



Economic Imperialism

Edward P. Lazear

The Quarterly Journal of Economics, Vol. 115, No. 1. (Feb., 2000), pp. 99-146.

Stable URL:

<http://links.jstor.org/sici?sici=0033-5533%28200002%29115%3A1%3C99%3AEI%3E2.0.CO%3B2-W>

The Quarterly Journal of Economics is currently published by The MIT Press.

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/about/terms.html>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/journals/mitpress.html>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is an independent not-for-profit organization dedicated to and preserving a digital archive of scholarly journals. For more information regarding JSTOR, please contact support@jstor.org.

ECONOMIC IMPERIALISM*

EDWARD P. LAZEAR

Economics is not only a social science, it is a genuine science. Like the physical sciences, economics uses a methodology that produces refutable implications and tests these implications using solid statistical techniques. In particular, economics stresses three factors that distinguish it from other social sciences. Economists use the construct of rational individuals who engage in maximizing behavior. Economic models adhere strictly to the importance of equilibrium as part of any theory. Finally, a focus on efficiency leads economists to ask questions that other social sciences ignore. These ingredients have allowed economics to invade intellectual territory that was previously deemed to be outside the discipline's realm.

By almost any market test, economics is the premier social science. The field attracts the most students, enjoys the attention of policy-makers and journalists, and gains notice, both positive and negative, from other scientists. In large part, the success of economics derives from its rigor and relevance as well as from its generality. The economic toolbox can be used to address a large variety of problems drawn from a wide range of topics.

In earliest times, economics was not distinct from other social sciences or even philosophy. Aristotle and Plato discussed economic issues in the context of social philosophy. Adam Smith [1776], Ricardo, and Malthus analyzed economic factors in broader contexts than most economists do today. The American Economic Association itself was hewn from the societies of other fields. The AEA was created as a joint effort of the American Social Science Association and the American Historical Association for the purpose of encouraging economic research.¹

At least during the last four decades, economics has expanded its scope of inquiry as well as its sphere of influence. Neither luck nor the inherent charm of economists is responsible for the change. Rather, the ascension of economics results from the fact that our discipline has a rigorous language that allows complicated concepts to be written in relatively simple, abstract terms. The language permits economists to strip away complexity. Com-

* This research was supported in part by the National Science Foundation. I am grateful to Kenneth Arrow, James Baron, Gary Becker, Roger Faith, Claudia Goldin, Morley Gunderson, Lawrence Katz, Robert Lucas, Michael Schwarz, Andrei Shleifer, and Nancy Stokey for helpful comments and discussions.

1. Kiger [1963]. Note that the current Allied Social Science Association (ASSA) is a different organization from the one that spawned the AEA.

plexity may add to the richness of description, but it also prevents the analyst from seeing what is essential.²

Our rigorous language can be used in many ways, but over the years, three themes have become fundamental in economics. First, economists assume that individuals engage in maximizing rational behavior. Second, economics adheres strictly to the importance of equilibrium as part of any theory. Third, economists place a heavy emphasis on a clearly defined concept of efficiency.

The starting point in economic theory is that the individual or the firm is maximizing something, usually utility or profit. Economists, almost without exception, make constrained maximization the basic building block of any theory. Many of our empirical analyses seek to test models that are based on maximizing behavior. When we obtain results that seem to deviate from what would appear to be individually rational, we reexamine the evidence or revise the theory. But the theoretical revisions almost never drop the assumption that individuals are maximizing something, even if the something is unorthodox. Few economists are willing to concede that individuals simply do not know what they are doing. We may permit imperfect information, transaction costs, and other intervening variables to muddy the waters, but we do not model behavior as being determined by forces beyond the control of the individual. Most sociologists, by contrast, argue that understanding the constraints is more important than understanding the behavior that results from optimization, given the constraints.³

The emphasis on maximization is important because it allows an analyst to make predictions in new situations. When individuals are assumed to maximize something, a well-defined and predictable behavioral response to any stimulus can be derived. Other social sciences that are unwilling to assume maximization are in the position of being unable to predict in new situations. The maximum of a function is a well-understood concept; other rules are not, especially when they vary from situation to situation.

2. Rigor need not take the form of mathematics, but much of economic rigor relies on its mathematical precision. Although many economists of earlier years were accomplished mathematicians, Samuelson [1947] made mathematical economics available to the profession at large.

3. Becker and Murphy [2000] argue that when social feedback effects are sufficiently strong, the maximizing individual will not be sensitive to the traditional variables of price and income. As a result, it will appear as though individual behavior is dictated by society. They argue that a more fruitful way to think about this is to allow for individual maximization with strong social interaction effects. In this way, equilibria can be understood, and the nature of the result and feedbacks can be studied and predicted.

A corollary of maximization is that on the margin, there are always trade-offs. The notion that there is no free lunch is central to economics. The simple, but crucial concept of opportunity cost lies behind much of the ability of economics to extend into other areas. Sometimes the trade-offs are subtle. Prices and costs are not necessarily parameters that are observed in market data, but they affect behavior nonetheless. Other social sciences do not place the same weight on explicit recognition of the tension between costs and benefits, which reduces the ability of these fields to grapple systematically with social phenomena. Thinking about trade-offs gives rise to related thoughts on substitutability. Economists place emphasis on choice. Things are not technologically determined. This is true for consumers and producers alike. There is no fixed number of jobs. Firms can trade off between employing labor and capital, and workers can choose between labor and leisure.

Second, as in the physical sciences, equilibrium is a central concept in economics. Virtually all economic theories have as primary desiderata that the behavior described must be consistent with some notion of equilibrium. Economic theory usually consists of modeling the behavior of agents. Then, behavior of the individual actors is aggregated to examine what happens when they interact. Often, this is in the context of a market. The economist's most familiar tools are supply and demand, which appeared during the nineteenth century (see Jenkin [1931, originally 1871]). Marshall [1890] made heavy use of these tools and derived a rich set of implications and testable predictions. Although the behavior of individuals who lie behind the supply and demand curves is inherently interesting, it is the interest in equilibrium itself that distinguishes economics from other social sciences. To be sure, other social sciences discuss spillover and feedback effects, but among social scientists, only economists insist on a physical-sciences-style equilibrium as part of the analysis.

Third, much of economics is driven by the notion that efficiency is important. Adam Smith's [1776] concept of the invisible hand is a guiding principle in economics. Individuals acting in their self-interest further the general goals of society. Smith took the moral ideas of the Enlightenment (especially the emphasis on free will) and transformed them into a positive theory of the economy, with limited or no role for the state. More formal statements have been provided during this century. The

idea that competitive equilibrium is efficient appears in the literature since the time of Marshall.⁴

The importance of efficiency is not that it is an apology for the status quo. Efficiency is a concept that, together with equilibrium, pushes economists to do a particular kind of analysis. When economists model a situation and the resulting equilibrium is inefficient, usually there are trades that could have occurred that are implicitly or explicitly ruled out. The analyst or his critics are induced to ask what the reasons are and what market or other institutions could arise to remedy the situation. Thus, the focus on efficiency when combined with equilibrium prevents the economist from being content with partial answers and half-truths. The notion that efficiency is a natural outcome motivates a larger series of questions and initiates deeper analysis. It also permits economists to make clear, unambiguous policy statements, although the assumptions that lie behind welfare economics are somewhat controversial. Still, Pareto optimality is a well-defined concept that allows us to take an axiomatic approach to issues over which other fields can only wring their hands.

Other social scientists generally ignore equilibrium considerations.⁵ In part, this is intentional, reflecting a belief that equilibrium takes too long to reach and too many things change before a given equilibrium is ever attained. For the most part, however, it is simply taken as a given, much as equilibrium is taken as a given for economists. In sociology and psychology, equilibrium is rarely considered. For economists, it is a necessary component of the model.

The power of economics lies in its rigor. Economics is scientific; it follows the scientific method of stating a formal refutable theory, testing the theory, and revising the theory based on the evidence. Economics succeeds where other social sciences fail because economists are willing to abstract. The old joke about a stranded, starving economist assuming a can opener to open a can of food pokes fun at our willingness to assume away what we

4. Early examples include Hotelling [1938] and Bergson [1938]. Formal analyses are found in Arrow [1951a] and Debreu [1951].

5. On rare occasion, sociologists develop models that discuss an equilibrium. One such example is Berger and Snell [1957]. Interestingly, this paper was heavily influenced by economics, in particular, the work of Prais [1955a, 1955b].

An important more recent exception is sociobiology, e.g., Wilson [1975]. This field uses the same approaches as those of economists to explain evolutionary developments. A nice summary of the literature on social selection of mates is found in Ridley [1993]. This book makes constant reference to trade-offs and to efficiency of equilibria and reads like an economics article.

believe to be unimportant or difficult details. Economists are used to posing the counterfactual question to do analysis. What would one expect in the absence of the hypothesized effect? What would be observed? Do the data allow us to choose between various hypotheses? Economists are not alone among social scientists in following this method, but this form of inquiry has become the standard for economic research.

It is the ability to abstract that allows us to answer questions about a complicated world. As economists, however, we believe in comparative advantage. I have argued elsewhere that the strength of economic theory is that it is rigorous and analytic (see Lazear [1995], Chapter 1). But the weakness of economics is that to be rigorous, simplifying assumptions must be made that constrain the analysis and narrow the focus of the researcher. It is for this reason that the broader-thinking sociologists, anthropologists, and perhaps psychologists may be better at identifying issues, but worse at providing answers. Our narrowness allows us to provide concrete solutions, but sometimes prevents us from thinking about the larger features of the problem. This specialization is not a flaw; much can be learned from other social scientists who observe phenomena that we often overlook. But the parsimony of our method and ability to provide specific, well-reasoned answers gives us a major advantage in analysis.

There are two claims made in this essay. The first is that economics has been imperialistic, and the second is that economic imperialism has been successful.⁶ To establish the validity of the argument, it is first necessary to define economic imperialism and then to establish a criterion against which success can be judged. Economic imperialism is defined as the extension of economics to topics that go beyond the classical scope of issues, which include consumer choice, theory of the firm, (explicit) markets, macroeconomic activity, and the fields spawned directly by these areas. The most aggressive economic imperialists aim to explain all social behavior by using the tools of economics. Areas traditionally deemed to be outside the realm of economics because they do not use explicit markets or prices are analyzed by the economic imperialist. For example, discrimination against particular groups,

6. This is not the first time this claim has been made. See, for example, Raditzky and Berholz [1987].

traditionally thought of as a perhaps irrational social phenomenon, has been addressed by economists during the past 40 years.⁷

Additionally, those issues that lie at a deeper level than those of traditional economics are also part of economic imperialism. Economics is extended to consider questions that are inside the "black box." For example, microeconomics historically took the firm as an entity. Modern economics examines the structure of relations within the firm, including issues of personnel policy and market strategy that have traditionally been outside the scope of economic analysis. Historically, economists assumed that firms would simply do what was best for maximizing profits, without attempting to describe the details on how profit maximization is best achieved.

Economists generally believe in the market test. Economic imperialism can be judged to be successful only if it passes this test, which means that the analyses of the imperialists must influence others. The effort to extend the field measures its success by inducing others to adopt the economic approach to explore issues that are not part of classical economics.⁸ One possibility is that scholars outside of economics use economic analyses to understand social issues. Political scientists, lawyers, and sociologists come to use the methods of economics to answer the questions that are of interest in their fields. Another possibility is that economists expand the boundaries of economics and simply replace outsiders as analysts of "noneconomic" issues, forcing noneconomists out of business, as it were, or at least providing them with competition on an issue in which they formerly possessed a monopoly. Below, it will be argued that both routes have been followed with success.

In what follows, a number of new areas into which economics has broken will be discussed. In each case, I will attempt to illustrate by way of these examples, how the framework, the focus on maximizing behavior, equilibrium, and efficiency have led to new insights on a diverse array of subjects.

7. Modern economic imperialism's birth is due primarily to Gary Becker, but there are precedents in the work on household economics by Margaret Reid [1934] and on human capital by T. W. Schultz [1959, 1961, 1963].

8. It is always a bit dangerous to claim that an area was not part of classical economics. There are very few topics today that cannot be argued to have some roots in the writings of the classical economists, especially Adam Smith.

