

The Heart of Teaching Economics

Lessons from Leading Minds

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2. Principles of macroeconomics

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John B. Taylor was born in Yonkers, New York in 1946 and obtained his AB in economics from Princeton University in 1968 and his PhD in economics from Stanford University in 1973. He taught at Columbia University between 1973 and 1979, becoming Professor of Economics in 1979. Between 1980 and 1984, he was Professor of Economics and Public Affairs at Princeton University and then moved to Stanford University, where he has remained ever since, currently serving as the Mary and Robert Raymond Professor of Economics and the Bowen H. and Janice Arthur McCoy Senior Fellow at the Hoover Institution.

At Stanford, Professor Taylor teaches an undergraduate course in *Introductory Economics*. In 1996, he was awarded the Rhodes Prize for outstanding contributions to the teaching of introductory economics at Stanford, and in 1991 he was awarded the Hoagland Prize in recognition for excellence in undergraduate teaching at the university.

Professor Taylor's research interests are monetary policy, fiscal policy, and international economics. His work has been published in the *American Economic Review*, *Econometrica*, *Journal of Political Economy*, *International Economic Review*, and *European Economic Review*, among others. His books include, *Economics* (Houghton-Mifflin, sixth edition, 2009), *Getting Off Track: How Government Actions and Interventions Caused, Prolonged, and Worsened the Financial Crisis* (Hoover Institution Press, 2009), *Inflation*,

Unemployment and Monetary Policy (MIT Press, 1998), co-authored with Robert Solow, and *Macroeconomics: Theory, Performance and Policy* (W.W. Norton, fifth edition, 1997), co-authored with Robert Hall.

Professor Taylor has an active interest in public policy. He served as senior economist on President Ford's and President Carter's Council of Economic Advisers (1976–1977), as a member of President George H.W. Bush's Council of Economic Advisers (1989–1991), and as economic adviser to the Bob Dole, George W. Bush, and John McCain presidential campaigns. From 2001 to 2005, he served as Under Secretary of Treasury for International Affairs.

I interviewed John Taylor in his office at the Hoover Institution at Stanford University. It was the early afternoon of Tuesday, July 14, 2009.

BACKGROUND INFORMATION

You have described economics as “fuzzy and techie” with lots of “little hurdles.” In some sense, were these things part of your attraction to the subject as a student?

The “techie” is the quantitative side, like the math and the graphs, and the “fuzzy” is the side that is harder to quantify, but equally if not more important, like the history and the philosophy. So I think economics is really unique in many respects. And it seems to me that when people understand that it combines both the quantitative and qualitative, they do a better job at the subject.

As a student, I was interested in the fuzzy things, but I always felt my comparative advantage was on the mathematical side. I think if I had known in the beginning how economics was a mixture, then it probably would've been easier, and I always emphasize that to students. Sometimes a freshman who's a whiz in math will come in to my office to tell me he's having trouble with “story problems.” I'll say, “I know you're good at math, but economics is more than that.” Or, a student might come in who's a brilliant writer and can describe events occurring over time in history, but falls apart with the graphs. Again, it's equally helpful to warn that student about the very unusual features of economics.

As a student, did any of your teachers stand out as being particularly influential or inspirational?

There was quite a number as an undergraduate in economics at Princeton. Burt Malkiel gave great lectures in finance and Phil Howrey helped me

in my research in macroeconomics. When I was a PhD student here at Stanford, my adviser was Ted Anderson, a statistician. He was a very dedicated scholar and motivational teacher. Later on, back at Stanford, I got to know Milton Friedman and worked with him. He was definitely influential. I think I learned a lot from many people in this dimension, not one person in particular.

As a teacher, have any of your colleagues been particularly influential or inspirational in terms of developing your style and approach in the classroom?

As a starting professor, I was influenced more by my teachers in graduate school and Ted Anderson, in particular. He was a very good, serious teacher. I remember when I was just beginning at Stanford and I missed a class, he called me up and said, "Where are you?" He was obviously interested in his students and was a role model for me. He was very careful in his notation and very disciplined in terms of teaching the material; well-prepared and not sloppy.

