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Behavioral Economics and Insurance Law: The Importance of Equilibrium Analysis

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1. Introduction

The discipline of economics and the field of insurance have had a long, mutually productive encounter. The economics of information grew out of ideas first articulated by insurance actuaries and then formalized by economists, some of whose life paths had taken them through the insurance business. (Baker 1996; Baker 2003). Mathematicians hired by insurance organizations in the 18th and 19th centuries developed statistical techniques that, with later advances, led to the subfield of econometrics (Daston 1986; Clark 1999; Alborn 2009). More recently, insurance institutions have employed insights and techniques from many parts of the economics discipline: insurance economics to be sure, but also financial economics, health economics, econometrics, and, last but not least, law and economics. One measure of the insurance industry's appreciation of economics can be seen in the International Association for the Study of Insurance Economics (the Geneva Association), the members of which are the Chief Executive Officers of 80 insurance companies worldwide, and which sponsors the journal The Geneva Papers on Risk and Insurance, which has published work by many leading economists. Law and

economics is a dominant paradigm in insurance legal scholarship, (Abraham 1986), and has had an impact on the development of insurance law, among other ways through the prolific insurance law opinions of Judge Richard Posner (Langer 2000; ALI Liability Insurance Project Preliminary Draft No. 1 2013).

The U.S. Affordable Care Act (§ 1501(a)(2)(I), as amended by § 10106; National Association of Insurance Commissioners, Exchanges (B) Subgroup, 2011) provides a striking example of the influence of economic ideas and economists on the insurance field, as well as the feedback loop between insurance practice and economic theory. The Obama Administration justified the most politically and legally controversial aspect of the Act (the mandate that individuals buy health insurance) on the basis of an economic idea (adverse selection) that is directly traceable to the encounter between insurance practice and economic theory.

> [I]f there were no requirement [to maintain minimum essential coverage], many individuals would wait to purchase health insurance until they needed care. By significantly increasing health insurance coverage, the requirement, together with the other provisions of this Act, will minimize this adverse selection and broaden the health insurance risk pool to include healthy individuals, which will lower health insurance premiums. The requirement is essential to creating effective health insurance markets in which improved health insurance products that are guaranteed issue and do not exclude coverage of preexisting conditions can be sold. Affordable Care Act, at § 1501(a)(2)(I), as amended by § 10106

The recent behavioral turn in economics provides another opportunity to learn from this encounter. Insurance provides a fertile testing ground for, and potential challenge to, standard economic theory. The product at issue is relatively straightforward: contingent claims on money. Thus, theory generates clear testable predictions and normative statements about when rational people will and should buy what kinds of insurance, provided of course that the institutional context can be adequately specified. Empirical and experimental research reveals consistent, reproducible patterns of behavior that depart from these predictions, however. This divergence between clear theoretical predictions and empirical findings poses a series of challenges—to the adequacy of the specifications of the institutional context underlying the predictions, to the rationality of the observed behavior, to the regulatory framework that shapes the insurance market, and ultimately to standard economic theory itself.

In this chapter we report on and engage with this ongoing, productive, and sometimes frictive encounter. As law professors with a substantial investment in understanding insurance institutions, we are especially interested in charting (and influencing) the meaning of this encounter for insurance regulation. But the payoffs from this exercise, like others in the long-term relationship between insurance and economics, extend beyond the specific problem at hand.

After first reviewing some basic economics of insurance and behavioral research, we closely analyze two types of insurance. Although both types are widely purchased, neither should be appealing to

most rational, reasonably informed individuals, because the net benefits they provide are almost certainly negative. The first—extended warranties for consumer products—is among the most profitable forms of insurance. This suggests both that the *perceived* benefits to purchasers very substantially exceed what expected utility theory would predict and that the market is not working to deliver the insurance protection at a reasonable price (Baker and Siegelman 2013). Our second case study—low deductible homeowners' insurance—looks similar to the first in some ways. Homeowners' insurance itself is valuable to a rational actor, but most people buy policies with deductibles that are far too low to be justified in expected utility terms. But there are some subtle, yet very significant differences between these two markets, as we demonstrate below.

These may seem like odd and perhaps even inconsequential phenomena upon which to direct serious analytical firepower. Yet, they are ideal for the task at hand. First, the observed behavior sharply diverges from the predictions of expected utility theory. Second, the institutional context is sufficiently well understood that we can be reasonably sure that the divergence reflects something about consumer behavior, not the difficulty of developing sound predictions for that context. Third, the behavioral research is sufficiently developed to provide a well-grounded explanation (or set of explanations) for consumer behavior and why it diverges from the predictions of expected utility theory. Finally, as others have already pointed out (Schwarcz 2010; Camerer, et al. 2003; Braun and Muermann 2004), this research might well point toward a sophisticated, "consumer sovereignty" justification for kinds of insurance that expected utility theory would condemn, posing a clear challenge to that theory. Both examples thus present difficult, practical, and generalizable problems for regulators: how should policymakers respond when consumers apparently "want" (or at least, are willing to pay for) something that a rational person would not choose to buy?[1] What, if any, forms of regulation are likely to be effective and desirable under these conditions?

[1] By way of contrast, consider *United States of America v. Rose Marks et al*, Case No. 11-80072-CR-MARRA/VITUNAC(s) (S.D. Fl. 2011) (available at http://www.justice.gov/usao/fls/PressReleases/Attachments/110816-01.SupersedingIndictment.pdf), in which the defendant and nine others are charged, among other things, with mail and wire fraud, for claiming "to have powers of intuition that enabled [them] to perceive things beyond the realm of the five senses," and "represent[ing] to [their] clients that [they were] conferring with the Archangel Michael for his advice and counsel for them." One defendant was accused of having told a client that "they would bring her [estranged] husband back to her, . . . [but that this] 'work' would require sacrifices which would mean money because money was the root of all evil." *Id*. at 12. The U.S. Attorney alleges that the amount wrongfully taken from clients exceeded $40 million. See, http://www.justice.gov/usao/fls/PressReleases/110816-02.html. Most readers presumably wouldn't question such indictments, although extreme devotees of caveat emptor might believe that fraud should not be criminalized. But surely the patrons of the alleged psychics believed that they were getting something worthwhile for the money they spent, just as buyers of extended warranties do. Both psychics and extended warranties can and do make people feel better; both do so only by appealing to their irrational natures.

2. The economics of insurance in brief

The discipline of economics has a simple but powerful explanation of the value of insurance to individuals, a well-worked out explanation of why insurance needs to be regulated, and a relatively consistent approach to the form that insurance regulation should take.

