

**Column: What crisis has taught economics**

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Paul Samuelson, who passed away recently, once said that funeral by funeral, economics advances. Talking of funerals, one of the many casualties of the recent financial crisis is the textbook macroeconomic model that assumed frictionless markets, flawless regulatory institutions, and fully rational agents. Once again, economists are back to the drawing board.

Was it the excessive formalism of economic models that led the economists astray, mistaking beauty for truth? It is a gloomy backdrop indeed for the legacy of Samuelson, who pioneered the use of formal models in economics.

The list of the most influential economists of the modern era is full of legendary names, such as John Maynard Keynes, John Hicks, John Nash, Kenneth Arrow and Milton Friedman. But what makes Samuelson stand out is that he, more than anyone else, helped unify and formalise the subject by the use of the language and tools of mathematics. He achieved this partly through his own path breaking research, which, as many have pointed out, could fetch him seven or eight Nobel Prizes. But a part of his legacy is through his best-selling textbook, *Economics: An Introductory Analysis*, which showed how the different branches of economics could all be integrated under a common analytical framework. To give a literary analogy, Samuelson helped invent the grammar of the language of modern analytical economics, and at the same time was one of its greatest writers of all times.

His doctoral dissertation from Harvard in 1941—when he was only twenty-six years old—was published as the *Foundations of Economic Analysis* in 1947 and is considered to be one of the all time classics in economics. In this he unified the theory of consumer behaviour and the theory of producer behaviour by noting that both—and pretty much any other economic decision—can be viewed as a mathematical problem of maximising a function subject to certain constraints. Once a decision-problem is formulated this way, a rich set of mathematical techniques allows us to derive a set of equations describing the behaviour of firms and consumers. These can then be solved together to find the equilibrium of the economy. Moreover, if the system is disturbed by some shock (say, technological change), Samuelson gave us some techniques that are in everyday use even today to figure the effect on individual and aggregate behaviour.

Samuelson applied some of the microeconomic techniques he developed and helped create a unified theory of international trade. He also made pioneering and lasting contributions in the fields of macroeconomics, welfare economics, public economics, finance, capital theory, and economic growth.

Long before it became a fashionable term, Samuelson helped globalise economics. From Beijing to Boston, from Delhi to Durban, from London to Los Angeles, economists speak in the same language and use the same set of tools. His legacy is acknowledged not just by MIT graduates and Left-of-Centre economists such as Joseph Stiglitz and Paul Krugman, but also by members of the free-market oriented Chicago school, such as Robert Lucas and Gary Becker, all Nobel laureates.

Having a unified language does not mean economists all think alike. Economists like nothing better than a good argument, and if there is any chance to disagree, they will. It is that, sharing the same language and analytical tools, they can understand very quickly where the differences in opinion are coming from. They might have the same view about how the world works but differ on the facts. For example, if the price of something goes up, two economists

can give very different opinions—one can think demand went up, the other can think supply went down—although they are both using the same conceptual framework of supply and demand. Alternatively, they might differ in how they believe the world works, that is, have competing models. The debate about land acquisition for industry, for example, between those in favour of the government's involvement and those favouring a market-oriented approach stems from models that differ in terms of their emphasis on the relative importance of government failures versus market failures.

The advantage of formal modelling is that the argument then quickly shifts to the empirical domain and the question of what facts and processes are, is the most relevant. If the facts change, the conclusions change, some models become more relevant than others, and sometimes, the need arises for new models. The recent crisis has highlighted, for example, the need to introduce frictions in macroeconomic models explicitly, for example, those arising in financial markets.

Formal models are wonderful things, but they are as good as the assumptions that go into them and consequently, their ability to explain phenomena. Whenever a model is proven to be inadequate by events, one should resist Luddite-like calls to abandon the formal modelling approach. To do otherwise would be like advocating going back to the abacus anytime a computer crashes. At the same time, one should also resist the temptation to stubbornly clutch on to old models because of their familiarity or formal elegance when waves of unfavourable evidence crash on the shores like a tsunami.

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