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Tontines for the Invincibles: Enticing Low Risks Into the Health-Insurance Pool With an Idea from Insurance History and Behavioral Economics

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TONTINES FOR THE INVINCIBLES: ENTICING LOW RISKS INTO THE HEALTH-INSURANCE POOL WITH AN IDEA FROM INSURANCE HISTORY AND BEHAVIORAL ECONOMICS

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Over one-third of the uninsured adults in the U.S. below retirement age are between nineteen and twenty-nine years old. Young adults, especially men, often go without insurance, even when buying it is mandatory and sometimes even when it is a low-cost employment benefit. This Article proposes a new form of health insurance targeted at this group, the "young invincibles"—those who (wrongly) believe that they do not need health insurance because they will not get sick. Our proposal offers a cash bonus to those who turn out to be right in their belief that they did not really need health insurance. The concept comes from the tontine life insurance that fueled the rise of the U.S. insurance industry in the late nineteenth century. A largely forgotten casualty of the 1906 "pacification" of the life-insurance industry, the tontine idea holds great promise for making health insurance attractive to the invincibles. The tontine feature frames the health-insurance purchase as a smart investment, rather than a way to spend money for something the customer does not think he needs. Tontines make insurance more attractive to the uninsured, without wasting funds by subsidizing those who are already covered. We identify a particular class of individuals (the invincibles), show how a specific cognitive bias accounts for their irrational behavior, and design an insurance mechanism (tontines or deferred dividends) to overcome the effects of this bias. The final sections of the Article offer an empirically calibrated pricing demonstration for a tontine health policy and an analysis of the legality of tontines in this context.

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INTRODUCTION

> *They're young and healthy, and insurance is expensive. As long as they don't . . . slip on the ice, crash a bike, snowboard into a tree, rupture an appendix, or get hit by a bus, everything will be fine. Right?*[1]

1. David Amsden, *The Young Invincibles*, N.Y. MAG., Apr. 2, 2007, at 26. *See also* Cara Buckley, *For Uninsured Young Adults: Do-It-Yourself Medical Care*, N.Y. TIMES, Feb. 18, 2009, at A1.

Over one-third of all uninsured adults below retirement age in the U.S. are between nineteen and twenty-nine years old.[2] When young adults, especially men, age out of the dependent-care coverage provided by their parents' employment benefits or public health insurance, they often go without, even when buying insurance is mandatory and sometimes even when that insurance is a low-cost employment benefit.[3] In health policy parlance, these people are known as the "young invincibles," and are considered unreachable by ordinary health insurance. Young adults grow older, and most of them eventually join the health-insurance pool.[4] But some of them face serious medical needs during that uninsured period, and their lack of insurance for those needs imposes costs on others in society—not to mention the consequences for the young adults themselves.[5]

Health-care policy-makers have suggested a number of ways to keep young adults in the health-insurance pool. Most obviously, a universal health-insurance program would achieve this objective. Other more targeted, incremental approaches include requiring employers to increase the maximum age of children who may be covered under their parent's health-care benefits and increasing the maximum age for

2. Jennifer L. Kriss et al., *Rite of Passage? Why Young Adults Become Uninsured and How New Policies Can Help*, 38 COMMONWEALTH FUND 1, 2 fig.1 (2008) (citation omitted) (reporting that 29 percent of non-elderly uninsured are from nineteen to twenty-nine years of age). Using their data, we compute that 37 percent of the uninsured non-elderly *adults* are from nineteen to twenty-nine years of age.

3. Sally H. Adams et al., *Health Insurance Across Vulnerable Ages: Patterns and Disparities from Adolescence to the Early 30s*, 119 PEDIATRICS e1033, e1034, e1038 (2007), *available at* http://www.pediatrics.org/cgi/content/full/119/5/e1033; S. Todd Callahan & William O. Cooper, *Gender and Uninsurance Among Young Adults in the United States*, 113 PEDIATRICS 291 (2004) [hereinafter Callahan & Cooper, *Gender and Uninsurance*]; S. Todd Callahan & William O. Cooper, *Uninsurance and Health Care Access Among Young Adults in the United States*, 116 PEDIATRICS 88, 88, 90, 93–94 (2005) [hereinafter Callahan & Cooper, *Uninsurance and Health Care Access*]. For evidence that Massachusetts's health-insurance mandate has reduced the incidence of uninsurance among young adults (at the cost of some coercion), but has left a significant fraction still uninsured, see Paul Wingle, Commonwealth Health Insurance Connector Authority, Presentation to Academy Health National Health Policy Conference on Young and Uninsured (Feb. 4, 2008) (slides and handout *available at* http://www.academyhealth/org/Events/content.cfm?ItemNumber=1512).

4. *See* Adams et al., *supra* note 3, at e1036, e1038.

5. *See, e.g.*, KARYN SCHWARTZ & TANYA SCHWARTZ, UNINSURED YOUNG ADULTS: A PROFILE AND OVERVIEW OF COVERAGE OPTIONS 6, 7 (2008), *available at* http://www.kff.org/uninsured/upload/7785.pdf (discussing the welfare consequences of uninsurance, and the case for reducing it); S. Todd Callahan & William O. Cooper, *Access to Health Care for Young Adults With Disabling Chronic Conditions*, 160 ARCHIVES PEDIATRICS & ADOLESCENT MED. 178, 181 (2006).

participation in state-based public insurance programs.[6] All of these are costly and involve an element of coercion.

Instead of forcing them to buy something they do not value, or making others subsidize that purchase, we suggest designing a product that the young invincibles would be more willing to pay for. "One size fits all" only rarely attracts consumers who have choices. Insurance history and behavioral decision research suggest that insurance is just like other consumer products or services in this regard. Different people have different preferences for insurance. Designing new insurance products to meet insurance-resistant young people's preferences offers a potentially promising new way to entice low risks into the health-insurance pool.

To this end, we propose tontines for the invincibles—health insurance that pays a cash bonus to those who turn out to be right in their belief that they did not really need health insurance. The simplest arrangement would award the bonus to those who did not consume more than a threshold value of medical care during a three-year period, potentially excluding preventive care. We discuss more complicated arrangements below.

The tontine concept comes from the tontine life insurance that fueled the rise of the U.S. insurance industry in the late nineteenth century.[7] Late nineteenth-century insurers seem to have understood some things about human nature that were largely forgotten over the intervening hundred years, only to be rediscovered more recently under the aegis of behavioral economics. Tontine life insurance paid a deferred dividend to policyholders who survived and faithfully paid their insurance premiums for a defined period, usually twenty years.[8] The amount of the dividend depended on how many people were left in the insurance pool when the dividend was paid.[9] A largely forgotten casualty of the 1906 pacification of the life-insurance industry, the tontine idea holds great promise for making health insurance attractive to the invincibles today.[10]

6. *Id.* at 7–8, 12–13; Kriss et al., *supra* note 2, at 13–15.

7. Henry William Manly, *On the American Tontine and Mutual Assessment Schemes*, 26 J. INST. ACTUARIES 182, 183–84 (1887).

8. *Id.* at 184–85.

9. *Id.* at 183–85.

10. Products that offer a link between insurance or savings and probabilistic prizes are not entirely dead. For more than fifty years, the government of the United Kingdom has offered a Premium Bond program that "guarantee[s] holders risk-free return of nominal principal" while paying a return that is "distributed to holders each month by a lottery-like mechanism." PETER TUFANO, SAVING WHILST GAMBLING: AN EMPIRICAL ANALYSIS OF UK PREMIUM BONDS 1 (2008), *available at* http://www.aeaweb.org/annual_mtg_papers/2008/2008_541.pdf. The bond has successful parallels in some third-world countries. *Id.*

There are, of course, many reasons why everyone should buy life, health, and other kinds of insurance.[11] But those reasons appeal to rational, prudent people, and especially to the *homo economicus* who populates traditional economic analysis. Insurance-resistant young adults belong to another tribe, at least when it comes to health insurance. They are "Humans," not "Econs," in Richard Thaler and Cass Sunstein's evocative terms; like other Humans, the invincibles predictably err in ways we can understand and for which we can plan.[12] Like other forms of choice architecture, our health-insurance idea is a "nudge," a menu-changing strategy that may help Humans make wise choices.[13]

Tontine health insurance would differ from ordinary health insurance or managed care in one main respect. Ordinary health insurance provides a tangible benefit only when you need health care. Tontine insurance would provide a tangible benefit even if you do not. We emphasize *tangible* benefits because the intangible peace of mind that insurance provides is demonstrably not enough to induce the young invincibles to insure. A tontine health-insurance policy would pay them a cash benefit when they do not use their health insurance, as well as covering their medical expenses when they do.

The tontine feature frames the health-insurance purchase as a smart investment, rather than as a way to spend money for something the customer thinks he does not need. Indeed, the tontine feature provides something close to the holy grail of health-policy planners: making insurance more attractive to the uninsured without "wasting" funds by subsidizing those who are *already* covered. The tontine has a role even if Congress adopts universal-coverage health-care reform. Offering the tontine would make it more likely that young invincibles would actually enroll and remain in the program.

A growing body of work uses behavioral insights to explain insurance demand. An early example is Eisner and Strotz's paper detailing the irrationality of flight insurance, which should not have appealed to a rational consumer, yet was widely purchased.[14] Johnson

11. *See, e.g.*, KENNETH J. ARROW, *Uncertainty and Medical Care*, *in* ESSAYS IN THE THEORY OF RISK BEARING 200–01 (1971) (full insurance is optimal when insurance is actuarially fair); Jan Mossin, *Aspects of Rational Insurance Purchasing*, 76 J. POL. ECON. 533, 557 (1968) (same).

12. *See* RICHARD H. THALER & CASS R. SUNSTEIN, NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS 6–8 (2008) (contrasting "Econs" and "Humans").

13. *See id.* at 3–6, 8.

14. Robert Eisner & Robert H. Strotz, *Flight Insurance and the Theory of Choice*, 69 J. POL. ECON. 355, 355, 364 (1961). Flight insurance remains far more common than insurance economists believe. It has become less visible because the

et al., used experimental and anecdotal evidence to show that people are willing to pay more for separate policies covering two risks individually than for a single policy covering both of them together (presumably because the separate events are more vivid).[15]

In recent work, Kunreuther and Pauly offer an extended taxonomy of anomalies in insurance decision-making on both the demand and supply side of the market, including consumers' preference for insurance policies that offer premium rebates, a concept that is similar to our tontine idea.[16] Their trenchant policy suggestions include redesigning insurance coverage to make it more attractive to those who "mistakenly" choose not to purchase it.[17] Our work is also in the spirit of recent papers in the behavioral economics of health and health insurance. We share the conclusion of Jeffrey Liebman and Richard Zeckhauser,[18] and Richard G. Frank,[19] that decisions regarding health insurance and health care are precisely the kinds of choices that are likely to be made poorly, and that insights from behavioral economics can be used to justify institutional design in this area.

The idea that an overly optimistic assessment of risk stands as an obstacle to effective demand for health insurance is by now quite standard.[20] Our contribution is to identify a particular class of individuals (the "young invincibles") subject to this bias, and to design a novel insurance mechanism (tontines or deferred dividends) to overcome its effects. In addition we identify the potential use of

airport kiosks of a previous generation have been replaced by automatic flight insurance arrangements sold through credit cards. *See Aviation Data, Inc. v. Am. Express Travel Related Servs. Co.*, 62 Cal. Rptr. 3d 396, 398 (Cal. Ct. App. 2007) (describing flight and baggage insurance program in the context of a consumer class action).

15. *See generally* Eric J. Johnson et al., *Framing, Probability Distortions, and Insurance Decisions*, 7 J. RISK & UNCERTAINTY 35 (1993).

16. Howard Kunreuther & Mark Pauly, *Insurance Decision-Making and Market Behavior*, 1 FOUNDATIONS & TRENDS IN MICROECONOMICS 63, 91–92 (2006). *See also* David M. Cutler & Richard Zeckhauser, *Extending the Theory to Meet the Practice of Insurance*, *in* BROOKINGS-WHARTON PAPERS ON FINANCIAL SERVICES (Robert E. Litan & Richard Herring eds., 2004).