What I do remember about my early teaching at Columbia was that I was very interested in bringing new ideas that we were working on into the classroom. Columbia has a lot of courses for juniors and seniors that encourage teaching of new things. I remember using Ned Phelps' book *Inflation Policy and Unemployment Theory* in an undergraduate course. It was written as a textbook, but it was very advanced conceptually, and I tried to talk to the students about the new ideas that we were working on as researchers. It was quite rewarding and the students liked it. Yes, it was hard, but they felt they were getting something new in macroeconomics.

GENERAL THOUGHTS ON TEACHING

What do you like most about teaching and what do you like least?

The most enjoyable part is figuring out how to communicate an idea in the most effective way, and when students understand it, that's very rewarding. I think the social interaction is also enjoyable. You're talking to students, they're talking to you, they're trying to learn, and you're also learning from them. It's a two-way thing, especially if they're beginning students, because their off-the-wall questions can get you thinking.

I can't imagine never teaching. Just doing research would be hard for me because you're trying out ideas or figuring out a new way to teach a complicated topic, like using experiments in the classroom. For the large-lecture, beginning courses, I also like the showmanship and performance

aspects. I enjoy getting the laughs and seeing their reaction and hopefully it'll help them understand more.

I like least the administrative aspects of teaching. One thing we did here several years ago was set up an introductory economics center, and its purpose was really to try to take the drudgery out of teaching an introductory economics course. I always say that in an ideal world to teach economics, you just have to be prepared to walk in and talk. But I worry about a lot of things, like the acoustics in the classroom, whether I can see students, and whether students can hear each other when they ask questions. So the more you can have other people take the things you like the least out of the picture – like making sure the equipment is ready to go – the more you can focus on the things that you like the most.

On balance, do you think that teaching effectiveness and research productivity are complementary or competing endeavors?

Well, I think in the best of all worlds they're complementary. To really explain something to students and to be able to reach different students at different levels, you have to understand it at a very deep level. And sometimes that comes from research.

I think also in certain research universities, like Stanford, there's the idea that you're trying to get students excited about a subject through the research. You can convey an excitement if the subject itself is live and changing and you're "into it" and participating in its evolution and work. That's an important interaction between the two. If students know that you've been involved in some important work, it can motivate them. They'll say, "Jeez, I'm hearing from a guy who's done this important work. How does he think?" They're thinking about how you think, and hopefully learning from that.

But the other side is that there are some very special kinds of skills in teaching that researchers don't always have. And another conflicting thing is that there are only so many hours in the day, and specialization is a way to get more done. But to the extent that we can at least have some people who do research also teaching at the basic level, I think that's the ideal.

THE LEARNING PROCESS

How would you describe your understanding of how humans learn?

I'm not an expert on how humans learn, that's for sure. I can think about how people learn in my own field. In economics, you have the

graphs, the equations, and the stories, and you mix them back and forth, and, depending on the student or the time, it just clicks. That's the idea that people learn in different ways. I'd say that people sometimes get something suddenly and you don't know why, and you don't know why they're lost for the rest of the time. But I think it's very important to recognize that what students see is not always what you see. For example, if I put up a graph, I'm looking at the axes and the scale and I'm scoping it out very quickly. But to lots of people, a graph is almost like an abstract painting and they don't try to check out all this detailed stuff. So, in that case, you have to be very basic with them – show them what's on the vertical axis and convey to them that the little wiggle on the graph actually means something. You're putting yourself in the student's shoes as much as you can. It's very hard because you don't think of things that way anymore, but you should try to remember what it was like when you learned a subject for the first time. Some people also get things very quickly, but don't get it at a deep level, and it takes other people a long time to get it, but then they really understand it at a fundamental level.

How do you assess whether the students are learning the material?

