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FROM THE LAB

IN THIS ISSUE

3rd Annual Women in Macro
Virtual Conference held in September 24–25, 2020

LAEF
Laboratory of Aggregate Economics and Finance
UC **Santa Barbara**

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FROM THE LAB

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Director's Message

Finn Kydland

In May 2018, LAEF organized, in Santa Barbara, the first annual Women in Macro conference. The academic organizers were Marina Azzimonti, Alessandra Fogli, and Veronica Guerrieri. The conference was a spectacular success in every way imaginable. In 2019, the Becker-Friedman Institute at University of Chicago took over the organization of the conference. This year, the third annual Women in Macro conference was originally scheduled to take place in June at the Stern School at NYU. For obvious reasons, it could not be held in person. The conference dates were moved to September 24–25. Before the conference, I admit to having my doubts about doing a conference in Zoom, but as in the previous two years, the conference, organized by the same three, was another spectacular success, obviously thanks to the quality of the papers and to the dedication of the three academic organizers in putting it on. Most of this issue of *From the Lab* is devoted to summaries of the proceedings—paper presentations as well as discussion—that took place.

I take the opportunity to announce an organizational change at LAEF. I've been told that on the very day Ed's and my Nobels were announced, in October 2004, the donor of my Chair, Jeff Henley, immediately proposed that a center in macro be created at UCSB. Our great Chancellor, Henry Yang, enthusiastically embraced that idea. Hence, in 2005, *Laboratory for Aggregate Economics and Finance* was created, with myself as the Director (Peter Rupert later brought on as Associate Director). As I'm not especially known for my organizational skills, I figured an outside Advisory Board was needed. Gary Hansen, Per Krusell, Richard Rogerson, and Víctor Ríos-Rull all accepted my invitation to serve for the next three years, 2005–2007. Especially in the beginning of my endeavor to lead such a center, their feedback was extremely useful. I would send them suggestions, they would provide feedback, sometimes propose academic conference organizers with specialty in particular subfields or on specific research questions, and so on. Getting the right people is all important, as the academic organizers basically have a free hand in putting the program, with participants, together. In my mind at least, this has been crucial to the success of the sequence of conferences that have been held over the years, usually three or four per year. No wonder I've kept the original four Advisory-Board members on for way more than the three years I had indicated when they were recruited. But now, 15 years on, I figure it's time for a change.

In the interest of continuity, and because they've been especially active in proposing, and even putting together conferences themselves (including the LAEF conference *Health and Mortality*), Gary and Víctor will stay on for another couple of years. Replacing Per and Richard will be Marina Azzimonti, Stony Brook University, Tim Kehoe, University of Minnesota, and Eric Young, University of Virginia. To read more about the three newcomers to our Advisory Board, you may go to http://laef.ucsb.edu/directors.html

Readers of my Director's Messages may have noticed that, over several years, Eric Young has been academic organizer or co-organizer of about one LAEF conference per year. This includes the conference on Credibility summarized in the last issue of *From the Lab*. I expect great suggestions from Eric also in the future. Marina, of course, has done a terrific job as co-organizer of the three Women in Macro conferences. I look forward to more to come. It would be great, for example, if conditions were to improve so that we could meet in person for another one in Santa Barbara. Finally, as I'm sure legions of then-finishing Ph.D students will attest to, it's hard to imagine the yearly Workshop on Dynamic Macroeconomics, which takes place every summer in Vigo, Spain, supported by LAEF and summarized in From the Lab, without the penetrating and constructive questions and comments especially from Tim Kehoe and Víctor Ríos, not to mention their contribution towards helping Jaime Alonso, University of Vigo, put the conference program together. Sadly, the 25th annual workshop that was to have taken place this July had to be cancelled. We hope conditions will permit going ahead with the anniversary workshop in person next summer.

Finally, as the long-time reader of *From the Lab* may recall, I have instituted the tradition of once a year providing a list of the international events, such as keynote speeches and public lectures, in which I have participated. Peter Rupert as well does a considerable amount of speaking at various events. He tends to concentrate more on the local economy, meaning California and especially Santa Barbara and surrounding counties, in part through his leadership of UCSB's Economic Forecast Project.

In the past, I've always done this list for the previous academic year. This time, as it's somewhat uncertain when the next issue can be published, I'll let the list run into the autumn. So here's my list of activities for the period July 1, 2019 through October 2020.

Keynote Speeches and Public Lectures

July 25–27: Session Chairman, UBC Summer Finance Conference, University of British Columbia

Aug. 15: Teaching Fellows Talk, CERGE-EI, Prague

Aug. 21: Public Lecture, Conference at Federal Reserve Bank of Minneapolis, on the occasion of 50 Years of Collaboration with University of Minnesota

Aug. 31: Keynote, WAIC World Artificial Intelligence Conference, Shanghai

Sep. 10: Keynote, World Computer Congress, Changsha

Oct. 13: Keynote, Innovative Urban Development Mode International Forum, Xi'an

Oct. 29–31: Lecture and panel discussion, 2nd Annual World Laureate Forum, Shanghai

