Risk Management for the Age of Information

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BOOK REVIEW

RISK MANAGEMENT FOR THE AGE OF INFORMATION—

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INTRODUCTION

Noted author and financial commentator Peter Bernstein began his book Against the Gods with a provocative question: "What is it that distinguishes the thousands of years of history from what we think of as modern times? The answer," Bernstein argues, "goes way beyond the progress of science, technology, capitalism, and democracy. The revolutionary idea that defines the boundary between modern times and the past is the mastery of risk.... The ability to define what may happen in the future and to choose among alternatives lies at the heart of contemporary societies." 1 In this spirit, Robert Shiller, in The New Financial Order ("NFO"), outlines a radical rethinking of the biggest risks facing society. NFO is an ambitious book, the product of many years of thought, scholarship and even entrepreneurship dedicated to its ideas. The proposals in NFO range from incremental improvements to existing risk management systems to wholesale reworkings of some of society's largest institutions. Shiller's ideas warrant serious attention. His last book, Irrational Exuberance, came out in March 2000, at the height of the Internet bubble. There Shiller argued—quite against the spirit of the times—that both the level of the stock market and the importance people attached to it were greatly exaggerated. 2 Investors ignored his warnings at their peril. 3 Once again, Shiller is cautioning that society faces risks that are massive but for various reasons all but invisible. And once again, we would do well to heed his counsel. 4

4. From another perspective, NFO may be viewed as a strange sequel to Irrational Exuberance. Whereas the former questioned the fundamental efficiency of financial markets, the latter suggests that various social ills can be solved or mitigated through dramatic and innovative expansions in financial markets. One is tempted to ask why, if
The thrust of NFO is that the information technology revolution is creating both unprecedented threats to people’s financial well-being, and, at the same time, unprecedented opportunities for risk management. The book is divided into five parts. In Part One, Shiller argues that rapid and accelerating advances in technology are creating new and potentially devastating risks that are inadequately addressed by existing risk management institutions. Technology threatens to exacerbate existing inequality among and within nations: whole categories of employment may vanish, home values may decline precipitously, and a nation’s GDP may shrink suddenly relative to the GDPs of other nations. The problem is, there’s no way to know ex ante where losses will fall. Moreover, certain cognitive obstacles prevent people from perceiving risks that accumulate gradually. Fortunately, as Shiller explains in Part Two, the dynamics giving rise to such threats also are creating opportunities: new technology and novel insights into the psychology of risk can be harnessed to spread the loss of major dislocations. In the operational sections of the book, Parts Three and Four, Shiller presents his core ideas for a new financial order. Certain of Shiller’s ideas are intended for implementation by the private sector; others would be the duty of governments. Though Shiller does not explicitly structure NFO this way, I think the private-public distinction provides a useful framework in approaching the book.

On the private side, Shiller argues that society-wide risk management could be vastly improved if private firms offered livelihood insurance, home equity insurance and income-linked loans. However, Shiller thinks conventional financial markets performed so poorly at the turn of the millennium, he is so eager to create new financial instruments.

6. See id. at 17.
7. See id. at 22–57.
8. See id. at 91–92.
9. See id. at 18.
10. See id. at 4.
11. As discussed more fully below, livelihood insurance and home equity insurance are different from, respectively, unemployment insurance and homeowners insurance in two important ways. First, one need not lose one’s job to collect under a livelihood policy, and one’s home need not be damaged to collect under a home equity policy.
private firms seeking to market such products face problems of both supply and demand. With respect to supply, there is no way to hedge the risks the products create—that is, no way for insurers or banks to spread or lay off the risks they take on by selling the products—and there is no database containing the information required to structure and settle the products. With respect to demand, the problems of moral hazard and adverse selection (both described and discussed below) make it difficult to market the products profitably. Shiller has answers to these problems. To enable banks and insurers to hedge the risks created by his products, he proposes macro markets—markets for trading the largest income flows (such as occupational incomes) and asset values (such as home prices). To solve the information problem, Shiller proposes global risk information databases, or GRIDs—huge, constantly updated compilations of all data relevant to the financial risks faced by individuals, corporations and governments. And to take care of moral hazard and adverse selection, Shiller introduces the powerful idea of settling certain classes of insurance contracts and setting income-linked loan repayment terms based on indexes of incomes and housing prices.