You need to have good tests that they can do well on if they learn the material. There's a temptation for faculty to do IQ tests, not tests on the subject. You must test them on the material to see whether you're actually teaching them what you *think* you're teaching them. And I also think it's important to grade the tests yourself, especially if it's not just multiple-choice tests. In grading short-answer questions, for example, you quickly may realize a learning/teaching problem and say to yourself, "Boy, I'm not getting to them at all on this."

I think that there's sometimes a danger of making things too clear in your teaching. It's a funny little contradiction. You lay out something very clearly and the students "get it" in class. But they didn't really struggle to learn it so much, and with one twitch difference on the exam they don't "get it." So, ironically, throwing in a little ambiguity in the class can be a good thing sometimes.

Another way of seeing whether you are coming across to the students is to do a fair amount of one-on-one with them. In the large course, that could be having office hours. Encourage them to come. If they're going to ask you a question, they might be nervous, but get them relaxed and use some follow-up questions as well. It's not foolproof because some students don't communicate as well orally as they do on paper, but I think it's a good way to test people.

How much importance do you attach to the students' official evaluations of your teaching?

I think they can be useful. My own experience with them, though, is that they can be “funny” – that’s the best word I can think of. For example, one time I got evaluations that were really good in one area and not so good in another area. The next time I taught, I corrected the bad area and the evaluations came back better on that area but worse on the other area. So I thought that maybe I should just do what’s in my gut feeling and what I get without the evaluations. But I’ve been fortunate to have had good evaluations over the years from the students. That’s obviously helpful; they’re not just going to give you ratings if you’re popular. I think by and large they feel better if they actually learn something well.

One interesting thing about evaluating teaching is that I don’t think the tests or the one-on-ones or any of the things we’re talking about here are really the be all and end all. In some sense, you won’t know until five years later when something that you taught is going to help a student make a decision better or make a change in career, which is really what it’s all about.

When I spoke to Robert Frank, he told me that the business school at Cornell has a teaching award for the professor whose courses had the most impact on students during the five years they’ve been out of school.

That’s a good idea, but even then you don’t know. In so many things in life, you’re trying to make people accountable and, frankly, I think teachers should be accountable. We need to think about it more. A lot of K-12 education experts say that if we have good ways of evaluating our teachers, we could do a better job by moving them to a different classroom or place or even job.

So I think accountability and evaluation in education is really very important, and certainly in many technical subjects you can do it; you can see which are the good teachers and which are the bad teachers. I don’t know where it comes from. It could simply come from attitude or dedication or hard work or just some innate skills. There is definitely a difference, but it’s harder to tell at the college level, so we don’t have these formal evaluations that occur in K-12.

TEACHING PHILOSOPHY AND TECHNIQUE

What do you promise your students?

Well, first of all I don't use the word "promise", but I tell them how much I love economics, how enthusiastic I am about it, and how they're going to hear that throughout the quarter. I tell them I'm going to do as good a job as I can within the time and limits I have. In other words, I promise them some dedication to the job. And I think there's a sense in which I want to promise them honesty. If I don't know something, I'll tell them, or I'll look it up or be generally honest about the subject. That's intellectual honesty. Those are the things that I would like to be part of my commitment.

What do you expect of your students?

The same kind of things. I want them to be hard-working, to take it seriously, to be enthusiastic about the subject, and to be honest about it.

How do you treat your students?

With a lot of respect. I treat them as customers, if it was a business analogy. They are usually paying a lot of money or their opportunity costs are high and I feel I want to provide a good service. And treating them with respect also means that there's no such thing as a stupid question. I will take everyone seriously. Of course, after a while you may get the same question a lot and be frustrated by it, but to the best extent possible you must be respectful and patient.

How do you prepare to teach?

It depends on whether I've given the lecture before or whether it's the first time. If I haven't taught the course for a year, it takes a lot of time – maybe three or four hours – for me to prepare a lecture, especially if it's a large class. You have to get the whole thing in your head and think about how to divide it into parts and transition from one part to another, as well as think of the places where you'll try to get students to ask questions.

