Essay

Adverse Selection in Insurance Markets:

An Exaggerated Threat

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INTRODUCTION

The phrase "adverse selection" was originally coined by insurers to describe the process by which insureds utilize private knowledge of their own riskiness when deciding to buy or forgo insurance.[1] If A knows he will die tomorrow (but his insurer does not), life insurance that is priced to reflect the average risk of death in the population as a whole will look like a very good deal to him. Conversely, if B knows she will live for much longer than the average person with her observable characteristics (age, gender, medical condition), insurance that is priced to reflect the average risk of death will seem like a bad deal to her, and she will be unlikely to buy it.

1. Adverse selection has by now assumed a central role in information economics in a variety of contexts that have nothing to do with insurance. The 2001 Nobel Prize in Economics was shared by three economists who did the most to call attention to the inefficiencies created by informational asymmetries—George A. Akerlof, A. Michael Spence, and Joseph E. Stiglitz. Akerlof's classic paper, *The Market for 'Lemons': Quality Uncertainty and the Market Mechanism*, 84 Q.J. ECON. 488 (1970), was the first formal treatment of adverse selection; Akerlof borrowed the phrase from the insurance literature. These additional applications of adverse selection are beyond the scope of this Essay, which focuses exclusively on insurance markets.

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When *A* buys lots of insurance and *B* buys none, insurers find themselves charging an average rate to a population that contains only the worst risks, and end up losing money by virtue of having their product selected only by high-risk individuals.[2]

But informational asymmetry may not just be bad for insurers. When insurers cannot distinguish between good and bad risks, theory predicts that it is possible (although not necessary) to end up with no coverage for anyone: As the good risks begin to exit, the average quality of those insureds remaining falls and prices rise in a vicious circle, ending in a so-called "death spiral" where no one is covered.[3] Even when insurance is available, it may be inefficiently distorted by the presence of adverse selection. Many theoretical models conclude that when adverse selection is a problem, good risks will be rationed: They will be allowed to purchase only limited coverage in an attempt to make such coverage less attractive to the bad risks, who would otherwise be eager to purchase it given its favorable price.[4]

As we will see, courts, policymakers, and legal academics routinely—and often uncritically—discuss adverse selection as a major issue in the design and regulation of insurance markets. In addition, economists have devoted scores of articles to the subject over the last decade. But the thesis of this Essay is that although theory demonstrates that adverse selection can occur, and some instances have certainly been documented, neither the theoretical models nor the empirical studies provide much support for its widespread importance in insurance markets. The nature of selection pressures turns out to be vastly more complicated than the rhetoric of courts and academic commentators would suggest. And while the economic theory of adverse selection in insurance markets has become enormously sophisticated, much of it is devoted to rarified analysis of the nature and

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2. The insurer-centered view of adverse selection was nicely captured by one judge, who wrote that

> "[a]dverse selection" is jargon which means exactly the opposite of what it says. It has nothing to do with selection [of insureds by an individual insurer]. It is the opposite . . . . [tendency of] younger/healthier subscribers to [switch to] a different company with a more comprehensive preventive health plan, [and leave the previous insurer] with an older, less healthy population, causing its claims costs per subscriber to increase.

Ocean State Physicians Health Plan, Inc. v. Blue Cross & Blue Shield of R.I., 692 F. Supp. 52, 59 (D.R.I. 1988), *aff'd*, 883 F.2d 1101 (1st Cir. 1989). For a recent summary of the various strands in the economic theory of adverse selection as applied to insurance markets, see Georges Dionne et al., *Adverse Selection in Insurance Markets, in* HANDBOOK OF INSURANCE 185 (Georges Dionne ed., 2000). The much smaller body of empirical literature is summarized in Pierre-André Chiappori, *Econometric Models of Insurance Under Asymmetric Information, in* HANDBOOK OF INSURANCE, *supra*, at 365, and in Georges Dionne, *The Empirical Measure of Information Problems with Emphasis on Insurance Fraud, in* HANDBOOK OF INSURANCE, *supra*, at 395.

3. *See infra* Section III.C.

4. As noted in Part III, the assumption here is that competitive markets ensure that policies are priced to earn zero economic profits.

existence of equilibria. It has thus managed to obscure some essential features of insurance demand that may undercut or even reverse the typical adverse selection results. In short, while adverse selection in insurance markets is clearly a possibility, it is often not the serious problem that it is taken to be. Courts, policymakers, and legal academics need to do much more than trumpet a concern for adverse selection as a justification for their preferred course of action.[5] And economists need to develop less obscure and more realistic models, and pay more attention to the empirical issues (as indeed they are beginning to do).

This Essay is organized as follows. Part I describes the importance ascribed to adverse selection in insurance markets by courts, regulators, and legal commentators. The common theme of these actors' analyses is that adverse selection is an extremely significant problem—one that justifies deference to longstanding common law doctrines in tort and contracts and a hands-off attitude with regard to insurance regulation.

In Part II, I briefly explain the theory of adverse selection as developed in the economics literature, and discuss its implications for the behavior and efficiency of insurance markets. Economic models suggest that adverse selection can cause the outright collapse of insurance markets and will *always* produce rationing and various other forms of inefficiency. But while enormously sophisticated, these economic theories are, I suggest, ill-suited for the (often rather casual) reliance that is placed on them by courts and commentators.

Part III considers the assumptions and predictions of the adverse selection model and compares them with the existing empirical evidence. After some preliminary questions, I focus on three issues: First, can insureds actually outpredict their insurers, as adverse selection theory requires, and does this lead the worst risks to buy more insurance? Second, are adverse selection "death spirals" a serious real-world phenomenon? And third, are good risks typically rationed in the amount of insurance they can buy, as adverse selection theory predicts? I answer all three questions largely in the negative.

Part IV considers an alternative model of selection in insurance markets, in which it is the good risks who buy more insurance. The standard adverse selection models assume that insureds are homogenous except for differences in the probability of loss. In particular, everyone is assumed to be equally risk-averse, and there is therefore no relationship between an insured's risk aversion and her riskiness. Once the assumption

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5. While adverse selection is invariably described as a mechanism by which insureds choose whether or not to buy insurance based on information not available to their insurer, insurance companies are known to practice their own version of selection, which may also have pernicious social consequences. This kind of reverse selection by insurers is discussed below. *See infra* Subsection III.B.3.

of homogenous risk aversion is relaxed, however, alternative selection mechanisms become possible. I therefore discuss the theoretical and empirical support for a model of "propitious selection,"[6] in which low-risk individuals are willing to buy insurance even at "unfair" rates. I conclude that propitious selection is at least as plausible as the standard adverse selection story in many cases.

I. ADVERSE SELECTION IN THE POLICY DISCOURSE

It is rare to find a discussion of the functioning of insurance markets that does not mention concerns for adverse selection. George Priest, for example, has suggested that "[a]dverse selection is a problem central to every insurance context, and it dominates the insurance function."[7] In this Part, I briefly discuss some examples of how concerns for adverse selection have been deployed to trump other concerns that might inform policymaking or legal analysis. In some of these instances there may have been a legitimate concern that good risks would drop out of the insurance pool and that bad risks would remain in it, with unfavorable consequences. But appeals to adverse selection, often with relatively little factual support, are frequently an important—even decisive—factor in legal decisionmaking and in policy debates.

A. *Justifying Public Policy*

1. *Civil Rights*

Consider the Equal Employment Opportunity Commission's (EEOC) guidelines for interpreting the Americans with Disabilities Act (ADA) in the context of employer-offered health insurance. The ADA prohibits discrimination on the basis of disability in any aspect of employment, which has been interpreted to include the provision of insurance benefits related to work.[8] This would ordinarily mean that an employer could not exclude persons with disabilities (such as AIDS or HIV infection) from coverage under its insurance plan. But the EEOC apparently had concerns that including high-cost/high-risk individuals (such as those with HIV) in a pool of low-cost/low-risk workers would raise the average premium so much that healthier individuals might decline to purchase insurance

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6. The term is attributed to David Hemenway, although the theory seems to have been developed independently by several authors. *See* David Hemenway, *Propitious Selection*, 105 Q.J. ECON. 1063 (1990); *see also infra* note 140.

7. George L. Priest, *The Current Insurance Crisis and Modern Tort Law*, 96 YALE L.J. 1521, 1541 (1987).

8. *See* 42 U.S.C. § 12,112(a) (2000); 29 C.F.R. § 1630.4 (2004).

altogether, leading, in the extreme, to the destruction of the entire insurance pool. Hence, under the EEOC's guidelines, an employer can justify excluding persons with disabilities from insurance coverage if it can show that

> the challenged insurance practice or activity is necessary (i.e. that there is no nondisability-based change that could be made) to prevent the occurrence of an unacceptable change either in the coverage of the health insurance plan, or in the premiums charged for the health insurance plan. An "unacceptable" change is a drastic increase in premium payments ... that would [among other things] ... make the health insurance plan so unattractive as to result in significant adverse selection.[9]

Of course, the practical impact of this exception depends on how stringently the EEOC and the courts apply the requirements it sets out.[10] For present purposes, however, what matters is that an agency otherwise committed to vigorous pursuit of a civil rights agenda has recognized that it might need to temper its goals because of adverse selection problems created by the equal treatment it would otherwise favor.

2. *Antitrust*

In the mid-1980s, a group of doctors and their HMO brought an antitrust claim against fee-for-service insurer Blue Cross & Blue Shield of Rhode Island.[11] Blue Cross & Blue Shield feared that it would lose younger, healthier customers to HMOs, which offered more comprehensive preventive health plans, leaving it with an older, frailer, and more costly pool of insureds. It therefore implemented a series of changes in its pricing policies and coverage to prevent the erosion of its customer base. Among these innovations was an "adverse selection policy," under which "employers were offered three different rates for Blue Cross & Blue Shield indemnity coverage," depending on whether they offered: (1) "only ... traditional Blue Cross & Blue Shield coverage" (the lowest rate);

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9. *EEOC: Interim Guidance on Application of ADA to Health Insurance*, 8 Lab. Rel. Rep. (BNA) No. 724, at 405:7121 (June 8, 1993). The document defines adverse selection as the "tendency of people who represent poorer-than-average health risks to apply for and/or retain health insurance to a greater extent than people who represent average or above average health risks." *Id.* at 405:7121 n.16.

10. *See, e.g.*, Anderson v. Gus Mayer Boston Store of Del., 924 F. Supp. 763 (E.D. Tex. 1996) (acknowledging the EEOC guidelines cited above, but refusing to grant the employer summary judgment as to whether the exclusion of the plaintiff-employee from the employer's health insurance plan was justified because inclusion would have resulted in undue hardship to the employer and other employees).

11. *See* Ocean State Physicians Health Plan, Inc. v. Blue Cross & Blue Shield of R.I., 692 F. Supp. 52 (D.R.I. 1988), *aff'd*, 883 F.2d 1101 (1st Cir. 1989).

(2) "traditional Blue Cross & Blue Shield, a competing HMO and [Blue Cross & Blue Shield's HMO-substitute] HealthMate" (an intermediate rate); or (3) "traditional Blue Cross & Blue Shield and a competing HMO . . . [without] HealthMate" (the highest rate).[12] This plan was designed to give employers an incentive to offer HealthMate and *not* to offer a rival HMO to their employees. Plaintiffs claimed that this behavior violated antitrust laws, because in many other contexts, offering a discount to dealers who agreed not to carry a rival's products would constitute a violation of the Sherman Act.[13] But in holding that there was no antitrust liability, the court reasoned that "[neither party] dispute[d] that adverse selection was a fact. Healthier persons would tend to enroll in an HMO. If they did so, then without doubt Blue Cross & Blue Shield would be left with more expensive subscribers."[14] Regardless of the merits, it is clear that the need to prevent adverse selection served to trump what would otherwise have been legitimate antitrust concerns, and allowed the defendant's practices to escape careful judicial scrutiny.[15]

3. *HIPAA*

Adverse selection also played a role in the debate over the portability of health insurance. Policymakers were concerned that workers with chronic medical conditions would find it impossible to switch employers because they would risk losing their health insurance due to the "preexisting conditions" exclusion in most healthcare policies. In 1996, Congress passed the Health Insurance Portability and Accountability Act (HIPAA) of

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12. *Id.* at 59. While not technically an HMO, HealthMate was a Blue Cross & Blue Shield product designed to mimic the structure of an HMO and appeal to the same kinds of customers who would find an HMO an attractive option.

13. A firm with substantial market share that attempted to limit competitors' market access, as Blue Cross did in *Ocean State*, would also likely run afoul of section 3 of the Clayton Act, which states that

> [i]t shall be unlawful for any person engaged in commerce [to] . . . fix a price charged . . . or discount from, or rebate upon, such price, on the condition, agreement, or understanding that the lessee or purchaser thereof shall not use or deal in the goods . . . of a competitor or competitors of the lessor or seller, where the effect of such lease, sale, or contract for sale of such condition . . . may be to substantially lessen competition or tend to create a monopoly in any line of commerce.

15 U.S.C. § 14. For a recent example in the market for chewable snuff, see Conwood Co. v. U.S. Tobacco Co., 290 F.3d 768 (6th Cir. 2002), *cert. denied*, 537 U.S. 1148 (2003).

14. *Ocean State*, 692 F. Supp. at 70.

15. For an analysis sympathetic to such antitrust concerns, see Jonathan B. Baker, *Vertical Restraints Among Hospitals, Physicians and Health Insurers That Raise Rivals' Costs: A Case Study of* Reazin v. Blue Cross and Blue Shield of Kansas, Inc. *and* Ocean State Physicians Health Plan, Inc. v. Blue Cross and Blue Shield of Rhode Island, 14 AM. J.L. & MED. 147 (1988). More recently, the Rhode Island district court held that a plan similar to the one at issue in *Ocean State*, and designed with the same kind of adverse selection problems in mind, *was* subject to antitrust scrutiny. *See* United States v. Delta Dental of R.I., 943 F. Supp. 172 (D.R.I. 1996) (refusing to grant the defendant's motion to dismiss).

1996,[16] which "requires group insurers and plans to make their health insurance coverage available to anyone who has had health insurance and who otherwise meets HIPAA's coverage eligibility requirements."[17] Under the statute, HMOs are permitted to deny coverage to a job-switcher only for conditions that occur during a two-month "affiliation period" immediately after the start of the new employment.[18] But out of concern for adverse selection, the statute allows HMOs to "use alternative methods ... to address adverse selection as approved by the ... official or officials designated by the State."[19] Once again, the bottom line is that policymakers believe that adverse selection should curtail efforts to achieve what would otherwise be an important goal.

4. *Annuities, Title VII, and* Manhart

In *Los Angeles Department of Water & Power v. Manhart*, the Supreme Court held that separate annuity rates for men and women violated Title VII of the 1964 Civil Rights Act.[20] Since, on average, women lived longer than men, the employer in *Manhart* had required women to make larger monthly pension contributions in order to receive the same level of periodic annuity payments on retirement. The Court found that such an arrangement constituted discrimination on the basis of sex, and required that employers abandon the use of sex-distinct mortality tables in computing pension contributions. In doing so, the Court rejected the adverse selection argument that since women live longer than men, the latter would find the pension plan unattractive and would differentially drop out. The Court commented that the defendant

> points to no "adverse selection" by the affected employees, presumably because an employee who wants to leave the plan must also leave his job, and few workers will quit because one of their fringe benefits could theoretically be obtained at a marginally lower price on the open market. In short, there has been no showing that sex distinctions are reasonably necessary to the normal operation of the Department's retirement plan.[21]

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16. Pub. L. No. 104-191, 110 Stat. 1936 (codified as amended in scattered sections of 18, 26, 29, and 42 U.S.C.).

17. Jack A. Rovner, *Federal Regulation Comes to Private Health Care Financing: The Group Health Insurance Provisions of the Health Insurance Portability and Accountability Act of 1996*, 7 ANNALS HEALTH L. 183, 186-87 (1998) (footnotes omitted).

18. 29 U.S.C. § 1181(g)(1).

19. *Id.* § 1181(g)(3).

20. 435 U.S. 702 (1978).

21. *Id.* at 716 n.30. While rejecting the importance of adverse selection in this particular instance, the Court left open the possibility that it might have decided the case differently if the defendant had been able to demonstrate significant adverse selection. Moreover, as I point out

Economist George Benston was highly critical of the Court's failure to buy the adverse selection argument in *Manhart*. Writing in the *University of Chicago Law Review*, Benston suggested that the Court had gotten the adverse selection argument badly wrong:

> [T]he effects of adverse selection on the availability of annuities and life insurance should be emphasized. . . . [A]s some males forgo annuities and some females, life insurance, the disadvantages to those remaining increase. At the same time, more females will find it advantageous to buy annuities, and males to buy life insurance. This destructive effect of adverse selection has previously been experienced by insurers. There is no reason to believe that it will not happen again.[22]

Benston's evidence for the existence of adverse selection in annuity markets was, however, weak, and it appears that the market for annuities has not vanished, as he predicted.

5. *Mental Health Insurance*

Concerns about adverse selection also motivated the Massachusetts legislature to intervene in the market for mental health insurance. Here, however, adverse selection concerns were used to *justify* a regulatory intervention in the insurance market, rather than to demonstrate the alleged foolishness or futility of such intervention.

In 1973, Massachusetts passed a statute that required health insurers to provide mental health benefits to persons with general health insurance policies.[23] The statute was enacted in response to the Commonwealth's conclusion

> that the voluntary insurance market was not adequately providing mental-health coverage, because of "adverse selection" in mental-health insurance: good insurance risks were not purchasing coverage, and this drove up the price of coverage for those who otherwise might purchase mental-health insurance. The legislature believed that the public interest required that it correct the insurance market in the Commonwealth by mandating minimum-coverage levels, effectively forcing the good-risk individuals to become part of the risk pool, and enabling insurers to price the

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below, the *Manhart* decision is something of an anomaly, since adverse selection arguments have generally fared quite well in federal courts. *See infra* Section I.C.