Second, payouts under the policies are determined by incomes in one's field and home prices in one's area, not by individual income or home price.

13. It is not entirely clear whether moral hazard and adverse selection are issues of demand or supply. Regardless of how they are characterized, both threaten to undermine the efficient functioning of insurance markets.
15. See id. at 189–20.
16. Barron's Dictionary of Finance and Investment Terms defines an "index" as a [S]tatistical composite that measures changes in the economy or in financial markets, often expressed in percentage changes from a base period or from the previous month. . . . Indices also measure the ups and downs of stock, bond, and commodities markets, reflecting market prices and the number of shares outstanding for the companies in the index. Some well-known indices are the Dow Jones Averages, the New York Stock Exchange Composite Index, the American Stock Exchange Composite Index, the Standard & Poor's 500 Index, the NASDAQ Composite Index, the Russell 2000 Index and the Value Line Composite Index. . . .

On the public side, Shiller offers three domestic policy proposals and one foreign policy proposal. With respect to domestic policy, Shiller first proposes replacing the current income tax with what he calls "inequality insurance"—in effect, a means of locking in the current level of inequality via annual adjustments to the tax schedule.\(^7\) Second, he suggests replacing the current pay-as-you go social security system with a tax that varies with the percentage of retirees in the population.\(^8\) Finally, he argues for replacing the existing money system with units of account indexed to the price of a representative basket of goods and services.\(^9\) With respect to foreign policy, Shiller proposes replacing (or at least augmenting) the typical foreign aid program with a system whereby countries or blocks of counties would swap unexpected changes in GDP; he calls the swaps "international agreements for risk control."\(^{20}\) Like his private sector ideas, Shiller's public sector ideas also face obstacles to implementation. The most obvious would seem to be political or institutional: particularly in the areas of tax and social security, economic ideas are closely intertwined with the political process—a process as fallible, imperfect and unpredictable as the humans who make up legislatures and constituencies. Shiller has little to say about politics or institutions, and the feasibility of his public sector ideas suffers accordingly.

This review proceeds as follows. Part I deals with Shiller's private sector ideas. In this part, I first describe Shiller's ideas relating to "insurance" (broadly construed)—livelihood insurance, home equity insurance and income-linked loans. Part II discuss the three problems besetting the private sector ideas, and Shiller's proposed solutions: macro securities for hedging, GRIDs for information and indexes for moral hazard and adverse selection. Part II continues with a discussion of the effect of indexes on the operation of various legal doctrines, a topic Shiller does not address. Part II concludes with suggestions for implementation of the private sector ideas. Part III deals with Shiller's vision for the public sector. In this Part, I first describe and critique Shiller's tax and social security proposals. Next, I discuss his proposed international agreements for risk control. Then I treat the idea of

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18. See id. at 165–74.
19. See id. at 202–21.
20. See id. at 175–85.
indexed units of account. The theme unifying Part III is that even the best economic ideas have to contend with the often cumbersome realities of the political process. A brief conclusion offers some thoughts on reading NFO.

Before proceeding, it should be noted that NFO presents an unusual subject for a book review. The book does not enter the fray of an ongoing debate or offer incremental refinements of existing ideas. Rather, it proposes a wholesale reworking of our assumptions and institutions in the conviction that financial ideas can improve fairness and efficiency in society. Regarding fairness, Shiller asserts early in the book that "[t]he primary subject matter of finance is the management of risks." As such, the tools of finance can help solve the problem of gratuitous inequality, that is, inequality that cannot be justified on rational grounds in terms of differences in effort or talent. Regarding efficiency, risk aversion implies that there are efficiency gains from insurance. As a result, Shiller, seeks to realize those gains to the maximum extent feasible by expanding the scope of insurance. For example, the introduction of indexes to settle certain types of insurance contracts would enable insurers to offer products that informed consumers might want, but currently cannot purchase.

