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PERCSPECTIVES ON RESEARCH

Sarah Zubairy is an Associate Professor of Economics at Texas A&M University, PERC's Shirley A. Lynch Fellow and University Chancellor's EDGES Fellow. She received her Ph.D. in Economics from Duke University and her undergraduate degree in Mathematics from the University of Rochester. Dr. Zubairy is an Associate Editor for the Journal of Money, Credit and Banking and Journal of Economic Dynamics and Control and is on the editorial board for the American Economic Journal: Economic Policy. Her research has been published in top economics journals including the Journal of Political Economy, American Economic Review, International Economic Review and Journal of Money, Credit and Banking. Dr. Zubairy's research focuses on empirical macroeconomics and monetary economics, with a particular focus on fiscal policy-related issues.

Your first position after receiving your PhD was working with the Bank of Canada. Tell me about your experiences there.

I was a part of a team that was involved in providing the projections to the Governing Council on whether or not they should change the interest rates. This was my first introduction to this interface between research and policy. It was as real as it can get because we were giving recommendations to policymakers who were going to raise or lower the interest rates which affects the entire Canadian economy.

One research agenda I have is based on studying the effects of monetary policy and how it interacts with household indebtedness. That was basically driven by the objectives of the Bank of Canada because they had kept interest rates low for a really long time. They didn't have the big boom/bust of house prices and financial crisis in the mid-2000s. Their recession was much milder. While I was there post-2010, the level of household debt was increasing, so they were very wary because they didn't want to experience what happened in the U.S. They were looking for other avenues and ways to address household borrowing. It was a great experience in seeing how policy can matter so much for driving our research questions and how research findings drive policy decisions.

What advice would you give to current graduate students who want to work at a place like the Bank of Canada?

It's a very dynamic environment. One of the things that you have to realize is unlike a university economics department where we have a few macro economists, it's a great setting because there's so many more economists working at an institution like Bank of Canada or the Federal Reserve Board. There are a lot more opportunities for research collaborations and they have a great visiting scholar program. The people who succeed the most are the ones who can build synergies between their research and policy. If they want to continue doing research, that's the way to go about it.

I would tell students to go in with an open mind because there is this gap between how we pursue research questions in an academic setting versus what policymakers want. How will you get your message across? How can you communicate the underlying message of your research clearly so that policymakers can actually make use of them? It's a learning experience, but if you go in with an open mind, it can become a really rewarding experience as well.

What are some of the differences you found once you made the jump to academia?

I started teaching undergraduates and also at the graduate level, and I have to say, teaching undergraduates is incredibly exciting for me personally, because it is an opportunity to shape

young minds about economics, especially in these economically interesting times we've been living in.

When I arrived at Texas A&M, it was post-Great Recession, and I had a writing assignment for my students asking them how the Great Recession was different or similar to previous recessions and to show it quantitatively. They had interesting insights. After the first wave of the pandemic, I taught an intermediate macro- hybrid course and I brought in what was happening in the economy and asked them to use it to forecast the unemployment rate and inflation. From an economic perspective, the pandemic was a great learning opportunity and for the undergraduates it's just very exciting to bring real world issues straight into the classroom. There is a fixed cost to developing a course but since it's a new set of students every time, the experience is also different every time.

The toughest part of the transition for me personally was advising graduate students because their future job depends on their research. As an assistant professor, you're trying to work and get research out to get tenure. Advising graduate students at the same time is tough. I also had one graduate student with whom I wrote a paper where they found a great job too, so it can be a rewarding and learning experience as well, but overall, I think it is a tough job, especially when you are new in the profession yourself.

In your research, you've taken a deeper look at home ownership and household indebtedness. What first made you look into home ownership as an avenue of research?

There were a lot of countries around the world that were dealing with this issue of high household indebtedness post-financial crisis. The Bank of Canada had their interest rates really low and so they were looking at other policy tools in their toolkit besides interest rates, which would affect household debt levels. That was the start of an agenda where my coauthor and I looked at these questions in the context of structural models. We looked at alternative tools like property taxes, down payment requirements or, in the case of U.S., mortgage interest rate deductions. This research focused on household debt. But notably a majority of household debt is mortgage debt. So then, I started looking at the home ownership decision, whether you buy a house or not. In my paper with Eunseong Ma, a graduate student who was also a PERC summer fellow, we looked at whether there are demographic differences for home ownership rates. Young people are trying to become homeowners, but they have barriers to entry. They need to have some savings to make the down payment and they need to have a certain level of income, to be eligible to get mortgage loans.

We looked at home ownership rates, which rose in the U.S. and started declining in 2005-2006 onwards. What was driving this decline? What we found was that young people are the most sensitive group when it come to the entry into and also the exit out of the home ownership pool.

In another paper that studied pensions, you created a data set of 55 years of pension data from a set of OECD countries. Can you talk about the data gathering process and the most interesting findings from that paper?