In this paradigm, people value insurance for two reasons: they are risk averse (meaning that they have a declining marginal utility of money) and, with regard to contingent losses, insurance is a more efficient way than savings to equalize the marginal utility of consumption over time. Put in ordinary language, insurance allows people to shift money from times when they do not need it very much to times when they need it much more. Expected utility theory teaches that insurance is most valuable when it provides a mechanism for a large group of people to each pay a small amount of money so that there is a large sum available for the few who really need it. The do-it-yourself alternative—savings—is not as efficient, because it shifts the money into the future whether you need it then or not. By contrast, insurance gives you the money in the future only if you need it.

In a world with perfect information and no transaction costs, every risk-averse person would be better off with insurance against all risks, actuarially-fair insurance (with a premium just equal to the expected loss) would be available for all risks, and there would be no need for regulation of insurance markets (Arrow 1971a). (Risk-neutral or risk-seeking people would not demand insurance even in this world; but there is very little evidence for the existence of risk-seeking or risk-neutral preferences.) Even if risks are correlated rather than independent of each other, this proposition is still essentially correct (Jaffee 2006). Adding a dose of realism by acknowledging the presence of transaction costs (i.e. the costs of selling the insurance and running the insurance business) changes this conclusion only slightly: instead of complete insurance, people would be better off with partial insurance, such as insurance with a deductible or coinsurance. With perfect information, once again, the market would supply the appropriately partial form of insurance, with no need for regulation.

The need (and economic justification) for insurance regulation becomes apparent after adding a second, larger dose of realism: taking into account the information problems that exist on both sides of the insurance relationship.

2.1. Information Problems Facing Insurers

Insurance companies have long been aware of the information problems that exist on their side of the relationship: there are limits to what an insurance company can find out about the people looking for insurance, and it's hard to monitor consumers' behavior once they have it. The result is that the people buying insurance tend to be more risky than average (the adverse selection problem) and, once they have

it, they aren't as careful to avoid losses as they would have been without the insurance (the moral hazard problem).

Economists have formalized the insurance companies' information problems and, in the process, developed what has come to be known as the economics of information. Insurance purchasers' private information about their risk leads to adverse selection, the information problem that George Akerloff (1970) first discussed in his Nobel prize winning paper on the "lemons problem" (Rothschild and Stiglitz 1976, and for a recent empirical survey, Cohen and Siegelman 2010). The insurer's inability to monitor its customers' behavior after they buy insurance leads to moral hazard, the information problem that Kenneth Arrow (1963)—another Nobel prize winner and a former insurance actuary—first discussed in his classic article on the economics of health insurance.[2]

Insurance companies' information problems offer parsimonious, powerful explanations of much of the institutional structure of real-life insurance relationships. As economic theory would predict, and as evidence confirms, insurers manage moral hazard through several devices. First, cost sharing arrangements such as deductibles or co-pays give policy-holders some "skin in the game" by leaving them with some of the potential losses that their conduct might cause. Second, insurance contracts expressly exclude coverage for certain kinds of losses (such as those caused by a policy-holder's reckless or deliberate behavior) (Shavell 1979). This, again, limits policy-holders' incentives to slack off on precautions. Insurers will often engage in pre-contract underwriting (screening) that attempts to discern the honesty, prudence and trustworthiness of insureds and denies coverage to those who meet certain minimum requirements. Finally, insurers rely on social norms to prevent excessive slacking-off in precautions (Heimer 1985; Arrow 1963)

Insurers manage adverse selection through an array of similar dervices. Risk classification entails the use of verifiable measures (such as smoking status or age or historical loss data) that correlate with risk to set premiums. Another technique relies on contract terms that encourage long term relationships (Handel and Lizzeri 2003). Providing a menu of insurance policies that induces policy-holders to sort themselves according to their riskiness is another approach insurers use to curtail adverse

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[2] Kenneth J. Arrow, *Uncertainty and the Welfare Economics of Medical Care*, 53 AM. ECON. REV. 941 (1963). Arrow worked as an insurance actuary before going to economics graduate school. He summarized the impact of his actuarial experience as follows:

> one thing is true ["about this actuary business"]: I really learned. One thing I learnt about during the course of this was moral hazard and adverse selection. . . . I suddenly realized insurance people knew what they were talking about: there was a real economic issue which economists had not understood. It turned out that even though I didn't pursue it [at the time], it was a very important economic problem. I really understood what risk bearing was about and understood the realities of it.

Interview with Kenneth Arrow, by Juan Dubra. Munich Personal RePEc Archive, March 2005. Available at http://mpra.ub.uni-muenchen.de/967/. Joseph Stiglitz, another Nobel laureate who worked on insurance information problems, was the son of an insurance agent (personal communication).

selection (Rothschild and Stiglitz 1976). Underwriting can also be useful in controlling adverse selection, since insureds informational advantage diminishes as the insurer learns more about them. For the most part, insurance organizations have been able to arrive at reasonably satisfactory solutions to these problems without the government's help. Exceptions to privately arranged solutions include the mandated purchase of insurance to prevent adverse selection (as in the Affordable Care Act) and the related regulation of competition among insurers to prevent cream-skimming (attempts to attract only the best risks) and other behavior that, in the limit, can sometimes lead to the failure of insurance markets (Cutler and Zeckhauser 1998; but see Siegelman 2004 for the relative infrequency of insurance market failures).

2.2. Information Problems Facing Consumers

Insurance regulators have long been aware of the information problems that exist on the consumer side of the insurance relationship. Left on their own, ordinary consumers can know very little about either the insurance they're buying or the companies selling that insurance; and once they buy insurance, they are vulnerable to insurer opportunism because they can not observe, for example, whether an insurer provides satisfactory claims-handling service (Sulze and Wambach 2005). These information problems are less susceptible to private contract-based solutions than those facing insurers, and thus provide wider ranging justification for insurance regulation. (Brokers or middlemen might in theory solve some of these problems, and are in fact commonly observed in insurance markets. But brokers create problems of their own, and in any case, are typically unavailable for smaller-scale transactions.) Insurance companies have private information about many things that affect the value of their products: for example, their solvency (a promise to pay is not worth much if the company is not able to pay), the meaning of the terms of their contracts, and their approach to investigating and paying claims.

Referring to this information as "private" does not mean that it is completely unobservable. For example, the written terms of an insurance contract appear in the insurance policy form (assuming that the insurance company is willing to provide the policy in advance, which is not always the case in practice) (Schwarcz 2011). But it is so time consuming and expensive to evaluate the terms of the contract or, indeed, most of the other observable aspects of quality, that no individual person or company would rationally make that effort (Harel and Proccacia 2009). Other aspects of quality, such as past claims servicing practices or current financial solidity, might be observable in theory, but that observation would require the disclosure of information that the insurer prefers to keep private and that is interpretable only in relation to information about other insurers (posing a collective action problem, a classic justification for regulation). Still other aspects of insurance product quality are completely unobservable by anyone at the time of purchase, because they depend on what happens in the future. Insurance consists

fundamentally of the promise to pay money in the future, sometimes very far in the future. No one can observe today the financial solidity and claims paying practices of an insurance company in the future.

