

# General Discussion: What Explains the Decline in $r^*$ ? Rising Income Inequality versus Demographic Shifts

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*Chair: Lisa D. Cook*

**Ms. Cook:** I am going to start with the first two questions. At the end of the paper, Amir (Sufi), you mentioned an alternative explanation related to life expectancy. There may be reasons why only the top 10% are responding to the rise in life expectancy. This seems to be an important further dimension of your income inequality explanation. Any conjectures about why this might be? The second question is in recent years, especially in the last year, much of the attention and research related to income and wealth inequality, also using the Survey of Consumer Finances, has focused on the racial dimension of this inequality. Did you and your co-authors look at this, and if so, what did you learn?

**Mr. Sufi:** First, Fatih (Güvenen) thank you for the fantastic discussion. We wanted to use this as an opportunity obviously to be a bit provocative. We think there are obviously huge open questions and trying to tease out causality and macro is a really difficult thing. And I still tend to think of the primitive shock in the economy to be the rise in income inequality. It was global. Most people think it's related to technology, to globalization. The shift-share approach is quite beautiful in the sense that, you take the saving rates as given and you just change the income shares and that's it. And then you can think of the residual as the endogenous response. So that's how

we're thinking about what's happening with the bottom 90%, that they're actually responding. Certainly, the interest rate patterns are consistent with that. You have to get people to borrow. So, interest rates fall, credit cards become easier to get. That's kind of the general narrative, but there were fantastic points in that discussion that we're going to have to continue to mull over. Lisa (Cook), just really quickly. Honestly, I'm not an expert on demographics. We came into this knowing we're going to have to learn more about the demographics. And so we make that point. And just to reiterate the point that Lisa is making if you're going to say life expectancy is the reason that everybody should be saving more, you are faced with the fact that the bottom 90% clearly are not saving more. Now, has their life expectancy gone up by as much? I know there's been some stagnation in life expectancies over the last 10, 12 years, but I think compared with the 1960s, I'd have to look at the data. At the 80th, 85th percentile, I would still think life expectancies have risen, but it's a great question, Lisa. And the short answer to your last question is we did not yet have the time to really look at any racial dimension, but it's definitely on our list of things to do.

**Mr. Rogoff:** A point Fatih made at the very end that I would have started with is that surely the  $r^*$  real interest rates are global. It's a very common phenomenon, so it's a little odd to look just at U.S. data. In fact, that's an oddity of the Laubach Williams framework that you have and even their international version of it. I would have considered actually looking at real interest rates instead of  $r^*$ , which I know you've done in other papers. But I guess this was Jackson Hole, so  $r^*$  loomed larger. I don't know if we can measure the real interest rate, but maybe something closer to it than we can  $r^*$ . Since we're talking about globally determined interest rates inequality may be a global phenomenon, but different countries, even large countries, have very different redistribution systems. The implicit redistribution through pensions and other transfer are very different from the United States. Their demographics cycles are been very different. And lastly, let's look at real interest rates as opposed to this rather artificial construct,  $r^*$ , which has gotten increasingly difficult to know what it is. The floor fell out since the Great Recession. Paul Schmelzing at Yale has real interest rates trending down at half a percent every 50

years; but they've fallen by 3% since the Great Recession. And you kind of wonder why. We had a paper here last year, which I discussed, that featured Barro-type ideas about greater fear of rare events.

**Mr. Bullard:** I do want to agree with Fatih on the notion that within cohort heterogeneity does not necessarily imply a lower interest rate for a lifecycle economy. I've got a series of papers under the rubric monetary policy for the masses. That is a lifecycle model. It's got a pencil and paper solution. It does have intra-cohort heterogeneity, so that each cohort has a continuum of people in it, and you have a single parameter that controls the distribution within that cohort. What you can do in that model is compare two economies. One that has a small amount of intra-cohort heterogeneity in income and another, that has a large amount of heterogeneity within cohort income. And what you'll find is that that will not affect the general equilibrium. You actually get exactly the same interest rate in that particular model. That provides a benchmark that would say that by itself the intra-cohort heterogeneity does not necessarily imply anything about the real interest rate that would balance savings and borrowing in the, in the closed economy. And I agree, about the comments also about the global aspects, but that's going to be tougher to do the global aspects.

**Mr. Werning:** Just two questions, kind of clarifying. The first is I understand the shift-share, but then I don't understand the focus, let's say Fatih especially put on what happened with savings because that could be moving along the demand curve, not the shift. So, I think the methodology should be like the shift-shares, and then you don't get to look at the equilibrium quantities. You've cited some general delivery models. That's what would happen in a general delivery model. You should expect some people are saving more, others are going to have to borrow. And then I guess this is a question more for the authors, is I don't know why we're taking the income shares. Shouldn't it be wealth shares? And also shouldn't we pay attention to the portfolios? I would imagine, it kind of matters whether the rich are buying bonds or buying stocks, and we can look at that. And also the performance of the stock market is going to matter during these time periods. We know wealth inequality has not exactly mirrored income, and it might go your way. I just like to understand, let's think harder, what we really want to do shift-shares with.

