
Macroeconomics in the Age of Climate Change

A CONVERSATION WITH
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On March 23, the Tufts Global Development and Environment Institute (GDAE) awarded its 2015 Leontief Prize for Advancing the Frontiers of Economic Thought to Duncan Foley and Lance Taylor. The Leontief Prize recognizes the contributions that these researchers have made to our understanding of the relationships between environmental quality and the macroeconomy.

FLETCHER FORUM: *What is meant by the phrase, ‘Macroeconomics in the Age of Climate Change?’ What is different about economic policy today in an era of climate change, and what will be the key challenges economists face as climate change intensifies?*

DUNCAN FOLEY: I think it would be better to call it growth theory [rather than macroeconomics when discussing] climate change because macroeco-

Duncan Foley is Leo Model Professor of Economics at the New School for Social Research. Dr. Foley has made key contributions to a wide range of fields, such as microeconomic theory, econometrics, political economy, and the economics of climate change. He is the author of *Unholy Trinity: Labor, Capital, and Land in the New Economy* and *Adam’s Fallacy: A Guide to Economic Theology*. Dr. Foley graduated from Swarthmore College with a B.A. in Mathematics and from Yale University with a Ph.D. in Economics. **Lance Taylor** is Emeritus Professor of Economics at the New School for Social Research and the former Arnhold Professor of International Cooperation and Development. He has served as Professor of Economics at Harvard and MIT; as Visiting Professor at Universidade da Brasilia, Delhi University, and the Stockholm School of Economics; and as a visiting scholar or policy advisor in over twenty-five countries. His most recent book for a non-technical readership is *Maynard’s Revenge: The Collapse of Free Market Macroeconomics*. He received a Ph.D. in Economics from Harvard University.

nomics tends to be focused on a relatively short-term business fluctuation period. There is certainly some interplay of climate damage with that, which is an interesting topic, but more important is the long-term impact of climate damage on economic growth and performance, standards of

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living, and those kinds of changes. And why is it important? Well it's important because for a long time the earth's population was small enough and the amount of fossil fuel we were burning was small enough that you could ignore [the impact], which economists tended to do in making analyses of economic growth. But since the Second World War we have reached a point where [these factors] are no longer negligible

in relation to the geophysics of the planetary environment. It is having definite repercussions on economic performance, distribution, and standards of living levels, so you have to take it into account in growth theory.

LANCE TAYLOR: You're basically talking about two dynamic processes that have their own time scales. One is that, for the last couple of centuries, rich countries have been thriving because of ongoing economic growth at something like 2 percent per year per capita. Way back 150 years ago greenhouse gas was quite stable and gradually it has been building up over time. The trouble is that the growth rate of CO₂ is now beginning to catch up with the growth rate of output, so essentially what is going to happen is that, depending how things work out, this growing carbon dioxide concentration in the atmosphere is in one way or another going to hammer output back down. Over what time frame that happens is not obviously clear and it is also complicated by a lot of other factors (for example methane escaping from holes in the tundra in Siberia) but nevertheless you're talking about a few decades before buildup of CO₂ is sufficient to really begin to hammer the economy. But once that happens then there could be a very difficult adjustment and it may have to be an adjustment that's very fast. All this is not understood well quantitatively. But trying to figure out how it will play out is a very important project.

FOLEY: There are two models we are presenting today. One is a more conventional supply-side model that starts from a production function relationship and the other is a demand-driven model. Both of them agree in one very important way, which is that the growth path for the next 70

to 100 years in both of them looks pretty much like the growth paths that you get out of the economic models that you get without climate change at all. It's almost indistinguishable; it's a very marked aspect of this. But at the 70-to-100-year point they all show this climate catastrophe ... The other timescale on which greenhouse gasses dissipate from the atmosphere is very long, hundreds of years for a half-life. It's very hard to get rid of.

TAYLOR: So once it's built up it's going to stay.

FLETCHER FORUM: *You two co-wrote a paper in 2013 on the social cost of carbon emissions. Could you explain that concept and how the findings might be relevant to the upcoming Paris Climate Change Conference or the general policy dialogue on carbon pricing?*

FOLEY: That paper tries to apply some very basic welfare economics to the concrete case of carbon emissions. The basic point being that carbon emissions are an externality—that is, at the moment there's a zero price on them but it's very likely that future generations will put a positive price on them, so there's a gap between the bid and the ask prices, if you will. The question then is how do you estimate the social cost of burning an additional ton of carbon: which is the right price to use? If you use the demand price, you get a very high estimate, on the order of USD 2,000 or 3,000 per ton of carbon. If you use the cost price—that is the marginal cost of reducing—you get a much lower estimate. So I would say what you want to do is bring those two prices closer together by restricting the greenhouse gas emissions.

If you have this analysis that it is an uncorrected externality, this is a case where our current allocation is inefficient. It seems like a frontier that we could reach if we made adjustments in the amount of emissions and conventional investments. When you have that kind of situation you have the possibility of what's called Pareto-improving change—you can move in a way that improves both current generations and future generations, in a way that improves both rich countries' and poor countries' standards of living. Curiously enough, though, it's much more likely for people to fail to coordinate on achieving a benefit to fail to coordinate on absorbing a cost. This is commonplace—people often leave money on the table because they can't agree on how to divide it up. That's what this is really about, and that's why the politics of it are so treacherous and so interesting. It's like the Ultimatum Game, where someone is given some money to divide up between them and the other person. The first person divides it up and the

other person gets to decide whether they take [the division], in which case they both get the division—or not to take it, in which case nobody gets anything—the inefficient case. It’s very well known that unequal divisions often are refused.

FLETCHER FORUM: *What have been some of your biggest challenges in communicating your results to policymakers?*

TAYLOR: Policymakers typically respond—if they respond to arguments at all—to more or less heuristic arguments about what’s likely to happen as a consequence of doing various things. Often that just becomes a case of throwing slogans back and forth without achieving any degree of consensus. In terms of climate negotiations, of course there are some clear conflicts, such as who is responsible, and should those who are responsible divert some of their resources (to a situation which probably would improve both their situation as well as others). These apparent conflicts are what tend to stymie climate negotiations, and it’s not clear to me how that will work out.

FOLEY: This is a problem of political entrepreneurship and policy craftsmanship—the two things have to go together. The policy end of it is that nobody is very good at figuring out how you can combine something like a 200 percent rise in the price of gasoline in a package with something else that people will get back—say better education, better public transportation,

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or lower taxes—that people will recognize as an improvement in their situation. That is the policy problem. It is partly a problem of perception—how do you sell this thing, how do you package it? This is the behavioral economics part of it. The policy entrepreneurship end of it is then how do

you build a political coalition behind a package of that kind that is going to be stable enough and strong enough to implement. *f*