This private information creates the potential for (inverse) adverse selection, the risk that bad insurance contracts will drive out the good, and (inverse) moral hazard, the risk that insurance companies will change their financial condition and claims-paying practices to the detriment of existing policyholders (Beal 2000/2001). Insurance regulation addresses these problems by certifying the quality of both insurance contracts and insurance companies. Government approval of insurance companies' standard form contracts certifies the quality of those contracts. Solvency regulation and insurance guarantee funds certify the insurance companies' ability to pay claims. Market conduct regulation and related tools such as private rights of action for insurer misconduct, in effect, certify insurance companies' willingness to pay claims and deter insurers from opportunism at the point of claim.

2.3. Insurance Economics and Insurance Regulation

The economic approach to insurance has been enormously influential among people who study and teach insurance, in actuarial training and practice, and, as a result, within at least the expert sector of the insurance regulatory community. Much of insurance regulation is broadly consistent with the economics of insurance, even if the actual implementation of regulation may fall short of economic prescriptions (Chandler, n.d.)

Nevertheless, our sense is that the standard economic model does not easily justify all of the consumer protection rationales for insurance regulation. The reason is that, in the standard economic model, consumers—bolstered by competition among insurers—are assumed to be reasonably well-equipped to maximize their own utility, so that intervention by insurance regulators is likely to deprive consumers of choices they would either prefer to make (in which case, the consumers experience a loss of welfare) or would not make (in which case, the regulatory intervention is simply useless). The behaviorally informed research that we review next presents a very different view of consumer behavior, in which consumers are poorly equipped to maximize their own utility, and of markets, in which firms are able to avoid the leveling effect of competition.

3. Behavioral economics and insurance

Much as the insurance market has provided fertile ground for the development of the economics of information, it has also spurred the growth of behavioral economics. Researchers such as Howard Kunreuther (Johnson, Hershey, Meszaros and Kunreuther 1993; Shoemaker and Kunreuther 1979; and for a recent comprehensive treatment, Kunreuther, Pauly and McMorrow 2013) and others (Cutler and

Zeckhauser 2004) have long noted that consumer behavior in the insurance market does not match the predictions of standard economic theory: anomalies abound. Consumers do not demand enough of some kinds of insurance that the standard account says that they should value highly, such as insurance against large-but-infrequent catastrophes (earthquakes, floods) and annuities (longevity insurance). At the same time, consumers demand too much of some other kinds of insurance that, in theory, they should not want at all, such as dread disease insurance and extended warranties for consumer products. And, given the choice, consumers regularly purchase insurance policies with deductibles and policy limits that are too low relative to the costs and benefits (Kunreuther, Pauly and McMorrow 2013; Cutler and Zeckhauser 2004). For example, Martin Feldstein (1973) has famously suggested that for reasonable levels of risk aversion, optimal health insurance would entail a much greater level of risk-sharing than current health insurance, with co-insurance rates of 50-66 percent, meaning that the policy holder is responsible for one-third to one-half of any insured medical expense. (Although risk-averse consumers would ideally choose to insure 100 percent of all exogenous risks when prices are actuarially fair, full insurance is no longer optimal when insurance is subject to moral hazard or over-use that increases premiums. In Feldstein's (1973, p. 251) analysis, reducing insurance coverage by one-third would lead to an increase in welfare equivalent to about 25% of total private insurance premiums).

3.1. Demand side anomalies

Research has revealed an increasingly well-defined set of what Kunreuther and Pauly call "demand side anomalies" in the insurance market, and we draw heavily on their taxonomy in what follows (Kunreuther and Pauly 2005; Kunreuther, Pauly, and McMorrow 2013) These anomalies are regularities in insurance purchasing behavior that differ systematically from what expected utility theory predicts. A great deal is at stake in the use of the word "systematically," as we demonstrate below. Even if replicable laboratory experiments can isolate particular biases in highly-controlled environments, behavioral research often lacks a meta-theory about which biases will be operative in complex real-world settings (Barberis 2013). As we suggest, this is especially significant for regulators, because biases seem to be context-dependent and of uncertain signs—that is, some biases lead to "too much" insurance being purchased, while others lead to too little. The following is a selective list:

- People choose low deductibles and, because of loading costs, overpay to provide protection against losses that are not worth insuring against, given plausible levels of risk aversion (Sydnor 2010).
- Having chosen and paid for a low deductible, people do not file a claim unless their loss is much larger than the deductible. One study found that 80% of households had a pseudodeductible higher than the next highest available deductible, meaning that they could save money without

affecting their actual coverage by selecting the higher deductible policy (Brown, Fader, Bradlow, and Kunreuther 2006).

- People buy some kinds of insurance that protect exclusively against losses that are small in relation to their wealth, sometimes even when the price for that insurance is quite high in relation to its expected value. For example, many people buy extended warranties for consumer durables such as TV sets, or purchase collision damage waivers for rental cars (coverage for losses to the rented vehicle only). Such purchases are *per se* irrational under the standard theory of risk aversion, which applies *only* to losses that are a large fraction of one's total wealth (Hogarth and Kunreuther 1995; Chen et al. 2009; Rabin and Thaler 2001; Jindall 2012, Baker and Siegelman 2013).
- People are more willing to insure emotionally treasured objects than they are to insure other objects of equal financial value, and they also put more effort into preparing insurance claims for the loss of a treasured object (Hsee and Kunreuther 2000). The standard economic model of insurance demand is predicated on risk aversion, which implies a decreasing marginal value of money. On this account, subjective value—e.g., for family heirlooms—should not motivate insurance purchases unless the loss of the object would increase the marginal utility of wealth. Thus, it is irrational to insure grandpa's shaving mug (market value $50) unless losing the mug would make an additional dollar (substantially) more valuable than if the mug were intact.
- People prefer insurance policies with no-claim rebates or deferred dividends (that is, policies that return some of the policy holder's premiums in the event that no claims are made on the policy), even though these policies violate the assumption of declining marginal utility of wealth (Slovic, et al. 1977; Baker and Siegelman 2010).
- Insurance against "named events" (limited purpose life insurance policy in the form of flight insurance, or "dread disease" insurance) is sometimes more attractive than more objectively valuable general insurance (Kunreuther and Pauly 2005).
- People do not buy more objectively valuable insurance against other low probability, high severity events (Camerer and Kunreuther 1989; Krantz and Kunreuther 2007).
- People are more likely to buy disaster insurance after a disaster, even when they (wrongly) believe that this disaster *reduced* the likelihood of the next one (Kunreuther et al. 1985).

