

LAW AND BEHAVIORAL ECONOMICS

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Abstract: Although the impact of economics on the analysis and practice of law is beyond any reasonable doubt, such impact and influence has been decreasing over time. This may be partly due to the fact that many economists seem to have forgotten the practical goals with which the field of law and economics was endowed. But it may also be due to the fact that researchers in behavioral economics found an audience more than ready to believe that individuals do not really behave as predicted by theory of rational choice. This article explores the behavior of individuals subject to bounded rationality and the implications of such behavior for lawmaking.

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I- INTRODUCTION

Few would deny that economics has had (and still has) a big impact on the study and practice of law, for the use of economic tools to analyze the law is now widely taught in law schools and lawmakers routinely use economic analysis to shape the law. Some others, however, may argue that economics has by now become a victim of its own success, for the impact of its contributions seems to have been decreasing over time.

Although economists have provided lawmakers with a tool to analyze and shape the law whose use is nowadays virtually taken for granted, it is a fact that many noneconomists resisted the economic analysis of law from the start. Arguably, this is at least in part due to the fact that many noneconomists never bought the starting point of all economic analysis: That individuals are rational and that, subject to some restrictions, take the actions that maximize their utility. It is not entirely surprising, then, that the messages of behavioral economics, starting from the assumption that individuals are “normal” rather than “rational,” found an audience more than ready to listen.

Behavioral economics is based on the assumption that most individuals make choices based on limited information and often using rules of thumb. As a result, their choices typically are not the ones that would maximize the utility of rational individuals; rather, their choices satisfy individuals whose rationality is bounded by limited availability of information and limited cognitive ability. The behavior and reaction to changes in the law of these individuals subject to bounded rationality are, in many cases, different from the behavior and reactions of rational individuals.

This article is by and large descriptive and does not intend to take a stand regarding whether economics or behavioral economics is the more appropriate approach to analyze and shape the law. Its purpose, in fact, is twofold: First, to briefly discuss what behavioral economics is about; and, second, to consider some implications of behavioral economics for lawmaking. To that purpose, the rest of the article is organized as follows: Part II contains a brief discussion of economics and its impact on the law; part III contains a discussion of bounded rationality, behavioral economics, behavioral finance, and cognitive imperfections; part IV contains a discussion of the impact of behavioral economics on some well-established results in the economic analysis of law; and part V contains a (very) preliminary assessment of the relationship between law and behavioral economics. The article concludes with an appendix containing an extensive list of behavioral patterns, and an extensive (though by no means exhaustive) list of important references on the subject.

II- ECONOMICS

Law and Economics (L&E) started out as a field of economics endowed with the purpose of providing a tool (microeconomics) to analyze and shape a target (the law). Although the impact of the L&E movement is beyond any reasonable doubt, the increasing formality of the tools used to analyze the law turned away many lawyers and lawmakers that were initially paying attention. Perhaps along the way, some economists forgot that the whole idea of the L&E movement was to provide a tool to improve the understanding and making of the legal system. Economic analysis of the law was (is) not supposed to be an end on itself, and the mathematical elegance of a model was (is) supposed to be less important than the model's practical implications.

It is in this regard important to remember the positive and normative goals with which L&E was endowed. The former has to do with using the tools of economic analysis to predict the impact of (changes in) the law on the behavior of individuals. The latter has to do with using the tools of economic analysis to shape the law so that resources flow to their highest-valued use. Essentially, economists used L&E to teach lawyers 1) that individuals react to changes in the law; 2) that this impact on behavior can be predicted using economic tools; and 3) that this impact must be taken into account in the design of optimal laws (or, more generally, in the making of any law designed with a specific goal).

It is therefore important to stress once again that economics was only supposed to provide a tool; an extremely useful one, but just a tool. However, having by and large succeeded in that endeavor, some economists forgot about the purpose of L&E and turned economic analysis into an end on itself. It is not uncommon to find nowadays published articles in which the goal seems to be that of displaying a sophisticated model, though the model itself has few or none interesting practical implications for lawmaking. As a consequence, many noneconomists find it increasingly hard to believe that individuals are as clever and complex as portrayed in many of these models.

In addition, dissatisfaction with the theory of rational choice has been growing for many and varied reasons. One reason is that noneconomists (and some economists) always found it hard to believe that, individually or in the aggregate, individuals are as "perfect" as postulated by the theory of rational choice; most people find themselves using rules of thumb and making some systematic mistakes, and not generally acting as the theory postulates. Another reason is that researchers in behavioral economics and behavioral finance have been stepping up their attack on the rational choice paradigm, poking more and more holes on this

theory. Korobkin and Ulen (2000) explore different versions of the theory of rational choice, as well as some of their pros, cons, and implications.