LOOKING INSIDE THE ATOM

Much of economic imperialism is analogous to looking inside the atom. For many purposes in physics and especially chemistry, taking the atom as the relevant unit of analysis is appropriate. For example, chemists tell us that water is made from the combination of two hydrogen atoms with one oxygen atom. But for other purposes, such as the production and harnessing of nuclear power, it is necessary to understand that the atom is made up of electrons, neutrons, and protons and to understand how they interact with one another.

The same is true in economics. For many questions, it is sufficient to think in terms of an individual, a household, or a firm. But the economic imperialists have not been content with answering questions that can be dealt with at that level of abstraction. They have tried to understand the preferences of the individual, the composition of the household, and the internal workings of the firm to answer more questions that are of interest to social scientists.

Let us begin, then, by examining economic imperialism that takes the form of moving to a deeper level of analysis. We start by considering consumer theory and with it, the preferences of and budget constraint faced by the individual.

CONSUMER THEORY

Modeling Tastes

In modern decades Gary Becker is surely the economist who has done the most to expand the boundaries of economics into the other social sciences, particularly sociology.⁹ Sociology arose in the early part of this century as a reaction against individual rationalism. Over his career Becker has reasserted the ability of economics, with its assumption of rational, maximizing behavior, to explain social phenomena that were in the purview of sociology. In virtually every area of economic imperialism, Becker's work plays a prominent and often controversial role. Like it or not, Becker has forced sociologists to take account of his theories.

9. For an excellent discussion of the impact of economics on sociology, see Baron and Hannan [1994], who argue that most of the attention that sociologists have paid to economics is directed toward human capital and critiques thereof.

One of Becker's early important contributions was more of a foray into psychology than it was an attempt to move to the level of society. Rather than trying to describe tastes directly, Becker recast consumption as production so that changes in prices and income could be the driving forces to understanding behavior. Becker's "Theory of the Allocation of Time" [1965] gave economists a different way of thinking about consumption and labor supply. This work, and that of Lancaster, gave major impetus to the creation of a field that has come to be known as household economics. Both Becker and Lancaster viewed goods as inputs into an individual's or household's production function. What entered the utility function were commodities z_i that could be produced by some combination of goods x_i and time t_i , according to a production function,

$$z_i = f(x_i, t_i).$$

This seemingly minor change in specification gave rise to a large number of implications and was especially helpful in explaining behavior. Rather than focusing on taste differences, Becker placed the emphasis on subtle prices and replaced some of the emphasis on heterogeneous preferences with a measurable and testable source of variation. Time-intensive commodities are more expensive to high-wage individuals than are goods-intensive commodities. Thus, high-wage people enjoy their leisure in different ways than low-wage people. High-wage people may spend fewer hours in leisure activities, but these involve high priced goods such as opera tickets, expensive restaurant meals, and yachting. Low-wage people combine their time with relatively low cost inputs spending a higher fraction of their time playing basketball and watching television.

Instead of assuming that poor people have different tastes than rich people, the allocation of time framework allowed economists to think about differences in consumption patterns in a systematic way. Poor people consume more time-intensive commodities not because they like them better than rich people, but because they cost relatively less to poor people who place a lower value on their time. Since economists are not particularly good at modeling taste differences across individuals, this model provided a real insight into at least some differences in consumption patterns. It also brought economics into the realm of psychology. The theory made it possible to predict the preferences of individuals for particular goods. Although economists generally

concede the analysis of tastes to psychologists, the allocation of time approach provided some competition. Most important, the predictions of the allocation of time model are borne out in market data and could also be tested using laboratory experiments.

Demography

Malthus [1890] was the first economist to model population growth. Noticing that income and population growth were positively correlated both cross-sectionally and over time, Malthus set about to construct an economic theory of population dynamics. Most important, Malthus' view of population relied on quite a formal notion of equilibrium, which was determined by the subsistence level of consumption. Furthermore, Malthus did allow (in his second version) for choice to play a role in the determination of the fertility rate. Malthus discussed delayed marriage, abstinence, and other methods that could be used to reduce population growth that result from the choice of individuals over childbearing. Malthus' model was quite successful at explaining the facts that prevailed during his time, but the theory did not do so well in explaining the population patterns of the twentieth century.

To explain twentieth century patterns, Becker used a direct extension of the allocation of time framework, which allowed for an even greater role of choice than did Malthus' framework. In one of Becker's more controversial works, he modeled the choice to have children as the demand for a consumer durable (see Becker [1960b]). Children produce a stream of services over time, much like an automobile, so one could talk about population growth in terms of consumption and demand curves.

The allocation of time approach is useful in predicting more recent time series and cross-sectional difference in fertility behavior. High-wage women are less likely to have children than low-wage women. Since child services (the commodity produced with children) is a time-intensive commodity, high-wage women face a higher price of children than do low-wage women. Also, as labor force opportunities improve for women, in part because of more equal distribution of education, women find it more costly to have children. The policy implications of this theory are profound: to reduce fertility, it is important to raise the wage rate of women and improve their labor market alternatives.

Becker argued that most of what determined fertility rates was choice and further, that individuals make rational decisions

to have children. Data supported his view. Declines in childhood mortality rates were followed by declines in fertility rates, suggesting that people were adjusting their behavior to obtain a desired family size.

There is considerable evidence of the success of the economic approach to fertility. Economists play an important role at annual demography meetings, publish papers on demography in both economic and demography journals, and are significant in the policy discussion. Even demographers who do not embrace the economic approach,¹⁰ view it as a force to be reckoned with.

Discrimination

An early economic exploration of the issue of discrimination was Gunnar Myrdal's *An American Dilemma* [1944]. Myrdal's work made tastes for discrimination endogenous and discussed a self-reinforcing equilibrium. He argued (see Chapter 9) that three factors, namely, economic well-being, ex post intelligence and educational attainment, and discrimination by whites were linked. Any one would give rise to the other two. This created a vicious circle and perpetuated the state of poverty into which the African-American found himself locked.

A more rigorous approach was provided by Becker in his doctoral dissertation. In fact, Becker started his imperialistic crusade in this work, which examined the phenomenon of discrimination, especially racial discrimination [Becker 1957]. Becker modeled discrimination as a taste against a particular group, but a taste that varied throughout the population. Becker assumed that a taste for discrimination was part of an individual's utility function. As a result, discrimination could be analyzed in the same way that the demand for other goods could be understood. The taste might reflect a utility function that most would regard as objectionable, sinister, or evil, but the behavior of the individual possessing such a taste is rational, that is, consistent with maximizing behavior. In the context of discrimination, being rational means being willing to pay a price in order to exercise one's taste for discrimination. In the labor market context, this would imply that an employer who did not like blacks would be willing to pay a higher wage to white workers of equal ability. Specifically, one could define a discrimination coefficient from the

10. A case in point was Kingsley Davis, the late, well-known demographer.

following relation:

$$w_w \equiv w_b + d$$

or

$$d \equiv w_w - w_b,$$

where w_w is the wage of white workers and w_b is the wage of black workers. An individual possessing a discrimination coefficient d would be indifferent between hiring a black at wage w_b and a white at wage w_w . The larger the value of d , the greater is an individual's discrimination against a particular group. Given this value of d , the individual's behavior was hypothesized to be otherwise completely consistent with standard predictions of consumer behavior.

Not only did Becker make rationality part of the theory, but discussion of market equilibrium was an essential part of the analysis. Because tastes vary, some employers are willing to pay a larger discrimination premium than others. But it is the taste of the marginal agent, not the average agent, that determines prices in markets. This means that the wage differential between black and white workers depended on supply as well as demand. If there are very few individuals from the group against which there was discrimination, then the equilibrium wage differential will not be large. Individuals from each group simply work for employers with the least taste against them. This gives the implication that wage differentials are smaller in markets with fewer of the discriminated against individuals.

Efficiency considerations also pushed Becker to consider the dynamics of this market. Since individuals who discriminate pay higher wages than those who do not, discriminators must accept a lower return on their capital. The expectation is that in the long run, discriminatory employers are replaced by nondiscriminatory ones. Thus, discrimination should not persist over the long run. The fact that wage differentials have persisted for a long period of time suggests that other explanations, perhaps relating to discrimination that occurs before the individual enters the labor market or discrimination at the level of the consumer, need be found.

Becker's model also provides a way to test for the existence of discrimination. For example, if it is alleged that lenders discriminate against a particular group, then those who do not discriminate should earn higher returns on their loans than those who do.

Economic theory provides a clear prediction that can be tested using cross-sectional data.

Becker's analysis of discrimination is one of the best examples of the ability of economics to understand "noneconomic" issues. Discrimination on the basis of race, sex, or religion is viewed by most as heinous, and the topic often inspires heated discussion. Nevertheless, the emotional aspect of the topic did not prevent economists from thinking about discrimination in a rigorous way. Economics derives the logical conclusions of a set of assumptions about discriminatory tastes and provides clean and testable implications. By adding a degree of logic to the discussion, economics has made a topic that previously could only be discussed in emotional terms one that is the subject of a great deal of theoretical and empirical analysis.

The Family

Most analyses in consumer theory assume that the utility function reflects the preferences of an individual or sometimes of a household. The composition of the household is taken as given. The economics of the family tries to understand the determinants of household structure and the interactions of its members, rather than taking the unit as a given. The major work in this area again belongs to Becker. Becker's [1991b] *Treatise on the Family*, first published about twenty years ago, dramatically changed the way that academicians thought about the family. Almost heretical, Becker's willingness to extend the economic framework to consider topics like marriage and divorce, love for children and parents, institutions such as primogeniture and even discipline, reward, and punishment in the context of the family, was nothing short of revolutionary.

As is always the case in Becker's work, rational maximizing behavior is the key to understanding behavior even when it comes to such seemingly irrational activities as love. Becker's theory of marriage and divorce relates closely to labor market theories of specific human capital and to matching theory (see Jovanovic [1979]). In the labor market, "marriages" between workers and firms tend to survive when the match is a good one. A good match consists of a situation where there is more surplus generated by the particular pairing than by other configurations. When workers have firm-specific human capital, the worker's value to his current employer exceeds that to another. Such pairings are robust. Analogously, marriages that have a great deal of marriage-

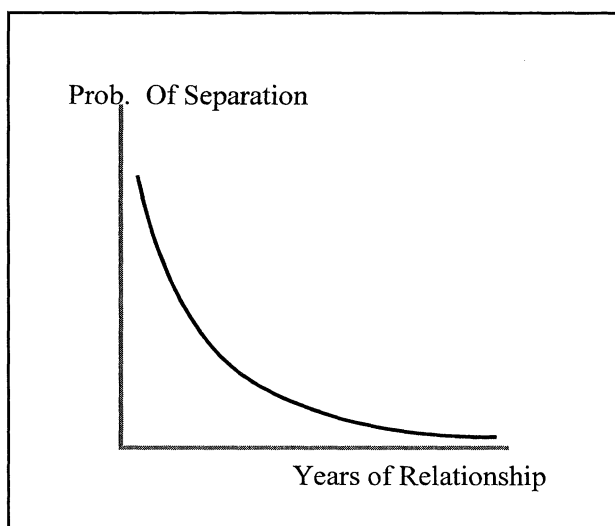


FIGURE I

specific capital are also likely to survive. Two proxies for marriage-specific human capital are the existence of children and the number of years during which the couple has been together. Children are marriage-specific because, perhaps for evolutionary reasons, parents tend to love their own children more than adults love the children of others. The presence of children, Becker suggests, reduces the likelihood of a breakup. Also, just as firm-specific human capital increases with time on the job, marriage-specific capital increases with time in the marriage. Thus, the observed patterns of declining hazard rates with job tenure are mirrored in the relation of divorce to time of marriage. The pattern shown in Figure I is consistent with the data on both worker turnover and divorce.¹¹

The way that parents relate to their children is modeled by appealing to altruism, which means formally that the child's utility (or consumption) enters the parent's utility function. The distribution of schooling across families and between siblings within families can be explained as an attempt to equalize utility across offspring. Such institutions as primogeniture, coupled with

11. See Becker, Landes, and Michael [1977] and Mincer and Jovanovic [1981].

sending a second son to the military, college, or the clergy can be understood in this context. Analogously, the patterns of support of the elderly and their housing choices also fit into this framework.

