The Economics of Incentives

While psychologists commonly write about "rewards," economists most often use the term "incentives." Economic research has long demonstrated that incentives strongly affect behavior in market situations, and like psychology, economics provides insights into and evidence demonstrating how rewards can improve learning in homes and schools.

Incentives in Economics

"Incentives are the pillar of economics and represent everything I'm about," John List, an economics professor at the University of Chicago, told a reporter for *Bloomberg Markets* in 2011. "If you understand the incentives people are operating under, you have a good first guess about what they're going to be doing in certain circumstances and how changes in the environment and/or in their institutions will influence their behavior."¹

Incentives often arise from competition for rewards. In 1776, Adam Smith anticipated today's debate over intrinsic and extrinsic motivation in education when he observed that "great objects" – the accomplishment of justice or service to humanity, for example – can motivate some people, but such objects "are evidently not necessary in order to occasion the greatest exertions. Rivalship and emulation render excellency, even in mean professions. ..."²

The ability of "great objects" to motivate some individual teachers is plainly on display in the accomplishments of Los Angeles math teacher Jaime Escalante or Chicago "miracle worker" Marva Collins, who produced striking results against seemingly impossible odds through strength of

character and force of will. But their accomplishments are unlikely to be imitated by others in the absence of institutions that reward such exemplary conduct. As James Taub has said, "any method that depends on a Jaime Escalante is no method at all."³

Better than relying on intrinsic motivation, said Adam Smith, is to have people compete with one another for rewards. In a famous passage in *The Wealth of Nations* he wrote, "where the competition is free, the rivalship of competitors, who are all endeavoring to jostle one another out of employment, obliges every man to endeavor to execute his work with a certain degree of exactness."⁴ Ever since, economists have been demonstrating how the rational pursuit of self-interest underlies much, though not all, of human action.⁵ If choosing a particular option seems likely to produce greater personal benefits than costs, the decision-maker is more likely to choose that option. If the costs associated with the option are greater than the benefits, the decision-maker is less likely to choose it.

The benefits of choosing to act a certain way include what we have been calling rewards or incentives. The costs of a particular action may include time, effort, or money as well as the "opportunity cost" of the decision – the loss of benefits that would have been received had a different choice been made. By studying the costs and benefits of choices, economists can reveal how incentives influence the behaviors of individuals and institutions.

Evidence of the Effectiveness of Incentives

Economists have demonstrated the role of incentives in production and consumption choices for a wide range of goods and services. While they often do not have access to the "gold standard" of a randomized controlled experiment, economists have the advantage over other social scientists of having objective historical data on prices, production, consumption, income, and wealth to test their hypotheses.

The data trail left behind by economic exchanges, sometimes involving millions of people and billions of decisions over periods as brief as a few minutes to as long as centuries, allows economists to view history as a series of natural experiments testing various theories.⁶ For example, an anthology of articles on price theory covers the impact of changes in prices on demand for cigarettes, coffee, automobiles, steel, outdoor recreation, durable goods, public education, baseball players, engineers, and scientists.⁷ A popular textbook gives examples of changes in the supply and demand

for wheat, oil, gasoline, rent, wages, tollway use, and drug-related crime.⁸

Economists study areas of life ordinarily thought to be outside of markets. This effort began in earnest in the 1950s and 1960s by such scholars as the University of Chicago's Gary Becker⁹ and Richard Posner,¹⁰ and the literature now covers advertising, art, baseball, charity, child-bearing, crime, dating, discrimination, homosexuality, marriage, religion, and more. Crime, for example, may be economically rational given the monetary benefits and low time costs to the perpetrator and the perceived low probability of apprehension, prosecution, and imprisonment.

In a 1970 book titled *The Gift Relationship*, the late Richard Titmuss argued that monetary compensation for donating blood crowded out the supply of blood donors by extinguishing internal motivation, an early instance of the kind of anti-reward reasoning we described in the previous chapter. His thesis inspired other researchers to conduct scores of studies and write hundreds of articles on the issue. As it turns out, the economics of incentives applies even to blood. A review published in *Science* of rigorous randomized experimental studies and large well-controlled surveys finds money and other valuable incentives have consistent positive effects on people's willingness to donate blood.¹¹ The research, which documented the use of 14 incentives, including small coupons, T-shirts, and a one-day paid leave from work, showed rewards of higher monetary value had larger effects. Thus, Titmuss was wrong. Similar research has made a convincing case for the use of financial and other incentives in encouraging organ donations.¹²

This literature demonstrates the pervasive power of economic theory to reveal the rational utility-maximizing basis for behavior that at first appears to be irrational or altruistic. It suggests how incentives could be used to encourage desirable behavior in widely divergent areas of life.