22. George J. Benston, *The Economics of Gender Discrimination in Employee Fringe Benefits: Manhart Revisited*, 49 U. CHI. L. REV. 489, 541 (1982) (footnote omitted).

23. 1973 Mass. Acts 1427 (current version at MASS. GEN. LAWS ANN. ch. 175, § 47B(a) (West Supp. 1998)).

insurance at an average market rather than a market retracted due to adverse selection.[24]

The Massachusetts mental health example makes it clear that there is no necessary ideological or political bias to adverse selection arguments: They can be used to justify intervention or to condemn it; they can support state programs that amount to progressive taxation or undermine the goals of civil rights legislation. For example, adverse selection concerns are sometimes used to support a universal coverage, single-payer national health insurance program: With universal coverage, everyone is insured, so there can be no adverse selection.[25] If adverse selection in health insurance turns out not to be as serious a problem as is sometimes believed, then one argument for national health insurance would obviously be weakened.[26]

B. *Adverse Selection in Markets for Liability Insurance*

Legal academics often use adverse selection to criticize judicial departures from longstanding common law principles, especially in tort and insurance law. The underlying theme of many such critiques is that traditional tort and insurance doctrines that limit tortfeasors' (or insurers') liability prevent adverse selection in the market for liability insurance. It is alleged that relaxing these limits on insureds' recovery could lead to adverse selection and the collapse of insurance markets. Hence, expansive readings—whether of victims' rights in tort or of injurers' insurance policies—are said to be ill-advised and counterproductive.

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24. Metro. Life Ins. Co. v. Massachusetts, 471 U.S. 724, 731 (1985). As of 2000, nineteen states had passed some form of "mental health parity" legislation that required insurers to offer mental health coverage, and legislation was pending in several additional states. *See* Maria A. Morrison, *Changing Perceptions of Mental Illness and the Emergence of Expansive Mental Health Parity Legislation*, 45 S.D. L. REV. 8, 14 (2000). Adverse selection may not have played as explicit a role in the adoption of such legislation as it did in Massachusetts, but cost concerns were clearly a factor. *See id.* at 10.

25. *See, e.g.*, Alain Enthoven & Richard Kronick, *A Consumer-Choice Health Plan for the 1990s*, 320 NEW ENG. J. MED. 29 (1989) (arguing for universal coverage to prevent adverse selection).

26. The analysis here is extremely complex, however. First, the empirical evidence on the (un)importance of adverse selection in health insurance—discussed below—is still relatively thin. *See infra* Subsection III.B.2. Second, even if adverse selection is not a serious threat to health insurance, it may be that the measures taken by insurers to successfully prevent such selection are welfare-reducing in and of themselves. For example, insurers may attempt to engage in "cream-skimming" (selecting only the best risks from among applicants) in order to offset adverse selection by insureds. *See infra* Subsection III.B.3.b. But cream-skimming may diminish welfare by as much as the adverse selection it forestalls, so that even in the absence of proof of adverse selection, we might still conclude that a move to national health insurance would be preferred to the alternative, insurer-initiated methods for avoiding adverse selection.

1. *The Insurance Crisis of the Mid-1980s*

Perhaps the most prominent proponent of the adverse selection consequences of expanded tort liability is George Priest. Writing in 1987, Priest asserted that rising premiums and the unavailability of insurance coverage for certain kinds of liability during the mid-1980s constituted a crisis triggered by an expansion of tort doctrines and of insurer liability.[27] In particular, he claimed that

> judicial compulsion of greater and greater levels of provider third-party insurance for victims. . . . [and] [t]he progressive shift to third-party corporate insurance coverage . . . has systematically undermined insurance markets. . . . The collapse [of these markets] is signalled by the accelerating conversion to self-insurance. This conversion, in turn, forces insurers to exact drastic premium increases, as well as to restructure the terms of the basic insurance policy, in order to salvage a market among remaining insureds. Where these salvage efforts have proven unsuccessful, insurers have refused to offer coverage altogether.[28]

In other words, Priest's view is that expanded tort liability led to a series of adverse selection death spirals in markets for some specialized kinds of liability insurance. To compensate for higher liability to their insureds, insurers demanded higher premiums. In reaction, the least risky insureds dropped out of the insurance pool, leaving those remaining with even larger premiums. The result, according to Priest, was a self-sustaining cycle of premium increases and withdrawals by insureds, leading ultimately to a complete collapse of certain segments of the liability insurance market. Whether or not Priest was correct,[29] his argument concerning the link

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27. *See* Priest, *supra* note 7.

28. *Id.* at 1524-25.

29. Although Priest relies on an adverse selection explanation for the insurance crisis, he can be criticized for failing to appreciate the importance of asymmetric information as a requirement for adverse selection. His scenario of competitive unraveling

> rests crucially on the dual assumptions that insurance companies cannot differentiate between low- and high-risk insureds, but that the insureds themselves can. If either assumption fails, the unraveling would not take place. If insurers could differentiate between high- and low-risk insureds, they could eliminate the cross-subsidization by charging different premiums to consumers with different risks. If the insureds themselves could not differentiate their risks under a new legal rule, they would be in no better position than the insurance companies to assess whether they are subsidizing others in the risk pool or being subsidized.

Ian Ayres & Peter Siegelman, *The Economics of the Insurance Antitrust Suits: Toward an Exclusionary Theory*, 63 TUL. L. REV. 971, 984-85 (1989) (footnote omitted).

　　　Other observers have offered alternative explanations of the crisis. *See, e.g.*, Steven P. Croley & Jon D. Hanson, *What Liability Crisis? An Alternative Explanation for Recent Events in Products Liability*, 8 YALE J. ON REG. 1 (1991) (arguing that recent changes in liability insurance may be efficient, and therefore beneficial); Kyle D. Logue, *Toward a Tax-Based Explanation of*

between developments in tort and insurance law doctrines and the effects on insurance markets via adverse selection has been very influential.[30]

2. *Directors' and Officers' Liability Insurance*

Roberta Romano makes a similar point in her analysis of the failure of the market for directors' and officers' liability insurance during the mid-1980s.[31] In her view, the problem did not arise because judicial activism during the 1980s created a new set of substantive legal doctrines subjecting corporate officers to liability.[32] Instead, she largely places the blame on expansive judicial interpretations of insurance contracts, under which courts piled on risks ex post that policies were not priced to cover ex ante. This led insurers to raise prices, and insureds to self-insure or drop out of the market, which in turn led to its eventual collapse.[33]

3. *Pollution Coverage*

Businesses traditionally purchased liability insurance that was written on a standard Commercial General Liability (CGL) form, prepared by the Insurance Services Office (ISO), as it was then known.[34] This standard CGL policy provided for uniform limited coverage and exclusions. The so-called "pollution exclusion" maintained coverage for liability arising from "sudden and accidental" pollution, but was originally designed to exclude coverage for long-term or gradual pollution arising from, for example,

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the *Liability Insurance Crisis*, 82 VA. L. REV. 895 (1996) (arguing that, whatever its initial cause, the crisis was made worse by insurers' responses to anticipated changes in tax laws during the mid-1980s); Ralph A. Winter, *The Liability Crisis and the Dynamics of Competitive Insurance Markets*, 5 YALE J. ON REG. 455 (1988) (arguing that the crisis was an extreme dip in the natural cycles of the property and casualty insurance markets). For Priest's response to some of his critics, see George L. Priest, *The Antitrust Suits and the Public Understanding of Insurance*, 63 TUL. L. REV. 999 (1989). An excellent overview of these issues can be found in Seth J. Chandler, *Insurance Regulation, in* 3 ENCYCLOPEDIA OF LAW AND ECONOMICS: THE REGULATION OF CONTRACTS 837 (Boudewijn Bouckaert & Gerrit De Geest eds., 2000).

   30. Over the past sixteen years, Priest's original article has been cited in nearly 300 other law review publications.

   31. *See* Roberta Romano, *What Went Wrong with Directors' and Officers' Liability Insurance?*, 14 DEL. J. CORP. L. 1, 27 (1989).

   32. *See id.* at 21 ("[S]ubstantive doctrine concerning the largest and most expensive category of D&O claims . . . has not undergone radical expansion or even major change since the 1970s.").

   33. Professor Romano explains:
> When courts rewrite an insurance contract, the price insurers received will not have been commensurate with the risk they actually bore. Higher premiums are necessary on new policies, with terms identical to older, cheaper policies, to compensate the insurer for the court-added risk. To the extent that the losses are within the insured's control [or knowledge], . . . the new risks being placed on insurers may be so difficult to assess as to be uninsurable, which could lead insurers to withdraw from the market.

Id. at 29-30.

   34. For a brief description of the CGL market, see Ayres & Siegelman, *supra* note 29, at 974-75.

illegal dumping of hazardous materials.[35] In 1986, however, the ISO revised its standard CGL form to drop all coverage for pollution liability, even when due to "sudden or accidental" pollution.[36]

Kenneth Abraham argues that the reason for the withdrawal of pollution liability coverage was that courts gave an expansive reading to the phrase "sudden or accidental" in the CGL policy. He asserts that

> gradual pollution is much more likely than a sudden and accidental discharge to result from the inherent character of the insured's operations than from an unintended mishap. If gradual pollution were nonetheless insured [as it would be under the expansive interpretation of "sudden and accidental"], losses that in effect are predictable costs of doing business would be charged against the insurer rather than the business. The risk of adverse selection by firms that could predict such losses would thereby be increased.[37]

In other words, if policies could not be limited to "sudden and accidental" discharges, coverage for any kind of pollution liability might be impossible. The reason is that insureds may know more than their insurers do about risks that are not "sudden or accidental," enabling them to select against their insurer, so that only the bad risks would choose to purchase insurance.[38]

C. *Summary*

The examples above demonstrate that concerns for adverse selection in insurance markets are widespread and influential. Institutional actors and legal academics often claim that the outcomes of cases or certain regulatory proposals are ill-advised because they create an adverse selection problem. Yet these claims are often based on relatively little evidence other than anecdote, and are made with little more than a nod toward the theoretical literature.

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35. Kenneth S. Abraham, *Environmental Liability and the Limits of Insurance*, 88 COLUM. L. REV. 942, 952-53 (1988).

36. Ayres & Siegelman, *supra* note 29, at 975.

37. Abraham, *supra* note 35, at 953. As examples of such expansive interpretation, Abraham cites *Buckeye Union Insurance Co. v. Liberty Solvents & Chemicals Co.*, 477 N.E.2d 1227 (Ohio Ct. App. 1984), *abrogated by* Hybud Equip. Corp. v. Sphere Drake Ins. Co., 597 N.E.2d 1096 (Ohio 1992), and *Jackson Township Municipal Utilities Authority v. Hartford Accident & Indemnity Co.*, 451 A.2d 990 (N.J. Super. Ct. Law Div. 1982). Abraham, *supra* note 35, at 963.

38. While plausible, Abraham's story is not a perfect fit with reality. For example, several insurers wished to continue using the old CGL form (with pollution coverage), and the decision to drop pollution coverage was apparently made by the ISO only after some arm-twisting by a small group of insurers. As Professor Ian Ayres and I asked, "If the occurrence form (with the pollution . . . coverage) was unprofitable, why should a boycott have been necessary to get the industry to abandon it? If the old form was a guaranteed money loser, why were many firms seemingly so wedded to it . . . ?" Ayres & Siegelman, *supra* note 29, at 988.

As a crude gauge of the impact of adverse selection arguments, I examined all sixty-five published federal court opinions that use the phrase "adverse selection."[39] Of the forty-five relevant cases, the party that was favored by the use of an adverse selection argument prevailed in thirty-three of them. The court found for the party that was "disfavored" by an adverse selection argument in twelve cases, giving adverse selection arguments a win rate of just over seventy-three percent.[40] Of course, it is often unclear whether the adverse selection argument is doing the work of convincing judges, or is merely a makeweight. Not even a detailed textual analysis could reveal exactly what role adverse selection concerns played in determining the outcome of these cases. Nevertheless, the pattern is quite striking: When judges choose to acknowledge the existence of adverse selection, they usually do so not to minimize its importance, but to justify the underlying behavior of the party for whom adverse selection is a concern.

In the rest of this Essay, I explore the theory and empirical evidence on the nature and prevalence of adverse selection.

II. THE ECONOMIC THEORY OF ADVERSE SELECTION

The theory of adverse selection in insurance markets was first developed by Michael Rothschild and Joseph Stiglitz.[41] Their model has had a huge influence in economics, and a substantial impact on legal scholarship concerning insurance markets. It is therefore important to

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39. I searched in the Lexis "Federal Court Cases, Combined" database on October 18, 2003, for the phrase "adverse selection." Fifteen of the sixty-five opinions either did not involve insurance or were other dispositions of the same case, leaving a total of fifty relevant cases. In five of these cases, it was not clear which side won, or not clear which side the use of adverse selection favored, leaving a total of forty-five usable cases.

40. It should go without saying that one needs to be extremely careful in generalizing about real-world practices on the basis of a sample of cases that generate published opinions. The reason is that such cases are not a random sample of real-world practices, but could be biased by many factors such as the parties' stakes in the litigation. *See* George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1 (1984). I am attempting to use these cases, however, only to show how adverse selection arguments fare in court. In that regard, the seventy-three percent win rate is noteworthy, given Priest and Klein's prediction of a fifty percent rate. Of course, this prediction only holds when the parties have the same stakes, and it is very difficult to say much about the symmetry of stakes in this context.

41. Michael Rothschild & Joseph Stiglitz, *Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information*, 90 Q.J. ECON. 629 (1976). It is important to bear in mind that Rothschild and Stiglitz were not concerned with modeling real-world insurance market institutions so much as establishing the theoretical point that competitive markets may not function properly (or indeed, at all) in the presence of asymmetric information—for example, the authors assume away any cost of providing insurance apart from paying claims. Thus, any translation from the theory to the real world should be viewed with caution. Rothschild and Stiglitz themselves asked whether "these theoretical speculations tell us anything about the real world." *Id.* at 648. Their conclusion was that "[i]n the absence of empirical work it is hard to say." *Id.*

understand what their work does and does not claim. Most significantly, the original theory of Rothschild and Stiglitz does not purport to offer a realistic assessment of how actual insurance markets work. Rather, it presents a simple model, devoid of institutional detail, that demonstrates that normal theoretical conclusions about the optimality—and even the existence—of a competitive market equilibrium can fail in the presence of asymmetric information. The model is a formal treatment of what *can* happen; it should not be read as a description of what actually *does* occur in insurance markets. To see why this is so, it is worth examining the model in some detail.

In the Rothschild-Stiglitz model, a competitive and unregulated insurance industry sells policies to a population consisting of two groups. The first group (Frails) has a greater likelihood of suffering a loss—such as an accident or illness—that would require a payout from the insurer than does the second group (Strongs). For ease of exposition, suppose that the Frails have a 60% probability of loss while the Strongs have a 20% probability, that the size of a loss is fixed at 100 for both groups, and that each group comprises one-half of the population.[42] Crucially, the model also contains the "bald assumption" that insurers cannot identify who is in which group, but that individuals know which group they are in.[43] A final important assumption is that each insurer takes the behavior of every competitor as fixed or given: This means that each firm maximizes its own profits, given the assumed behavior of its rivals.

Since the model also assumes away any costs of conducting business apart from the payouts on insured losses,[44] an insurer's profits are just the difference between the premiums it collects and the payouts it has to make. That is, if the premium collected from all of a firm's insureds is I, the probability of a loss is p, and the size of the loss is L, then the firm's profit is $I - pL$.

Rothschild and Stiglitz consider two possible types of equilibria that might exist in such a market.[45] In the first, both Strongs and Frails purchase a single insurance policy, forming a common insurance pool or "pooling" equilibrium. In the second, Strongs and Frails purchase different policies, leading to a "separating" equilibrium—or possibly to no equilibrium at all.

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42. As we will see, the ratio of the two groups' size can play an important role in determining whether or not any equilibrium is possible in the market.

43. Rothschild & Stiglitz, *supra* note 41, at 632.

44. In this simple world insurers have no underwriting or sales costs; they also earn no investment income.

45. The authors only consider Cournot-Nash equilibria—that is, equilibria in which each firm acts independently of others, and in which there are no insurance contracts that produce expected losses and no opportunities for additional contracts that would yield expected profit. *See* Rothschild & Stiglitz, *supra* note 41, at 633.

The potential for each of these different types of equilibria to result from such a model is discussed in the following two Sections.

A. *Nonexistence of a Pooling Equilibrium*

It is simple to show that there is no "pooling" equilibrium possible in the Rothschild-Stiglitz model. We begin by noting that any pooled policy must break even: If it earns losses for the insurer, it will be withdrawn; if it earns positive economic profits, a competitor will introduce an identical policy priced slightly more favorably and steal all the insureds. This means that the equilibrium-pooled premium must be "actuarially fair," one that just breaks even when sold to the population as a whole. In our example, the population as a whole has an average risk of 40% of experiencing a loss of 100, so the premium must be 40.

Notice, however, that when both types of insureds purchase the same policy, the Strongs subsidize the Frails, because the Strongs have a lower probability of loss (20% versus 60%). The Strongs are thus overpaying, since they could get a better premium (20%) if they could buy a "Strongs-only" policy. This means that there will always be another policy that a rival could offer that would have somewhat less coverage at a slightly better rate, and that would attract all the Strongs from the pooled policy—provided the new policy is properly designed so as to attract the Strongs without simultaneously attracting any of the Frails.[46] Hence, a pooled policy cannot provide an equilibrium.

B. *Separating Equilibrium or No Equilibrium*

1. *Self-Selection via a Menu of Insurance Contracts*

The alternative to a pooling equilibrium is for insurers to offer separate contracts to each group. The trick here is that even though the insurers cannot identify insureds by type, it is possible to get the purchasers to self-select, or sort themselves, by offering the right menu of contracts. In particular, the separating equilibrium involves two contracts, either of which can be purchased by anyone, but each of which is designed to be attractive to only one group. The first contract is for full insurance, priced at the actuarially fair rate for a pool of high-cost Frails only. The second contract is for partial insurance, priced at the actuarially fair rate when sold

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46. A policy with deductibles might be one method designed specifically to cater to Strongs without attracting Frails. For an example of such a "partial insurance" policy, see *infra* note 47 and accompanying text.

to Strongs only.[47] The amount of coverage must be chosen so that Frails still marginally prefer full coverage at the expensive (Frails-only) rate to partial coverage at the much cheaper (Strongs-only) rate. In such an instance, both policies break even, each group picks a different policy, and nobody wants to switch. Since there is no possibility of luring individuals to switch insurance coverage once such a system exists, the result is an equilibrium.