Related to this work are some important spillovers into macroeconomic and social security policy. Barro's [1974] work on Ricardian equivalence and the effect of various governmental policies on investment derive in large part from thinking in terms of intergenerational links and altruism. Auerbach and Kotlikoff [1987] build a system of intergenerational accounting that uses the economics of the family as a foundation.

Becker's work on the family is recognized, both inside economics and to some extent in other fields as well, as the most comprehensive and rigorous treatment of family formation and preferences to date. Again, the market test vindicates the use of economics to understand family behavior. Ideas that were considered bizarre and almost comical twenty years ago are now standard. Even sociologists, who were initially very resistant to the concepts, have given some ground here.¹²

Social Interactions

Taste formation has generally been declared off limits to economists. Preferences are of primary interest to psychologists and to sociologists. More recent studies in economics have attempted to incorporate the concepts of the other social sciences, but in doing so, to provide theories that better explain the social phenomena from which the observations are derived. In particular, concepts that have long been discussed in other fields now are analyzed by economists as well. For example, the sociologist's notions of peer pressure, norms, and social interaction now appear in the economics literature.

Sociologists stress the importance of constraints imposed on individuals by the fact that they live in a community, interacting with other individuals. Peer pressure is exactly one such interaction. Kandel and Lazear [1992] consider the effect of peer pressure on work effort. Individuals maximize, but take into account the effect of their actions on the views of their peers, which enter the individual's utility function. Guilt and shame can act as motivators in social and work contexts. Norms are established as the

12. The "rational choice" school of sociology, best represented by the late James Coleman, is a move back in the direction of economics. Furthermore, in addition to being a member of its Department of Economics, Becker is a member of the Department of Sociology at the University of Chicago.

equilibrium outcome of a process where deviations from any given (say, mean) level of effort results in direct or indirect sanctions. Peer pressure is more likely to be effective in small groups.

A more complete theory of social interaction is offered by Becker and Murphy [2000]. The emphasis here is on maximizing behavior, but an additional important component is attention paid to equilibrium. The word “market” in the title of their work, *Social Markets: The Marriage of “Economic” and “Social” Forces*,¹³ emphasizes that the action takes place in an equilibrium framework. Specifically, Becker and Murphy allow for feedback effects from other individuals. As in Kandell and Lazear, Becker and Murphy postulate a utility function where concern for the actions of others is important. Thus, an individual may prefer to go to a restaurant that others favor simply because he derives utility from being associated with these individuals or the image of going to a crowded restaurant.¹⁴ Becker [1991a] shows that such behavior can result in multiple equilibria and may cause a restaurant with long queues of customers to resist raising prices. By raising prices, and reducing the number of individuals who come to the restaurant, additional spillover effects are created that reduce the demand for the restaurant’s product. Under such circumstances, it may be more profitable to charge a lower price and to encourage large queues. Earlier, Schelling [1978] used the same kind of analysis to explain how a neighborhood could tip from being predominantly white to predominantly nonwhite.

Rather than saying that individuals have little control over outcomes because most are determined by social constraints, Becker and Murphy prefer to frame the problem in terms of maximization in the face of large spillover effects. When these effects are large, the elasticities of quantities with respect to the traditional variables of price and income are small. They argue that this is what sociologists mean when they say that individuals are constrained by the actions of society because agents are less responsive to the standard economic variables.

The more general point illustrated by this example is that feedback effects can affect individual decision-making, which in turn affects the equilibrium that is observed. The importance of

13. Schelling [1978] considered social markets using a somewhat different approach, but also assuming rationality and maximization.

14. Another way to think about this is that there is information conveyed by the fact that others are purchasing a particular good or service. This has been emphasized in the finance literature, e.g., Bikhchandani, Hirshleifer, and Welch [1992], and Bulow and Klemperer [1994].

thinking about the world in this way is first that it changes the focus from the nonrational to the systematic and predictable. Second, it causes the researcher to ask other questions that do not arise in a nonmaximizing context. Becker and Murphy emphasize the importance of reference groups when large social spillovers exist. If individuals' elasticities are small once peer effects are considered, then it is important to choose one's friends wisely. Thus, the choice of neighborhood in which to locate is a decision that affects many aspects of consumption. This theory provides a different way to think about neighborhood effects and location choice. Finally, the theory is extended to examine dynamic structures and especially fads and fashion, where feedback effects seem to be the heart of the issue. The notion that social spillovers are important has been used to examine criminal behavior and to predict riots. In this invasion into the study of crime, the notion of equilibrium is again key. Sah [1991] models the spillover effects of crime on the probability of a given criminal being apprehended. In neighborhoods where many crimes are being committed, the probability that any one criminal will be caught is low because police are busy chasing others.¹⁵ DiPasquale and Glaeser [1998] have extended the idea to model the likelihood of riots. This is modeled as a situation of multiple equilibria, where spillover effects determine whether a riot occurs or not. If a potential rioter believes that no others will riot, he is reluctant to take action for fear that he will be caught. But if many others are rioting, the limited police resources are spread thin, reducing the probability of detection to acceptable levels and making rioting worthwhile. Thus, small changes in beliefs can set off a riot as society jumps from one equilibrium to another.¹⁶

It is already clear that economists feel comfortable extending standard analysis to consider issues that involve society as a whole or some subset of it. Whether noneconomists are eventually persuaded that our approach is useful remains to be seen.

15. There is a supply side to this story as well. High crime neighborhoods may warrant a greater police presence, which works in the opposite direction. Economies of scale in detection play an important role in determining the direction of the net effect.

16. As with all models that rely on multiple equilibria, the story is incomplete. The existence of multiple equilibria means that something is absent from the model that determines which of the equilibria prevails. In this context, missing is a model of beliefs and changes in them over time.

Religion

If bringing economics to bear on the analysis of the family seems disrespectful, applying it to religion is downright dangerous, given the power of higher authorities. Yet economics has made an impact on religion, and the work by Lawrence Iannaccone, in particular, is viewed by those who study religion as a social phenomenon as one of the (newly) established schools of thought.¹⁷

There are at least two ways to bring economic thinking into a discussion of religion. One is to simply assume that religion enters the utility function. Treating religion in this way relegates it to being simply one of many important industries, and it is the approach followed by Azzi and Ehrenberg [1975], who study religiosity. Their model of church attendance addresses the problem as one of investment under uncertainty, where the uncertain event is entering heaven. Although the predictions of the theory are empirically verifiable (e.g., older people should be more likely to attend church), the validity of the underlying assumptions is impossible to determine in the current life.

An alternative is to view religion as changing preferences or prices in a more fundamental way. This is Iannaccone's approach. Iannaccone uses agency theory to model the practices of religious groups. Specifically, Iannaccone [1992] argues that free-rider effects were important in religious groups and that they had to find ways to deal with these effects. One method is to lower the value of alternatives, thereby increasing commitment to the group. By changing the prices or alternatives, the budget constraint is shifted, inducing individuals to take actions that are better for the group in question. Thus, Hari Krishnas, by dressing in unusual ways, make themselves unacceptable to others, which decreases the incentives to spend time engaged in activity outside the Hari Krishna circle. A similar point is made by Max Weber [1946, 1970, originally 1906–1924]. Kosher laws followed by Jews make it impossible for them to accept invitations to eat in nonkosher households, thereby restricting their contact to other kosher Jews. Recently, Berman [1998], used the Iannaccone model to explain puzzling fertility rate changes and labor force participation behavior among ultra-orthodox Jews. Related, un-

17. North [1981] argues that “any successful ideology must overcome the free-rider problem” and argues that modeling the free-rider problem is key to building a positive theory of laws and institutions.

usual dress codes and costly practices provide a screen (e.g., the Amish). Individuals signal their commitment to the group by acceding to the group's dress codes and other restrictions.

THE THEORY OF THE FIRM

Just as consumer theory can be taken to a deeper level of analysis, so too can economists penetrate the standard concepts used in production theory to extend the boundaries of economics. This can be done in a few ways.

First, the quality of factors of production can be viewed as endogenous. The most direct application of this kind of thinking opened up the economics of education.

Second, the nature of the interactions between various agents can be modeled and studied. Economists are no longer content with writing down a production function and assuming that the nature of that function is the scope of engineering or organizational behavior. Alfred Marshall's famous statement that it is not the business of the economist to tell the brewer how to make beer is less true today than it was in his day. Imperialistic economists are anxious to get inside the brewing process. Although not literally true, economists now see it as their task to understand how various production technologies and interactions can arise.

Third, the notion that firms simply maximize profits is no longer sufficient. Economists now want to know how it is done. What is the method used to monopolize a market and to choose which products to produce?

Although these questions that relate to the firm may seem to be closer to the main topics that economics has studied, we should not take for granted that these areas were open to economists. Indeed, for most of this century, other social sciences controlled this territory.

Surprisingly, scholars in the area in which economics would seem to be most applicable, namely the study and analysis of business, have avoided using economics until recent decades. There are still some holdouts. In some famous business schools, basic microeconomics is not even part of the curriculum.¹⁸ Perhaps as a result of the high level of abstraction, economics was not thought to be applicable to business issues. The view was that economics was not practical. Economic analysis has only recently

18. Harvard Business School is an important example.

changed that view and has made its mark in finance, accounting, marketing, human resources and industrial relations, the theory of organizations, and business strategy. By now, despite some laggards, the impact of economics on the study of business is profound. Economics has genuinely altered the way that business research and education is conducted.

Economic theory's slow entrance in business was in part a fault of economics itself. Economists, as scholars, have emphasized the positive aspects of economics and eschewed the normative (see Friedman [1953]). Business is in large part normative because the goal of a business education is not so much to explain the world, but to run it. Thus, much of the contribution of economics to both the study and teaching of business has been a result of translating positive lessons into normative ones.

The impact of economics has not been confined to the study of business. Economics has made its mark on the business community itself. An obvious example of this is the Black-Scholes formula for option pricing. Options are now priced in the market very much in line with the Black-Scholes formula. The fact that people believe that this is the correct way to price options forces market prices to conform to this formula, whether they did so before or not. Consulting firms borrow concepts from economics and sell them to their clients. For example, compensation consultants price jobs based on their nonpecuniary attributes. These concepts on which the method is based date back to Smith's *Wealth of Nations*.¹⁹ Yet consulting firms still reject economics as being fundamental to understanding business and advising clients. These firms are filled with psychologists and others with broad managerial training. Things are changing over time, however, as economists have shown that they have a different, but insightful way of looking at issues that have been of traditional concern to the firms' clients.

Determining the Quality of Labor

The theory of human capital is the most important contribution to determining the quality of labor inputs. Human capital theory, especially as it was applied to education, opened up a new area of inquiry and is strong evidence of the power of the economic framework. The three names most important here are Jacob

19. See Smith [1986, originally 1776] Book I, Chapter 10 on wage differences that compensate for job characteristics.

Mincer [1958], T. W. Schultz [1959,1961,1963], and again Becker [1960a,1962,1975]. Forty years later, it is obvious that education can be thought of as an investment that affects the quality of labor. It was not so obvious at the time. The notion that humans were capital was anathema to many inside the economics community as well as out.

The costs of education are somewhat subtle. As in the area of demography, recognizing that a large part of the cost of education consists of forgone earnings provided key insights into understanding the distribution of schooling across a population. The fact that the young are more likely to go to school than the old is derived in part from this point. Because the opportunity cost of a child's time is low, this is the ideal time to invest. (It also allows the greatest payoff period.) Prime-age workers rarely drop out of work to attend school even if attendance would increase their earnings. They simply cannot afford to do so because the opportunity cost of forgone wages is too high.

Both equilibrium and efficiency drive a number of the results associated with the economics of education. Initially, economists worried that there was too little investment in education because the rate of return to schooling exceeded what most thought of as the rate of return on other investments. Some then claimed that the reverse was true: as a result of increased enrollment in schools, done to avoid military service during the Vietnam War, the rate of return to schooling plummeted during the seventies, only to return to its highest historical level by the time of this writing (see Freeman [1976]). The importance of the economic approach to education is that it gives social scientists a way to think about who would acquire education, when education would be acquired, and it guides social policy by providing a method for determining the optimal level of schooling. No other social science has delivered the same implications or prescriptions.