Finally, economists use their tools to measure the impacts of government interventions on consumers and producers. Economists have documented the costs and benefits of the entire range of government activities including affirmative action, antitrust laws, gun control, immigration, minimum wage laws, rent control, speed limits on roads, taxation, restrictions on trade, welfare and other entitlement programs, zoning, and even mosquito abatement.¹³

Misleading Research

While economics demonstrates that much of the behavior we observe in

daily life consists of rational responses to incentives, economists do not assume that all persons act rationally or selfishly all the time. Nevertheless, claims that the validity of economics depends on an assumption of *homo economicus* or "economic man" date back to the nineteenth century. Modern critics often start by citing the 1981 work of economist Amos Tversky and psychologist Daniel Kahneman.

Tversky and Kahneman reported the results of an experiment involving about 300 college students who were asked to choose among strategies that involved weighing the certainty of gains or losses against the uncertainty of either greater gains or greater losses. The authors noted an asymmetry in the students' choices that revealed a greater aversion to the risk of greater losses than of lesser gains.¹⁴ The study helped launch an effort to find other examples of such behavior – "behavioral economics" – that appear to observers to be irrational and therefore counter to what traditional economics would predict.¹⁵

More examples were not difficult to find. Dan Ariely, a psychologist at Duke University, conducted dozens of similar experiments on college students and found they made frequent errors when assessing risk and making decisions.¹⁶ In a popular book he described and labeled 11 situations in which his students were "predictably irrational," including "decoys" (college students were easily distracted by a false option), "anchoring" (they searched for benchmarks even when they were obviously irrelevant), and sex (male college students who read or viewed pornography subsequently underestimated the risk of unprotected sex). First-year marketing students and parents of teenagers and 20-somethings would not find any of these results surprising, but Ariely claimed his experiments were profoundly important. He wrote that they contradicted the "assumption of *rationality*" that "provides the foundation for economic theories, predictions, and recommendations."¹⁷ [italics in original]

Bruno Frey, an economist at the University of Warwick (U.K.), also has weighed in over the past 20 years with scores of articles and several books questioning the assumption that people generally make rational decisions. "When people make decisions," he wrote with Alios Stutzer in 2006, "they mainly take salient extrinsic attributes of choice options into account. They thus overvalue characteristics relating to extrinsic desires such as income and status and underestimate those relating to intrinsic needs such as time spent with family and friends and on hobbies. It follows that they tend to underconsume goods and activities with strong intrinsic attributes."¹⁸ In his

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1997 book aptly titled *Not Just for the Money: An Economic Theory of Personal Motivation*, Frey claimed "intrinsic motivation is of *great importance* for all economic activities. It is inconceivable that people are motivated solely or even mainly by external incentives."¹⁹ [italics in original]

Two more influential voices in the debate are George Kerlof, a professor of economics at the University of California - Berkeley, and Robert Shiller, an economist at Yale University, who say economics "fails to take into account the extent to which people are also guided by noneconomic motivations. And it fails to take into account the extent to which they are irrational or misguided. It ignores the *animal spirits.*"²⁰ [italics in original] Their book, they write, "accounts for how it works when people really are *human*, that is, possessed of all-too-human animal spirits."²¹ [italics in original]

These writers use sweeping claims and lots of italics to persuade readers that conventional economic reasoning had been overturned and is no longer a reliable guide to the role of incentives in behavior. Many of the same educators who embrace the pop psychology claim that external motivation often extinguishes intrinsic motivation also embrace the views of these authors.

Definitive Research

Critics of mainstream economics misrepresent or overlook extensive research that contradicts their views. Their case against the way mainstream economics treats incentives, similar to the case against how mainstream psychology treats rewards, rests on experiments involving small sample sizes and flawed designs. These "laboratory experiments" typically involving college students may be useful to marketers,²² but determining the effectiveness of rewards in a wide range of areas including learning requires much larger, longer-term, and better-designed experiments.