In short, Shiller sets ambitious goals for himself in NFO. The chief success of NFO consists not in achieving those goals, per se, but in pointing the way toward solutions. The book covers a lot of territory, sometimes at the expense of depth and clarity. The target audience is by no means clear: a financial novice will find insufficient exposition, and an expert will find insufficient detail. Anyone interested in a fuller understanding of the ideas in NFO will have to look beyond the book, perhaps to related scholarship by Shiller and others. However, NFO

21. Id. at 1.
22. See id. at 2. Rawls therefore provides the philosophic underpinning of Shiller's new financial order. The book approaches economic equality from a Rawlsian "original position," asking "[W]hat kind of world, in the broad picture, we would we like to live in if we could choose before we were born, assuming we had an equal probability of being born as anyone?" SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 17. Though Shiller does not share Rawls' assumption that people are infinitely risk averse—the basis for Rawls' "maximin" principle—Shiller does assume some degree of risk aversion.
23. The rhythm of the text is also interrupted by a number of typos and grammatical faux-pas; Princeton University Press should have been more careful.
succeeds in conveying a powerful sense of the creative potential of financial innovation. It leaves the reader eager to learn and participate.

I. PRIVATE SECTOR IDEAS

This Part describes each of Shiller’s private sector risk management ideas—livelihood insurance, home equity insurance and income-linked loans. The next Part discusses the problems with each of these ideas, and Shiller’s solutions. It also explores potential ramifications of indexes for the operation of law and possible methods for implementing the ideas.

A. Livelihood Insurance

Our ability to earn income constitutes one of our most important assets, yet today no method exists for insuring occupational incomes. Therefore, investment of time and money in the specialized knowledge required for many careers involves the risk that the career category will disappear (e.g., will go overseas or will be outmoded by new technology) and the specialized knowledge will be rendered useless. At the margin, the presence of this risk prevents potentially qualified people from pursuing cutting edge careers, and inhibits the development of society’s collective talents.

To mitigate that risk, Shiller suggests that private insurance companies could write policies that would insure occupational incomes, with contract settlement based at least in part on an income index arranged by occupation or other characteristics. For example, in exchange for a premium, a policy might pay the insured 50 percent of the decline in the average income of a person who started in the insured’s field, and 50 percent of the decline in the insured’s income below a floor specified in the policy, with the second 50 percent

25. See id. at 107–10.
26. See id.
27. See id. at 111.
28. The premium might be a fraction of future income, a fixed annual indexed sum, or an up-front premium which might be borrowed against future income, presumably in the form of an income-linked loan, as described below. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 109.
contingent on the insured remaining fully employed or going back to school for retraining.\textsuperscript{29} Consider a young scientist—call her “A”—specializing in recombinant DNA technology (Shiller uses the same field to illustrate his idea). Assume that the average income of those who started in the field is $50,000 per year, and A makes the average income. A, or her employer or union on her behalf, could purchase a policy like the one described above: she would get 50\% of the fall in the average income of DNA scientists below $40,000, and 50\% of the decline in her personal income below $30,000. Now assume that universities continue to substitute lower-paid postdoctoral appointments for regular positions, and as a result the average income of those who started as recombinant DNA technologists falls the next year to $25,000 (ignoring, for the moment, inflation and income from other sources). Our scientist continues to work in her field, and her income falls with the average. Under this scenario, the policy would pay our scientist $10,000 in that year.\textsuperscript{30}

The livelihood insurance proposed by Shiller would constitute a regular and recurring supplement to declining income rather than a one-time payout in the event of unemployment.\textsuperscript{31} In this sense, livelihood insurance resembles a short position in a futures contract settled on the index of occupational incomes.\textsuperscript{32} The insurance company might fund

\textsuperscript{29} This example is included here to illustrate, rather than exhaust, the possible structures of livelihood insurance contracts.

\textsuperscript{30} \((\frac{40,000 - 25,000}{2}) + \frac{(30,000 - 25,000)}{2}\).

\textsuperscript{31} Shiller does not address the interaction of livelihood insurance with unemployment insurance. In order for the former not to undermine the latter, regulations would have to specify that unemployment benefits are not offset by any livelihood insurance payments. That is, a “collateral source rule” should govern the interaction of unemployment benefits and livelihood insurance. \textit{See} MARC A. FRANKLIN \& ROBERT L. RABIN, TORT LAW AND ALTERNATIVES 746–47 (Foundation Press 7th ed. 2001) (describing the collateral source rule).