2. No Equilibrium at All

It is also possible, however, that even a separating equilibrium may not exist. This is an important result highlighted by the Rothschild-Stiglitz model, and can occur for either of two reasons. First, suppose that the Frails are only a small fraction of the population, so that the weighted average premium for a combined Frail/Strong group is essentially the same as for the Strongs alone.[48] It may then be possible to construct a policy that meets two criteria: (1) It is preferred by the Strongs to the rationed or partial insurance contract, under which they receive partial coverage at an actuarially fair rate;[49] and (2) the policy does not immediately lose money for the insurer because the premium is actuarially fair for the combination of Frails and Strongs. The market will thus be driven, temporarily, to a pooled insurance contract, which will then be vulnerable to the same instability discussed in Section II.A. Coverage will thus have a tendency to fluctuate between partial and pooled insurance, yielding no equilibrium at all.

Alternatively, the same result can occur if the Strongs are extremely risk-averse. Intuitively, this means that the costs of separating are very high—the losses from less-than-complete coverage are directly related to the insureds' risk aversion, because partial coverage necessarily entails some exposure to risk. In the limit, for example, if the Strongs were infinitely risk-averse, it would always pay for them to pool with the Frails. No separating equilibrium would ever be reached, any more than it would be in a population with a small number of Frails.

Joseph Newhouse cogently summarizes the dynamic in these two scenarios: "[T]hose who are below average in demand for services (or

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47. Partial insurance is usually interpreted to mean that there is a deductible, so that the insured receives only some fraction, less than one, of her loss as payout from the insurer.

48. When there are very few high-risk individuals, the cost to the Strongs of pooling with the few Frails is very low. Imagine that the world is 99% Strongs and 1% Frails. Then the actuarially fair premium for a pooled policy would be given by $.99(I - 20) + .01(I - 60) = 0$, which implies that the premium would be 20.4. Here, the Strongs pay only 2% more than they would if there were no Frails also buying the same policy.

49. Under the alternative policy, the Strongs pay a little more (to subsidize the few Frails in the insurance pool) but also receive more coverage.

below their group's average) always have an incentive to form a separate group; the remaining bad risks then will attempt to remerge with the good risks and the process keeps repeating itself."[50] It is not completely clear what a market with no equilibrium would look like, but it might oscillate wildly, or collapse entirely.

3. *Other Possibilities*

The characterization of equilibria in markets with adverse selection is a cottage industry in economics. There are dozens of papers demonstrating how the results change if one allows for a monopolistic insurer, or assumes that insurers take each others' reactions into account before deciding which policies to issue, or permits policyholders to subsidize each other, or recognizes that insurers may learn something about their insureds over time.[51] In some models, pooling equilibria are actually possible, but the central conclusions of the Rothschild-Stiglitz model generally survive: Riskier individuals buy more insurance, while less risky individuals buy less; the good risks are often unable to purchase as much insurance as they wish; and there are usually welfare losses associated with selection (at least vis-à-vis a world with symmetric information).

C. *Consequences*

1. *Rationing*

A striking prediction of most adverse selection models is that insurance for good risks will be rationed—that is, Strongs will find themselves unable to purchase as much insurance as they would like at the going rate appropriate to their risk status. Since the insurer cannot tell which group any individual belongs to, the only way to keep the high-risk individuals out of the low-risk pool with its favorable rates is to restrict the amount of insurance *anyone* can buy at the rate appropriate for the low-risk insureds. The low-risk insurance policy must be priced so that it breaks even (or else competitors will enter at a lower price). At such an advantageous price, the only way to make the policy sufficiently unattractive to the high-risk

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50. Joseph P. Newhouse, *Is Competition the Answer?*, 1 J. HEALTH ECON. 110, 113 (1982). This is one mechanism that could generate the so-called "death spiral," described at greater length in Section III.C.

51. *See, e.g.*, Russell Cooper & Beth Hayes, *Multi-Period Insurance Contracts*, 5 INT'L J. INDUS. ORG. 211 (1987) (describing a two-period model in which consumers cannot switch insurers in the second period and insurers cannot renegotiate); Charles Wilson, *A Model of Insurance Markets with Incomplete Information*, 16 J. ECON. THEORY 167 (1977) (proposing a reactive-equilibrium solution that allows firms to react by dropping policies so that they at least break even, and that can thus produce pooling rather than separation under some circumstances).

insureds is to limit the quantity of insurance that can be bought. This limit affects only low-risk individuals, however, since those with high risk can buy all the insurance they want at the higher rate appropriate to them, and indeed will choose to do so on the Rothschild-Stiglitz assumptions.

2. *Welfare*

Economists have continued to be fascinated by adverse selection, and by asymmetric information in general, because it can overturn one of the central tenets of economic theory—that perfectly competitive markets are efficient. Typically, a market with many consumers and producers and full information will exhaust all mutually beneficial trades between buyers and sellers, so that there is no way to make anyone better off without making someone else worse off. Asymmetric information changes all this.

To see the inefficiency of adverse selection, recall that at equilibrium Strongs either cannot purchase any insurance at all or cannot purchase as much as they would like at the actuarially fair price. In such a scenario, it is clear that the market is not functioning optimally. In some models, the equilibrium with adverse selection is "second-best optimal" in the sense that it is impossible to do better as long as the informational asymmetry between insurers and insureds is maintained. But even this result does not always hold—there are some instances in which it is possible to impose corrective taxes or subsidies so as to improve welfare for everyone.[52] Nonetheless, the generally accepted wisdom is that adverse selection can generate inefficiencies—small or significant—for the insurance market. And as Part I demonstrated, many a legal or academic argument has been made under the assumption that such inefficiencies do indeed exist.

III. A CRITIQUE OF ADVERSE SELECTION MODELS

This Part questions such generally accepted wisdom. It argues that there are some serious empirical and theoretical problems with the standard adverse selection story. Part IV continues this critique by proposing an alternative selection mechanism, arguing for its plausibility on theoretical and empirical grounds, and showing that it leads to dramatically different conclusions about how insurance markets function.

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52. As Rothschild and Stiglitz note, "The . . . equilibrium we have described may not be Pareto optimal even relative to the information that is available. . . . [T]here may exist a pair of policies that break even together and that make both groups better off." Rothschild & Stiglitz, *supra* note 41, at 638.

A. *Is There Relevant Informational Asymmetry?*

1. *Information-Processing Requirements*

One obvious question to ask about adverse selection is whether insureds really do know something that their insurers don't—and if they do, what exactly it is. The standard adverse selection models treat "the probability of experiencing a loss" as "primitive": Not only is it determined by factors beyond the insured's control, but it also does not need to be constructed from other features of everyday life. In these models, I just *know* that I have a twenty-five percent chance of having an accident, the same way I know the probability of getting exactly two heads in two flips of a fair coin. I do not have to solve a difficult induction problem in order to compute this probability; there is just a little p attached to me, and I have access to it in an uncomplicated and unmediated way.

In real life, of course, the probability of a loss or an accident is almost never an objectively measured occurrence that is as straightforward as the coin-flip example. Consider the probability that I will have an automobile accident over the next year. This obviously depends in a complex way on a large number of variables: the amount I drive and the style in which I do so, the type of car I have, when and where I drive, and so on. All of these facts must be weighted and aggregated to come up with a single number that measures the probability that I will have an accident. In the process of constructing or estimating my p, all kinds of biases and random errors will inevitably be introduced, most of which are likely to weaken the selective effect of any private information I possess. If my estimate of my own riskiness is biased (systematically too low or too high), or imprecise (accurate on average, but with a high degree of uncertainty attached), it will be a poor guide for my future behavior. Moreover, the worse my estimate is, the more likely it is that my insurer will be able to do better than I can, even if I have information that the insurer does not. These ideas are fleshed out below.

Consider automobile insurance. We begin by distinguishing between two types of information, public and private. Public information such as the insured's age or previous driving record is available to both the insured and her insurer. Private information such as the insured's psychological temperament or attitude toward risk is available only to one party (usually the insured).[53] To simplify matters, we can assume that age and

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53. Of course, the public-private distinction is far from watertight. Even private information can presumably be uncovered by the insurer at sufficiently high cost—for example, through a psychological examination. The point is simply that the insured probably knows more about herself than her insurer does, and this additional knowledge may represent an advantage for the insured.

temperament are the only deterministic factors that explain whether someone will get into an accident. Of course there are also random factors such as weather or bad luck that are unpredictable and unknown to either party.

Even someone who knew her own age and temperament would not have direct knowledge of her probability of an accident, however; there must also be some function that maps these facts onto a probability. The standard account of adverse selection assumes that the insurer estimates the probability of an accident based only on the public information—here, the driver's age. The insured is assumed to use age, plus her additional knowledge of temperament, to estimate this same probability. It should be clear that if both parties use the information available to them optimally, the insurance company's prediction will always be worse than the insured's, since the latter is based on additional information.[54]

But this account omits several important sources of error, each of which serves to dilute the selective force of the private information that insureds have.

2. Sources of Predictive Dysfunction

a. Problems of Inference

First, insureds might not know which information is actually relevant to predicting an accident. That is, in predicting the chance of an accident they may ignore relevant private information, such as their temperament, or falsely include irrelevant information, such as the fact that their car has leather seats. Moreover, even if the insured uses all and only the relevant factors to predict her own riskiness, she may not do so correctly. That is, she may not appropriately weight or aggregate the information she has to reach a final estimate of her own risk of an accident.[55]

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54. This assumes that the information-processing costs are the same for both insurer and insured. We should not be so cavalier in making this assumption. Indeed, I argue below that at least in some contexts (automobile accident risks), insureds may know something about themselves that their insurers don't, but translating that knowledge into a judgment about how much insurance to buy is actually quite costly to insureds. Put another way, a cost advantage in information processing by insurers might offset some or all of the informational advantage of insureds. I thank Prasad Krishnamurthy for bringing this point to my attention.

55. See William M. Grove & Paul E. Meehl, Comparative Efficiency of Informal (Subjective, Impressionistic) and Formal (Mechanical, Algorithmic) Prediction Procedures: The Clinical-Statistical Controversy, 2 PSYCHOL. PUB. POL'Y & L. 293, 315 (1996) ("Humans simply cannot assign optimal weights to variables, and they are not consistent in applying their own weights.").

b. *Systematic Versus Random Factors*

A second issue concerns the role of randomness in predicting risks. Whether or not one gets into an automobile accident is influenced by a variety of factors such as those described earlier—age, experience, driving speed, and driving habits. But even if she knew all these variables and many, many more, it would be impossible for any individual to predict with certainty whether she would be involved in an accident over the next year, because there would always be relevant information that nobody knew. That is, even among a group of people who are the same age, drive the same car at the same speed, and so on, there will still be some who get into accidents and others who do not. What differentiates the subgroup of people who have accidents from their identical peers who do not are factors we cannot observe, which we typically refer to as "luck" or random error.

By assumption, the error has a zero mean, so on average it neither increases nor decreases the estimated probability of an accident. But the key issue is the variance or variability of the error, which determines how much of the estimated probability is explained by public and private information together, and how much is due simply to luck—that is, to unknowable factors. Even if insureds have information their insurers don't (e.g., information about their own driving style), and even if they can use this information to make better forecasts of their risk of getting into an accident than their insurer can, this improved prediction might do little good if luck mostly determined whether there would be an accident, and luck were not reflected in either the public or private information. In other words, adverse selection requires not only that insureds have private information, but also that they have relevant private information—knowledge that is strongly correlated with the risk that both they and their insurers are trying to predict.[56]

3. *Empirical Evidence on Self-Assessments of Riskiness*

Whether people are accurate judges of their own riskiness is ultimately an empirical question, about which there is relatively little direct evidence.

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56. One might imagine trying to run a (probit) regression to predict whether or not an individual will have an accident next year. The dependent variable would be whether there was an accident (coded 1) or not (coded 0). The insurer's regression would attempt to explain accidents by observable variables such as age, gender, years of experience, type of car, and so on. Now, suppose we were somehow given access to each insured's private information on, say, driving style. The addition of driving style to the regression would necessarily raise the equation's explanatory power as measured by its R^2 coefficient (as long as driving style is independently related to the likelihood of an accident). But if most of what determines accidents is luck, the incremental increase to R^2 would be very small; the informational advantage that insureds have would then not be worth very much, because most of what determined accident probabilities would be "noise" that is not known to anyone.

An ideal study for these purposes would have the structure of a predictive "horse race." We would begin by asking people to predict the likelihood that they would experience some outcome (automobile accident, heart attack) in the future. Using publicly available data about individuals (age, gender, smoking status), we would then develop an econometric model that attempted to predict the same probabilities, in much the same way that an insurer would. Finally, we would compare each of the two predictions with actual events, to see which forecast turned out to be more accurate.

Such studies are difficult to conduct. There is, however, some direct evidence about how well people can predict outcomes in their own lives, and this evidence does not seem to support the typical adverse selection story. For example, there have been some attempts to assess whether the elderly can predict the likelihood of attaining a given age, with some studies finding that subjects did a reasonably good job of predicting how long they would live.[57] In more recent work, however, John Cawley and Tomas Philipson compared survey evidence in which retirees were asked to predict their likelihood of living to the age of seventy-five or eighty-five with the actual mortality experience of these people. They concluded that there was only "a rather weak dependence between self-perceived and actual risk" of death.[58] In other words, people could not forecast their own demise very well. There is, however, still some dispute on this question.[59]

In a famous study, Ola Svenson tested the accuracy of people's forecasts of their own riskiness not by comparing predicted with actual riskiness, but in relative terms.[60] Svenson found that 46.3% percent of U.S. drivers surveyed believed that they were among the top twenty percent safest drivers.[61] The drivers in Svenson's survey obviously had access to

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57. *See, e.g.*, Daniel S. Hamermesh, *Expectations, Life Expectancy, and Economic Behavior*, 100 Q.J. ECON. 389 (1985).

58. John Cawley & Tomas Philipson, *An Empirical Examination of Information Barriers to Trade in Insurance*, 89 AM. ECON. REV. 827, 841 (1999).

59. In a recent paper, Michael Hurd, James Smith, and Julie Zissimopoulos compare a person's self-assessed mortality risk with her decision about when to start claiming Social Security benefits. Economic theory predicts that those who expect to live longer should delay claiming, in effect purchasing a larger annuity for their retirement years. But among those less than 62 years old, persons who rate their chances of surviving to age 85 to be 0% do not retire earlier than those who give themselves a 50% chance of surviving to age 85—suggesting either that such ratings of individuals' own chances of survival are poor indicators of their true beliefs, or that the decision of when to begin claiming Social Security benefits is not a fully rational one for many individuals. MICHAEL D. HURD ET AL., THE EFFECTS OF SUBJECTIVE SURVIVAL ON RETIREMENT AND SOCIAL SECURITY CLAIMING 10 (Nat'l Bureau of Econ. Research, Working Paper No. 9140, 2002), http://papers.nber.org/papers/w9140.pdf. The authors also conclude that subjective estimates of mortality do predict actual mortality fairly well. On average, those who died between the first and second rounds of the survey estimated that they had a .45 probability of surviving to age 75. *Id.* at 7. Those who survived estimated their survival probability to be .65. *Id.*

60. *See* Ola Svenson, *Are We All Less Risky and More Skillful than Our Fellow Drivers?*, 47 ACTA PSYCHOLOGICA 143 (1981).

61. *Id.* at 146.

the full range of evidence about their own riskiness, but many of them could not have been using this information correctly.

In addition to direct evidence—comparing predicted with actual outcomes—we can also consider "indirect" evidence about our inductive abilities. Experiments by Thomas Gilovich, Daniel Kahneman and Amos Tversky, and others have identified dozens of anomalies in the way people make probabilistic judgments.[62] The import of this work is that we are generally not at all good at making inferences from data—we overgeneralize from rare but noteworthy events, misperceive our own differences from baseline data, and so on. The bottom line, as two distinguished psychologists put it, appears to be that "[t]he human brain is a relatively inefficient device for noticing, selecting, categorizing, recording, retaining, retrieving, and manipulating information for inferential purposes."[63] This vast literature strongly suggests that potential insureds— even if they have private information about factors that contribute to their riskiness—are unlikely to be able to turn that information into an accurate assessment of how much more or less risky than average they actually are.

B. *Can Insureds Outpredict Their Insurers?*

As we noted earlier, adverse selection models require not that insureds can accurately forecast their own risk, but rather that they can do so more accurately than their insurers can. If insureds use the private information that they have inaccurately, or if the private information simply is not worth much (because most of what matters is random "noise" that is unknown to either party), it is quite possible that insurers may not find themselves at a significant disadvantage, even though they are limited to public information in making their risk assessments.

The kind of comparison between insureds and their insurers that is required to sustain adverse selection is very difficult to evaluate. But regardless of what that degree of difference may be, studies seem to suggest that insurers are unlikely to find themselves at any predictive disadvantage whatsoever—let alone one sufficient to support adverse selection.

1. *Clinical Versus Statistical Prediction*

Individuals' ability to draw inferences from data has been extensively studied by psychologists under the rubric of "clinical versus statistical

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62. *See, e.g.,* JUDGMENTS UNDER UNCERTAINTY: HEURISTICS AND BIASES (Daniel Kahneman et al. eds., 1982).