17. Kunruether & Pauly, *supra* note 16.

18. Jeffrey Liebman & Richard Zeckhauser, *Simple Humans, Complex Insurance, Subtle Subsidies* (Nat'l Bureau of Econ. Research, Working Paper No. 14330, 2008).

19. Richard G. Frank, *Behavioral Economics and Health Economics* 4, 28 (Nat'l Bureau of Econ. Research, Working Paper No. 10881, 2004), *available at* http://www.nber.org/papers/w10881.

20. *See, e.g.*, Peter Diamond, *Organizing the Health Insurance Market*, 60 ECONOMETRICA 1233, 1236 (1992). For a recent appraisal of the evidence on optimism bias, see Alvaro Sandroni & Francesco Squintani, *The Overconfidence Problem in Insurance Markets* (Econ. Learning & Soc. Evolution, Working Paper No. 116, 2004), *available at* http://else.econ.ucl.ac.uk/papers/squintani/overconfidence.pdf.

deferred dividends to address ex post moral hazard in health insurance, although we defer thorough exploration of this topic to future work.

There are some tricky issues to address in designing a tontine health-insurance plan: for example, we do not want to discourage the invincibles from using their insurance when they actually need it. Before fully explaining the concept and addressing this and other important issues, however, we first take a trip through life-insurance history, back to a time when insurance companies more openly acknowledged that they had to offer a little "spice" to get customers to buy their products.[21] We then set out the details of our proposal, using behavioral decision research to explain the power of the tontine idea and to address some theoretical objections.

I. TONTINE LIFE INSURANCE

Tontine life insurance emerged in the United States in the mid-nineteenth century and became a resoundingly successful alternative to traditional life insurance.[22] A tontine life-insurance policy paid a deferred dividend to policyholders who timely paid their life insurance premiums for a specified period: ten, fifteen, or twenty years, depending on the policy that the applicant chose.[23] People who died earlier would receive the stated death benefit, but they would not receive any share of the dividends. With this arrangement, a tontine life-insurance policy paid a cash benefit to customers who otherwise might think that they had lost their bet with the insurance company.[24]

Before the advent of tontine policies, mutual companies paid dividends, but they credited the dividends against the next year's

21. Historian Timothy Alborn quotes an early twentieth-century English insurer, discussing the "noble work" of selling life insurance, who suggests that "man is essentially a gambler, and it is this feeling that he may score off the insurance companies . . . that induces him to insure." TIMOTHY ALBORN, REGULATED LIVES: LIFE INSURANCE AND BRITISH SOCIETY, 1800–1914, at 310 (2009). One broker advised that customers who were "fond of excitement" could be induced to buy insurance by a bonus scheme that added "a zest to life compared to which Kaffir Ketchup is insipid." *Id.* (referencing kaffir limes, the leaves of which are used as a spice in Asian cooking).

22. *See* Sharon Ann Murphy, Life Insurance in the United States Through World War I, EH.NET, http://eh.net/encyclopedia/article/murphy.life.insurance.us (last visited Feb. 28, 2010) ("Estimates indicate that approximately two-thirds of all life insurance policies in force in 1905—at the height of the industry's power—were deferred dividend plans.").

23. *See* Manly, *supra* note 7, at 184.

24. ALBORN, *supra* note 21, at 310 (reporting that in 1891 "the *Bankers' Magazine* attributed [the] popularity [of tontine life insurance] to 'the element in human nature which disposes every individual to regard his own chances of life favourably'").

premium, in effect lowering the price of the insurance coverage.[25] This arrangement allowed mutual life insurance salesmen to collapse the insurance premium and the policyholder dividend into a single number when pitching their policies. Sheppard Homans, "the most prominent actuary in the country" in the mid-nineteenth century, recognized the explosive sales potential that lay in exploiting, rather than obscuring, the dividend.[26] He saw that the dividend could be cut loose from the premium and then deferred to provide an enticing cash bonus for loyal, healthy customers.

A company that deferred the dividends and then distributed them only to policyholders who had faithfully paid their premiums for twenty years would accomplish three very useful things.

First, the company would make its life-insurance policy more attractive to men (and it was mostly men buying life insurance) who liked a little spice packaged with an otherwise dull purchase.[27] Second, the company would give its agents an excellent answer to the prospect who objected that he was healthy and did not need life insurance.[28] "No problem," the agent could say, "our deferred dividends mean that you can *back your own life*, and you cannot lose. Either you die and your heirs emerge as the winner on your behalf, or you survive and we give you a cash payment at the end of twenty years—and, by the by, no need to let your wife or your creditors know about that little bonus."[29] Third, the company would gain "one of the best solutions to the problem of healthier lives lapsing at a higher rate than unhealthy ones—since 'backing one's life' required the continued payment of premiums."[30] In economic terms, the deferred dividend worked as an anti-adverse-selection device. It appealed disproportionately to people who thought that they were low risk, and it kept them in the insurance pool.

These new policies were called "tontine" life insurance policies because of their similarities to an investment scheme developed by Lorenzo Tonti in the seventeenth century and used by governments into the eighteenth century to raise money, and to finance private projects

25. *See* Gilbert E. Roe, *The Insurance Investigation*, *in* 3 THE MAKING OF AMERICA 459, 462 (Robert Marion La Follette ed., 1973) (reporting that the leading tontine life insurance companies had until 1868 paid dividends annually). The Equitable Life Insurance Company introduced tontines to the market in 1868. *See* Roger L. Ransom & Richard Sutch, *Tontine Insurance and the Armstrong Investigation: A Case of Stifled Innovation, 1868–1905*, 47 J. ECON. HIST. 379, 380 (1987).

26. Ransom & Sutch, *supra* note 25, at 380.

27. ALBORN, *supra* note 21, at 310.

28. *Id.*

29. *Id.*

30. *Id.*

well into the nineteenth century.[31] In the original tontine, contributors pooled their funds and distributed the interest each year to the surviving members of the pool, with the last living member "taking the whole of the fund."[32] With tontine life insurance, all the members of the pool who faithfully paid their premiums and survived to the end of the predefined period split the fund. The tontine feature distinguished this life-insurance product from a similar, but less successful product called endowment life insurance, in which the amount of the deferred dividend was fixed in advance.[33]

Tontine life insurance quickly swept the life-insurance field, and the mutual life-insurance companies selling tontine policies became the largest financial institutions of the day.[34] At the same time, however, the millions of dollars that the companies accumulated during the deferral of the dividend proved too tempting to some of the managers of the leading firms. The result was a scandal and investigation in 1905 that rocked the life-insurance industry more profoundly than anything since.[35] One key result was the prohibition of tontine life insurance—not because there was anything wrong with such insurance in theory,[36] but rather because tontines allowed the life companies to amass enormous reserves that led executives to public extravagance and gave them too

31. *See generally* Kent McKeever, *A Short History of Tontines*, 15 FORDHAM J. CORP. & FIN. L. 491-521 (2010), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1340062 (noting that "[a] tontine was also one of the options proposed by Alexander Hamilton as Secretary of the Treasury to reduce the national debt of the United States at the beginning of the Republic"). The serial murder incentives posed by the tontine provided the plot for a story by Robert Louis Stevenson and his stepson, Lloyd Osbourne, *The Wrong Box* (The World's Classics ed. 1954) (1889), which was made into a movie in 1966 (Columbia Pictures) (starring Michael Caine, Peter Sellers, and Dudley Moore, among others).

32. Manly, *supra* note 7, at 183.

33. *See* MERVIN TABOR, THE THREE SYSTEMS OF LIFE INSURANCE 29 (1900).

34. *See* MORTON KELLER, THE LIFE INSURANCE ENTERPRISE, 1885–1910, at 56 (1963) ("Nothing was more fundamental to the business growth of the Big Three, or more evocative of the values that governed them, than the deferred dividend policy."); Murphy, *supra* note 22; Ransom & Sutch, *supra* note 25, at 380 (reporting that "[i]t is generally acknowledged that the phenomenal expansion of the U.S. life insurance business over the next thirty years was largely driven by the popularity of tontine policies, helped along, perhaps, by the aggressive marketing techniques of the large firms").

35. Mark J. Roe, *Foundations of Corporate Finance: The 1906 Pacification of the Insurance Industry*, 93 COLUM. L. REV. 639, 637 (1993) (describing the Armstrong investigation of the insurance industry as "the 1980s takeover wars, the junk bond boom, and the insider-trading scandals rolled into one sustained event").

36. *See* KELLER, *supra* note 34, at 58 (describing deferred dividend policies as "[appropriate] . . . to their market and their time").

much influence over the companies whose shares they purchased as investments for the reserves.[37]

In short, tontine life insurance was so successful at vacuuming money out of consumers' pockets and into insurance companies' funds that states legislatures stamped it out as part of what Mark Roe has called the "1906 pacification of the insurance industry."[38] It was not until the late twentieth-century that the life-insurance industry was able to reassemble some of the tontine's heady mix of prudence and speculation, in the form of the variable life and annuity insurance products that bundle insurance and investment and dominate the life-insurance market today. But the life-insurance industry never regained the economic control that tontines helped it gain in the late nineteenth century.

For us, the payoff from this history lies in what life-insurance tontines teach about the sales potential of insurance that allows people to "back their own lives."[39] Ordinary health insurance, like ordinary life insurance, amounts to a bet against the health of the purchaser, since the insurance pays off handsomely only when something goes seriously wrong. The tontine feature changes that equation and thus should be especially enticing to people who think that they would lose the ordinary health-insurance bet—the invincibles. In effect, the tontine feature provides a hedge against the risk of paying what may, in hindsight, seem like pointless health-insurance premiums.

37. *See* H. Gerald Chapin, *The Armstrong Amendments: A Synopsis of New York's New Insurance Legislation*, 14 AM. LAW. 389, 389 (1906) (reporting that section 83 of the legislation "requires that every policy issued on or after January 1, 1907, contain a provision 'that the proportion of the surplus accruing upon said policy shall be ascertained and distributed annually and not otherwise'"); Roe, *supra* note 25, 467, 473–74 (arguing that the tontine-fueled reserves were "being used as a compact money power in the hands of five or six men to control the industries of the country" and urging the prohibition of tontine and related deferred dividend life insurance products); Roe, *supra* note 35, at 639.

38. Roe, *supra* note 35, at 639. Roe focused largely on the companion legislation prohibiting insurance companies from putting more than a small percentage of their reserves into stock, but observing that the legislation also "restricted sale of key insurance products, holding back . . . growth." *Id.* at 670. *See also* Ransom & Sutch, *supra* note 25, at 380–81 (reporting that the Armstrong investigation led to the prohibition of tontine insurance). As Roe reports, the Armstrong investigation and resulting legislation "fragmented and pulverized the insurance industry," which had been "on the verge of developing not into the passive institution [it] became, but into an institution that would vaguely resemble the powerful German universal banks or the main bank system in Japan." Roe, *supra* note 35, at 639.

39. ALBORN, *supra* note 21, at 310.

II. TONTINE HEALTH INSURANCE: THE BASIC IDEA

A tontine health-insurance policy would pay a deferred dividend to a policyholder who maintains his or her health insurance for a specified period—we suggest three years (an arbitrary number that could easily be changed based on market research). Significantly, the amount of the dividend would depend on the extent to which customers use the health insurance. The young invincibles who in fact turn out not to use very much insurance would share the dividend, while those who use more insurance would get their benefits from the policy exclusively in the form of the covered health care they received.

The simplest arrangement would condition eligibility for the dividend on the participant not having consumed an aggregate dollar value of medical care above a pre-set threshold amount over the relevant period, perhaps with the cost of preventive care not counting against the threshold (in order to encourage preventive care). More complicated arrangements might require the participants to receive preventive care to be eligible for the dividend and, instead of a single three-year period, there might be annual or even quarterly periods, each subject to lower thresholds, offering participants the ability to lock in some dividend rights as long as they did not exceed the threshold during these shorter periods. In addition, the program might offer periodic lottery-like prizes to eligible participants to help address the problem of hyperbolic discounting. We will explore some of these design options after we discuss the economics of adding the tontine feature to health insurance.