Nov. 12: 2019 Jiangbeizui New Financial Summit, Chongqing

Jan. 31: Panelist, The Hegra Conference of Nobel Laureates, Hegra, Saudi Arabia

Feb. 21: Public Lecture, Department of Finance, NHH Norwegian School of Economics, Bergen

Apr. 14: Full-page interview by the journalist Lluis Amiguet in major Spanish newspaper La Vanguardia

Oct. 29–31 (2020): 3rd Annual World Laureate Forum, Shanghai; speech for the Forum recorded in August by recording crew at my home; panel discussion (virtual) among five Economics Nobel Laureates during Forum

Panels and Committees

Feb. 10: Oslo Business for Peace Award, selection-committee meeting, New York City

Aug. 6–9: Ghana Priorities Eminent Panel (virtual), Copenhagen Consensus Center, to rank solutions to the problems of Ghana

Oct. 18–20: Premios Jaime I (prestigious Spanish prize), selection-committee meeting (virtual) for Economics prize, Valencia

Off-Campus Educational Activities

July 8–11 (2019): XXIV Workshop on Dynamic Macroeconomics, Vigo, Spain; opportunity for PhD students to present their research for feedback from more than half-a-dozen seasoned professors, including myself!

3rd Annual Women in Macro

September 24–25, 2020

Marina Azzimonti – Stony Brook University
Sandra Black – Columbia University
Maryam Farboodi – MIT Sloan
Raquel Fernandez – New York University
Alessandra Fogli – Federal Reserve Bank of Minneapolis
Nicola Fuchs-Schundeln – Goethe University Frankfurt
Cecile Gaubert – University of California, Berkeley
Gita Gopinath – IMF
Veronica Guerrieri – University of Chicago Booth School of Business
Finn Kydland – University of California Santa Barbara
Sydney Ludvigson – New York University
Lisa Kahn – University of Rochester
Ellen McGrattan – University of Minnesota
Cecilia Parlatore – New York University Stern School of Business
Elena Pastorino – Stanford University
Alessandra Peter – Columbia University
Marla Ripoll – University of Pittsburgh
Aysegul Sahin – University of Texas at Austin
Claudia Sahm – Washington Center for Equitable Growth
Stephanie Schmitt-Grohe – Columbia University
Stefanie Stantcheva – Harvard University
Nancy Stokey – University of Chicago
Laura Veldkamp – Columbia University
Annette Vissing-Jorgensen – Haas School of Business, University of California, Berkeley
Arlene Wong – Princeton University
Vivian Yue – Emory University

Job Search Behavior Among the Employed and the Non-Employed

Jason Faberman, Andreas Mueller, **Aysegul Sahin**, and Giorgio Topa

Our understanding of the labor market depends critically on the tools and theories we use. An important area of inquiry is referred to as on-the-job search. There is little empirical evidence concerning how job search behavior might depend on employment status. The goal of this paper is to fill this void by designing and implementing a unique survey to study job search behavior both for employed and for unemployed individuals. The authors provide comprehensive evidence on the nature of on-the-job search behavior in the U.S. and uncover new facts.

Based on their survey, the authors found that 22% of the employed report looking for work in their survey months. Moreover, they show that the intensity of on-the-job search significantly declines with a worker's residualized current hourly wage. An important finding of the paper is that on-the-job search is more effective than search by the unemployed: the authors show that although the employed workers put a fraction of the search effort of the unemployed, both groups receive a similar number of offers. Moreover, the employed workers receive a disproportionate number of unsolicited offers.

The authors further show that the employed workers appear to sample from a higher-quality job offer distribution than the unemployed: unconditionally, the wages offered to the employed are 44 percent higher than the wages offered to the unemployed. The authors argue that observable worker and job characteristics explain only half of this wage offer differential between the employed and the unemployed. Finally, the authors document that the unemployed are about one-and-a-half times more likely to accept an offer despite the poorer quality of their job offers.

In the second part of the paper, the authors employ an on-the-job search framework that is based on Christensen, Lentz, Mortensen, Neumann, and Werwatz (2005) with additional features supported by the data to quantitatively investigate potential explanations for the wage offer premium observed in the data. The authors find that the majority of the wage offer premium is accounted for by the favorable selection of the employed along with observed and unobserved characteristics, and the employed workers' more selective censoring of potential offers. The model estimates suggest that differences in unobserved heterogeneity by employment status account for around 70% of the residual wage offer differential observed after controlling for observable worker and job characteristics, while censoring accounts for 10 percent of the wage offer differential.

Previous studies have employed different surveys, and a member of the audience asked whether the estimates obtained by the authors' model were consistent with those of past research. The presenter said that their estimates were consistent with Mueller (2017), who found, using the Current Population Survey, that unemployment risk is significantly higher for workers below the median residual wage after controlling for observables.

Why are Average Hours Worked Lower in Richer Countries?

Alexander Bick, **Nicola Fuchs-Schündeln**, David Lagakos, and Hitoshi Tsujiyama

The authors ask why, on average, individuals work for fewer hours in richer countries than in poorer countries. They consider two explanatory forces. First, income effects may dominate substitution effects, resulting in a larger allocation to leisure in rich countries. Second, taxes may distort choices on how much time to allocate to work versus leisure. This paper tries to quantify the contribution of each force by using a simple model, and subsequently allows for intensive and extensive labor supply margins and self-employment. They find that income effects are the primary driver of the phenomenon and that tax systems across countries do not vary enough for the distortion explanation.

