

**BEHAVIORAL ECONOMICS AND
INSTITUTIONAL INNOVATION**

BY

ROBERT J. SHILLER

COWLES FOUNDATION PAPER NO. 1150



**COWLES FOUNDATION FOR RESEARCH IN ECONOMICS
YALE UNIVERSITY**

Box 208281

New Haven, Connecticut 06520-8281

2006

<http://cowles.econ.yale.edu/>

Distinguished Guest Lecture

Behavioral Economics and Institutional Innovation

Robert J. Shiller*

Behavioral economics has played a fundamental role historically in innovation in economic institutions even long before behavioral economics was recognized as a discipline. Examples from history, notably that of the invention of workers' compensation, illustrate this point. Though scholarly discussion develops over decades, actual innovation tends to occur episodically, particularly at times of economic crisis. Fortunately, some of the major professional societies, the *Verein für Sozialpolitik*, the American Economic Association, and their successors, have managed to keep a broad discourse going involving a variety of research methods, including some that may be described today as behavioral economics, thereby maintaining an environment friendly to institutional innovation. Further, the broad expansion of behavioral economics that is going on today can be expected to yield even more such important institutional innovations.

JEL Classification: B41

1. Introduction

I wish to talk today about how economic research leads to fundamental innovation in our economic institutions, institutions such as our social welfare system or our financial infrastructure. This topic is really about how economic research contributes to human welfare since so much of what helps humanity in the long term from economics comes from a change in our institutions.

In this context the major theme I wish to address is the importance of behavioral economics in bringing economic ideas to successful results. Behavioral economics is really the application of methods from other social sciences—particularly psychology—to economics. Behavioral economics is central to institutional innovation because it rounds out the details, the frictions or imperfections that might make some grand idea for a new economic institution unworkable if not appropriately dealt with.

A related theme that I wish to cover is to try to say something useful about the centrality and the difficulties of the inventive process that underlies institutional innovation and its essential similarity to engineering invention. The invention of economic institutions is not unlike engineering inventions: It must deal with a multitude of problems and obstacles, including the problem that the people who must use the invention are themselves imperfect. What engineers call “human factors engineering” is

* Cowles Foundation and International Center for Finance, Yale University, 30 Hillhouse Avenue, New Haven, CT 06511, USA.

Distinguished Guest Lecture, Southern Economic Association Meetings, New Orleans, November 21, 2004.

Robert J. Shiller is the Stanley B. Resor Professor of Economics in the Department of Economics and Cowles Foundation for Research in Economics at Yale University and fellow at the International Center for Finance at the Yale School of Management. He received his B.A. from the University of Michigan and his Ph.D. in economics from the Massachusetts Institute of Technology. He has been research associate with the National Bureau of Economic Research since 1980 and is serving as vice president of the American Economic Association and president of the Eastern Economic Association.

especially important in the invention of economic institutions. As with engineering inventions, the breakthroughs, the discoveries of new economic institutions, tend to be infrequent, sudden, and dramatic. Once an invention of an economic institution is made, it tends to be copied all over the world.

In the course of considering these themes, I will also make three subsidiary points: that institutional innovation requires a motivated and enthusiastic level of scholarly discussion of economic innovation, that a sense of economic crisis may often propel such discussion, and that advances in information technology are often behind major advances in economic institutions.

Some of these themes were discussed in my 2003 book *The New Financial Order: Risk in the 21st Century*, which also included a number of proposals for new risk management institutions. But here I will focus on developing the basic ideas about institutional innovation further in the context of social insurance and with special attention to the role of behavioral economics.

In this talk I will consider a little history of thought in both fields, behavioral and institutional economics together, from the perspective of their contribution to some of our most important social welfare institutions, institutions that help people manage the risks of living. I will trace the interaction of practical policy with economic thought extending back to the beginnings of modern social welfare institutions in 19th-century Germany up to the present. The example of the invention of workers' compensation will be particularly stressed, as it affords a perfect example of the interplay between economic theory and behavioral economics in producing fundamental economic innovation. I hope this will offer some insights into the way that progress is made in economic policy through the interaction of economic thought and the experimentation of social policymakers.

2. Behavioral Economics

We divide the social sciences according to subject matter but also according to method. We might define the field of economics in terms of subject matter as the study of prices, quantities, resource allocation, and economic organization. But we might also define the field of economics as it mostly exists today as a certain *approach* to social science, an approach that is based models of rational optimization and, in particular, of individuals' maximizing an expected utility function.

Unfortunately, the division of the social sciences by subject matter does not neatly match with the division according to method. The method of modeling rational optimization is not coterminous with economics. Many other methods, including aspects of psychology, have long been used by economists; I will cover some of this later. Moreover, noneconomists often make use of the rational optimizing model. Political science has been heavily influenced by, some would say over influenced by, rational optimizing models.¹ The field of law has also had a great reliance on the rational optimizing model ever since Ronald Coase's work in the late 1950s and the founding then of the *Journal of Law and Economics*. Some would say too that the field of law was overinfluenced by the rational optimizing model.²

The study of prices, quantities, and economic organization does not completely succeed if conducted only from the paradigm of rational optimization. There is increasing recognition of this fact. A behavioral economics revolution has been taking place, a revolution that has accelerated over the past 10 or 20 years.