We can broadly group the behavioral explanations for these anomalies into two categories. The first set of explanations focuses on biases that affect the perception of the value of insurance in a manner that conflicts with expected utility theory. Some of these biases tend to decrease the perceived value of insurance and, thus, may lead to insufficient demand. These include:

- Excessive discounting (an irrationally high preference for money today over money tomorrow), and
- Over-optimism bias (believing that bad things are unlikely to occur to one's self (Williams, this volume). Note that at least in some formulations, optimism bias may represent an even deeper form of irrationality than is contemplated in most behavioral models, since it may be "inconsistent with the independence of decision weights [e.g., probabilities] and payoffs found in models of choice under risk, such as expected utility, subjective expected utility, and prospect theory" (Bracha and Brown 2010).

Other biases tend to increase the perceived value of insurance and, thus, may lead to exaggerated demand, including:

- Loss aversion (the marginal disutility of loss exceeds the marginal utility of gain). Although paying for insurance is an out of pocket expense, many consumers frame this as a "cost" or "price," while perceiving an uninsured loss as a true "loss" (Johnson et al. 1993).
- Emotional attachment to people or objects, which should not influence insurance demand, unless the loss changes the marginal utility of wealth (Hsee and Kunreuther).
- Superstition (buying insurance in the belief that it will prevent bad things from happening).

Still others could have either effect, depending on context, including:

- The availability heuristic (risks that are easier to recall are assumed to be more likely to occur than they actually are, and vice versa) (Tversky and Kahneman 1982; Keller et al. 2006).
- Regret aversion (wanting to have made the optimal choice, as determined ex post (Loomes and Sugden 1983). Adding regret aversion to a model of insurance demand leads individuals to "hedge their bets" by purchasing more insurance for small losses and less insurance for large losses than would be optimal from an expected utility perspective (Brown and Muermann 2004).
- Threshold effects (ignoring probabilities below a cut off in some situations, and, in others, overweighting reductions from an extremely low probability to a perceived zero probability) (Krantz and Kunreuther 2007).
- Overconfidence (sometimes called the control illusion). This bias reduces the perceived likelihood (or effect) of events you can control (car crash) and increases the perceived likelihood (or severity) of events you can't control (plane crash), making you less likely to buy car insurance and more likely to buy flight insurance.
- Herding (copying my friends and family).

Most of the demand side anomalies listed earlier can be explained by some combination of these biases. Regret aversion helps explain buying insurance for low value losses (if a loss happens, I don't want to regret not having the insurance) and buying insurance with a no-claim rebate (if the risk doesn't materialize, I can be sure I get at least something for my money (Johnson et al. 1993; Baker and Siegelman 2010). So, too, loss aversion and mental accounting: the prospect of future "loss" weighs more heavily than the small additional "price" paid to buy a lower deductible, an extended warranty, or any other low value insurance sold in connection with another product or service. Emotional attachment helps explain buying insurance for treasured objects. The availability heuristic and dread help explain buying insurance for named events. Threshold effects help explain not buying insurance for low probability, high severity events. The availability heuristic helps explain buying that same insurance after a disaster.

A second set of explanations for the demand side anomalies focuses on more general information processing problems that consumers face in making decisions of all kinds. These kinds of behavioral regularities are different from those listed earlier because they don't directly affect the perceived value of insurance. Rather, they reduce the capacity to make a decision, whatever the perceived value of insurance may be. These include:

- Hyperbolic discounting (valuations that fall rapidly for small delays, but more slowly for longer delays, leading to procrastination and other time-inconsistent preferences),
- Complexity aversion (avoidance of options that are complicated to evaluate) (Bruce and Johnson 1996).
- Aversion to contemplating some topics (death, stigmatized or taboo events) (Chan 2012).
- More general cognitive constraints. Fredrick (2005) finds, for example, that a simple 3-item "Cognitive Reflection Test" can predict such aspects of individual behavior as risk preferences and time preferences, and speculates that "some preferences are better than others and that cognitive ability is one indicator of the 'better' preference. Dohmen, et al. (2010) conclude that individuals with higher cognitive ability are more willing to take risks and are more patient than those with lower cognitive ability.

In the insurance context, these information processing problems can lead consumers to make the default "decision" not to buy insurance, or leave them vulnerable to firms that frame or create a bad decision as the default. For example, consumers are often vulnerable to high-pressure sales tactics that encourage them to buy extended warranties on consumer durable items, even when such insurance is massively overpriced by any measure, and even when a rational consumer would not choose to insure such

relatively small losses in the first place. Segal (2012) provides anecdotal evidence of abusive seller practices; U.K. Competition Commission (2003) offers more systematic details.

Considering all of these biases and information processing problems together produces a rather bleak picture, at least for those who would like to see behavioral economics provide clear guidance to policymakers. There are systematic yet conflicting biases that affect the perceived value of insurance. Consumers want too much of some "bad" kinds of insurance and not enough of some "good" kinds of insurance, and, even if they are motivated to distinguish between good and bad insurance, information processing problems make doing so very difficult.

In a world of complete information and zero transactions costs, actuarially-fair insurance is always and everywhere a valuable financial product for a rational, risk averse consumer. In the real world, insurance is only sometimes a good financial deal. Whether it is a good deal in any particular situation is a complicated question that turns on individual preferences, and the frequency and severity of loss, and the loading charges that insurance companies must impose in order to run their business, not to mention the complications resulting from moral hazard, adverse selection and the existence of alternative ways to manage risk. The behavioral decision research clearly demonstrates that people do a remarkably poor job at making decisions that involve even simple mathematical concepts, such as the compounding of interest (Kunreuther, Pauly and McMorrow 2013). Insurance is a much more complicated financial product than a bank account or loan (Jackson 1999), so it should come as no surprise to learn that behavioral decision research provides very little reason to be confident that consumers are making optimal insurance purchasing decisions.

3.2. Protecting the Imperfectly Rational

Suppose we take it as a given that consumers cannot be relied upon to make wise choices with respect to insurance: What role does this then leave for policy interventions to improve welfare? Our message here is that even if we know the causes and direction of consumer "errors," the behavioralist turn makes good regulation of insurance more, or at least no less, difficult than it ever was. In this section we discuss some general problems with the design of regulation to protect imperfectly-rational insurance buyers.

A key problem for regulators seeking to act on behavioral insights is that behavioral theories may do a good job of *explaining* behavior, but they do so in a way that severs the connection between a consumer's behavior and her welfare. Under standard economic assumptions, there is a tight link between the two: behavior is chosen to maximize welfare—indeed, this is close to the very definition of rationality. It would be irrational if one preferred X to Y, yet choose Y when both options were possible. A rational consumer who chooses to buy an extended warranty is *by definition* doing so because she

believes it advances her welfare, and there's an obvious subjective sense in which she must be right. The link between behavior and welfare is what gives economics much of its normative bite: allowing consumers to act as they choose is desirable precisely because their actions will be rationally chosen to promote their well-being.