\textsuperscript{32} \textit{See} ROBERT J. SHILLER, MACRO MARKETS: CREATING INSTITUTIONS FOR MANAGING SOCIETY’S LARGEST ECONOMIC RISKS vi (Clarendon Series; Oxford Univ. Press 1993) [hereinafter SHILLER, MACRO MARKETS].

A futures market . . . can be described as a market for bets on the course of the price or index that defines the market; the primary purpose of these markets is not to enable people to gamble but to ‘hedge’, to make offsetting bets, to cancel out the bets that they have already found themselves making due to their economic circumstances. \textit{Id.} The analogy, however, is not symmetrical: the insured would not be required to pay the insurer if the index went up, so the insurer should not be analogized to the “long” party to a futures contract.
periodic payments to the insured via offsetting positions in macro markets for occupational incomes.\textsuperscript{33} Importantly, the insured does not have to leave his or her field to collect livelihood insurance proceeds.\textsuperscript{34}

As the above example demonstrates, the viability of livelihood insurance depends crucially on the ability of governments and private companies to work together to design and implement accurate occupational income indexes, as well as the creation of hedging institutions in which insurers can lay off risk.\textsuperscript{35} The indexes proposed by Shiller would measure through time the incomes of individuals who begin in a certain occupation, regardless of whether such individuals remain in that occupation.\textsuperscript{36} Such an index design incorporates the recognition that individuals in a declining occupation may substitute to other occupations. The reach and precision of livelihood insurance can be enhanced through the use of indexes based on job history, education, general income level or, more controversially, genetic make-up.\textsuperscript{37}

\begin{itemize}
  \item[33.] Macro markets are described below. See infra Part II.A. Generally, insurance companies use stock and derivative markets to hedge the risk undertaken by writing policies. For example, an insurer who writes commercial general liability policies for financial services firms may also take a short position in an index of financial stocks. If things go bad in the financial services industry, the insurance company will be obligated to make payouts under the policies. But at the same time, the index will decline, and therefore the short position will increase in value. The increase in value of the short position (inflow) should offset the payouts (outflow). Also note that whereas the increase in value of the short position in the index is immediate, the payout under the policy is delayed, sometimes for years (this is particularly the case for reinsurers, which essentially are insurers that insure other insurance companies). Between the time of the loss and the time of any ultimate payout under a policy, the insurance company can earn income on its invested premiums. Therefore, insurance companies can remain profitable even at loss ratios in excess of 100 percent. (The “loss ratio” describes the relationship of an insurance company’s incurred losses and loss adjustment expenses to its earned premiums.)
  \item[34.] Thus, while livelihood insurance may be analogized to a short position in a futures contract, it should not be compared to a put option on the income index with a strike price equal to the income floor. See Richard A. Brealey et al., *Fundamentals of Corporate Finance* 642–47 (McGraw Hill Irwin 4th ed. 2004).
  \item[35.] See infra Part II.A (discussing macro markets).
  \item[37.] See id. at 113–14.
\end{itemize}
B. Home Equity Insurance

For many people, homes are the single largest asset. However, no method exists today for insuring against declines in the price of a home.  

Shiller therefore proposes home equity insurance to insure the market values of individual homes, with settlement based at least in part on an index of the prices of homes of similar location and quality. To ensure that such indexes are reasonable proxies for the price experience of individual homes, the indexes would have to be narrowly tailored in terms of geographic region. At the same time, to counter moral hazard (described below), the data sets on which the indexes are based would have to be large enough so that no single homeowner could materially affect the performance of an index. 

The art and science of index design consists in striking a balance between these competing concerns. Shiller speaks with particular authority on the design of indexes for risk management: in 1991, along with Karl E. Case and Allan Weiss, Shiller founded Case Shiller Weiss, Inc., a for-profit company to create new measures of price appreciation by zip code and home value tier in the United States.

Sale of the insured's home would not be a condition for collection—just as unemployment would not be a condition for collection of livelihood insurance—thus mitigating the problems of strategic selling and strategic cancellation. Instead, home equity policies would pay out in any period in which the value of the applicable index fell below a predetermined level. Therefore, similar to livelihood insurance, home equity insurance would resemble a short position in a futures contract settled on the applicable index of home prices.


