More than 50 years have passed since Robert Solow published the path-breaking model of economic growth for which he won the Nobel Prize in 1987. This model proposed that growth occurred not solely from the accumulation of capital and increase in labor, as previously theorized, but also from what Solow called “technological progress”—a term now better known as total-factor-productivity growth, which encompasses advances in technology as well as in management and organizational techniques. In the early 1990s, Solow accepted the role of academic adviser to the then-fledgling McKinsey Global Institute (MGI), which was proposing to research and explain differences in the productivity of industries and countries. Economist Martin Neil Baily and McKinsey Publishing’s Frank Comes recently sat down with Solow to discuss the implications of those early studies for business and economics, as well as the prospects for future productivity-led growth.

**The Quarterly:** What, if anything, surprised you about the findings of the early MGI studies?

**Robert Solow:** What came as something completely new to me was that if you looked at the same industry across countries, there were almost always dramatic differences in either labor productivity or total factor productivity. To my surprise, it turned out that most of the time, certainly more often than not, the difference in productivity—in the auto industry or the steel industry or the
residential-construction industry in the US and in countries in Europe—was not only substantial but couldn’t seriously be explained by differences in access to technology.

We also found that the productivity differences could not be traced to differences in access to investment capital. The French automobile industry, much to my surprise, turned out to be more capital intensive than the American automobile industry. So it was not that either. The MGI studies instead traced these differences in productivity to organizational differences, to the way tasks were allocated within a firm or a division—essentially, to failures in managerial decisions.

I was, of course, instantly suspicious of this. I figured to myself, “What do you expect a bunch of management consultants to find but differences in management capacities? That’s in their genes. That’s not in my genes.” But MGI made a very convincing case for this. And I came to believe that it was right.

The Quarterly: So management was the primary factor in productivity differences?

Robert Solow: Yes, and there was another surprise, for which there was partly anecdotal, partly statistical evidence. If you asked why there were differences that could be erased or diminished by better management, the answer was that it took the spur of sharp competition to induce managers to do what they were in principle capable of doing. So the idea that everybody is everywhere and always maximizing profits turned out to be not quite right.
MGI made a very good case that what was lacking in these trailing industries in other countries—or in the US, in cases where the US trailed—was enough exposure to competition from whoever in the world had the best practice. And this, of course, can apply within a country. We know that in any industry, there is a whole distribution of productivity levels across firms and even, sometimes, across establishments within a firm. And much of that must be due to the absence of any spur to do more.

So an interesting conclusion to me was that international trade serves a purpose beyond exploiting comparative advantage. It exposes high-level managers in various countries to a little fright. And fright turns out to be an important motivation.

The Quarterly: So competing against the global best-practice leaders is a way to encourage your own industry to use best practice?

Robert Solow: Yes, and it goes beyond that, even. Competing as part of the world economy is an important way of gaining access to scale. If you’re a Belgian company or even a French company, it may be that best practice requires a scale of production larger than the French domestic market will provide for French producers.

So it’s important for such companies to have access to the international market. That was not something I had thought of. And I don’t think anyone had—at least I had no reason to think, within economics, that there had been much thought about management activities as a big difference between best practice and less good practice. We had always thought, “Well, people seek profits. And if they seek profits, they’ll have to adopt best practice.” Not so.

The Quarterly: Do you think the lessons from the microsector-level view have changed the way economists work? Or has this remained outside the economics profession?

Robert Solow: I think it’s been partially absorbed by the economics profession. There is much more interest in industrial organization, in competitive advantages and how they work themselves out in productivity.
The Quarterly: Looking toward the future, are there other issues in economics that MGI’s sector-level approach might be helpful for?

Robert Solow: I would like to see more work on the determinants of productivity and productivity increases within the service sector. To begin with, I don’t think we even have a very clear idea about the relative capital intensity within the service sector or between the service sector and goods-producing sector.

I remember I was once writing something in which I was describing the service sector as being of relatively low capital intensity. And then I stopped and remembered that the following day I had an appointment with my dentist and that my dentist’s office was as capital intensive a 500 square feet as I had ever seen in my life.

So I think the place where the MGI approach is most needed right now is in the service sector. There has been service-sector work within MGI, and outside of it as well, but not as much as is warranted in view of the 70 percent or more of all employment in advanced economies that’s in service industries.

The Quarterly: Are there particular places in the service sector where you’d look first?

Robert Solow: Well, that brings me to another MGI result that I found fascinating. At one point, we were trying to understand the industrial basis, the sectoral basis, for the acceleration and deceleration of productivity growth. And one of the things we found was that the two largest sectoral contributions to the acceleration of productivity growth when it was accelerating and, presumably, to the deceleration when it was decelerating came from wholesaling and retailing.¹ Both of them, at the time, were low-productivity sectors and low-productivity-growth sectors. But they employ so many people that a slight improvement in the productivity of retailing makes a large contribution to the increase in national productivity.