Of course, these days PowerPoint affects preparation, but perhaps not in a completely good way because you tend to rely on the slides instead of your notes. You want your notes to be in your head or on a piece of paper, not on something that the students look at with you. With the slides, you sometimes get to the point where you're part of the audience, not part of the show – that's not good.

I don't really get up and practice a lecture in advance, probably because I've been teaching for so long. But I always take lots of care with timing. A lot of it is trying to imagine how it's going to go, although that's not always so easy. Sometimes you just don't really prepare, particularly if there's going to be a lot of "Q&As." You will need spontaneity for that part of it to work.

What are your primary teaching methods? I know that you are someone who believes that entertainment and education are closely related.

Let's focus on beginning students. I think absolutely that entertainment and economics go together. I don't have any problem saying that. The reason is you want to make economics memorable to people so they don't forget about it after the lecture, the course or the exam. Occasionally the memory is related to something that was entertaining, and that's why I do skits and surprise things for the students.

I am not a comedian; my humor is mostly deadpan, and it probably takes a few lectures to figure out when something's a joke. One thing I do to entertain the students is have my lecture interrupted in the middle by Adam Smith, who speaks through the PA system, "Professor Taylor, I hear you're talking about economies of scale, but you did not mention the pin factory. . ." So the students get to learn about *The Wealth of Nations* and have a good laugh at the same time.

I like to illustrate externalities using a mythical room next door, which is playing loud music. I pretend that there is a music appreciation class there. I then work out an arrangement with a music appreciation teacher and class, so that they only play at the beginning and the end of the class. I tell my students that we need some compensation for the other class to stop the noise in this way, but the students don't want to chip in. So that's entertainment, but with a really important concept for the students to recognize: externalities sometimes can and sometimes can't be resolved by the two parties without the imposition of a government solution.

People also like to tell the story of when I dressed up as a California raisin to illustrate government subsidies. The Californian state government provided money for an advertisement to buy raisins, and they had these cartoon characters dancing around to the Marvin Gaye song, *I Heard it Through the Grapevine*. So when I heard about the rationale for this ad, I figured I would dress up like a raisin to illustrate the ad. That's pretty crass entertainment, but the students got a kick out of it.

There are lots of these things you can do. It's obviously somewhat idiosyncratic to the professor, the students and the location, but I think it's

hard to overdo it quite frankly, as long as you think of its purpose as not just to entertain but to convey the ideas so that the students understand them. And it shows your enthusiasm. If I'm dressed up like a raisin, I want to say, "Guys, if I can do something this crazy, you can ask me a crazy question." They feel more comfortable with you – more like a friend – and it levels the playing field in terms of questions and answers.

Do you think your approach is more likely to be successful with a large class?

Yes, I think so. Some things are more natural to a crowd. It's like a concert versus entertainment in a night club. But I always say in talking about teaching that it's really an individual teacher's choice how to do it. Some people wouldn't want to even think about doing some of the things I've just said, and there are other equally good ways to teach.

How do you deal with the heterogeneity that exists among students in a typical class?

I think going back to the idea of respect for each student is one place to begin. You want to be sure as best as possible that you don't teach under the best student or teach above the worst student. That sounds impossible, but there are various things that you can do. For example, I was working on an op-ed yesterday for a newspaper, and a sentence required a qualification. Strictly speaking, the qualification should have gone in the middle of the sentence, but if I did that it was just going to confuse some people who didn't understand what it meant anyway. So I put it at the end of the sentence, figuring that people who aren't going to understand it can still get the sentence and then skip to the next one. But it was good to include the qualification for the advanced, knowledgeable people who would understand it.

You can do a lot of that in teaching economics. For instance, in the first lecture of a beginner's course, you might stick the word "externality" into a sentence. Maybe some students will have learned about that in high school and will appreciate it, but as long as you don't emphasize it, the other students won't be distracted. So you have to be cognizant and respectful of the different students, and find ways to reach them so that the advanced ones feel good that they already knew a concept, but that the ones who aren't there yet are not blown away or confused.

