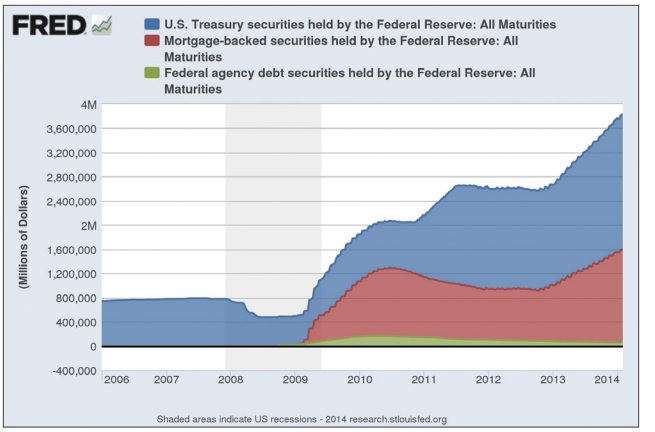
ANDOLFATTO

Why don't you tell us a little bit about the question that your paper is addressing?

WOODFORD

The question is one posed by dramatic changes in monetary policy, particularly in the U.S. in the last few years, although to some extent on the part of other central banks as well. And that's been a switch from monetary policy being about deciding on the level of short-term interest rates—the federal funds rate here in the U.S.—to instead focusing on the Fed's purchases of assets, various types of long-term Treasury securities or agency-issued securities. And that's been a very important change. It's raised a lot of questions about what exactly the Fed is doing playing as big a role suddenly as it is in buying different types of assets and many more assets than it used to.

There hasn't been a lot of economic theory developed to explain what that kind of policy would be about. There have been many decades of discussion of what central banks should do with interest rate policy and what effects it seems to actually have on the economy. This new tool has been much less studied, although under pressure of the emergency central banks have been experimenting in a big way with these unconventional policies. And our paper is trying to begin at least a discussion within economic theory of how we can understand the new tool and how it's similar to or different from traditional interest rate policy.



ANDOLFATTO

There is a conventional wisdom of how these tools might work. Can you explain to us the findings of your own research, how they might corroborate these findings or these beliefs? Or go against them in some manner? Is there something surprising that emerges from what you've discovered?

WOODFORD

I think so. I think a lot of the discussion that you see of the point of asset purchases suggests that there should be a lot of similarity between the effects of purchasing long-term assets and the effects of cuts in the federal funds rate, the Fed's traditional tool. People say the whole point of cutting the federal funds rate is longer-term bond yields would also go down, and if you can just buy longer-term bonds, push up their prices, that's doing the same thing with a different mechanism. It's a different way of doing the same thing. And if you can't cut the federal funds rate further, then there's an obvious reason to use the other method.

And our analysis suggests that this analogy between the two tools is not nearly as strong as you might have expected.

ANDOLFATTO

Why is that exactly?

WOODFORD

Well, one reason is that the question of whether it's clear that Fed purchases of longer-term assets can affect the prices of those assets as directly as traditional interest rate policy would. But I think the more surprising thing is that our analysis suggests that even under circumstances when the central bank finds that its purchases do affect the market price of the longer-term assets, the connection between that and spending in the economy, and then the effects on inflationary pressure, are not necessarily at all similar to those of conventional interest rate policy.

ANDOLFATTO

So you're suggesting that it is possible, at least in theory, that the Fed engages in the large purchase of a certain class of assets? Injects money into the economy by purchasing a particular class of assets? And that this may, in fact, have very exact opposite sort of effects than conventional data might suggest?

WOODFORD

Right. We clearly show that that's at least a theoretical possibility. And obviously then deciding whether you think that's actually happening is another thing. But I think the analysis points out that you shouldn't assume that the mere fact that you could raise the price of the bonds answers then the question about what effect you're having on the economy.

ANDOLFATTO

So can you explain the economic intuition for that effect and whether or not it has some bearing as to the conduct of Fed policy today?

WOODFORD

I think the point is a fairly simple one, and it has to do with the question of why the central bank purchases should be able to move the market price anyway, which, again, people thought was kind of obvious. They said if you're buying more of something, surely that will tend to make it more expensive. But when you ask whether that should actually happen with a lot of sophisticated traders out there in the market that are also trading against the central bank, what we argue is that if the other traders in the economy aren't constrained in the financing they can mobilize to take the positions that make sense for them, they will tend to automatically have an incentive to trade against the central bank and to neutralize then the effects of the central bank's trades.

The case where that won't happen is if the people who would have an incentive to trade against the central bank are financially constrained. In particular, if people who would wish to shift out of the particular kind of assets that the central bank is buying aren't able to reduce their exposure to those kinds of risks as much as they would like to, you can have the market valuation changing.

But what may very well be happening is then you're forcing, in fact, parts of the economy to bear types of risk that they don't want to. You're pushing them more tightly against their financial constraints and saying that that's a victory because you're changing market prices. You're doing something, but you have to ask whether you're doing something that's making the financial markets function more the way you want them to, or making financial constraints have even more perverse effects because they're constraining people even more.

ANDOLFATTO

These so-called financial constraints that you're alluding to have to be present even in the case where the Fed intervention has conventional effects on the economy? What are the circumstances that distinguish whether or not the Fed purchase of the assets kind of makes things go in the right direction, or kind of makes them go in the opposite or unintended direction? What's the distinguishing characteristic between those two cases?