There has been some work on that, but I think the work is needed now more in personal services. God knows, in healthcare. And education. Or child care. All sorts of things.

Robert Solow: As an ordinary macroeconomist, I have avoided forecasting as if it were a foul disease—as indeed it is. It’s very damaging to the tissues. So I don’t think one can say too much.

But two things are pretty clear. Everywhere, both in the developed economies and in the emerging economies, population growth is likely to be slower, much slower than it has been in the past century. I don’t know how this is going to go in the very poor parts of the world, like Africa, but certainly in the emerging economies the classical demographic transition will take place. And in the developed economies, population growth is going to slow. So there is going to be a problem that both of them will face. The motivation for what we used to call capital widening—simply to provide the standard capital intensity for an increasing population in areas such as housing and consumer domestic durables—will be weaker, and that will certainly slow the total rate of growth.

The growth of per capita income is a different matter. And there I think the key issue is economies such as Russia, India, China, Brazil, and so on. There, industries still have to catch up to the technological frontier, still have to modernize to achieve the level of technological advancement that Europe and North America have already achieved. That catching up, I think, you have to expect to happen. If it doesn’t happen, that will likely be for political, not economic, reasons. But leaving aside politics, about which it’s hard to say anything intelligent, there is still a lot of room for catch-up. And this needs to be quantitatively analyzed, industry by industry, because industries catch up, not whole economies.

Robert Solow: I’m not as pessimistic as Bob Gordon about the long-run technological prospects, because I feel less certain about
them than he is. In the case of Gordon, by the way, I think that to a certain extent he is concerned not so much with the real-GDP-per-hour-worked side of this as with how much technology changes our lives. And though we might conceivably have technological innovations which improve productivity dramatically, they won’t change life as much as the wheel or, as Bob Gordon likes to point out, the flush toilet. But I’m not as pessimistic as Bob Gordon about the future of advanced technology. I’m just uncertain.

The secular-stagnation notion is that it may be harder, for the next 50 years, to maintain full utilization of economies than it was in the last 50 years. One technical way to put it is that the real interest rate compatible with full utilization might be negative. This is like Alvin Hansen’s old secular stagnation. In a way, it rests on running out of profitable investment opportunities.

Rapid technological progress, if it entails hardware, is a way of providing investment opportunities that are profitable. So we have to hope for that. And as I say, I’m not necessarily pessimistic about that at all. If slower population growth eliminates some investment opportunities—those that come from providing a house and a refrigerator and a washing machine for every family—then if technological progress slows a little bit, the balance between diminishing returns and technology could shift a bit in favor of diminishing returns. The available rates of return on plant and equipment investment might be a little lower. The motivation to invest—comparing that with the rate of interest, which can’t fall below zero—that gap might narrow. And it could get harder to maintain full employment.

There’s a good Keynesian answer to this, which involves government expenditures. But we’re not so great at that and not getting any better at it either. So I think that there is a case to be made that it might be harder in the future to generate the investment spending—the nonincome-induced spending, the autonomous spending, to use the lingo—that’s needed to maintain full employment and full utilization.

The Quarterly: And here we are at a time when corporate investment is low.

Robert Solow: It’s a little mysterious because corporate profits are very good, and corporations are sitting on cash. The natural reading of that—but I don’t know if it’s true—is that they’re worried about their future profitability, because that’s what would limit their willingness to invest. Why they are worried about their future profitability, I don’t know.

The Quarterly: What might be done to accelerate growth? Do you think there are things that managers could do to spur the US or the global economy?

Robert Solow: I take the Milton Friedman point of view here, which is strange for me. It’s not the business of the individual manager to say, “What would be good for the health of the economy?” It’s primarily the business of the individual manager to increase efficiency and profitability. I think that to the extent top management is paralyzed by political uncertainty or whatever, that is a kind of funk—a failure of collective action.

The Quarterly: In the 1980s, you said that we can see IT everywhere but in the productivity numbers. Do you think that was true then? And if so, did it remain true?

Robert Solow: I think when I made that remark, I was reviewing somebody’s book. It was true, and now it’s no longer true. You can, in fact, trace the productivity effects of information technology. In retrospect, and probably inevitably, there was a lag in learning how to make effective use of it in manufacturing, in retailing, in wholesaling, in all sorts of large sectors. But now, I think there’s no doubt that you can measure big user gains in productivity from the computer. I don’t think I was wrong when I said that you couldn’t. I wasn’t predicting the future. I was saying what was true at the time.

This interview was conducted by Martin Neil Baily, who holds the Bernard L. Schwartz Chair in Economic Policy Development at the Brookings Institution, and McKinsey Publishing’s Frank Comes.