In my early work during and right after graduate school, I worked on government spending multipliers, which summarizes if there is a $1 increase in government spending, how much does GDP increase? It informs the policy debate, but I always also think that the type of spending matters. In this project we focus on a specific type of spending, old-age pension spending. When I visited the Kansas City Fed, my co-author who is an economist there and I started the data gathering process where we started reading OECD surveys for different advanced economies.

OECD has country surveys each year starting in the 1960s or so for each country, and they discuss lots of economic things happening in the country, including different types of policies. We took a mix of ten countries and we went through OECD surveys to identify different public pension policy changes. The big innovation of our data set is that it goes further back relative to other data sets and, in addition to identifying what type of change and what policy tools it used, we also codified motivation. What drove the governments to introduce these policy changes? You have to read between the lines in some cases and in other cases they spell it out. For instance, in the '70s

and early '80s, inflation was really high, so there are a lot of indexation related rules to keep up with the cost of living. If inflation is high, they would raise the pension benefits so that it keeps up with the cost of living.

We focus on pension changes that were driven by longer term goals, like keeping up with demographics or fiscal sustainability driven goals, like debt reduction. If you want to do some kind of causal analysis to be able say this policy change caused this effect to happen, one has to deal with endogeneity problems. This involves distinguishing between policies driven by short versus long run concerns. By focusing on these policy changes that are driven by long- run concerns, we could then do causal analysis. When there is a particular pension policy change, how does it affect the retirement decision of people who are close to retirement? We also identified that some policy changes are immediately implemented and some are implemented with long delays. What we found was that when you have a pension reform announced and immediately implemented, people stay in the labor force a little bit longer. But on the other hand, if there are delays between the announcement and implementation, there is an exit from the labor force of folks close to retirement.

If pension policies are implemented with a long delay, why would you leave the workforce? We explored different cases where there are pension reforms which might create incentives for agents to want to lock in benefits under the current regime as opposed to risk waiting. Having trust in government also matters a great deal. If you divide the countries into two samples, based on some credibility measures from OECD, the exit in the labor force is larger in countries where agents don't trust the government. The lack of credibility seems to create uncertainties for the agents who then want to just lock in what they know well as opposed to kind of taking the risk that maybe down the road the government will change its mind again. This is at the aggregate level and indicates average effects over all these countries over many years. We thought it was very cool that you can see these differences based on implementation lags, and we give policy makers some prescriptions on pension policy design.

As part of your graduate studies, you published work on government spending multipliers that is widely sourced. Can you describe these multipliers and their uses in fiscal policy?

In one of my most notable works with Valerie Ramey, we create historical data for the U.S. going back to 1890 to study whether or not effects of government spending differ based on high unemployment periods, when we have slack in the economy versus low unemployment periods. And until then, most of the analysis had always focused on the post- World War II period. If you want to make more precise statements about high and low unemployment periods, you need more data and then the further back we go, we have more variation in government spending, and we have more variation in high and low unemployment. We have the Great Depression in the sample, World War I, and World War II. We found that there's not that much of a difference between the government spending multiplier in a recession versus an expansion. Under some conditions, you can get a larger multiplier during a high unemployment period, but it is still less than one, meaning $1 of government spending is still stimulating GDP less than $1. This was contrary to what some other people had found and we gave methodological reasons for why that might be the case.

Another contribution we had is that in theoretical models, the other hypothesis is that if monetary policy has rates that are not moving or are close to zero, then an increase in government spending will have a bigger bang for its buck. We didn't have that much data on zero-lower-bound (ZLB) economies before, so nobody had really tested it empirically. In that paper, we have this long time series data that has both post-Great Recession data and around the Great Depression, where the monetary authority had its hands tied. We looked at multipliers in ZLB versus normal times and we don't find much difference across those two, but if we exclude the World War II period, then we do find larger multipliers in ZLB.

This paper is also used by other people because of the econometric framework. You can just plug in anything and conduct state-dependent effects of any policy measures. This also became important in current debates, and more so with the pandemic,

when the design of the fiscal plans was being discussed. I think very early on, monetary policy took whatever actions it could, but then the rates were at zero. So, then there was a lot of pressure on fiscal policy and we had lots of targeted plans - unemployment insurance and Paycheck Protection Programs and so forth. But at the same time, if you are going to send money to state and local governments, the Congressional Budget Office had to construct multipliers for that, how much do we think this is going to contribute to stimulating the economy? If they use our estimates in the ZLB period, the multipliers are going to be higher.

At the same time, I am working on a project with Yoon Jo, my colleague here at Texas A&M, where we refine the argument even further. As an example, in the pandemic, we're in this scenario where the government sent checks to people, and that might work in a normal recession: you go and spend money and that's how they stimulate the economy. It doesn't matter if a rich person gets it or a poor person gets it. But it was not the most effective of policies during the pandemic because where are you and I going to go and spend money when all the shops are closed? So, the nature of the recession also matters. Is it a demand driven recession, so that for a given price, firms cannot sell their goods because there is a decline in demand? Or is it the fact that for a given price, firms are having a harder time producing and selling goods and therefore supply driven? We've taken the state dependent common spending multiplier literature one step further to say that even in recessions, government spending, which is thought of as a demand stimulating tool, works best if it's a demand driven recession, but not so much if it is a supply driven recession.