WOODFORD

What our analysis implies should be looked at more is the question of who you think is financially constrained and how much they're financially constrained. On the one hand, it is possible that there are people in the economy who would like to take on more of a certain kind of risk and are currently being prevented from taking on as much of that risk as they would like to because of their financial constraints. And perhaps the central bank then taking on that risk and then indirectly causing people in the economy to bear it, whether they're voluntarily doing it through their own portfolios or not, is helping them to take on risks that they would have liked to take on themselves. Alternatively, it is possible that people who would like to reduce that kind of risk are prevented from reducing their exposure to a certain kind of risk because of their financial constraints. And by forcing them to take on more of it, then you're pushing them in the opposite direction to where they would be moving if their financial constraints were reduced.

ANDOLFATTO

Do you think that there's scope for central bankers to take the lessons of your model, for your theory to tailor their activities, their interventions in the economy? I guess another way of asking the question is: Are you largely in favor of the large-scale asset purchase program that the Fed is currently undertaking? Does your theory have anything to say about that in particular?

WOODFORD

The main thing it has to say, I think, is that it would encourage caution about plunging into the policy as far as we have without more investigation of what it's supposed to achieve. In general, our analysis would say that simply looking at whether you think you can move the market prices isn't at all an adequate basis for conducting the policy.

Something that our theoretical analysis implies is that even if you had more people constrained in their ability to take on more risk of a certain kind, and you would be helping them have more exposure to that kind of risk through central bank purchases of a certain scale, if the central bank continues taking on more of that type of risk on its balance sheet, as that policy proceeds, it becomes more and more likely that the relevant constraint is on the other side. People would like not to be exposed as much to that kind of risk and are not going to be able to reduce their exposure to it.

And the question of who's more financially constrained —people who want more risk or people who want less—is something that I think should be looked at when considering the policies. And I don't think it's been too much a focus of investigation. But something that our theoretical analysis implies is that even if you had more people constrained in their ability to take on more risk of a certain kind, and you would be helping them have more exposure to that kind of risk through central bank purchases of a certain scale, if the central bank continues taking on more of that type of risk on its balance sheet, as that policy proceeds, it becomes more and more likely that the relevant constraint is on the other side. People would like not to be exposed as much to that kind of risk and are not going to be able to reduce their exposure to it.

And so I think the further you would go with asset purchases of a particular kind, the more reason you would have to be concerned that the effects are more likely to be on one side than the other.

ANDOLFATTO

You talk about Fed purchases of risky assets. I mean, do you have in mind some loose connection of the Fed's purchase of the mortgage-backed securities, the agency debt?

WOODFORD

I think that the main argument that's been made for the desirability of the Fed asset purchases relies upon the idea that certain types of risk are going to be taken onto the Fed's balance sheet, and the claim that taking those types of risk out of the portfolios that people in the private sector have to hold is going to make a difference for the pricing of risk in the economy. And so the whole idea that you're concentrating certain kinds of risks on the balance sheet of the central bank, I think, is entirely the theory behind what's going on. It's not just an accidental effect.

And so then you have to ask: What do you think that does? And I think it's a mistake to say, well, the central bank just takes the risk away. It doesn't take it away. It can affect who is, in fact, going to bear the risk, because essentially it means that a public institution is taking on the risk, and that means that taxpayers as a group are going to have no choice about bearing that kind of risk. And the question is whether you think that concentrating the risks in that way is facilitating an allocation of risk that was, in fact, desirable and that the markets would have been achieving themselves through voluntary trades if financial constraints hadn't been impeding it, or whether you're bringing about an allocation of risk that people would have liked to trade away from if financial constraints weren't keeping them from doing it. And you're pushing them even further into a corner they don't want to be in.

ANDOLFATTO

If you were Chairman of the Federal Reserve, what sort of policy or policy intervention would you be favoring at this time, just endowed with the situation as it has developed to this point?

WOODFORD

It's obviously a very complex situation. In general, I wish the Fed were speaking more about the need for fiscal policy to take on more of the burden of trying to get the economy moving. I'm afraid that, to some extent, the Fed's desire to stress the fact that we still have tools, we haven't used all of our ammunition, has had unfortunate effects. Of course, the intention of that is to reassure the public. The feeling is that letting people be scared that maybe we're out of ideas would itself create uncertainty about the future that would be undesirable for the economy. And that's understandable. But I worry that it's had the undesirable effect of letting Congress off the hook a little too easily by letting them say, "The Fed still has lots of things they can do to take care of the situation, so we can play other games." And I think maybe the Fed would have helped the public debate if it had pushed back a little more on the view that everybody should be assuming the Fed will save everything.

The paper's main takeaways, according to Woodford:

- It's not a paper that claims to have given anything like a complete analysis of the situation that we're currently in. It's more an exploration of some important considerations and how they're connected to each other.
- Even when asset purchases might have useful effects, one should ask how far it is useful to go with them, because even in the cases where there are beneficial effects of shifting some risk of a certain side on the central bank's balance sheet, it definitely doesn't mean that then shifting more and more of it can only be better.
- I think there are real questions about how far you would want to go down that path.

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