40. See id.

41. See id.

42. See id. at 120.

43. See id. at 11.

44. See id. at 119.

45. See SHILLER, MACRO MARKETS, supra note 32, at vi.
equity insurers would, in theory, be able to make regular payouts by hedging home price risk in macro markets for real estate.46

C. Income-Linked Loans

Linking loan repayments to the vagaries of the borrower’s fortunes goes back at least as far as Milton Friedman’s 1962 book Capitalism and Freedom.47 There, Friedman speculated on the possibility of applying to education financing the model of stock market financing used by corporations: “The counterpart for education would be to ‘buy’ a share in an individual’s earnings prospects; to advance him the funds needed to finance his training on condition that he agree to pay the lender a specified fraction of future earnings.”48 Friedman doubted the practicability of income-linked loans, calling the idea an “amusing” speculation and citing the likelihood of irrational public condemnation and high administration costs.49 In NFO, Shiller seeks to rejuvenate Friedman’s core idea and to expand its scope.50

Under Shiller’s proposal, lenders—including banks, mortgage originators and governments—could offer to individuals, corporations and other governments long-term loans with repayment terms defined in terms of the borrower’s income or an index of incomes of similar borrowers, or some combination of the two.51 Instead of competing on interest rates and points, lenders might compete on the proportion of borrower-specific income and index income required for repayment, and

46. See infra Part II.A (discussing macro markets). See also Shiller, The New Financial Order, supra note 5, at 119.
47. See Shiller, The New Financial Order, supra note 5 at 139.
48. Id. at 139–40 (quoting Milton Friedman, Capitalism and Freedom 103 (Univ. Chi. Press 2d ed.1982) (1962)).
49. See id.
50. See id.
51. See id.
on the index to be applied in defining repayment terms. Shiller notes that income-linked loans would reduce (though not eliminate) the risk of bankruptcy. He therefore concludes that the bankruptcy code should be amended to prohibit the discharge of income-linked loans in bankruptcy, just as the code prohibits discharge of certain student loans.

II. PRIVATE SECTOR IDEAS—PROBLEMS AND SOLUTIONS

Shiller's private sector ideas are beset by three categories of problems, and Shiller offers a solution for each. First, insurers need a way to hedge the risks taken on by writing policies, and banks need a way to lay off the risk that borrowers will default on loans. Shiller solves the "hedging" problem by proposing macro markets for trading the largest income flows and asset prices. Second, the information required to create the products does not exist in any existing database. Accordingly, Shiller calls for the creation of giant databases containing the necessary information. Third, the insurance products would have to contend with the problems of moral hazard and adverse selection. As a countermeasure, Shiller submits that indexes can be created and used to settle insurance contracts and set loan repayment terms. This part assesses each of Shiller's proposed solutions. In particular, this part explores in some depth the implications of indexes for insurance markets and law—topics Shiller mentions only in passing. This part concludes with thoughts on implementation of the insurance ideas, based largely

52. For example, one lender might require the borrower to pay each year for thirty years five percent of her income and five percent of an income index, while another lender might require the borrower to pay ten percent of an index. Likewise, a lender might define a borrower's repayment schedule in terms of the borrower's occupation or location. See id. at 141.

53. See id. at 147. See generally 11 U.S.C. § 523(a)(8) (2003) (restricting the dischargeability of educational benefits or loans which were insured or guaranteed by a governmental unit or under any program funded by a governmental unit or nonprofit institution); Santa Fe Med. Services, Inc. v. Segal, 57 F.3d 342, 33 C.B.C.2d 1496 (3d Cir. 1995) (explaining that the participants in educational loan programs, whether lenders or guarantors, grant credit to persons who might not qualify for credit under traditional credit standards, in order to foster the government's policy of promoting access to educational opportunities).

54. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5 at 123–24.

55. See id. at 189–90.

56. See id. at 190.
on recent scholarship on "asymmetric paternalism" or "libertarian paternalism" (both discussed below).

A. Hedging and Macro Markets

Macro markets play a crucial role in Shiller's new risk management infrastructure. Macro securities themselves (discussed in a moment) are a versatile risk management tool. In addition, macro markets provide an essential hedging institution for insurers writing livelihood or home equity insurance and lenders making income-linked loans. Macro securities should also facilitate the structuring of intergenerational social security and international agreements for risk control.