The extension of economics into education had spillover effects. The earnings equation that Mincer derived in the late 1950s stated that

$$\ln (\text{Earnings}) = a + r (\text{Schooling}).$$

This function or some variation of it has probably been estimated more times, by more researchers, and on more different data sets than any other relation in economics. It generated an enormous interest in analyzing cross-sectional and panel data sets and was a force behind the acquisition of some of the data collected during

the 1960s and 1970s. A consequence of this kind of analysis was the refinement of econometric techniques and an emphasis on serious statistical analysis. Of course, serious statistics are not without their precedents in labor and consumer economics. For example, Friedman and Kuznets [1945] is a masterpiece in combining economic theory with data analysis. But the work in human capital gave impetus to the collection of new kinds of data, which made economics far more empirical than it had been in the past. Furthermore, the intensity and quality of empirical analysis gave credibility to the results obtained by economists that surpassed that earned by scholars in other fields.

No one can doubt the impact that human capital theory has had on other fields. Scholars in education now think of the model as mainstream. The National Science Foundation is currently funding a major project in understanding human capital. Even the business press features articles on human capital. It has taken over the way that most social scientists model education and the quality of labor.

Personnel Economics

Human resource executives are often regarded as the lowest form of managerial life. The same has been true of those academics who study human resources. There is a reason: historically, the field was loose talk. It was descriptive. It was ad hoc. It lacked positive predictions or reliable normative prescriptions. The older analysts focused much of their attention on industrial relations, which has all but died as unions have become less important in the American labor market.

Human resource management is today where finance was twenty years ago. Recently having become rigorous, both research and teaching in the field have been influenced, if not taken over, by economics. Industrial relations has been replaced at the top business schools by personnel economics. The difference between this approach and earlier human resources research is that the economic approach emphasizes maximization and rational decision-making by workers, competition in labor markets, and efficiency in labor contracting.

Personnel economics uses economic analysis to model the relationships between workers, managers, and owners. It is an attempt to move inside the profit maximization equation to determine how labor supply is elicited, who has incentives to do what to whom, and how firms can best make decisions about the

use of factors of productions. It is somewhat more normative than many traditional economics fields in that it reasons through complicated incentive problems, partly with the goal of informing managers. It is for this reason that it was started by individuals whose primary appointment was in business schools.

It is instructive to contrast the approach of the personnel economist with that of more traditional human resource scholars. Let me offer an example. One area in which economics has direct application is in determination of turnover and layoff policy. Economists naturally think about issues involving market competition and appropriate matching. These ideas may be implicit in old-style human resources, but they are never dealt with in a systematic way, in large part because the disciplines from which human resources scholars were traditionally drawn do not have a framework for analyzing these issues. Among the more analytic and respected of the human resources authors is George Milkovich. In his text with John Boudreau [1988, p. 327], turnover is discussed as follows:

Many employment planners establish specific rates of turnover (or patterns of mobility) as an objective. Subsequently, personnel programs are designed to achieve the objective. Looking again at Kodak, it designed early retirement programs to encourage older, experienced, and more expensive employees to leave. It also designed layoffs and instituted a recruiting freeze. . . . Whether to seek increased or decreased turnover rates depends on the circumstances faced by the organization.

Although there is little that is controversial in this statement, there is also no guidance as to when to lay workers off, whom to lay off, what is a desirable turnover rate, and how does it vary with economic conditions. Contrast this with the approach that economists use [Lazear 1998, Ch. 1]. The economic approach focuses on profit maximization and on efficiency. The efficiency rule can be stated as follows: a worker should be kept whenever his productivity at the current firm, Q , exceeds the value of his alternatives, A . This can be broken down into two statements. A firm wants to lay off a worker whenever the wage W exceeds Q . The worker wants to quit whenever $W < A$. In situations where the worker has rights to his job, the framework provides a rule for successful buyouts, which is another manifestation of the Coase theorem. Whenever $Q < A$, there exists the possibility of a buyout. The worker earns rent $W - A$ by staying. The firm loses rent $W - Q$ by having the worker stay. Thus, the firm is willing to pay $B \leq W - Q$ to have the worker leave. The worker will accept $B' \geq W - A$ to go. A

successful buyout exists whenever $B < B'$, the offer exceeds the demand, or whenever

$$W - A < W - Q.$$

This can be rewritten as

$$A > Q,$$

which is the efficiency condition. A successful buyout offer can always be made whenever it is efficient for the worker to go elsewhere.

Of course, estimating the values of A and Q may be a difficult task. But the old HR approach has the same difficulty. Anytime a layoff decision is made, the firm is saying that it views the worker's net output as less than his wage. The economic approach does this explicitly and gets the decision rule correct at the outset.

The economic approach to turnover is very different from the traditional HR approach. The economic approach focuses on efficiency, competition and market equilibrium, and profit and utility maximization. It provides many more implications for specific rules of turnover than does the HR approach. It dictates that layoffs occur not when things are bad at any particular firm, but when things are worse there than elsewhere. It also implies that young individuals and older ones are most likely to separate because the young have little firm-specific human capital and the old have alternative uses of time that are close to the value of their productivity on the job.²⁰ Finally, it prescribes a specific structure of buyouts that will be successful for targeted workers.

The difference between the way that economists and other social scientists think about personnel issues is illustrated by the following example.

The CEO of a major financial services firm recently stated that in a survey of the firm's workers, one finding was ubiquitous at offices throughout the world. Workers said that they would prefer better working conditions to more money in their current jobs. Critics of the economic approach often delight in facts like this, which they often believe negates the economic approach that places such heavy emphasis on money. An industrial psychologist might argue that improved working conditions signal to the worker that the firm cares about the worker's welfare and creates

20. Efficient retirement occurs at the age when the value of alternatives just equals the value of productivity on the job. Workers who were paid their marginal products would retire voluntarily at the efficient age.

a feeling of family and loyalty. There may be truth to this, but the economist would take a harder line. First, the economist might point out the question was not well-posed. It is first necessary to specify whether the improved working conditions cost more or less than the additional money offered to the worker. It would hardly be surprising to find that firm spending of \$50,000 on improved worker conditions for a given worker is preferred to an increase of, say, \$1000. Unlike other social scientists, the economist asks "at what price or cost?" Second, even if the comparison were between working conditions and benefits that cost the same amount, they should have equal value to the worker at the optimum. At the optimum, a dollar spent on working conditions should produce the same utility for a worker as a dollar spent on salary. If a dollar spent on working conditions produces more utility, then resources should be transferred from salary to working conditions until the worker is indifferent between the two. The finding reported by the CEO that improved working conditions are preferred to money simply reveals that this firm is not at the optimum and should transfer resources from salary to working conditions. The reverse could just as well be true at other firms that overspend on office furniture.

Personnel economics deals with interactions that are inside the firm in a rigorous way. The field, which applies labor and microeconomics to human resource management, has had a large impact on the literature and is having an impact on teaching. Whether it will come to dominate the field in the same way that economics has dominated finance remains to be seen.

Whereas human capital theory and personnel economics have helped delve deeper into the understanding of labor within the firm, modern finance has made much progress in rationalizing the study of capital usage. To some, this may not seem like imperialism at all. What could be a more natural part of economic theory than finance? Although seemingly obvious, it took some energetic economic pioneers to wrest the field away from the traditional management types who owned the discipline until the sixties.

Prominent among these earlier researchers was Merton Miller. Miller's contribution was to discover that because changes in capital structure do not alter the flow of earnings over time, altering the division of the firm's liabilities between stocks and bonds leaves the total value of the firm unchanged. When asked about his contribution with Franco Modigliani to understanding finance, Miller remarked, "If I take a pizza and cut it into eight

pieces, it's still a pizza." This insight was one of the first building blocks of modern finance [Modigliani and Miller 1958]. Not all financial economists accept the reasoning of the M&M theorem, but even its doubters have been influenced by it to look into areas of corporate governance and incomplete markets that might affect interpretation of the theory.

There are a few other individuals who are noteworthy. Harry Markowitz's [1952] early analysis of portfolio choice, William Sharpe's [1964] capital asset pricing model, Eugene Fama's [1970] work on efficient markets, and the already-mentioned Black-Scholes formula are the groundwork on which much of the research in modern finance is based. Work in finance during the fifties and early sixties focused attention on capital budgeting, much of which can be traced back to early treatises on the time value of money, especially by Irving Fisher [1930]. More modern asset pricing research, however, owes much of its existence to the economic theory provided by economists mentioned above.

Their theories were a major break from the institutional finance that used to be the subject of business teaching and analysis. Absent economic theory, with maximizing agents, equilibrium, and efficiency, financial scholars spent much of their time describing the institutions such as banks that prevailed in markets and trying to understand their differences and similarities. Much of the material was classificatory, grouping certain assets into some categories and other assets into other categories. The new finance broke away from this approach by keying in on both equilibrium and efficiency.

The simple concept of arbitrage made much of the work possible. Although arbitrage does not always guarantee efficiency, it was the concentration on economic efficiency, maximization, and equilibrium that induced financial theorists to think in terms of arbitrage conditions and thereby change the direction of finance. The Black-Scholes options pricing formula, widely used in the business world as well as in academia, exploits the concept of arbitrage in a sophisticated way. Understanding that constraints were placed on prices by the ability to trade assets that were identical or equivalent to the ones in question imposed discipline on economic predictions. The assumption that market agents maximize profits by engaging in particular trades was a straightforward and powerful engine that yielded results. Market equilibrium based on standard supply and demand analysis

replaced institutional taxonomies for determining the linkages between securities.

The effects of the introduction of economic theory and econometric analysis into finance have been powerful. Finance is viewed as the premier field in business schools and attracts some of the finest talent in the profession. (In addition to the Nobel Laureates listed above, note that two of the last seven winners of the John Bates Clark Medal are financial economists.) Finance has relevance to the real world; it has mathematical and statistical sophistication; it is important in terms of spillovers to and from other branches of economics and, as a result, commands great respect as a discipline. It is no wonder that finance has experienced a meteoric rise in status, especially in the research community, over the past three decades. Neither is economists' takeover of the field of finance a given, nor is it an obvious extension of traditional economics. Just as sociologists argue that institutions are more important in determining individual behavior than is maximization given constraints, management professors who taught finance believed that institutions were the key to understanding finance and financial institutions. They controlled the field and rejected the idea that economic theory could inform their discipline. They have been replaced by financial economists, almost to the person.

Accounting

If finance sits atop the altar of business research, accounting is the ancient language of the temple. Almost every manager who has had even a rudimentary business education has at least a basic knowledge of elementary accounting. Terms such as assets and liabilities, credit and debit, and the simple balance sheet are standard in business vernacular. Like finance, until recent years, accounting was a field rich in description, but lacking rigorous theory. That started to change perhaps three decades ago, and the departure from the old style of analysis in accounting has accelerated in recent years.

Accounting is a field that is a natural to be informed by economics, but like finance, the resistance was great, and inroads were made only recently. Economics was so absent from accounting that the two fields had very different concepts of profit, which led to significant confusion. Businesspersons often have a difficult time understanding why any firm would be in business simply to earn zero profit, neglecting the fact that economic profit allows a

normal return on capital and to managerial labor. The economist's definition is the one that comes from a notion of equilibrium; the accountant's definition a usage of the term that is unrelated to equilibrium.

Much of the change in accounting came about as the awareness of information economics grew. Since accounting is for the most part about information, breakthroughs in the theory of information had direct application to accounting. This showed up most dramatically in managerial accounting. There came to be a recognition that the kind of information that is most useful for guiding decisions is not necessarily the kind of information that was reported to or required by governmental agencies. Decision-making requires a sophisticated understanding of costs and knowing what to do with the information. Allocating costs to various units or activities in firms poses deep theoretical and empirical challenges. Microeconomics provided guidance in the middle of this century to those trying to decide whether costs should be regarded as fixed or variable and what the classification implied for build or scrap decisions (see Horngren, Sundem, and Elliott [1999]). Information and personnel economics provided insight into other kinds of decisions problems. Transfer pricing provides incentives to divisions and managers to behave in ways that can make the firm better off, but setting the prices correctly or choosing to use implicit rather than explicit systems requires a sophisticated understanding of economic mechanisms. Modern accountants now possess that understanding.