In behavioral economic terms, tontine health insurance takes advantage of the optimism bias that appears to be particularly prevalent among the young invincibles.[40] In addition, the tontine feature frames the health-insurance purchase as a smart investment, rather than a way to spend money for something that the customer does not really need.[41]

III. THE BEHAVIORAL ECONOMICS OF TONTINE HEALTH INSURANCE

To an economist, the idea of using what amounts to a gamble to market health insurance has at least two strikes against it.

First, the very idea of "marketing" insurance—if marketing means more than providing basic information on pricing and coverage—is at

40. *See infra* notes 60–62 and accompanying text.

41. *Cf.* CHERIS SHUN-CHING CHAN, MARKETING DEATH: CULTURE AND THE MAKING OF A LIFE INSURANCE MARKET IN CHINA (forthcoming 2011) (describing how local insurance companies gained market share from foreign insurance companies by framing life insurance as an investment).

odds with standard economic theory. Someone who is rational, risk-averse, and can buy insurance that is actuarially fairly priced,[42] should *always* want to buy it and should not need additional inducements—a tontine "prize" or anything else—to "sweeten the deal."[43] However, the evidence we review below suggests that there are indeed many millions of Americans who have chosen not to buy health insurance that seems roughly fairly priced and within their means.[44] This is insurance coverage they "should" want to purchase, according to standard economic theory, but they do not do so. It is this group of potential insureds who are the target of our policy proposal. We will shortly explore the size of this population, the possible explanations for its "insufficient" demand, and the problems that this poses for public policy.

The use of bundled gambles to sell health insurance faces a second objection as well: why should bundling tontine prizes provide any inducement at all for someone to buy insurance? Insurance is ordinarily understood to be motivated by risk aversion, while gambling is motivated by risk preference.[45] Since the two phenomena seem inconsistent (at least on standard accounts), people who find insurance attractive should have nothing to gain from adding an uncertain prize to their coverage. Indeed, a risk-averse individual should by definition

42. Actuarially fair insurance is that for which the premium is equal to the expected loss: an insured facing a one percent chance of a $100,000 loss has an expected loss of $0.01 \times 100{,}000 = \$1{,}000$. If coverage for that risk costs $1,000, it is fairly priced. Of course, perfectly fair pricing is rarely available, since there are administrative costs to providing insurance, but fair pricing serves as a useful benchmark.

43. Indeed, one definition of what it *means* to be risk averse is that a rational risk averse individual will always purchase actuarially fair insurance for any loss. If the insurance is *not* fairly priced, it is not clear whether buying it would be welfare-enhancing. In that case, inducing a rational actor to buy insurance through clever marketing tricks might well be welfare-reducing, since anyone who would have benefited from insurance would choose to buy it without the marketing. *See* LOUIS EECKHOUDT ET AL., ECONOMIC & FINANCIAL DECISIONS UNDER RISK 51 (2005) (explaining why a risk-averse individual will not want to purchase full insurance when that insurance is not actuarially fair).

44. We hasten to add that the many people lack health insurance not because they choose not to buy it when they could and rationally "should" do so. Rather, there are supply side problems (such as employers who do not offer insurance to their workers) and other factors that account for a substantial fraction of the uninsured. Our proposal is a modest one, whose goal is only to induce some fraction of the uninsured population to take up insurance at a relatively low marketing cost.

45. *See, e.g.*, Milton Friedman & L.J. Savage, *The Utility Analysis of Choices Involving Risk*, 56 J. POL. ECON. 279, 289 (1948), who write that a risk-averse individual "will never participate in a 'fair' game of chance . . . [because] the gain in utility from winning a dollar will be less than the loss in utility from losing a dollar, so the expected utility from participating in the game is negative."

prefer a $1 cash discount on her insurance premium to tontine prize with a $1 expected value.[46] Why, then, do "prizes" involving gambles (such as lottery tickets) seem to be an effective tool for marketing insurance in other countries?[47] Why does the historical record reveal significant "gambling" elements in the marketing of insurance, until such practices were banned in the late nineteenth and early twentieth centuries? And why are probabilistic rewards (such as lottery tickets) an unusually effective motivational device in other contexts besides insurance?[48]

46. If the insured were *not* risk-averse, then they would presumably not find it attractive to purchase insurance, even with the lottery ticket thrown in. *But see generally* JOHN A. NYMAN, THE THEORY OF DEMAND FOR HEALTH INSURANCE (2003) (stating an alternative motivation for health insurance, based on access to expensive care, rather than spreading financial risk).

47. For example, regulations permit, and several insurers actually use, prizes to market insurance in many Latin American countries. (It is worth noting that the tontine prize differs from a lottery prize, in that the purchaser of the tontine policy may believe that he has private information indicating the low nature of his risk and, thus, the payoff of a tontine will not be perceived to be random. Indeed, this is one of the appeals of a tontine to an optimist.) We have not found any instances of prizes for health insurance, but drawings for prizes (keyed to the national lottery) are used in Brazil, and insurers in Argentina, Bolivia, and Ecuador also use prizes to market auto and/or life insurance.

Peter Zweifel analyzes a premium rebate program—used by two of the ten largest German health insurers in 1988—that was roughly homologous with our prize structure. Peter Zweifel, *Premium Rebates for No Claims: The West German Experience*, *in* HEALTH CARE IN AMERICA 323–46 (H.E. Frech III ed., 1988). Zweifel employs a standard neoclassical model (without the over-optimism assumption we feature) to analyze the rebates. Although he does not consider the role of prizes in attracting the uninsured, he does find empirically that "rebate options [prizes] are more effective in restraining utilization of medical care in minor episodes of sickness than are . . . deductibles and/or coinsurance." *Id.* at 325.

48. The use of probabilistic prizes as rewards for good behavior has been studied in several non-insurance contexts, and such rewards have been found to be highly effective in altering behavior, at relatively low cost. Since these studies were conducted with an eye towards efficacy, rather than causation, they do not say much, directly, about why probabilistic prizes should offer such strong incentives, but the results are certainly compatible with the kind of optimism bias we believe is characteristic of the invincibles. That is, subjects seem to over-value the probabilistic prize, relative to its actuarially-fair equivalent, presumably because their subjective assessment that they will win is higher than the true probability. *See, e.g.*, Todd A. Olmstead et al., *Cost-Effectiveness of Prize-Based Incentives for Stimulant Abusers in Outpatient Psychosocial Treatment Programs*, 87 DRUG & ALCOHOL DEPENDENCE 175 (2007) (showing that "lottery tickets" for small prizes could create substantial incentives for drug addicts to comply with treatment protocols); Lorenz Goette & Alois Stutzer, *Blood Donations and Incentives: Evidence from a Field Experiment* (IZA Discussion Paper No. 3580, 2008) (discussing rewards, in the form of lottery tickets, for donating blood led to increased donation rates, without lowering the "quality" of blood donors).

A. Who Lacks Health Insurance, and Why?[49]

Forty-seven million Americans did not have health insurance as of 2008.[50] As Jonathan Gruber notes, roughly 32 million of these uninsured persons were in families with incomes less than 200 percent of the poverty line.[51] These people may be too poor to buy health insurance and are not the targets of our proposal, although some of them might nevertheless respond positively to it. Our audience is the remaining 15 million uninsured who are not poor or near-poor. Rather than looking at the uninsured by income, we can look by age. Thirteen percent of the non-elderly uninsured (those less than sixty-five years old) are between the ages of eighteen and twenty-four, and just under one-third are between nineteen and twenty-nine.[52] Of this group, roughly half have incomes greater than 200 percent of the poverty line. They are the special focus of our proposal. As Figure 1 illustrates, 80 percent of people have insurance at age eighteen (presumably through their parents or through Medicaid), and nearly as high a percentage have insurance at age thirty, but in the intervening years, the proportion drops to just over 60 percent.

49. This section draws heavily on a recent and authoritative survey article by Jonathan Gruber, *Covering the Uninsured in the United States*, 46 J. ECON. LIT. 571 (2008). Gruber points out that the number without health insurance at any point in time may be twice as large as the number without insurance over the course of an entire year, suggesting that there is substantial mobility between insured and uninsured status. *Id.* at 576.

50. *Id.* at 575.

51. *Id.* The poverty line for a family of four was $19,307 in 2004. For a single individual under age sixty-five, the poverty line was $9,827. U.S. Census Bureau, Poverty Thresholds 2004, http://www.census.gov/hhes/www/poverty/threshld/thresh04.html (last visited Feb. 28, 2010).

52. Kriss et al., *supra* note 2, at 2 fig.1.

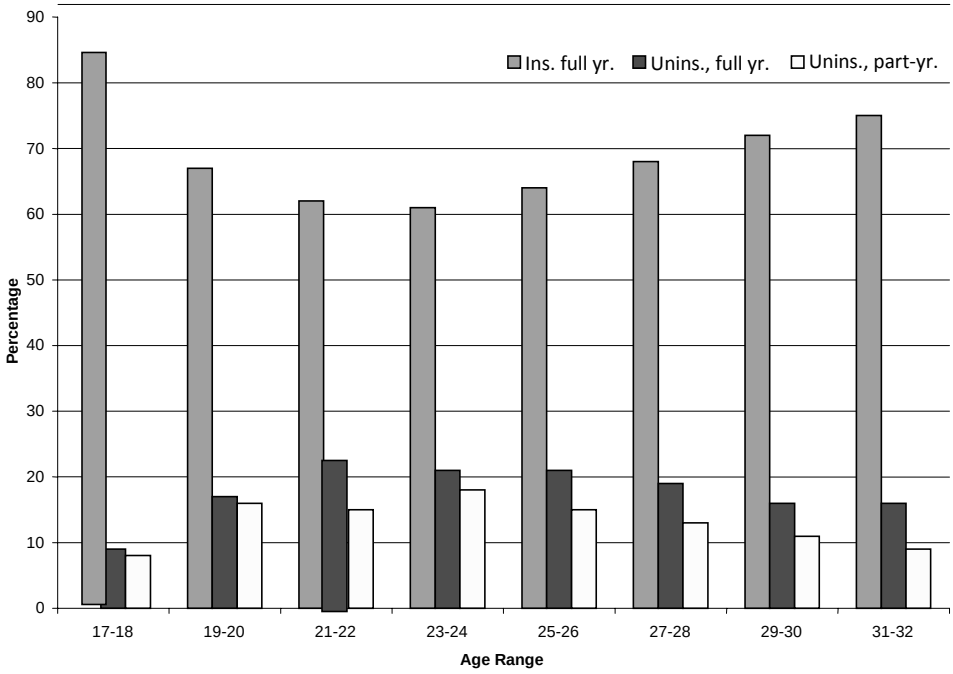

Figure 1: Percentage of Young Adults with and without Health Insurance[53]

Gruber points out that surprisingly little is known about why those who can afford it choose to do without insurance,[54] but he considers the following two major possibilities: adverse selection and behavioral foibles of the invincibles.

1. ADVERSE SELECTION?

Many of the uninsured cannot get insurance from their employer, and much health insurance available on the individual market is quite expensive. A superficially plausible story—albeit one with little supporting evidence[55]—is that individually purchased health insurance is expensive because of adverse selection. Those who choose to go without health insurance may be (unobservably) healthier than those

53. Adams et al., *supra* note 3, at e1033, e1036 (based on data from 48,827 responses to the National Health Interview Survey).

54. "[T]here are a variety of hypotheses for why so many individuals are uninsured, but no clear sense that this set of explanations can account for 47 million individuals." Gruber, *supra* note 49, at 581.