In sum, an indisputable initial impact of economics on the law, followed by a wide acceptance of economics as a tool to analyze and shape the law, and economics' very own law of diminishing marginal returns, all conspire nowadays, some forty years after L&E established itself as a field, against this movement. These factors, coupled with an increasing complexity of the economic models of the law, a decreasing emphasis on the practical implications of such economic models, and an increasing dissatisfaction with the theory of rational behavior all left the field open for the entrance of behavioral economics into law.

III- BEHAVIORAL ECONOMICS

We discuss in this part, first, the idea of bounded rationality pioneered by Herbert Simon; then, some insights of behavioral economics and behavioral finance; and, finally, several behavioral patterns inconsistent with the theory of rational choice.

1) Bounded Rationality

Nobel prize winner Herbert Simon coined the term *bounded rationality* to describe a theory that postulates that most individuals are not able to make *optimal* choices and make *satisficing* choices instead. According to the theory of rational choice, individuals make decisions after performing an accurate cost-benefit analysis based on all relevant information; according to the theory of bounded rationality, individuals make choices based on limited information and often using rules of thumb.

Bounded rationality postulates neither that individuals sabotage themselves nor that they are dumb. Rather, it postulates that individuals make “suboptimal” choices because of the costs of obtaining and processing information. Most individuals, most of the time, make decisions based on limited (as opposed to full or perfect) information. Furthermore, they process the information they obtain with limited (as opposed to perfect) cognitive ability and often using heuristics (rules of thumb). As an inevitable consequence, choices fall short of being those that would maximize utility and tend to instead reach some specified level of satisfaction.

Psychologists Daniel Kahneman and Amos Tversky complemented the concept of bounded rationality by developing what they called *prospect theory*. This theory, which attempts to describe the way individuals make decisions under uncertainty, has at least two differences with the theory of rational choice; one difference has to do with the way

individuals perceive the relevant probabilities involved in any given decision, and the other with the utility function displayed by individuals.

With respect to probabilities, Kahneman and Tversky argue that individuals often *misperceive* the relevant probabilities involved in their decisions. More precisely, they argue that the assessment of probabilities is distorted by several cognitive imperfections, such as the representativeness bias, the availability bias, and the hindsight bias, all of which are discussed below.

With respect to the utility function, Kahneman and Tversky argue that individuals tend to be risk averse in gains (thus displaying a concave utility function in gains) but risk *seekers* in losses (thus displaying a convex utility function in losses). Because the inflexion point of the utility function is at the initial endowment, individuals that display this behavior are said to be subject to the endowment effect (discussed in more detail below). Experimental evidence in fact indicates that most individuals require at least twice as much to give something up than they would be willing to pay to obtain the same thing, although rational choice predicts that these amounts should be roughly the same.

2) Behavioral Economics and Behavioral Finance

Researchers in behavioral economics and behavioral finance, sometimes called *behavioralists*, focus on basically two things: First, on uncovering “imperfect” patterns of behavior, usually referred to as *cognitive imperfections*; and, second, on analyzing the implications of such cognitive imperfections, essentially trying to uncover how individuals really make decisions.

The starting point of behavioral economics (and behavioral finance) is that individuals are not as rational as postulated by the theory of rational choice; rather, the basic assumption is that individuals are subject to bounded rationality. In other words, as mentioned above, in behavioral economics individuals are assumed to be *normal* rather than rational. The problem is that, although it is quite clear how to model the behavior of a rational individual, it is not at all clear how to model the behavior of a normal individual. The holy grail of behavioralists is, in fact, to propose an alternative model of behavior; a model that, as of today, has not yet been proposed. (More on this below.)

Modern financial theory, for example, starts from the assumption that investors make investment decisions by maximizing a utility function that depends on two parameters, the expected return and the risk of each available investment opportunity. (This is essentially analogous to assuming in economics that consumers maximize their utility or that firms maximize their profits.) Researchers in behavioral finance, however, do not believe that

investors make an unbiased assessment of risk and return and that they subsequently select the portfolio of assets that maximizes their utility. Rather, behavioralists tend to believe, first, that investors consider more variables than just risk and return; and, second, that they process all these variables in a somewhat-imperfect way to end up with a decision that *satisfies* them (though one that typically does not maximize utility).