Second, accountants have come to realize that accounting statements are not the only determinant of market valuation. This derives from an awareness of asset-pricing mechanisms by knowledge of modern finance and the economics that created it. Much of the empirical accounting literature over the past two decades is concerned with the kind of information that is most likely to affect market valuation (see Beaver [1968]).

Finally, a large part of accounting is normative. It provides guidance for managers and sometimes for policy-makers. Various agencies use the work of accountants to guide their policies on rules that firms must follow. Since the analyses are based in large part on economic reasoning, economics has altered policy.²¹ For

21. The Federal Accounting Standards Board (FASB) has been caught in the middle of a battle between academic accountants and businesspersons for the past ten years over whether the expected value of options should be deducted from earnings at the time that they are granted. Academics generally believe that the

example, one question is whether a regulatory agency like the IRS should announce or conceal its audit rules. If rules are announced, then firms know what they can get away with and what they cannot. This will induce them to take actions that they might have been afraid to take if the rule had remained secret. But making the audit rule clear also means that transgressions that might have occurred if the rule had been kept secret will be completely eliminated by publicizing that such behavior will result in certain punishment. No cheating on the audited items occurs when the rule is announced.

Modern accounting scholars now use the language and tools of economics. Agency theory,²² information economics, and economic notions of equilibria and pricing are used in cost accounting. The fact that young accountants, who possess the new skills that make heavy use of economics, are in such demand by business schools is testimony to the impact of economics on the field.

STRATEGY

Until very recently, economists assumed that they had little to say about the optimal strategy of the firm. Emphasizing positive economics, economists generally shunned making normative prescriptions. Rather, the direction was the reverse. Businesspeople were assumed to know what they were doing. The economist's job was only to document it and to explain the behavior in a systematic way. That goal still remains noble, but it has been broadened.

The field of business strategy was never part of economics proper. Even Adam Smith did not include it among the topics that he discussed. Twenty years ago, research in business strategy (sometimes called business policy) meant studying the composition and behavior of boards of directors. The analysis was much like Kremlin watching in the former Soviet Union. Who sat next to whom at the board table was noted with significance and the importance of liaisons was emphasized. Much of the change is a direct result of Porter's [1980] book, which took the positive economics of industrial organization and made it normative.

impacts will not be significant because the market will see through the change in accounting rules. Firms that grant options are adamantly opposed to such a change.

²². See, for example, Lambert, Larker, and Verrecchia [1991] and Ritter [1984].

Porter used what we know about vertical integration, monopoly, and pricing and translated it into rules or lists of factors that businesspersons could follow. Some view this as mere intellectual arbitrage. To do so is equivalent to denigrating a producer for merely copying and improving an existing product. By making a product better and cheaper, the follower may generate the lion's share of consumer surplus. In a similar vein, business strategy scholars have done much to improve our understanding of business by taking theories that were positive in nature and applying them in a more normative context. And there is no doubt that they have succeeded. Strategic management as a field is now applied industrial organization, where the appropriate boundaries of the firm, product choice, where, when, and along which dimensions to compete, are all studied systematically. Previously missing, but now at the heart of the field, is the assumption of profit maximization by firms, working out market equilibria as a result of engaging in a particular strategy, and efficiency considerations.

Game theory has added much to the discussion of strategy issues. The language used in game theory is the same as that of business strategy. In game theory, as in strategy, attention is paid to economic efficiency. Business strategy is a process-oriented field. Game theory is attractive, not only because it allows the derivation of equilibria where the standard models were unsatisfactory, but also because it focuses more on process than the old competitive model.²³ The Walrasian auctioneer was an analytic fiction to make us feel more comfortable about the process that generated a result we believed in. Game theory and mechanism-design analyses place much more emphasis on process than the competitive model and the stories seem realistic. When we consider two firms interacting with one another in a market, prisoner's dilemma scenarios seem to vividly capture the nature of at least some interaction. When we think about firms that are fighting over a standard to be selected for the industry, the battle-of-the-sexes framework seems to be more than just a metaphor. But herein lies the danger, which shows up in business strategy literature. Because the models of the process are so realistic, scholars are often content with results that imply inefficiencies. Rather than asking whether the selection of the strategy space has ruled out efficiency-enhancing trades, modelers sometimes stop too soon and do not question whether there is a

23. This is especially true when considering oligopoly.

pattern to the inefficiencies that might be explained by a more complete theory. Standard competitive theory is less likely to lead to this conclusion because almost no weight is placed on the process, instead the focus is on the equilibrium itself. An example is instructive.

Suppose that a firm is engaged in a long-term trading relationship with a supplier. Since the relationship has bilateral monopoly aspects to it, one possible way to model this is to allow the supplier to demand a particular price and to allow the buyer to accept or reject. This is not an unrealistic description of the process that might occur in the real world. Let the value of the input to the purchaser be M , distributed $F(M)$, and the reservation price of the supplier be C , where C is known to all. Suppose that the supplier does not know the realization of M , but knows the distribution $F(M)$. The supplier's problem is then to announce a demand price P to solve

$$\max_P [1 - F(P)](P - C),$$

since the producer accepts the supplier's price whenever $M > P$ or $(1 - F(P))$ of the time. The solution is

$$P = C + (1 - F(P))/f(P).$$

This is monopoly pricing and results in an inefficiency. Because the supplier is trying to maximize its own surplus, it announces a demand that exceeds its reservation price. Inefficiency results in those situations when $P > M > C$. Trade does not occur because $P > C$; i.e., the price is set above the reservation value. Trade should occur because $M > C$; i.e., the value of the trade is positive.

The inefficiency results, however, because the strategy space is not sufficiently rich. The seemingly realistic structure disguises the fact that there is room for trade that eliminates the inefficiency. Since C is known to all, the solution is to sell the power to set price to the producer who is the buyer of the input, not to the supplier who is the seller of the input. The producer pays a retainer to the supplier, which determines the share of rent that goes to each party. All trades take place at price C , which the supplier always accepts. Whenever $M > C$, the producer offers the supplier C . When $M < C$, no offer is made, and no trade occurs. This eliminates all inefficiency since the producer buys if and only if $C < M$.

Concentrating on the process rather than the equilibrium is

more common in other social sciences. There, constraints are accepted as part of the problem's description, and researchers are unlikely to ask whether there are incentives to relax the assumed constraints in order to eliminate an inefficiency. If not, why not? Perhaps the inefficiencies are minimal and of little social consequence.

OTHER BUSINESS SCHOOL DISCIPLINES

Organizational behavior (OB) as a discipline is at the opposite end of the spectrum from economics. Whereas economics is precise, rigorous, and willing to abstract from details, organizational behavior is rich in description of details and empirically observed phenomena, but loose and without a parsimonious framework. Economists love to generalize. OB scholars like to focus on differences. Most important, economists who examine the issues assume maximization that must be consistent with an equilibrium. Researchers in organizational behavior feel no such compulsion and are generally put off by the notion that individuals are rational and maximize.

Economists have begun to have an impact on the way that organizational behavior is researched and taught. Work by Williamson [1975], Milgrom and Roberts [1992], Brickley, Smith, and Zimmerman [1997], and most recently Jensen [1998], brings economic reasoning to bear on questions of organizational structure. For example, Milgrom and Roberts emphasize efficiency at the outset of their book. Efficiency considerations determine whether firms operate using a system of transfer prices or whether they operate using quotas. Milgrom and Roberts emphasize brittleness, which is a measure of the amount by which expected profits decline when a manager has imperfect information (see p. 94). Their approach represents a clear break from the organizational behavior tradition. "Brittleness" is not what an OB scholar would make central. While economists already take this as an appropriate model of the internal workings of the firm, organizational behaviorists, with a few exceptions, have not yet signed on.

Economics has influenced empirical analyses done by sociologists in the area of organizations. Thus, two sociologists, Baron and Hannan [1994], summarize the work of sociologists who have studied promotion and incentive systems, the economic models of tournaments, internal labor markets and acquisition of human

capital, agency theory, and worker-firm matches. The fact that there is a literature to summarize attests to some influence that economics has had on this neighboring field.

Marketing has always been a field dominated by psychology, not economics. Like most of the fields that have been the target of economic imperialism, the field was not studied by economists because we have traditionally held the view that to understand marketing, it is necessary to understand taste formation. Since economists generally have been reluctant to discuss taste formation, it is not surprising that economists have not played a significant role in marketing. Nor is it obvious that economics is well suited to discussing the kinds of issues that are central to marketing. Still, economists have tried to analyze some of the more market-oriented aspects of the field, and some have gone beyond to model tastes and advertising (see Becker and Murphy [2000]). Clearly, pricing policies, bundling practices, and retail/wholesale relationships can all be informed by economics. For the most part, marketing scholars have been affected by economics primarily by encouraging sophisticated econometric analyses.

There are a number of areas in which economics has had strong impacts. Application of standard price-theoretic and game-theoretic models to marketing are summarized in Moorthy [1993], Rao [1993], and Blattberg and Neslin [1993]. They include analyses of price competition, promotions (i.e., sales), advertising competition as an arms-race phenomenon, and media scheduling as a jumping-the-gun phenomenon [Roth et al. 1994]. Finally, incentive models from personnel economics have been used to understand sales force compensation (see Coughlan [1993]). Most of these are inherently economic and are imperialistic only in the sense that individuals who studied and taught marketing would not have been willing to use these approaches twenty years ago. Nevertheless, it is noteworthy that five out of eighteen chapters in a recent handbook of marketing are devoted to economic analyses or applications thereof.

MOVEMENT ACROSS BORDERS

The impact of economics has not been confined to digging more deeply into the standard economic constructs. Economics has affected thought in other fields, most notably law, politics, and health.

Law

Half a century ago, the cornerstones for the field of law and economics were being laid at the University of Chicago's Law School. An early pioneer, Aaron Director, set much of the tone for the work that followed. Again, the familiar themes were present. Maximizing behavior, equilibrium, and efficiency all played a role. The most celebrated result in all of law and economics is the Coase theorem [Coase 1960], which is a powerful use of the concept of efficiency. The Coase theorem states that in the absence of transactions costs, the allocation of resources will be unaffected by the assignment of property rights. Although the distribution of income is affected, the nature of production is not. When there are no transaction costs, the welfare-maximizing allocation is obtained.

The Coase theorem is perhaps the best example of the old saw that important results are first claimed to be incorrect and then asserted to be obvious. The various interpretations of the Coase theorem provided a number of useful directions for economics to follow. Because the result is so profound, many concluded that one interpretation of the theorem is that transactions costs must be very important because the allocation of resources does seem to be affected by property rights. Many economists have built their careers thinking about the impact of transactions costs on economic behavior.²⁴

More important is that legal scholars have been influenced by the Coase theorem. The focus of the work by Richard Posner [1972], Frank Easterbrook and Daniel Fischel [1991], and Richard Epstein [1985] is efficiency.²⁵ Posner especially has viewed the law as in large part attempting to bring about efficient outcomes. This was a radical concept. The idea that the law should deal with efficiency rather than "justice" was a bitter pill for legal scholars to swallow.²⁶ An example from contract law is useful.

Consider a woman who signs a contract with a builder to have a new house constructed. She agrees to pay him x at the time of completion. After signing the contract, the builder is presented with an alternative that has value z to him. The builder breaches his contract with the woman and accepts the alternative. The woman who retained the builder initially can have the house

24. Williamson [1999] is a well-respected case in point.

25. Actually, Epstein [1985] questions whether efficiency is sufficient or whether the law should take into account implementability.

26. See Kaplow and Shavell [1998] for an argument that efficiency is the only reasonable definition of justice.

constructed by another builder, but at a cost of $y > x$. The house is actually worth $v \geq x$ to the woman. How much should the builder who breached the contract be required to pay? One obvious choice is to order the contract violator to pay the difference between replacement cost and contract price, i.e., to pay of $y - x$. Another choice is to order him to pay the difference between the value to the buyer and contract price, i.e., a payment of $v - x$.

