

# Robert M. Solow

## Even a Worldly Philosopher Needs a Good Mechanic

ANYONE WHO TEACHES ECONOMICS OWES A DEBT TO *THE WORLDLY PHILOSOPHERS* for having attracted so many bright and interested students to economics, much as Paul de Kruif's *Microbe Hunters*—a lesser book—recruited the young of my generation to the study of biology and medicine.<sup>1</sup> Those same teachers are also aware that some of the same students felt let down by the texture of the discipline when they began to study it. Instead of debating big ideas about the nature of society, they found themselves drawing demand and supply curves and learning to set marginal this equal to marginal that.

In the last chapter added to *The Worldly Philosophers*, Heilbroner tries to diagnose the source of his own, more sophisticated version of this kind of disappointment. He locates it in the unwillingness of modern economists to focus on the essential characteristics of capitalism as a system of social relations. There and elsewhere he speaks of a failure of “vision” on the part of economists, and their misguided attempt to construct a Science—the capital S is essential—in the image of physics or astronomy. I have never been satisfied with that way of looking at the context and method of economics. Bob Heilbroner and I used to talk about this in the days when we saw more of each other. I take this opportunity to make one more statement of my view of the end of the worldly philosophy.

From the start, I have to dissent from Heilbroner's assertion that the disciplined study of economics (as we know it) is tied essentially

to the capitalist system. His statement is: “The worldly philosophy is the child of capitalism and could not exist without it.” There is more in the same vein. I can think of at least two things wrong with this identification. One is that economics—and manifestly the economics we study and teach today—does have application outside of capitalism. A long line of economists, including Barone, Hayek, Lange, Meade, Dobb, Durbin, Crosland, and many others, has used standard tools to analyze how a socialist economy might operate. They cover a reasonably wide ideological spectrum—though there are no men from Mars among them, for good reason—but they are clearly doing economic analysis. To take a different kind of example, Vernon Smith<sup>2</sup> has shown that economics has interesting things to say even about hunter-gatherer society; a slightly weaker point is illustrated by Radford’s famous article on “The Economic System of a Prisoner-of-War Camp.”<sup>3</sup>

Sensible analysis of any economic system, capitalist or not, has to pay attention to the characteristic motivations and institutions of that society’s way of organizing production and consumption. You do not have to go all the way to Lionel Robbins’s famous characterization of economics as the study of scarce resources, and therefore presumably in some sense universally applicable, to see that some basic ideas can be adapted to a wide variety of institutional settings, some of them well outside capitalism. There is, after all, a well-recognized subdiscipline called “comparative economic systems,” whose practitioners believe that what they are practicing is economics.

Which leads me to question Heilbroner’s formulation also from the opposite direction. Capitalist societies are not all alike, as he would have been the first to recognize. Even within the collection of historical and easily imaginable versions of the capitalist economy, there is enough variation to require nontrivial adaptation of basic economic principles to alternative institutional settings. From Irish peasants to post-Deng China to the postwar United States to corporatist Austria to French indicative planning to Erhard’s Germany to Thatcher’s England to Sweden’s Middle Way, there are enough similarities and enough differences to require substantial tailoring to fit. I do not think any

purpose is served—not even Heilbroner’s own—by the suggestion that there is a clearly defined capitalism and therefore a unique vision for economic theory.

There is a quite different, constructive way to visualize the nature and structure of the discipline. I will introduce it by endorsing a judgment due to David Hilbert. (I owe this reference to Michael Rothschild; it comes from Hilbert’s famous lecture about the 23 Problems.)<sup>4</sup> I realize that I am taking my life in my hands by quoting a mathematician, because there is a well-established bad habit—definitely not Heilbroner’s—of identifying mathematical method with pure formalism in economics. Intelligent readers will see that this is not the case, certainly not here. Hilbert’s remarks are the thoughts of an experienced problem-solver about solving problems. They could easily have been written by a great historian or chemist instead of a great mathematician.

