

## John B. Taylor

Stanford University economist John Taylor has straddled the worlds of academia and government service, with distinguished, complementary careers in each. His academic work has informed his efforts as a policymaker, and his experience in government has provided insights about potential research questions and how to frame them. The most well-known example of the latter is the “Taylor Rule” — a straightforward, concise formula designed to guide monetary policy and largely remove discretion from the policymaking process — which he developed after working at the Council of Economic Advisers from 1989-1991. Many observers have stated that the Fed and other central banks have, in large measure, implicitly followed the Taylor Rule, though Taylor argues the Fed strayed from the rule in the mid-2000s.

Taylor has been a critic of the Fed’s actions during the financial crisis and the subsequent recovery, arguing that the Fed has unwisely engaged in credit policy, threatening its independence and bringing into question serious constitutional issues about which institutions of government have the power to disburse funds. He also has expressed reservations about the 2009 fiscal stimulus package. While many policymakers and some economists have argued that the “multiplier effect” of those government expenditures was on the order of 1.5, Taylor and colleagues have estimated that it was probably closer to zero or perhaps even negative.

In his most recent book, *First Principles: Five Keys to Restoring America’s Prosperity*, Taylor argues that the key to economic success is economic freedom, which has five defining principles: a predictable policy framework, the rule of law, strong incentives, a reliance on markets, and a clearly limited role for government. He then explains how those principles can be applied in practice to a number of current policy issues.

Aaron Steelman interviewed Taylor in Washington, D.C., on Feb. 24.



**RF:** What were the policy events and theoretical developments in the economics profession that helped lead you to formulate what has been dubbed the “Taylor Rule”?

**Taylor:** I first presented it at a Carnegie-Rochester conference in November 1992. But I would go back quite a bit before that. In some sense, I have been interested in policy rules ever since I started studying economics. I had a professor as an undergraduate at Princeton named Phil Howrey, who taught time series analysis and his approach to macroeconomics was to treat the economy very much as a dynamic system, consistent with what we would today call dynamic stochastic structural modeling. So I got interested in policy from the point of view of feedback rules to stabilize a dynamic economic system, and in many respects my whole research focus has been from that perspective. Early on, I worked on how to design policy rules when you don’t know the model, and you have to do econometrics simultaneously with your policy evaluation. I also did some stuff on optimal policymaking when people are learning about the impact of policy. Later on, I built models with sticky prices and rational expectations in order to evaluate policy rules. And in the 1980s, I was developing multicountry models with the same purpose.

By the late 1980s, it appeared that we had done all this research on policy rules and it didn't seem like the central bank was explicitly following that approach. So I decided it was time to get practical and develop something workable rather than a theoretical policy rule with, say, 20 variables on the right-hand side. Another big change was moving toward using the interest rate rather than the money supply as the policy instrument in the feedback rules. So it goes back a long time, and that rule was part of something I had been looking for for many years. In a way, I did not think of the 1992 presentation as a big deal. I just was trying to find a way to write down something that was consistent with all the research I had been doing but also simple enough and workable enough — and consistent with the way the Fed was thinking about and doing policy, which was focusing on the federal funds rate, even though that wasn't talked about much.

**RF: Could you describe what the Taylor Rule says about how central banks ought to generally respond when the inflation rate deviates from its target?**

**Taylor:** The rule is quite simple. It says that the federal funds rate should be 1.5 times the inflation rate plus .5 times the GDP gap plus one. The reason that the response of the fed funds rate to inflation is greater than one is that you want to get the real interest rate to go up to take some of the inflation pressure out of the system. To some extent, it just has to be greater than one — we really don't know the number precisely. One and a half is what I originally chose because I thought it was a reasonably good benchmark.

**RF: From observing policy actions and now reading the transcripts of FOMC meetings, to what extent, in your opinion, has the Fed implicitly adopted something like the Taylor Rule and when has it deviated from its general framework?**

**Taylor:** The biggest period where the deviations are apparent is the 1970s. It would have been a terrible policy rule if it had been estimated in the 1970s. I never really thought of it as an estimate. I thought of it more as a recommendation. I also think there were significant deviations from the rule from 2003 to 2005, when basically there were rate cuts greater than I think any reasonable interpretation of the rule would suggest. So I think the period when the rule was followed fairly closely was roughly from the 1980s through 2003. The way I think about it is that the Fed's actions have been largely consistent with the rule without using it explicitly. We do know from the transcripts, though, that the rule and other rules have been referred to fairly commonly.

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I have never been to an FOMC meeting but a number of members of the FOMC have talked favorably about it, from Janet Yellen to Charles Plosser, so you know it's out there. In the late 1990s Chairman Greenspan told me that it explained about 80 percent of what they were doing during his tenure, but that doesn't mean that he was looking at it explicitly. And there is evidence that a number of foreign central

banks have acted in ways that are consistent with the rule, which surprised me somewhat because I originally had U.S. policy in mind.