What are you working on now?

I'm currently working on a project where we're looking at innovations that uses information on patents. When a firm makes a discovery, we compute an index to measure technological news shocks and estimate how it affects the aggregate economy and GDP. For example, we can think about how the innovation of vaccines helps the economy and also impacts projected profits of the firms producing them, and we see it reflected in the increase in stock prices of those companies. Using this kind of information, we can identify new shocks. These news shock have positive aggregate effects on the economy and we find that these discoveries have a bigger effect in recessions than in expansions. Now what we're working on currently is to go from the aggregate to the firm level to study transmission mechanisms. If a firm has a major patent granted in a recession, does it behave differently? What kind of decisions does it make, such as investing in more capital? That's one agenda I'm pursuing going forward.

You were recently given one of the EDGES awards. What went through your mind when you found out you had been selected?

It feels great and humbling at the same time to be recognized for my research. I'm just very grateful that the department and the college nominated me. It's really encouraging that my current work is recognized and it gives me further motivation to do bigger and better things in the future. Especially, now that I work a lot with grad students, it gives me the confidence to lead them through their research.

HOUSEHOLD DEBT AND THE EFFECTS OF FISCAL POLICY

Since the Great Recession, policymakers have increasingly relied on fiscal policy to stabilize and stimulate the economy. In PERC working paper 2011, PERC's Shirley A. Lynch Fellow Sarah Zubairy, along with co-authors Sami Alpanda and Hyunji Song, investigate how the effects of government spending policy shocks depend on the balance sheet position of households by examining spending by households that rent, hold a mortgage, or own their homes.

In recent years, a growing literature has shown that alternatives to the standard representative agent model, which relies on representatives or agents to conform to the same actions, should be explored in order to better understand overall spending dynamics in response to government spending shocks. Along this vein, other studies have shown that household liquidity, income, and wealth all play key roles in how households respond to government policy shocks.

Since mortgage debt constitutes the vast majority of household debt and housing status has been shown to be a useful proxy for debt and asset position, the authors use data on mortgagors, outright homeowners, and renters as a substitute for the financial position of households. In prior studies, few datasets included detailed long-term information about household income, expenditures and liabilities. In this paper, the authors use data from the

U.S. Consumer Expenditure Survey, which provides these data on over a long period of time. Concerns about selection bias and endogenous choice into housing status are also addressed, showing that the share of households in each group does not respond significantly to public spending shocks.

First, the authors establish the differences of government spending effects based on housing status. Findings show that in response to a positive government spending shock, mortgagor households experience a large rise in their consumption. Renters also experience a rise in their consumption, although smaller than mortgagors. In contrast, outright homeowners without mortgage debt experienced almost no change in consumption in response to a public spending shock. These different responses cannot be explained by differences in income responses, which have a similar response across the three types of households. Additionally, consumption patterns differed across durable and non-durable consumption. These results show that it is not the housing status, per say, that matters but rather the level of household indebtedness or liquid wealth that differentiates a household's response to a government spending shock.

Second, the authors provide a theoretical framework to justify these empirical findings and further examine the transmission mechanism. A dynamic stochastic general equilibrium (DSGE) model with housing, borrowing and lending across heterogeneous households, and financial frictions in the form of collateral constraints similar is constructed. Going one step further than what is currently found in the literature, this model features three types of households instead of two: savers who own their housing, borrowers with mortgage debt, and a new third type, those who rent housing. Since the paper's focus is on mortgage debt, the model uses fixed-rate mortgage loans which are amortized over the long term. The parameters of the model are then adjusted to match micro-evidence and various data moments like housing shares of various types of households in the U.S. economy.

The authors then prove that this model can successfully match overall responses and also account for the different responses across households to a public spending shock. Government spending shocks move through the economy primarily through wealth and liquidity effects. Although labor income responds positively and similarly across all types, some households actually decrease both consumption and labor supply based on the expectation of higher taxes. Households who own a paid off home are hit hardest by this negative wealth effect given their portfolio of taxable assets. Renters living hand-to-mouth are least affected, with the borrower households affected intermediately. The persistence of the spending shock generates

different degrees of wealth effects and plays an important role in the effect of the shock. For the borrower households, government spending shocks help relax their borrowing limitations and thus their ability to borrow and consume.

Lastly, the model is also used to account for durable and non-durable consumption and the overall responses match those seen in the empirical analysis. Of note, durable consumption responses are distinct from housing responses, particularly for renters. If interest rates are at or near zero, the effects on output and consumption due to positive government spending shocks were found to be significantly higher than in normal times. Findings from both the empirical analysis and the model suggest that household mortgage debt position plays an important role in the transmission of fiscal policy.

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