But what happens if the link between behavior and welfare is broken or attenuated, which is precisely the conclusion of the behavioral research in insurance? One obvious regulatory solution—which unfortunately rarely works—is to provide the consumer with the correct information about the relevant risks involved. Doing so poses relatively few problems for a preference-based, welfarist approach to policy making: by assumption, the consumer will use the new, accurate information to make the appropriate (subjectively welfare-maximizing) choice not to buy the insurance. If on the other hand, providing the information does *not* alter the consumer's decision, then (arguably) buying the insurance must have been based on some kind of non-standard preferences (for example, regret aversion or loss aversion), and therefore the purchase actually increases the consumer's utility. Either way, disclosure appears to solve the problem.

Camerer et al. (2003, at 1253-54)) and Schwarcz (2010) follow this line of reasoning in arguing that mistakes can and should be corrected by disclosure, but that if consumers are (irrationally) buying extended warranties because of loss-aversion or as relief for "anxiety," they should be free to do so, because restricting their ability to make such decisions would leave them (subjectively) worse off. Schwarcz, for example, writes that behavioral anomalies in the purchase of insurance

> can plausibly be explained as sophisticated consumer behavior to manage emotions such as anxiety, regret, and loss aversion. Moreover, the capacity of insurance to address these negative emotions is not necessarily an artifact of manipulative insurance sales or marketing. Rather, it may be a sophisticated and informed strategy on the part of consumers to manage emotions that exist independently of insurers' (and their agents') sales efforts.

Yet behavioral (and other) research has not been kind to the proposition that disclosure corrects decisional errors (Ben-Shahar and Schneider 2011; Willis 2008). Precisely because consumers who buy extended warranties are not fully rational, frequency-of-repair statistics and other forms of "de-biasing" education will be difficult for them to process. Behavioral research might help to make disclosure more effective, but we see no reason to be optimistic that disclosure can fully overcome even the most minimal behavioral impediments to appropriate decision-making. This in turn implies that the distinction between mistakes (based on incorrect information) and non-standard preferences as motives for insurance purchases does not provide a solid basis for regulatory policy. Unless we define "mistakes" tautologically (as those decisions that can be altered by disclosure), *effectively* correcting mistakes will often require

something more than disclosure, and thus entails making it difficult or impossible for consumers to do what they "want."

A second important problem—typically only implicit in much of the behavioral research—is the possibility of heterogeneity among consumers. While rational consumers are all alike (in their rationality, if not their preferences), there are a multitude of ways to be irrational. Not only are some people apparently "more rational" than others (Choi et al. (2011) find considerable heterogeneity among subjects, with richer and better educated subjects more likely to exhibit rational behavior); the multiplicity of possible irrationalities adds enormous complexity to policy-making because it means that the conventional Kaldor/Hicks or Pareto criteria for policy evaluation are often unavailable, and distributional issues cannot be avoided.[3] Policies that help one group of irrational consumers may hurt another. Policies that help the rational may harm the irrational, and vice-versa. We have relatively little to offer here, except to say that behavioral heterogeneity makes policy-making even more difficult than it would be in a world where consumers were all fully rational.

Finally, when considering whether to modify insurance law or regulation to take the behavioral economic findings into account, it is vital to acknowledge the potential effects of intervention in equilibrium, after all relevant actors have had a chance to adjust their behavior (Schwartz and Wilde 1979). At least since the pioneering work of Rothschild and Stiglitz (1976), economists have understood that equilibrium in insurance markets—which are pervasively characterized by asymmetric information (as described earlier)—can be extraordinarily complex and in some cases might not even exist at all. Adding behavioral "anomalies" to the equilibrium analysis is far from straightforward. But without such an analysis, regulatory interventions are likely to have unintended consequences, and may even be welfare-reducing.

Consider the possibility of over-optimism—consumers' mistaken belief that they have a lower risk of some loss than is actually the case. One might naturally conclude that this cognitive bias would lead to an inappropriately low demand for insurance, and thus result in welfare losses from excess exposure to risk. And one might be tempted to conclude that education or "nudges" should be deployed to give consumers a more appropriate sense of the risks they face. But in an equilibrium model with asymmetric information, that conclusion no longer holds. In an elegant paper, Sandroni and Squintani (2007) show theoretically that over-optimism can actually *improve* welfare in the presence of adverse selection. That is, when some high risk insureds optimistically (but mistakenly) believe that they are low risk, they are less inclined to purchase insurance than they would otherwise be. That makes selection

[3] We do not mean to suggest that distributional concerns *should* be avoided, but only that heterogeneity makes it impossible to ignore these issues. Choi (2011), Fredrick (2005) and Dohmen (2010) all suggest that there are non-surprising correlations between class, gender and ethnicity and financial "mistakes," which in our view only strengthens the case for regulatory intervention.

problems less severe, and the market actually reaches a better equilibrium as a result. So efforts to debias consumers by giving them a better sense of the probability of loss can correct one problem (overconfidence) only to exacerbate another (selection), in way that might well be welfare-reducing (On the challenges facing behaviorally informed regulation, see also chapters by Sunstein; Pi, Parisi, and Luppi; and Mitchell (this vol.).)

The moral of these examples is *not* that behavioral economics offers little or no scope for welfare-enhancing intervention. It is rather that when non-standard motivations or imperfect reasoning combine with informational asymmetries, policy interventions need to be very carefully tailored to particular circumstances in order to be effective; there is no simple route from identifying a behavioral flaw (itself a complicated endeavor) to recommending an appropriate regulatory policy. We illustrate this conclusion below, in our analysis of low deductible homeowners' insurance and extended warranties. Both forms of insurance are a bad buy in expected utility terms, but an equilibrium analysis suggests very different regulatory responses.

4. Two Examples

In this section, we offer a more detailed behavioral analysis of two kinds of insurance, extended warranties for consumer products and low-deductible homeowners insurance. Both markets reveal significant anomalies: many consumers make choices that are essentially incompatible with rational behavior. And yet, the equilibrium that results, and the scope for policy interventions, differs widely across these two ostensibly similar situations.

4.1. Extended warranties for consumer products

Extended warranties (EWs) are optional insurance contracts that are sold with many products to supplement the standard warranty provided by the manufacturer (they are entirely distinct from ordinary warranties that are provided by the manufacturer and that serve as a signal of product quality. See Spence 1977; Priest 1981). Since they are essentially unregulated, it is difficult to know the dollar value of EWs sold each year, but estimates are in the range of $16 Billion for the U.S. (Baker and Siegelman 2013).