**RF: Empirically, do you observe any shortcomings with the Taylor Rule as it was initially conceived?**

**Taylor:** The worry I have always had, and many people have pointed this out, is that it calls for a response to the deviation of potential GDP from real GDP, and potential GDP is hard to estimate. So there is an inherent uncertainty and it's much worse in emerging market countries where potential growth is hard to estimate — China, for example. So people have various ideas about that. One is to lower the coefficient on the gap. But, of course, if you lower the coefficient too much, then you are not responding adequately when there is a recession, so that seems to me not to be the answer. I basically now say, let's just take an average of various people's estimates of potential growth and use that to calculate the gap.

I think that is the biggest concern. You want central banks to respond to inflation and you want them to avoid large discretionary deviations so they don't create their own instability or inflation. This is related to the issue of the Fed's mandate. I think there should be a single mandate: price stability. But it appears contradictory when the rule has the central bank responding to real GDP. It is not contradictory, however, because it is optimal to respond to real GDP even if you are only interested in price stability because that is indicative of where inflation is going. But that is hard to explain sometimes.

**RF: How much do you think the Fed's close interaction with the Treasury during the crisis — and the central bank effectively conducting credit policy — has compromised the Fed's independence?**

**Taylor:** I think the Fed engaging in credit allocation has been a problem and has led to a sacrifice of its independence. There are many reasons that it happened. But it really doesn't make much difference whether the Fed chose to voluntarily get involved in fiscal policy or if it was persuaded to do so. It makes people question why you need an independent central bank to conduct monetary policy. I also

think it raises some serious constitutional issues about which agencies of government are given the authority to appropriate funds and whether that was violated during the crisis.

**RF: How should the Fed reduce its balance sheet?**

**Taylor:** Well, we can learn from what the Fed did after 9/11, when it increased reserves quite a bit. There was a real liquidity crunch in the markets and it was well within the Fed's role to respond that way. During the worst of the 2008 panic, the Fed also provided funds that increased the balance sheet and if it had stuck to the exit policies that it pursued following 9/11, those reserves would have been reduced pretty quickly. But instead the Fed moved after the panic into interventions in the mortgage market and the medium-term Treasury market. Those actions, it seems to me, raised many precedential issues. In fact, in the early part of 2009, Don Kohn was on a panel with me at a conference; I argued that while the Fed can talk about these temporary interventions during the panic, I would worry that if the recovery is slow, it will continue to do these sorts of things — not because there is a liquidity problem, but just because the economy is still sluggish. Kohn said, no we won't do that. But that, in fact, was what the Fed did.

So now we have a situation where there are massive interventions that are not conventional monetary policy and we need to get away from that. However, I'm not sure the Fed will get away from such policies, because now people are writing papers, including academic papers, which say the Fed can and should do these things: It can have its role in terms of setting the interest rate and it also can use its balance sheet to supposedly stimulate growth. The reason it can do that, people argue, is that the Fed now pays interest on reserves and thus it can ignore the supply and demand for money or reserves when setting the interest rate. I think that is not a good approach. It is very unpredictable and it will inherently raise questions about the independence of the Fed. So I would like the Fed to go back to a world where the interest rate is determined by the

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### ► Present Position

Mary and Robert Raymond Professor of Economics, Stanford University, and George P. Shultz Senior Fellow in Economics at the Hoover Institution at Stanford University

### ► Previous Faculty Appointments

Princeton University (1980-1984) and Columbia University (1973-1980)

### ► Government and Business Positions Held

Under Secretary of the Department of Treasury for International Affairs (2001-2005); Member of the President's Council of Economic Advisers (1989-1991); Senior Staff Economist at the President's Council of Economic Advisers (1976-1977); Economic Analyst, Townsend-Greenspan and Company (1978-1981)

### ► Education

A.B. (1968), Princeton University; Ph.D. (1973), Stanford University

### ► Selected Publications

Author or editor of numerous books, including *First Principles: Five Keys to Restoring America's Prosperity* (2012); *Getting Off Track: How Government Actions and Interventions Caused, Prolonged, and Worsened the Financial Crisis* (2009); *Monetary Policy Rules* (editor, 1999); *Inflation, Unemployment, and Monetary Policy* (with Robert Solow, 1998); and *Macroeconomics: Theory, Performance, and Policy* (with Robert E. Hall, 1986); and author or co-author of papers in such journals as the *American Economic Review*, *Journal of Political Economy*, *Journal of Monetary Economics*, and *Econometrica*

supply and demand of reserves. That would prevent this extra instrument from playing such a big role.