55. "[T]here is surprisingly little work on . . . whether those who choose to be insured are adversely selected; the [only] two studies on this topic . . . reach mixed conclusions." *Id.* at 577.

who do buy it, and therefore find it unattractive to pool with the relatively sick who require high premiums.[56] On this account, the uninsured make rational comparisons between the cost of insurance and their risk of illness, and when they find that insurance is over-priced (given their risk aversion and a realistic assessment of their own risk of illness), they choose to forego it. The evidence in support of this story is fairly weak, however, and a recent Kaiser Foundation report demonstrates that healthy young adults are actually *more* likely to be insured than their sicker counterparts, which is inconsistent with most adverse-selection models.[57]

Moreover, there are low-cost health-insurance policies marketed to young people that appear quite affordable. For example, Tonik, a health-insurance plan marketed explicitly to young people (with a Web site featuring "hip" graphics, funky typefaces, and slang) and sold directly to individuals, offers a plan with a $5,000 deductible, $20 co-pays for four in-network office visits per year (which are not subject to the deductible), and some benefits for prescriptions and vision expenses (also not subject to the deductible). The premium for California residents is quoted as "as low as $88 per month."[58] That represents an

56. If the healthy uninsured could credibly convey their health status to their insurers, competition would drive down their premiums. *Id.* at 576–77. But on this account, the healthy uninsured lack any means to distinguish themselves from the sicker people who *do* choose buy insurance, and so they must buy at an actuarially unfavorable rate appropriate for the sicker pool they would have to join. *Id.* at 577. However, the healthy uninsured may distinguish themselves by not buying—presumably there would be some health insurance package that would be worth their while, which would probably involve low premiums & high deductibles. *See infra* note 58.

57. The study finds that 73 percent of young adults in excellent or very good health have insurance, while only 60 percent of those in worse health do. SCHWARTZ & SCHWARTZ, *supra* note 5, at 6. This does not seem consistent with an adverse selection story, under which it is the worst risks that should demand the most insurance. The complex relationship between selection and optimism bias is explored in Alvaro Sandroni & Francesco Squintani, *Overconfidence, Insurance and Paternalism*, 97 AM. ECON. REV. 1994 (2007). In Sandroni and Squintani's model, where some high-risk agents have incorrect perceptions of their own riskiness, many of the standard conclusions about selection no longer obtain. *Id.*

58. *See* Tonik, California, Cover Your A-Z, https://www.tonik.com/ca/ (last visited May 17, 2009); Tonik, Georgia, Cover Your A-Z, https://www.tonik.com/ga/ (last visited May 17, 2009). The Tonik Web site quotes premiums for similar coverage in the following states as follows: Colorado ($89), Connecticut ($145.83), New Hampshire ($150.18), and Nevada ($103). *See* Tonik, Colorado, Cover Your A-Z, https://www.tonik.com/co/ (last visited Jan. 18, 2010); Tonik, Connecticut, Cover Your A-Z, https://www.tonik.com/ct/ (last visited Jan. 18, 2010); Tonik, New Hampshire, Cover Your A-Z, https://www.tonik.com/nh/ (last visited Jan. 18, 2010); Tonik, Nevada, Cover Your A-Z, https://www.tonik.com/nv/ (last visited Jan. 18, 2010). Note that the average individually insured eighteen to twenty-nine year old paid monthly premiums were approximately $120 in 2006–2007. *See* AHIP CENTER FOR POLICY & RESEARCH, INDIVIDUAL HEALTH INSURANCE 2006–2007: A COMPREHENSIVE

annual premium of $1,056, only 4.7 percent of the annual income of a single person earning twice the poverty line,[59] and less than the cost of auto insurance in many jurisdictions. Of course, whether Tonik is a good buy depends on one's degree of risk aversion, one's probability and cost of various types of medical treatment, the coverage Tonik provides, and the possibility of alternative (free) care for those whose medical bills exceed their assets. Nevertheless, at least as a first approximation, the existence of such policies suggests that at least some portion of the uninsurance problem for young adults remains unexplained by conventional economics.

2. BEHAVIORAL FOIBLES: THE INVINCIBLES

A second possibility is that the young uninsured may not be making reasonable judgments in the face of excessively high prices, but may instead be reacting irrationally in some fashion. A simple but appealing story is that they underestimate the probability that they will get sick and need health insurance, a kind of optimism bias that has been well-documented in many other contexts. Simply put, many people tend to have an unfounded belief that bad things will not happen to them. Such a belief, whether mistaken or not, obviously makes insurance less attractive—why pay to cover losses that you "know" you will not experience?

Optimism bias can be formally defined as the tendency of individuals to believe that they are less likely to experience negative events (accidents, job loss, poor health) than the average person, and more likely to experience positive events.[60] In an early study, Weinstein found that such a bias was widespread among college students for both positive and negative events.[61] Weinstein also observed that the

SURVEY OF PREMIUMS, AVAILABILITY, AND BENEFITS 7 tbl.2 (2007), *available at* http://www.ahipresearch.org/pdfs/Individual_Market_Survey_December_2007.pdf.

59. U.S. CENSUS BUREAU, POVERTY THRESHOLDS FOR 2008 BY SIZE OF FAMILY AND NUMBER OF RELATED CHILDREN UNDER 18 YEARS (2009), *available at* http://www.census.gov/hhes/www/poverty/threshld/thresh08.html (listing official 2008 poverty threshold for a single person under sixty-five with no children as $11,201).

60. Neil D. Weinstein, *Unrealistic Optimism About Future Life Events*, 39 J. PERSONALITY & SOC. PSYCH. 806, 806 (1980).

61. *Id.* at 806–07, 813–14. Optimism bias has even been given a possible neurological basis: more optimistic individuals (as measured by a psychological test) were more likely to "expect positive events to happen closer in the future than negative events, and to experience them with a greater sense of pre-experiencing." Tali Sharot et al., *Neural Mechanisms Mediating Optimism Bias*, 450 NATURE 102, 102 (2007). In a neuro-imaging study, the parts of the brain that may be used to retrieve memories of past events in constructing representations of the future—in particular the rostral anterior cingulate cortex—were more likely to be activated in positive imaginings

"perceived controllability" was highly positively correlated with the extent of optimism bias: subjects tended to be more optimistic about events they believed they could control (contracting a venereal disease) than about those they thought were outside of their control (buying a car that turned out to be a lemon).[62]

Other studies suggest an important reason why the young should be especially likely to experience optimism bias—they tend to lack relevant experience with negative outcomes. As one survey put it,

> Experience matters . . . . Drivers who have been hospitalized after a road accident are not as optimistic as drivers who have not had this experience. Similarly, middle-aged and older adults are less optimistic about developing medical conditions than their younger counterparts are, presumably because older persons have had more exposure to health problems and aging. Acutely ill college students (approached at a student health center) perceive themselves to be at greater risk for future health problems than do healthy students, indicating that risk perceptions can be "debiased" if the person has a relevant health problem. Acutely ill students, however, continue to be unrealistically optimistic about problems that do not involve physical health.[63]

In health policy circles, the uninsured who choose to "go bare" in the belief that they will not get sick or be injured have a name: "The Invincibles."[64] Although there is no definitive study of this group, recent *New York Magazine* and *Wall Street Journal* articles are suggestive.[65] The *Journal* reported that companies trying to market health insurance to young people found that such buyers were often uninterested in plans that offered bare-bones (major medical) coverage for premiums of $50 to $100 a month.[66] "What came through loud and clear in focus groups . . . was that people did not see value in a [catastrophic coverage] plan with just a high deductible," apparently

(relative to negative ones) in those who scored higher on a measure of psychological optimism. *Id.* at 103.

62. *See* Weinstein, *supra* note 60, at 18 tbl.2.

63. David Dunning et al., *Flawed Self-Assessment: Implications for Health, Education, and the Workplace*, 5 PSYCH. SCI. PUB. INT. 69, 80 (2004) (citations omitted).

64. *See, e.g.*, Amsden, *supra* note 1.

65. *Id.*

66. Vanessa Fuhrmans, *Health Insurers' New Target: Companies Go After the Uninsured with Cheaper Plans, Clever Marketing, but Benefits Are Sparser*, WALL ST. J., May 31, 2005, at B1.

because they viewed such a plan as paying for something they would probably never use.[67]

In order for the invincibles to be victims of optimism bias, they not only have to believe they will not get sick; they must also be wrong in their assessment of their own risk. Apparently, they often are. For example, "[o]ne in five uninsured young adults report that they were unable to get needed care due to cost, . . .[and] 18 percent . . . said they could not afford a prescription" within the past year.[68]

Callahan and Cooper report similar findings based on the National Health Interview Survey,[69] a representative nationwide sample taken between 1998 and 2001. Among respondents aged nineteen to twenty-four, even after controlling for income, race, and gender, "the uninsured remained at significantly higher risk for reporting delayed or missed medical care, not filling a prescription because of cost, having no contact with a health professional, and having no usual source of health care, relative to privately insured peers."[70] The lack of insurance is a particular problem for young adults with chronic health conditions.[71] In subsequent work, Callahan and Cooper demonstrate that those with chronic conditions who lacked insurance had six to eight times higher rates of unmet health-care needs because of cost, when compared to otherwise similar young adults who did have insurance.[72] When a young adult develops a chronic health condition, he may change his mind about the benefits of health insurance, but by then the low-priced policies offered to healthy young people will not be available. In sum, the blasé attitude about risks and costs that seems to characterize the invincibles appears to be factually unfounded: the invincibles may be healthier than the population average, but they are ultimately no less vincible then their insured peers.[73]

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67. *Id.*

68. SCHWARTZ & SCHWARTZ, *supra* note 5, at 7.

69. Callahan & Cooper, *Uninsurance and Health Care Access*, *supra* note 3, at 89.

70. *Id.* at 88 (statistics omitted).

71. Callahan & Cooper, *supra* note 5, at 181.

72. *Id.* at 180. Although people who already know that they have a serious chronic condition are unlikely to find tontine insurance appealing, some of the young people with chronic conditions are likely to have developed those conditions only after "aging out" of dependent care coverage and, thus, would have been good candidates for the tontine health insurance.

73. Of course, there is a large and growing catalogue of deviations from fully rational behavior, and optimism bias is by no means the only possible explanation for the invincibles' failure to purchase health insurance. We focus on this explanation because it seems to fit the stylized facts so well, and is so analytically tractable, but we recognize that other explanations may play some role in the underinsurance problem. A related type of irrationality is the tendency to "overvalue short-run insurance costs

B. Why Adding a Prize to an Insurance Policy Should Make it Less Attractive to Homo Economicus

This Section explores the logic of the standard model of insurance demand and explains why a rational, risk-averse individual—an "Econ"—would always prefer a fair insurance policy without an actuarially fair prize to one that contained such a prize.

To start, consider a rational, risk-averse, expected-utility-maximizing individual who faces a loss L with known probability p. Since he is risk averse, his marginal utility of wealth falls as his wealth increases. Thus, the individual benefits (in utility terms) if he can reduce his wealth in the state of the world where wealth is high, while increasing his wealth in the state of the world where wealth is low. Moving a dollar from the high-wealth to the low-wealth state of the world leaves him better off because he is giving up low-marginal-utility dollars and getting back high-marginal-utility dollars, which are worth more in utility terms.

Actuarially fair insurance is available when the premium charged is equal to the expected loss (pL), and any risk-averse individual should want full insurance if it is available at the fair price. Full insurance guarantees that the individual's wealth is the same, regardless of whether the loss occurs; this means that the insured has maximized expected utility by equalizing the marginal utility of wealth in both states of the world (whether the loss occurs or not).[74] That in turn implies that *wealth* itself should be equalized in the two possible states of the world, which is only possible if the individual buys full insurance.

Now, consider adding a stylized tontine "prize" to this problem. (We can loosely define a tontine as any insurance policy that pays off both when the loss occurs and when it does not. The "prize" is the amount paid if there is no loss.) Under this arrangement the individual can pick an amount of coverage, I, under the same conditions as above.