Economists realize their model of rational utility-maximizing conduct does not provide a complete picture of human nature, but they do not believe this truth invalidates their discipline. Most feel the very lack of realism in the model – its parsimonious use of assumptions about motives and values – makes it more, rather than less, scientific and powerful.²³

Economists believe the best way to predict the outcome of a transaction is to assume most participants act rationally to attain whatever it is they value. More precisely, the economic doctrine of rational action holds that

consumers have stable and ordered preferences and choose the combination of goods that is most preferred at any given time.²⁴ Ordered preferences imply transitivity: If A is preferred to B and B is preferred to C, then A will be preferred to C. It also implies "more is preferred to less," also called "maximizing behavior."²⁵

Nobel Laureate Gary Becker has emphasized "the preferences that are assumed to be stable do not refer to market goods and services, like oranges, automobiles, or medical care, but to underlying objects of choice that are produced by each household using market goods and services, their own time, and other inputs. These underlying preferences are about general aspects of life, such as health, prestige, sensual pleasure, benevolence, or envy, that do not always bear a stable relation to specific market goods and services."²⁶ This understanding of rational behavior, much different from the caricatures presented by the critics, provides room for economists and psychologists to collaborate on theories of motivation.

Rationality in economics also refers to the outcomes of markets rather than the motivation of individuals acting *in* markets. Markets reward rational action by giving greater control over resources to people who act rationally. When studying markets, it is usually safe to assume rational behavior is the rule rather than the exception, because business owners and managers who do not act rationally tend to produce products and services consumers do not want or at prices they will not pay; consequently, irrational actions lead to the loss of customers and investors. The businesses that survive – the ones we observe – tend to be rationally managed. Most consumer choices, moreover, are rational at least in the sense that they reflect what is preferred and affordable at the time of purchase. To remain employed, workers, too, must usually behave rationally.

Becker emphasizes "the basic demand relations are derived fundamentally from scarcity alone, rather than from an assumption that behavior is 'rational.'"²⁷ For a typical good or service, the number of units demanded falls as its price rises "even when consumers behave irrationally."²⁸ Even market critic Robert Kuttner concedes this point: "Even if individual preferences were somewhat arbitrary, unstable, and manipulable, entrepreneurs would remain subject to competitive discipline to offer the best product at the most attractive price."²⁹

By focusing on the rational acts of individuals, economists can solve the problem of complexity by assuming as little as possible about people's motives. This is in stark contrast to much of non-behavioral sociology and

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psychology, where many conflicting theories lead to little agreement in explaining people's behavior. Rather than claim to know or to judge an individual's values, economists speak of "revealed preferences" – those values that are revealed by prices and investment and consumption data each time a consumer chooses one thing over another.

Conclusion

Economists since Adam Smith have argued that most human behavior can be explained by people acting reasonably in response to the incentives they face. They have used "natural experiments" created by changes in prices, supply, and demand to test their hypotheses, resulting in a large body of literature explaining how incentives work.

Financial and other rewards cause many people to exert the additional effort needed to perform at high levels. Economists have quantified those effects and shown how they apply to a wide range of activities that do not normally take place in markets. As we will see in the next chapter, one of those areas is education.

Many of the critics of the use of incentives are the same critics of rewards that we met in the previous chapter, here citing small and flawed "laboratory studies" that show people are not always perfectly rational in their decision-making. But economists don't assume perfect rationality, nor is it required for incentives to work. The application of economics to institutions demonstrates how important it is to allow individuals to make their own choices, even in cases where "experts" claim they know better how those individuals should decide.

Economists, in short, have plenty to say about using incentives. In the next chapter we will look at some of their findings that are specific to education.

Notes

1. Quoted in Oliver Staley, "Professor List's Reality Show," *Bloomberg Markets*, April 2011, p. 92.

2. Adam Smith, *The Wealth of Nations* (Indianapolis, IN: Liberty Press, 1976 [1776]), pp. 759–60. Smith drew from earlier writers including Bernard Mandeville, *The Fable of the Bees* (New York, NY: Capricorn Books, 1962 [1705]).

3. James Taub, "What No School Can Do," *New York Times Magazine*, January 16, 2000, p. 56.

4. Adam Smith, supra note 2, p. 759.

5. Edward P. Lazear, "Economic Imperialism," *Quarterly Journal of Economics* 115, no. 1 (February 2000): 99–146.

6. Gerard Radnitzky and Peter Bernholz, *Economic Imperialism: The Economic Method Applied Outside the Field of Economics* (New York, NY: Paragon House Publishers, 1987).

7. Donald S. Watson, *Price Theory in Action* (Boston, MA: Houghton Mifflin Company, 1969).

8. N. Gregory Mankiw, *Principles of Economics* (Fort Worth, TX: The Dryden Press, Harcourt Brace College Publishers, 1998).