How do you keep the material fresh for your own sense of engagement in the classroom?

I think you can do a lot of economics by relating things to current events. There's nothing better than coming in with the morning's headlines on the newspaper and that's what you are talking about in the class. And you can also freshen things up by talking about some of the recent research that's being done relating to the topic. That's becoming easier to do because of Google and so on.

How do you achieve the right balance between being objective and incorporating your own views in the classroom?

Well, you should give both sides to whatever extent you can. That doesn't mean you're always supposed to tell every other view, but if you're just emphasizing your own view, that's not a good idea. I've sometimes been teaching when I've been involved in public policy, where it's adversarial and I've had my viewpoint. That's an important part of economics to be sure, but a classroom is not the place to do that. And I have a textbook that has some views that John Taylor doesn't hold, but that's because you want to give different perspectives.

I sometimes wonder if the students could benefit from more "point-counterpoint" debates. When Milton Friedman was alive, I'd ask him to come to my introductory course and usually he would do it. He believed very much in the free market and didn't mince his words. He would say, "There are two big things the government is involved in and they're not working: one is education and the other is drugs." That got both sides from the left and right firing questions. There were wonderful exchanges. But it wasn't an attempt to give different views; Friedman was giving his view. And that's good because there is an aspect of economics that is more adversarial, and understanding that is part of learning the subject.

To what extent does your experience of teaching affect your role as an adviser? Similarly, to what extent has your role as an adviser affected your role as a teacher?

There are good impacts both ways. Obviously, many people that you speak to as an adviser are not experts in economics, and some of them don't have any economics at all. So it's not that much different from teaching economic principles, but in some sense it's less technical. You're not going to get out a supply and demand diagram for a member of Congress because there's not enough time to do that. But just because they don't know the supply and demand diagram doesn't mean that they don't have more relevant knowledge than you do about getting something done or about the impact of legislative action on commerce and trade. So again

we are back to this idea of respect. When I say the experience of teaching economic principles is useful for conveying ideas to policy-makers, I don't mean at all that I am "talking down" to them.

Of course, the other side of the policy-teaching interaction is that you get the policy experience to tell students about. You can use it to illustrate how an idea was used in practice. If they're learning about a price ceiling or a price floor, or about marginal tax rates, or about interest rates, you can tell a story about how they actually worked in government, or about what you said to a certain politician and what their reaction was – there are some nice anecdotes you can get from that. The students feel good about the subject if they can see how it's been used in practice, and I think that's a really big part of teaching.

Like Robert Frank, you have spent your career at elite institutions. Most students taking an introductory course do so at community colleges or second- and third-rank state four-year colleges and universities, where in terms of preparation, ability, and motivation, typically the mean of any given class of students will be lower than at Stanford or similar, and simultaneously the range much, much wider. How would you adjust what you do in an introductory course to deal with that situation compared to Stanford?

I think mainly from doing it occasionally. In the context of writing textbooks, for example, I've given lots of talks to community colleges in New Jersey, Missouri, Texas, or wherever. Sometimes a community college student has much more work experience than a student at an elite college. And they may have experience that you've never had, like not having health insurance or working at the minimum wage. So you learn a little bit about that. I can't say that I've taught whole semesters or give many lectures at community colleges, but I have done enough in terms of traveling around or asking people about their experiences of teaching in them. I think that's another part of your question – what is it like to be an economics teacher at a community college in not such a great neighborhood? When you talk to them, you see there are things that we don't see much of, like the fact that a student might have a part-time or full-time job and, let's be frank, just wants to get to the course credit fast.

Another type of educational institution that has a somewhat different teaching mission than a place like Stanford is a military academy. I've sometimes given guest lectures or gone to their classes at West Point. The students are very busy and the focus is very much on getting the material taught as efficiently as possible, and then moving the students on to other

things. So it's a little less luxurious and a little more demanding. And as you say, that's the experience of many students around the country, and we ought to understand more about it.

COURSE CONTENT AND DESIGN

Should the principles of macroeconomics be presented before the principles of microeconomics?