Consider as an example the so-called “green” funds (those that invest only in companies that are friendly to the environment) or more generally the “socially-responsible” funds (those that, on top of being “green,” avoid investing in companies whose main business is to produce and sell “sin products” such as cigarettes or alcohol). Behavioralists argue that it is not the risk-return combination offered by these funds the reason to invest in them; rather, they believe that some investors buy these funds for other reasons, such as their desire to contribute to protect the environment from pollution, or their children from addictive products. In other words, investors do not consider only risk and return when making investment decisions; they also consider many other variables, and process all the information in an imperfect way that distorts their choice.

Behavioral economics and behavioral finance are also very different from economics or finance from a methodological point of view. The standard path in economics or finance is to start from a model, then to derive some testable implications, and finally to test the empirical validity of those implications. In behavioral economics and behavioral finance, however, the path is exactly the other way around: It goes from observing patterns of behavior to building a model that fits (and to analyze the implications of) those observed patterns.

3) Cognitive Imperfections

As argued above, behavioralists have uncovered several patterns of “imperfect” behavior usually known as cognitive imperfections, most of which distort the behavior of decision makers. Some of these imperfections and their implications are briefly discussed in the remainder of this section, where special emphasis is placed on examples related to the behavior of investors, an area in which it is plausible to assume that individuals are particularly keen about making correct decisions.

The theory of rational choice assumes that individuals have a concave utility function, thus displaying a decreasing marginal utility of wealth. Behavioralists, however, believe that individuals have an S-shaped (first-convex-then-concave) utility function with an inflexion point in the endowment, thus being subject to the *endowment effect* (sometimes called the *status-quo bias* or *loss aversion*). Such utility function, convex in losses and concave in

gains, implies that individuals demand much more to give up something than they would pay to obtain the same thing; it also implies that individuals have a tendency to prefer the status quo, because the disadvantages of leaving it loom much larger than the advantages. (*An experiment performed with the audience of the conference will show this cognitive imperfection.*)

Rational individuals are also assumed to make choices based on all the variables relevant to any given decision, ignoring anything that is irrelevant. Most individuals, however, are subject to **frame dependence**; that is, a pattern that implies that individuals alter their choice of identical options when such options are contemplated under different frames. Rational individuals should, of course, be able to see through the frames and make the same choice consistently. (*An experiment performed with the audience of the conference will show this cognitive imperfection.*)

Rational individuals are also supposed to make accurate forecasts of all probabilities relevant to any given choice or decision they have to make. Most individuals, however, are prone to three closely-related cognitive imperfections, one of which is the **representativeness bias**. This pattern refers to an overestimation of the correlation between two variables by ignoring a “base-rate” probability. As an example, consider a *randomly*-selected student from a college campus. His profile, that of a computer scientist, is given to a group of individuals that have to guess the student’s major. Most experimental groups do in fact guess that the student’s major is computer science; but they ignore that the “base-rate” probability of randomly selecting a computer science student is very low. This cognitive imperfection shows up often in the selection of mutual funds for investment purposes, for many investors tend to choose funds managed by “managers of the year” on the presumption that they will be likely to beat the market, forgetting that the vast majority of fund managers actually fail to beat the market.

A related cognitive imperfection is the **availability bias**, which refers to the fact that many individuals overestimate the probability of events easily available to them. Most people believe that words beginning with a “k” are more numerous than those in which “k” is the third letter, presumably because it is easier to bring to mind words beginning with a “k” than words in which “k” is the third letter; the latter set of words, however, is about twice as large as the former. Similarly, many individuals believe that homicides cause more deaths than strokes, presumably because they can more easily bring to mind more cases of homicides than cases of strokes; strokes, however, are over ten times more likely than homicides.

Another related cognitive imperfection is the *hindsight bias*, which refers to the fact that many individuals overestimate the probability of an event after the event actually occurs and is widely publicized. Many people, for example, overestimate the probability of a plane crash right after a plane crashes and news about the incident is widely reported in the media. Going back to the selection of mutual funds, an investor may wrongly believe that a given mutual fund manager is likely to beat the market after wide coverage in the press highlights that the manager beat the market the year before.

Furthermore, most individuals tend to overestimate (underestimate) the probability of good (bad) things happening to them, thus being subject to *overconfidence*, a widely reported behavioral pattern. As an example, consider that some studies show that, although the divorce rate in some countries such as the U.S. is around 50%, when groups of individuals are asked about the probability that they get a divorce themselves, the median probability reported by the groups is 0. Overconfidence often leads investors to overtrading in (and overpaying for) stocks, thus reducing potential returns significantly.