Lisa B. Kahn of the University of Rochester, who was the discussant, said that in a previous work the authors showed that the decline of hours of work was a function of GDP per capita and that almost all of the decline came from moving to middle-income status from poor country status. It is quite flat within high-income countries, with a few countries showing a rise. In other work on within-country elasticity of hours with respect to wages, the U.S. and the U.K. show positive elasticity, which is not supportive of the authors' finding. Dr. Kahn also commented on a different pattern in intensive margin hours. A large increase was shown when moving into the middle-rich country status, followed by a more strict decline when entering into the highest-income countries.

The model sets the Marshallian elasticity to account for differences in hours across countries that cannot be explained by tax-and-transfers systems. They find -0.1 Marshallian elasticity, which seems roughly in line with a wide range of estimates from the literature.

Dr. Kahn said it would be interesting if the authors asked how well they did at matching the hours distribution for a range of estimates of the Marshallian elasticity. She said it was striking that the reversal in the hours-wage gradient for rich countries actually could be matched in the model, even though it was not directly targeted. This is because tax-and-transfers progressivity is so large in the richest countries that it distorts hours at the bottom. Finally, she highlighted that the model could rationalize the extensive margin with the steep-decline-then-flat shape and the intensive margin with the inverse-U shape.

Ayse Imrohoroglu asked if there could be a relationship between retirement age and how many hours people work before retirement, as people sometimes retire in their 40s in poor countries, resulting in shorter working lives. The presenter answered that their results did not appear to be due to the composition effect of ages. They built hypothetical hours using the same age composition across countries, and they found exactly the same patterns.

An audience member suggested considering marginal tax rates on both the paid and self-employed workers. Dr. Fuchs-Schündeln answered that they did have nonlinear income taxes data that they approximated, and that she thinks they went much further than usual in capturing their effects.

Another participant questioned the extent to which the share of the traditional sector was agriculture. There are many months when it does not make sense to work, such as wintertime in the agricultural sector. The presenter answered that a large share of the traditional sector is agricultural, but they also see a substantial share in the service sector which lacks the seasonality. She said they saw the seasonality very clearly in the data, which made it important for them to use the sample that only asked about hours over the entire year. She agreed that they should report how much of the traditional sector was agricultural.

An audience member asked whether it was possible to adjust the informal sector since underdeveloped countries usually did not report the numbers through the formal sector. The presenter answered that although traditional sectors in underdeveloped countries were a bit like the informal sector, the patterns were fairly robust across different countries. Furthermore, the data came from a survey that asked how much people worked in the last week, with no obvious reason to misreport.

One question pertained to time series evidence in the most advanced economies that work hours among males has been declining over the last hundred years, and that this decline seemed attributable to the income effect. The audience member asked whether it would be possible to further demonstrate the importance of the income effects by analyzing this data, and the presenter said that the authors did some analysis on the U.S. time series and the decrease in hours over that time span.

Assets and Job Choice

Titan Alon, Natalie Bachas, and **Arlene Wong**

The average debt a graduating senior can borrow almost tripled since the mid-1990s. Student debt makes up an essential part of young college graduates' net worth, especially for the bottom fifty percentile young graduates. How does debt from early in life affect the labor earnings profile over the remainder of life?

The authors decompose their study into three main parts to answer the question. First, they test the causal impact of student debt on initial earnings and on returns to experience for the subsequent 10 to 15 years. They propose with further empirical evidence that student debt could affect labor earnings through occupation choice and the amount of on-the-job investment. Next, they apply a heterogeneous agent life-cycle model with college and occupation choice and borrowing constraints to NLSY 1997 and CPS data and arrive at their empirical findings. Last, they experiment with the model setup for quantitative implications of debt for the allocation of talent and for aggregate labor productivity.

One finding based on the causal analysis is that there is a significant effect of debt on initial earnings, which aligns with the existing literature. The authors find that there exists a tradeoff between higher initial earnings and lower return to experience over the next 10 to 15 years. They also propose based on empirical evidence that the initial occupation choice and industry heterogeneity may explain the effects of student debt on earnings profile. More specifically, every thousand dollars increase in debt causes individuals to have 3.14% higher initial earnings, about $500 more initial earnings, including people on the extensive margin. The people with high initial debt tend to have lower average returns to experience. Every thousand in debt leads to a return to experience about 1.37 percentage points lower each year, which is quite sizable, considering that the young workers' earnings grow 7.75% each year.

Initial occupation and industry heterogeneity may be relevant for understanding the effects of student debt on earnings profiles. Evidence based on CPS data says that log initial earnings and log earning's growth over the fifteen years are negatively correlated. The occupations that promise higher initial earnings and a lower rate of returns to experience are jobs that have reportedly less importance of continued on-the-job training. More debt-constrained young graduates could endogenously select themselves into occupations that pay a higher amount out front and subsequently have a flatter wage profile.

