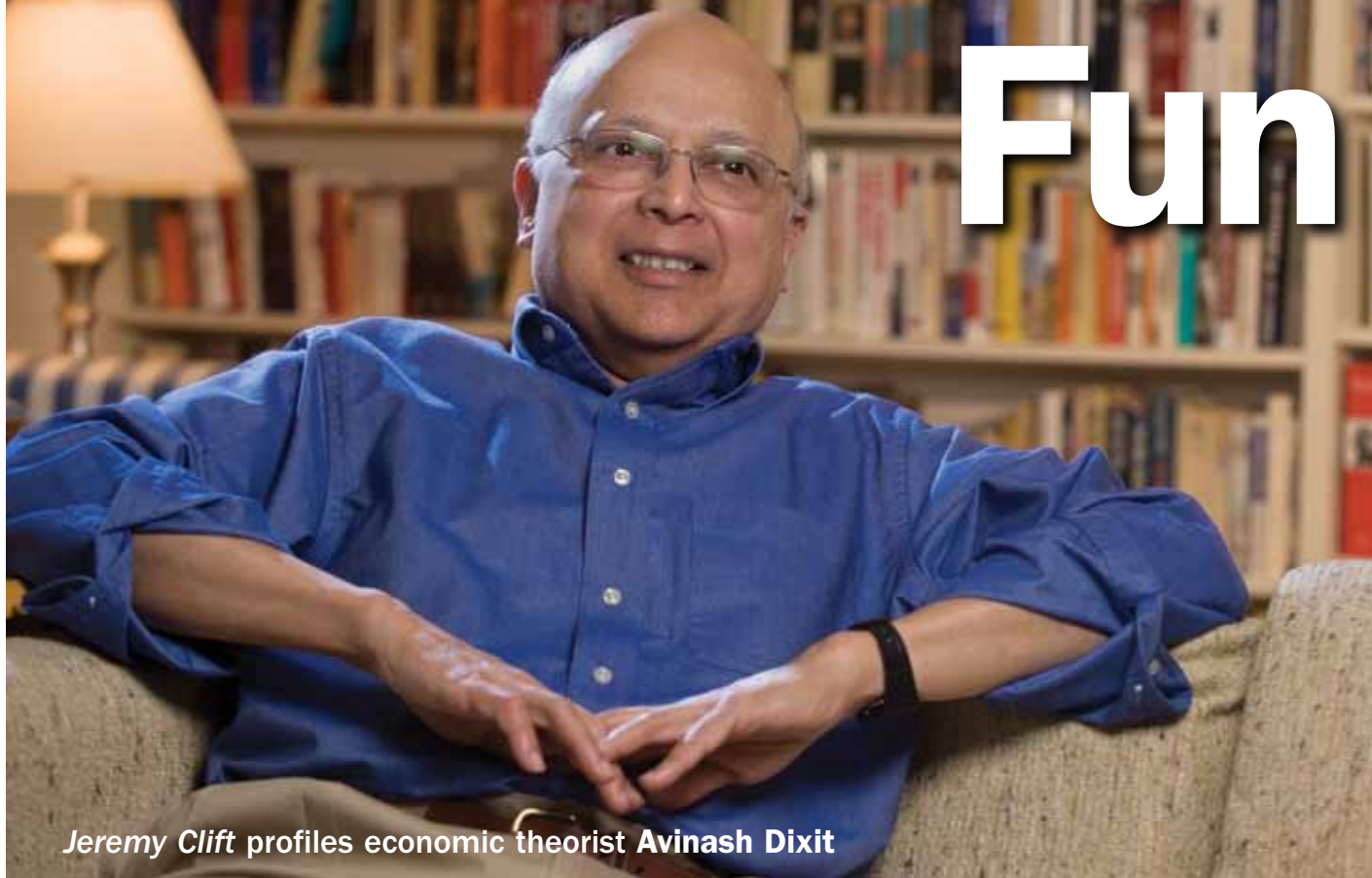


# Fun



Jeremy Clift profiles economic theorist Avinash Dixit

“Victory awaits him who has everything in order—luck, people call it. Defeat is certain for him who has neglected to take the necessary precautions in time; this is called bad luck.”

—from *The South Pole*, by Roald Amundsen

**I**T may seem strange that Avinash Dixit, who grew up in the tropical heat of India, has a shelf in his living room of neatly arranged books on icebound Antarctic expeditions. But the owlish Princeton University professor has a simple explanation: “They’re ideal for illustrating game theory strategies. Almost always an expedition had a fatal flaw that guaranteed defeat compared with the rival that succeeded.