Certain things like moving supply and demand curves around are easier to do at the micro level, and you've got that analytical ability out of the way before you come to macro. But, for a long time, we did macro first. I think that was a fine way to learn and, who knows, we might go back that way. Macro takes you to current events more quickly and it can motivate you more quickly. I started with macro first and maybe that's why I'm a macroeconomist.

When you are designing your undergraduate syllabus on the principles of macroeconomics, how do you strike the right balance between teaching established ideas that have stood the test of time and incorporating current research?

Well, over the years when I've been teaching economic principles, I've always tried to incorporate new ideas. For example, Paul Samuelson's original textbook had very little on incentives, dynamics and expectations, and when I started teaching economic principles, I wanted to bring those things into the story, so that was a case of new ideas coming into the curriculum. I think it would've been a mistake not to have done that, and there are periods when new ideas come more rapidly or are more important. We've got the current crisis that raises ideas about whether capitalism is still the right way to do it or whether we need to go back to more of a mixed economy. That's not really bringing in new ideas – it's using current events to influence the teaching in the curriculum – but in a few years there may be a lot more to be doing. And of course one of the reasons you want to teach is to try new ideas.

How about the balance between formalism and reality? In particular, what do you think of David Colander's view that the current model-based story of growth in introductory economics should be replaced with an historical-based story that introduces students to growth through a consideration of the broad historical developments about economic growth?

I think the idea that there's an analytical model that helps organize your thinking is very important. If you're talking about growth over time, I'd say the Solow growth accounting formula is really valuable for just sorting out the roles of capital, labor and technology. That kind of analytical structure is very important for us to teach in the economics curriculum, and in some sense distinguishes it from history, pure and simple. But you would want to very much use that structure to describe history: the productivity slowdown in the '70s and '80s, for example, and the resurgence of productivity in the mid-'90s. Why did the Soviet Union stop growing? Was it because of not enough capital? No, it was because technological growth slowed down. To me, part of our comparative advantage in economics, or at least what we have to offer, is an analytical structure for organizing your thinking about history.

Where does your course begin and why does it begin where it does?

The first lecture is an overview of the certain things about economics that are unusual – the fuzzy and techie things – and highlights the correspondence between graphs, tables, equations and stories. And of course the basic principles of economics are presented in very summary form, like comparative advantage, the three roles of prices in a market economy, and the idea that people are doing the best they can with limited resources, but also interacting with other people when they do that. I always start off with a story of Tiger Woods, who was a student of mine in the introductory class here at Stanford. He learned about opportunity costs when he took economics, so he joined the pro tour and it paid off. He had limited resources – he couldn't both go to college and play on the pro tour at the same time – so he had to make a choice. But he also had to interact with other people – his fans and his family – and so it's not just Robinson Crusoe making choices with limited resources.

Which are the key ideas at the heart of your course and how do you teach them?

Let me focus on the macroeconomic part. First of all, there's the idea that the subject is so gigantic in the sense that in macro we're thinking about the whole national economy. We distinguish between long-term growth and short-run fluctuations. Why do we have growth? Well, because of increases in productivity and population. Ultimately, the way people are going to get a higher standard of living is through higher productivity. Countries are rich because their workers are more productive than in countries that are poor. In terms of fluctuations, why do we have recessions? Why do

they end? Why do they last for a long time or a short time? Why might they be big or little? Why are they painful to people? So the main concept is the macroeconomic big picture, plus growth and fluctuations and the theories that underlie both of those.

Which intellectual abilities or qualities will your course help students develop?

Again focusing on the macroeconomic part, the intellectual skill they learn is to be able to solve and work with a model to describe what would happen with different types of monetary or fiscal policy actions. In terms of the growth model, being able to understand why some countries are rich and why some are poor is quite important. I would also like them to understand a little bit of Keynesian theory as an intellectual underpinning to the short-run fluctuations in the economy, and Schumpeterian theories of creative destruction and longer-term growth. Even on the macro side, the traditions of Ricardo and Smith are also very important in terms of international trade between countries.