The other thing that happened during this episode was that the interest rate got to the zero lower bound. That generated this idea that something else had to be done, that the balance sheet had to increase a lot. That is not the implication. The implication is that when the interest rate is at the zero lower bound, you should make sure money growth doesn't fall. Whatever aggregate you look at, you need to make sure it doesn't decline. That is much different than massive quantitative easing.

**RF: On balance, how effective were the fiscal-policy actions implemented to help the economy recover? If they were relatively ineffective, in your view, were there structural problems in their design that led them not to have the intended stimulative effects?**

**Taylor:** In November 2008 I was asked to testify before the Senate Budget Committee. As sort of a play on words, I said we shouldn't do "temporary, targeted, and timely" policies but rather we should do "permanent, pervasive, and predictable" policies and then I outlined four steps. I thought that approach would have been promising. But in January 2009 a government white paper was issued that argued that the multiplier of a temporary targeted stimulus was going to be 1.5, and that was a big disappointment to me because everything we had been teaching our students over the years suggested that was not the case. I

wrote a paper with some colleagues and we arrived at the conclusion that the effect would be one-sixth of what was estimated. In later research I found that even that estimate turned out to be optimistic. In fact, despite its large size, the 2009 stimulus did not result in much of an increase in government purchases. There were two reasons for that. One, there was virtually no increase in federal purchases of goods and services. Second, the logic that money sent to the states would be used for infrastructure and to hire people to build roads turned out to be flawed. It turns out, the best we can tell, the grants were not used for increased purchases.

Instead, they were largely saved and the states and local governments borrowed less. So while we debated what the multiplier was, the overall effect of the stimulus was probably negative because, to the extent that the states were required to increase transfer payments — in particular, Medicaid — they actually reduced government purchases, including infrastructure.

**RF:** In your most recent book, *First Principles: Five Keys to Restoring America's Prosperity*, you talk a lot about entitlement reform. Could you discuss what you have in mind?

**Taylor:** The proposal is to bring federal spending as a share of GDP to what it was in 2007. It went up a lot from 2008-2010 and according to the budget that was proposed last year, it was going to stay out there at 23 percent or 24 percent of GDP. The alternative proposal is to gradually bring spending back down to 19.5 percent, and thereby undo the binge that occurred during the crisis. That raises the question of what we do about entitlements.

Social Security is, in some sense, easier to deal with because the current program increases the amount paid per beneficiary in real terms by substantial amounts. For example, a 30-year-old today is going to get much more in retirement payments in real terms than a 60-year-old. So what you need to do is to adjust that formula so that the two receive the same level of benefits adjusted for inflation. There is no reason why a younger person should expect to receive more benefits than a person about to retire. If you do that, you basically deal with the Social Security problem. That's my proposal and it is not unique to me, but I think characterizing it in this way seems helpful. The counter to it is that you should get benefits proportional to what you earned over your lifetime, and my question is, what is Social Security really for? I think Social Security was created to make sure you had a good retirement and did not live in poverty.

In terms of Medicare, there doesn't seem to be too much disagreement about how much growth there should be. Roughly speaking, both parties agree that it should not grow much faster than GDP. The difference is how do you do that? One way is that you set the amount each beneficiary gets so that it does not grow too fast and then you have individuals decide what type of insurance they will receive, within limits, of course. And you also effectively means-test it so that you don't have as much growth for wealthier people as you do for poorer people, and you risk-adjust it. So that seems to make sense to me. You are using the market and since you need to control the growth, why not do it in a way that is the least painful for people.

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**RF:** In *First Principles*, you discuss the dangers of "crony capitalism." Historically, when one thinks of that term it is often used in the context of developing countries where the rule of law is not particularly well established, but you make the case that we also now see it in the United States. What do you have in mind?

**Taylor:** The United States has traditionally been good on this due to constitutional checks that have prevented the government from arbitrarily helping certain groups or individuals. But as economists, I think we didn't emphasize how important those constitutional provisions are. An example is how we thought about the Soviet Union following its implosion. Many people thought that once the new regime abandoned central planning and began to embrace markets everything would be fine, but what has been missing in Russia is the rule of law and that has caused a lot of problems.

Compared to many developing countries, the United States still does not have a significant problem with cronyism, but we are slipping a bit. It is an issue that is hard to explain in the abstract. It is something that almost needs to be experienced to be well understood. Some of the examples of the United States slipping are fairly subtle. The bailouts are one, where we skipped over the bankruptcy code and even when we did use bankruptcy in the case of automobiles, we gave preference to certain creditors who were not next in line. In terms of the way the new health care law is applied, there are a lot of waivers that are being given and the reasons are not transparent. I think the same is true with too big to fail, with more powerful entities receiving protection. So I think cronyism is there and is a real danger. The other part of crony capitalism that economists have talked about is regulatory capture, and I think we have a lot of evidence of that in the case of Freddie Mac. One of the reasons for the success of the deregulation movement with the transportation industry in the late 1970s and 1980s is that people recognized that was a case of regulatory capture.