9. Gary S. Becker, *The Economic Approach to Human Behavior* (Chicago, IL: University of Chicago Press, 1976). For a more recent compilation of his popular writing, see Gary S. Becker and Guity Nashat Becker, *The Economics of Life* (New York, NY: McGraw Hill, 1997).

10. Richard Posner, *Sex and Reason* (Cambridge, MA: Harvard University Press, 1992), and by the same author, *The Economics of Justice* (Cambridge, MA: Harvard University Press, 1981); *Aging and Old Age* (Chicago, IL: University of Chicago Press, 1995); and *The Economic Structure of the Law* (London: Edward Elgar, 2000).

11. Nicola Lacetera, Mario Macis, and Robert Slonim, "Economic Rewards to Motivate Blood Donations," *Science* 340, no. 24 (May 2013): 927–28.

12. Lloyd R. Cohen, "Increasing the Supply of Transplant Organs: The Virtues of a Futures Market," *George Washington Legal Review* 58, no. 1 (November 1989); Eric Boehm, "Time to Reconsider Cash for Organs?" *Health Care News*, August 2013, p. 14.

13. Anthony Downs, *An Economic Theory of Democracy* (New York, NY: Harper and Row, 1957); James Buchanan and Gordon Tullock, *The Calculus of Consent* (Ann Arbor, MI: University of Michigan Press, 1962); Dennis C. Mueller, *Public Choice* (Cambridge, MA: Cambridge University Press, 1979); and on mosquito abatement specifically, see

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Gordon Tullock, *Private Wants, Public Means: An Economic Analysis of the Desirable Scope of Government* (Lanham, MD: University Press of America, 1987).

14. Amos Tversky and Daniel Kahneman, "The Framing of Decisions and the Psychology of Choice," *Science* 211, no. 4481 (January 30, 1981): 453–8.

15. Kahneman won the Nobel Prize in economics in 2002 for his work with Tversky (who died in 1996), despite having never taken an economics course in his life.

16. Dan Ariely, *Predictably Irrational: The Hidden Forces That Shape Our Decisions* (New York, NY: HarperCollins Publishers, 2008).

17. Ibid., p. xix.

18. Bruno S. Frey and Alios Stutzer, "Mispredicting Utility and the Political Process," in Edward J. McCaffery and Joel Stemrod, eds., *Behavioral Public Finance* (New York, NY: Russell Sage Foundation, 2006), p. 113.

19. Bruno S. Frey, Not Just for the Money. An Economic Theory of Personal Motivation (Cheltenham, UK: E. Elgar, 1997), pp. 118–9. See also by the same author, *Inspiring Economics: Human Motivation in Political Economy* (Cheltenham, UK and Northampton, MA: Edward Elgar Publishing Ltd., 2001); and *Happiness: A Revolution in Economics* (Cambridge, MA: The MIT Press, 2008).

20. George A. Akerlof and Robert J. Shiller, *Animal Spirits: How Human Psychology Drives the Economy, and Why It Matters for Global Capitalism* (Princeton, NJ: Princeton University Press, 2009), p. 3.

21. Ibid., p. xxv.

22. Richard H. Thaler and Sendhil Mullainathan, "How Behavioral Economics Differs from Traditional Economics," Library of Economics and Liberty, http://www.econlib.org/library/Enc/BehavioralEconomics.html, visited March 10, 2013.

23. Milton Friedman, *Essays in Positive Economics* (Chicago, IL: University of Chicago Press, 1953), pp. 14–5; Gary S. Becker, *The Economic Approach to Human Behavior*, *supra* note 9, pp. 13ff.

24. Herbert Simon, "A Behavioral Model of Rational Choice," *Quarterly Journal of Economics* 69 (1955): 99–118; Herbert Simon, "Theories of Bounded Rationality," in C.B. McGuire and Roy Radner, eds., *Decision and Organization: A Volume in Honor of Jacob Marshak* (Amsterdam: North-Holland Publishing Company, 1972), pp. 161–76.

25. Gary S. Becker, Economic Theory (New York, NY: Alfred A. Knopf, 1971), p. 26.

26. Gary S. Becker, The Economic Approach to Human Behavior, supra note 9, p. 5.

27. Gary S. Becker, supra note 25, pp. 21-3.

28. Ibid., p. 25.

29. Robert Kuttner, *Everything For Sale* (Chicago, IL: University of Chicago Press, 1996), p. 42.