**Mr. Mian:** Let me take Ken's (Rogoff) question first. Ken, I completely agree with you both in terms of the limitations of  $r^*$  as a measure. I also like looking at the real. In fact, I would propose, and that's what we're going to, we are doing a new paper that will look at global inequality and it's more across country thing that takes into account a number of the things you mentioned, but let me just throw it out there that wealth-to-income ratio in my mind is perhaps also a good sufficient statistic for thinking about what  $r^*$  might be given the unobservability of this otherwise. So, we are definitely working on that and we tend to find sort of similar patterns and the results of the data, but you have to see the paper before we push further on that. One broad comment, and this is maybe partly addressing Iván's (Werning) question and some of what Fatih said well, I just want to first make an accounting point about saving and this perhaps macroeconomists don't emphasize enough. Net saving is always zero. If you want to talk about an aggregate, the true net saving by construction is always zero. What we call saving is just an artifact of saving equals investment, which is an imposition in the national accounts. I think that should be my group, my starting point that we all know net saving is always zero at every point in time, that's just an accounting identity. So, what are we really talking about? I think what we're really talking about is that before we get into this question, we all know the basic macro facts, which is that investment is kind of has been slightly declining downward. And we have, we have seen interest rates fall while credit has been expanding a lot the world over. So, we take kind of those facts as given. So, it's absolutely right, that we are making certain assumptions about, which curve is shifting and which one is not shifting, but there is a bit of a background about those assumptions. So, that's how we entered this equation. And for this reason, the class of models that Fatih mentioned, we don't pay as much weight to them because their prediction is counterfactual because  $r^*$  will rise in those models. That's one reason we don't emphasize them in this particular paper, but in any case, the point of this paper is purely empirical. Right? And all of those cyclical questions are very important questions that should be further investigated. Jim's (Bullard) paper sounds very interesting. I'd love to read it.

**Mr. Straub:** I think your research today is great Jim and you're absolutely right, that if you write down sort of a very standard off-the-shelf lifecycle model, that's going to be homothetic in the sense that, right, if I double your income, you're going to double your saving, double your consumption. And, so, in that model, you're not going to get anything. And I show that in a previous paper, but once you start incorporating some of the facts that we've documented, that it does seem to be the case that richer individuals have higher saving rates, then you start to break that sort of neutrality result. And then you actually can replicate some of the findings that Amir showed today.

**Mr. Lorenzoni:** My questions overlap a lot with Iván's, is again about the stocks. There must be a way of looking at the problem in terms of stocks, instead of in terms of flows in terms of saving rates, but instead of wealth allocation. And that seems like a useful complement, especially with the fact that stock evaluations are changing, wealth are changing for a bunch of other reasons and on the international dimension. I would follow up with what Ken Rogoff said that, yes, it's surprising that there are countries that also had increase in inequality, but much more redistribution. And somehow the puzzling thing is that it seems that the countries with more distribution tend to run current account surpluses and the U.S with lesser dissolution tend to run deficit, which is kind of like, it's very hard to reconcile with the logic of your story.

**Mr. Furman:** I wanted to ask about your measure of inequality. I think it comes out of your data set. I'm guessing that it's pre-tax and transfer inequality. If you look at something like CBO after-tax and transfer inequality has basically been flat since the year 2000. If you look at the top 10% income share, it is identical after taxes and transfers in 2018 and in 1999.

**Mr. Sufi:** Jason (Furman), I don't believe that. So, just, just a pause. I just don't believe the CBO numbers; I think they're inconsistent with the Piketty, et al. numbers.

**Mr. Furman:** It's fine to not believe the CBO or the CBO estimates, a wide range of other estimates show inequality increased much more in the two decades before 2000 than it did in the two decades after

2000, you look at the ratio at you look at EPI's numbers on CEO pay to median worker pay. Those are flat from 2000 to the present. They exploded in the 20 years before 2000. So, then you compare that to  $r^*$ , which only fell a little bit from 1980 to 2000, when you see a much bigger increase in inequality. In the last 20 years,  $r^*$  falls a lot with a much smaller increase. So, I'm wondering if you use a range of estimates of income inequality that take into account the tax and transfer system, whether it's CBO, EPI, or others, you would get the results that you get.

**Mr. Brunnermeier:** My question was very much what Iván asked, whether it's a stock or flow, why to focus on income inequality, not wealth inequality. And the second thing concerned the portfolio choice. The rich, hold a very different portfolio than the poor. They hold more risky assets rather than bonds which yield the risk-free rate. To see this, consider a hypothetical experiment: take the wealth of the top 10% and redistribute their wealth to the poor to lower inequality. The portfolio between risky assets and risk-free bonds will change. The poor's portfolio tilts more towards the risk-free asset and hence there will be more demand for risk-free assets lowering  $r^*$ . I was wondering whether you can elaborate on this point.