The economically efficient solution is to require the builder to pay $v - x$ in compensatory damages. The fact that the builder accepted the alternative tells us that $z > x$. But efficiency requires that the builder turn down the alternative unless $z > v$ because social value is maximized by having the builder spend his time in the highest valued use. If the builder is required to pay $y - x$ in damages, he will breach the contract if and only if

$$z - (y - x) > x$$

because he receives z , but pays $(y - x)$ for a breach. If he honors the contract, he receives x . This simplifies to breaching if and only if

$$(1) \quad z > y.$$

If, instead, the builder is required to pay $v - x$, then he will breach if and only if

$$z - (v - x) > x$$

or if

$$(2) \quad z > v.$$

Expression (2) guarantees efficiency. Expression (1) does not. Specifically, there might be situations where the cost of having the house built by another builder far exceeds its value to the woman. Consider the situation where $y > z > v$. Rule (1) would cause the builder to honor his contract with the woman when a breach would actually be efficient. Because $y > z$, the builder honors the contract. But this is inefficient since $z > v$. The value of the alternative use of the builder's time exceeds the value to the woman of having the house built. Forcing the builder to pay only the difference between the value to the buyer and the agreed-upon price is tantamount to requiring (2), which simply states the efficiency criterion. This is always the correct rule.

The law requires reimbursement for damages, not for replace-

ment cost.²⁷ Reasonableness rules are consistent with this. The prohibition of requiring specific performance under most circumstances is an example of efficiency in this context. Take an extreme case where there is no alternative builder who could build the house. Thus, y is infinite. The court could not require infinite payment in damages, but it could compel the builder to honor the contract. This would amount to specific performance, which is prohibited in labor contracts. Instead, the contractor would be responsible for damages, equal to the difference between the value to the woman of the house and the negotiated price.

Ironically, the Coase theorem taken to its logical conclusion implies that the court's damages rule should not affect efficiency. Even when the builder is required to pay $y - x$ in damages, an efficient breach can occur. The woman knows that the builder will not breach when damages are $y - x$. But she can agree to permit the breach at some price greater than $v - x$ but less than $z - x$. As long as $z > v$, which is the condition for efficiency, a deal of this sort can be struck. Thus, even if the court adopts an inefficient rule, the Coase theorem implies that it will have no effect on efficiency absent transactions costs. The key is the phrase "absent transactions costs." The existence of courts may be evidence that transactions costs are positive and substantial. Alternatively, they may merely reflect the attempt by the various parties to affect the distribution of rents, independent of the allocation of resources.

A natural outgrowth of the interest in law is an interest in incentives that are created by the law. In particular, deterrence associated with penalties for committing crimes is a primary goal of any punishment system. How large is the deterrent effect that is associated with any particular penalty? Becker [1968] modeled deterrence in an expected cost framework. The key insight is that the criminal cares about the expected penalty, defined as the product of the size of the penalty and the probability of having the penalty imposed.²⁸ This simple point provided strong normative

27. Sometimes damages are equal to replacement cost. This occurs when $x < y < v < z$. In this situation, the house can be built by a third party at a cost less than the woman's value of the house. Efficiency requires that the woman accept the offer to build at cost less than v . Efficiency also requires that the original contractor take his alternative because z exceeds v . Thus, the general rule should be that the penalty for a breach should be equal to the smaller of replacement cost or the value of the house to the contracting party.

28. It is actually the change in the probability as a function of committing the crime that is relevant. If a court system imposes high penalties randomly, then the penalty has no deterrent effect at all. Deterrence comes from the change in the expected penalty associated with committing a crime.

implications. Since detection is imperfect, it is necessary to overpenalize the convicted. Having the penalty fit the crime results in too little deterrence if this is interpreted to mean that the penalty be equal to the damages caused. Efficiency requires that the penalty should be inflated by the reciprocal of the probability of conviction.²⁹

This framework was used in a number of empirical studies to determine the effect of various policies on deterrence. Among the best known and most controversial is the analysis by Ehrlich [1975] of the effect of the death penalty on murder rates. Ehrlich found strong deterrent effects, and this evidence has been used to bolster the case for capital punishment.

Economists gained insight into deterrent effects by assuming rationality. Even criminal behavior, which many believe to be inherently irrational, was modeled as a rational process where individuals maximize utility and take punishment into account in a rational way. Pushing the notion that individuals maximize utility provided guidance, rigor, and specificity that was lacking in other disciplines' approach to analysis of criminal behavior.

The economists' approach to the law has indirect spillovers. I have argued that etiquette is simply a way by which society enforces rules that lead to efficient behavior as an extension of the notion that the law promotes efficiency [Lazear 1993]. Etiquette is law where custom substitutes for courts. For example, etiquette dictates that a young person give his seat to an older one on a crowded bus. This is efficient because the gains from sitting to the older person exceed the costs of standing to the younger one. In poor societies, etiquette dictates that working men eat first and children receive what is left. This is not the general pattern in wealthier societies. When a family is close to subsistence, investing calories in working men may be the best way to ensure the family's survival. In wealthy societies, investments in children and women may be more efficient.

Another example relates to professional etiquette. Orr [1993] states that it is poor department etiquette to dump committee work on junior faculty. This is consistent with efficiency since

29. There are some complications to this simple rule. A risk-averse society may not want such a severe penalty rule when there is some probability of convicting an innocent person. Furthermore, since it is marginal considerations that are important, imposing too large a penalty for small crimes reduces the deterrence for larger crimes. For example, if the penalty for stealing a loaf of bread is execution, then the thief might be attempted to kill a policeman to escape because the penalty for murder is no worse.

comparative advantage in committee work rests with senior, not junior faculty. Finally, law journals allow simultaneous submission of papers. Economics journals require that a paper be submitted exclusively to one journal at a time. Law articles are refereed by students who view the task as education. Economics articles are refereed by more senior scholars, whose time is more valuable. The differences in etiquette across fields can be explained by efficiency.³⁰ Thus, economists may even have an impact on Miss Manners.

The influence of economics on legal scholarship has been substantial. Landes and Posner [1992] document its growth over the 1980s. By counting citations to particular economists associated with law and economics, they find that citations in law journals increased from 283 between 1976 and 1980 to 2227 between 1986 and 1990.

Political Economy

It has never been much of stretch between economics and politics. Historians, political scientists, and economists alike have believed that economics can exert a strong influence on politics, both at the national and international levels. This connection, however, has nothing to do with economic imperialism. Economic imperialism in the realm of political economy consists of the use of economic methods to understand political processes. In earlier times, the two were inseparable. The Mercantilists, Physiocrats, and Adam Smith focused much of their attention on the relation of economics to politics. Modern economists have returned to some of the same themes, but in a somewhat different way. Two early works in this area are Schelling's [1960] *The Strategy of Conflict* and Buchanan and Tullock's [1962] *The Calculus of Consent*.

Schelling uses early game theory to analyze the interaction between political entities. Much of the work considers international relations. Key is that Schelling emphasizes rational choice based on maximization. Schelling writes, "Threats and responses to threats, reprisals and counter-reprisals, limited war, arms races, brinkmanship, surprise attack, trusting and cheating can usefully be viewed as either hot-headed or cool-headed activi-

30. Some less important rules of etiquette seem to reflect multiple equilibria. For example, who goes first (women before men, age before beauty) is a convention that is useful, but arbitrary. Since there are no strong efficiency impacts of one versus another, they tend to vary over time and across societies.

ties. . . . [It is] asserted that the assumption of rational behavior is a productive one in the generation of a systematic theory" [p. 16].

He makes the radical statement that "Hitler, the French Parliament, . . . Khrushchev" can be modeled as behaving in a maximizing way [p. 17]. In addition to pushing the notion that maximizing behavior can be used to understand political interactions, Schelling puts forth a variety of ideas that show up later in the game theory literature. Perhaps most important is Schelling's well-known point about there being strength in weakness. This early version of pointing out that it is helpful to be able to commit to a particular strategy has many applications in political economy. For example, a country can prevent surprise attacks by publicizing the existence of a device that automatically launches full-scale nuclear retaliation at the first sign of attack. A potential aggressor who knows this would not benefit from attempting an early strike.

Issues of voting rules and constitutionality appeared early in Arrow [1951b] who proved the well-known impossibility theorem and Downs [1957], who modeled the median voter. Buchanan and Tullock opened a large area of research by arguing that standard economic tools could be used to understand political processes. Individuals and groups act in their self-interest using the political process to further their own goals. Buchanan and Tullock employ economics to construct a general theory of constitutions, to discuss the impact of majority rules, rules of unanimity, different legislative structures, and the optimal size of government.³¹ Their approach has paramount in it questions of efficiency. When side payments can eliminate an inefficient outcome, they ask whether a political system will impede such side payments.

Rent-seeking activities that are socially unproductive, but privately beneficial, are common in a system where some agents can gain at the expense of others by a political system that favors their goals. Theories of regulation and government capture, presented by Stigler [1971], are extensions of the Buchanan and Tullock approach to rational action in a political environment.

Modern political scientists use economic tools and game-theoretic constructs as well as the logic of maximization, efficiency, and equilibrium to analyze political situations. Much builds on the work of Downs and the importance of the median

31. They argue that governments should be small for two reasons. First, this allows for more competition between entities. Second, smaller jurisdictions can cater more specifically to the interests of their residents. Only when externalities are sufficiently large should the size of the governmental unit be expanded.

voter, but the main point is that the literature assumes a self-motivated, rational, maximizing voter. John Ferejohn and Morris Fiorina [1974], two distinguished political scientists, consider strategic interaction among agents and other decisions rules to explain why a rational individual votes. Their approach is economic. Costs and benefits are weighed. The controversy in this literature is over what are the appropriate ways to treat uncertainty, not over whether the individual is a maximizer. Additionally, the analyses, of which this is an early example, use the economist's definition of equilibrium, usually in the sense of Nash.

The literature considers policies efficient which are defined as those that benefit one group by more than others are penalized, i.e., Pareto optimality. Some models have Congress playing a game against a president who has the power of veto by presenting him with a bill that he does not necessarily prefer, but one that he likes better than the alternative of no bill at all. Here, as in Schelling's early work, the ability to commit to consider no other bills after a veto strengthens the hand of Congress. Compensation and incentive theory finds its way into the literature as well. For example, Ferejohn [1986] models a representative's behavior who seeks the reward of votes. Voters cast their votes on the basis of the representative's performance, and the reward structure and incentive analysis resemble the tournaments of personnel economics, where output is only imperfectly observed.

Economics has permeated international affairs. In Bueno de Mesquita [1985] and Altfeld and Bueno de Mesquita [1979], choices of sides and strategies in war are modeled as the outcome of rational, maximizing behavior. Once again, equilibrium in the economic sense is incorporated into the analysis. Not only are theories developed, but the predictions are tested and confirmed using the historical record.

Health Economics

Part of health economics can be viewed as an extension of the theory of the firm. Education is one way to affect the quality of labor. Investing in health is another. Accounting for about 15 percent of GDP, the health industry is an extremely important part of our economy.

Most health issues do not revolve around improving the quality of labor. Medicine is interesting to economists not only because it is an important industry and not only because it affects labor quality, but also because many people view health care as

inherently different from other goods or services. Early work by Fuchs [1974] and Feldstein [1971] changed this view among economists. Fuchs, in particular, had a significant effect on academic physicians and those who study health administration.

Fuchs's book made clear to those in the health industry that trade-offs are as important in medicine as they are in any other arena. Health care is an economic good, that is, a scarce resource that cannot be provided to everyone. Part of what made this palatable was that Fuchs cast much of the discussion in terms of production trade-offs. For example, a hospital with limited resources must choose between another kidney dialysis machine and some orthopedic device. In the absence of economic reasoning, one might reason that the kidney machine is more essential because it is life-saving, whereas the orthopedic device simply makes life more pleasant for someone. Yet almost all hospitals choose to have some of both, implicitly trading off a life-saving device for one that may seem less important. Just as in diamond-water paradox, people value diamonds more highly on the margin than they do water even though water is life-sustaining and diamonds are mere ornaments. Economics makes clear the difference between the value of the first unit and of marginal units. At some point, kidney dialysis machines are sufficiently abundant in a particular hospital that it pays to spend marginal dollars on orthopedic equipment because the additional kidney machine has lower value than the first orthopedic device.