63. Grove & Meehl, *supra* note 55, at 316.

prediction."[64] In this literature, an expert (social worker, doctor, guidance counselor, lawyer) is asked to predict the future behavior of a group of subjects (juvenile delinquents, patients, high school graduates, firms). For example, the expert might be asked to predict which individuals will go on to commit further crimes, what each individual's college grade point average will be, or which firms will go into bankruptcy. The expert is typically given a relatively rich set of information about the subjects whose behavior is to be predicted. The expert's predictions are then compared to those of a simple statistical model that also makes predictions of future behavior, typically based on a more limited information set than was available to the clinician.[65] Surveying 136 such studies across a wide variety of contexts and settings, William Grove and Paul Meehl concluded that the statistical method significantly outperformed the clinical method 47% of the time, while the two methods were essentially equivalent in an additional 47% of studies; the experts outperformed the actuarial model in only 6% of the studies.[66]

These results are significant in this context for two reasons. First, the clinicians being studied were all experts with professional training in making these kinds of predictions. They would presumptively be better predictors than an untrained individual asked to predict her own risk of developing cancer, or causing an automobile accident, or being sued for a slip and fall on her property. Second, the clinical predictors in these studies always had access to at least as much information as—and usually more than—was employed in the statistical models. In other words, there was typically a significant informational asymmetry in favor of the clinicians (and never an asymmetry favoring the statistical model). Despite this informational advantage, the experts were almost always unable to outperform the "objective" statistical model.[67]

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64. *See, e.g.,* PAUL E. MEEHL, CLINICAL VERSUS STATISTICAL PREDICTION: A THEORETICAL ANALYSIS AND A REVIEW OF THE EVIDENCE (2d ed. 1996); Grove & Meehl, *supra* note 55.

65. For example, William Grove and Paul Meehl describe one study involving high school guidance counselors who tried to predict a student's grade point average in her first year of college on the basis of a wide range of information about the student, including objective performance measures and an interview. The experts' predictions were then compared with those of a simple regression equation, in which the only two explanatory variables were "college aptitude test score and high school grade record." Grove & Meehl, *supra* note 55, at 294. Both of these pieces of information were also known to the counselors. The results? "The accuracy of the counselors' predictions was approximately equal to the two-variable equation for female students, but there was a significant difference in favor of the regression equation for male students . . . ." *Id.*

66. *See id.* at 298.

67. Of course, it is always possible that persons are better at predicting outcomes in their own lives (whether or not they themselves will cause automobile accidents) than experts are at predicting the behavior of others. But this seems unlikely. Recent research in behavioral law and economics suggests that people are not even very good at making predictions about their own reactions to future experiences, which would seem to be easier than predicting the experiences

The manifest deficiencies of "clinical" (i.e., unsystematic or impressionistic) prediction lead one to question the core assumption of adverse selection models. Individual insureds may perhaps have access to more information about themselves than their insurers do, but it is not the information itself that counts; it is the use to which it is put in making predictions about the future. Even an individual with abundant information is in no position to select against her insurer if she cannot accurately forecast the occurrence of the event she is insuring against. Grove and Meehl's bottom line is that more information is not as useful as the knowledge about how to make accurate predictions from the data one already has. In fact, their results suggest that statistical prediction, even using quite simple techniques, might give insurers an informational advantage over their insureds, rather than vice versa. In any case, the contest might not be as uneven as the simple adverse selection models imply.

2. *Do Worse Risks Buy More Insurance?*

The fundamental result of adverse selection theory is that insureds who buy "better" (i.e., more) coverage tend to have more accidents, poorer health, or otherwise pose higher costs for their insurer. A positive relationship between the amount of coverage purchased and riskiness constitutes the essence of adverse selection, and virtually all models predict such a relationship.

If both parties had the same information about insureds' riskiness, profit-maximizing insurers would use this information to increase the premiums paid by riskier insureds. This would give the high-risk insureds no incentive to purchase additional insurance. If, after controlling for all other relevant and observable variables about the insured, riskier individuals do purchase more coverage, it must be because they know something about themselves that their insurers do not know, and can use this knowledge to "sneak" into risk pools to which they do not belong.[68]

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themselves. *See, e.g.,* George Loewenstein & David Schkade, *Wouldn't It Be Nice? Predicting Future Feelings, in* WELL-BEING: THE FOUNDATIONS OF HEDONIC PSYCHOLOGY 85 (Daniel Kahneman et al. eds., 1999).

68. It follows that the best test for whether insureds have more information about their own riskiness than insurers do requires that we observe all the information that the insurer has about its customers. Suppose a study starts with something less than the insurer's full information set and concludes that insurers can't predict risk as well as their insureds can. Such a study is always vulnerable to the criticism that the additional information that the study did not have, but that the insurer *did* have, would eliminate the insureds' advantage in predicting their own riskiness.

The converse is not true, however: A study that fails to find an advantage for the insured, even without access to all the insurer's information, is not vulnerable to this criticism. If an economist can outpredict insureds with only some of the information available to the insurer, the insurer can only do better, a fortiori, with even more information. As Pierre-André Chiappori and Bernard Salanié put it, "It is quite easy . . . to mistakenly conclude that adverse selection does

A spate of recent papers has attempted to test the fundamental result of adverse selection theory in a variety of insurance markets. These studies are summarized in Table 2, located in the Appendix, and a few are discussed briefly below.[69] In general, the literature provides little or no support for the existence of selection due to informational asymmetries in insurance markets. While a few studies do detect evidence of an informational advantage for insureds, the substantial majority do not, or they find that the informational advantage has been largely offset by other factors.

Unfortunately, very few of these studies allow one to say much about why adverse selection is not a problem. One possibility is that insureds simply do not have any informational advantage at all, or that they cannot make good use of the advantages they do have, as suggested in Section III.A. An alternative that is also consistent with many of the empirical studies is that insurers have at their disposal various strategies that compensate for—or even overcome—whatever informational advantage insureds might have. Insurers can and do require insureds to provide information about their own riskiness via the processes of underwriting and risk classification, and it is possible that these measures are sufficient to counterbalance whatever additional information insureds start with. A third possibility is that "behavioral" or "psychological" factors—on their own or in combination with insurer behavior—help to offset insureds' informational advantages. For example, as discussed below under the rubric of propitious selection, when the most risky insureds are also the least risk-averse, these two factors work in opposite directions and can cancel out the additional demand that higher risk would ordinarily entail.

Of the studies listed in Table 2, the strongest case for adverse selection is made by Alma Cohen.[70] Her data are of unusually high quality, since she has repeat observations on the same individual insureds over a five-year period. She is also able to distinguish between insureds who switch insurers and those who remain with the same insurer. She finds that insureds who chose a low deductible also cost the insurer between $58 and $78 in additional claims per year above what a regular-deductible insured cost,

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exist . . . . [But this] problem . . . does not arise in a symmetric way. . . . [A] negative conclusion [about the existence of adverse selection], like the one we get, is probably much more robust than any positive finding could be." Pierre-André Chiappori & Bernard Salanié, *Testing for Asymmetric Information in Insurance Markets*, 108 J. POL. ECON. 56, 72 (2000).

69. Because the literature is technical and somewhat esoteric, I discuss only a few of the papers here, relegating the rest to the Appendix.

70. ALMA COHEN, ASYMMETRIC INFORMATION AND LEARNING IN THE AUTOMOBILE INSURANCE MARKET (Harvard Law Sch., John M. Olin Discussion Paper Series, Working Paper No. 371, 2002), http://www.law.harvard.edu/programs/olin_center/papers/pdf/371.pdf.

which amounts to roughly 20% more.[71] This is precisely what adverse selection theory predicts.[72]

Cohen's paper is, however, a clear outlier in the recent adverse selection literature summarized in Table 2. Two recent studies are more in line with the bulk of scholarship. Both studies document behavior by insureds that limits the informational advantage that insurance buyers may have over sellers. Mark Pauly and his coauthors examine the market for term life insurance.[73] They conclude that even if insureds know more about their mortality risk than insurers do, this advantage is offset by "sluggishness" in insurance demand. Buyers of insurance do not use their informational advantage to make large adjustments in the amount of insurance they purchase on the basis of either its price or their own riskiness.[74] Put another way, the price elasticity of demand for term life insurance is relatively low, meaning that consumers are not as sensitive to price changes as is usually assumed. This in turn suggests that adverse selection is less likely to occur, because good risks will not respond to a price increase by dropping out of the insurance pool.

The flip side of this insight is the finding that demand is less sensitive to risk than it is to price—that is, high-risk consumers do not respond to their higher risk by demanding more insurance (at a given price).[75] As the authors point out, a differential response to changes in risk and changes in price is ruled out under standard assumptions of expected utility theory.[76] One possibility is that the differential response is driven by some kind of irrational behavior. The evidence is also consistent with the heterogeneity

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71. *Id.* at 16.

72. While Cohen's paper offers the most compelling evidence for adverse selection, it raises several unanswered questions. Tests of adverse selection are also, of necessity, simultaneously testing the hypothesis that insurers maximize profits. If Cohen's findings are correct, they appear to be inconsistent with profit-maximizing behavior by the insurer she studied. With full information, the insurer should presumably have recognized the heightened risk imposed by low-deductible insureds, just as Cohen herself was able to do, and then charged them a higher premium. For example, Cohen finds that insureds who switch insurers have higher accident rates, controlling for all variables observed by the insurer. *Id.* at 2. If Cohen could figure this out, there is little reason to think insurers could not do so as well, especially since they have a clear incentive to get it right. Provided that the costs of observing such information among insureds did not outweigh the additional profits from doing so, there would then no longer be an informational asymmetry favoring insureds, and insurers would alter their insurance offerings accordingly.

73. MARK V. PAULY ET AL., PRICE ELASTICITY OF DEMAND FOR TERM LIFE INSURANCE AND ADVERSE SELECTION (Nat'l Bureau of Econ. Research, Working Paper No. 9925, 2003), http://papers.nber.org/papers/w9925.pdf.

74. *Id.* at 3 ("[B]ased on the range of plausible assumptions about variation in risk [and estimates of the risk-sensitivity of insurance demand], information asymmetry would have to be very pronounced indeed for the insurance market to exhibit strong adverse selection effects; the likelihood of a 'death spiral' is even lower.").

75. *Id.* at 30 ("[T]he [price] elasticity of demand for 1-year level term life insurance contracts is about –0.4 to –0.5. . . . Demand is usually less sensitive to risk than to premiums although the risk term is usually positive and statistically significant.").

76. *Id.* at 3.

of underlying utility functions—that is, high-risk insureds may have different risk preferences than low-risk consumers, which is just what is predicted by propitious selection models.[77] Whatever the explanation, the authors conclude that forces are at work that "greatly mitigate[] the effect of asymmetric information about individual risk between insured and insurer in term life insurance markets."[78]

Amy Finkelstein and Kathleen McGarry suggest a different mechanism that mitigates the effect of asymmetric information in the market for long-term care insurance.[79] They test for the presence of asymmetric information by directly comparing insurers' and insureds' predictions of the likelihood that an individual insured will enter a nursing home. They conclude that insureds do have private information about their risk types, and that high-risk insureds use this information to buy more insurance than low-risk insureds (a finding that is at odds with most of the studies in Table 2). Nevertheless, they find that there is no adverse selection at work.[80]

How is it possible that insureds could use their private information without causing adverse selection? Their explanation is that "more cautious individuals . . . are both more likely to own long-term care insurance and less likely to end up using long-term care."[81] The reason is presumably that the more cautious individuals typically engage in more preventive activities such as getting flu shots or mammograms, which in turn lead to lower rates of nursing home utilization.[82] This is precisely the result predicted by the propitious selection theory that I discuss below.[83]

What these studies reveal, along with the others discussed in the Appendix, is that the empirical evidence for adverse selection is strikingly limited. In general, however, the studies do not explain why insureds do not

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77. *See infra* Part IV.
78. PAULY ET AL., *supra* note 73, at 31.
79. AMY FINKELSTEIN & KATHLEEN MCGARRY, PRIVATE INFORMATION AND ITS EFFECT ON MARKET EQUILIBRIUM: NEW EVIDENCE FROM LONG-TERM CARE INSURANCE (Nat'l Bureau of Econ. Research, Working Paper No. 9957, 2003), http://papers.nber.org/papers/w9957.pdf.
80. *Id.* at 2.
81. *Id.* at 3.
82. *Id.* at 30.
83. In this sense, Finkelstein and McGarry are somewhat at odds with Pauly and his coauthors. The former claim that insureds use their informational advantage, but that heterogeneity among insureds mutes the selective effect of private information because the least risky are also the heaviest demanders of insurance:

> The lack of a positive correlation between insurance coverage and care utilization—*despite* the presence of private information about risk type—is explained by the [fact that] individuals have private information not only about their risk type but also about preference-related characteristics that have the opposite correlation with insurance coverage and risk occurrence. . . .
> Such preference-based selection can offset the positive correlation between insurance coverage and risk occurrence that asymmetric information about risk type [alone] would tend to produce.

Id. at 32. The latter argue that insureds are not very responsive, either to changes in price or to changes in risk. *See* PAULY ET AL., *supra* note 73, at 30.

utilize whatever informational advantages they have to select against insurers. Consistent with the argument of this paper, however, a few of the studies do suggest either that insurance demand is not very sensitive to self-perceived riskiness, or that higher-risk insureds are also more risk-averse and tend to take more precautions against loss, thereby mitigating or eliminating adverse selection pressures.

3.   *Other Evidence*

a.   *Informational Asymmetries Favoring Insurers*

The "clinical versus statistical prediction" debate discussed earlier suggests, by rough analogy, that insurers using even relatively unsophisticated actuarial techniques with limited information might be able to outpredict their insureds in assessing riskiness in some cases. But there may be some circumstances in which insurers actually know more about their customers than the customers know about themselves. Indeed, this is the conclusion of Pierre-André Chiappori and Bernard Salanié, who suggest that "the view generally shared by French automobile insurers [is that] the information at the company's disposal is extremely rich and that, in most cases, the asymmetry, if any, is in favor of the company."[84]

One obvious source of asymmetric information in favor of insurers is a preinsurance medical examination, the results of which are known to the insurer but not to the prospective insured. Several cases have held that the insurer has no duty to disclose information about the insured gained by a medical exam given by the insurer for screening purposes, even if that information is of potentially great significance to the insured herself.[85] Here is a clear case, where the insurer knows something about the insured that the latter does not know about herself, that lessens the applicability of the standard adverse selection story.

Or consider the expiration date of an insurance policy. In one sense, this is not an obvious source of asymmetric information in favor of insurers, because insureds can always keep records that will allow them to discover for themselves that the time for renewing a policy is at hand. Conversely, it is clear that insurers will almost always have a superior record of such matters, thanks to automated recordkeeping systems. And in cases in which insureds did not know that their policies were expiring, courts have found

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84. Chiappori & Salanié, *supra* note 68, at 73.
85. *See, e.g.*, Eaton v. Cont'l Gen. Ins. Co., 147 F. Supp. 2d 829 (N.D. Ohio 2001) (holding that an insurer had no duty to disclose information regarding the plaintiff's HIV status, gleaned from a preinsurance medical exam, to the plaintiff), *aff'd*, 59 Fed. Appx. 719 (6th Cir. 2003) (unpublished decision); Petrosky v. Brasner, 718 N.Y.S.2d 340 (App. Div. 2001) (same).

that insurers have no duty to disclose this fact,[86] once again giving the insurers an informational advantage over their customers. Insurers could use this advantage to select against their insureds: They could choose not to notify the worst risks that their policies were about to lapse, while seeking to retain the best risks by providing them notice.

Another source of asymmetric information in favor of insurers is a complete understanding of the technical language in the insurance contract itself. Of course, insureds presumably could seek expert advice about their coverage, or could ask their insurer to explain language they did not understand. But at least in some states, an insurer has no independent duty to explain complex language to the purchaser of insurance, giving the former a substantial informational advantage over the latter.[87]

Finally, consider the growing use of a person's "credit score" in order to price her automobile insurance.[88] The credit score is a simple numerical indicator of a person's creditworthiness, usually on a one-to-five scale, based on the person's past credit history. This may also create an informational asymmetry in favor of the insurer: While an insured may know her own credit history, she generally will not know her credit score, how to compute it from the information she has, or that it is relevant in predicting her likelihood of an automobile accident.[89]

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86. *See, e.g.*, Shindler v. Mid-Continent Life Ins. Co., 768 S.W.2d 331, 333 (Tex. App. 1989) ("Texas courts have held unequivocally that, absent policy provisions, life insurers have no legal duty to give notice of premiums due. Likewise, no duty exists to give notice that the policy has lapsed." (citations omitted)).

87. *See, e.g.*, Pinney v. State Farm Mut. Ins. Co., 552 S.E.2d 186, 191 (N.C. Ct. App. 2001) (holding that an insurance agent "had no duty as a matter of law to undertake to explain the requirements of [a given type of] coverage to [a policyholder], absent an allegation that [the policyholder] requested such information").

88. According to Barbara Bowers,

"[T]he number of companies that are not using credit scores is continuing to diminish, because most companies find that in order to be competitive, they have to use credit-based insurance scores."

. . . .

According to a 2001 Conning & Co. study, 92% of the companies that accounted for 43% of the personal auto premium volume in 1999 use credit data in underwriting or rating, and more than half have been doing so since 1998.

Barbara Bowers, *Giving Credit Its Due: Insurers, Agents, Legislators, Regulators and Consumers Battle To Define the Role of Insurance Scoring*, BEST'S REV., May 2002, at 37, 40-41 (quoting Joseph Annotti, Assistant Vice President of Public Affairs for the National Association of Independent Insurers).

89. Credit scores are apparently quite useful in predicting riskiness:

Credit scoring fills a need for auto insurers that motor vehicle records often can't. . . . "It's provided some predictability in identifying better risks vs. worse risks, which is hard to do, considering that most motor vehicle records are really very inaccurate," . . . [because] drivers often have violations and convictions removed from their records. "[Credit-based scoring is] highly correlated with risk, as highly correlated as any factor . . . ever used before."