Herbert Simon, in his entry "Behavioral Economics" in *The New Palgrave Dictionary of*

¹ See Green and Shapiro (1994) for a critique of the application of rational optimizing models to political science.

² See Sunstein (2000).



Robert J. Shiller, Yale University,
2005 Distinguished Guest Lecturer.

Economics and Law (1998), pointed out that the term “behavioral economics” is a sort of pleonasm, for what else is economics about than a study of human behavior? How could it possibly be that all the work done in departments of psychology, sociology, and anthropology are irrelevant to economics? The discovery of behavioral economics in the past decade or two is really a return to reality from an untenable position that the rational optimizing model is the only framework for economics.

Another revolution in economics has been taking place that is not usually associated with the behavioral economics revolution, and that is the institutional economics. It becomes related when one looks at the defining characteristics of the two fields. One of the cardinal principles of behavioral economics, as enunciated by its most important exponents, Daniel Kahneman and Amos Tversky (2000), is framing, that human actions are heavily influenced by frames of reference. The institutional structure that we have is the basic framework for all our economic decisions.

All academic disciplines proceed by fits and starts, and a new paradigm, once adopted, tends to be carried too far, until earlier research assumptions are rediscovered. The exclusive reliance of many in the economic profession on the rational optimizing model was an example of carrying a model too far. Thus, we are seeing the emerging fields of what are called behavioral economics and the “new institutional economics,” which are really returns to a more balanced approach to all of economics.

One signpost of a revolution in economics is the founding of new societies and journals. The Society for the Advancement of Behavioral Economics was founded in 1982. The International Society for New Institutional Economics was founded in 1997. Other evidence can be found in the creation of new scholarly journals. The *Journal of Economic Behavior and Organization* was created in 1980. The *Journal of Economic Psychology* was created in 1981. The *Journal of Behavioral Finance* was created in 1999 (under a slightly different title at first). The *Journal of Institutional and Theoretical Economics* began in 1997 (as a transformation of an earlier German journal), and in the same year the *Review of Economic Design* appeared.

But the founding of societies and the establishment of journals does not accurately represent progress in the fields, for creative research is always directed by individual researchers, not organizations. There appears to be something to be gained by people of similar research methods coming together to talk with each other, but there is also the risk that by defining themselves as a separate group, they will lose their vitality and lose their ability to interact constructively with the profession at large.

Behavioral economics and institutional economics represent two distinct branches of economic theory that are often viewed as not central to economic theory and have gone through periods of revival and discard over the history of economic thought. Behavioral economics has long been regarded as not very successful by many in the profession, for it has not produced an elegant theoretical framework that is readily applied to a wide variety of circumstances. Institutional economics has been criticized as little more than simple storytelling about our existing economic institutions and off-the-wall proposals for the future. But, despite their frequent disparagement, these fields thrive in their ability to make institutional innovation happen.

3. Economic Crisis as an Instigator of Institutional Innovation

Economic research is a fairly steady enterprise, but major institutional innovation is not. Those who would like to see their economic theories embodied in new institutions may have to wait many years to see that happen. One reason that innovation seems so episodic is that it tends to be spurred by

major economic crises and can take place only in the rare times when the public perceives an urgent need for change.

Sometimes economic crisis can be so pressing as to bring economic innovation on even before the theorists have opined on it. An example is the 1780 invention of inflation-indexed bonds in early America, when the erosion of soldiers' pay by wartime inflation was so intense and so resented that it actually created some mutinies among American soldiers. But in such cases, the innovation, not fully worked out or justified in theory, may be abandoned as soon as the crisis is over. Inflation-indexed bonds were not issued again in the United States until 1997.³

The American Economic Association was founded by practical economists who were motivated in some measure by the industrial depression of the 1870s. A period of irrational exuberance and overbuilding of railroads after the Civil War had led to a stock market crash (the panic of 1873) and a period of massive unemployment, by far the longest contraction (from 1873 to 1879) in the National Bureau of Economic Research chronicle of business cycle dates.

The principal scholarly work of that time that dealt with the policy toward this depression was written not by a professor but by a journalist: Henry George. His 1879 book *Progress and Poverty* was long on proposals for institutional change but a little short on a factual basis in scholarship. Henry George had had only five months of secondary schooling before joining the publishing industry at age 16, and he wrote in a loose and impressionistic manner. He did have a keen appreciation of the possibility of improving welfare by changing economic institutions (in his case, to convert the tax system to a single tax on land), and his beginning was an inspiration to many.

The intense public reaction to George's proposal to solve the problem of poverty attendant on industrial depression both inspired and created hostility from academic economists. The simplicity of George's ideas repelled academic economists, but the sudden appearance of a public apparently willing to make major changes in economic institutions inspired them.

