role of insurance occurring in any way because risks today are less likely to meet the criteria for "ideally insurable risks"? And, there is no discussion of the role of increasingly sophisticated consumers—especially corporations and governments that insist insurance provide not only risk transfer, but also *cost-effective* risk transfer.

Although written from a sociological perspective, *Embracing Risk* raises substantive issues that help inform the debate on such topics as social insurance and insurance regulation. For example, given that lenders require insurance for approval of a mortgage, insurers' underwriting criteria are, in effect, governing who can or cannot buy a home. As such, insurance is a form of regulation and has the potential to affect individuals and society in a significant way (both positive and negative).

Embracing Risk also contributes to the discussion regarding Enterprise Risk Management (ERM), without actually using that term. In emphasizing the need to view risk as having both positive and negative consequences, and in recognizing that risks are more interrelated now than in the past, the book helps to make the case for ERM as a practical strategy in today's environment. In addition, the precautionary principle that is discussed in the last chapter parallels changes we see occurring in corporate governance guidelines. That is, given that uncertainty still exists even after our best attempts at assessing and quantifying risk, decision makers need to attempt to anticipate "what if" scenarios that imagine the worst case scenario and develop strategies that can mitigate the negative effects of such outcomes.

This is a book of essays. As such, it is written by a collection of authors and the connections between individual essays are not always clear, despite summaries in Chapters 2 and 9 that attempt to highlight the themes and connections. The work itself would have been enriched by greater synergy among writers and the book certainly would be more accessible if better bridges existed between and among the essays. In particular, the chapters on mental health and policing are not tied as well into the main theme of the book as are the other essays.

This book will be of interest to social historians and social theorists who do not have a background in insurance. And for scholars who do possess a background in insurance, this volume contains more historical depth and insights than they would normally consider and also provides important sociological considerations that relate to the risk and insurance economics literature. If a reader should find his or her interest in the book waning, the reviewers strongly believe that it would be a mistake to stop without reading the concluding chapter.

The Theory of Demand for Health Insurance, by John A. Nyman, 2003, Stanford Economics and Finance, Stanford, California: Stanford University Press.

Reviewer: Michel Grignon, Senior Scientist, Health Economics, IRDES (Institute for Health Economics)

This book exposes a new theory of demand for health insurance. Not only is this theory really new (even radically new), but it is highly welcome as well. If this theory is taken seriously by health economists, the dialogue will be easier and more fruitful between them and physicians, policy makers, health services researchers, and even the general public. To tell it in a nutshell, this book provides a much more realistic theory of demand for health insurance than the one economists routinely use, but without dropping the core of the normative economic approach of demand.

In a way, it is an elegant solution to a long-lasting controversy opposing the welfarist conventional conception of demand for health insurance, which takes the demand for health care of the uninsured as the "true" willingness to pay for health care, on one hand, and the extra-welfarist approach, which takes the guidelines written by medical experts as the "norm" of health-care consumption, on the other hand.

Not only is the solution elegant, it is well written and the author provides several examples to illustrate the theoretical considerations, which helps the reader to understand the key concepts.

What does the new theory have to say?

First, consumers do not demand (health) insurance in order to reduce financial uncertainty; the conventional theory assumes that, due to the concavity of the utility of wealth, individuals always prefer a certain financial loss to an uncertain one of the same expected magnitude. An abundant literature has shown, however, that this assumption is contradicted by empirical results (in experiments, individuals prefer uncertain losses) and yields paradoxical results. Here, Pr. Nyman uses a result (due to Rabin, 2000; Rabin and Thaler, 2001), which is not specific to health insurance, but applies to attitudes toward risk in general: there is no link between the shape of the utility function of wealth and the attitude toward risk.

Second, consumers demand (health) insurance because they exhibit a concave utility of wealth, even if this concavity is not related to risk aversion. To understand the crux of the idea, it is useful to decompose it in sequence: when deciding to buy an insurance contract, I voluntarily forgo part of my income. In case I am ill (or the event occur), my income first decreases by the amount of health-care (damage repairing) expenditures needed to treat the illness (repair the damage caused by the event); however, due to being insured, I then receive an income transfer that raises my income above this lower level. If the utility of wealth is concave, and if the income transfer is greater than the premium (i.e., if the probability of the event is lesser than one), I derive more expected utility from the income transfer when ill than I lost utility from the forgone income (the premium).[1] It can even be shown that the lesser the probability, the greater the gain.