At the more modern level, I like them to learn about financial theories, like efficient markets, and how that affects our financial system. Milton Friedman's permanent income model and the theory of rational expectations are also both very powerful intellectual accomplishments that you want to convey to the students. You need to explain how all these theories represent progress, but how they still can be improved.

Which aspects of the course do the students find particularly fascinating?

If you're doing an hour lecture a day for four days a week, which is what we do for the introductory course, there's a crescendo during each week that students like. On Monday, we might be going through the building blocks of monetary policy, which may not be all that exciting, but by the end of the week, we could have a plausible and understandable explanation for the recession we're in, and the students are charged up for that.

Where do the students have most difficulty with motivation or understanding?

Monetary policy is probably the most difficult concept. It can be arcane, even in terms of understanding the difference between a Treasury bill and money. And there's a complicated causality that you have to work through in explaining open market operations. When the central bank purchases securities, that increases the money supply and somehow that drives down

the interest rate, which moves you along the investment curve or consumption curve, and you have to worry about net exports as well. Of course, it is also meant to be a dynamic process and, for both micro and macro, dynamics is maybe the hardest thing for students to really understand.

Where does your course end and why does it end where it does?

I tend to end with a big picture. I show the students what we have accomplished – we can now analyze why we have this recession, and see the extent to which the Fed had a role or did not have a role. I don't know how successful it is. I think by the end, the students really want to know what's on the exam, and so it might be best if I did less of this grand summing up and finished on some kind of specific substance.

TEXTBOOKS

You teach from your own introductory economics textbook. What are the distinguishing features of your book?

On the macro side, it was the first book to do growth first. And it also modeled monetary policy in a more accurate way for the students. When the FOMC meets to choose the interest rate, they don't really decide about moving the money supply, so I tried to relate that in a very practical way.

Why did you do growth first?

Well, if you learn about the behavior of the economy over the long term, in a sense you know where you're going when you deviate from that. It's a bit of a philosophy that the business cycle is short-run temporary fluctuations around a long-term growth path. Maybe that's not exactly true, but I think it's a pretty good description. Fundamental supply considerations like productivity growth and labor force growth ultimately generate the enormous progress we make over time, and they explain why we're so much better off in terms of income per capita than we were a hundred years ago. So getting growth concepts down first makes it easier to talk about how a recession is a temporary deviation from the potential growth path, which could occur because of a policy mistake or because of a change in expectations. Then one can explain how the dynamics in the economy will bring you back toward that path, how policy can affect the speed at which you get back to that path, and how you can improve on that with countercyclical policy. You could argue that a deviation from the path

itself affects the long-run path, and that's true to some extent, but I think the right concept is that you're coming back to that path after a recession, and so it is more satisfactory if you do the long run first.

Why did you write your textbook?

I think the main reason for me is to bring new ideas to a broader audience. I'd been pretty successful as a teacher, and that gave me the motivation to see if I could be successful beyond my own students. Of course, writing a book is a much different process than teaching, but it is easier if you are teaching the material. What I called the zero-th draft of my textbook was a transcription of the lectures; the first draft was the version that takes the oral expression to written. And that first draft has a lot of repetition. You can't expect every student in a classroom to pay attention to every word for 50 minutes, so I do repeat a lot, but you've got to cut that out for the book.

Has it made you a better teacher?

I don't think it's had much impact on the teaching itself. I would do the same thing if I didn't have the book. I more or less see the book as a way for me to spread my teaching abilities beyond the classroom or my one-on-one tutorials. Sentences that are being written down are sentences that I would say to you if I were trying to give a tutorial here in this room. In fact, one of my innovations that goes back a long time is having very good step-by-step captions on the graphs in the book. That comes from the teaching. And as I said earlier, students often don't look at what's on the axes of a graph. So when I'm writing the book, I'll also say in the text, "The vertical axis on Figure 14.3 shows. . ." You don't even see that sentence in many books, but you'll see it in an awful lot of things that I've written because I think many students need it. And so that's an illustration to me of how the book comes from the lectures.