The authors then use a heterogeneous-agent life-cycle model with credit constraints to capture the empirical findings. Credit constraints are crucial in the model because people cannot borrow as much as they want to through the asset market when the constraints bind. Thus individuals will have to borrow by distorting their human capital. People distort their human capital in two ways: through within-occupation human capital decisions, like on-the-job training; and through distorting their occupation choice. If not constrained, the more talented an individual is, the more payoff she may get from the on-the-job investment. With constraints binding, people distort by investing less in on-the-job training, and coinciding with the empirical evidence, they get higher initial earnings at the expense of lower return to experience.

The model predicts people make different occupation choices compared to when there are no borrowing constraints. The difference in occupation choice due to the borrowing constraint is defined as the misallocation of talent in the study. According to the model, the more talented a person is, the more likely she is to be constrained. The more talented a person is, the more she may want to invest in herself when young, and this means giving up more initial earnings. Thus given a certain level of assets and earnings, talented people are more likely to be constrained. If there is no dispersion in the wages and no borrowing constraints, people will base the selection of jobs on their talent endowment, and there will be no misallocation of talent.

The model suggests that when there is dispersion in wages among jobs, if the borrowing constraints are not binding, more people choose the occupation that pays higher; when the borrowing constraints are binding, there will be additional people selecting themselves into the occupation that promises a higher initial earning instead of the occupation where they possess a higher talent endowment. They would have chosen differently if the borrowing constraints did not bind.

The authors find that, in their model, the level of initial assets reduces the extent of misallocation. As they experiment with the parameter, by allowing people more wealth and more grants, they observe fewer distortions made due to the borrowing constraints.

The discussant, Elena Pastorino, praised the authors' idea as simple yet compelling. Among the comments, there were concerns about endogeneity of experience on wage profiles, which may potentially overestimate the effect of debt on returns to experience, and possible overstatement of the initial occupation's role on the distortions if there exists job switching with people moving to higher-wage-growth jobs over time or when experience comes as a byproduct of working.

Attendees commented that the effect of debt on their wage profiles could be different depending on other characteristics and that it would be interesting to see whether, as the student debt increased over time, the types of jobs people mostly sought had changed.

Place-Based Redistribution

Cecile Gaubert, Patrick Kline, and Danny Yagan

Governments that try to reduce poverty often target policies to poor communities. These place-based policies can serve as a distributive tool for low-income areas. However, these policies often co-exist with already redistributive policies like progressive income taxation and income-based cash transfers. Drs. Gaubert, Kline, and Yagan analyze whether Place-Based Redistribution (PBR) policies complement other forms of taxation to redistribute wealth to the poorest populations. While most research has focused on the efficiency costs of PBR policies or their potential to address market failures like productivity spillovers, this paper focuses on analyzing its distributional component. Examples of PBR policies, such as the Opportunity Zones, target transfers to location. The rationale of these policies is that some areas tend to be poorer, and, by investing in them, it is possible to correct inefficiencies.

Dr. Gaubert started by highlighting some facts about the spatial distribution of economic outcomes in the United States. For instance, economic advantages and disadvantages are spatially concentrated. Poverty, crime, and air pollution tend to be concentrated in low-income areas in the United States. Apart from helping to redistribute earnings across income groups, place-based policies can generate gains across spatial locations. These motivating facts allow the authors to study conditions under which PBR can improve on place-blind taxation. The authors present a spatial equilibrium where households choose among two locations: Distressed or Elsewhere. In addition to location, households choose how much housing to consume and how much to earn. A social planner designs policy instruments that would maximize social welfare: a place-blind income tax and a PBR levied on the residents of Elsewhere that would benefit the residents in Distressed.

The authors find that when both policy instruments have the same equity gains, a place-blind policy can have higher efficiency costs of redistributing earnings than those of a PBR policy. Therefore, PBR is desirable, as it can achieve equity gains that other income-based policies cannot. Finally, the authors performed a calibration exercise to calculate the optimal place-blind income tax and its corresponding transfer to residents of the poorest 1% of United States census tracts. The authors find that the optimal transfer is approximately $5,400 per resident when the income tax system is implemented.

The paper's discussant, Nancy Stokey, said that the paper took a different approach from the existing literature by focusing on the distributional benefits of PBR. Dr. Stokey also raised questions concerning the feasibility of PBR policies given their political costs. Dr. Gaubert replied by explaining that the PBR they studied could be introduced in a limited way, restricting it to the poorest areas, which in their case represented 1% of the total census tracts. The audience also raised questions about how these policies could be applied in practice. For example, an audience member asked about the role of states in implementing PBR, given that individual states have different income taxes. Another audience member asked whether the income transfers the authors considered included funding for amenities like high-quality schools that could benefit poor areas. Dr. Gaubert responded that amenities like schools or parks tended to be public goods, which related to the efficiency gains of PBR policies.

Exchange Rates and Uncovered Interest Differentials: The Role of Permanent Monetary Shocks

Stephanie Schmitt-Grohe and Martin Uribe

Much of the existing literature on monetary shocks describes the effects of transitory shocks. However, recent studies show the importance of distinguishing transitory shocks from permanent policy shocks. Permanent shocks, resulting for instance from permanent shifts in long-run inflation expectations, have been shown to be at least as important as transitory shocks in explaining the dynamics of output, inflation, and interest rates in the United States. This paper estimates the effect of monetary policy shocks on exchange rates with an emphasis on the distinction between transitory and permanent shocks.