Third, the normative consequences of this alternative motive of demand for health insurance depart dramatically from the traditional ones. Formally, if one uses the same utility function of wealth, both theories predict the same demand for insurance. But they disagree on how to interpret a specific feature of insurance for health care, namely, the firmly established empirical fact that the insured spend more to treat their illnesses than the uninsured.[2] Both theories agree on the fact that this overconsumption of the insured stems from the price pay-off mechanism specific to health insurance:

[1] This is another elegant feature of the theory: implicitly, and realistically, individual utility is state dependent (individuals value health care more when ill), but the theory does not need it since individuals rationally anticipate this effect.

[2] The traditional theory labels this difference "overconsumption of the insured," while the new theory labels it "access problem of the uninsured." The access problem is two-pronged: the uninsured deters health care that are affordable but might jeopardize other consumptions, or simply cannot buy some medical procedures that cost more than her total wealth. In the latter case, the income transfer due to the insurance contract might bring the final income level (if ill) well above the initial income level.

while most insurances provide a lump sum of money if the event occurs (one speaks of "contingent claims contracts"), health insurance usually pays off by reducing the price of health care. Both theories also agree on the cause of this specificity, which turns around the difficulty for an insurer to monitor precisely the lump sum cost of a given illness. However, the consequence of the price payoff mechanism is a systematic welfare loss for the traditional theory, while it is beneficial for the new theory.

Here, the crux of the argument is that the price reduction is purely exogenous in the traditional case: the insured individual bought a risk reduction and received a price reduction. As any exogenous price change of a good, the price payoff mechanism yields a pure price effect (the consumer substitutes more of the cheaper good at the expense of the other goods) and an income effect (the consumer has more money to spend on all goods). The income effect is neutral in terms of aggregated welfare (the gain derived from the income effect is paid for through the premium), and the price effect is negative in the case of health insurance, since it induces consumers to consume health-care units that bring less utility than their production cost.

In the new theory, the price reduction is not an exogenous phenomenon to the buyer of the insurance contract, since he precisely bought his contract in order to benefit from an extended access to health care. The fact that the insured consumes more health care than the uninsured is not a deplorable fact of the life of insurance, but a *quid pro quo* transaction on behalf of the insured. More precisely, the insured bought the income effect contained in the difference between his health-care consumption and that of the uninsured, therefore this income effect is beneficial: it brings welfare, and the consumer has a willingness to pay for it. This welfare enhancing effect of the insurance contract stems from the fact that it allocates income where it brings more utility, akin to the functioning of a credit market.

As in the traditional theory, the pure price effect is still welfare decreasing (it induces to consume health-care units for which the production costs exceed the willingness to pay), but, now, it must be compared with a welfare enhancing income effect (whereas the income effect was neutral in the traditional theory). Pr. Nyman provides estimates, based on the monetary equivalent of the health benefits derived from the "overconsumption" of the insured[3] and shows that it greatly exceeds, even under conservatory assumptions, the monetary equivalent of the welfare loss due to inefficient moral hazard (the pure price effect).

Moreover, the price effect has less importance relative to the income effect in the new theory. We are driven here to the familiar decomposition of the effect of the change in the price of one good on the consumption bundle of the representative consumer. Since the traditional theory sees the change in the price of health care as exogenous, it uses the traditional hicksian decomposition (the change along the same indifference curve is due to the pure price effect). Because the new theory sees the price payoff mechanism as endogenous, it logically considers any change away from the initial budget constraint as an income effect, since the price payoff was bought out of this

[3] This estimation strategy is not straightforward, we go back to this issue later.

constraint. Therefore, the income effect is evaluated first, as the difference between the final bundle and the bundle that stands at the intersection of the income expansion path (the curve linking health-care consumption an income, based on the income elasticity of health-care expenditure) and the original budget constraint. The pure price effect is then the difference between this bundle and the original one.

With standard indifference curves (concave to the origin), the budget constraint is steeper than the indifference curve, therefore the increase in health-care consumption due to the pure price effect is lower in the new decomposition: Rough estimates provided in the book are that the pure price effect under the new theory is only 30 percent of the pure price effect evaluated under the traditional theory.

With this new theory at hand, our understanding of the true issues confronting health-care systems and our ability to provide policy recommendations are both enhanced.