The American Economic Association was founded to provide a more scientific and scholarly approach to the same questions that George addressed. A *New York Times* article in 1886, the year after the founding of the American Economic Association in Saratoga, New York, describes the new association:

They do not mean to rest content with theoretical discussions of political science, but hope to achieve practical results. They believe that the industrial problem is the one which presses the most urgently for solution, and that while it remains unanswered there can be no security and no real progress. By careful and candid consideration of it at this stage they hope to avert catastrophes which they think must come if it is left untouched.⁴

One might compare the mission of the Southern Economic Association, founded much later, in 1927. The association was not founded at a time of economic crisis, but the *Southern Economic Journal* was, in 1933, the bottom of the greatest depression this country had ever faced. The lead article by Tipton Snavely in the first issue of the *Southern Economic Journal* describes the kind of scholarship that sets the example for this association as the works of the southerners (as well as U.S. presidents in their day): Thomas Jefferson, James Madison, and James Monroe.⁵ These people responded to a crisis (the discord between the United Kingdom and its American colonies that led to the Revolutionary War) by becoming some of the most profound inventors of economic institutions in world history: Jefferson was the author of the Declaration of Independence, and Madison was one of

³ See Shiller (2005).

⁴ "Practical Political Science," *New York Times*, 28 February 1886, p. 5.

⁵ Snavely (1933, p. 7).

the authors of the *Federalist Papers*, which set forth a theory of democratic government that shapes world institutions today, and he has been called the father of the U.S. Constitution. All three of them were interested in economics and helped guide the curricula of the southern universities that were in formation then.

Even before the founding of these associations, similar changes in response to crisis were happening in Europe. The very first national social insurance programs were instituted by the German government led by Otto von Bismarck in the 1880s. The German government created health insurance (*Krankenversicherung*) in 1883, followed by accident insurance (*Unfallversicherung*) in 1884 and old-age insurance (*Altersversicherung*) in 1889. These institutions were then copied around the world. Indeed, the Social Security institutions that we have in the United States today are very similar to those instituted in Germany in the 1880s.

The German social insurance is often described as recommended to Bismarck by his economic advisers, including Johann Karl Rodbertus and Hermann Wagener, as a response to the threat of the emerging socialist and communist movements. The 1848 Revolution, which started in Sicily and spread to France, Germany, Italy, and Austro-Hungary, had made a strong impression of the potential dangers an angry proletariat posed to the established order. The *Communist Manifesto* by Karl Marx and Friedrich Engels was written in that same year and helped launch an international communist movement. These events undoubtedly led to a motive for established governments to preempt these revolutionary movements by improving the economic lot of the poorer element of society. A social insurance system would impress on them the benevolence of their government and create public support for the state. To use Bismarck's own words, workers will think that "if the state comes to any harm, I'll lose my pension."⁶

Bismarck himself was hardly interested in social insurance and embraced the social insurance programs suggested to him because of their apparent political expedience. He did not even bother to mention the birth of social insurance in his memoirs. It appears to be the *academic* discussion of options for social welfare that laid the groundwork for the innovations, and this public discussion had aspects of recognition of modern principles of behavioral economics, that it designed social welfare institutions around these principles.

It remains to be seen whether the crisis of globalization and the pressures of the emerging economies on the United States will be sufficient to generate this kind of response.

4. Importance of Economic Discourse Generated by Crisis

There is evidence that there were some more fundamental reasons than simple political expedience for Germany's invention of social insurance in the 1880s. One of these is an inventive spirit and public discussion that led to the details of the social insurance plans.

In the 1870s and 1880s, there was widespread public and scholarly discussion of the "social question" (*soziale Frage*), no doubt at least partly in response to the communist threat. People wanted to know a moderate response to the same issues that motivated the communists. The German equivalent of the American Economic Association (*Verein für Sozialpolitik*) was founded in 1872.

In the second half of the 19th century in Germany, there were also some of the finest university economics departments in the world, where the social issues of the day were debated. At that time

⁶ Otto von Bismarck, speech of 18 June 1889, in *Sten. Berichte des Reichstags*, VII, IV, vol. 3, 1831–26, 1834, quoted in Ritter (1983, p. 35).

there was in contrast relatively little academic economics in the United States. In a review of U.S. economic literature, Charles F. Dunbar was struck by the “general sterility of American thought on this subject, and the failure of our scholars as well as statesmen to contribute their share in the progress made by the world.”⁷ The economists the United States did have near the end of the 19th century tended to be products of German universities. Historian Daniel Rodgers notes,

Of initial 6 officers of the American Economic Association in 1885, 5 had studied in Germany, of its first 26 presidents, at least 20 had done so. In 1906, when Yale’s Henry Farnum polled what he took to be the 116 leading economists and social scientists in the US and Canada, 59 had spent a student year or more in Germany.⁸

The American Economic Association in its early years was actually often described as an exponent of German economics. The person most responsible for founding the American Economic Association, Richard T. Ely, felt that the parallel between the American Economic Association had become so strong that it needed to be corrected:

Dr. Ely also maintained that the proposed association ought in no sense to be regarded as a German movement, as some had intimated. Nothing about it was more marked than its American character. It had sprung up almost spontaneously to answer to felt needs. Doubtless many present had studied in Germany and were grateful for what they had learned in the German universities; but nothing was more foreign to their purposes than to import Germany into America.⁹

The German economics departments were much involved in advancing social causes, and their relative advantage in understanding economic theory was a critical factor making possible the creation of social insurance.