Another cognitive imperfection well documented by behavioralists is *aversion to regret*, a pattern displayed by individuals that avoid taking actions that are accompanied by a sense of defeat, or that take actions to avoid that sense of defeat. Investors suffering from aversion to regret may, for example, be reluctant to sell a stock and cut their losses, thus hopelessly holding on to a losing stock. Markowitz himself, one of the fathers of modern financial theory, has been on record saying (contrary to his own recommendations) the following about his own investment strategy for retirement: “I visualized my grief if the stock market went way up and I wasn’t in it, or if it went way down and I was completely in it. My intention was to minimize my future regret. So I split my contributions fifty-fifty between bonds and equities.”

Many individuals are also prone to *compartmentalizing*, thus mentally or in fact having separate accounts for different purposes. It is easy to show that having, for example, an investment account to save for retirement and another one to save for the kids’ college tuition is likely to be suboptimal. (This is due to the fact that the covariance of returns between the two accounts is ignored.) And yet, many individuals do have two separate accounts for these two purposes. Many individuals also invest by layers, having for example a portfolio for “downside protection,” another for “upside potential,” and so on. This investment strategy is also likely to be suboptimal because it wrongly ignores, again, the covariance between portfolios.

Of course, these individuals do not have to be irrational for maintaining separate accounts or portfolios; they may actually know that they have a *lack of self control*, and they respond to it by isolating the downside-protection account from any risky bet made with the funds invested in the upside-potential account. In fact, the payment of dividends, a largely-unresolved puzzle in modern financial theory, has a behavioral explanation: Individuals who lack self-control may resort to a rule of “spend the dividends but do not dip into capital,” thus having a preference for stocks that do pay dividends. Dollar-cost averaging, another popular investing strategy that can be shown to be suboptimal, is likely to be popular simply because it “forces” investors who lack self-control to a simple rule of investing a fixed amount of money every month or every year.

These cognitive imperfections are but a few of those uncovered and reported by behavioralists; Olsen (1998) considers a much more comprehensive list of forty patterns. Because it is not the purpose of this article to be as exhaustive, we now move to explore some of the implications of a few behavioral patterns for the economic analysis of law; the list of patterns reported by Olsen (1998) is reproduced here in the appendix.

IV- LAW AND BEHAVIORAL ECONOMICS

We first discuss in this part some situations in which the law implicitly assumes that individuals do not behave according to the theory of rational choice but according to bounded rationality instead; then, we consider some implications of assuming bounded rationality for lawmaking.

1) The Implicit Assumption of Bounded Rationality

A useful starting point to discuss the implications of behavioral economics for lawmaking is to notice that the law already assumes bounded rationality and the limited ability of individuals to make optimal choices in many ways. A law that requires drivers to wear a seat belt, for example, is clearly based on the assumption that, left on their own, most individuals would underestimate the benefits of wearing a seat belt and therefore would not buckle up.

Note that a mandatory seat-belt law is very different from a speed limit. The latter can be justified by arguing that, if drivers were not subject to a “safe” speed limit, their driving could end up imposing a cost or damage to other drivers or pedestrians. In other words, the speed limit may be justified by the need to contain a negative externality. (Whether speed limits increase or reduce the number of accidents, however, is a controversial and separate

issue from the one considered here.) Arguably, seat belts benefit only the drivers wearing them, and therefore no argument based on the presence of a negative externality can be used to justify the existence of mandatory seat-belt laws.

The social security system, by forcing individuals to save, is another example of a law implicitly based on the presumption of bounded rationality. As in the example above, it is not clear that someone who does not save enough for retirement harms anyone but himself; hence, there is no negative externality to contain. The social security system, then, seems to be based on the belief that individuals are not smart enough, or are not informed enough, to determine their optimal proportions of saving and consumption over time.

As a matter of fact, the law goes even further in assuming bounded rationality than in the two examples just discussed. In those two examples, the cost-benefit analyses required to make an optimal choice are arguably complex and the law steps in “to help” (in fact, to force) individuals to make “the right” choice. But consider as a final example the issue of liquidated damages. Contract law provides that, in the case of a contractual breach, liquidated damages are unenforceable unless they are a reasonable approximation to actual damages (and actual damages are feasible to be estimated). But why does the law have to evaluate the plausibility of damages mutually agreed upon by rational individuals? It is obvious that, often, this general rule will affect situations in which the cost-benefit analysis performed by the parties will be far from complex; and yet, courts do step in to assess the assess (and often correct) the damages.