For over a decade, Shiller has been thinking about the design of institutions for trading macro risks. In his 1993 book *Macro Markets*, Shiller proposed that such trading could be accomplished through the use of what he there called "perpetual futures." Perpetual futures would resemble index-settled futures traded on existing markets, such as

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57. *See supra* Part I.A (describing livelihood insurance) and Part I.B (describing home equity insurance). Shiller notes that "if these retail insurance products were introduced after macro markets for real estate were created, then insurance companies could hedge themselves in the macro markets for the risks that they took on by writing home equity insurance policies for individuals." *See id.* at 119.

58. *See infra* Part I.C (describing income-linked loans). Shiller notes that "borrowers guided by sound financial advice from their financial planner, their employer, or their labor union might even use the loan to buy a portfolio of macro securities that provided income that helps protect them against possible declines in their household income." *See id.* at 141.

59. *See* Robert J. Shiller, Social Security and Institutions for Intergenerational, Intragenerational, and International Risk Sharing, in 50 CARNEGIE ROCHESTER CONFERENCE SERIES ON PUBLIC POLICY 165, 169 (1999) ("The creation of the international macro markets might even solve most of the risk-management problem that social security is designed to deal with, and produce a greater welfare improvement than would the optimum social security system without these markets.").

60. *See infra* Part III.E (describing international agreements for risk control). For example, a country could short its own GDP in the macro markets and purchase a long position in the GDPs of other nations, in effect swapping its own national income risk for a better diversified portfolio of national incomes. *See SHILLER, THE NEW FINANCIAL ORDER, supra* note 5, at 123. Similarly, in specifying GDP expectations for the design of international agreements for risk control, macro securities based on GDP could provide useful guidance. *See id.* at 178.

61. *See SHILLER, MACRO MARKETS, supra* note 32, at 5.
the Chicago Board of Trade, with two related exceptions: the daily settlement formula would be different and the contracts would have no expiration date.\textsuperscript{62} Each day the short party to a perpetual futures contract would pay the long party an amount roughly equal to the excess of the return on the index over the return on the alternative asset (probably short-term government debt).\textsuperscript{63} In effect, the short party would be swapping the risk of a long-term claim on the index for the return on the alternative asset.\textsuperscript{64}

Shiller recognizes that the complexity of perpetual futures threatens to undermine their utility as risk management devices.\textsuperscript{65} Most people are unfamiliar with futures contracts and may be put off by margin requirements and margin calls.\textsuperscript{66} Macro securities—an idea Shiller has patented—are designed to serve the same risk management function as futures contracts but in a more user-friendly format. In their simplest form, macro securities would work as follows. A stock exchange or other entity would automatically issue pairs of macro securities—an “up macro” and a “down macro”—whenever it received matching orders.\textsuperscript{67}

\begin{itemize}
\item 62. \textit{See} Shiller, \textit{The New Financial Order}, \textit{supra} note 5, at 302 n.4. With respect to daily settlement, the long and short parties to a conventional futures contract have contracts with the exchange rather than with one another. To prevent default, the exchange requires each party to post collateral in a margin account to cover any losses. If the collateral in a margin account falls below a specified level, the broker contacts the account holder to request that more money be added to the account. Such a request is known as a “margin call.” If the account holder does not respond immediately, the broker liquidates the account holder’s futures position at the prevailing market price and returns to the holder any excess collateral. At the end of each trading day, all accounts are “marked to market” based on that day’s settlement prices. That is, if today’s settlement price is higher than yesterday’s, money is transferred from the margin account of the short party to the exchange, and from the exchange to the margin account of the long party. If the contract settles lower, the margin balance is shifted via the exchange from the account of the long party to the account of the short party. \textit{See also} Zvi Bodie & Robert C. Merton, \textit{Finance} 361–63 (Prentice Hall 1993).


\item 64. \textit{See id.} For a fuller description of perpetual futures, \textit{see} Shiller, \textit{Macro Markets}, \textit{supra} note 32, at 42–46.


\item 66. \textit{See id.} (“Most people are unfamiliar with futures contracts and do not like to have to deal with margin requirements and margin calls.”).