Using an open-economy extension of the model proposed in Uribe (2018), with monthly data from the United States, the United Kingdom, and Japan, the authors attempt to estimate an empirical model of exchange rates. There were three main findings. First, a permanent monetary tightening causes the normal exchange rate to depreciate not only in the long run but also in the short run, while also causing deviations from uncovered interest rate parity against the high interest rate currency. Second, a temporary monetary tightening causes the nominal exchange rate to appreciate gradually without an overshooting effect, as well as deviations from uncovered interest rate parity in favor of the high interest rate currency. Third, permanent monetary shocks explain a larger fraction of exchange rate movements than temporary ones.

Discussant Vivian Yue suggested adding foreign inflation and foreign transitory shocks to investigate the impacts on real exchange rate dynamics. She also discussed some potential interpretations of estimated shocks. She proposed estimating the empirical model based on a panel of countries as a robustness check. For the measure of observables, she pointed out another way to obtain the real interest rate directly by using inflation and nominal interest rates. Dr. Yue suggested comparing the estimations with those using a New Keynesian open-economy model in order to rationalize the empirical findings. It could help answer questions regarding the impact of exogenous and endogenous monetary policy changes on exchange rates.

Among the workshop participants, some questioned the elements selected to determine the permanent shocks and whether the shocks could be endogenous. They proposed a way to reduce this concern by including more controls. Some asked whether the permanent monetary shocks are the same in other countries. The presenters replied that including more controls would be unfeasible because of limited computational power and that they lacked adequate methods to test for endogenous permanent shocks.

Rational Sentiments and Economic Cycles

Maryam Farboodi and Peter Kondor

Empirical research suggests a strong connection between overheating in credit markets and subsequent recessions. The authors propose a mechanism for these cycles from periods of high credit supply, low interest rates, and diminishing credit quality to periods of scarce and expensive credit. They attempt to show how the interaction between credit market sentiments and real economic outcomes might generate the cycles that we see in the data.

The authors propose a theoretical framework where credit market sentiments, captured as lenders' rational choice of lending standards depending on the quality composition of borrowers, determine interest rates and output growth, as well as the quality of future credit applications. The authors use their framework to investigate what type of policy response would work best to steer the economy toward higher welfare.

The model features two types of borrowers and lenders. On the borrower side, there are good borrowers, who are able to pay back their debt, and bad borrowers, who cannot. On the lender side, there are skilled lenders, who are perfectly able to identify the type of borrowers, and unskilled lenders who cannot. However, unskilled lenders have access to a costly technology that can imperfectly reveal a borrower's type. Specifically, unskilled lenders can choose to run one of two tests to determine which borrowers to lend to: a bold test approves the credit application of all good borrowers along with some bad ones (representing lax lending standards), while a cautious test only approves a fraction of good applications and rejects all bad applications (representing tight lending standards).

In this framework, lenders optimally choose lax lending standards when there are few bad borrowers in the market, which generates high credit growth and high output, as well as decreasingly lower quality of credit applications. When the average borrower's quality is sufficiently low, lenders rationally switch to tight standards, which produces high credit spreads and low quantity of credit, but also leads to a high quality of issued credit. The improvement in the pool of credit applications causes a shift back to lax lending standards.

The authors show that their model generates a variety of cyclical behavior depending on the underlying parameters. They further show that the generated cycles are not constrained efficient, as the lenders fail to internalize the adverse selection produced through their choice of lending standard. Still, the authors argue that a constrained planner often prefers a cycling economy to one with persistently lax or persistently tight lending standards. The authors conclude their investigation by relating their constrained optimal solution to realistic monetary and macroprudential policies. They show that both macroprudential and counter-cyclical monetary policies strongly dominate a non-state-contingent monetary policy.

An audience member asked how the study differentiated itself from other studies with dynamic lending standards, where lenders' choice of information acquisition on borrowers differed in booms and in recessions. The presenter responded that their study differed from existing studies in its ability to generate endogenous cycles using a single mechanism, whereas most of the existing studies did not provide an endogenous mechanism explaining how growth transitioned to recessions and recessions transitioned to growth.

How the Wealth Was Won: Factor Shares as Market Fundamentals

Daniel Greenwald, Martin Lettau, and **Sydney C. Ludvigson**

It is exceedingly common to use changes in the value of the stock market as an indicator of general economic trends. But one need only look at the divergent behavior of the market throughout the COVID-19 recession to see that the correlation is imperfect. Indeed, throughout the Post-WWII era the gap between economic output and the value of the stock market has gradually widened. Despite this, relatively little research has been conducted analyzing the precise relationship between changes in economic output and changes in the market valuation of equity. The authors of this paper seek to help fill this gap in knowledge by testing whether, and to what extent, the same factors which contribute to economic growth might also explain observed changes in market equity.

To answer this question, the authors build a model of the U.S. equity market, and then test the performance of their model using historic stock market and economic data. This allows the authors to estimate parameters representing the relative contribution of certain economic factors on the valuation of equity. The model consists of a representative firm with two types of agents: workers, who consume labor income and contribute labor hours, and shareholders, who finance their consumption using their assets and receive periodic cash payments from the firm. The model is built flexibly with exogenous factor share shocks, allowing the authors to capture any number of possible changes to the allocation of rewards to shareholders, such as changes in labor bargaining power or industry concentration. Having built the model, the authors then estimate the model's parameters with U.S data for the following: log output growth, log earnings share, log risk-free rate, log equity-to-output ratio, and the risk premium.