2) Implications of Behavioral Economics for Lawmaking

We consider in this section some implications of assuming bounded rationality rather rationality, focusing on how some standard results in L&E can be affected by this change of assumptions. It is important to stress from the outset, however, that the relationship between law and behavioral economics is in an incipient stage, and, therefore, most of the implications of this theory are only beginning to be analyzed.

Consider first the Coase theorem, which argues that when transaction costs are low property rights will eventually end up in the hands of those who value them most, regardless of the initial allocation of property rights. If individuals are affected by the *endowment effect*, however, property rights are likely to be much less transferable and the initial allocation of these rights does become relevant. As an example, consider the following hypothetical situation taken from Korobkin and Ulen (2000):

Cain would be willing to pay (WTP) \$5,000 for a piece of property if he did not own it, but would accept (WTA) no less than \$7,000 to sell it if he did own it. Abel has a WTP of \$4,000 for the same piece of property and a WTA of \$6,000.

Notice that if the property is initially allocated to Cain, Abel would not buy it, but if the property is initially allocated to Abel, then Cain would not buy it. In other words, unlike the prediction of the Coase theorem, in a situation of low transaction costs (there are only two individuals), the initial allocation of property rights *is* relevant. This result implies that allocating property rights may be more complicated than suggested by Coase, for such allocation when individuals are subject to the endowment effect *is* relevant when property rights are both high *and* low.

It is a standard result in L&E that criminals can be deterred by an expected punishment higher than the benefit criminals obtain from their crime. Criminals, however, may be subject to ***overconfidence***, thus believing that the probability of being punished is lower than it really is. In that case, they will underestimate their expected punishment and commit more crimes (or more serious crimes) than they would if they correctly perceived such probability. It thus follows that expected punishments should be set higher when criminals are overconfident than when they are rational, thus forcing society to allocate more resources to security (to increase the probability of punishing), or to set higher fines. (Overconfidence also has an impact on the probability of settlement and trial, for the more overconfident the parties are regarding the probability of prevailing at trial, the more likely they are to go to trial. In other words, overconfident parties litigate more often than rational parties, thus distorting the optimal allocation of resources.)

Another standard result in the economic analysis of crime is that, under some conditions, fines should be as high as possible and the probability of punishing as low as possible. If criminals are subject to the ***availability bias***, however, it may be better for society to allocate more resources to security (than when criminals are rational) in order to increase the probability of punishing, and to widely disseminate information about convictions. This way, criminals subject to this cognitive imperfection will overestimate their expected punishment and respond by committing less crime (or less serious crimes).

Cognitive imperfections may also affect jurors. Consider, for example, individuals subject to the ***hindsight bias*** and acting as jurors in liability cases. Efficiency requires that the precaution taken by the potential injurers is such that the costs of precaution do not outweigh its benefits, and that jurors determine negligence accordingly. If jurors are subject to the hindsight bias, however, they may wrongly perceive the probability of the accidents

considered to be higher than it really is, thus overestimating the expected cost of the accident and finding injurers liable more often than they should; as a result, potential injurers would exercise overprecaution. In this case, a rule of “clear and convincing evidence” may be more efficient than a rule of “preponderance of the evidence,” and strict liability may be more efficient than negligence. (The hindsight bias also implies that the new or increased regulations that follow well-publicized accidents or tragedies may be suboptimal.)

V- A PRELIMINARY ASSESSMENT

It is obviously difficult to make an assessment of the impact of behavioral economics on the law when the relationship between these two fields of knowledge is in such an incipient stage. Any assessment at this early stage should be viewed as preliminary at best.

By assuming that individuals are rational and subsequently exploring the implications of such assumption for lawmaking, the field of law has been enormously enriched. Economists have provided lawmakers with a tool they can use to predict changes of behavior following changes in the law, and to shape the law so that resources flow to their highest-valued use. Lawmakers have by now largely accepted the usefulness of such tool.

However, at the same time that the impact of economics on the law has been decreasing over time, an alternative theory of behavior has been gaining ground. This alternative theory, based on the idea of bounded rationality, posits that most individuals are not able to make optimal choices, thus making satisficing choices based on limited information and using rules of thumb.

Although behavioral economics (and behavioral finance) have not gained much respect from economists (and financial economists), research in this area is becoming increasingly popular. However, a fatal deficiency of behavioral economics, at least as of today, is that it has not gone beyond poking holes on the theory of rational choice. It is in this regard important to remember that *it takes a model to beat a model*, and behavioralists cannot go much further without proposing a model of individual behavior of their own.