The implications are even more dramatic in other situations. The decision to spend money on a heart-lung machine rather than on equipment that makes possible chemotherapy for leukemia patients might favor older individuals over children. Money spent on breast cancer instead of prostate research favors women over men. Money spent on health care over homeless shelters favors the middle class over the poor. Such trade-offs, obvious and natural to economists, were anathema to those in health care.

Economics plays a role in current thinking on incentives and reimbursement. Much of this comes from the relatively new area of personnel economics. Reimbursement systems that pay doctors a fixed amount for a given illness (the diagnostic related group or "DRG" system) tend to encourage cost saving, but lower the quality of treatment. Systems that reimburse for costs tend to induce more than the optimal quality of care, with excessive testing and treatment. There is nothing unique to medicine. This is a direct application of standard contracting theory, where

distinctions are made between payment on input and payment on output. When a builder is given a fixed-price contract, he wants to cut corners and reduce quality. When he is paid on a cost-plus basis, he tends to spend too much on the job and does not concern himself enough with efficiency.

The impact of economics in this field, particularly the focus on rational behavior, has been profound. The concept of opportunity cost is now explicit in medical decisions. Many major medical schools and schools of public health have economists on their staffs. Economists publish in medical journals,³² and there is widespread recognition that economics can be of assistance in thinking about the allocation of resources, of pricing, and of reimbursement algorithms.

Other Targets

One of the more unusual applications of economics derives from Sherwin Rosen's [1974] work on valuing attributes. Rosen showed that nonmonetary attributes of a good, service, or job could be valued by looking at market trade-offs. Rosen argued that this idea could be used to estimate the value of a life. In Thaler and Rosen [1976] the notion that workers are willing to give up something to work in a less dangerous environment is used to estimate the value that workers attach to their own lives. The logic is that if a job that has no danger associated with it whatsoever has a lifetime wage of say, \$2,500,000, and one that has a 1/100 probability of death pays a lifetime wage of \$2,550,000, then the marginal worker views a 1/100 chance of death as being worth \$50,000. If marginal utility equals average utility, then the value of life would be estimated to be 100 times \$50,000, or \$5 million. Even under less stringent assumptions, lower (or upper) bounds can be placed on the value of a life. The method has been used in the medical literature to determine whether a particular procedure is worthwhile (see Kessler and McClellan [1996]), in determining whether a particular piece of military hardware is cost effective, and in court cases involving damages in a loss of life situation.

In another unusual application, economics has begun to venture into linguistics. The jumping-off point is the notion that language can be thought of as a standard (see, for example,

32. See, for example, Sicherman, Bombard, and Rappoport [1995] on when to use amniocentesis testing.

Church and King [1993]). Like all standards, other things equal, it is better if all conform to one standard. This idea has been used to model cultural assimilation and the equilibrium distribution of languages across a region (see Lazear [1999] and John and Yi [1995]. In my own model, I argue that the main purpose of language is to facilitate trade, broadly defined. Thus, the incentives to learn another language are greater when the language in question is used by a large portion of the population. It is for this reason that minorities are more likely to learn the majority language than are majorities to learn the minority language. The empirical findings are extremely strong. Using the 1900 and 1990 U. S. Federal Population Census, it is found that individuals who live in ghettos with many others from their native land are much less likely to be fluent in English than those who live in communities in which they are a smaller minority. The approach is then used to examine the equilibrium that occurs in countries under a variety of circumstances. Minority languages tend to disappear over time. Countries made up of many equal-size minorities are likely to adopt one language (often an outside one) as the standard. Chauvinism, where a society forces immigrants and minority members to learn the majority language, may be socially optimal because the gains to the community as a whole in increased trade swamp the costs borne by minority individuals. Finally, ghettos are a natural outgrowth of the attempt to increase trade by associating with those who share a language or culture and need not result from constraints imposed by others.

The emphasis in this literature is on the three key economic ingredients. Individuals learn language as a rational choice. They do this taking into account the resulting equilibrium and that the equilibrium reflects the actions of optimizing agents. Finally, societies may attempt to impose rules, taxes, or subsidies to eliminate inefficient outcomes in language choice and assimilation speed.

BARBARIANS AT THE GATE

It would not be fair to discuss economic imperialism without also mentioning the effect that other fields, most notably and recently psychology, have had on economics. This comes in two forms. Because much of psychology is empirical, based on laboratory experiments where economic theories can be tested in a controlled environment, findings by psychologists are sometimes

of interest or worse, a source of embarrassment to economists (see, for example, the work of Tversky and Kahneman [1990]). There have been two approaches to the anomalies to which outsiders call our attention. The first is to incorporate them into economic models. This approach, best exemplified by Akerlof's [1982] work, which takes concepts from psychology and imbeds them in an economic model.³³ These models retain all of the essential ingredients of economic analysis. They continue to assume a maximizing individual, albeit one with a perhaps unorthodox utility function. They also maintain the central role of equilibrium in the analysis. The approach is economic, but economics informed by psychology.

Another approach attributed to those who study behavioral economics does not accept the economic framework. Rather, results from other fields are used to tweak the noses of economists for being so naive and using abstractions that do not fit the data. Camerer et al. [1997] is an example of this type of analysis. Rather than relying on maximizing behavior, equilibrium, and efficiency, this work attempts to show that the standard models are at odds with the data. They are often presented as puzzles.

Although puzzles and anomalies are useful because they provoke thought, they are best thought of as starting points rather than conclusions. Most economists who have done empirical research find that they encounter many puzzles along the way. The goal of the scholar is to make sense of the data, to reconcile the puzzles, and if completely successful, to bring them into a general framework that allows predictions to be made. Success is defined by enhanced understanding, not by increased confusion. To the extent that the anomalous results lead to improved analyses and better models, they are indeed worthwhile. This does not imply that the economist should adopt the methodology of other fields. It is the obsession with theories that are consistent, rational, and unifying that gives economics its power.

An example of the difference between the way economists and psychologists think about a problem is instructive. Psychologists have been studying utility functions and trying to specify what they actually look like. One case involves perceptions about living in California. Despite the common perception that living in California is pleasant, Schkade and Kahneman [1998] find that Californians are no happier, as measured by their responses to a

33. See, for example, Akerlof [1982] and Akerlof and Dickens [1982] Thaler and Sheffrin [1981] might also fit into this category.

particular survey, than are non-Californians. They view this as being somewhat anomalous. Perhaps, but an economist would think of this in a different way. Because we focus on equilibrium, we would argue that the marginal person in Chicago can be no less happy than the marginal person in California. Geographic sorting on the basis of local characteristics is the essence of the point made by Tiebout [1956]. Free mobility ensures that happiness is equated for the marginal individual. If everyone had the same tastes, then land prices or other attributes of the communities would change such that in equilibrium, everyone would view the communities as producing equal satisfaction. If tastes differ, then the marginal individual is indifferent, and all others are happier in their current location. Economic models try to make sense out of nonsense. Sometimes, they abstract away from the essence of the problem. But the better analyses provide insight where there was confusion.

CONCLUSION

Economics has been successful because, above all, economics is a science. The discipline emphasizes rational behavior, maximization, trade-offs, and substitution, and insists on models that result in equilibrium. Economists are pushed to further inquiry because they understand the concept of efficiency. Inefficient equilibria beg for explanation and suggest that there may be gaps in the underlying models that created them.

Because economics focuses so intently on maximization, equilibrium, and efficiency, the field has derived many implications that are testable, refutable, and frequently supported by the data. The goal of economic theory is to unify thought and to provide a language that can be used to understand a variety of social phenomena. The most successful economic imperialists have used the theory to shed light on questions that lie far outside those considered traditional. The fact that there have been so many successful efforts in so many different directions attests to the power of economics.

UNIVERSITY OF CHICAGO

REFERENCES

- Akerlof, George, "Labor Contracts as Partial Gift Exchange," *Quarterly Journal of Economics*, XCVII (November 1982), 543-569.

- Akerlof, George, and William Dickens, "Economic Consequences of Cognitive Dissonance," *American Economic Review*, LXXII (1982), 307–319.
- Altfeld, Michael F., and Bruce Bueno de Mesquita, "Choosing Sides in War," *International Studies Quarterly*, XXIII (March 1979), 87–112.
- Arrow, Kenneth, "An Extension of the Basic Theorems of Classical Welfare Economics," in J. Newman, ed., *Proceedings of the Second Berkeley Symposium on Mathematical Statistics and Probability* (Berkeley: University of California Press, 1951), pp. 507–532.
- , *Social Choice and Individual Values* (New York: John Wiley & Sons, 1951).
- Auerbach, Alan J., and Laurence J. Kotlikoff, *Dynamic Fiscal Policy* (Cambridge: Cambridge University Press, 1987).
- Azzi, Corry, and Ronald Ehrenberg, "Household Allocation of Time and Church Attendance," *Journal of Political Economy*, LXXXIII (February 1975), 27–56.
- Baron, James N., and Michael T. Hannan, "The Impact of Economics on Contemporary Sociology," *Journal of Economic Literature*, XXXII (September 1994), 1111–1146.
- Barro, Robert J., "Are Government Bonds Net Wealth?" *Journal of Political Economy*, LXXXII (November/December 1974), 1095–1117.
- Beaver, William, "The Information Content of Annual Earnings Announcements," *Journal of Accounting Research*, Empirical Research in Accounting: Selected Studies, Supplement to Volume VI (1968), 67–72.
- Becker, Gary S., *The Economics of Discrimination* (Chicago: University of Chicago Press, 1957).
- , "Underinvestment in Education?" *American Economic Review*, L (May, 1960a), 346–354.
- , "An Economic Analysis of Fertility," in Universities—National Bureau Committee for Economic Research, *Demographic and Economic Change in Developed Countries* (Princeton: Princeton University Press, 1960b), pp. 209–231.
- , "Investment in Human Capital: A Theoretical Analysis," *Journal of Political Economy*, LXX (October 1962), 9–49.
- , "A Theory of the Allocation of Time," *Economic Journal*, LXXV (September 1965), 493–517.
- , "Crime and Punishment: An Economic Approach," *Journal of Political Economy*, LXXVI (March–April 1968), 169–217.
- , *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, 2d ed. (New York: Columbia University Press for National Bureau of Economic Research, 1975).
- , "A Note on Restaurant Pricing and Other Examples of Social Influences on Price," *Journal of Political Economy*, XCIX (October 1991a), 1109–1116.
- , *A Treatise on the Family*, enlarged edition (Cambridge: Harvard University Press, 1991b).
- Becker, Gary S., Elisabeth Landes, and Robert Michael, "An Economic Analysis of Marital Instability," *Journal of Political Economy*, LXXXV (December 1977), 1141–1187.
- Becker, Gary S., and Kevin M. Murphy, *Social Markets* (Cambridge: Harvard University Press, 2000).
- Berger, Joseph, and J. L. Snell, "On the Concept of Equal Exchange," *Behavioral Science*, II (April 1957), 111–118.
- Bergson, Abram, "A Reformulation of Certain Aspects of Welfare Economics," *Quarterly Journal of Economics*, LII (February 1938), 310–334.
- Berman, Eli, "Sect, Subsidy and Sacrifice: An Economist's View of Ultra-Orthodox Jews," Boston University, 1998.
- Bikhchandani, Sushil, David Hirshleifer, and Ivo Welch, "Theory of Fads, Fashion, Custom, and Cultural Change as Informational Cascades," *Journal of Political Economy*, C (October 1992), 992–1026.
- Blattberg, Robert C., and Scott A. Neslin, "Sales Promotion Models," in Handbooks in Operations Research and Management Science, Volume 5, *Marketing*, J. Eliashberg and G. L. Lilien, editors (Amsterdam: North-Holland, 1993), pp. 553–609.
- Brickley, James A., Clifford W. Smith, Jr., and Jerold L. Zimmerman, *Managerial Economics and Organizational Architecture* (Chicago: Irwin, 1997).