The model estimates that, in the post-war period, 2.9 percentage points of the difference between the mean log return on stocks and the risk-free rate is attributable to a string of favorable factor share shocks, and not attributable to additional compensation for risk. Or to put this another way, they find that the excess stock returns in the sample overestimate the risk premium by 44%. Furthermore, the authors find that since 1989, approximately 43% of the increase in the total value of the stock market can be attributed to these factor shocks, while actual economic growth contributed only 25%. This is in contrast to the earlier period (before 1989), during which economic growth explained over 100% of the rise in equity value. The authors show that the bulk of this difference is best explained by changes in labor's share of earnings. Thus, it seems that the favorable string of shocks led to a reallocation of rewards from workers to shareholders, increasing the market value of equity.

The discussant of the paper, Annette Vissing-Jorgensen, suggested that the authors might consider repeating this study using enterprise value rather than equity value, as equity value might be affected by changes in capital structure that occur throughout the sample period. The discussant also noted that because the authors find that changes in the risk-free rate contribute relatively little to the increase in equity valuation, something which is at odds with the current literature, it might be useful to use survey data to augment their argument. Conference participants were curious as to why changes in corporate tax rates didn't have a bigger effect, and whether the decline in labor share was more pronounced in larger firms.

Policy Panel: COVID-19 and the Economy

Sandra Black and **Gita Gopinath**

The panel offered both macro and micro-perspectives concerning the effects of the COVID-19 pandemic on women. The pandemic-induced recession is different than the Great Recession (2008-2009) and the Great Depression (in the early 1930s). Both in labor markets and at home, the pandemic has disproportionately hit women. Currently, women face a tougher employment picture relative to men: a difference of three percentage points in their unemployment rates. This contrasts with all recessions after 1949, which disproportionately affected the employment of men. This can be accounted for by the shutdown of the hospitality and services industries, and the challenges are especially acute for women from underrepresented minorities.

Women tend to bear a disproportionately high share of the burden of raising children. As a result, working mothers are 15% more distracted than working fathers. While mental health among both men and women has deteriorated during the pandemic, it has worsened disproportionately among women, according to Britain's June 2020 household longitudinal survey.

At the macroeconomic level, an economic recovery appears to be underway, but it is highly uneven and there are signs of stalling. Both manufacturing and services purchasing manager indexes have increased steadily since April. Simultaneously, countries have initiated unprecedented fiscal responses. Government stimulus has been substantial in advanced economies (20% of GDP), and smaller in emerging and lower-income developing countries (around 7% and 2% of GDP, respectively). As a result, public debt levels are the highest recorded in history since World War II—120% of GDP in advanced economies and 70% of GDP in emerging economies. Fiscal support is beginning to wane. Baseline projections suggest social distancing will continue in 2021 and, as vaccines and treatments roll out, the pandemic will conclude in late 2022, possibly concluding later in emerging economies. In the meantime, global risks will come from rising tensions in trade, investment, and geopolitics.

The audience asked about long-term consequences on children and women. Dr. Black said that, according to previous research, as parents lose jobs children will have lower incomes and education levels. In the current pandemic, the fraction of children going hungry has risen drastically. A member of the audience pointed out that it was difficult to tease out the pandemic's effect on lost food assistance since summers usually mean no food assistance for poor children. In terms of schooling, evidence from exogenous variation in teacher strikes suggested that lost schooling will have permanent effects on child education levels. The switch to online classes will not compensate as research suggests it is not on par with in-person schooling. The audience pointed out that higher female unemployment might be related to single mothers not having someone to take care of their children. For emerging economies, Dr. Gopinath suggested that the impact on schooling would be more severe, as these countries lack the required infrastructure for remote learning.

With new COVID-19 cases still growing in emerging economies, the audience inquired about the status of the millennium development goals for those countries. Dr. Gopinath stated that the pandemic would erase years of advancement in the alleviation of poverty. Additionally, emerging economies will have a slower convergence to their pre-COVID growth path than advanced economies. Current conditional cash transfer programs have lowered the costs of assisting poor households in emerging economies.

The audience asked whether the IMF had shifted policy in response to the pandemic. Dr. Gopinath answered that the IMF historically had three-year programs with strict conditions, but had eased rules on their emergency programs with the sole condition that money be used for its intended goal. The Fund is ready to provide liquidity with $750 billion in funds for countries in need.

The audience wondered which one policy the economists would recommend to prioritize efforts. Both Drs. Black and Gopinath agreed that a universal solution to the health crisis was most important.

Houses and Families Across Countries

Alessandra Peter, Monika Piazzesi, and Martin Schneider

This research concerns the relationship between family composition, homeownership, and savings, using European data. They employ a model that extends the traditional life-cycle with housing framework with two additional assumptions: home production technology that creates a higher expenditure share on housing for singles than for couples and adult cohabitation with parents. These assumptions generate informal rental and credit markets.