Most implications of assuming that individuals are subject to bounded rationality are not yet clear, though the examples above show that the assumptions of rationality and bounded rationality may have fairly different implications for lawmaking. As a consequence, it is certainly worth doing more research both on the way individuals really behave, as well as on the implications of such behavior for lawmaking.

APPENDIX

• Behavioral Patterns

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- Decision makers tend to rely more heavily on stereotypical, analogic, heuristic (rule-of-thumb), or other intuitive or experiential decision processes as decisions become more complex, time grows short, or emotions run high.
 - Decision makers' choices are influenced by affect, or feeling, because an objective of a good decision is positive affect.
 - Decision makers tend to discount future outcomes at rates that vary inversely with the size of the outcome.
 - Decision makers tend to overweight confirming evidence and underweight disconfirming evidence.
 - Decision makers tend to overweight probabilities of favorable outcomes and underweight probabilities of unfavorable outcomes.
 - Decision makers tend to overweight the more salient or more memorable facts and evidence.
 - Decision makers tend to overweight low-probability events and underweight high-probability events. (Events with very low probability tend to be treated as certain to not occur; events with very high probability are treated as certain to occur.)
 - Decision makers tend to be improperly regressive and thus fail to understand that outcomes tend to revert to the mean.
 - Decision makers are social animals. Thus, decisions are influenced by needs for self-control and group acceptance as well as the fear of experiencing regret.
 - Decision makers appear to discount distant future losses at higher rates than distant future gains.
 - Decision makers' choices appear to be influenced by the existence of separate mental financial accounts based on social and economic criteria.
 - Decision makers tend to be loss averse rather than risk averse.
 - Decision makers tend to exhibit a strong preference, all else being equal, for an ascending pattern of returns.
 - Decision makers tend to experience diminishing returns for gains and losses.
 - Decision makers appear to focus on changes in, as opposed to absolute levels of, decision attributes.
 - Decision makers engage in outcome gain and loss segregation or aggregation among decisions to enhance perceived net benefit.
 - Decision makers' perceptions of risk vary inversely with perceptions of control.
 - Decision makers place more weight on decision information that is presented in a formal consistent with the choice format. For example, if an answer is sought in numerical terms, verbal information will be underweighted.
 - Decision makers tend to weight negative evidence more heavily when they are under stress than when they are not.
 - Decision makers tend to reduce the portion of information considered when they are under stress.
 - Decision makers tend to overestimate the probability of conjunctive events.
 - Decision makers treat small samples as overly representative of populations.
 - Decision makers are very imperfectly aware of the actual weight they give to separate pieces of information in a decision.
 - Decision makers weight information that seems personal more heavily than impersonal information.
 - Decision makers tend to overestimate their ability to have correctly forecasted past events (hindsight bias) forecast and make correct decisions.
 - Decision makers tend to be overconfident about their ability to forecast and make correct decisions.
 - Decision makers tend to use information in the form given.
 - Decision makers tend to overestimate the variability associated with a random series.
 - Decision makers tend to confuse precision with reliability and view quantitative information as more reliable than nonquantitative information.
 - Decision makers often forecast by establishing an "anchor" value, and the adjustment they make to the anchor based on specific information is usually insufficient.
 - Decision makers give greater weight to information that has been made to seem more complete by the addition of nondiagnostic facts.
 - Decision makers give greater weight to nondiagnostic information as diagnostic information becomes ambiguous.
 - Decision makers weight information based on the order in which it is obtained. Primacy (earliest data gets most weight) appears to dominate for simple decisions, whereas recency (latest data gets greatest weight) appears to dominate for complex decisions.
 - Decision makers exhibit greater inconsistency in choice when under stress.
 - Decision makers tend to overestimate the accuracy of consensus judgments.
 - Decision makers give greater weight to nonnumeric information as numeric information becomes ambiguous.
 - Decision makers' accuracy, speed, and decision processes can be influenced by the physical format of the information supplied.
 - Decision makers' task participation is enhanced by providing immediate and dynamic feedback.
 - Decision makers are "locked into the present"; they overweight current beliefs and feelings and are very inaccurate when forecasting future hedonic (pleasurable) states.
 - Decision makers give greater weight to anchor values as forecasting becomes more difficult.
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Source: Olsen (1998), exhibit 1.