Germany in the late 19th century was also the country most on the move in terms of scientific research. Germany invented then the modern concept of a graduate school where doctoral students would work with professors on fundamental research. Germany, in the 1870s, invented the modern concept of an in-house research laboratory within a corporation, an invention of a way of inventing that was later widely copied in other countries.¹⁰ While these in-house departments were probably not the venue for most discussions of social insurance, the kind of intellectual environment they represented apparently carried forward in many directions in German society. In many ways the vitality of our economics profession today has to do with copying educational institutions from Germany.

5. Information Technology

The other cause of the creation of national social insurance in the 1880s is a number of inventions in information technology, in the information infrastructure, that made much more feasible the ambitious social insurance plans. Some of the 19th-century innovations were the invention of cheap paper, of preprinted forms in books with carbon paper between them, of typewriters, and of vertical filing cabinets. We are not talking about computers here but instead about the simple methods of keeping track of people, maintaining their records, and following a social insurance program methodically.

⁷ Dunbar (1876, p. 146).

⁸ Rodgers (1998, p. 86).

⁹ “Discussion of the Platform at Saratoga” (1886, p. 24).

¹⁰ See Mowery and Nathan Rosenberg (1998).

In Germany, notably, an efficient government bureaucracy stood out; its system of management as well as professionalism among its employees was already an example for the entire world by the 1880s. Germany was an example of government professionalism for the entire world.

The 19th century also saw the development of the first modern and efficient postal services. The cost of mailing a letter declined sharply, and post offices proliferated into every town and village. The German postal service was one of the most advanced, and it became a financial conduit through postal savings. The postal service became the information infrastructure for the age, the Internet of the 19th century, so to speak.

The kind of economic innovation that was seen in Germany in the 1880s would probably not have been possible in earlier centuries: The cost of accurate record keeping, record transmittal, and funds transfer would have been prohibitive then.

6. The Origin of Social Insurance: Workers' Compensation as an Invention

Workers' compensation is a good example of a radical invention in social welfare since in most countries, including the United States, it was historically the first major government social insurance scheme to be put in place. In fact, according to Arthur Williams, who did an extensive study of workers' compensation around the world, workers' compensation was the first social insurance program for 106 of 136 countries.¹¹ It was the first because it, as an invention, had a clear logic and functioning and thus stood to be copied.

Workers' compensation (workman's compensation) is the U.S. version of the German accident insurance, a government-mandated accident, disability, and life insurance program that applies only to work-related events: work-related injuries, illnesses, and deaths. After workers' compensation began in Germany in 1884, it was copied by Poland in the same year, and by 1900 it had spread to 11 countries.¹² By 1988, all but five of 141 countries had some form of workers' compensation. Even the Soviet Union, with a very different ideology from the countries where workers' compensation began, adopted a workers' compensation that was not fundamentally different.

Workers' compensation is an institution that reduces risks to livelihoods but deals only with a subset of risks, the risks that are work related. One naturally wonders what is the essence of the idea that has been so widely copied. One wonders why work-related injuries should be given a separate program from a general welfare program and why the programs stop short of dealing with the bigger issues of lifetime income risk management.

In the United States, after the turn of the 20th century, the workers' compensation cause was led by economists Richard T. Ely and John R. Commons, both professors at the University of Wisconsin and founders of the American Economics Association. At that time, the U.S. federal government was not considered the proper authority for social welfare institutions, and so the idea had to be sold individually to each of the state governments. Wisconsin and New York led the way by adopting workers' compensation in 1911. By 1920, all but six states had adopted it, and by 1948 all states had.¹³

We must try to understand the essence of this institution in order to appreciate the reasons for its near universality. It is a sort of "invention" that has an internal logic and substance, so that its spread

¹¹ Williams (1991, p. 1).

¹² Williams (1991, p. 1).

¹³ Williams (1991) points out that the administration of workers' compensation by local governments is an anomaly by world standards; only the United States, Canada, and Australia have a local administration of workers' compensation.

is not unlike the spread of technology in other areas. It allows a kind of risk management that had not been possible before. The elements of the invention, in its original 1884 form in Germany as well as many successor versions, are several. The 1884 law set up new mutual associations for each industry in Germany and for large industries several mutual associations. The law also set up a government-financed imperial office (in Berlin) that regulated these associations. The law specified that firms were required to pay an assessment to their respective mutual association, from which compensation for workers' claims would be made. A definition of events that are presumed to be work related was drawn up to be the basis of claims. Claims would be automatically paid if the event satisfied the definition, whether or not there was fault on the part of the employer.

The workers' compensation system replaced an older model in which employees' only recourse when they were injured at work was to sue their employer. The old system seemed to work very poorly for a number of reasons. In many injuries, it was difficult to prove fault on the part of the employer. Lawyers might argue that the employer's working conditions were such as to make such an injury more probable than it should be, but such arguments are often too intangible a basis on which to predicate a huge award. Sometimes affixing blame on an employer requires testimony from other employees who might be reluctant to testify against their employer. Lump-sum awards for permanent disability would have to be very large to compensate for lifetime disabilities, and firms may find it difficult to pay in some circumstances. Firms cannot be guaranteed to continue making regular payments indefinitely; firms do not last forever. Before workers' compensation, the lawsuit often failed to produce a sizable settlement, and the worker thus suffered a catastrophic decline in living standards, leading even sometimes to a life of beggary.