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relative to [future] medical expenditure risk." Gruber, *supra* note 49, at 577. This kind of myopia has been extensively analyzed by behavioral economists under the rubric of "time-inconsistency" or "hyperbolic discounting," whereby individuals apply a steeper discount rate to long-term benefits than to short-term costs. The term apparently originated with George W. Ainslie. *See* G.W. Ainslie, *Impulse Control in Pigeons*, 21 J. EXPERIMENTAL ANALYSIS BEHAV. 485 (1974). In this context, it can lead to essentially the same results as optimism bias. Rather than understating the probability that one will get sick and need benefits, a hyperbolic discounter applies too high a discount rate to these future benefits, and thus ends up undervaluing them in comparison to present costs.

74. The only way for the marginal utility of wealth to be the same in both states of the world is for wealth to be the same in both states, which implies full insurance.

In addition, though, the individual can also choose to receive an amount T if the loss does *not* occur (which happens with probability $(1-p)$).[75] The fair premium for this payment is $(1-p)T$, and just as with insurance, the tontine premium must be paid whether or not the loss occurs or the prize is awarded.

As before, the individual still prefers full insurance. But what about the optimal size of T? It should be clear that a risk-averse individual will not find paying a fair rate for a tontine prize (paid if the loss does not occur) to be in his interest. Doing so requires the insured to move dollars from the loss state, where he pays the tontine premium with dollars that are scarce (and thus worth more, in utility terms) to the no-loss state, where he receives the tontine prize in dollars that are plentiful (and thus worth less, in utility terms). Put another way, the prize *adds* financial risk, and should thus be abhorrent to a rational, risk-averse utility maximizer.

C. Why Tontines Should Be Attractive to the Invincibles

1. OPTIMISM BIAS LEADS TO UNDER-INSURANCE (OR NONE AT ALL)

Instead of assuming that individuals have accurate perceptions of all relevant risks, consider an Invincible—someone who suffers from optimism bias. We can characterize this bias in many ways, but the simplest version is that for a loss that occurs with objective probability p, an Invincible assigns it a subjective probability of q, which is smaller than p. In making his insurance purchase decision, the optimistic individual will choose the amount of coverage to maximize expected utility given his *subjective* probability of loss, not the objective one. The objective probability, however, will still be used by the insurer to set the premium.

75. Of course, this amount T does not fall out of the sky. It must be paid for somehow. One possibility is that T is paid for out of additional premiums. That is, the insured might be charged an actuarially fair premium, p, to cover expected losses, and an additional amount to cover payouts in the event that there is no loss. So, for example, if p is 0.1, then the probability of no-loss is $(1-p) = 0.9$. Suppose the loss, L, is equal to 1,000 and the tontine "prize" T is equal to 10. Then the premium required to support the prize is $(1-p)T = 0.9 \times 10 = 9$. Thus someone who bought the combined tontine policy would have to pay $0.05 \times 1{,}000 = 50$ for the insurance coverage and 9 for the "prize," for a total of 59. T might alternatively (or in addition) be paid for out of investment income earned by the insurance company on the "float" between the time when premiums are collected and the time when losses are paid out. But that complication does not add anything to the simple model we consider because if there were such a float, it could be used to reduce premiums *below* the actuarially fair level, were there no tontine element to support.

It is easy to show that someone characterized by optimism bias who faces an actuarially fair premium will choose to buy less than full insurance and may purchase none at all: this makes sense, since such a person sees less reason to transfer wealth from the no-accident to the accident state of the world. Invincibles do not appreciate the need for insurance, precisely because their subjective assessment of the probability of loss is too low.

2. A PRIZE MAKES THE POLICY LOOK MORE ATTRACTIVE TO AN OPTIMIST

Since the insurer is by assumption charging actuarially fair rates, it is not possible to lower premiums to induce the optimist to buy (more) insurance—that would mean the insurer could not collect sufficient premium revenue to cover its payouts and would earn losses (unless it received a subsidy).[76]

However, a fairly priced tontine structure would break even for the insurer and, under some conditions, could induce optimists to buy insurance who would otherwise not want to do so. The reason is that the insurer needs to charge $(1-p)$ per dollar of tontine prize awarded. The insured, however, expects to receive the prize with probability $(1-q)$, where by definition $(1-q > 1-p)$. The gamble thus looks like a *good* deal for exactly the same reason (optimism bias) the insurance looks like a *bad* one.

Although the insurance contract by itself will not be attractive to some invincibles, the perceived subsidy from bundling a prize should be enough to induce some of them to sign up for the prize/insurance combination. The reason is that the optimist's under-assessment of the probability of *loss* is at least partially matched by his over-assessment of the probability of *gain*. The availability of the tontine "prize" balances out the invincibles' unwarranted undervaluation of the insurance. In fact, tontine health insurance has a kind of "ju-jitsu" element to it, because it uses consumers' very irrationality to induce them to make welfare-enhancing choices they would otherwise forego.

It is important to be clear that adding the prize only works, in mathematical terms, if the wrongly perceived "extra" value of the prize is as large as the wrongly perceived "discounted" value of the

76. If the insurance is being sold with some load factor that makes premiums larger than is actuarially fair, it might be possible to lower the load factor, reduce premiums, and still allow the insurer to cover its costs. But it is difficult to imagine how society could force insurers to lower their costs. Given that such cost reduction is difficult to achieve, it is widely understood that the only way to make insurance more attractive to the uninsured without making it unprofitable to the provider is to subsidize its purchase. We suggest otherwise.

insurance. Suppose for example that the true probability of a $20,000 loss is 10 percent, but the optimist mistakenly believes the probability to be only 1 percent. Even if full insurance against this loss can be purchased for $2,000, the Invincible will likely reject such insurance, believing it should cost only $200. Now suppose that the insurer bundles the fairly priced insurance with a tontine prize of $10,000 (payable if the loss does not occur, which happens with 90 percent probability). The fair price for the prize alone is $9,000, and the fair price for the combination of prize and insurance is thus $11,000. Although the Invincible believes he is getting a good deal on the prize element (paying $9,000 for a perceived 99 percent chance of winning $10,000), he also believes he is getting a correspondingly bad deal on the insurance element; and since the "extra" value attributable to his optimistic assessment of the likelihood of winning the tontine prize ($999) is smaller than the "discounted" value of the insurance ($1,800), the prize/insurance bundle is still unattractive.

There are several reasons to think that, in practice, the prize/insurance bundle might be more attractive than this simple example suggests, however. The first reason is history. The prize/insurance bundle was tremendously successful in the life-insurance context despite the same mathematical limitation described above.[77] The second reason is that real insurance is not complete (most significantly because of deductibles), which reduces the wrongly assessed discounted value of the insurance that the prize needs to offset. Using the numbers from above, if we assume that the insurance covers only 80 percent of the loss, then the (wrongly) discounted value of the insurance will be $1,620 ($1,800-180). That is still more than $999, but the gap is smaller. Third, it is plausible that optimists may be loss-averse as well as overly optimistic. They misperceive the risk, but they are still willing to pay some amount above the actuarially fair price of the risk that they do perceive, further reducing the discount that the optimist places on the value of the insurance; and they may even be risk-preferrers for small gambles, which of course makes the prize more attractive than it would be on purely actuarial grounds. Finally, the fact that insurance is socially desirable to purchase increases its perceived value even to an optimist, who presumably is just as motivated to do socially acceptable things as everyone else.

So, for example, a young man might be willing to pay significantly more than what he perceives to be the actuarially fair price for health insurance, not only because he is risk-averse, but also because that will make his mother happy and make him feel responsible. He is not willing to buy the insurance as it exists today, because the price is just

77. *See supra* notes 23–24 and accompanying text.

too far from what he thinks the insurance is worth, even considering risk aversion and social expectation, but the gap between the price and the willingness to pay is smaller than his optimism alone would predict.

These other factors should not substantially impact the prize side of the equation. The loading charge for adding a prize element to health insurance should be close to trivial. Risk aversion does not appear to be symmetric, as the research suggests that humans have a taste for gambling as long as the stakes are not too large. Finally, his mother is not likely to care very much that he chose the insurance policy with a prize, especially if it is called something more socially acceptable. We will call the prize a deferred dividend, and market tontine health insurance as a tool that helps young people save for the future. His mother will like that and, we predict, so will he.

D. Targeting, Efficacy, and "Bang for the Buck" Issues

Given the political economy of health care and the widespread belief that we will need to publicly subsidize insurance for the currently uninsured, one legitimate concern for public policy is the size of such subsidies, and the extent to which they are directed towards those who currently lack insurance, rather than just making health insurance cheaper for those who already have it. Finding a way to make insurance more attractive to the uninsured, without "wasting" funds by making it cheaper for those who are *already* insured, is thus a difficult institutional design issue, as Gruber stresses. In his helpful analogy,[78] we can

> think about the uninsured as tuna and those who already have insurance as dolphins. The goal of environmentally conscious fishermen is to catch as many tuna as possible in their nets, while minimizing the number of dolphins who are caught. . . . If the uninsured tunas were swimming in a separate ocean than the insured dolphins, the problem would be minimized. And if the uninsured tunas greatly outnumbered the insured dolphins, then there would also be a minimal dolphin catch. But, in reality, the 47 million uninsured tunas mostly swim in a part of the ocean where there are 190 million privately insured dolphins, making it

78. Gruber, *supra* note 49, at 585–86. To the extent that one uses subsidies to alter behavior, any money directed towards those already engaged in the desired behavior is a waste. In tax policy, the problem of subsidizing pre-existing conduct while trying to create incentives for new behavior is known as "buying the base." *Id.* at 585.

> difficult if not impossible for policymakers to design insurance nets to capture the tuna without pulling in the much more numerous dolphins.

As Gruber points out, at every income level most people are insured.[79] Thus, basing subsidies for health insurance on income would thus result in spending considerable sums on those who are *already* insured, while netting relatively few uninsured.

Tontine health insurance can help to mitigate this problem for two reasons. First, allowing private insurers to bundle prizes with health insurance requires no governmental outlay at all! At least from a budgetary perspective, this is a zero-cost strategy for reducing uninsurance.[80] Moreover, although tontines would catch some dolphins, they would be more attractive to the tuna we care about: the invincibles who have demonstrated that they are not willing to purchase an existing policy.[81] And the dolphins captured by the tontine net would not be harmed. Indeed, from their perspective, the tontine option would be utility enhancing.

IV. DESIGN OPTIONS

If we are to be true to the tontine idea, then the payoff in the good state of the world should be a deferred dividend paid to people who did not otherwise use their insurance, rather than a monthly prize or other lottery for which all policyholders are eligible. Even limiting the product design in that way, there are still a wide variety of options. To explore those options, we ask a series of questions and offer some tentative answers. An actual tontine health-insurance product would obviously require extensive consumer research, for which our discussion is no substitute. Instead, our goal here is to describe some of the ways that a tontine health-insurance product could be designed and to highlight some of the more important choices involved in the design process.

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79. *Id.* at 586.

80. It is important to remember that budgetary outlays are not an end in themselves, and that a true welfare analysis is substantially more complicated.

81. In this respect at least, a tontine prize is like other aspects of insurer-side selection. *See, e.g.*, Jacob Glazer & Thomas G. McGuire, *Optimal Risk Adjustment in Markets with Adverse Selection: An Application to Managed Care*, 90 AM. ECON. REV. 1055 (2000) (pointing out how HMO coverage can be designed to select for certain groups). For example, bundling a health club membership with premiums is likely to be especially attractive to young, healthy, low-risk insureds; offering excellent oncology care has the reverse selective effect.

Analytically, the components of a tontine policy are the eligibility threshold (what it takes to qualify for the prize), the size of the prize itself, the duration of the eligibility period, and the size of the premium. Of course, these are not completely independent parameters: for example, the choice of a threshold and a prize amount will determine the premium the insurer must charge to break even.

A. Eligibility

1. THE EXPENSE THRESHOLD

How should we think about the health-care expense threshold that will be used to condition eligibility for the dividend? Setting a precise number will require technical assistance from a health-insurance actuary, but there are judgments involved that have marketing and, in some cases, even public-policy consequences. For example, should the threshold be set relatively low so that fewer people can get larger dividends, or should it be set higher so that more people get relatively smaller dividends? In general we are agnostic with regard to this and subsequent questions. We prefer whatever product design *works*, in the sense of being most appealing to people who do not buy traditional health insurance. But it is possible that setting the threshold too low might in some cases discourage participants from getting care that they need. We address this concern shortly.