Id. at 40 (quoting David Snyder, Assistant General Counsel for the American Insurance Association) (fourth alteration in original).

b. *Cream-Skimming*

More generally, once we recognize that *each* side may have some information that the other lacks, we need to think about adverse selection problems in a different way. Theoretically, the appropriate models are those with *two*-sided asymmetries, which generally yield results that are complex and difficult to characterize.[90]

Pragmatically, the recognition that insurers may know more than insureds should lead us to realize that a kind of "reverse adverse selection" by insurers—sometimes known as "cream-skimming"—is as worthy of our attention as is adverse selection by insureds.[91] The mechanism underlying cream-skimming is different from that involved in classical adverse selection because typically it is not based on an informational asymmetry in favor of insurers. Instead, it arises because insurers are, at times, able to "rig" the incentive structure so as to encourage selectively the patronage of certain kinds of "desirable" insureds (e.g., the healthiest or lowest risks).

For example, it is rumored that one insurer distributed its applications for health insurance to the elderly only in its third floor office, reachable only by staircase. Anyone fit enough to climb the stairs was presumably a good risk; thus the insurer was able to screen out the least healthy among those potentially in the insurance pool. The flip side of this tactic is to screen by benefits offered rather than traits required to sign on to the policy: For example, a health insurer could offer free health club memberships to its insureds. Only those interested in—and fit enough to benefit from—such memberships would find this an attractive offer. Hence, the insurer could select the best risks from among those eligible by its choice of benefits.[92]

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90. *See, e.g.*, Peter C. Cramton, *Bargaining with Incomplete Information: An Infinite-Horizon Model with Two-Sided Uncertainty*, 51 REV. ECON. STUD. 579 (1984). A relatively accessible model using two-sided asymmetric information is Robert H. Gertner, *Asymmetric Information, Uncertainty, and Selection Bias in Litigation*, 1993 U. CHI. L. SCH. ROUNDTABLE 75.

91. Cream-skimming is the practice of selection by which an insurer attempts to increase its profits by refusing to write policies for the worst risks in an insurance pool. For a careful empirical study documenting such selection decisions by quasi-private job-training entrepreneurs, see JAMES J. HECKMAN ET AL., WHAT DO BUREAUCRATS DO? THE EFFECTS OF PERFORMANCE STANDARDS AND BUREAUCRATIC PREFERENCES ON ACCEPTANCE INTO THE JTPA PROGRAM (Nat'l Bureau of Econ. Research, Working Paper No. 5535, 1996), http://papers.nber.org/papers/w5535.pdf. There may be sound policy reasons to reject those applicants for job training who are least trainable; the point is that selection by insurers is every bit as worthy of our attention as is selection by insureds.

92. Conversely, being known as the HMO that provides the best oncology care will make an HMO especially attractive to those insureds who believe they have a high risk of cancer, which is of course very expensive to treat. Hence, HMOs will have an incentive to *under*provide those kinds of treatment that are especially attractive to high-cost insureds. For an insightful theoretical analysis of incentives that undo these "reverse selection" or "cream-skimming" problems in the design of benefits, see Jacob Glazer & Thomas G. McGuire, *Optimal Risk Adjustment in Markets with Adverse Selection: An Application to Managed Care*, 90 AM. ECON. REV. 1055 (2000).

HIPAA allows insurers to "offer, on a nondiscriminatory basis, premium discounts, rebates, or modified copayments or deductibles to promote bona fide wellness programs and disease

C. *Do "Death Spirals" Really Exist?*

The so-called "death spiral"—in which adverse selection causes the market for insurance to completely implode, eliminating all coverage for certain kinds of risks—makes for a dramatic and effective rhetorical trope. Even the name sounds evil. Many authors have suggested that an exogenous increase in premiums (or mandated pooling of heterogeneous risks) can drive out the best risks from an insurance pool, leaving behind a group of increasingly bad risks that cannot be covered except at even higher premiums; this in turn leads to a vicious cycle of premium increases and withdrawals until the market for insurance completely unravels.[93] In fact, some seem to confuse adverse selection with the death spiral by suggesting that even a penny's worth of informational asymmetry can or will lead to the collapse of the entire market.[94] This confusion is unfortunate. Of course, a total unraveling of the market is clearly bad for everyone involved, and the possibility that the market could vanish entirely is therefore a legitimate worry for those making insurance policy. But both the theoretical and empirical support for such claims is much more ambiguous than is widely believed. No one should claim that adverse selection is a serious problem based on the frequency of death spirals in insurance markets.[95] In this Section, I summarize the evidence for the existence of death spirals.

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prevention." Rovner, *supra* note 17, at 201. Since such programs are presumably more attractive to those who are healthy than to those who are sick, this aspect of HIPAA further exacerbates cream-skimming problems.

93. For examples of this kind of argument, see Priest, *supra* note 7; and Romano, *supra* note 31.

94. *See, e.g.,* Hass v. Or. State Bar, 883 F.2d 1453 (9th Cir. 1989) (rejecting an antitrust challenge to a requirement that lawyers purchase malpractice insurance from the state bar association). In holding for the defendant, the court suggested that

> [w]ere private carriers permitted to write coverage for selected practitioners, the Fund would be left to insure attorneys who were denied coverage by the private carriers, or who could not afford to buy coverage from such carriers. The Fund would be forced to underwrite an adverse selection of lawyers unacceptable to private carriers. The result would likely be assessments so high that many of these lawyers would not be able to afford the assessments and would be forced to discontinue the practice of law.

Id. at 1463. Similarly gloomy conclusions are drawn by the court in *Currie v. Group Insurance Commission*, 290 F.3d 1 (1st Cir. 2002). According to that court, "Adverse selection is a problem confronted by voluntary insurance plans, whereby those individuals who consider themselves to have a low risk opt out of the program. . . . Of course, as the cost of coverage rises, more low-risk individuals will choose to opt out." *Id.* at 4.

95. Mark Pauly has wisely noted that "[o]ne of the things that theory [suggests] is that only a little bit of adverse selection may cause market equilibrium to unravel. But then only a little bit of consumer inertia is needed to reinstate it." Mark V. Pauly, *Is Cream-Skimming a Problem for the Competitive Medical Market?*, 3 J. HEALTH ECON. 87, 93 (1984).

1. *Mutual Assessment Societies*

The experience of assessment societies—an early form of mutual life insurance in which members made equal annual contributions to pay the expenses of those who died or became disabled—is often cited as a paradigmatic example of a death spiral. According to John Magee,

> Early assessment companies collected . . . equal annual assessments from each member, regardless of age. It was soon realized that benefits at lowest cost were obtainable when the majority of members were young. Young people, in the old society, with many older members, began to drop out when the assessments became frequent. . . . As the younger members dropped out . . . the inevitable result was an abnormally high rate of assessment, and not infrequently a collapse of the organization.[96]

But the recent evidence provided by a careful analysis of the historical record reveals a rather different story from the traditional anecdotes. Herbert Emery's financial analysis of Canadian assessment societies concludes that, far from being bankrupted by adverse selection, many were financially viable as late as the 1920s.[97] John Witt's study of American cooperative insurance societies reaches a similar conclusion.[98] While the death spiral stories presumably had some validity, it now appears that many mutual benefit societies did manage to cope with adverse selection problems and were ultimately undone by other factors.[99]

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96. JOHN H. MAGEE, LIFE INSURANCE 32-33 (3d ed. 1958), *quoted in* J. DAVID CUMMINS ET AL., RISK CLASSIFICATION IN LIFE INSURANCE 28 (1983).

97. J.C. Herbert Emery, *Risky Business? Nonactuarial Pricing Practices and the Financial Viability of Fraternal Sickness Insurers*, 33 EXPLORATIONS ECON. HIST. 195 (1996). My thanks to Tom Baker for this reference.

98. John Witt writes:
> [B]y the late nineteenth-century, [cooperative or] workingmen's insurance societies became the leading systematic mechanism for compensating victims of accidental injury, and they remained such into the first decade of the twentieth century. . . . [T]he insurance associations presented a remarkably well designed insurance mechanism that developed novel solutions to the moral-hazard and adverse-selection problems endemic to disability insurance.

John Fabian Witt, *Toward a New History of American Accident Law: Classical Tort Law and the Cooperative First-Party Insurance Movement*, 114 HARV. L. REV. 690, 696-97 (2001).

99. Recent empirical work by George Zanjani complements these stories. Rather than adverse selection, Zanjani concludes that a major cause of the demise of fraternal life insurers was governmental: Solvency regulations had "a significant effect—but a destructive one." George Zanjani, The Rise and Fall of the Fraternal Life Insurer: Law and Finance in U.S. Life Insurance, 1870-1920, at 4 (Oct. 2003) (unpublished manuscript), http://www.nber.org/~confer/2004/insw04/zanjani.pdf.

2. *Community Rating in Health Insurance*

Community rating is a way of imposing restrictions on insurers' ability to vary their premiums by the riskiness of their insureds. Under a strict community rating system, an insurer is required to charge the same rate to all individuals or groups in a given community, regardless of objective risk indicators such as gender, age, or smoking behavior.

It is widely asserted that community rating produces a death spiral,[100] and New York's experience with community rating is frequently adduced as evidence for this proposition.[101] A careful recent analysis by two economists, however, reveals that there was no death spiral—or even the beginning of one—in New York.[102]

A recent paper by Melissa Thomasson similarly refutes allegations that community rating led to a death spiral for "the Blues" (Blue Cross & Blue Shield) during the 1950s.[103] She notes that the Blues originally practiced community rating for all policies, while their competitors used experience ratings that tied a group's premiums to its medical expenses in previous years. This practice was abandoned in the late 1950s.[104] Thomasson finds

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100. Mark Hall's mid-1990s work on reforming the healthcare industry provides a good example. According to Hall,

> Adverse selection forced Blue Cross to abandon community rating in favor of experience rating for groups, and it is now destroying the market for individual and small-group insurance as subscribers select against the Blue Cross community-rated pools. Adverse selection has impeded the development of a significant market in private long-term health care insurance, since younger people with little need decline to purchase, and older subscribers cannot afford the high premiums.

MARK A. HALL, REFORMING PRIVATE HEALTH INSURANCE 40 (1994). Hall subsequently revised this conclusion. *See* Mark A. Hall, *Public Choice and Private Insurance: The Case of Small Group Market Reforms*, 1998 U. ILL. L. REV. 757, 770-72 (discussing empirical findings that show community rating has worked well in the small-group market and has not led to adverse selection there).

101. *See, e.g.*, Roberta B. Meyer, *Justification for Permitting Life Insurers To Continue To Underwrite on the Basis of Genetic Information and Genetic Test Results*, 27 SUFFOLK U. L. REV. 1271, 1290-91 (1993) ("There is . . . evidence of adverse selection in connection with other lines of insurance. Most strikingly, the recently enacted New York health insurance community rating statute is beginning to cause what appears to be a scenario of adverse selection. The community rating requirement has led to an increase in rates for young, healthy insureds. As a result, many of them have dropped their health insurance coverage, leaving a pool of increasingly unhealthy insureds subject to an upward spiral in their rates." (footnotes omitted)); Katherine Pratt, *Funding Health Care with an Employer Mandate: Efficiency and Equity Concerns*, 39 ST. LOUIS U. L.J. 155, 206 n.227 (1994) ("Community rating without a mandate could lead to an adverse selection problem. New York State, in 1992, enacted legislation that required community rating for individual and small business health insurance policies. Premiums increased for young people, causing many of them to discontinue their coverage.").

102. *See* Thomas Buchmueller & John DiNardo, *Did Community Rating Induce an Adverse Selection Death Spiral? Evidence from New York, Pennsylvania, and Connecticut*, 92 AM. ECON. REV. 280, 281 (2002).

103. MELISSA A. THOMASSON, DID BLUE CROSS AND BLUE SHIELD SUFFER FROM ADVERSE SELECTION? EVIDENCE FROM THE 1950S (Nat'l Bureau of Econ. Research, Working Paper No. 9167, 2002), http://papers.nber.org/papers/w9167.pdf.

104. *Id.* at 1-2.

that in the group market, there was no evidence that the Blues' enrollees were worse risks than those enrolled in competing experience-rated plans. The Blues' insureds did not have higher medical expenses than those insured by their rivals, and hence there seems to have been no adverse selection pressure in the group market.[105] The decision to discontinue community rating for the group market was thus not plausibly driven by an adverse selection death spiral, as some have claimed.[106]

3. *Multiple Health Insurance Plans*

Studies that provide compelling evidence for death spirals involve adverse selection against close insurance substitutes, rather than against the insurance market as a whole. By far the strongest evidence for a death spiral is offered by David Cutler and Richard Zeckhauser, based on data from Harvard University's health plans.[107] Harvard offered two types of plans, a PPO (preferred provider organization) and several HMOs.[108] When financial pressure on the university forced it to change the way it contributed to the two types of plans, the PPO became substantially more expensive relative to the alternatives.[109] This in turn precipitated a rapid flight from the PPO plan (and into the HMOs) by younger, lower-risk employees, with PPO enrollment falling by roughly seventy-five percent over three years. Concomitantly, the remaining high-risk PPO subscribers had to pay dramatically higher premiums for coverage, which rose nearly fivefold over this same period. Eventually, the PPO had to be withdrawn altogether.

It is important to note, however, that the death spiral documented by Cutler and Zeckhauser was caused by adverse selection against a particular health plan, in a setting in which essentially all employees had some kind of

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105. *See id.* at 2.

106. *See id.* at 15. The story seems to be different for individually purchased insurance. There, Thomasson concludes, those who chose to insure with Blue Cross did have higher medical expenses than their privately insured counterparts, which is evidence that the Blues were being selected against by insureds who knew that they had higher-than-average medical costs. This finding is not surprising, given that the Blues did not screen individual applicants nearly as carefully as their commercial rivals did. *See id.* at 5 ("While commercial health insurance companies used rigorous criteria to screen potential individual contracts, the Blues used much less aggressive screening techniques. . . . [P]otential individual subscribers could obtain coverage through Blue Cross and Blue Shield by simply filling out a 'health statement.'" (footnote omitted)).

107. David M. Cutler & Richard J. Zeckhauser, *Adverse Selection in Health Insurance*, 1 FRONTIERS HEALTH POL'Y RES. 1 (1998).

108. *Id.* at 11. A PPO is traditional fee-for-service health insurance in which the insured chooses her doctor and is then reimbursed by the insurer (sometimes with a copayment or deductible) for any medical expenses incurred.

109. The university moved from an equal-percentage to an equal-dollar contribution rule, which raised the employee's marginal cost of the PPO substantially. The HMO-PPO gap was exacerbated by a decline in the HMO premium negotiated by Harvard. *See id.* at 11-14.

coverage and had to choose among various types of insurance. The community rating story involves adverse selection against the entire insurance market, in which insureds needed to decide whether to purchase any insurance at all. As Thomas Buchmueller and John DiNardo point out, the two situations are neither theoretically nor empirically similar. In the second case, adverse selection means dropping out of the insurance market altogether—doing without coverage.[110] This is obviously a different decision from a choice among insurance plans. Hence, we should be wary of generalizing from the Cutler and Zeckhauser setting (a single employer with multiple plans) to marketwide interventions such as community rating.

In sum, it is clear that adverse selection may sometimes accelerate into a so-called death spiral, in which it becomes impossible to sustain insurance for certain kinds of risks. There is at least one very well documented case of this phenomenon. But it is also clear that the death spiral seems to be quite unusual; many of the alleged instances of this kind of unraveling seem to be little more than urban legends.

D. Rationing: Are the Good Risks Unable To Buy Full Insurance?

As noted earlier, the rationing of good risks is a standard prediction of many adverse selection models. But such rationing seems strikingly at odds with the actual practice in insurance markets. Insureds who are rationed would like to purchase more insurance at given prices but cannot find an insurer who will sell it to them.[111]

Rationing therefore suggests an inevitable source of tension between insurers and insureds. People who are rationed want to buy more insurance

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110. See Buchmueller & DiNardo, supra note 102, at 280-81 ("The strongest argument made against community rating legislation is that such laws lead to adverse selection against the entire market. Since in the [case studies of adverse selection against individual health insurance plans], coverage is essentially universal, [these studies] offer little insight as to whether imposing pure community rating in a voluntary insurance market will reduce the number of persons purchasing coverage.").

111. For reasons discussed earlier, the standard model predicts that it is the "good" or low-risk consumers who are quantity-constrained. This prediction need not hold in the more general case where we allow for heterogeneity of consumers by both their riskiness *and* their degree of risk aversion. As Michael Landsberger and Isaac Meilijson point out, it is the consumers with the highest certainty equivalent—a function of both expected loss (riskiness) and risk aversion—who are rationed:

> [R]esults obtained earlier in the literature to the effect that full insurance is assigned to agents who are either more risk averse or hold a riskier position, are only incidentally true and hold only because the models were narrowly formulated. The real factor behind the scene is the order of certainty equivalents. When agents differ in terms of utilities and risk, ordering types by certainty equivalents need not coincide with ordering by risk or by attitudes towards risk, since a less risk averse agent may have a lower certainty equivalent and thus be assigned full insurance.

Michael Landsberger & Isaac Meilijson, *A General Model of Insurance Under Adverse Selection*, 14 ECON. THEORY 331, 333 (1999).

than is available to them at existing prices. Insurers want to prevent this from happening, because it is precisely the inability to purchase unlimited amounts of low-risk/low-cost insurance that allows insurers to screen out the high-risk insureds from the low-risk pool, and to price the low-risk policies appropriately.[112] Hence, if rationing were an important feature of insurance markets, we should expect to observe low-risk insureds eagerly looking to buy more insurance coverage than they actually have, and insurers trying to prevent this from happening. The universe of published adverse selection cases, however, does not suggest that this is a serious problem.[113]

For example, in *Bankers National Insurance Co. v. Hembey*, the plaintiff was injured in a bus crash and sued to recover disability benefits on two health and accident insurance policies issued by Bankers National.[114] The question before the court was whether Hembey's recovery "should be denied because [he] was the holder of policies with three other companies at the time of the accident."[115] The court concluded that the insurer "was informed of such [additional] insurance in [the plaintiff's] application for the two policies here involved, which provide that the insurance therein shall not be affected by any other insurance held with any other company."[116] In other words, the insurer not only knew that the insured had purchased additional insurance, but also explicitly denied that this purchase had affected its original coverage. This sort of behavior is not consistent with rationing to prevent adverse selection.