Extended warranties are the quintessential bad deal (at least for a rational, expected utility maximizer) for two related reasons. First, a rational person should not demand insurance for losses that are small relative to his or her wealth, even if he or she is risk-averse. As several distinguished economists have noted, classical risk-aversion stems from—indeed, it just *is*—the declining marginal utility of wealth. But a small loss, by definition, doesn't change wealth very much, and so it simply can't change the marginal utility of wealth by much either (Arrow 1971b; Pratt 1964; Rabin and Thaler 2001). The

demand for insurance arises because a dollar of premium paid in the no-loss state when wealth is high is worth less (in utility) than a dollar of *payment* received in the loss-state (when wealth is low). Even if one's flat screen TV set blows up one year after purchase, the loss of one or two thousand dollars should not "move" the marginal utility of wealth by very much for most people. Demand for EWs thus cannot plausibly be attributed to classical risk aversion: whatever the reason for a buying an EW, nobody could be risk-averse enough to justify the purchase for a small value item. Indeed, recent experimental evidence (Huysentruyt and Reed 2010; Jindal 2013) suggests that EW purchases are much more driven by loss- or regret-aversion, rather than a rational calculation of the expected utility gained from the purchase.

The second reason why EWs are such a bad deal is that they are exceedingly expensive. Estimates vary, but profits on EWs are many times higher than on standard insurance policies, and loss ratios (payouts to premiums collected) are often staggeringly low (Baker and Siegelman 2013; UK Competition Commission 2005).

There are thus two puzzles about EWs: why do people want them at all, and even if they do, why don't the forces of competition push the profits on EWs down to normal levels. Behavioral economics offers compelling answers to both these questions.

4.1.1. What Explains the Demand for EWs?

Behavioral analysis offers a wide range of explanations for consumers' irrational purchase of extended warranties. Indeed, there are so many plausible stories that distinguishing between them is quite difficult. Fortunately, however, the normative conclusions appear to be independent of the particular mechanism involved.

One possible story involves "regret aversion," under which people (know now that they) will feel bad in the future if a choice they have made today works out badly, even if it was appropriate at the time it was made. Theoretical work by Michael Braun and Alexander Muermann (2004) shows that regret aversion leads people to purchase insurance for low-value losses: when insurance is available, is not purchased, and a loss occurs, a regret-averse person will feel this loss very heavily, since they could have chosen to buy insurance but did not.

Another variation on this theme is the idea that utility is not simply a function of final wealth, but depends on whether that final wealth is framed or experienced as a gain or a loss relative to some reference point (Kahneman and Tversky 1979). According to Kahneman and Tversky's prospect theory, this reference dependence is accompanied by loss aversion and diminishing sensitivity. Loss aversion is the phenomenon that losses loom larger than gains: people hate to loose more than they like to gain (Zamir, this vol.). Parting with goods that are held for exchange, such as money, is not, however, perceived as a loss, but rather as a "cost" (Novemsky and Kahneman 2005). Diminishing sensitivity

means that people value the first dollar of a gain the most and each additional dollar of gain less. At the same time, people hate the first dollar of a loss more than any additional dollar. In other words, they have a declining marginal *dis*utility of loss that mirrors their declining marginal utility of gains. All this means that people will often pay dearly to avoid even a small loss (Johnson et al. 1993). In the add-on insurance context, that translates into paying what feels like a small additional cost to avoid the emotional distress associated with a larger future loss.

There are still other behavioral explanations for the irrational willingness to buy extended warranties, including those based on non-linear "probability weighting" (Kahneman and Tversky 1979; Barberis 2013) (meaning that small loss probabilities are exaggerated relative to their true value, while larger ones are understated); and of course several explanations could be operating at the same time. Distinguishing between them is extraordinarily difficult, although one recent attempt to do so using experimental data and statistical methods concludes that loss-aversion is the most significant driver of EW purchases (Jindal 2012). Our sense is that while a precise understanding of consumers' motivations is a worthwhile objective, what really matters, at least in this context, is that EWs are a bad deal for a rational consumer.

4.1.2. What Explains the High Profit Margins on EWs?

For an explanation of why competition among retailers fails to reduce the profit margin on EWs, we rely on the well-known "shrouded pricing" model of two-stage purchases first developed by Gabaix and Laibson (2006). We summarize that model here, stressing its prediction that when some actors are subject to a plausible behavioral anomaly, inefficient and discriminatory terms *can* survive in equilibrium. It is important to note that this result is at odds with the traditional story of equilibrium in markets with rational but imperfectly-informed consumers (Schwartz and Wilde 1979, p. 653). In the standard account, "the presence of at least some consumer search in a market creates the possibility of a 'pecuniary externality:' persons who search sometimes protect nonsearchers from overreaching firms." Moreover, in their model, if at least one-third of consumers undertake comparison shopping, the market price will be close to the competitive price in market where all consumers are informed.

In the shrouding model, a consumer has to make an initial purchase, and then *optionally* makes a secondary purchase that is somehow tied to the first. Gabaix and Laibson use examples such as a laser printer and replacement cartridges, a hotel room and telephone charges, or a car rental and a collision damage waiver. There are two kinds of consumers in their model—"myopes," who don't think about the possibility of future "add-ons" when they make their initial purchase, and "sophisticates," who do. The initial purchase is made in a competitive market, where all stage-one prices of all sellers are completely observable; but the first purchase exposes the buyer to a subsequent purchase from the same seller, in a

potentially non-competitive market in which the price is unobservable at the time the initial purchase is made (unless one inquires about it).

As Gabaix and Laibson observe, the second stage price is often significantly above the marginal cost of providing the good or service. That is certainly the case for extended warranties, where sellers earn margins that are unheard of in virtually any other line of insurance. We think it is helpful to think of the second stage purchase as taking place in a "situational monopoly" in which the seller has a captive market for that part of the purchase. One could presumably buy an extended warranty separately from the primary purchase, but this turns out to be very rare in practice, with the result that extended warranties are sold at decidedly supra-competitive, monopoly-like prices. The shrouded pricing model provides an explanation for why.

Suppose a firm tries to compete by offering a lower second-stage price than its rival—e.g., on extended warranties—and by alerting potential customers to the fact that its rivals charge more ("come buy from us—we charge less for our warranties."). Doing so has several consequences. First, the fact that the overall market is competitive means that the firm offering cheaper warranties would have to charge a higher price for the first-stage product—otherwise, the discounter would earn negative profits and would prefer to exit the industry. Second, the discounter's announcement educates its rivals' sophisticated consumers, alerting them to the fact that cheaper warranties are possible. But ironically, this means that rivals' customers will *all* prefer to stay where they are, rather than switch to the discounter. Sophisticated customers will want to stick with the rival to obtain the lower base charge, and will avoid the rival's high add-on charges by substituting a competitively-supplied extended warranty for that offered by the seller; or, better yet, by not buying one at all and relying instead on savings or a credit card (which provides the liquidity needed to purchase a replacement and, in some cases, may include limited warranty protection on purchases made with the card) to replace the product if it breaks. Importantly, however, this advertising will have no effect on rivals' myopic consumers, who aren't paying attention to the second-stage transaction at all. Thus, competitive attempts to unmask rivals' high add-on prices will only succeed in transferring benefits from the rival to the rival's sophisticated customers, and will not do anything for the firm providing the educational information at all. Hence, there will be no reason for any firm to unmask its rivals' high add-on fees, which can then persist in equilibrium.