First, the theory easily explains why people buy health insurance, even if it induces more health-care consumption from the insured, and it does not need to rely on the awkward explanation that the tax subsidy induces people to buy a product that is so welfare decreasing. That is comforting and illuminating. The new theory must be confronted however with the fact that some people do not buy health insurance, and Pr. Nyman addresses this issue with two major (from my point of view) arguments, namely loading fees and the extent of free substitutes. Loading fees are certainly a major explanation of why some people do not buy insurance: it is congruent with the well documented fact that employer-sponsored insurance works by reducing it as well as through the subsidy, and that the uninsured are small enterprises workers or self employed as much as poor individuals. It yields the conclusion that tax subsidies for health insurance are not only welfare enhancing, but also well grounded on equity, since the loading fees are fixed costs that inhibit the poor to benefit from a welfare enhancing service.

The extent of free health care (through charity) or free health insurance (Medicaid), which might deter some consumers to buy health insurance is less clear-cut. First, the equation proposed in the book (p. 125) does not tell the whole story, since it would suggest that all households (not only the poorest) would benefit from remaining uninsured, would the deductible being close to the premium. One must add some means-test (such as the spend down rule in Medicaid) or a difference in the quality of care provided by charity that might explain that the non-poor still buy private insurance. This quality effect shows through natural experiment, such as the implementation of free insurance for the poor, by comparing health-care consumption before and after the implementation: such a natural experiment occurred in France in 2000 and the consumption of the non–previously covered changed dramatically, in pattern as well as level (Grignon et al., 2004). Therefore, charity is not a pure substitute. Second, the literature on the crowding out effect of Medicaid is less conclusive than the book suggests.

Second, consistent with the new theory, coinsurance cannot be the panacea of optimal health insurance, since, by reducing the difference in health-care expenditures between the insured and the uninsured, it reduces both efficient and inefficient moral hazard. The same happens for managed care when it is aimed at reducing overall quantity of care. The best policy is to set various coinsurance rates for every kind of

illness, according to the relative importance in welfare of the income and pure price effects. The income elasticity of health-care expenditures of those who suffer from one specific illness is the key parameter to set this optimal coinsurance rate: full coverage would then be optimal for cancer, while 100 percent coinsurance would apply to aesthetic surgery or discretionary care in general.[4]

As mentioned earlier, Pr. Nyman provides many back-of-the-envelope (albeit sophisticated envelopes) estimates of the welfare gain and loss of health insurance. However, as he recognizes in the book, the new theory still awaits for sound empirical tests, evaluation of the income and price effects, and simulation.

I will concentrate on two issues.

The first one relates to the estimates of the welfare gain compared with the losses. A strategy is proposed pages 40 and 41 of the book, and coined "consumer's income payoff test": the idea would be to allocate varying lump sum payments to randomly selected ill individuals (with the same level of severity of illness) and to correlate their health-care expenditures with the sum they received.[5]

This test seems rather impractical, however, at least for ethical reasons[6] and, in the rest of the book, the welfare gain is assessed based on extra-welfarist measures (Quality Adjusted Life Years, QALYs) rather than the willingness to pay that would be more consistent with the theoretical framework of the new theory.

Not only is it a matter of internal consistency but it poses two practical problems.

First, the extra-welfarist measure relies on the idea that more health care means more health, and that we are able to estimate the dose–response link. Surprisingly, however, such a link is not that easy to estimate, and the consequences in QALYs of more access to health care are subject to strong assumptions.

Second, it yields recommendations that are not in line with the general intuition of why individuals buy insurance, as can be seen from the policy recommendation proposed page 155: for observable and severe illnesses with more than one possible treatment, the recommendation is that the cheapest treatment should be 100 percent covered and the other alternatives' supplementary costs should be supported by the consumers who desire it. Thus, writes Pr. Nyman, health insurance would solve the access problem without incurring inefficient moral hazard. It is perfectly sound from

[4] Here, again the new theory predicts the true behavior of the health insurance market or regulation: in France, chronic and expensive illnesses are fully covered, while dental prosthesis is poorly covered under the public insurance scheme. In the United States, Medicare was created to cover those most susceptible of suffering from costly, severe, and chronic illnesses.

[5] This test might also serve as a behavioral test of the fundamental intuition that individuals buy insurance to benefit from an income transfer.

[6] Adams et al. (2003), wonder whether the Rand experiment cannot be considered a kind of income transfer and be used as a test for the new theory. Another alternative would be to study the "collective demand" for innovations in health care, or the historical path through which the innovations made their way to the insurers' formularies, both in market and public environments (the official rationale is the extra-welfarist QALYs or outcome measures, but one can doubt such a clear-cut methodology always applies in actual decision making).

an extra-welfarist point of view, as long as the alternative treatments are not life improving, but leaves unanswered the welfarist question of "why do people buy insurance?": if the consumer desires an income transfer when ill, it might be to access "necessary" (life saving or incapacity reducing) health care, *and* "less painful" health care as well, and that should not be interpreted as inefficient moral hazard from the point of view of the new theory. Here, only the income transfer test could help us understanding what people actually do when they receive money if ill (do they buy the cheapest treatment and endure pain, or do they use the extra-income to buy a lower pain treatment).