The authors detail several stylized facts for Europe: singles rent more than couples; singles have a higher expenditure share on housing; and single owners save more than couple owners. Their model predicts that weak rental markets in Southern Europe justify higher ownership, cohabitation, and youth savings; whereas, in Northern Europe, their model suggests that stronger credit markets promote higher ownership rates, but prevent cohabitation and savings.

Their model features agents that live for three periods (young, middle, and old age) and either live alone or form couples. The households derive utility from a Cobb-Douglas mix of private consumption and shared housing services. The housing services technology depends on family structure (single versus couples) with a total-factor-production parameter depending on the taste between owning and renting. When deciding to either rent or own a house, households face a trade-off: homeownership requires a down payment, and consequently, households will save more to meet this payment; whereas renting commands a higher user cost. Family structure affects the trade-off between owning and renting. Since couples spend less on land and structures, they do not save as much as singles and are more likely to own than singles. To study their model's predictions, the authors use both within and across country variation in Europe, with data from the Household Finance and Consumption Survey.

Marla Ripoll, the discussant, pointed out that there was a disconnection in the rent expenditure share between Europe and the United States. In the U.S., the rent-consumption ratio is flat across the life cycle when it includes the homeowner's imputed rent; whereas, in Europe, the rent calculated without including the owner's imputed rent is flat.

Dr. Ripoll also pointed out that the paper would benefit from more institutional details on rental and credit frictions, for example documenting down payments, rental market indicators, transaction costs, tax deductions on mortgage interest rates, and capital gain taxes. The discussant also stated that the model abstracted from portfolio choice frictions, which might explain high ownership rates in Greece (77%), Italy (71%), Slovakia (90%), Slovenia (86%), and Spain (84%). For instance, Italy is known to oblige their banks to invest in government bonds. Similarly, she pointed out that the model did not exploit ownership rate differences between married and cohabitating couples across Europe (Bazyl 2009).

Dr. Ripoll commented that the paper could benefit from more discussion on parents transferring wealth to their children (housing bequest, housing donations, or inter vivos transfers), and on how labor market frictions explain cohabitation (Fogli 2004; Becker, Bentolila, Fernandes and Ichino 2004; Chiuri and Del Boca 2010; Kaplan 2009). The speaker commented that employment status and labor income strongly predicted cohabitation. Both the audience and the discussant pointed out that the model did not exploit urban and rural differences in housing availability within European countries.

The audience wondered if taxation differences across countries better explain the decisions on homeownership and family composition than frictions in credit and rental markets. The audience pointed out that the model did not capture children as complementary goods. The speaker answered that the presence of children did not matter much for ownership, but that the number of adults in the household mattered most.

The audience wondered whether the downward trend in Europe's fertility rate would relieve pressure for homeownership. The audience asked whether differences in rental frictions across housing markets, like apartments versus houses, could affect savings, ownership, and cohabitation. Likewise, the audience wondered whether, in the presence of labor market frictions, employment protection of older workers at the expense of the younger workers would be welfare improving when members of those two generations cohabitate.

Quantifying Efficient Tax Reform

Job Boerma and **Ellen McGrattan**

The authors try to quantify the size of welfare gains from Pareto efficient tax reforms in an overlapping generations (OLG) framework. The authors use a positive economy as a baseline, matched to administrative data from the Netherlands that include earnings, hours, and education. The positive economy is an OLG economy with incomplete asset markets and households that are heterogeneous in age, productivity, and education. There are other heterogeneities, like unemployment risk, marriage risk, and divorce risk, that are still being researched for potential inclusion in the model.

First, the authors solve equilibria for the positive economy, where fiscal policy and wage processes are inputs and values under current policy are outputs. Second, they solve the planner problem recursively, where the inputs are values under the current policy and outputs are labor and savings wedges, as well as welfare gains. Finally, they use these results to inform current politically feasible policy and reforms. This paper extends Hosseini-Shourideh's (2019) analysis to add dynamic risks. The authors consider their biggest contribution to the literature to be the linking of the OLG economy to the planner's problem in full general equilibrium.

For their baseline parameterization, the authors find large welfare gains, on the order of 21 percent of lifetime consumption for future cohorts. They are working on moving both existing and future cohorts to a Pareto-improving state. The main source of gains is increased consumption in early life, which suggests large potential welfare gains to early-life transfers. The speaker emphasized that this paper was work in progress. The ultimate goals of the project are: (i) estimating gains from efficient reforms; (ii) identifying sources of gains; (iii) generating ideas for new policy instruments; and (iv) creating a prototype for future analyses.

The discussant, Marina Azzimonti, pointed out that the authors really try to replicate all the tax policies of the Netherlands. She also highlighted that incomplete asset markets and incomplete tax instruments prevent the planner from taking the economy to a first best. She contrasted two approaches in the literature for analyzing tax policy: (i) macro public finance (MPF) and (ii) new dynamic public finance (NDPF). The MPF approach starts with a realistic tax system and then analyzes what happens with different combinations of taxes and policies observed in reality. The MPF approach analyzes narrow reforms that are not necessarily Pareto improvements. In contrast, the NDPF literature thinks of optimal policy by pursuing the best allocation the planner can achieve given constraints (in this case, that individual types are not observable). Thus, the economy is constrained efficient. Dr. Azzimonti mentioned that such allocations were potentially better than allocations inside the frontier but that the NDPF approach was utopic.