2. DURATION OF ELIGIBILITY PERIOD

How long should the deferred dividend period be? Answering this question requires more granular information than we have about health-insurance purchasing patterns. If the period is too short, the dividend will not appear enticing enough. If it is too long, the hyperbolic discounting that is likely to be another characteristic of the young invincibles will make the dividend appear too small. Moreover, people may think that they will never be able to collect, perhaps because they will assume that they will eventually get a good job that includes good health-care benefits. This last issue brings us directly to our next question.

3. ADDITIONAL ELIGIBILITY REQUIREMENTS

Should eligibility for the dividend be conditioned on something other than the health-care expense threshold? For example, should eligibility for the dividend depend on the policyholder having received designated preventive care? For us, once again, the best answer is

whatever the marketing research reveals to be most popular. We predict that simpler plans will work better, and that conditioning eligibility on preventive care smacks of the paternalism that the young invincibles reject. Many of the same public-health benefits sought by mandating preventive care may be gained by exempting preventive care expenses from counting against the threshold, and by marketing preventive care as the smart thing to do to stay healthy enough to get the dividend. (Indeed, as we plan to explore in subsequent work, the deferred-dividend concept could well allow a more socially acceptable form of managed care.)

B. Payout Size

Should the deferred dividend be fixed in advance? Or should it depend on variables such as the percentage of policyholders who are eligible for the dividend at the time of distribution? If it is not fixed, what are potential variables, and what is at stake with regard to each? Here we predict that a variable dividend would out-perform a fixed dividend, by recruiting the optimism bias to magnify the predicted size of the dividend that the invincible participant believes he will receive. A variable dividend also works better from an actuarial perspective by reducing the risk to the insurance company. The tontine idea suggests simply dividing the dividend pie by the number of the people eligible for the dividend. It would be interesting to take that idea a step further and make the size of the pie depend on the profitability of the pool. We predict that young adults would not like this last variation because they would not trust health-insurance companies' computation of profits, but, once again, market research should produce a more reliable answer than our intuitions.

C. Other Considerations

1. INTERACTION WITH EMPLOYEE-BASED HEALTH INSURANCE

How should tontine health insurance interact with employment-based health benefits? We conceived of tontine health insurance as an individual market product, not something that would be offered as an employment benefit (but we could imagine that deferred dividends could play an important role in managing moral hazard in the employment context, as we plan to explore in subsequent work). Our current focus in the relationship between tontine health insurance and employment-based benefits lies in alleviating the young invincibles' legitimate concern that they might not qualify for the dividend because they will find a good job, with good benefits, before the deferred-

dividend period is up. To address that concern, we suggest the tontine policies offer participants the ability to cash out their dividend rights if they exit the plan to purchase an employment-based policy for which they recently became eligible. In addition, we are intrigued by the possibility of offering the option of retaining the deferred-dividend participation rights if the participant enrolls in an employment-based program run by the same company as the company running the health insurance tontine.[82]

2. INVERSE MORAL HAZARD?

Under what plausible circumstances might a participant's concern about exceeding the health-care expense threshold lead him or her to forgo incurring a health-care expense and suffer adverse health consequences as a result?[83] What could be done to address that problem? Again, we take no firm position on this important issue, preferring to leave the question to future experimentation. We do note that economists almost universally believe that the low deductible coverage provided by virtually all health-insurance plans is overly generous because it encourages (ex post) moral hazard and over-use of insurance, but provides relatively little of the consumption-spreading benefits that (allegedly) motivate insurance purchases in the first place. Martin Feldstein's design for optimal insurance, for example, would involve a 50 percent co-payment for expenses up to 10 percent of the insured's income, with full coverage thereafter.[84] In short, there may be good reasons to discourage "over-use" of health insurance (while, of course, lowering premiums). If so, the tontine element could be designed to serve this function by appropriately calibrating eligibility for the "prize" to the amount of use. More complicated prize functions could exempt certain kinds of health-care expenditures (e.g., preventive medicine such as routine checkups, flu shots). Usage-based restrictions

82. This possibility offers one way to forge the kind of long term relationships between consumers and health insurance companies that make investments in preventive care valuable to insurance companies. At present, people are free to switch insurance plans each year, and enough do that insurance companies cannot be sure that they will realize the benefit of investing in preventive care.

83. Richard Derrig pointed out to us that there is good evidence of inverse moral hazard in the Massachusetts safe-driver plan. For accidents that are only slightly higher than the insured's deductible, people engage in "roadside settlement" so as to avoid having a claim show up on their records and raising their future premiums. Personal Communication with Richard Derrig, NBER Insurance Conference, Cambridge, Mass. (May 2009).

84. *See* Martin S. Feldstein, *A New Approach to National Health Insurance*, 23 PUB. INT. 93, 103 (1971). Feldstein's plan also featured a basic deductible of 5 percent of income. *See also* Gruber, *supra* note 49, at 578–79.

on prize eligibility might be accompanied by lower co-pays if it were unnecessary to use both of these methods to discourage overuse. Shorter eligibility periods with vested dividend rights could be another answer to the concern about inverse moral hazard. With shorter periods, going to the doctor only risks the dividend rights from the current period, not the rights to the entire three-year deferred dividend. On the other hand, the easier the dividend is to get, the more people will get it, and the smaller and therefore less enticing it will have to be.

V. IMPLEMENTATION: A CALIBRATED EXAMPLE

In this Part, we consider a back-of-the-envelope empirical implementation of a tontine health-insurance policy. We envision the tontine element bundled with an ordinary health-insurance policy (as sold on the individual market), rather than being priced separately. Our calculations are meant to give a rough sense of how much the tontine add-on might be expected to raise premiums and what kind of "prizes" could be offered.

We rely on the Medical Expenditure Panel Survey (MEPS) data for 2006 to calibrate the relevant parameters.[85] We divide the population of uninsured eighteen to twenty-nine year olds by gender, but do not attempt to differentiate them any further. We assume a tontine period of three years, and further assume that the rate of return on invested premiums is just equal to the load factor, allowing us to ignore these issues.[86]

Our tontine policy consists of four parameters, of which any three can be chosen by the insurer. We define:

T = size of tontine prize at the end of three years.
τ = monthly premium collected to support the prize
Θ = threshold for spending over the previous three years that defines eligibility for the tontine prize.[87]

85. For MEPS data, see Medical Expenditure Panel Survey, Summary Data Tables, http://www.meps.ahrq.gov/mepsweb/data_stats/quick_tables.jsp.

86. The administrative expenses associated with running the tontine should be very low, since the policy would be piggy-backing on—and indeed, would be bundled with and indistinguishable from—ordinary individual health insurance. There might be some fixed costs associated with setting up the software to keep track of eligibility, but marginal costs should be quite low. On the other hand, because the product is new and rather unusual, it might require more involvement by sales agents, at least in early years.

87. For instance, if Θ = $2,000, those individuals who spend less than $2,000 over three years are eligible for a rebate at the end of that period.

> $p = F(\Theta)$ = probability that an insured is eligible for the prize (i.e., spends less than the threshold amount), where F is the empirical cumulative distribution function for health care expenditures by individually insured policyholders of a given gender, ages eighteen to twenty-nine, as calculated from the MEPS data.

To close the model, we simply assume that competition among insurers drives the expected payout to equal the total monthly premium collected, or

$$p(\Theta)\,T = 36\tau.$$

Selection issues are, of course, of paramount importance in the provision of insurance. An important feature of the tontine policy, however, is that it has precisely the reverse selection effect from ordinary insurance—the tontine is most attractive to the individuals who think they are the healthiest (since they are most likely to expect to receive the end-of-period rebate). To account for moral hazard, we calibrate health-care usage, and hence the threshold and prize amounts, based on the *insured* population of eighteen to twenty-nine year olds. That is, we assume that the uninsured will have the same utilization as the currently insured. (To the extent that the uninsured who would be motivated to buy a tontine health-insurance policy are healthier than the currently insured because of adverse selection, this imparts a conservative bias to our utilization estimates.[88])

We do not account, however, for "inverse moral hazard," created by the incentive that the tontine provides to *under*-utilize insurance. Of course, the advantage of bundling a tontine with an ordinary health-insurance policy is that deliberate underutilization of the insurance to secure eligibility for the prize creates a benefit to the insurer. But consider someone facing a $500 expenditure threshold and a prize of $1,000. At the margin, a reduction in spending of $1 earns $1,000 by putting the person below the threshold, while the insurer saves $1 and pays out $1,000. In other words, if there is "bunching" at the threshold, the insurer's savings in covered expenses may be outweighed by the additional payouts for prizes to those falling below the threshold.

88. A more problematic assumption relates to the correlation of health care expenditures across years. Since the MEPS data do not permit one to track individuals for three years, we assume in constructing our estimates that health care usage is independent across years. To the extent that this is not true, the threshold may need to be lower to achieve the same T. This uncertainty is yet another reason to promise a deferred dividend that is based on a share of the dividend pool, rather than a specific amount.

One solution, in keeping with the design of the original tontines and with modern variable annuities, might be to make the prize a share of the total deferred dividend: the more shares, the smaller the dollar value of each individual's share of the dividend, and vice versa. Alternatively, we could use percentile rather than dollar thresholds to qualify for the prize. That is, instead of specifying that those spending below, say, $500, are eligible, one could instead limit eligibility to the lowest-spending 10 percent of all insureds.[89] Both solutions transfer the risk of inverse moral hazard to the insureds themselves. For ease of exposition, our numerical examples here use fixed prizes. The decision between fixed and variable prizes for an operating tontine health-insurance plan should be based on market research. We favor whatever works.

According to a report by AHIP, the average monthly premium of eighteen to twenty-nine year olds in the individually insured market was about $120 in 2006–07.[90] We consider monthly premiums τ, of $10, $25, and $50, and eligibility thresholds (Θ) of $250, $500, $750, and $2,000. This yields a 3×4 matrix of possible prizes that could be offered, consistent with the insurer's breakeven constraint, which we display in Table 1.

Table 1: Size of Tontine Prize (T), for various Monthly Premiums and Spending Thresholds[91] (insured eighteen- to twenty-nine-year-old men only)

Monthly Tontine Premium, τ	Three-Year Spending Threshold, Θ			
	$250	**$500**	**$750**	**$2,000**
$10	$878	$720	$643	$493
$25	$2,195	$1,800	$1,607	$1,223
$50	$4,390	$3,600	$3,214	$2,466

89. If, for example, 20 percent of insureds spent nothing, then the prize could be given randomly to only half of those 20 percent, or the prize amount could be cut in half.

90. AHIP CENTER FOR POLICY & RESEARCH, *supra* note 58, at 7 tbl.2. The survey covered almost 2.3 million individual market policies, of which over 555,000 were issued to policyholders between eighteen and twenty-nine years of age. *Id.* The $120 figure represents the weighted average premium for the eighteen- to twenty-four- and twenty-five- to twenty-nine-year-old groups. *Id.* These premiums are in the same range as the Tonik premiums. *See supra* note 58 and accompanying text.

91. The authors' calculations in Table 1 are based on MEPS data for N=1376 men ages eighteen to twenty-nine, for 2006. "Premium" is for the tontine element only and excludes the premium for insurance itself. *See supra* note 85 and accompanying text.

The key fact that underlies Table 1 is the relatively low utilization rate of eighteen- to twenty-nine-year-old men. For example, 41 percent of insured eighteen- to twenty-nine-year-old men reported spending less than $83 on medical care in 2006 (less than $250 over three years, on our assumptions). This means that the prize that can be awarded for spending less than $250 over three years is only (1/0.41) 2.4 times the total premium collected. As the threshold gets larger, the percentage of participants qualifying for the prize necessarily gets larger, so a $10 per month premium can only support a $493 prize if the threshold for eligibility is spending less than $2,000 over three years. Since women in the MEPS data set are more likely to use care than men, the corresponding prizes for women are larger by a substantial degree: at the $250 threshold, the prize for women is 100 percent greater than for men, falling to about 55 percent greater at the $2,000 threshold.