We need to deal with this issue for a lot of reasons, including maintaining people's faith in the market system. When they see these inherently unfair policies, their trust is naturally eroded.

**RF:** As someone who has spent decades in academia as well as held high-level policy advisory and policymaking positions, what have you taken from your experience in government and how has it influenced your academic work? And how did your academic work influence the way you approached issues as a policy adviser and policymaker?

**Taylor:** The short answer is a lot — and in both directions. As an example, going back to the first Bush administration, in the *Economic Report of the President* we decided that it would be good to write down the advantages of policy rules based on research that we talked about earlier in this conversation. Not everything was adopted, of course, but I think it was useful to get it down on paper for policymakers and their staffs to see. In general, I think having economists in government is a good idea, and that applies to many different positions. When I was Under Secretary of the Treasury for International Affairs, my job was mainly operational but having an economic perspective was very helpful. I had always been attracted to that job, by the way. When I thought about the position I imagined I would be negotiating economic reform agreements with international counterparts, but things turned out to be very different because of 9/11. Instead a big part of the job was setting up a new currency in Iraq and getting terrorist financing under control. It was a fascinating time and a very challenging experience.

When I went back to academia in the 1990s after my experience at the CEA, I might not have come up with the Taylor Rule if I hadn't been in government. That was a process of thinking through something that I believed would help generate policy as well as be generally acceptable to many at the Fed after having observed more closely how the Fed operates. In fact, Alan Greenspan says that the Fed should deserve an assist for the Taylor Rule because of the type of conversations I benefited from when I was in government. My undergraduate teaching also has improved from being in government and having to explain economic concepts to noneconomists. Also, in academia there are so many different things that you can work on, but there are only a few that are really helpful for policy. So you get a sense of where you should focus your attention.

**RF: Has the profession moved too much in the direction of work that ultimately will not have policy implications?**

**Taylor:** There is certainly a place for work that will have no policy implications at all. But I do sometimes think that there could be more research that relates to policy. After my stint in government in the early 1990s, I went back to Stanford and started a series of conferences with the San Francisco Fed. The idea was to get academic monetary economists together with monetary economists involved in the formation of policy. An even better example, of course, that goes back much further are the Carnegie-Rochester conferences. Karl Brunner and Allan Meltzer would consistently try to get topics that academics could work on that would be very practical. I think the work that Brookings does is very much the same way. There is a tendency among academics to shy away from practical or operational policy-related topics, unfortunately. Policy research does not always lend itself to elegant work of the kind that is appealing to

academics and for which the professional rewards are very great. However, the long-run rewards from research on more policy-related topics can be very large. Keynes was not a particularly technical economist but he was interested in policy and his work became very influential among academics because of that. The profession is still trying to formalize many of the things that he wrote in the 1930s.

**RF: What are the big unanswered — or understudied — questions in macroeconomics?**

**Taylor:** I have been saying for a while that the nexus between finance and macro and trying to understand how the monetary transmission process works is very important. It's not like we haven't been trying to improve our models in this direction for a while. The flow of funds data were originally collected for that purpose but I think the progress has been kind of disappointing. To me, it's not just the banking sector, although that's a big part of it. Rather, it's the whole financial system and how it interacts with the real economy.

There is a worry I have about some of the models that we are using in macro, in particular the New Keynesian or dynamic stochastic general equilibrium models. They are in a funny halfway place between fitting some theory and fitting the data. To me, they have prior distributions which are too precise and as a result they pay too little attention to the data. But that's a very general statement and I don't have any alternatives right now. But I think that quantitative macro modeling is an area where more work needs to be done.

**RF: Which economists have been most influential in shaping your research agenda and your thinking about economic policy issues?**

**Taylor:** As I mentioned at the beginning of this conversation, Phil Howrey was important when I was first starting out in economics. He really helped me to begin thinking about macroeconomics in a much different way than if I just had taken a standard undergraduate macro class. I would also say my Ph.D. thesis adviser Ted Anderson, a mathematical statistician who gave me a way to think about models and mathematics in a rigorous way, was very important for my research. On policy issues, I learned a great deal from Milton Friedman, from both reading his work about policy rules which I was very interested in and then being a colleague of his. I have benefitted from a lot of interaction with George Shultz whose experience as a statesman has been helpful to my thinking about policymaking in practice. Alan Greenspan also was an influence. When I first went to work as an economist in Washington at the CEA in the Ford administration he was the chairman, and I liked his approach to data and ways to think about getting deeper into the economic analysis. I later went to work for him at his firm in New York and doing forecasting work there helped me later in my career. There are so many people who I have been fortunate to meet and get to know. **RF**