In *Hall v. Time Insurance Co.*, the plaintiff was required, under the terms of his divorce from his first wife, to maintain health insurance coverage for their son.[117] Hall purchased a policy from Time covering himself, his second wife, and the son, who lived with his mother. In applying for the policy, Hall "represented that neither himself, his [second] wife ..., [n]or his son ... were covered by any other health insurance

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112. As Cummins and his collaborators point out, "A necessary condition to attain a [separating] equilibrium is that each consumer is permitted to buy only one policy or, equivalently, that companies can monitor the amount of coverage purchased from other firms." CUMMINS ET AL., *supra* note 96, at 38.

113. *See supra* Section I.C. Any generalization about real-world practices from the small and possibly unrepresentative sample of published opinions is hazardous and should be undertaken only with great caution. *See, e.g.*, Peter Siegelman & John J. Donohue III, *Studying the Iceberg from Its Tip: A Comparison of Published and Unpublished Employment Discrimination Cases*, 24 LAW & SOC'Y REV. 1133 (1990) (finding substantial differences between published employment discrimination opinions and filed cases alleging employment discrimination). In what follows, I am not claiming that the practices discussed are broadly representative of insurer behavior, but only that they are, broadly speaking, inconsistent with a concern for adverse selection on the part of insurers.

114. 233 S.W.2d 637 (Ark. 1950).

115. *Id.* at 639.

116. *Id.*

117. 663 F. Supp. 599 (M.D. Ga. 1987), *rev'd on other grounds*, 854 F.2d 440 (11th Cir. 1988).

policies. [But] ... on the date that Mr. Hall applied for insurance with Time, [his son] was an insured under a policy .... obtained by Mr. Hall's former wife."[118] The son subsequently became seriously ill, and the insurer attempted to deny coverage because of the presence of additional insurance policies.

In holding that Hall's accidental misrepresentation regarding the presence of additional insurance on his son was not material, the court relied in large measure on testimony by the defendant's own sales agent. He had testified, in the court's words, that "based upon his experience as an insurance salesman, individual group and accident policies are written on insureds that have other available medical insurance.... [T]he mere presence of other insurance is not a *per se* reason to reject an applicant's request for insurance ...."[119]

Pennsylvania Life Insurance Co. v. Tanner involved a similar set of facts.[120] The insured purchased a life insurance policy on himself, with his wife as beneficiary. Asked in his application about his total life insurance, Tanner filled in only the space marked "company," where he wrote "Globe Ins." Asked about his disability insurance, he again filled in only the space marked "company," this time writing simply "Penn Life."[121] When Tanner died, the insurer refused to pay "because the application did not divulge all of the life insurance policies owned by [the insured]."[122] The insurer claimed that it would not have issued a policy to Tanner if it had known about the other policies he had already owned. The court, however, held that since the insurer was aware of the incomplete information it had, and had chosen to issue another policy in conscious ignorance of the extent of additional coverage by the insured, it could not claim misrepresentation in order to avoid payment after the fact.

As a final example, consider the sample homeowner's insurance form reproduced in Kenneth Abraham's casebook on insurance law. The policy requires the insured to "[s]end to us [the insurer], within 60 days *after our request*, your signed, sworn proof of loss which sets forth ... [o]ther insurance which may cover the loss."[123] This example suggests that insurers do not prohibit an insured from taking on additional coverage from another source, as would be required by the standard adverse selection model.

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118. *Id.* at 600. Note that this is a straight moral hazard concern: The presence of additional insurance makes the insured less careful, and with sufficient overinsurance, encourages him to bring the insured-against risk to fruition. *See id.* at 604.

119. *Id.* at 603. Even if the insurer "had ... known the true facts," the court concluded, it "would not have rejected coverage on [plaintiff's son] solely because of [the] other insurance" taken out by Hall's ex-wife. *Id.* at 604.

120. 293 S.E.2d 520 (Ga. Ct. App. 1982).

121. *Id.* at 521.

122. *Id.* (alteration in original) (internal quotation marks omitted).

123. KENNETH S. ABRAHAM, INSURANCE LAW AND REGULATION: CASES AND MATERIALS 190 (2d ed. 1995) (emphasis added).

There are a few cases in which courts have found that the insured's failure to provide information about other insurance policies *does* constitute material misrepresentation. These are invariably situations involving serious moral hazard, in which the insured has overinsured against some contingency and then engineered the very contingency for which he purchased insurance.[124] This is quite different from a concern for adverse selection, however. Taken together, what these cases reveal is that the predictions of rationing in the adverse selection literature are not borne out. Insureds rarely try to purchase additional insurance, and insurers do not seem to care much if they do. When the issue of multiple insurance purchases arises at all, it is invariably in the context of moral hazard rather than adverse selection.

E. *Do Insurers Fail To Seek "Relevant" Information?*

Some adverse selection models predict that low-risk insureds will be constrained—that is, unable to purchase as much insurance as they would like at going prices. But *all* adverse selection models (tautologically) imply a constraint on insurers, who would like to obtain more information about their insureds, given the benefits of such information, but who are unable to do so. Surprisingly, theorists have paid relatively little attention to the mechanisms by which insurers actually do obtain information about insureds.[125] It is usually just assumed that residual information asymmetries remain even after insurers have learned what they can through whatever means are available. In fact, however, insurers have several devices for coping with problems of asymmetric information, including underwriting,

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124. *Globe Life & Accident Insurance Co. v. Still*, 376 F.2d 611 (5th Cir. 1967), offers a paradigmatic example of the moral hazard problems that multiple insurance policies can cause. In that case, the insured experienced an "accidental" gunshot wound resulting in the amputation of his foot. The insurer sought to deny coverage because Still had claimed on his application that he had only one additional policy, but had in fact purchased eighteen different health and accident policies and thirty-six different life insurance policies that provided dismemberment benefits. While representatives of the insurer helped Still complete his application, however, Still explained how many policies he had. The insurer's "agent interrupted Still and asked the state manager if it was necessary to put all of the companies' names in the application. The manager said it was not, so the agent put only the word 'Independent' in the answer." *Id.* at 613. In other words, at the time of the application, the insurer seemed not to care that Still was overinsured; even after the fact, it seemed to care only because of the moral hazard problem. *Still* is thus very different from the cases predicted by adverse selection models, in which a good risk seeks to buy full insurance in small, low-priced chunks from various insurers.

125. There are some theoretical pieces that model insurer learning over time (in a very stylized manner). *See, e.g.*, Cooper & Hayes, *supra* note 51. Another theoretical paper with some institutional bite is Avinash Dixit, *Adverse Selection and Insurance with* Uberrima Fides, *in* INCENTIVES, ORGANIZATION, AND PUBLIC ECONOMICS: PAPERS IN HONOUR OF SIR JAMES MIRRLEES 41 (Peter J. Hammond & Gareth D. Myles eds., 2000), which shows how an ex ante requirement of full disclosure combined with ex post auditing of the accuracy of an insured's statements can reduce adverse selection. These works are the exceptions, however.

risk classification, and ex post investigation.[126] How effective these methods are at eliminating informational asymmetries in favor of insureds is in the end largely an empirical question. But after a careful review of the literature, Georges Dionne concludes that for adverse selection, as compared to moral hazard, "effective mechanisms have been established to reduce [the] distortions [caused by imperfect information] and to eliminate residual problems at the margin."[127]

One way to test Dionne's conclusion is to examine the information-gathering practices of insurers directly. If we observe insurers ignoring opportunities to collect presumptively relevant information about insureds, we can interpret this as evidence against the importance of adverse selection, at least after the deployment of whatever screening or information-gathering mechanisms are available.[128] This is precisely what seems to occur in the real world.

Consider an application for automobile insurance. As Chiappori and Salanié point out, most insurers do not even ask applicants how many miles they drive per year, which would seem to be the single fact (known to the driver but not the insurer) that is most obviously related to the risk of an accident.[129] If insurers do not attempt to collect seemingly valuable information that is available at relatively low cost, they are either failing to maximize profits or they do not consider this information important. The latter explanation cannot be consistent with a concern for adverse selection.

A startling example of an insurer's failure to request easily available and relevant information comes from *Uslife Credit Life Insurance Co. v. McAfee.*[130] McAfee, an insurance salesman, learned that his wife had

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126. There is not sufficient space to discuss these mechanisms in detail. For theoretical analyses, see generally HANDBOOK OF INSURANCE, *supra* note 2. For a more institutional account of the importance of risk classification, see KENNETH S. ABRAHAM, DISTRIBUTING RISK: INSURANCE, LEGAL THEORY, AND PUBLIC POLICY 64-100 (1986); and Leah Wortham, *The Economics of Insurance Classification: The Sound of One Invisible Hand Clapping*, 47 OHIO ST. L.J. 835 (1986).

127. Dionne, *supra* note 2, at 414.

128. I am sure this is not an original insight, but I am not aware of any reference in the literature. Note that insurers are in some cases legally unable to ask about or utilize certain kinds of information, including gender in the context of employer-sponsored annuities, race in many contexts, the results of genetic testing, and so on. I abstract away from these considerations.

129. *See* Chiappori & Salanié, *supra* note 68, at 73. The point is explored at length by Aaron Edlin, who rigorously shows that there would be substantial efficiency gains to charging by the mile. *See* AARON S. EDLIN, PER-MILE PREMIUMS FOR AUTO INSURANCE (Competition Policy Ctr., Univ. of Cal. at Berkeley, Working Paper No. CPC02-030, 2002), http://repositories.cdlib.org/iber/cpc/CPC02-030/index.html. Annual mileage is not listed on the sample automobile insurance form reprinted in ABRAHAM, *supra* note 123, at 635-46, but Edlin and others have proposed several mechanisms with which to price insurance by the mile. For instance, insureds could be asked to declare beforehand what their actual mileage will be, and this declaration could then be checked only if there were an accident. *See* Chiappori & Salanié, *supra* note 68, at 73 n.20. For a theoretical analysis of this type of ex post auditing in the context of a Rothschild-Stiglitz model of insurance, see Dixit, *supra* note 125.

130. 630 P.2d 450 (Wash. Ct. App. 1981).

incurable cancer. He realized that she would be ineligible for life insurance, which required a declaration of health status on the application. Instead, the couple engaged in at least seventeen transactions in which the McAfees borrowed money from a bank, immediately deposited it in a blocked savings account in the same bank as security for the loan, and then elected "credit life insurance" coverage on each loan transaction.[131] When Mrs. McAfee died, the insurance companies paid her husband the value of the policies, but then sued alleging fraud. Perhaps surprisingly, the court held that since the application for credit life insurance did not contain a question about the insured's health, the McAfees were not committing fraud by withholding this information from their insurers.[132]

This case can be read in two ways. The obvious conclusion is that the McAfees were an adverse selection nightmare—they utilized private information to purchase insurance for an event (Mrs. McAfee's death) that they knew was certain to occur, at rates that reflected the much lower *average* probability that the event would occur. But a better way to see this case is that credit life insurance was so profitable, and this kind of cheating so unlikely, that some thirty years after this kind of insurance had been invented, many firms did not even find it necessary to ask whether the applicant was in good health.[133] Any firm genuinely worried about adverse selection would simply have added a line on the insurance application requiring the insured to disclose any significant health risks.

A common sense "prediction" of adverse selection models is that insurers should be extremely careful in their underwriting practices. If customers really do know more about their own riskiness than their insurers do, insurers should ask lots of relevant questions. Instead, they often fail to ask for obviously relevant information, even accepting applications that are missing answers to key questions. If insurers can obtain information at almost no marginal cost that would largely eliminate any asymmetry between themselves and their insureds, and yet fail to do so, can adverse selection really be a serious worry?

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131. The court described credit life insurance as follows:
   Credit Life Insurance is life insurance issued on the life of the debtor. It is normally
   sold by a lending institution or a retail outlet. It requires that there be a valid debt, and
   that the debtor-insured has not reached his 65th birthday, and is generally issued up to
   the limits of between $12,500 and $15,000 without any medical questions or medical
   examination.
Id. at 452.

132. The only exceptions were the two policies issued by the insurer for whom McAfee worked, and to whom the court found he owed a more substantial duty. In these instances, his withholding of information about his wife's health was considered fraudulent. *Id.* at 455-56.

133. Credit life insurance seems originally to have been developed as a way to get around usury laws in the context of consumer credit. The earliest reference I can find is *Texas Finance & Thrift Ass'n v. State*, 224 S.W.2d 522, 522 (Tex. Civ. App. 1949). Credit life insurance has long been known to be an actuarially unfair (overpriced) form of insurance.

IV. PROPITIOUS SELECTION

Economists have recognized the possibility that under the right conditions, adverse selection might be reversed by sufficiently high levels of risk aversion within the low-risk group.[134] But until recently, this idea has not been taken seriously, nor has its empirical plausibility been appreciated. In part, this may be because it takes a theory to beat a theory, and the alternative to the standard adverse selection story was never treated as anything more than a curious possibility. Recent empirical research, however, as well as theoretical advances, have developed a compelling case for an alternative mode of selection—one that turns out to be favorable or "propitious" for insurers rather than adverse to their interests. To see how this kind of selection operates, we need to briefly discuss the demand for insurance.

A. *The Demand for Insurance*

The economic theory of insurance posits that it is valuable because people are risk-averse, meaning that they would prefer a small but certain loss to a large but highly variable one when the two are of equal expected value. Consider a gamble in which you lose $100,000 with probability 5% and lose $0 with probability 95%. The average (or expected value) of this gamble is .05(-$100,000) + .95($0) = -$5000. A risk-averse person should prefer to pay a premium of at least $5000—and even somewhat more—with certainty rather than face the risk of a $100,000 loss.

More technically, the assumption underlying risk aversion is that there is a decreasing marginal utility of wealth: As you increase a person's wealth, the increment in additional utility that the person receives becomes smaller and smaller. That is, going from zero wealth to $1000 increases utility by more than going from $1,000,000 to $1,001,000.

A complementary way of viewing insurance is to think about two alternative states of the world—one in which a wealth-reducing accident occurs, and the other in which it does not. Since wealth is especially valuable when you do not have a lot of it (i.e., when the accident *does* occur), it behooves you to ship your wealth from states of the world where

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134. For example, Cummins and his collaborators have observed that

> [i]f high and low risks had different utility functions and low risks were sufficiently risk averse, it is conceivable that all low risks would buy full coverage even at the average rate .... In this unlikely case, the [single-rate] insurance plan would be financially sound. Historical examples of market failure show, however, that low-risk policyholders are not sufficiently risk averse to subsidize the high-risk group.

CUMMINS ET AL., *supra* note 96, at 30. The authors present only a single "historical example[] of market failure"—early assessment societies, which date from the late nineteenth century. *Id.* at 28. I discuss this example above. *See supra* Subsection III.C.1.

it is plentiful to those in which it is scarce and hence worth relatively more in utility terms.[135] This is precisely what insurance accomplishes. The insured pays a small amount in good times, reducing wealth slightly at a time when wealth is plentiful and the money spent on insurance is relatively painless. She then gets back a large payment in bad times (e.g., after her house has burned down) when her wealth is low and an additional dollar of wealth is worth a great deal.[136]

A standard result in insurance demand is that any risk-averse person will always choose to purchase full insurance if it is priced at the actuarially fair premium—that is, at the expected value of the loss itself. In fact, this virtually amounts to a definition of what it means to be risk-averse. But it is not particularly helpful, because insurers are unlikely to offer full insurance at the actuarially fair premium. There are two reasons for this. First, moral hazard and adverse selection generally require some degree of risk sharing by the insured in the form of a deductible or copayment. Second, insurers have costs—ranging from the costs of selling and underwriting policies to the administrative costs of running the company and making payouts—that must be recouped, usually by loading them onto the pure risk premium that insureds pay.[137]

Experience suggests that people differ in the extent to which they are averse to financial risks. Someone whose marginal utility of wealth falls off very rapidly as wealth increases is more risk-averse than someone whose marginal utility of wealth does not change much as she becomes wealthier.[138] Individuals whose utility increases at a constant rate for each additional dollar of wealth, regardless of the amount of wealth they already have, are said to be risk-neutral.

Higher risk aversion translates into a willingness to pay more to eliminate financial risk. Equivalently, for a given premium, a more risk-

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135. This formulation is derived from J. Hirshleifer, *Investment Decision Under Uncertainty: Applications of the State-Preference Approach*, 80 Q.J. ECON. 252 (1966).

136. Formally, the rational utility-maximizing insured will seek to equalize the expected marginal utility of wealth across all states of the world.

137. At the same time, of course, insurers can earn income by investing their premiums. For a more detailed discussion of the business of insurance, see generally SCOTT E. HARRINGTON & GREGORY R. NIEHAUS, RISK MANAGEMENT AND INSURANCE (1999).

138. Economists use the Arrow-Pratt measure of (local) risk aversion to compare preferences for avoiding risk. The Arrow-Pratt measure of risk aversion is defined as the ratio of the second derivative of the utility function to its first derivative, $U''(W)/U'(W)$, where U is the utility function and W is wealth. This is a representation of the curvature of the utility function (at a given wealth level), with more curvature implying higher aversion to risk. *See* KENNETH J. ARROW, ASPECTS OF THE THEORY OF RISK-BEARING (1965); John W. Pratt, *Risk Aversion in the Small and in the Large*, 32 ECONOMETRICA 122 (1964). It is important to note that this is a measure of "local" risk aversion, meaning that it is only valid for comparing small changes around a fixed level of wealth. "Global" comparisons of risk aversion are problematic because any change in the curvature of the utility function will also alter its height, so it becomes impossible to isolate a "pure" change in risk aversion.

averse insured will be willing to tolerate a higher deductible before declining to purchase insurance than someone who is less risk-averse.