REFERENCES

- Arlen, Jennifer (1998). "Comment: The Future of Behavioral Economic Analysis of Law." *Vanderbilt Law Review*, 51, 1765.
- Barber, Brad, and Terrence Odean (1999). "The Courage of Misguided Convictions." *Financial Analysts Journal*, Nov/Dec, 41.
- Daniel, Kent, and Sheridan Titman (1999). "Market Efficiency in an Irrational World." *Financial Analysts Journal*, Nov/Dec, 28.
- De Bondt, Werner (1998). "A Portrait of the Individual Investor." *European Economic Review*, 42, 831.
- De Bondt, Werner, and Richard Thaler (1985). "Does the Stock Market Overreact?" *Journal of Finance*, 40, 479.
- De Bondt, Werner, and Richard Thaler (1995). "Financial Decision-Making in Markets and Firms: A Behavioral Perspective." In *Finance, Handbooks in Operations Research and Management Science*, edited by Robert Jarrow, Vojislav Maksimovic, and William Ziemba. North Holland.
- Dembo, Ron, and Andrew Freeman (1998). *Seeing Tomorrow. Rewriting the Rules of Risk*. Wiley.
- Eisenberg, Melvin (1995). "The Limits of Cognition and the Limits of Contract." *Stanford Law Review*, 47, 211.
- Fisher, Kenneth, and Meir Statman (1999). "A Behavioral Framework for Time Diversification." *Financial Analysts Journal*, May/June, 88.
- Hanson, Jon, and Douglas Kysar (1999). "Taking Behavioralism Seriously: Some Evidence of Market Manipulation." *Harvard Law Review*, 112, 1420.
- Hillman, Robert (2000). "The Limits of Behavioral Decision Theory in Legal Analysis: The Case of Liquidated Damages." *Cornell Law Review*, 85, 717.
- Issacharoff, Samuel (1998). "Can There Be a Behavioral Law and Economics?" *Vanderbilt Law Review*, 51, 1729.
- Jolls, Christine (1998). "Behavioral Economics Analysis of Redistributive Legal Rules." *Vanderbilt Law Review*, 51, 1653.
- Jolls, Christine, Cass Sunstein, and Richard Thaler (1998). "A Behavioral Approach to Law and Economics." *Stanford Law Review*, 50, 1471.
- Jolls, Christine, Cass Sunstein, and Richard Thaler (1998). "Theories and Tropes: A Reply to Posner and Kelman." *Stanford Law Review*, 50, 1593.

Kahneman, Daniel and Amos Tversky (1979). "Prospect Theory: An Analysis of Decision Under Risk." *Econometrica*, 47, 263.

Kahnemann, Daniel, Paul Slovic, and Amos Tversky (1982). *Judgement Under Uncertainty: Heuristics and Biases*. Cambridge University Press.

Kamin, Kim, and Jeffrey Rachlinski (1995). "Ex-Post Does Not Equal Ex-Ante: Determining Liability in Hindsight." *Law and Human Behavior*, 19, 89.

Kelman, Mark (1998). "Behavioral Economics as Part of a Rhetorical Duet: A Response to Jolls, Sunstein, and Thaler." *Stanford Law Review*, 50, 1577.

Korobkin, Russell (1994). "Policymaking and the Offer-Asking Price Gap: Toward a Theory of Efficient Entitlement Allocation." *Stanford Law Review*, 46, 663.

Korobkin, Russell (1998). "Inertia and Preference in Contract Negotiation: The Psychological Power of Default Rules and Form Terms." *Vanderbilt Law Review*, 51, 1583.

Korobkin, Russell (1998). "The Status Quo Bias and Contract Default Rules." *Cornell Law Review*, 83, 608.

Korobkin, Russell (1999). "The Efficiency of Managed Care 'Patient Protection' Laws: Incomplete Contracts, Bounded Rationality, and Market Failure." *Cornell Law Review*, 85, 1.

Korobkin, Russell, and Chris Guthrie (1994). "Psychological Barriers to Litigation Settlement: An Experimental Approach." *Michigan Law Review*, 93, 107.

Korobkin, Russell, and Chris Guthrie (1997). "Psychology, Economics, and Settlement: A New Look at the Role of the Lawyer." *Texas Law Review*, 76, 77.

Korobkin, Russell, and Thomas Ulen (2000). "Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics." *California Law Review*, 88, 1051.

Kuran, Timur, and Cass Sunstein (1999). "Availability Cascades and Risk Regulation." *Stanford Law Review*, 51, 683.

Langevoort, Donald (1998). "Behavioral Theories of Judgment and Decision Making in Legal Scholarship: A Literature Review." *Vanderbilt Law Review*, 51, 1499.