In dealing with mathematical problems, specialization plays, as I believe, a still more important part than generalization. Perhaps in most cases where we seek in vain the answer to a question, the cause of failure lies in the fact that problems simpler and easier than the one in hand have been either not at all or incompletely solved. All depends, then, on finding out these easier problems, and on solving them by means of devices as perfect as possible and of concepts capable of generalization. This rule is one of the most important levers for overcoming mathematical difficulties and it seems to me that it is used almost always, though perhaps unconsciously.<sup>5</sup>

Now let me sketch an attitude toward economics that is more like Hilbert and somewhere near the opposite end of the spectrum from the worldly philosophy as seen by Heilbroner. I remember seeing a book for 12-year-olds called *How Things Work*.<sup>6</sup> Each page or facing pair of pages described, with plenty of sketches and diagrams, how some familiar mechanism does its thing: how a jack enables a small person to

lift a large car; how a doorbell rings when you press the button; how a turbine generates electricity from falling water. It was absolutely fascinating. One can think of economics as a compendium with the title *How Economies Work*.

The real-world economy, any real-world economy, is full of mechanisms that are not entirely transparent. Some of them are markets, for perishable or durable goods or for services, competitive or monopolized, with symmetrically or asymmetrically informed agents, and so on; some of them are decision processes for families, businesses, and government agencies; some of them are responses to exogenous forces; some of them are more like games of strategy; and so on. We need to know how they work.

I am being deliberately extreme, to reinforce the contrast, but in fact could hope to build up something like a worldly philosophy by accumulation, agglomeration, and interconnection of such mechanisms. Of course one would not expect that literally to occur; the intellectual community will sometimes jump ahead, sometimes look back, the usual. The understanding of a bunch of different mechanisms will sometimes suggest a higher-level generalization. Those generalizations will sometimes suggest particular mechanisms to study, and offer hints about how they work. Nevertheless, the spirit of *How Things Work* is quite different from the spirit of *The Worldly Philosophers*, and I rather prefer it. Why? I suppose it is partly a matter of temperament. But I also think that it offers a surer route to the understanding of any particular form of capitalism.

This line of thought kept reminding me of something. It turns out that I expressed similar ideas more than 30 years ago in a chapter on “Microeconomic Theory” in a little survey volume on *Economics* (Solow, 1970, esp. 31-33). There I had distinguished attitudes toward microeconomic theory: system-building and problem-solving (remember that I was talking only about theory).

Most of the square-footage of economic theory fits under the rubric of problem-solving. The problems are some-

times quite specific and concrete, sometimes less so. Some problems arise from the need to extend conventional theory to different institutional settings—for example the wish to study the effects on factor proportions in public utilities of rate regulation based on a “fair rate of return on capital,” or to analyze the effects of alternative land-tenure arrangements on the input-output choices of farmers. Other problems arise from the desire to improve models of economic behavior by extending them to cover aspects of reality previously neglected—for example, the attempt to find useful ways of formalizing behavior in the presence of uncertainty, and to introduce reactions to uncertainty in the theory of asset choice, taxation, and public expenditure.

Economic theory at this level often emphasizes the clever simplification at the expense of completeness and rigor, in contrast with the drive for generality in systematic theory. . . . Problem-solving theory is most often carried on with a particular applied problem, and sometimes even a particular body of data, in view. Hence the importance attached to the tactical simplifying assumption. . . .

There remains a tension between the two theoretical styles. System-builders observe that problem-solvers isolate what cannot in principle be isolated, neglect interactions that may not in fact be negligible. Problem-solvers observe that system-builders can never actually use their elegant theories to answer any interesting questions (Solow, 1970).

System-building theory is not coterminous with the worldly philosophy. But anyone can see how those remarks could be modified to bear on the issue I have been discussing.

Now what about Heilbroner’s remarks on the wish he discerns in others to make economics into a Science. Here I am on his side, but only sort of. So perhaps I can sketch a concurring but distinct opinion.