B. *Risk Aversion and the Theory of Propitious Selection*

Adverse selection models are premised on a reasonable—but not necessarily accurate—assumption that there is no relationship between an insured's riskiness and her attitudes toward risk. In an unduly neglected article, David Hemenway critically examined this assumption, and found it unsatisfactory.[139] In many cases, Hemenway suggested, the riskier insureds are precisely those who do not want to buy insurance; the same attitudes that lead them to take risks in the first place give them little reason to insure against such risks.

Hemenway went on to suggest that many insurance markets are actually characterized by "propitious," rather than adverse, selection. Propitious selection, as its name suggests, implies that insurance is most attractive to the lowest-risk individuals among those eligible to buy it, not to those with the highest risks.[140] Of course, when only the best risks buy insurance, the profitability of insurers does not suffer, but is enhanced.

Two key modifications to the classic adverse selection model underlie the propitious selection result. The first is relatively innocuous—we simply allow insureds to differ from one another in their tolerance for or aversion to risk, as seems empirically plausible. The second modification is more controversial, however: It assumes that there is a negative correlation between risk aversion and riskiness. In other words, the "belt-and-suspenders" types are not only more averse to financial risks—and hence more willing to pay to eliminate such risks through insurance—but they are also more likely to reduce risks on their own by, for example, taking

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139. *See* Hemenway, *supra* note 6, at 1063-64.

140. This insight was independently given more rigorous treatment in David de Meza & David C. Webb, *Advantageous Selection in Insurance Markets*, 32 RAND J. ECON. 249 (2001). They refer to "advantageous" rather than "propitious" selection, but Hemenway's priority in time suggests we should use his terminology.

The point has also recently cropped up in other places in the literature. Chiappori and Salanié, for example, have written that

> [r]isk is not the only possible source of informational asymmetry and probably not the most important one. There are good reasons to believe that individuals know better their own preferences and particularly their level of risk aversion—an aspect that is often disregarded in theoretical models. The presence of preference-related adverse selection would explain . . . the absence of correlation between [insureds'] choice [of coverage] and their accident probability. An extreme version of this is the so-called cherry-picking story. . . . [under which] more risk-averse drivers tend to both buy more insurance and drive more cautiously; this would even suggest a *negative* correlation between insurance coverage and accident frequency.

Chiappori & Salanié, *supra* note 68, at 74.

precautions or refusing to engage in physically risky activities. Since the second assumption is controversial, it is worth exploring in detail.

Although they sometimes confuse even themselves, economists use the term "risk aversion" in a much narrower sense than does the general public. To an economist, risk aversion means only that the marginal utility of wealth declines as wealth increases. Someone who is risk-averse in the economic sense will refuse a fair gamble (a fifty-percent chance of losing or winning $10,000), but this aversion applies only to financial risks. Our financially risk-averse individual might still enjoy hang gliding, eating puffer fish, or driving fast on twisty mountain roads. She might even gamble at unfavorable odds, if she got sufficient "thrill" from the act of gambling itself (as opposed to the financial winnings). All these activities are perfectly compatible with risk aversion (narrowly defined), as long as our subject holds a diversified portfolio of financial assets while she undertakes them.

Put another way, the economist does not see any necessary connection between attitudes toward financial risks and attitudes toward physical (or other) risks. While theory does not forbid such a correlation, it does nothing to suggest one either. And methodological concerns make economists unwilling to speculate about the content or form of people's utility functions, except in certain minimal ways necessary to guarantee logically coherent decisions.[141] In this view, to suggest that people who are averse to financial risks also tend not to like skydiving is no more justified, a priori, than to claim that people who prefer apples to oranges also tend to prefer dogs to cats. Both are just "artificial" restrictions on the form of utility functions that economists are generally reluctant to make.

Academic psychology and popular intuition seem to point in the opposite direction from the economist's view of risk, however: Attitudes toward risk do seem to be correlated across financial and other domains, as described below. The key point for now is that once we allow for a (sufficiently large) negative relationship between financial risk aversion and physical riskiness, it turns out that we can substantially reverse virtually all of the conclusions of standard adverse selection models. Recall that in the standard model, the low-risk individuals do not want to pool themselves with the high-risk group. If they do, they have to pay a premium that, while actuarially fair for the group as a whole, is too high for those with a low level of risk. But if it turns out that the low-risk group is also sufficiently risk-averse, they will value insurance so highly that it will be worthwhile

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141. For example, utility functions are assumed to obey a transitivity principle, so that if $U(A) > U(B)$ and $U(B) > U(C)$, then $U(A) > U(C)$. This seems to be a fairly innocuous and nonsubstantive restriction, although there is evidence that even this requirement is not always met. *See, e.g.*, Herbert Hovenkamp, *Legal Policy and the Endowment Effect*, 20 J. LEGAL STUD. 225 (1991).

for them to buy it even at rates that are substantially "too high" in a purely actuarial sense. In such a scenario, adverse selection is no longer a problem, as the best risks do not drop out of the insurance pool.

Table 1 presents a numerical example of two groups, each comprising half of the population. The Lows have a .2 probability of getting into an accident, while the Highs have a .6 probability. Both groups have identical wealth of 100, which is completely wiped out if the accident occurs.

TABLE 1. AN EXAMPLE OF A PROPITIOUS SELECTION EQUILIBRIUM

	Low-Risk Insureds	High-Risk Insureds
Group Characteristics:		
Proportion of Population	50%	50%
Probability of Loss, p	.2	.6
Wealth	100	100
Size of Loss, if Accident Occurs	100	100
Actuarially Fair Premium	20	60
Utility Function, $U(W)$	$W^{.25}$	$W^{.95}$
Coefficient of Absolute Risk Aversion[a]	$.75/W$	$.05/W$
Expected Utility if:		
1. No Insurance	2.530	31.773
2. Full Insurance at Actuarially Fair Premium	2.991	33.262
3. Percent Gain from Full Insurance	18.2%	4.7%
4. Pooling Equilibrium, Premium = 40[b]	2.783	48.893
5. Menu of Contracts: (a) Premium = 20, Deductible = 65.61 (b) Premium = 60, Deductible = 0	(a) 2.782 (b) 2.515	(a) 33.260 (b) 33.262

[a] The coefficient of absolute risk aversion is defined as $U''(W)/U'(W)$ where U'' is the second derivative of the utility function and U' is the first derivative.

[b] Forty is the actuarially fair premium when both groups are pooled.

In addition to different probabilities of an accident, the two groups also differ in their aversion to risk: The Lows are more risk-averse than the Highs. Another way to see this is to compare the expected utility of each group in the absence of insurance. The Lows face a lower risk of loss, and have higher expected income, but have a lower expected utility because the risk they *do* face is more costly to them in utility terms, even though it is smaller in absolute dollars.

If we now introduce insurance, we observe the following. First, if each group can be sold insurance separately, the Lows obtain a much larger percentage gain in utility than the Highs do. This occurs both because greater risk aversion makes a dollar of insurance coverage more valuable in utility terms and because the Lows have to pay less per dollar of coverage (since they impose a lower cost on their insurer).

Comparing Rows 1 and 4, we see that the low-risk group prefers to pool with the high-risk group rather than go without any insurance, even though pooling means that the low risks end up subsidizing their riskier neighbors. This is of course better for the high-risk group as well, since they not only get the benefits of insurance, but also obtain it at a cheaper rate by virtue of the less risky individuals with whom they are pooled.[142]

Finally, when the high-risk group is offered an actuarially fair policy for full insurance, we can solve for the deductible that must be offered to the low-risk group (at an actuarially fair premium) in order to prevent the high-risk group from switching to what would otherwise be a more attractively priced policy. As demonstrated in Row 5, the deductible necessary to keep the high risks out of the low-risk pool is 65.61, which, at a premium of 20, leaves the low-risk insureds (just barely) preferring to pool with the high risks (even at a premium of 40) rather than obtaining only partial insurance at the fair rate.

The moral of the story is that when the low-risk group is sufficiently risk-averse, a pooling equilibrium is possible in which both groups purchase insurance, and there is no tendency for markets to unravel or for the worst risks to select against the insurer. For even larger differences in risk aversion between the groups, the *worst* risks may choose to drop out, leaving only the best risks seeking coverage.

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142. Work by David de Meza and David Webb points out that if there are costs to processing insurance claims—as there surely are—this can lead to a reversal of the standard conclusions about the optimality of a pooling equilibrium. *See* de Meza & Webb, *supra* note 140, at 250-51. When the high-risk group is also less risk-averse, it may not value insurance enough to make purchase worthwhile when it has to pay for its risk plus the full cost of administering claims. When the high risks can pool with their low-risk neighbors, however, they may find insurance worthwhile. Hence, de Meza and Webb show that welfare might be increased by a tax on insurance purchases that is rebated to all citizens as a lump sum. This has the effect of driving the high-risk insureds out of the market, but they are more than compensated by the tax on the low risks who continue to purchase insurance, and society saves the cost of administering those policies that are not purchased.

C. *Evidence for Propitious Selection*

Of course, it is a long way from concocting a numerical example to asserting that such a scenario is an accurate description of reality. But the key propitious selection assumption is intuitively plausible. Moreover, it seems to be supported by anecdotal evidence.

Hemenway offers several observations of what appears to be a negative correlation between insurance demand and riskiness. They include:

- Those who purchase optional collision damage insurance on their rented car are more likely to wear seatbelts than those who do not. This suggests (though of course it does not prove) that purchasers of insurance drive more carefully and take more precautions against loss than those who decline to purchase such insurance. This is precisely the opposite of what a standard adverse selection story would imply.

- Subscribers to AAA towing insurance have newer cars (which are less likely to break down) than the population as a whole. The explanation is that those who buy the insurance are especially worried about a breakdown; they buy newer cars *and* towing insurance because they seek to prevent a breakdown and minimize its effects should one occur. Again, this is the exact opposite of the standard conclusion.[143]

Findings of other researchers also support the propitious selection story. For example:

- Those who purchase life insurance have a lower death rate than those who do not, even after controlling for factors such as smoking status and income.[144] Under the standard adverse selection story, insurance should be most attractive to those who expect to die soon. But propitious selection suggests that the same people who lead cautious lifestyles (eat well, get plenty of exercise) will also be motivated to buy insurance against an early death.

- According to a French insurance executive quoted by Chiappori and Salanié, the industry's view is that "[t]he really risky clients are

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143. Hemenway, *supra* note 6, at 1066-67.

144. Cawley & Philipson, *supra* note 58, at 829. More precisely, they find that the mortality of insured males is lower than the mortality of *all* males (both the insured and the uninsured), so, a fortiori, the uninsured must have a higher death rate.

those who believe they are first-class drivers!"[145] Again, the import is that the worst risks will tend to shun insurance, while the best risks will want it.

- According to David de Meza and David Webb, "4.8% of U.K. credit cards are reported lost or stolen each year, whereas for insured cards, the corresponding figure is only 2.7%."[146] This again suggests that those who purchase insurance are not the people who know that they are most likely to lose their cards, as the adverse selection story would have it. Rather, insurance purchasers are both more sensitive to the loss and more careful to take precautions against its occurrence.

- Perhaps the strongest evidence for propitious selection comes from the work of Finkelstein and McGarry. Using previous expenditures on preventive healthcare measures as a proxy for risk aversion, they show that people who spend more on their own health (1) buy more insurance, and (2) are less likely to use long-term nursing home care.[147] This is precisely the relationship predicted by propitious selection, and indeed, Finkelstein and McGarry find that even though sicker people do tend to buy more insurance (holding risk aversion constant), this effect is dominated by the positive relationship between insurance purchase and risk aversion.

D. *Correlation Between Financial and Nonfinancial Risk Aversion*

The key assumption that makes propitious selection work is the negative correlation between riskiness and risk aversion. While this assumption seems psychologically plausible, it is difficult to investigate directly, and to my knowledge no one has done so. What propitious selection seems to require is that individuals have an underlying psychological temperament that is reflected in *both* aversion to financial risks and aversion to nonfinancial risks to life and limb.

This view has attracted some limited empirical support. George Loewenstein and his coauthors argue for an affect-based—rather than purely cognitive—understanding of risk.[148] As part of an extensive survey of the psychological literature on risk-taking, they note studies suggesting that "highly anxious individuals attend preferentially to threat-related stimuli and interpret ambiguous stimuli and situations as threatening" and

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145. Chiappori & Salanié, *supra* note 68, at 73 n.18 (internal quotation marks omitted).
146. De Meza & Webb, *supra* note 140, at 249.
147. *See* FINKELSTEIN & MCGARRY, *supra* note 79, at 2-3.
148. George F. Loewenstein et al., *Risk as Feelings*, 127 PSYCHOL. BULL. 267 (2001).

that "fearful individuals make relatively pessimistic risk assessments and relatively risk-averse choices,"[149] much as propitious selection models would seem to require. Indeed, if "emotions are designed to help people make approach-avoidance distinctions," then emotions will play "a critical role in rational, risk-averse, forward-looking, decision making,"[150] and there ought to be a consistency across people in their approaches to financial and physical risks. The psychological and neurological evidence cited by Loewenstein, while not direct proof of the propitious selection assumption, is entirely consistent with the notion that financial and physical risk aversion are positively correlated.

Recent work by economists also hints at support for the propitious selection story. Kip Viscusi and Joni Hersch look at the jobs chosen by cigarette smokers and nonsmokers.[151] They find, first, that smokers select riskier jobs than nonsmokers. According to the standard theory of compensating differentials, persons who choose risky jobs should receive higher wages as compensation for the additional risks they bear—compare the wages of window washers with those of janitors. But Viscusi and Hersch's second finding is that smokers receive lower wage compensation for risk than do nonsmokers: Smokers in riskier jobs get less of a wage premium over smokers in less risky jobs than nonsmokers in risky jobs get over nonsmokers in less risky jobs. The authors conclude that smokers are in essence a separate part of the labor market: "[S]mokers and nonsmokers differ both in terms of their prefences [for risk versus safety] and their market offer curves."[152] The study suggests that persons who are willing to take one kind of risk (cigarette smoking) are also willing to take another kind of risk (job injuries) without demanding additional financial compensation for bearing such risks. This implies that, for whatever reason, there is a correlation between attitudes toward physical risk and attitudes toward financial risk.[153]

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149. *Id.* at 271.

150. *Id.* at 272.

151. W. Kip Viscusi & Joni Hersch, *Cigarette Smokers as Job Risk Takers*, 83 REV. ECON. & STAT. 269 (2001).

152. *Id.* at 270.

153. A somewhat similar conclusion is reached, albeit tentatively, by M. Christopher Auld, Smoking, Drinking, and Income 30 (Sept. 2002) (unpublished manuscript), http://jerry.ss.ucalgary.ca/smokes6.pdf. Note that the correlation between smoking and financial risk could be explained in numerous ways. Smoking might cause neurological changes that dull one's aversion to physical and financial risks. Smoking, physical, and financial risk-taking might all be "caused" by some underlying psychological propensity. Or perhaps culture or social class shapes preferences for risks of all kinds. For our purposes, it does not matter which of these accounts, if any, is correct.

A second study by Luigi Guiso and Monica Paiella looked more directly at aversion to financial risk.[154] The authors first constructed a direct measure of risk aversion, based on survey data in which respondents were asked the maximum amount they would be willing to pay to enter a hypothetical lottery.[155] The risk aversion measures thus derived were then used to predict various other aspects of the respondents' lives. The study found that people with higher risk aversion (in the financial sense) were more likely to work for the government (rather than the private sector, where the risk of being fired was higher), more likely to live in the same region in which they were born, less likely to have changed jobs over the past few years, and less likely to have a chronic disease than those who were less risk-averse. "Overall," the authors concluded, "the evidence . . . implies that attitudes towards [financial] risk have considerable explanatory power for several important . . . [nonfinancial] decisions."[156]

In a similar vein, Robert Barsky and his collaborators compare measures of financial risk aversion with, among other things, measures of nonfinancial risk-taking such as smoking and drinking.[157] They find that there is a positive correlation between answers to a survey question designed to measure financial risk aversion and behaviors such as smoking, drinking, not having insurance, and choosing risky employment. "These results are often strongly significant statistically and are associated with quantitatively significant coefficient estimates. . . . [However, the] fraction of the variance of the various behaviors that [the] survey instrument explains is . . . quite small."[158] For example,

> risk tolerance . . . predicts smoking and drinking even after controlling for [several] demographic variables. . . . [T]he most risk tolerant respondents are over three and a half percentage points more likely to have ever smoked than the least risk-tolerant respondents . . . . Moving from the lowest to highest response for risk tolerance is associated with a 4 percent increase in the

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154. LUIGI GUISO & MONICA PAIELLA, RISK AVERSION, WEALTH AND BACKGROUND RISK (Ctr. for Econ. Policy Research, Discussion Paper No. 2728, 2001), http://www.cepr.org/pubs/dps/DP2728.asp.

155. Respondents were offered the opportunity to enter a hypothetical lottery in which they would pay X to play and could then win $5000 or win nothing, each with a fifty-percent probability. They were then asked, "What is the [largest X] that you are prepared to pay [to take this gamble]?" The authors show how to derive a measure of risk aversion from the answer to this question. *Id.* at 5-6 (internal quotation marks omitted).

156. *Id.* at 26-27.

157. Robert B. Barsky et al., *Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and Retirement Study*, 112 Q.J. ECON. 537 (1997).

158. *Id.* at 551.

probability of drinking . . . and a 0.1 drink increase in the number of drinks per day . . . .[159]

All of these findings are broadly supportive of the psychological basis for the propitious selection story.

CONCLUSION

In one sense, the lessons of this work are negative. Adverse selection in insurance markets is a complicated phenomenon the existence of which is indisputable. I have not claimed that it never occurs or that we can safely ignore it.[160] But its importance appears to have been grossly exaggerated. Neither economic theory nor empirical evidence points to adverse selection as the overwhelming, central problem that many courts and scholars describe. This suggests that there is more room for policy interventions in insurance markets than many seem to believe. Of course, such interventions may be unwise for other reasons, but there may be little need to reject an otherwise desirable intervention out of a fear that adverse selection will result.