Table 2 takes the tontine prize amount as given at $5,000, and asks what combinations of monthly premia and eligibility thresholds would finance this payout.

Table 2: Eligibility Threshold for a $5,000 Tontine Prize (T), for various Monthly Premia[92] (eighteen- to twenty-nine-year-old men only)

Monthly Tontine Premium, τ	Three-Year Threshold Amount for Eligibility, Θ
$10	$0[93]
$25	$0[94]
$50	$96

A premium of $10 per month represents $360 in total premiums over three years. Since we know we will pay out $5,000 to those who qualify, it follows that we are looking for a threshold (Θ) at roughly the (360/5000) seventh percentile of the health-care utilization distribution. In fact, roughly 20 percent of insured men ages nineteen to twenty-nine had no health-care expenses at all in 2006, so the threshold is $0 for both $10 and $25 premia. To award a $5,000 prize therefore requires

92. *See supra* Table 1.

93. Since about 20 percent of those surveyed reported $0 expenditures, the $10 premium permits only about one-third of eligibles to collect the $5,000 prize; the $25 premium permits about 90 percent of eligibles to collect. A randomization procedure would be required to determine which of the eligibles would collect.

94. *See supra* note 93 and accompanying text.

some sort of randomization for any premium below about $28/month. For example, at a $10/month premium, only about one-third of those with no spending could actually receive a $5,000 prize. The similar figures for women place the seventh percentile at $0, the eighteenth percentile (corresponding to $25/month premium) at $165, and the thirty-sixth percentile at $1,077.

Table 3 examines the possibility of exempting "preventive care" from counting against an insured's expenditures for purposes of tontine eligibility. As we discussed earlier, it would make sense from a policy perspective to encourage insureds to undertake preventive care such as vaccinations, routine checkups, and so on. An obvious way to do this would be to exempt such expenditures from counting towards the tontine threshold. MEPS does not classify expenditures by "preventive" versus "other," so we adopt an extremely crude definition of what constitutes preventive care: for these purposes, "preventive" expenditures are everything except emergency room and in-patient hospital expenses.

Table 3: **Size of Tontine Prize** (T), for Various Monthly Premiums and Spending Thresholds[95] (eighteen- to twenty-nine-year-old men only)

Monthly Tontine Premium, τ	Three-Year Spending Threshold, Θ' (Excluding "Preventive Care")[96]			
	$250	**$500**	**$750**	**$2,000**
$10	$409	$406	$400	$384
$25	$1023	$1015	$1001	$959
$50	$2043	$2029	$2002	$1919

Men use less "non-preventive" care than total care, of course, so the prize that can be offered for a given premium and threshold is smaller when "preventive" care does not count towards eligibility. Comparing Table 3 and Table 1, the prizes that can be offered to men for a given premium are about 50 percent to 75 percent as large if we exclude everything but emergency room and in-patient expenses. The male-female gap in "non-preventive" care is smaller than for total care expenses, with the result that eliminating "preventive" care from counting towards the eligibility threshold substantially lowers the size of the prize available to women, cutting the amount by more than two thirds for the lowest threshold.

95. *See supra* Table 1.

96. "Preventative" care assumed to include everything but expenditures on emergency room and in-patient hospital care.

Finally, we consider a scenario that attempts to account for selection. The tontine will be least attractive to those uninsured with the highest expected health-care utilization, since they are least likely to qualify for the prize. (Of course, these are precisely the people who would have been most likely to sign up for insurance already, but suppose for some reason they failed to do so.) Table 4 shows what happens if the tontine policy were not attractive to this group. As compared with Table 1, feasible prizes are about two thirds to three quarters as large, because instead of, for example, 41 percent of all insureds spending less than $250 over three years, 63 percent do (once we have eliminated the top 10 percent of all spenders).

Table 4: **Size of Tontine Prize** (T), for Various Monthly Premium Amounts and Spending Thresholds[97] (eighteen- to twenty-nine-year-old men only, excluding the highest-using 10 percent)

Monthly Tontine Premium, τ	Three-Year Spending Threshold, Θ[98]			
	$250	**$500**	**$750**	**$2,000**
$10	$574	$479	$433	$367
$25	$1,435	$1,198	$1,803	$917
$50	$2,871	$2,397	$2,166	$1,835

VI. IF HEALTH TONTINES WOULD BE SO EFFECTIVE, WHERE ARE THEY?

One short answer is that something like a health tontine is already being marketed in China, where the Ping An Life Insurance Company recently began selling "policies that combine life, accident, hospitalization, critical disease, endowment, and dividend components."[99] Like insurance companies in other developing countries—including the U.S. in the nineteenth century, and Japan in the mid-twentieth century—Chinese insurers have found that deferred dividends appeal to the insurance-resistant.[100] Private, supplemental

97. *See supra* Table 1.

98. Assumes that the highest-utilizing 10 percent of uninsured do not sign up for coverage, and that their spending would be equivalent to that of the 10 percent highest-using insureds.

99. *See* Cheris Shun-ching Chan, *Creating a Market in the Presence of Cultural Resistance: The Case of Life Insurance in China*, 38 THEORY & SOC'Y 271, 294 (2009).

100. *See* Chan, *supra* note 41, at epilogue (detailing the history of life insurance in Japan).

health insurers in Europe have also offered deferred dividend health insurance plans, suggesting that health tontines can appeal to consumers in developed countries as well.[101]

A longer and admittedly more speculative answer to this question revolves around the longstanding effort to separate insurance from gambling, a related commitment among insurance practitioners to an understanding of insurance that leaves little room for "spicy" insurance products, the self-conscious transformation of health-insurance companies into health-care companies, and lingering (but misplaced) concerns about the legality of tontines.

A. Separating Insurance from Gambling

Until Parliament passed the Gambling Act in 1774, it was possible and indeed common to purchase insurance on a stranger's life in Great Britain.[102] Such insurance came to be condemned as gambling, and the Gambling Act was part of an effort to separate insurance from other sorts of speculation that continue today, as represented by the current controversies over credit default swaps and stranger-owned life insurance.[103]

Many states in the U.S. adopted the Gambling Act's insurable interest requirement, which prohibited the purchase of insurance on a life or property in which the purchaser did not have an interest.[104] Even with this legal fence between insurance and gambling in place, nineteenth-century bankers still derided insurance as gambling, on the grounds that the insurance payoff depended on a random event—death, in the case of life insurance—rather than the slow and steady

101. *See* Zweifel, *supra* note 47; Peter Zweifel, *Bonus Options in Health Insurance*, Dordrecht: Kluwer, 1992. (Thank you to H.E. Frech for bringing the European experience to our attention.)

102. *See* GEOFFREY CLARK, BETTING ON LIVES: THE CULTURE OF LIFE INSURANCE IN ENGLAND, 1695–1775, at 49, 62–63, 89–90 (1999) (concluding that the prudential aspect of life insurance did not succeed the speculative aspect until at least 1850).

103. *See* Derivative Markets Transparency & Accountability Act, H.R. 977, 110th Cong. § 16 (1st Sess. 2009) (proposing insurable interest requirement for credit default swaps); Sarah Quinn, *The Transformation of Morals in Markets: Death, Benefits, and the Exchange of Life Insurance Policies*, 114 AM. J. SOC. 738, 740 (2008) (investigating "questions of wagering, speculation, and trust" in the secondary market for life insurance). *Cf.* Edwin W. Patterson, *Hedging and Wagering on Produce Exchanges*, 40 YALE L.J. 843, 844 (1931) (exploring the difficulty of distinguishing between hedging and speculation).

104. *See* ROBERT H. JERRY II & DOUGLAS R. RICHMOND, UNDERSTANDING INSURANCE LAW 274 (4th ed. 2007) (providing a non-exhaustive list of states).

accumulation of savings.[105] Insurance entrepreneurs responded to this charge in a variety of ways: drawing analytical distinctions (gamblers seek gains while insurers seek protection against loss),[106] pointing to the good reputation and high standards of people in the insurance industry,[107] and publicizing their efforts to exclude the immoral from the insurance pool.[108]

Nevertheless, the gambling charge clearly struck home. Indeed, some prominent insurance industry leaders mounted that same charge against tontine life insurance.[109] While these insurance men surely would not accept the "gambling" label for a lump-sum payment made upon the fortuity of the death of a particular insured (i.e., the death benefit), they were willing to apply that label to a lump-sum payment that depended on the fortuity of the number of people who died before the deferred dividend was paid. As inconsistent as that position may have been in theory, this internal critique from within the insurance industry played an important part in the early twentieth-century reform of the mutual life insurance business. [110]

When reformers sought to pacify the powerful mutual life insurance companies that profited from tontine life insurance, they used all the rhetorical tools at their disposal—including the conceptual link between tontines and gambling. When the reformers succeeded in 1906, they outlawed tontine life insurance, and their victory story recounted

105. *See, e.g.*, A.B. Johnson, *The Relative Merits of Life Insurance and Savings Banks*, 25 HUNT'S MERCHANTS' MAG. & COM. REV. 670, 671 (1851) (arguing that "life insurance assimilates with gambling" and that "we should provide for these purposes by self-denying accumulations"—in banks such as those he operated, of course).

106. *See, e.g.*, George W. Savage, *Origin and Nature of Fire Insurance*, 4 HUNT'S MERCHANTS' MAG. & COM. REV. 159, 160 (1841) ("Insurance is, in reality, nothing more than a wager . . . but in a moral point of view, it should be considered entirely different.").

107. *See, e.g.*, H.S. TIFFANY, TIFFANY'S INSTRUCTION BOOK FOR FIRE INSURANCE AGENTS 20 (1883) ("This business is not a mere lottery or game of chance, but an honorable one in which some of the most experienced men of the age are engaged, and in which millions of dollars are invested.").

108. *See* VIVIAN A. ROTMAN ZELIZER, MORALS AND MARKETS: THE DEVELOPMENT OF LIFE INSURANCE IN THE UNITED STATES 72, 96–97, 110–11, 117 (1979); *cf.* Quinn, *supra* note 93, at 741 ("[T]he spirit of insurable interest . . . established the *decency* of life insurance . . . because it kept the insurance from being a gamble . . . .").

109. *See* KELLER, *supra* note 34, at 57 ("Deferred dividends became a special target of insurance men opposed to the corporate values of the great companies.").

110. *See, e.g.*, Jacob L. Greene, Letter to Editor, *Facts About Tontine: The Alleged Enormity of the Wickedness*, N.Y. TRIB., May 9, 1885 ("[T]he Tontine principle in life insurance is absolute, unqualified gambling . . ."); Manly, *supra* note 7, at 183–87. *See generally* CONN. MUT. LIFE INS. CO., PAPERS RELATING TO TONTINE INSURANCE (1885–86).

the earlier debased nature of the insurance industry and the morally superior forms of life insurance that remained after the Armstrong investigation's "ordeal of corporate sackcloth and ashes."[111] To this day, the fact that some life insurance companies did not participate in the "tontine affair" of late-nineteenth-century life-insurance industry remains a point of pride among their employees.[112]

B. A Cultural Commitment to Insurance as a Risk-Management Technology

When the sociologist Cheris Shun-ching Chan investigated the Chinese life-insurance market in the early 2000s, she was initially surprised at the success of inexperienced, undercapitalized local insurers in their competition with well-capitalized, experienced Western insurers in the Chinese market. She concluded that the local insurers' inexperience actually gave them an advantage, because they were more willing to provide what their customers wanted: life insurance that paid deferred dividends.[113] The foreign insurers' experience had taught them that life insurance was "really" about managing the risk of premature death, and that life insurance was not a good savings or investment product.[114] Yet their Chinese customers did not want to talk or even think about premature death.[115] Instead they wanted to accumulate money to live the comfortable old age that precedes a good death. So they preferred to buy the financially insecure, but more culturally resonant products offered by the upstart local companies. Eventually, the foreign insurers caught on, and began offering similar products.[116]

111. KELLER, *supra* note 34, at 275. *See, e.g.*, PROCEEDINGS OF THE SEVENTEENTH ANNUAL CONVENTION OF THE NATIONAL ASSOCIATION OF LIFE UNDERWRITERS 58, 61, 65 (1906) (address of Young E. Allison) (describing the poison of tontine life insurance and explaining that the results of the Armstrong investigation will be to "take [the] element of gambling out" of life insurance and restore it to "the highest gospel of co-operative organization that ever was preached"); *see generally* BURTON J. HENDRICK, THE STORY OF LIFE INSURANCE (1907) (recounting the events leading up to the Armstrong investigation as a "thirty years' war" between "the good and the bad in life insurance" concluding with the triumph of Jacob Greene—the "good" anti-tontine leader who lost in market share but won in principle—over Henry Hyde—the "bad" purveyor of tontines who won in market share but lost his reputation).