“The Brits, for example, thought they knew it all, and had nothing to learn from anyone else,” he said, while slicing sandwiches for lunch in his sparsely equipped kitchen. “Scott of the Antarctic, for example, thought that the hierarchical structure of the British Navy was the right way to organize his team, when a more open participatory organization would have been better for his small group’s fateful attempt to reach the South Pole.”

Dixit, who compares academic research to rock climbing—it’s “the breathtaking view from the top” that makes it all worthwhile—is a passionate advocate of game theory and argues it has become part of the basic framework of economics.

He was drawn to it when he discovered *The Strategy of Conflict* by Thomas Schelling, one of the pioneers of the

study of bargaining. “That, to me, made game theory come alive,” said Dixit, in an interview at his Princeton, New Jersey, townhouse. “As Schelling says, ‘When two trucks carrying dynamite meet on a single-lane road, who backs up?’”

### Making learning fun

Teaching game theory, he insists, must be fun—he has won awards for his teaching prowess—and he tries to illustrate key concepts with tales from films, books, and real life.

Dani Rodrik, professor of international political economy at Harvard, says Dixit was the best classroom teacher he ever had—he never treated anything as silly or obvious. “No matter how stupid a question seemed, he would stop, raise his hand to his chin, narrow his eyes, and think a long time about it, while the rest of us in the classroom would roll our eyes at the stupidity of the questioner,” said Rodrik. “Then he would say, ‘Ah, I see what you have in mind . . .’” and he would roll out an answer to a deep and interesting question the student had no idea he had asked.”

“What makes him special,” says former student Kala Krishna, now an economics professor at Penn State, “is that more than anyone else I know, he sees economics as an inescapable part of life: from books, movies, negotiating with a taxi driver—everything has economic content. He truly loves economics, and you can see how much he is enjoying himself doing it.”

Others praise his wit. “Avinash Dixit is one of my favorite economists, in part because he has a trait that is extremely rare among economists: a good sense of humor,” said Steven



# Games

D. Levitt, coauthor of the best-selling book *Freakonomics*.

Dixit, who received his doctorate from the Massachusetts Institute of Technology (MIT), taught in Princeton's economics department from 1981 to 2010. He attained recognition early on for his work with Joseph Stiglitz on imperfect markets and what is referred to by economists as monopolistic competition. This concept offers an intermediate theoretical ground between pure monopoly, in which one firm controls the market, and perfect competition, in which there are so many competitors none has any market power.

He is also famous for his textbook on trade with Norwegian economist Victor Norman, *The Theory of International Trade*, which was enormously influential, and his work on oligopoly and industrial organization.

## Path-breaking model

What became known as the “Dixit-Stiglitz” model underpins a huge body of economic theory on international trade, economic growth, and economic geography—a model tapped by Paul Krugman, who won the Nobel Prize in 2008.

The model, first published in 1977, became a building block for others in the new fields of endogenous growth theory and regional and urban economics—what journalist David Warsh described as “one of those economical and easy-to-use ‘Volkswagen’ models that were the hallmark of MIT” (Warsh, 2006).

Monopolistic competition was pioneered by Joan Robinson and Edward Chamberlin in the 1930s and was the stuff of basic economics for years. But Stiglitz—who went on to win a Nobel Prize in 2001 for his work with Michael Spence and George Akerlof on the analysis of markets with asymmetric information—and Dixit took it to a new level.

“The success of the Dixit-Stiglitz model of monopolistic competition might have come as a surprise to students of the history of economic thought, as it was by no means the first attempt to deal with imperfect markets or monopolistic competition,” said Steven Brakman and Ben Heijdra in a book analyzing what they termed a revolution in the analysis of imperfect competition.

“However, where the earlier attempts failed, the Dixit-Stiglitz approach turned out to be very successful and has the potential for ‘classic status.’”

## Huge impact

The theory of monopolistic competition shook up modern trade theory, which Oxford economist Peter Neary attributed to “one factor above all others”: the development of the “elegant and parsimonious” model by Dixit and Stiglitz.

The duo applied their innovation only to the classic question in industrial organization of whether monopolistically competitive industries would yield an optimal level of product diversity. But within a few years, many were applying the approach to international trade.

Dixit admitted to Warsh that he hadn't foreseen the wide applications of the model. “Joe and I knew that we were doing something in building a tractable general equilibrium model with imperfect competition, but we didn't recognize that it would have so many uses—obviously; otherwise we would have written all those subsequent papers ourselves!”

Masahisa Fujita, Krugman, and Anthony Venables rave in their book, *The Spatial Economy*, about the model's adaptability in the field of economic geography. “In short, Dixit-Stiglitz lets us have our cake in discrete lumps while doing calculus on it, too.”