4.1.3. Insights from the Shrouded Pricing Model

The shrouding model offers several important insights for the application of behavioral economics to the regulation of insurance. Most significantly, it shows how behavioral "flaws" don't just influence the consumer's decision about what/how much to buy. These flaws also shape the structure of competition between firms and the resultant market equilibrium. An analysis that focuses only on

consumers' deviations from perfect rationality (or non-standard preferences) will miss the important properties of the equilibrium that results. Sadly, there is thus no short-cut from behavioral anomaly directly to policy recommendations: rather, as the previous examples also demonstrate, the behavioral anomalies have to be inserted into an overall model of market functioning to predict how policy can influence welfare.

The shrouding model also helps explain why the enhanced disclosure approach to extended warranty overcharges proposed by the U.K. Competition Commission failed so dramatically. After an impressive empirical analysis of the market for EWs in the UK, the Competition Commission decided to require advertising of the extended warranty price along with the price of the covered product, thereby allowing consumers to shop on the basis of the combined price; the Commission also proposed further reforms of the sales process designed to reduce the likelihood that customer would being pressured into buying an EW. (Competition Commission 2003). Along with some other reforms, the Commission's proposals were adopted by regulation, effective April 2005.[4]

Yet profits from extended warranties on consumer electronic products in the U.K. continue to be very high, despite the reforms, and the U.K. Office of Fair Trading still sees the market as "unfair and uncompetitive." (Neate 2011). Just as the shrouded pricing model would predict, disclosure did not work. True, prices of extended warranties have declined at traditional retailers since the reforms. But that appears to be the result of competition from internet retailers and big box stores (Office of Fair Trading, 2011). The Office of Fair Trading's follow-up investigation concluded that disclosure was not working and recommended, instead, an information technology solution that would eliminate the situational monopoly. British retailers recently accepted that recommendation as an "agreed remedy," perhaps to avoid the ban that we recommend for extended warranties in the add-on context.

Exactly why disclosure failed is ultimately an empirical question, but the shrouding model would say that myopic consumers ignored the disclosures, while rational consumers reasoned that lower warranty prices must mean higher up-front prices, so that disclosure would not in fact enhance competition over customers.

Equilibrium analysis also bears on the paternalism problem, voiced by Dan Schwarcz (2010). Suppose we concede that consumers are not "mistaken" in many insurance purchasing decisions and that instead, they are motivated to purchase credit life insurance, flight insurance, collision damage waivers, or extended warranties by genuine (albeit "non-standard") fears or anxieties. It does not follow that consumers should over-pay for the insurance they purchase, as the shrouding model predicts and the

[4] http://www.competition-commission.org.uk/inquiries/completed/2003/warranty/index.htm; http://www.legislation.gov.uk/uksi/2005/37/contents/made (the regulation as adopted allowed for a 45 day cancellation period).

evidence strongly suggests is the case. In other words, an equilibrium behavioral analysis might still suggest a market failure that regulation could potentially address, even if insurance is purchased for "legitimate-but-non-standard" reasons such as regret- or loss-aversion. The market failure arises not from consumer motivations per se; it arises from the way such motivations shape the resultant market equilibrium and reduce the ability of competitive market forces to present consumers with prices that closely track the cost of providing the service (see also Baker and Siegelman 2013).

4.2. Low deductible homeowners insurance

Consumers' choice of deductible in homeowner's insurance provides a second compelling example of the kinds of problems we have been discussing. Research by Justin Sydnor (2010) conclusively demonstrates that many policyholders choose deductibles that are *much* too low to be justified as the decision of a rational, risk-averse actor. Sydnor uses data from one large insurer to demonstrate that 83 percent of consumers choose a deductible that is dramatically too small to be justified by any reasonable level of risk aversion or future expected claims. For example, many consumers chose a $500 deductible, rather than the $1,000 deductible they might have picked instead. Given typical claiming rates, the average expected monetary benefit from the additional coverage was only about $20, but its additional cost was about five times more than that. In other words, consumers paid $100 to receive an expected $20 monetary benefit (Sydnor 2010, p. 196).

Sydnor's was an observational study, which limited his ability to explain precisely *why* consumers were willing to overpay for a low deductible. But he suggests this finding might be explained by a number of behavioral anomalies, but an obvious candidate would be loss-aversion: paying a higher premium in return for a lower deductible "just doesn't feel" like a loss, in the same way that paying out of pocket for an uncovered loss (that would have been covered had the policyholder chosen a lower deductible) does (see also Johnson et al, 1993).

To justify the lower deductible, a rational consumer would have to have a utility function that was so astronomically risk-averse that he would almost-literally never be able to get out of bed. In quantitative terms, buying the lower deductible is a rational economic decision only if one's coefficient of relative risk aversion is between 1,840 and 5,064. Yet empirical studies estimate plausible values for the coefficient of relative risk aversion to be in the single digit range. Someone with a coefficient of relative risk aversion of 5000 would turn down a bet that offered a 50/50 chance of either losing $1,000 or gaining *any amount of money* (including, say $1,000,000,000,0000). (Sydnor 2010, Table 3, p. 190). Instead, Sydnor's preferred explanation for the purchase of unreasonably low deductibles is that consumers have inconsistent and imperfectly rational preferences that do not match those in the standard economic account. "Feelings about money given up for a purchase are segregated from attitudes towards surprise

losses," such that "loss aversion affects attitudes towards money paid when an accident happens (i.e., the deductible) but not the amount of money paid up front for the policy." (Sydnor 2010, p. 196).

Whatever the explanation for this choice, the purchase of "excess" deductibles appears to be costly to consumers: Sydnor estimates that other things equal, "homeowners could expect to save roughly $4.8 billion per year by holding the highest available deductible." (One might think of the $4.8 billion as money well spent *given consumers' actual, if inconsistent, preferences*. Alternatively, the $4.8 billion might be characterized as a cost of irrationality that society ought to take steps to overcome.) But as Sydnor points out, this analysis can be seriously misleading as a guide for regulation, because it ignores the way markets equilibrate. Consistent with competition among suppliers, the insurer he studied did not appear to earn excess profits on its low-deductible policies, even though consumers "overpaid" for these policies relative to the expected value of the low deductible. This is because low-deductible consumers had higher claim rates, presumably due to the presence of adverse selection. The low-deductible consumers, who had private information about their own elevated likelihood of making a claim, chose policies that reflected this information, even though the additional expected claims were not "worth" the cost of the additional coverage. In fact, those with a $500 deductible had about a 50 percent higher claim rate (between 3% and 3.5% per year) than those with a $1000 deductible (only about 2% of whom made a claim each year), by various measures that controlled for the fact that people with a $1000 deductible cannot make a claim for a $900 loss (Sydnor 2010, p. 198; it is important to control for the fact that those with a lower deductible can make claims for amounts between $500 and $1000 that those with a higher deductible cannot; thus, it is appropriate to use the rate of claims in excess of the higher deductible for this comparison). Thus, if the low deductible policies were to be eliminated, the equilibrium would look very different and might not exist at all.