- Buchanan, James M., and Gordon Tullock, *The Calculus of Consent: Logical Foundations of Constitutional Democracy* (Ann Arbor: University of Michigan Press, 1962).
- Bueno de Mesquita, Bruce, "The War Trap Revisited: A Revised Expected Utility Model," *American Political Science Review*, LXXIX (1985), 156–177.
- Bulow, Jeremy, and Paul Klemperer, "Rational Frenzies and Crashes," *Journal of Political Economy*, CII (February 1994), 1–23.
- Camerer, Colin, Linda Babcock, George Loewenstein, and Richard Thaler, "Labor Supply of New York City Cabdrivers: One Day at a Time," *Quarterly Journal of Economics*, CXII (May 1997), 407–441.
- Church, J., and I. King, "Bilingualism and Network Externalities," *Canadian Journal of Economics*, XXVI (1993), 337–345.
- Coase, R., "The Problem of Social Cost," *Journal of Law and Economics* (October 1960), 1–44.
- Coughlan, Anne T., "Salesforce Compensation: A Review of MS/OR Advances," in *Handbooks in Operations Research and Management Science*, Volume 5, *Marketing*, J. Eliashberg and G. L. Lilien, editors (Amsterdam: North-Holland, 1993), pp. 611–651.
- Debreu, Gerard, *The Coefficient of Resource Utilization* (Chicago: University of Chicago Press, 1951).
- DiPasquale, Denise, and Edward L. Glaeser, "The Los Angeles Riot and the Economics of Urban Unrest," *Journal of Urban Economics*, XLIII (January 1998), 52–78.
- Downs, Anthony, *An Economic Theory of Democracy* (New York: Harper & Row, 1957).
- Easterbrook, Frank H., and Daniel R. Fischel, *The Economic Structure of Corporate Law* (Cambridge, MA: Harvard University Press, 1991).
- Ehrlich, Isaac, "The Deterrent Effect of Capital Punishment: A Question of Life and Death," *American Economic Review*, LXV (June 1975), 397–417.
- Epstein, Richard Allen, *Takings: Private Property and the Power of Eminent Domain* (Cambridge, MA: Harvard University Press, 1985).
- Fama, Eugene F. "Efficient Capital Markets: A Review of Theory and Empirical Work," *Journal of Finance*, XXV (May 1970), 383–417.
- Feldstein, Martin S. "An Econometric Model of the Medicare System," *Quarterly Journal of Economics*, LXXXV (February 1971), 1–20.
- Ferejohn, John, "Incumbent Performance and Electoral Control," *Public Choice*, L (1986), 5–25.
- Ferejohn, John, and Morris Fiorina, "The Paradox of Not Voting: A Decision Theoretic Analysis," *American Political Science Review*, LXVIII (1974), 525–536.
- Fisher, Irving, *The Theory of Interest* (New York: Macmillan, 1930).
- Freeman, Richard B. *The Market for College-Trained Manpower: A Study in the Economics of Career Choice* (Cambridge, MA: Harvard University Press, 1971).
- Friedman, Milton, *Essays in Positive Economics* (Chicago: University of Chicago Press, 1953).
- Friedman, M., and S. Kuznets. *Income from Independent Professional Practice* (New York: NBER, 1945).
- Fuchs, Victor R., *Who Shall Live?* (New York: Basic Books, 1974).
- Horngren, Charles T., Gary L. Sundem, and John A. Elliott, *Introduction to Financial Accounting*, 7th edition (Upper Saddle River, NJ: Prentice-Hall, 1999).
- Hotelling, Harold, "The General Welfare in Relation to Problems of Taxation and of Railway and Utility Rates," *Econometrica*, VI (July 1938), 242–269.
- Iannaccone, Laurence R., "Sacrifice and Stigma: Reducing Free-Riding in Cults, Communes, and Other Collectives," *Journal of Political Economy*, C (April 1992), 271–291.
- Jenkin, Fleming, "The Graphic Representation of the Laws of Supply and Demand, and Other Essays on Political Economy," London: London School of Economics and Political Science 1931. [No 9 in series of reprints of scarce tracts in Economics and Political Science].
- Jensen, Michael C., *Foundations of Organizational Strategy* (Cambridge, MA: Harvard University Press, 1998).

- John, Andrew, and Kei-Mu Yi, "Language, Learning and Location," unpublished manuscript, University of Virginia, 1995.
- Jovanovic, Boyan, "Firm-Specific Capital and Turnover," *Journal of Political Economy*, LXXXVI (December 1979), 1246–1260.
- Kandel, Eugene, and Edward P. Lazear, "Peer Pressure and Partnerships," *Journal of Political Economy*, C (August 1992), 801–817.
- Kaplow, Louis, and Steven Shavell, "Fairness versus Welfare Economics in Normative Analysis of Law," Harvard Law School, 1998.
- Kessler, Daniel, and Mark McClellan, "Do Doctors Practice Defensive Medicine?" *Quarterly Journal of Economics* CXI (1996), 353–390.
- Kiger, Joseph, *American Learned Societies* (Washington, DC: Public Affairs Press, 1963).
- Lambert, Richard A., David F. Larcker, and Robert E. Verrecchia, "Portfolio Considerations in Valuing Executive Compensation," *Journal of Accounting Research*, XXIX (Spring 1991), 129–149.
- Landes, William M., and Richard A. Posner, "The Influence of Economics on Law: A Quantitative Study," University of Chicago Law School John M. Olin Program in Law & Economics Working Papers, 1992.
- Lazear, Edward P., "Discussion: The Economics of Professional Etiquette," *American Economic Review*, LXXXIII (2) (May 1993), 44.
- , *Personnel Economics* (Cambridge, MA: MIT Press, 1995).
- , *Personnel Economics for Managers* (New York: John Wiley & Sons, 1998).
- , "Culture and Language," *Journal of Political Economy*, CVII (December 1999), S95–S126.
- Malthus, Thomas Robert, *An Essay on the Principle of Population* (London: Ward Lock 1890).
- Markowitz, Harry, "Portfolio Selection," *Journal of Finance*, VII (March 1952), 77–79.
- Marshall, Alfred, *Principles of Economics*, 9th (variorum) edition, with annotations by C. W. Guillebaud. (London, New York: Macmillan for the Royal Economic Society, 1961 [first edition 1890]).
- Milgrom, Paul, and D. John Roberts, *Economics, Organization and Management* (Englewood Cliffs, NJ: Prentice-Hall, 1992).
- Milkovich, George T., and John W. Boudreau, *Personnel / Human Resource Management*, 5th edition (Plano, TX: Business Publications, Inc., 1988).
- Mincer, Jacob, "Investment in Human Capital and Personal Distribution of Income," *Journal of Political Economy*, LXVI (August 1958), 281–302.
- Mincer, Jacob, and Boyan Jovanovic, "Labor Mobility and Wages," in *Studies in Labor Markets*, Sherwin Rosen, ed. (Chicago: University of Chicago Press for NBER, 1981), pp. 21–64.
- Modigliani, Franco, and Merton H. Miller, "The Cost of Capital, Corporation Finance and the Theory of Investment," *American Economic Review*, XLVIII (June 1958), 261–297.
- Moorthy, Sridhar K., "Competitive Marketing Strategies: Game-Theoretic Models," in *Handbooks in Operations Research and Management Science*, Volume 5, *Marketing*, J. Eliashberg and G. L. Lilien, editors (Amsterdam: North-Holland, 1993), pp. 143–190.
- Myrdal, Gunnar, *An American Dilemma* (New York: Harper and Row, 1944).
- North, Douglas C., *Structure and Change in Economic History* (New York: W. W. Norton, 1981), Ch. 5, "Ideology and the Free-Rider Problem."
- Orr, Daniel, "Reflections on the Hiring of Faculty," *American Economic Review*, LXXXIII (May 1993), 39–43.
- Porter, Michael, *Competitive Strategy* (New York: Free Press, 1980).
- Posner, Richard A., *Economic Analysis of Law* (Boston: Little, Brown, 1972).
- Prais, S. J., "Measuring Social Mobility," *Journal of the Royal Statistical Society*, CXVIII (1955a), 56–66.
- , "The Formal Theory of Social Mobility," *Population Studies*, IX (1955b), 72–81.
- Raditzky, G., and P. Berholz, *Economic Imperialism: The Economic Method Applied Outside the Field of Economics* (New York: Paragon, 1987).
- Rao, Vithala R., "Pricing Models in Marketing," in *Handbooks in Operations Research and Management Science*, Volume 5, *Marketing*, J. Eliashberg and G. L. Lilien, editors (Amsterdam: North-Holland, 1993), pp. 517–552.

- Reid, Margaret, *Economics of Household Production* (New York: John Wiley & Sons, 1934).
- Ridley, Matt, *The Red Queen: Sex and Evolution of Human Nature* (New York: Penguin, 1993).
- Ritter, Jay R., "The 'Hot Issue' Market of 1980," *Journal of Business*, LVII (April 1984), 215–240.
- Rosen, Sherwin, "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition," *Journal of Political Economy*, LXXXII (January/February 1974), 34–55.
- Roth, Alvin E., et al., "Jumping the Gun: Imperfections and Institutions Related to the Timing of Market Transactions," *American Economic Review*, LXXXIV (September 1994), 992–1044.
- Sah, Raaj Kumar, "Social Osmosis and Patterns of Crime," *Journal of Political Economy*, XCIX (December 1991), 1272–1295.
- Samuelson, Paul A., *Foundations of Economic Analysis* (Cambridge, MA: Harvard University Press, 1947).
- Schelling, Thomas C., *The Strategy of Conflict* (London: Oxford University Press, 1960).
- , *Micromotives and Macrobias* (New York: W. W. Norton and Company, 1978).
- Schkade, D., and Daniel Kahneman, "Does Living in California Make People Happy? A Focusing Illusion in Judgments of Life Satisfaction," *Psychological Science*, IX (1998), 340–346.
- Schultz, Theodore W., "Investment in Man: An Economist's View," *Social Service Review*, XXXIII (June, 1959), 110–117.
- , "Investment in Human Capital," *American Economic Review*, LI (December 1961), 1–17.
- , *The Economic Value of Education* (New York: Columbia University Press, 1963).
- Sharpe, William F., "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk," *Journal of Finance*, XIX (September 1964), 425–442.
- Sicherman, Nachum, Allan T. Bombard, and Peter Rappoport, "Current Maternal Age Recommendations for Prenatal Diagnosis: A Reappraisal Using Expected Utility Theory," *Fetal Diagnosis and Therapy*, X, (May–June 1995), 157–166.
- Smith, Adam, *Inquiry into the Nature and Causes of the Wealth of Nations*, original 1776 (Penguin version—Hammondsworth: Penguin, 1986).
- Stigler, George J., "The Theory of Economic Regulation," *Bell Journal of Economics*, II (Spring 1971), 3–21.
- Thaler, Richard, and Sherwin Rosen, "The Value of Saving a Life: Evidence from the Labor Market," in *Household Production and Consumption*, Nestor E. Terleckyj, ed., Studies in Income and Wealth 40 (New York: Columbia University Press for NBER, 1976).
- Thaler, Richard H., and H. M. Shefrin, "An Economic Theory of Self-Control," *Journal of Political Economy*, LXXXIX (April 1981), 392–406.
- Tiebout, Charles, "A Pure Theory of Local Expenditures," *Journal of Political Economy*, LXIX (October 1956), 416–424.
- Tversky, Amos, and Daniel Kahneman, "Anomalies: Preference Reversals," *Journal of Economic Perspectives*, IV (Spring, 1990), 201–211.
- Weber, Max, *From Max Weber: Essays in Sociology* (New York: Oxford University Press, 1946).
- , *Le Judaïsme Antique* (Paris: Plon, 1970).
- Williamson, Oliver, *Markets and Hierarchies: Analysis and Antitrust Implications*, (New York: The Free Press, 1975).
- , *The Economics of Transaction Costs*, edited by Oliver E. Williamson and Scott E. Masten, eds. (Cheltenham, UK; Northampton, MA: E. Elgar Pub., 1999).
- Wilson, E. O., *Sociobiology: The New Synthesis* (Cambridge, MA: Harvard University Press, 1975).