## Wide-ranging work

By his own admission, Dixit is somewhat haphazard and opportunistic about his research interests and focus. “I have always worked on the next problem that grabbed my interest, and tackled it using whatever approaches and techniques seemed suitable, never giving a thought to how it might fit into an overall world-view or methodology,” Dixit wrote in *Passion and Craft: Economists at Work*, edited by Michael Szenberg (see Box 1).

Barry Nalebuff, coauthor with Dixit of the popular book on game theory *Thinking Strategically*, jokes that Dixit was

Box 1

### Being twenty-three

“Of all the lessons I have learnt during a quarter-century of research,” writes Dixit, “the one I have found most valuable is always to work as if one were still twenty-three. From such a young perspective, I find it difficult to give advice to anyone.”

Dixit, who likes popular science and engineering books, says he pretends to have a perpetually youthful mind so as not to be confined by his field and the “distilled wisdom of a middle-aged has-been.”

Research may seem frustrating and daunting to outsiders, but he delights in it. “For me, it is the mental equivalent of free-climbing a new rock face, using only hands and feet for the ascent, or even free solo climbing, without any ropes, pitons, or harnesses to protect one if one falls.”

the human prototype for Wikipedia, the online encyclopedia. “Then and now, no matter what part of economics, he was able to answer your question, and push it further.”

Dixit also wrote the introductory textbook *Games of Strategy* with Susan Skeath, a former student and now professor at Wellesley College. John Nash, the founder of modern game theory and Nobel Prize–winner portrayed in the film *A Beautiful Mind*, is a friend and occasional lunch or beer companion.

Apart from game theory and his eponymous model, Dixit is known for seminal work on microeconomic theory, international trade and growth, and development. But his varied interests have moved him to write extensively about governance, the role of institutions, law, and democracy in development, and political polarization. He says his most cited work is *Investment under Uncertainty*, written in 1994 with Robert Pindyck of MIT, about how firms make investment choices.

That book points out the inherent irreversibility of most business investment decisions. Dixit and Pindyck suggest a way to deal with the risks posed by irreversibility: wait before acting. Waiting is valuable because with time comes additional information whose value would be lost had the irreversible decision already been made.

Dixit has advocated the same approach in other fields, and it is at the heart of a paper based on an episode of the popular TV show *Seinfeld*, in which a young woman must make decisions about using her finite supply of contraceptive sponges (see Box 2).

Dixit, who was president of the Econometric Society in 2001 and the American Economic Association in 2008, has taught at several U.S. and U.K. universities and had stints at the International Monetary Fund and New York’s Russell Sage Foundation, which is dedicated to research in the social sciences.

### From mathematics to economics

Dixit didn’t start out in economics. His bachelor’s degree from Bombay University is in mathematics and physics; he earned another bachelor’s in mathematics from Cambridge University. He credits a professor at his Cambridge college, Corpus Christi, for setting him on his new path by suggesting he read Paul Samuelson’s *Foundations of Economic Analysis* and Gérard Debreu’s *Theory of Value*.

Box 2

#### The hidden model

In an episode of the television sitcom *Seinfeld*, Elaine Benes’s favorite contraceptive sponge is taken off the market. She scours pharmacies to stock up, but her supply is now finite, so she must “reevaluate her whole screening process.” Every time she dates a new man, she has to consider whether he is “spongeworthy.”

When Elaine uses a sponge, Dixit says, she is forfeiting the option to have it available when an even better man comes along. He developed a mathematical model to quantify this concept of spongeworthiness many years ago, but kept quiet because it seemed inappropriate at the time. “I hope that my advanced age now exempts me from the constraints of political correctness,” Dixit wrote after retiring from teaching earlier this year.

When he arrived at MIT in 1965, he was interested in economics but formally a master’s student in the operations research department. “They sent me to see Frank Fisher for advice on what economics courses to take. He heard my story and said, ‘Operations research is boring; it’s just all algorithms. Come and join the economics Ph.D. program.’”

Although Dixit professes that his primary interest is in “the ideas, not the people,” he goes out of his way to pay tribute to the ideas and research of others, in particular fellow MIT economist and *New York Times* columnist Krugman, and Samuelson, the first U.S. economist to win a Nobel Prize, who Dixit says taught him the unity of economics as a subject.

“From his own work and his teaching, I realized that all the ‘fields’ into which economics is conventionally divided are intricately linked pieces of one big puzzle, with a common framework of concepts and methods of analysis—choice, equilibrium, and dynamics.”

### Time of turmoil

Dixit calls himself a theorist, “albeit of a relatively applied kind.” He started his research career in 1968, when the academic world of Europe and the United States was in turmoil. Dixit says the prevailing atmosphere was decidedly left-wing and anti-establishment, and research almost had to be “relevant.” In this climate, topics such as the problems of less-developed countries, urban areas, and the environment reigned.