The invention of workers' compensation allows a certain spreading of risk that had not been possible before. By mandating the program for all firms, the law eliminated the selection bias problem (that only firms that had inside knowledge that working conditions were relatively more dangerous would sign up for insurance against workers' judgments against them). By defining an objective list of work-related events for compensation, without regard to fault, the law eliminated the problem that fault was difficult to prove. By creating long-lived organizations, the mutual associations, or their equivalent, the government made it possible for workers to be compensated in the long term even though firms were irregular and transitory in their ability to pay.

The essential element of this invention of workers' compensation is a formal definition of "work-related" injuries or illnesses that is the basis of claims. Arriving at this definition would appear to be the most difficult step in implementing workers' compensation, and the issues make the definition so ambiguous that one wonders why relation to work should be an issue in a government-sponsored insurance plan.

While it is clearly possible to identify an accident in which a worker is crushed by a machine as work related, more often the source of the injury or illness is hard to pin down. Repetitive work can bring on arthritis, but most people who live long enough get arthritis eventually anyway. Should arthritis be covered? Wouldn't that bring on a flood of claims from people experiencing normal age-related arthritis? Back problems are sometimes work related, but back problems are very common among the general population. Isn't there a risk of a large number of claims that work brought on a back problem?

What if a worker falls ill with an infectious disease following a minor injury at work? Should we suppose that the injury made the worker vulnerable to the disease? Should mental illnesses or stress-related conditions be covered? Jobs may produce psychological stress that arguably could be held responsible. Heart and lung disease may be worsened by atmosphere, and many workplaces have some at least minor problems with atmosphere.

By working out answers to these questions, Germany created a model for an economic institution, something that could be copied with relative ease in other countries. In this sense, there was a great deal of research and development that led to workers' compensation; it was a real invention.

One wonders why the government should make such a point of trying to decide whether an injury or illness is work related. Part of the reason must be the employee lawsuits against employers for work-related injuries and illnesses, for which the same ambiguities have to be worked out by courts in a context of faultfinding and case-specific arguments. A sequence of judgments on individual cases is probably not the best way to arrive at systematic judgments on definition of work-related injury or illness. An invention does not have to be perfect to be adopted widely; it has only to be the best available technology.

There are very good reasons for adopting something like workers' compensation, and this must account for its spread. These reasons for workers' compensation do not, however, explain why the compensation is limited to work-related injuries and why it is usually financed by employers' contributions. Some accounts of the reasons to have workers' compensation separately from a general social insurance scheme are unconvincing:

Two possible reasons for this special treatment [for work-related injuries] are that (1) the nation believes that employers and society have a greater obligation to workers injured or exposed to disease because of their work, and (2) the WC benefit may be the exclusive remedy of the employee against the employer for job-related injuries or diseases.¹⁴

It is hard to see why workers are so different from nonworkers in terms of society's obligations that we need to have a separate program for them, and the workers' compensation benefit does not need to be the exclusive remedy of the employee. The weakness of these arguments leads one to wonder if the existence of workers' compensation as a program separate from other government illness or disability insurance is nothing more than a historical accident, caused by the fact that pressing and widely observed problems with employee lawsuits against employers caused workers' compensation to be the first social insurance program to be created, and the institutions have just lived on since.

There is, however, an important reason why workers' compensation financed by employers' contributions is an important invention that is different from other forms of social insurance: Such a program, if the rates are related to the employer's or industry experience with workplace illness and injury, creates proper incentives for employers to reduce the riskiness of their work environment. It is perhaps for this reason that workers' compensation is best thought of as a separate invention, apart from other kinds of social insurance. One might also argue that employer contributions that are somehow related to experience with injuries or illnesses related to the employer are an essential element of the invention of workers' compensation without which it would not work well. If we institute workers' compensation without relating contributions to loss experience, then we would create incentives for even worse workplace conditions than were there before it. Employers would become encouraged to allow workplace safety to deteriorate even further since the cost of injury and illness would be subsidized by the insurance program.

John R. Commons, a tireless campaigner for workers' compensation in the United States, referred to this effect of workers' compensation by the term "internalization principle," the principle that society should impose whenever possible all costs that firms cause for society onto the firms themselves, so that firms will have an incentive to contain these costs, thereby "internalizing" costs

¹⁴ Williams (1991, p. 7).

that were formerly borne externally to the firm. Commons noted that many turn-of-the-century workplaces had dangerous conditions for the workers, that workers would occasionally incur a disabling injury at work. With workers' compensation, firms have an incentive to make the workplace really safer and not just to create an appearance of safety enough that lawsuits against them could not prove they caused the accident.

The original German *Unfallversicherung* was in fact a model for creating such an incentive. Since the 1884 law specified a separate mutual association to insure the risks of each industry, higher insurance premiums would be assessed on firms in industries that pose high risks to their workers. Ultimately, these higher insurance premiums would be passed on to consumers of their products through higher prices. It is efficient that consumers pay the full costs (including costs of injury to workers) and decide whether the product is attractive to them at that price; if it is not, the industry does not justify the risk to injury.