This paper computes a constrained efficient Pareto allocation frontier using the NDPF approach, which is highly complex. Then the authors search for allocations that ensure everyone will have a Pareto gain. Thus, reforms are Pareto improving by construction, with informative results for policymakers. The discussant considered the authors' main contribution to be the bridging of the gap between the MPF approach and the NDPF literature, adding that the paper provided a significant technological improvement and opened a new research agenda. In addition, the discussant pointed out the need to analyze the transition toward the new steady state of the reform economy. Such transition involves changes and distortions in capital—people consume less and invest more±which will be painful for generations in the middle.

Dr. Azzimonti said that the analysis did not take into account generations in between and asked whether there was discounting. The presenter mentioned that the authors were working on the transition. Finally, the discussant highlighted the challenge of going from characterizing allocations to actual reforms in order to make results policy relevant.

An audience member asked how the authors arrived at stationarity in the economy, given that they assumed a small open economy with no trade, no capital flows, and constant interest rates. The presenter mentioned that capital flows were very large in the Netherlands and that they do have a foreign sector. She said that they were considering a closed-economy variation as a sensitivity check, but that it would not be part of the benchmark model. Another audience member asked how they calibrated the linear piecewise tax schedule. The authors took statutory rates for each of the income brackets. They focused on

households that worked and also included lump-sum components.

One commenter noted that the paper focused on Pareto improvements, which tended to be hard to reach, and asked whether the analysis could be applied to other changes. The presenter responded that Pareto improvements were the ultimate goal of political economists, but that they could also analyze other reforms. An audience member asked what were the feasible instruments that the authors allowed for moving halfway toward the frontier. The speaker mentioned that the instruments included: (i) tax functions for labor, assets, and consumption; (ii) early life transfers; and (iii) social security.

Universal Base Income: A Dynamic Assessment

Diego Daruich and **Raquel Fernández**

Universal basic income (UBI) has become increasingly popular recently, especially in light of the ongoing pandemic. A UBI represents an unconditional cash transfer; that is, a lump sum of money given to individuals free of obligations or requirements. All citizens are eligible and may spend the money however they like.

Advocates of UBI tout its ability to address potential inadequacies of social safety nets, growing inequality, and low intergenerational mobility. However, the consequences of a UBI have not been widely studied. There is only some partial short-run evidence from a variety of cash transfer programs. And we are especially ignorant of the longer-run larger-scale consequences of UBI. The goal of this paper is to bolster our understanding of the implications of a UBI, especially as it relates to policy.

The authors employ a dynamic, overlapping generations model and find that in the short run a UBI is good for low-income individuals in the current generation. Over the long-run, however, it reduces labor supply, savings, and human capital acquisition, resulting in a reduction of 13% to GDP.

The authors' general equilibrium Aiyagari-style model includes twenty periods and four life stages (childhood, college, work, and retirement) with endogenous intergenerational links and a potential role for government intervention. Individuals make saving, labor supply, and college choices. Wage depends on age, education skills, and exogenous shocks. Parents care about their children's welfare and can invest in a child's skill set through time or money and can also give monetary transfers.

The model is estimated to the U.S. economy in the year 2000, restricting the sample to 2-adult households to best match the model. To nail down tax rates, the authors use simulated method of moments to match the household-level data. The authors choose a UBI large enough to put every adult above the poverty line. This amounts to $11,000 per year for every household. They assume that a balanced budget is required every period using a labor-income tax. Most importantly, the authors evaluate the role of UBI on welfare, distinguishing among incentive effects, taxation effects, and general equilibrium consequences. Furthermore, they evaluate the importance of endogenous intergenerational linkages in welfare results.

The authors find that a UBI leads to decreases in parental expenditures on children; that is, they invest less time (29% decrease from baseline) and money (50% decrease) in their children. Labor productivity falls 3.9%; college attendance falls 12.4%; and overall capital falls 20%. All of these changes lead to a decrease in overall welfare. While the first generation gains from the UBI, all future generations suffer losses.

Discussant Stefanie Stancheva began by pointing out that the effects of UBI are difficult to study given its rarity in the world. Long-run effects are especially difficult to study empirically, because they must be enacted for decades before the effects can be studied across generations. This research addresses these difficulties by applying theory in modeling the effects of a UBI.

The discussant praised the use of the structural model and the authors' care with its specification and with data selection. She highlighted the use of state-of-the-art structural techniques and validation exercises that increase confidence in the model. She noted the importance of this research given its timeliness with respect to policy. Dr. Stancheva explained that a universal basic income and mean-tested transfers are economically equivalent, with potential differences of degree. As a result, she gave examples of several other policy questions that could be asked using the framework of the paper.

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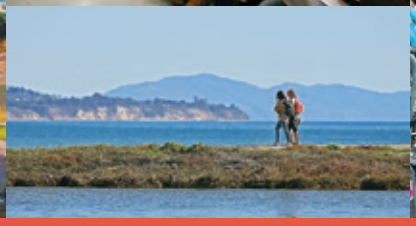

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