Consider civil rights, for example. Insurers are not allowed to use race in pricing, say, life insurance,[161] even though race is correlated with mortality risk.[162] Whether or not the result is some modest degree of adverse selection—and I am unaware of any studies suggesting that whites buy less insurance and blacks more because they are heterogeneous risks lumped into the same insurance pool—almost everyone would concede that this is a price we should pay to achieve a measure of interracial equity. The

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159. *Id.* at 553-54.

160. Indeed, it may be precisely because insurance law and the practice of insurers already take adverse selection into account that we see relatively little of it. My point is rather that, as John Donohue put it, "courts and policy makers should not just invoke the magical words 'adverse selection' but rather should have to think about what the real danger of adverse selection is in a particular case." E-mail from John J. Donohue III, William H. Neukom Professor of Law, Stanford Law School (Sept. 19, 2003) (on file with author).

161. The Pennsylvania Insurance Code, for example, states that insurers are forbidden from [m]aking or permitting any unfair discrimination between individuals of the same class and essentially the same hazard with regard to underwriting standards and practices or eligibility requirements by reason of race, religion, nationality or ethnic group, age, sex, family size, occupation, place of residence or marital status. The terms "underwriting standards and practices" or "eligibility [requirements]" do not include the promulgation of rates if made or promulgated in accordance with the appropriate rate regulatory act of this commonwealth and regulations promulgated by the commissioner pursuant to such act.

40 PA. CONS. STAT. ANN. § 1171.5(a)(7)(iii) (West 1999).

162. The life expectancy of a 35-year-old white male is 41.7 years, while for a black male of the same age the corresponding figure is only 36.7 years, a difference of 5.0 years or 13%. *See* U.S. CENSUS BUREAU, U.S. DEP'T OF COMMERCE, STATISTICAL ABSTRACT OF THE UNITED STATES: 2003, at 85 tbl.107 (2003). Conversely, annual death rates at age 35 are 1.67 per 1000 for white males and 3.24 for black males. *Id.*

point is not that "other" concerns such as civil rights should automatically trump worries about adverse selection, or vice versa. It is rather that we should begin thinking about tradeoffs among various desirable goals, of which reducing adverse selection might be one, but not the only one. This in turn requires that we start asking quantitative questions: How much adverse selection would actually result if we permitted or refused to allow certain conduct, and how serious would this be? The task of generating theories and empirical work that can answer such questions is only just beginning.

One place *not* to begin is by confusing adverse selection with death spirals, as many courts and commentators seem to do. Adverse selection can lead to the eventual collapse of the entire insurance pool. But theory does not tell us that a death spiral is the inevitable result of any informational asymmetry, and the empirical evidence for this kind of unraveling is quite limited. In fact, even when adverse selection does occur, theory predicts that a stable equilibrium may be possible, albeit one in which there is inefficiently incomplete insurance coverage available to some actors. The key point is that modest adverse selection may be tolerable in a second-best world where there are other important objectives—ranging from civil rights to antitrust—that are also at stake in many insurance contexts.

Along more positive lines, we need to start thinking more carefully about how insurance markets actually work. In terms of theory, this means abandoning the economic theorists' obsession with increasingly complex and recherché specifications of game-theoretic equilibria, and beginning to focus on the more relevant questions about how people and firms actually go about making decisions. Greater psychological realism and more careful attention to institutions are necessary for a fuller understanding of how insurance markets work.

One set of unanswered questions focuses on the demand for insurance, and in particular the connections between financial risk aversion and the amount of care people undertake. Experimental or survey data will be useful, since there are currently no data sets that combine information on insurance purchases with data on attitudes toward financial and physical risks. Another valuable approach involves simulation of insurance markets using large numbers of simple "agents" (individual purchasers) whose behavior is calibrated to resemble that of real individuals. By suitably varying parameters such as the average risk aversion in the population, the degree of heterogeneity across individuals, and the types of insurer underwriting, Seth Chandler's recent work allows us to see which features of insurance markets are particularly likely to give rise to (or prevent)

adverse selection.[163] These are precisely the kinds of questions that are missing from virtually all current discussions of the phenomenon.

Although this Essay has implicitly treated many different kinds of insurance as identical, there is no reason to think this should be so. Insureds could be better (relative to their insurers) at forecasting their need for healthcare than their chances of getting into an auto accident. Firms might be better than individuals at forecasting their own riskiness, or might have a better outside option (self-insurance) than individuals have. Hence one might expect more adverse selection in markets for health insurance and insurance sold to commercial customers than in the market for personal automobile insurance.[164] Unfortunately, current models of adverse selection do not allow such questions to be raised, despite their obvious importance for policy analysis.

Another important dimension of variation is in the precision of an insured's information. Contrast the risk of acquiring AIDS with the risk of being involved in an automobile accident. We now have medical tests that can detect the presence of HIV antibodies (denoting exposure to the virus) with substantial accuracy. Anyone who tests positive knows that she will either have a higher likelihood of early death or at the very least will require extensive medical care for a long period of time.[165] If insureds have such information and insurers do not, it seems likely that insureds would choose to act on it by purchasing underpriced insurance. Automobile accident risk is very different, however: Even if insureds have a sense of how carefully or recklessly they drive, and even if insurers do not, insureds may have a very hard time predicting the likelihood and magnitude of an accident in a way that would allow them to select against an insurer. In sum, it is essential to recognize that all risks are not created equal.

One of the 2000 Nobel Prizes in Economics was awarded to James Heckman for his pioneering work in understanding the consequences of selected samples in labor markets.[166] The success of Heckman's models is

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163. *See* Chandler, *supra* note 29.

164. Cross-national or cultural differences might also be relevant. Adverse selection might be more of a problem in the Israeli market analyzed in COHEN, *supra* note 70, than in the French market analyzed in Chiappori & Salanié, *supra* note 68. We need a theory that is capable of suggesting whether these differences matter, and why.

165. Even highly accurate tests can give misleading results when applied to members of the general population for whom the risk of exposure is low. For an extended treatment, see GERD GIGERENZER, CALCULATED RISKS: HOW TO KNOW WHEN NUMBERS DECEIVE YOU 115-40 (2002).

166. *See* Press Release, The Royal Swedish Academy of Sciences, The 2000 Sveriges Riksbank [Bank of Sweden] Prize in Economic Sciences in Memory of Alfred Nobel (Oct. 11, 2000), http://www.nobel.se/economics/laureates/2000/press.html. For example, those who sign up for voluntary job training programs are a selected sample of those eligible for training. Enrollees are likely to be more highly motivated and more receptive to training than nonenrollees. Suppose that graduates of job training programs are shown to be more successful than persons who were eligible for such programs but chose not to enroll. On the basis of this evidence alone, we cannot

based on a rich understanding of the processes by which people decide whether or not to participate in the labor market, and good data with which to refine the models' predictions. Selection in insurance markets is in many ways a structurally similar problem—those who decide to buy insurance may not be a random sample of those who are eligible for it. But we are only beginning to appreciate the empirical complexities of selection in insurance markets, and these insights have not yet been picked up by the courts and the legal academy. At least for now, a healthy skepticism is the best way to greet claims about the seriousness of adverse selection in insurance markets.

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be confident that we have identified a real effect of the program rather than a statistical artifact caused by the greater propensity to enroll of those who are highly motivated, since such graduates would have likely done better even if they had not participated. Heckman and others have developed an array of statistical techniques to measure and control for effects of this kind. For an accessible treatment of Heckman's work, see Symposium, *Essays in Honor of James Heckman, 2000 Nobel Laureate*, 27 LAW & SOC. INQUIRY 1 (2002).

APPENDIX: ADDITIONAL EMPIRICAL STUDIES OF ADVERSE SELECTION

This Appendix describes several studies of adverse selection in insurance markets that are listed in Table 2 but are not discussed in the body of this Essay.

James Cardon and Igal Hendel look for evidence of adverse selection using a sophisticated two-stage model of the demand for health insurance.[167] In their setup, individuals first receive a private signal that is correlated with their future health, and then make their choice about how much insurance to purchase. In the second stage, individuals then consume healthcare, with the amount depending on their actual health status, their previously chosen insurance coverage, and other variables that are observable (such as income). The test for adverse selection "is based on whether the link between insurance choice and health care consumption can be attributed to [observable variables]. If observables account for the link, then we can rule out the importance of unobservables in the joint insurance/health care decision."[168] In other words, even if people who choose more insurance also turn out to have worse health and higher demand for healthcare services, this by itself is not evidence of adverse selection. If the choice of more insurance and the choice to make more claims on that insurance are both explained by variables that the insurer can observe—such as age or income—then there is no information asymmetry favoring insureds, and no adverse selection. It is only if the insured has valuable *private* information (information her insurer does not have) about her likely future health status that adverse selection becomes a problem.

Cardon and Hendel's conclusion is that "the link between health insurance choice and health care consumption is mostly explained by observables. . . . There is no evidence of unobservables linking insurance status with health care demand,"[169] and hence apparently no private information that insureds can use to select against their insurers.

Chiappori and Salanié test for adverse selection using a large data set from a single French automobile insurer.[170] Their insureds are a relatively homogenous group of drivers with less than four years' driving experience. Their careful tests reveal no evidence that drivers with higher accident rates purchase more insurance than those with lower rates, as adverse selection would require.

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167. James H. Cardon & Igal Hendel, *Asymmetric Information in Health Insurance: Evidence from the National Medical Expenditure Survey*, 32 RAND J. ECON. 408 (2001).

168. *Id.* at 409. Cardon and Hendel note that their model requires that individuals choose their employers without regard to their own health status. If sicker individuals choose employers with better health insurance plans, then there will be unmeasured adverse selection operating prior to the decisions that the authors explicitly model.

169. *Id.*

170. Chiappori & Salanié, *supra* note 68.

Using a more limited data set, Dionne and his collaborators test for adverse selection in the Quebec auto insurance market.[171] They conclude that relevant differences among insureds are sufficiently captured by the risk classification system, so that there is essentially no residual adverse selection problem once insureds are sufficiently sorted by age, sex, and so on.

Cawley and Philipson test for adverse selection in the market for life insurance using several large and rich data sets.[172] They have three compelling findings. They first demonstrate that after controlling for age, gender, and smoking status, the death rate for persons with life insurance is actually *lower* than for those without it. This clearly runs counter to the basic adverse selection story, in which it is the worst risks who buy insurance and the best risks who choose to drop out of the market.

As Cawley and Philipson point out, most models of adverse selection require that the good (low) risks are rationed in equilibrium. If persons could purchase full insurance at a favorable premium, and individuals knew more about themselves than their insurers did, those with known high risk levels would flock to buy the cheap insurance. To prevent this, cheap insurance must come with a high deductible in order to make it unattractive to buyers who know that their risk of an accident is high. Rationing, in turn, requires that prices for insurance must rise with additional coverage. Otherwise, insureds could just buy two $100,000 policies for less than a single $200,000 policy. Cawley and Philipson's second finding contradicts this requirement: Life insurance premiums *fall* with higher quantities. Such quantity discounts are inconsistent with a significant role for adverse selection in life insurance.[173]

Finally, Cawley and Philipson compare people's self-assessed risk of death (based on interviews with insureds) with the amount of coverage they purchased. They conclude that while people were moderately good at predicting their own likelihood of death, they were no better than their insurance companies were. This finding is again at odds with the presence of adverse selection, which requires that individuals be able to outpredict their insurer on the basis of their private information.[174]

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171. Georges Dionne et al., *Testing for Evidence of Adverse Selection in the Automobile Insurance Market: A Comment*, 109 J. POL. ECON. 444 (2001).

172. Cawley & Philipson, *supra* note 58.

173. Cawley and Philipson note that "seams" in the pricing schedule mean that it may sometimes be cheaper to buy more insurance than less—for example, $500,000 will be cheaper than $475,000.

174. Technically, the authors attempted to predict whether or not an individual would die over a given period, using age, gender, smoking status, and the subject's self-assessed likelihood of dying. After controlling for the size of an insured's premium calculated from life insurance tables—which reflects the insurer's assessment of that individual's risk—there was no additional gain to knowing the insured's self-assessment.

TABLE 2. ECONOMETRIC TESTS FOR INFORMATIONAL ASYMMETRY ("IA")
BETWEEN INSUREDS AND INSURERS, BY YEAR OF STUDY

Author	IA?	Insurance Type	Sample	Complete Info?	Conclusion
Finkelstein & McGarry[1]	Yes, but . . .	Long-Term Care, U.S.	Complete policies of large U.S. long-term care insurer	Yes	Individuals do have private information about their risk type, but more cautious individuals are both more likely to have long-term care insurance and less likely to enter a nursing home.
Pauly et al.[2]	Yes, but . . .	Term Life, U.S.	Random sample of policies for 35 insurers comprising half of the insurance market	No	The price elasticity of demand for insurance is low, and the risk elasticity of demand is even smaller.
Cohen[3]	Yes	Auto, Israel	200,000 policies issued over 5 years, panel data	Yes	No IA for inexperienced drivers, but for experienced drivers, low-premium purchasers associated with $58-$78 (20%) higher claims costs.
Cardon & Hendel[4]	No	Health, U.S.	826 unmarried individuals, National Med. Expend. Survey	No	Complex econometric model reveals essentially no informational advantage for healthcare insureds over their insurers.
Dionne et al.[5]	No	Auto, Quebec	Large private insurer, sample size unknown	No	Risk classification exhausts potential IA.
Chiappori & Salanié[6]	No	Auto, France	20,000+ drivers, < 4 yrs' experience; sample of 21 firms with 70% of market	Yes?	Insureds who choose "better" coverage do not have a higher probability of an accident, after controlling for variables observed by the insurer. No evidence of IA.
Finkelstein & Poterba[7]	Yes, but . . .	Annuities, U.K.	41,000 policies from compulsory and voluntary markets of one insurer	Yes	No selection on initial amount of annuity payment, but evidence of selection on the time profile of payments and whether annuity makes payments to annuitant's estate.
Cawley & Philipson[8]	No	Life, U.S.	Several large data sets, panel data	No	Persons who expect to die soon do not buy more insurance. Insureds have lower death rates than those without insurance. Premiums decline with increasing coverage, rather than rise (as required by adverse selection theory).
Ettner[9]	Equiv-ocal	Supp. Medicare (Medigap), U.S.	8561 elderly patients	No	"Modest but mixed evidence" of adverse selection: Insureds who bought insurance through employer bought less coverage than those who bought individually.

van de Ven & van Vliet[10]	No	Health, Neth.	16,682 families	No	Consumers choosing hypothetical no-deductible plan did not have higher subsequent healthcare expenses, controlling for information known to insurer. Risk classification sufficient to create homogeneity within class.
Browne & Doerping- haus[11]	No, but . . .	Health, U.S.	191 families	Unknown	Insureds with higher unobservable risk do not purchase policies with different cost-sharing provisions. However, they do pay lower premiums per dollar of benefits received.
D'Arcy & Doherty[12]	Yes, but . . .	Auto, U.S.	6 insurers	No	Loss ratios decline over time for each cohort of insureds, as insurers learn selectively more about individuals' accident propensities.

[1] AMY FINKELSTEIN & KATHLEEN MCGARRY, PRIVATE INFORMATION AND ITS EFFECT ON MARKET EQUILIBRIUM: NEW EVIDENCE FROM LONG-TERM CARE INSURANCE (Nat'l Bureau of Econ. Research, Working Paper No. 9957, 2003), http://www.nber.org/papers/w9957.pdf.

[2] MARK V. PAULY ET AL., PRICE ELASTICITY OF DEMAND FOR TERM LIFE INSURANCE AND ADVERSE SELECTION (Nat'l Bureau of Econ. Research, Working Paper No. 9925, 2003), http://www.nber.org./papers/w9925.pdf.

[3] ALMA COHEN, ASYMMETRIC INFORMATION AND LEARNING IN THE AUTOMOBILE INSURANCE MARKET (Harvard Law Sch., John M. Olin Discussion Paper Series, Working Paper No. 371, 2002), http://www.law.harvard.edu/programs/olin_center/papers/pdf/371.pdf.

[4] James H. Cardon & Igal Hendel, *Asymmetric Information in Health Insurance: Evidence from the National Medical Expenditure Survey*, 32 RAND J. ECON. 408 (2001). Although the authors do not have complete access to the insurers' data on each insured, they do have data on the complete set of alternative health insurance plans of each employer, and thus know all options open to insureds.

[5] Georges Dionne et al., *Testing for Evidence of Adverse Selection in the Automobile Insurance Market: A Comment*, 109 J. POL. ECON. 444 (2001).

[6] Pierre-André Chiappori & Bernard Salanié, *Testing for Asymmetric Information in Insurance Markets*, 108 J. POL. ECON. 56 (2000).

[7] AMY FINKELSTEIN & JAMES POTERBA, ADVERSE SELECTION IN INSURANCE MARKETS: POLICYHOLDER EVIDENCE FROM THE U.K. ANNUITY MARKET (Nat'l Bureau of Econ. Research, Working Paper No. 8045, 2000), http://www.nber.org/papers/w8045.pdf.

[8] John Cawley & Tomas Philipson, *An Empirical Examination of Information Barriers to Trade in Insurance*, 89 AM. ECON. REV. 827 (1999).

[9] Susan L. Ettner, *Adverse Selection and the Purchase of Medigap Insurance by the Elderly*, 16 J. HEALTH ECON. 543 (1997).

[10] Wynand P.M.M. van de Ven & René C.J.A. van Vliet, *Consumer Information Surplus and Adverse Selection in Competitive Health Insurance Markets: An Empirical Study*, 14 J. HEALTH ECON. 149 (1995).

[11] Mark J. Browne & Helen I. Doerpinghaus, *Information Asymmetries and Adverse Selection in the Market for Individual Medical Expense Insurance*, 60 J. RISK & INS. 300 (1993).

[12] Stephen P. D'Arcy & Neil A. Doherty, *Adverse Selection, Private Information, and Lowballing in Insurance Markets*, 63 J. BUS. 145 (1990).

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