Commons's internalization principle was an effective argument; it appealed to state legislators who would respond by adopting mandatory workers' compensation programs. Commons was not successful in his proposal for health insurance, which did not have the internalization principle behind it.

In the U.S. workers' compensation systems today, employers may be class rated, experience rated, or retrospectively rated. Class-rated employers are assigned to one of over 600 industrial classes and then see their premiums depend on the injuries and illness experience of others in their class. Class rating is used for small employers who are too small for it to be possible to estimate their injury and illness rates accurately. The experience-rated or retrospectively rated employers see their premiums depend on their own actual loss experience. Some states also allow schedule rating, which adjusts the employer's premium with regard to safety programs and other factors believed to affect future losses. In 45 states, employers may also choose to purchase insurance privately. The alternatives incorporated into this system are designed to have a very effective link between premiums paid by a firm and its actual loss experience, thus internalizing the losses firms create very effectively.

In Japan, the Workmen's Accident Compensation Program divides employers into 54 categories, and employer contribution rates differ dramatically across categories, from 14.5% for firms constructing hydroelectric power plants to 0.1% for firms in banking and insurance.

Not all countries have an effective link between losses and premiums. A notable example is the United Kingdom, where their industrial injuries scheme does not make contributions vary according to either employers' industry or individual firm experience. However, the United Kingdom is a country where workers are allowed to sue employers for damages even though they are compensated by workers' compensation, and so this defect of their system is not as serious as it would otherwise be.¹⁵

7. Behavioral Economics and the Invention of Mandatory Social Welfare

When national social insurance was invented in the 1880s, German social thinkers, such as Adolph Wagner and G. Behm, were arguing that national social insurance should be made *mandatory* to deal with the problem that few people would actually buy the insurance, a problem that is ultimately behavioral.

There are many complex reasons grounded in human behavior why social insurance needs to be mandatory. The "risk as feelings" hypothesis is the product of research in clinical and physiological

¹⁵ See Williams (1991) for a comparison of workers' compensation plans across countries.

psychology. It asserts that emotional reactions to situations involving uncertainty or futurity often differ sharply from cognitive assessments of those situations and that when such differences occur, it is often the emotional reactions that determine behavior.¹⁶ Rational optimizing economic theory assumes that people calculate their rational advantage and then *act* consistently with that. In fact, it is a common human shortcoming that steps to put into action one's rational decisions are often postponed or neglected.

The hyperbolic discounting theory developed by David Laibson (1997) helps us quantify an important human tendency: a tendency to postpone consideration of important problems indefinitely. People violate the precepts of rational optimizing theory by displaying time inconsistency, repeatedly violating their own plans for the future.

The theory of mental compartments developed by Richard Thaler helps us understand why people may be very cautious to protect themselves against some small, even inconsequential, risks and to ignore some of the biggest lifetime risks of all.

The research on "wishful thinking bias" has demonstrated that people really do tend sometimes to believe what they want to believe. They may then disregard some important risks, not deal with them. For example, soccer enthusiasts overestimate the probability that their team will win,¹⁷ and supporters of political candidates overestimate the probability that their candidate will win.¹⁸

While these are modern research results, the ideas were anticipated in the discussions that led to the establishment of 19th-century social welfare institutions. That the social insurance should be made compulsory emerged as a central theme. In many countries, there were already voluntary benevolent societies and insurance companies. By making the government plans compulsory, the government solved the selection bias problem that plagued private insurance plans, and they solved the problem that some individuals, of lesser intelligence, discipline, or foresight, will omit to buy insurance and then, after a bad outcome, throw themselves at the mercy of others. The social insurance replaced or supplemented the poor laws, which had until then offered some support for the most unlucky, but not on the basis of insurance, that is, out of sympathy and without regard for prior contributions or contractual coverage.

The argument for making plans compulsory hinged partly on some recognition of the limitations of human ability to tackle risk management. G. Behm, in his 1874 paper for the Society for Social Politics (*Verein für Sozialpolitik*), noted that

From my experiences, I have to say it is very doubtful that any substantial number of workers would on their own sign up for a pension plan.¹⁹

Fritz Kalle, a businessman, in another paper collected in the same 1874 volume, offered his interpretation of the reasons workers gave for not wanting insurance. The worker would say, Kalle quotes,

As long as I am alive I can earn my bread, from the little that I can now save, I cannot also afford contributions for insurance, and should I die young, which surely won't happen as I am strong and healthy, the community would take care of my wife and children.²⁰

¹⁶ See Loewenstein et al. (2001).

¹⁷ Bahad (1987).

¹⁸ Uhlaner and Grofman (1986).

¹⁹ Behm (1874, p. 141).

²⁰ Kalle (1874, p. 4).

Kalle says that such statements reveal a “deficiency of foresight and a deficiency of concern for heirs.”²¹ Such statements appear to reflect a number of judgment errors that 20th-century psychologists have studied closely: overconfidence, underestimation of low probability risks, and myopia about the not-so-near future.