The second issue is concerned with the income elasticity of health care. As seen in the summary sketch of the theory, income elasticity is a key empirical parameter to use the new theory. However, estimating it is a true issue (as recognized in the book). There is a purely technical matter first, the need to base such an estimate on data observed on an uninsured population only; it can be solved thanks to the extent of high-quality data in countries where the huge majority of the population is not insured (e.g., Vietnam Living Standard Surveys). A more problematic issue is that, even without formal insurance, individuals can benefit from income transfers when ill, from informal credit markets (Townsend, 1994; Ravallion and Chaudhuri, 1997; Gertler and Gruber, 2002; Cox, 2002). In Low Developed Countries, where these markets are usually studied, they are able to transfer income to the ill, and one could imagine that, thanks to their community based rules of functioning (and close scrutiny of what beneficiaries do with their income transfer), they are prone to reduce inefficient moral hazard. They might also avoid another form of moral hazard, the so-called *ex ante* moral hazard in health care (increase in the probability of the event in the insured population), by allocating the income transfer to the "deserving" individuals only, those who do not suffer from the illness because of their previous behavior. Medical savings accounts (MSAs) are certainly a sort of equivalent of these informal credit markets for the rich countries: they claim to rely on *ex ante* savings rather than on pooling across wide populations, in order to avoid both *ex post* and *ex ante* moral hazard. In the case of MSAs, *ex ante* moral hazard would be the lack of personal savings to prepare for old age, and health insurance as we know it would be an undue transfer from the future-oriented and prudent to the present-oriented and risk-lover, something the overall population could be less prone to support than the transfer from the rich to the poor and from the healthy to ill. Pr. Nyman sees MSAs as a way to subsidize preventative or routine health care for the healthy (p. 155), but a considerable strand of literature considers it as a grand scale alternative to population-based insurance. To sum the argument up, if individuals buy insurance to get an income transfer when needed, then the optimal contract should be evaluated against all alternatives in the world of insurance, but also against alternatives in the world of credit market and savings arrangement. The empirical issue is therefore to determine whether individuals seek to cover long-term risks (the risk of becoming a bad risk because of a chronic illness) and what kind of income (permanent or current income) transfer they buy.

Apart from these two empirical issues (which are more proposals for future research than criticisms of the theory), I would like to emphasize a question raised by Pr. Nyman in his recommendations, which stands at the core of the "optimal insurance" issue. Even if full coverage is the optimal solution from the demand-side point of

view, one could still suspect that supply side effects could jeopardize this optimal solution: if physicians have any opportunity to charge too much, due to market power of any sort, for procedures that are fully covered, the net benefit from health insurance is less than predicted by the theory (which relies on the standard assumption that prices reflect the value of the purchased good). The book approaches this issue (p. 152, "a price-reduction strategy"), but for severe illness with an objective content, such that the insurer might monitor the physician as agent. My concern is that, in the future, health insurers (and specifically public insurers such as Medicare) might have to deal increasingly with diagnostics with subjective content, such as depression or chronic fatigue syndrome, rather than with clear-cut diagnostics such as cancer or diabetes, and see coinsurance as the easiest way to curb expenditures, even if welfare-decreasing.

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Why Stock Markets Crash: Critical Events in Complex Financial Systems, by Didier Sornette, 2003, Princeton, NJ: Princeton University Press

Reviewer: Rick Gorvett, University of Illinois at Urbana-Champaign

Consider the following events: a pressure tank within a rocket propulsion system fails during a launch; tectonic plates shift, causing the first significant earthquake in a locale for several decades; a stock market experiences a crash after a prolonged run-up in price levels. The commonality here is that all of these events are ultimately characterized by a "rupture" in the underlying system, following a buildup of "pressure" over a period of time. The recognition of certain engineering and geologic events as analogous in this way to financial market crashes was the impetus for the interesting and enjoyable new book *Why Stock Markets Crash: Critical Events in Complex Financial Systems*, by Didier Sornette.

The major thesis of this book is that a stock market crash is not the result of short-term exogenous events, but rather involves a long-term endogenous buildup, with exogenous events acting merely as triggers. In particular, Sornette examines financial crashes