McCaffery, Edward (1994). "Cognitive Theory and Tax." *UCLA Law Review*, 41, 1861.

Olsen, Robert (1997). "Investment Risk: The Experts' Perspective." *Financial Analysts Journal*, Mar/Apr, 62.

Olsen Robert (1998). "Behavioral Finance and Its Implications for Stock-Price Volatility." *Financial Analysts Journal*, Mar/Apr, 10.

Olsen, Robert, and Muhammad Khaki (1998). "Risk, Rationality, and Time Diversification." *Financial Analysts Journal*, Sep/Oct, 58.

- Posner, Richard (1998). "Rational Choice, Behavioral Economics, and the Law." *Stanford Law Review*, 50, 1551.
- Rabin, Matthew (1998). "Psychology and Economics." *Journal of Economic Literature*, 36, 11.
- Rachlinski, Jeffrey (1996). "Gains, Losses, and the Psychology of Litigation." *Southern California Law Review*, 70, 113.
- Rachlinski, Jeffrey (1998). "A Positive Psychological Theory of Judging In Hindsight." *California Law Review*, 65, 571.
- Rachlinski, Jeffrey (2000). "The 'New' Law and Psychology: A Reply to Critics, Skeptics, and Cautious Supporters." *Cornell Law Review*, 85, 739.
- Rachlinski, Jeffrey, and Forest Jourden (1998). "Remedies and the Psychology of Ownership." *Vanderbilt Law Review*, 51, 1541.
- Raghubir, Priya, and Sanjiv Das (1999). "A Case for Theory-Driven Experimental Enquiry." *Financial Analysts Journal*, Nov/Dec, 56.
- Rasmussen, Robert (1998). "Behavioral Economics, the Economic Analysis of Bankruptcy Law and the Pricing of Credit." *Vanderbilt Law Review*, 51, 1679.
- Shefrin, Hersh (2000). *Beyond Greed and Fear. Understanding Behavioral Finance and the Psychology of Investing*. HBS Press.
- Shefrin, Hersh, and Meir Statman (1985). "The Disposition to Sell Winners Too Early and Ride Losers Too Long: Theory and Evidence." *Journal of Finance*, 40, 777.
- Shefrin, Hersh, and Meir Statman (1985). "Behavioral Asset Pricing Theory." *Journal of Financial and Quantitative Analysis*, 29, 323.
- Shleifer, Andrei (2000). *Inefficient Markets. An Introduction to Behavioral Finance*. Oxford University Press.
- Simon, Herbert (1955). "A Behavioral Model of Rational Choice." *Quarterly Journal of Economics*, 69, 99.
- Simon, Herbert (1987a). "Behavioral economics." In *The New Palgrave: A Dictionary of Economics*, edited J. Eatwell, M. Millgate, and P. Newman. Macmillan.
- Simon, Herbert (1987b). "Bounded rationality." In *The New Palgrave: A Dictionary of Economics*, edited J. Eatwell, M. Millgate, and P. Newman. Macmillan.
- Statman, Meir (1995). "A Behavioral Framework for Dollar-Cost Averaging." *Journal of Portfolio Management*, Fall, 70.
- Statman, Meir (1999a). "Foreign Stocks in Behavioral Portfolios." *Financial Analysts Journal*, Mar/Apr, 12.

Statman, Meir (1999*b*). "Behavioral Finance: Past Battles and Future Engagements." *Financial Analysts Journal*, Nov/Dec, 18.

Sunstein, Cass (1997). "Behavioral Analysis of Law." *Chicago Law Review*, 64, 1175.

Sunstein, Cass (1999). "Behavioral Law and Economics: A Progress Report." *American Law and Economics Review*, 1, 115.

Thaler, Richard (1992). *The Winner's Curse. Paradoxes and Anomalies of Economic Life*. Princeton University Press.

Thaler, Richard (1999). "The End of Behavioral Finance." *Financial Analysts Journal*, Nov/Dec, 12.

The Economist (1999). "Rethinking Thinking." Dec/18, 69.

Tversky, Amos, and Daniel Kahneman (1981). "The Framing of Decisions and the Psychology of Choice." *Science*, 211, 453.

Ulen Thomas (1998). "The Growing Pains of Behavioral Economics." *Vanderbilt Law Review*, 51, 1747.

Weiss, Deborah (1991). "Paternalistic Pension Policy: Psychological Evidence and Economic Theory." *University of Chicago Law Review*, 58, 1275.