Part of the reason that individuals would not buy insurance is that they feel that they are already protected from extreme vicissitudes by their family and friends, who would help them out then if anything went seriously wrong. This feeling was surely also largely an illusion or wishful thinking. Friends will not appreciate the dimensions of economic hardship one may encounter. Making the insurance compulsory creates a common knowledge among society in general that the government has taken on the former role of the vaguely defined community, so that they are freed from ill-defined obligations to take care of others. Compulsory social insurance provides a clean break from the imperfect informal risk sharing.

The hopes, expressed in other many countries, that voluntary associations would solve the risk problem people faced were simply unrealistic. The benevolent societies and fraternal organizations that were entrusted with the social welfare function before the German invention of social insurance covered few people and even these inadequately. Still, despite this evidence, it was hard for social thinkers in the late 19th century to justify any mandatory plans since they seemed to run counter to principles of individual freedom. But after the German experiment with social insurance in the 1880s, which revealed the benefits of such insurance, now virtually every advanced country in the world has some form of social insurance. The advantages of compulsory insurance have become so clear that the principle is accepted even in the societies that value individual liberty the most.

Making social insurance mandatory deals with, as we would put it now, the selection bias problem that hampers private insurance (e.g., only sick people would sign up for voluntary health insurance). The mandatory nature of social insurance makes it possible to keep insurance down from levels that would discourage most potential applicants from buying insurance (much as the analogous invention of group policies, such as corporate health insurance policies, for the same reason, but with its own different problems).²²

Mandatory social insurance was one of those difficult pills to swallow that delayed the adoption of important social insurance innovations. But when the arguments for it were made persuasively enough, the innovations eventually did happen and are now accepted by all shades of political leanings, from the most conservative to the most liberal.

8. Gentler Alternatives to Some Mandatory Programs

Today, modern behavioral economics is suggesting new ways of encouraging better economic decision making without necessarily making the plans mandatory. These new ways of handling the problems that interfere with good decision making are grounded in behavioral research, that is, in the barriers to individual success in economic decisions.

James Choi et al. (2003) have shown evidence that in order to encourage better economic behavior, we may have only to institute economic institutions that make the good behavior the

²¹ Kalle (1874) also buttressed his case by noting that most workers have little interest in fire insurance. He asked workers at a factory if they had fire insurance; of 40 breadwinners, only three had fire insurance (p. 5). Today, of course, fire insurance is institutionalized; one cannot obtain a mortgage without obtaining the insurance.

²² Behm (1874).

“default option.” Most people let stand a default option that is suggested to them, and so merely setting up an institutional environment that requires people to make a tiny effort to deviate from the default option can be enough to encourage better economic decision making. As simple as this point seems to be, it has often eluded government policymakers. One suspects that their failure to see this point is a consequence of habitual overreliance on rational optimizing models of human behavior.

Shlomo Benartzi and Richard Thaler (2004) have shown through some experiments that people can be encouraged to save more if employers merely offer them a plan that specifies that a fraction of their future pay increases will be automatically diverted into a savings program. By specifying that only *future* increases will be diverted, they make it easier for individuals to sign up for the program, overcoming a tendency for people to procrastinate in their savings decisions. By requiring that people make a little effort to cancel the program, they succeeded in preventing most cancellations. Their programs resulted in a quadrupling of the saving rate in 40 months, far more than any government tax incentives toward saving have done, and with no mandatory provisions.

Richard Zeckhauser and Jeffrey Liebman (2004) have shown how complicated schedules, such as schedules of tax rates relative to income, are a source of endless confusion to the general public. Complicated schedules can sometimes be used to victimize the public, as, for example, by cell phone companies that advertise low rates on calls made in accordance with a complex schedule and profit from customers' failure to comprehend the schedule. But at the same time, a benevolent designer of economic institutions can use schedules to improve economic welfare by changing the psychological salience of factors that might inhibit constructive economic behavior. An example is the tax schedule involving the earned income tax credit, which encourages unemployed people to find a job by offering a negative tax rate on the salient first income. The earned income tax credit encourages them to make the psychologically difficult transition from unemployment to work. At the same time, the high marginal tax rates on subsequent income are apparently not noticed by most people and do not operate as a significant deterrent to further work.

These, then, are concrete examples of behavioral economics offering us some real institutional solutions to problems afflicting individual decision makers, alternatives to mandatory programs, and alternatives that have the potential to increase economic welfare.

9. Conclusion

Proposing major innovations in economic institutions is the most important way that economists make lasting contributions to society. The major general economic societies in history, such as the *Verein für Sozialpolitik* and the American Economic Association, have over the years supported a broad spectrum of views on economic research and have encouraged fundamental economic innovation. The recent shift in interests of economists toward behavioral economics and institutional economics offers further hope that the economics profession can achieve more such institutional change in the future.

But we have also seen that major changes in economic institutions often need to await an economic crisis, some major exogenous event that makes the public ready to listen to ideas for fundamental change and to accept such changes. Today, the public may not be in the mood to make big changes. Certainly, in the United States today, it is not in the mood to see any changes that might require an increase in taxes.

The biggest crisis that we are in today may be the war against terrorism, along with the smoldering wars in Iraq and Afghanistan. Those events, whose impact goes far beyond the United States, serve more to distract attention away from economic reform than to bring attention to it.