The issue—is Economics a Science, or should it be?—pops up frequently. I think the question is badly posed. Maybe I can indicate what I mean by asking another question. Suppose my answer to the first question is “no.” Am I then committed to the belief that economics is or should be unscientific? Something has gone wrong here. Part of the problem is the difference between capital S and small s.

Another part has to do with the definition of science (or Science). In German—a language in which all nouns are capitalized—the word *Wissenschaft* is always translated as science. But I am a member of a scholarly society that distinguishes in its organization between *Naturwissenschaft* and *Geisteswissenschaft*. *Naturwissenschaft* is obviously natural science. I would translate *Geisteswissenschaft* as the humane sciences (not “human” by the way: *Geist* is usually translated as “spirit,” as in *Zeitgeist*, the spirit of the age.) Economics is classified under *Geisteswissenschaft*, which leaves me just as uncomfortable as the alternative. I am not sure that Heilbroner’s question would arise so easily in German.

I would not claim for economics the role of the physics of society. But I would insist precisely on a scientific approach to economics, which I take to mean a commitment to logic and an ultimate respect for facts. That is certainly good enough for compiling and revising *How Economics Work*.

It seems to me that Heilbroner goes off the rails when he says, “If economics were in fact a science, we humans would be mere robots, no more capable of choosing what was to be our response to a price rise than is a particle of iron to the presence of a magnet.” This would seem to imply that psychology is in no sense a science, or cannot be scientific. Human choice can surely be an object of scientific study; and when it is, the methods and the results will be different in texture and scope from those arising in the scientific study of magnetism. These remarks have, at least to my eye, a certain all-or-nothing character that goes too far.

There is a similar lack of precision in Heilbroner’s comments on the old question of “objectivity.” He says, “But what does it mean to be ‘objective’ about such things as inherited wealth or immiserat-

ing poverty?” Maybe the problem is that (lack of) objectivity can mean different things in different contexts. In the most elementary sense, it all goes back to respect for logic and fact. On some heavyweight issues of social and political choice, there is ideological pressure on economists and others to fudge some logic and to skip or distort or fabricate some facts. Successfully resisting this pressure is what we mean by objectivity. The alternative is prejudice, or in extreme cases, dishonesty. Absence of prejudice may be close to what we normally mean by objectivity.

A more general and more subtle possibility arises in the context of everyday work in economics (and other disciplines). When the signal-to-noise ratio is low, there is always some tendency to see what you want to see. This can happen in hard science too, when the combination of theory and observation does not speak at all clearly. Economists seem to be congenitally condemned to low signal-to-noise ratios. Then the alternative to something one might choose to call “objectivity” is wishful thinking. Honest reporting goes a long way, as Heilbroner recognizes. It is worth emphasizing that the ultimate guarantor of objectivity is not the mere personal integrity of the individual economist or astrophysicist, but the critical energy of the scientific community. It is the vultures of another persuasion that keep the original vultures honest. The danger to objectivity comes from fads and party lines.

In the end *The Worldly Philosophers* comes out at the right place, sort of: “But when it comes to policy recommendations, it is impossible to present economic analyses as if they stemmed unchallengeably from the givens of society.” Actually much can be said, scientifically and objectively, about inherited wealth and immiserating poverty, and also about the likely consequences of particular social and political choices designed to deal with inherited wealth and immiserating poverty, but of course not about the intrinsic desirability of the social and political choices themselves. That is an old story.

It seems to me that *How Economies Work* should be the ally, not the enemy, of the worldly philosopher. The more we know about all those mechanisms and their operating characteristics, the closer we

can come to what Bob Heilbroner described as the purposeful end of the worldly philosophy: “to develop a new awareness of the need for, and the possibilities of, socially as well as economically successful capitalisms.” At the very least, like chicken soup, it couldn’t hurt.

## REFERENCES

Solow, Robert. “Microeconomic Theory.” *Economics*. Ed. Nancy Ruggles. 7PLACE: Prentice-Hall, 1970).

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