112. Personal Communication with Robert Googins, former General Counsel of Connecticut Mutual Life Insurance Company.

113. *See* Chan, *supra* note 99. *See also* Cheris Shun-ching Chan, *Honing the Desired Attitude: Ideological Work on Insurance Sales Agents*, *in* WORKING IN CHINA: ETHNOGRAPHIES OF LABOR AND WORKPLACE TRANSFORMATION 229, 229–46 (2007); Chan, *supra* note 41.

114. *See* Chan, *supra* note 99.

115. *Id.*

116. *Id.*

Although this is a difficult claim to document, we think that U.S. health insurers are even more committed to insurance as risk management than U.S. life insurers.[117] The Blue Cross and Blue Shield plans grew out of efforts by doctors to provide financing for hospital care, and their leadership always resisted being considered part of the insurance industry.[118] Although the big commercial U.S. health insurers like Aetna and CIGNA mostly grew out of the life-insurance business, the primary connection between the life and health businesses in those companies was a shared commitment to selling group policies to large corporate customers. Group life insurance, like group health insurance, is marketed in the U.S. exclusively as a risk-management product, not as a way to accumulate savings. Aside from this shared marketing, the life and health divisions in a commercial insurance company have little to do with each other, and the designers of the health-insurance products do not think of themselves as being in the same business as more "spicy" asset-accumulation life-insurance products. Accordingly, both the Blues and the commercial insurers share an understanding of health insurance as a health risk-management and risk-spreading product, not an instrument of accumulation.

C. The Transformation of the Health-Insurance Industry into a Health-Care Administration Industry

The transformation of the traditional indemnity health-insurance product into the plethora of managed care products that dominate the health insurance market today has made a health insurance tontine even less thinkable for an executive at an Aetna, CIGNA, United Health, or a Blue. Today, health *insurance* is about the administration of *health care*, and many people in the industry would deny that they are in the insurance business at all.[119] The more health insurance becomes a business of delivering and managing health care, the less plausible the tontine feature will seem to a health-insurance company executive. Indeed, the tontine feature highlights the messy, morally ambiguous history of the insurance business, just the kind of thing that the health-care financing industry MBAs and MDs are running away from as quickly as they can.

117. *Cf.* Quinn, *supra* note 103, at 742 ("Just as a geological formation bears the traces of the environment that sculpted it, so too does a market bear the imprint of the social currents that shaped its development.").

118. *See* Paul Starr, The Social Transformation of American Medicine (1984).

119. *See* Email from John Day, former Chief Health Counsel, CIGNA, to Tom Baker (Feb. 18, 2009, 05:44 PM EST) (on file with author) (further explaining that the vast majority of the health-insurance business today is administrative, with other parties bearing much of the risk).

The recent efforts that some health-insurance companies have made to develop new products that would be more appealing to the young invincibles provides a useful illustration of the disconnect between the young invincibles' preferences and the health-insurance industry's assessments.[120] The marketing materials for the new policies reflect the need for some spice. There are snappy graphics, fast cuts on Web pages, and slang drawn from extreme sports.[121] But the products are just stripped-down managed-care policies that offer less coverage for a lower price.[122] These bland products may appeal to people who are not buying insurance because they need the money to pay the rent, but they are not going to appeal to people who do not think that they need health insurance. The invincibles will reason—correctly—that they are even less likely to "collect" under the stripped down policies.

D. Lingering Concerns about the Legality of Tontine Insurance

We have identified three potential legal concerns about insurance tontines, none of which would apply to a properly designed health tontine. First, state insurance codes commonly prohibit insurance rebating, which is the practice of refunding to customers some or all of their premiums or providing some other benefit to them (other than insurance) in return for their premiums.[123] This might seem to present a serious legal objection to a tontine. On close analysis, however, the objection melts away, because the statutes explicitly permit rebating that is "*plainly expressed in the insurance contract.*"[124] Moreover, tontines are not the kind of agreement that the anti-rebating statutes were designed to discourage, since they do not threaten the solvency of the company or agents' commission rates, and there is no covert discrimination between similarly situated policyholders. [125]

120. Fuhrmans, *supra* note 66.

121. *Id.*

122. *Id.*

123. *See* Spencer L. Kimball & Bartlett A. Jackson, *The Regulation of Insurance Marketing*, 61 COLUM. L. REV. 141, 146–47 (1961).

124. Robert H. Jerry II & Reginald L. Robinson, *Statutory Prohibitions on the Negotiation of Insurance Agent Commissions: Substantive Due Process Review Under State Constitutions*, 51 OHIO ST. L.J. 773, 775, 783 (1990) (discussing a greatly influential Model Act promulgated by The National Association of Insurance Commissioners (NAIC) in 1947). As of 1990, forty-nine states and the District of Columbia had an anti-rebating statute (California passed but later repealed a statute), and forty-seven of those states have modeled their statute directly on the Model Act, so there is general uniformity in anti-rebating laws among the states. *Id.* at 775.

125. As the Supreme Court of Pennsylvania stated, "it is obvious that the object of [the anti-rebating statute] is to outlaw 'unfair treatment of prospective insurants of the same class by offering inducements to one person that are not available

Second, New York and many other states passed legislation immediately after the Armstrong investigation that prohibited life-insurance tontines.[126] Significantly, this legislation applies only to "life insurance companies,"[127] and not to health-insurance companies (which did not exist at the time of the 1907 legislation). Moreover, the primary objective of this anti-life-tontine statute was to prevent life-insurance companies from using the deferred dividends to accumulate large surpluses over long periods, tempting insurers to engage in financial manipulation, a concern that would not apply to a health-insurance tontine.[128]

Third, states closely regulate games of chance and gambling, and there might be some concern in light of insurance history that tontine health insurance could be characterized as being in part a game of chance or a lottery.[129] In our judgment these laws would not apply to health tontines any more than similar laws would have applied to life-insurance tontines. A health tontine is not a true lottery or game of chance. The participants' right to the dividend would depend on their own health experience: precisely the sort of legally permissible

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to all persons of the same class.'" *McDowell v. Good Chevrolet-Cadillac, Inc.*, 154 A.2d 497, 500 (1959) (quoting *In re Insurance Rebate*, 19 Pa. D. 567, 569 (Pa. Atty. Gen. 1909)).

126. *See* Ransom & Sutch, *supra* note 25, at 381.

127. *See* N.Y. INS. LAW § 4231 (McKinney 2007). Policyholder's participation in surplus of life insurance companies:

> (a)(1) Except as herein otherwise provided, every domestic life insurance company shall ascertain and distribute annually, and not otherwise, the proportion of any surplus accruing upon every participating insurance policy and annuity or pure endowment contract entitled as hereinafter provided to share therein, issued on or after the first day of January, nineteen hundred seven.

128. *See id.* § 4231(a)(3) (McKinney 2007). *See also id.* § 4231 note 2.

129. *See*, *e.g.*, MASS. ANN. LAWS ch. 271, § 7 (LexisNexis 1992) (Lotteries: Disposal of Property by Chance):

> Whoever sets up or promotes a lottery for money or other property of value, or by way of lottery disposes of any property of value, or under the pretext of a sale, gift or delivery of other property or of any right, privilege or thing whatever disposes of or offers or attempts to dispose of any property, with intent to make the disposal thereof dependent upon or connected with chance by lot, dice, numbers, game, hazard or other gambling device, whereby such chance or device is made an additional inducement to the disposal or sale of said property, and whoever aids either by printing or writing, or is in any way concerned, in the setting up, managing or drawing of such lottery, or in such disposal or offer or attempt to dispose of property by such chance or device, shall be punished by a fine of not more than three thousand dollars or by imprisonment in the state prison for not more than three years, or in jail or the house of correction for not more than two and one half years.

contingency that lies behind traditional health and life insurance, albeit in an opposite direction. And the amount of individuals' dividends would depend on the health experience of the group as a whole: precisely the sort of legally permissible contingency that lies behind traditional mutual insurance dividends.

CONCLUSION

Our positive thesis is that there is a significant and identifiable group of individuals—the invincibles—who do not buy health insurance they can afford and "should" want. They wrongly believe that the insurance is not worthwhile, since nothing bad will happen to them, a form of optimism bias. Our normative recommendation is that health insurance should be reformulated so as to make it more attractive to these invincibles by taking advantage of their optimism. By bundling health insurance with a deferred dividend or "prize," insurers should be able to entice this group to buy coverage they would not otherwise choose to purchase. Prizes have historically been used to sell life insurance in much this way, with great success.

But is this a good thing? Why should we "trick" people into buying insurance they would not otherwise want?[130] We think that the case for doing so is actually quite strong, although we recognize not everyone will be convinced. First, there are possible externalities at play when the uninsured fail to secure care for communicable diseases, although efforts to quantify them suggest that the magnitude of these externalities is small. The uninsured also rely heavily on the public fisc to pay for the care that they do receive, but the amount of uncompensated care is quite small compared to total health-care expenditures, so the fiscal externality is not large. The strongest argument comes from the evidence that a significant number of young adults who lack insurance are hampered in their ability to seek medical care, relative to those who are insured. So there is a plausible paternalistic rationale for getting the invincibles enrolled in health care for their own good.[131] As noted earlier, moreover, our proposal only works because it appeals to the invincibles' optimism bias. Anyone who is rational and immune to the bias should not find tontine health insurance attractive. Thus, we can be fairly confident that whoever is "tricked" into buying under our proposal suffers from a cognitive

130. As Jonathan Gruber perceptively notes, "the simple fact that so many are without insurance is not necessarily a cause for public-policy intervention; many more individuals do not own their own homes or are obese." Gruber, *supra* note 49, at 581.

131. Gruber concurs, suggesting that "the major motive for caring about the uninsured is paternalism." *Id.* at 582.

illusion that impairs their potential claims to be the best judge of their own interests.

Tontine health insurance has an additional advantage over other plans to cover the invincibles: it would be much less coercive than insurance mandates, and much less costly than subsidizing insurance to make it cheap enough to be attractive.[132] Even those who disagree with the idea of extending coverage to the invincibles would presumably agree that whatever coverage we *do* provide should be done as cheaply and as light-handedly as possible. Tontine health insurance meets those objectives.

The time has come, we think, to revive the tontine, a nineteenth-century insurance innovation that capitalizes on some fundamental truths about human nature to design better insurance.

132. One insurance blogger recently wrote that:

> [U]nless the gummint [sic] makes it more painful to **not** buy coverage than to do so, people are more likely to ignore any such requirement. We saw this in Massachusetts, where folks who failed to play along lost an exemption worth about $200. Compared to potentially thousands of dollars for insurance premiums, who can blame them? Young, healthy people aren't *stupid*: if you don't hurt them in the wallet, a lot of them are just going to say "the heck with it."

Henry Stern, *Mandated Missteps*, INSUREBLOG.BLOGSPOT.COM, Sept. 15, 2008, http://insureblog.blogspot.com/2008/09/mandated-missteps.html.