How important for the students do you think the introductory economics textbook is?

It was important for me. I had Samuelson's book. It was very well-written and witty, and he was a famous guy. So I view the book as a very important part of the learning process, and I also think it's important to have close continuity between the book and the lectures. A lot of teachers don't do that, but to the extent that you can, it's better. If you want to challenge the students in a particular area with a different approach, that's fine, but

don't have them read a chapter that is the same thing done in a different way; there's enough difficulty and confusion at the beginning level as it is. Of course, you can add a tremendous amount to the book by bringing in your own experiences or stories, but don't take a different approach. Some people figure that it's value-added, but I think value-added means that you get the students to learn the subject as best they can, and you can help if you're a good teacher.

When I interviewed Robert Gordon for this book, I asked him whether he would recommend students to read Keynes' General Theory or Friedman and Schwartz's Monetary History of the US for an intermediate macroeconomics course. He was not impressed by the idea. What is your view on this?

I think it's a good idea to try to do that. I would choose a chapter or two of the *General Theory* for more advanced students to read – not beginning students obviously – because I think it's important that they get a sense of what the writing was like. In my first-year graduate course, I try to have the students read original articles. So if we're talking about time-inconsistency, I'll have them read the Kydland and Prescott article rather than some textbook explanation. They need to see where these people were coming from, what they were thinking about, and why it was revolutionary. For beginning students, I think it would be appropriate to read some Smith – not the whole book – because some sections of *The Wealth of Nations* are really good.

I think it would be good to get the students to read chapters from Friedman and Schwartz's book – that's a classic. One of the interesting things about that book is that they had a huge impact on how people thought about the Great Depression. And they did it without mathematics. They used diagrams, institutional kinds of arguments, personalities and stories. They had a model in mind certainly, but it was not mathematically represented. As long as you don't assign too many pages, I think that's a wonderful reading for intermediate macro. I'm very much from the school that believes that the more people who understand the nature of the history of thought, the better off we'll be.

TEACHING ECONOMICS IN THE FUTURE

How do you think the process of teaching economics will change over the next few years and to what extent will student demands and expectations shape that change?

Well, you've got to think about using more technology when teaching. When I started, we had a blackboard in a big room, then it was an overhead projector, and now we have PowerPoint and video stream lectures. I tried video stream lectures for my introductory class one year to see if it affected attendance. It didn't seem to have that much effect, but it was abused by a few students who said that they watched all the lectures at the end of the course (*laughs*).

I was hoping for a while that we would use experiments more in teaching because there's so much interest in experimental economics in the profession. And I think it's a wonderful way for students to learn the ideas. I've often used a double oral auction to teach supply and demand and the efficiency of equilibrium. It's beautiful. I wish people would use more of these experiments. But I think the problem is that it takes some planning and so instructors are reluctant to do it.

In terms of the future, what else? We probably want to think about what's in vogue with respect to macro. I believe the current crisis will bring macro to the forefront again, and we might even start teaching it first in some cases.

You've said in the past, that in the 20th century, the two big events we've learned from in terms of policy were the Great Depression and the Great Inflation. Which lessons do you think we have learned from the current crisis and how do you think the current crisis will be taught to future students?

What I'm hoping is that we will learn in this crisis not to do the things that caused it. To me, a big part of it was way too easy monetary policy, especially in the 2003 to 2005 period. So I'm hoping we'll teach students that there was a great deviation from a policy that worked pretty well in the '80s and '90s. Like the Great Depression and the Great Inflation, the financial crisis will be part of the learning experience and, of course, books will require some revision. We've just done a crisis edition of my introductory book, and the section on monetary policy is quite different because the Fed has so many new policies. We've had to talk a little bit about what happens when the interest rate hits zero, about quantitative easing, and about what they've done to purchase different types of assets. And once we come out of it with an exit strategy, we'll have to decide how much needs to be revised again. It's a really different animal than in the past.