“Looking back on those years, much of the ‘relevant’ research in economics left little lasting mark on the subject. Problems of less-developed countries and urban areas proved so political that good economic advice would have achieved nothing even if we had been able to give it,” Dixit said in “My System of Work (Not!),” an article he wrote in 1994.

“No, the topics that proved to have lasting value in economics were quite different—for example the theory of rational expectations, the role of information and incentives, and later in this period, game theory. In the early 1970s much of this work seemed abstract and irrelevant and would have been called politically incorrect had that phrase existed in those days.”

Dixit’s work with Victor Norman on international trade changed how people think about factor price equalization analysis—which looks at how free trade in commodities affects factor prices such as wages and interest rates—and most who studied international trade in the 1980s and 1990s acknowledge its influence.

He also brought sophisticated ideas from game theory to the study of industrial organization. His work on investment and entry deterrence looked at incumbent firms’ strategic buildup of excess capacity as a way to protect their monopoly by scaring off new entrants to the market.

### What drives development?

Dixit has spent the past decade watching what drives economic development, including governance and institutions, and has studied fragile states—poor countries recovering from conflict or disasters. “Governance was neglected by economists for a long time, perhaps because they expected the government to provide it efficiently. However, experience with less developed

and reforming economies, and observations from economic history, have led economists to study non-governmental institutions of governance,” he says (Dixit, 2008).

To this he brings his habitual skepticism.

While Dixit acknowledges the importance of democracy, property rights, contract enforcement, and the provision of public infrastructure and services that support private economic activity, he is scathing about attempts to draw up a menu of items that underpin development in low-income countries.

“There’s a long, long tradition of people offering recipes which don’t work out,” he says. He stirred things up with a lecture at the World Bank in 2005 that he said he hoped would be provocative and critical, but “evenhandedly so.”

In many cases, he argued in that lecture, the accumulated research on the role of institutions in development stopped short of giving useful or reliable policy prescriptions. “I hope to give everyone some incentives to think further and harder.”

In a subsequent talk at the Reserve Bank of India (Dixit, 2007), he said that in general “bottom-up and organically generated reforms will work better than imposed top-down ones.”

The World Bank’s Philip Keefer, who was Dixit’s respondent at the 2005 lecture, said the Princeton professor was right to be skeptical, but “big ideas” could help guide a country’s reform agenda.

To work effectively, Dixit said, change must be coordinated and take place across several fronts. “The one recipe that works is what I call ‘strategic complementarities.’ That is, if 15 things need to be done, doing 3 of them is not going to get you 20 percent of the way there. It’s going to get you much less. You’ll need to get all 15, or at least 13 or 12, right before you start to see any big effect. So that’s one thing, strategic complementarities, and the second is luck.

“Napoleon supposedly said that the quality he most admired in his generals was luck, and the same goes for governments and countries.”

## Economics and the crisis

Dixit, recently retired from full-time teaching at Princeton, rejects the agonizing of some chastened economists following the global economic crisis. He says they are wrong to blame the “dismal science.”

“Actually, I think that economic theory came out of this rather better than policy practice did. . . . Economic theory and economic analysis based on pretty standard theories told everybody that the situation was unsustainable, that there was going to be a house price bust sometime. The timing is always unpredictable, but pretty much everybody knew that things were going to go bad.

“But what we were not able to predict is the quantitative magnitude of it—how far, for example, house prices would fall. And secondly, we were not able to recognize how big an effect the financial crisis would have on the real economy.”

In light of the crisis, how should economic research adapt?

“Going forward, I think some of the most fruitful research will come from a better integration of financial theory and macroeconomic theory. It may be supplemented by bet-

ter recognition of rare major events, something that already exists in financial theory, but is less assimilated into financial practice than it should be.

“But the real fault was not so much in economic theory as, if you like, in the political and business world, where people actually swallowed some of the simplistic views about the wonder of markets too much without recognizing the hundreds of qualifications that Adam Smith and a number of others have told us about, and we should all have known about.”

## Crises won’t go away

Dixit, now a visiting professor for part of the year at Hong Kong’s Lingnan University, says the biggest message to take on board is that crises are not going to go away.

“We shouldn’t think they have been abolished,” Dixit said. “Thinking that we have abolished them is an illusion and perhaps a dangerous illusion, because if you think you have abolished crises, your policymakers, business people, consumers, et cetera, will behave in more reckless ways and thereby make crises more likely.”

He advises prudence in good times. “The lesson that really should be learned, and I’m afraid will never be learned, is that the time for fiscal prudence is when times are good. “That’s when governments should be running substantial surpluses, so that when crises or a recession hit, they can spend freely without worrying about debt.

“Unfortunately, the reason the lesson will never be learned is that good economic times are especially conducive to the illusion that bad times will never return.” ■

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