There is also a possible worldwide economic crisis spurred by the rapid development of emerging countries, most notably China and India, whose demand for the limited supplies of energy and raw materials is suddenly soaring. The recent spike in oil prices to well over \$50 a barrel was bordering on creating a world economic crisis, but it did not reach the proportions of the crisis generated by the second oil crisis, in 1980, when real shortages of oil and long lines at gasoline stations made a huge impression on the public. A public mood for fundamental institutional change may yet come, but it has not happened yet.

Thus, despite some hopeful signs, we today may not be embarking in the immediate future on a major new era of innovation in our economic institutions. But the kind of work that can lead to real institutional innovation is something that economists ought to be doing continually. Advancing our understanding of institutional innovation is an ongoing process that takes years and years. We as economists should not be deterred by the fact that we might have to wait years to see some major innovations happen. We should be, over the coming years, setting the groundwork for major new innovations, in our own countries and around the world, biding our time until these have a real chance to be implemented.

References

- Bahad, E. 1987. Wishful thinking and objectivity among sport fans. *Social Behavior: An International Journal of Applied Social Psychology* 4:231–40.
- Behm, G. 1874. Über Alters- und Invalidencassen für Arbeiter. *Schriften des Vereins für Sozialpolitik*, 5.
- Benartzi, Shlomo, and Richard H. Thaler. 2004. Save more tomorrow: Using behavioral economics to increase employee saving. *Journal of Political Economy* 112:S164–S187.
- Choi, James, David Laibson, Brigitte Madrian, and Andrew Metrick. 2003. Passive decisions and potent defaults. NBER Working Paper No. 9917.
- Coase, Ronald H. 1960. The problem of social cost. *Journal of Law and Economics* 3:1–44.
- Commons, John R. 1934. *Institutional economics: Its place in the political economy*. New York: Macmillan.
- Discussion of the Platform at Saratoga. 1886. *American Economic Association Publications* 1:21–30.
- Dunbar, Charles F. 1876. Economic science in America, 1776–1876. *North American Review* 122(205):124–54.
- George, Henry. 1880. *Progress and poverty*. 4th edition. New York: Henry George and Company.
- Green, Donald P., and Ian Shapiro. 1994. *Pathologies of rational choice theory: A critique of applications in political science*. New Haven, CT: Yale University Press.
- Jolls, Christine, Cass R. Sunstein, and Richard H. Thaler. 2000. A behavioral approach to law and economics. In *Behavioral law and economics*, by Cass Sunstein. New York: Cambridge University Press, pp. 13–59. Originally published in *Stanford Law Review* 50:1471.
- Joskow, Paul A. 2004. The new institutional economics: A report card. ISNIE Presidential Address, Budapest, Hungary.
- Kahneman, Daniel, and Amos Tversky. 2000. *Choices, values and frames*. New York: Russell Sage Foundation and Cambridge University Press.
- Kalle, Fritz. 1874. Eine deutsche Arbeiter. Invaliden-, Wittwen-, und Waisen-Casse. In *Schriften des Vereins für Sozialpolitik*. Leipzig: Verlag von Duncker und Humblot.
- Laibson, David I. 1997. Golden eggs and hyperbolic discounting. *Quarterly Journal of Economics* 62:443–78.
- Loewenstein, George F., E. U. Weber, C. K. Hsee, and N. Welch. 2001. Risk as feelings. *Psychological Bulletin* 127:267–86.
- Mowery, David C., and Nathan Rosenberg. 1998. *Paths of innovation: Technological change in 20th century America*. Cambridge: Cambridge University Press, pp. 11–46.
- Ritter, Gerhard A. 1886. *Social welfare in Germany and Britain: Origins and development*. Translated from German by Kim Traymor. New York: Berg, Leamington Spa.
- Rodgers, Daniel T. 1998. *Atlantic crossings: Social politics in a progressive age*. Cambridge, MA: Belknap Press.
- Shiller, Robert J. 2003. *The new financial order: Risk in the 21st century*. Princeton, NJ: Princeton University Press.
- Shiller, Robert J. 2005. The invention of inflation-indexed bonds in early America. In *Origins of value: The financial innovations that created modern capital markets*, edited by William N. Goetzmann and K. Geert Rouwenhorst. Oxford: Oxford University Press, chap. 14.
- Simon, Herbert. 1998. Behavioral economics. In *The new Palgrave dictionary of economics and the law*, edited by Newman. London: Macmillan, pp. 221–5.
- Snaveley, Tipton R. 1933. Economic thought and economic policy in the South. *Southern Economic Journal* 1:3–14.

Sunstein, Cass. 2000. *Behavioral law and economics*. New York: Cambridge University Press.

Ulhaner, C. J., and B. Grofman. 1986. The race may be close but my horse is going to win: Wish fulfillment in the 1980 presidential election. *Journal of Political Behavior* 8:101–29.

Williams, C. Arthur. 1991. *An international comparison of workers' compensation*. Boston: Kluwer Academic Publishers.

Zeckhauser, Richard, and Jeffrey Liebman. 2004. Schmeduling. Unpublished paper, Harvard University.