**Mr. Dudley:** My question was what kind of magnitudes are we talking about here? If I moved a bunch of money from rich people to poor people, well, how much would  $r^*$  move? And the second question I have is, what about productivity growth? You never really focused on the savings side, just this whole investment side, and productivity growth has also moved around a lot in the last 40, 50 years.

**Mr. Gourinchas:** I want to come back to a number of the points that have been made going back to Ken (Rogoff) and Guido (Lorenzoni) about the global aspect. The paper, which I find very interesting says, increasing inequality increases net saving and this contributes to lowering  $r^*$ . I have some problems with that. Let me tell you what my problem is. As many people have mentioned, the decline in  $r^*$  is global. If the driving force behind the decline in  $r^*$  was increasing equality in the U.S., we would see current account surpluses in the U.S. We haven't seen current account surpluses in the U.S. Now we could say there's increasing equality in other

parts of the world, and there have been, in Germany, China, other countries. This could work in the same direction in depressing  $r^*$ . It could be even big enough to generate current account deficits for the U.S. Then I would say the story about a low  $r^*$  is not really driven by inequality in the U.S. It's driven by what's happening in China and Germany and the rest of the world. So, we have a little bit of a tension here in thinking about the connection between your findings and  $r^*$ . And I want to close with, an alternative interpretation. Can I think that somehow the decline in  $r^*$ , coming from whatever force you want, could also increase inequality through some of the channels that Fatih has mentioned. For instance, it could lead to a situation where the U.S, as a safe asset provider, is in a trap and therefore safe interest rates, which most people earn, are low, but there are high return on risky assets, which only the rich earn, providing an increase in inequality. Such a channel is present in some work I've done with Ricardo Caballero and Emmanuel Farhi. So, I just want to lay this out there.

**Mr. Sufi:** Let me say on the global factors and current account surplus, this is the biggest issue in our mind that we're working on. And we actually have, Ludwig (Straub) has already started to get a theory that we think makes sense about why countries that might have higher inequality end up running current account deficits. And I don't even want to hint at what the mechanism is, but be on the lookout for the paper, because I think that is something we have to think about. I will say that, of course, the rise in inequality has been global. Right? You can look across Europe and you've seen top 10%, top 1% share gone up substantially. Jason (Furman), we show the scatter plot within the SCF-plus of the rise in income inequality. I have gone deeper than I ever will want to go into all the different estimates of income inequality, the revised after-tax share by Piketty, Saez and Zucman, and the 2020 estimate I think is credible. I think they've responded to the complaints in the right way. And I would say that's the preferred estimate. And I think that estimate shows a continued rise in inequality, or continued increase in top income shares. And so the SCF-plus and the PSZ estimates, I think are perfectly consistent with the time series correlation. On the portfolio point that Iván and Markus (Brunnermeier) have raised, our entire

paper, "The Saving Glut of the Rich" has answers to these questions. So, please take a look at "Saving Glut of the Rich" where we talk about the portfolios in a lot of detail. And in terms of the last thing I'll say on the magnitudes Bill (Dudley), I mean, it's the 25 cent saving rate versus 10 cents. That'll give you a difference in the consumption or demand effect. And then that's what everyone's saying. Relaying that back to  $r^*$  is harder. We actually do it in indebted demand. We actually do have a quantitative magnitude simple back-of-the-envelope calculation. And if I remember it's something like 1 to 2 percentage points; Ludwig you can correct me if I'm wrong. It's something like that, in terms of how much of the decline in  $r^*$  comes from inequality.

**Mr. Straub:** I just want to make clear that nobody walks away here thinking that we don't believe in things like say the global savings, but there are other forces out there. This is not the only one and the global saving, that definitely has been important, especially post-2000. And so that might contribute to the decline in  $r^*$  and also to the current account deficits that we see in the U.S., so just to make sure that this doesn't suddenly fall by the wayside.

**Mr. Guvenen:** On the general equilibrium point that Ivan raised. That's what I was trying to show with the percentiles. There's a presumption that the shock that happened was an acceleration of incomes at the top. So, there was an increased demand for savings, that the borrowers had to accommodate. The picture's not like that. Incomes have been falling at the bottom. This is a different interpretation that is equally valid, and that increased borrowing demand actually has to be matched, now, by lenders. I want to draw a demand-supply figure from one of my papers to show that, and both the income, both the demand and supply are both moving, and they have different slopes. So, if you put them together, you can see this clearly, that it's not just moving along at constant demand function. I'm not suggesting, actually, that that force will be so strong that it will go in the opposite direction. I'm saying there are offsetting effects that need to be taken into account, that's coming from, really, borrowers want to save, and then that will push up the interest rate.