I may be able to get a better view at the ball game if I stand up, but this does not imply that *everyone* can simultaneously get a better view if we all do so. Similarly, Sydnor (2010, p. 198) concludes that "[i]ndividual consumers could benefit financially by avoiding over-insuring modest risk. However, if all homeowners changed their behavior, the company would likely need to raise insurance costs or create a new higher deductible in order to separate the more and less risky consumers. . . . If all consumers had standard risk preferences, the new market equilibrium would not necessarily be welfare-improving for the customers."

5. Conclusion

As we noted at the outset, extended warranties and low deductible homeowners insurance are ideal examples for evaluating the potential contributions of behavioral economics to insurance regulation. The market outcomes sharply diverge from the predictions of expected utility theory, and we understand

the institutional context sufficiently well to conclude that the divergence reflects non-rational behavior. In addition, behavioral economics provides a reasonably well-grounded set of explanations for the observed behavior, posing a clear challenge to expected utility as a positive theory. Both examples thus present difficult, practical, and generalizable problems for regulators: how should policymakers respond when consumers apparently "want" (or at least, are willing to pay for) something that a rational person would not choose to buy? What, if any, forms of regulation are likely to be effective and desirable under these conditions?

We conclude that even though it does not explain actual consumer behavior very well, expected utility theory may serve as an acceptable descriptive basis for *normative* policy evaluation. Insurance consumers are clearly willing to pay much too much for products they shouldn't want at all, and behavioral economics offers powerful explanations for why this should be so. As has long been noted (Kunreuther and Pauly 2005; Kunreuther, Pauly and McMorrow 2013; Cutler and Zeckhauer 2004) there are parallel anomalies involving the opposite form of behavior: consumers fail to purchase certain kinds of insurance for large losses, even when that insurance is available at subsidized rates that make it better than actuarially fair. We do not discuss these anomalies here, but we believe our approach is applicable in those contexts as well.

How, then, should regulators respond to such irrational behavior? One possibility is simply to ignore consumers' motivations, relying on a "revealed-preference" approach which presumes that if consumers are willing to pay for something, their welfare is enhanced by purchasing it, even if no rational person would make this choice. We think that insurance products that so dramatically fail the rational expected utility maximizer's cost-benefit calculus are not worthy of this respect. They are bad deals, and we suspect that the high-pressure and deceptive tactics used to sell them explain a large fraction of the demand for such products (on the exploitation of consumer biases by suppliers, see generally Bar-Gill (this vol.).

For extended warranties we advocate paternalist regulation of the strongest kind: prohibiting their sale, at the very least in the contexts in which people presently are most likely to buy them (Baker and Siegelman 2013). (For the full explanation, readers will have to consult our paper. One intuition is that a mandatory rule eliminates regret aversion because there is nothing to regret any more.) For low deductible homeowners' insurance, we advocate leaving the market alone. The difference is not because people are making good, or even well-informed, choices in one context but not the other. The difference lies in the equilibrium effects of the choices in these two markets.

As these examples illustrate, the most significant regulatory payoffs from the encounter between behavioral economics and insurance have not come from a more precise understanding of the motives for buying insurance or from advances in identifying what constitutes "good" insurance or the ultimate goals

of insurance regulation.[5] Rather, the benefits have come from advances in the understanding of the equilibrium that results when real—incompletely rational—people buy insurance.

A recent paper by Handel (2013) beautifully illustrates the central theme of this chapter: deviations from rational behavior that might be welfare-reducing in standard market settings (or when considered in isolation) may actually be welfare-enhancing in insurance market equilibrium. Handel examines "inertia" in individuals' choice of employer-provided health insurance plans. (Although his analysis does not identify a particular cognitive failure that gives rise to this inertia, it is not difficult to imagine several behavioral explanations.) He finds compelling empirical evidence that people tend to stick with a given plan, even if other offerings are clearly better for them: such inertia "causes an average employee to forgo $2,032 annually," a substantial fraction of the $4,500 that an average employee's family spends each year (Handel 2013, 2645). Inertia obviously leads to individual welfare losses. But its upside is that it reduces adverse selection, precisely because it retards consumers' tendency to utilize their informational advantage in choosing the insurance plan that is best for them. A welfare analysis that combines both consumer inertia and adverse selection requires a model of how insurers would alter pricing in response to selection pressures. After developing and tested such a model, Handel concludes that "where insurance prices endogenously respond to different enrollment and cost patterns, . . . [an intervention that] reduces inertia by three-quarters . . . improves consumer choices conditional on prices, but . . . also exacerbates adverse selection, leading to a 7.7 percent reduction in welfare" (Handel 2013, 2646 (emph. added)). The bottom line is simple, if pardoxical: given the complexities of insurance market equilibria, behavioral failings can actually increase welfare. There is thus no warrant for believing that "correcting" irrational behavior in insurance markets is justified on efficiency grounds.

Others have made this point before, but it is worth emphasizing: behavioral decision research has normative implications, but those implications are largely in the realm of means not ends. Eventually, behavioral economics may lead to a new understanding of what constitutes "good" insurance, but the "behavioral" part of behavioral economics has not produced a widely-accepted alternative to expected utility theory as a normative guide. (This is not a criticism of behavioral economics.) For the moment at least, what the behavioral turn can do is help policymakers design better tools for achieving the ends that any pertinent normative theory identifies. For the insurance field, the payoff lies in devising ways to help consumers choose good insurance products, identifying situations in which they are so unlikely to make good choices that stronger regulation is justified, and, with appropriate attention to equilibrium analysis, guiding policymakers in designing regulatory strategies, such as those addressing the extended warranty market.

[5] We do not mean to imply by this that behavioral research is, or should be, directed at determining what is "good" insurance. Behavioral decision research often lacks such a normative ambition.

What we have learned from working through these examples extends beyond insurance. Behavioral economics does provide scope for welfare-enhancing interventions. But, once we admit the existence of non-standard motivations or imperfect reasoning, those interventions must be very carefully tailored to particular circumstances in order to be effective. There is no simple route from identifying a non-standard motivation or a "flaw" in reasoning to recommending an appropriate regulatory policy. Put perhaps too simply, we need psychology to identify how people reason, economics to understand the consequences of that behavior for market equilibrium, and law and other disciplines that reward detailed institutional knowledge to incorporate these insights into regulatory strategies that have a chance of moving the market toward a new, welfare-enhancing equilibrium.

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