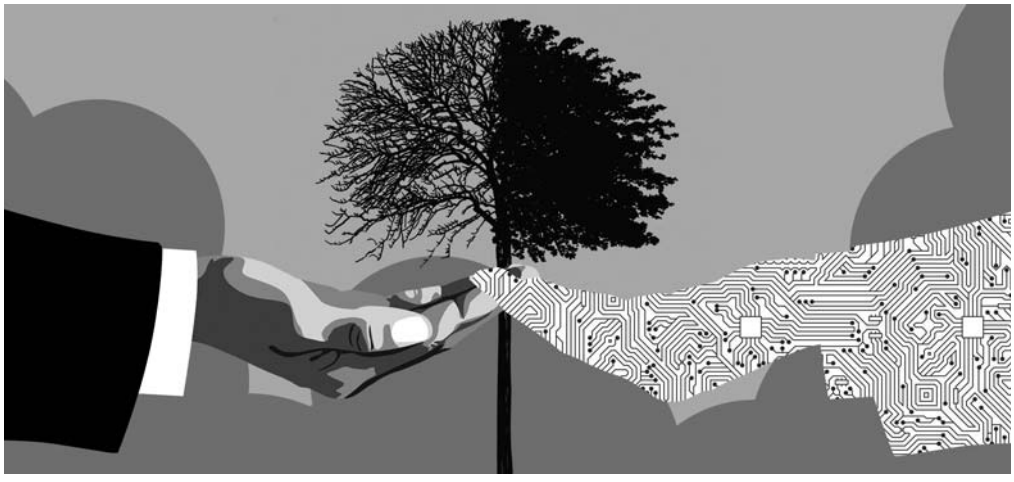
ILLUSTRATION BY BINAY SINHA



Pricing social returns in economic growth

The government needs to play an active role in encouraging basic research as well as protecting the environment

At first, the news that Paul Romer and William Nordhaus have jointly received the Nobel Memorial Prize in Economics for integrating technological innovations and climate change in the analysis of economic growth seemed a bit surprising. There has been some buzz about a prize for endogenous technological change in the air for a while, as has been a prize for the emerging field of environmental economics, and both Romer and Nordhaus are obvious frontrunners in these respective areas. What seemed surprising at first was the pairing of the two. But upon reflection, it seems like a rather innovative decision on part of the Prize Committee, and particularly apt in the current era where innovation and technological change are literally in the palm of our hands and yet unchecked growth and climate change bode disaster for the planet.

MAITREESH GHATAK

Romer's work examines what drives technological change that enables growth in productivity and allows society to escape the limits to growth due to scarce resources. Nordhaus' work explores how we can achieve sustainable growth taking into account the effect of economic activity on climate change. Technological change expands our ability to enjoy higher standards of living while the environment puts natural bounds on how much we can grow. Researches on these questions are, therefore, closely linked and yet, study forces that are somewhat in tension with one another, one pushing us forward and the other holding us back, like yin and yang in Chinese philosophy.

The field of economic growth studies the factors causing variation in levels and growth rates of per capita income over time and across countries. Research in this area is driven by the following questions: What forces drive long-run growth, and what are the constraints that put limits to growth? Robert Solow, a pioneer in the field, won the Nobel Prize for his contributions to the theory of economic growth in 1987. Solow's growth framework represents the classical view of development. In a world where markets and governments work well, and individuals make savings and work decisions optimally trading off current and future consumption, the problem of growth is essentially one of accumulating capital stock through savings and investment.

The growth framework developed by Solow had two major limitations. Romer and Nordhaus' work extended it in two different directions to address these.

First, Solow's theory does not actually explain long-run growth. As a country accumulates more capital, the returns to investment diminish as there are fixed factors, such as land and natural resources, as well as knowledge and technology. The gains from having more and more machines or workers at some point get exhausted. Therefore, eventually, a country's growth rate slows down and without changes in productivity, would become zero. Moreover, the standard growth model predicts that poor countries will grow faster, as they have little capital and so high rates of returns -- just like children grow faster, adults slow down. This is a prediction that finds little support in data.

Second, despite its popularity, per capita income has many limitations as an index of development as it only captures the value of goods and services that money can buy. It does not consider important determinants of our quality of life such as the environment, as that is not bought and sold in the market. Also, when we calculate national income, we allow for the depreciation of the capital stock needed to generate it but do not factor in the devaluation or depletion of natural resources. Yet, unlike buildings, infrastructure and machinery, natural resources cannot be rebuilt or replenished when needed.

Given that economics is all about pricing and allocating scarce factors, why were both technological change and the environment taken to be outside the domain of its analysis until recently? Because both are examples of public goods where the standard economic logic fails. An idea or a blueprint, once produced can be replicated infinitely at zero cost. Similarly, how does one price clean air or water? Unlike a standard good such as an apple, in these cases, your consumption does not reduce mine, and also, it is difficult to apply a "no pay no use" policy, both of which are essential for a good or a service to have a market. Because of this, left to market forces, there will be too little innovation (as inventors often don't get to capture their share of the benefits without adequate patent protection) and too much pollution (as there is no cost of doing it, unlike the cost of utilities such as electricity or water or heating).

Romer's contribution lies in bringing innovation within the purview of analysis, and providing a better understanding of what kind of market conditions and government policies regarding patents and investment in R&D can raise the long-run rate of growth. Nordhaus' contribution lies in studying the two-way interaction between economic activity and the climate, and how they would co-evolve over time, and the role of policies, such as carbon taxes, to better align the goals of material prosperity and environmental sustainability. Both also highlight the limitations of the market-fundamentalist view. In both cases market prices capture the private but not the social returns, requiring the government to play an active role in encouraging basic research as well as protecting the environment. Without these, we would kill the goose that lays the golden eggs.

The writer is professor of economics, London School of Economics