\item 67. Although macro securities must be issued and redeemed only in pairs of “up macros” and “down macros,” following issuance, the two components of a pair may trade separately, at different prices. \textit{See id.} at 126–27.
\end{itemize}
The up macro would be designed so that its price moved up when the index moved up, and the down macro would be designed so that its price moved down when the index moved up.68 Each security would have a cash account that would be adjusted daily in accordance with the index, and each security would pay dividends, probably quarterly, equal to the interest on its cash account.69

Shiller provides the following helpful illustration. Assume that a pair of macro securities is issued for $100 each when the GDP index is scaled to equal 100. The purchase price of each of the up and down macros goes into its associated cash account. If the index moves to 102, the custodian moves $2 from the down macro cash account to the up macro cash account. Similarly, if the index falls to 97 (from 100), the custodian moves $3 from the up macro cash account to the down macro cash account.70 Each macro pays dividends equal to the interest on its cash account.71 Therefore, buying an up macro corresponds to a long position in the index, while buying a down macro corresponds to a short position in the index, plus the value of the down macro cash account balance.72 Importantly, transfers between cash accounts would take place daily (like daily marking to market of futures contracts), whereas the dividend payments would occur less frequently, presumably quarterly. The prices of macro securities would anticipate the index but would not track the index directly. Prices of macro securities thus would represent the present value of future claims on the underlying index. For instance, if most investors expected GDP to fall, the price of down macros would increase. Investors would value such claims differently, thereby facilitating trading.73

Macro markets hold a central place in Shiller’s new financial order. Without them, home equity and livelihood insurers and income-linked lenders could not adequately hedge their risks, and Shiller’s public-sector ideas would be harder to implement. It is therefore curious that in

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68. See id. at 126.
69. See id. at 127.
70. Note that after interest is paid, the total amount in the two cash accounts in this example always equals $200. See id.
71. See id.
72. See U.S. Patent No. 5,987,453 (issued Nov. 17, 1999) (providing helpful examples of how macro securities—or “proxy assets,” as they are called therein—would work).
his macro markets chapter—the longest chapter in Part III of NFO—Shiller dedicates only one short paragraph to a major potential problem: speculation. Shiller has written convincingly about the propensity of speculation to undermine the efficiency of securities markets and to thwart markets' risk management potential. If investors have a tendency to speculate in the stocks of corporations about which they know relatively little, it stands to reason that investors will speculate even more—with more deleterious long-term consequences—in securities based on items about which they (often mistakenly) think they know relatively more, such as incomes in their occupations and property values in their neighborhoods. Thus, in markets for securities based on income streams that are “close to home,” “noise trading” can be a serious problem. Similarly, the tendency toward “herd behavior” characteristic of speculative bubbles may be even more pronounced when investors can talk to their colleagues and neighbors about macro securities based on incomes or home values. Moreover, patriotic sentiment or national “triumphalism” following good events in one country or bad events in another may exacerbate speculation in macro securities based on GDP. Shiller emphasizes that efficient macro securities markets can provide a useful guidance function for people choosing occupations or neighborhoods, and for governments designing international agreements for risk control. However, people or governments looking to speculative markets for direction may be seriously misguided.

Another problem involves the integrity and reliability of the data underlying macro securities prices. The recent spate of corporate accounting scandals in the United States demonstrates that securities

74. See id. at 137.
75. See SHILLER, IRRATIONAL EXUBERANCE, supra note 2, at 203–07.
76. See id. at 203 (noting that very few people “feel the need to perform careful research on the long-term investment value of the aggregate stock market”).
78. See SHILLER, IRRATIONAL EXUBERANCE, supra note 2, at 148–68 (describing and documenting “herd behavior”).
79. See id. at 21–22, 228.
80. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 131–33, 178.
prices are only as good as the data on which they are based.\textsuperscript{81} Take the example of macro securities based on GDP. Shiller argues that GDP would be the most important income flow traded in macro markets because GDP is the broadest existing index of economic risk.\textsuperscript{82} Ideally, countries could hedge GDP risk via short sales in macro markets, or by purchasing "down macros" on their GDPs; gains from any decline in the country's GDP could be used to purchase a portfolio of long positions in the GDPs of other countries.\textsuperscript{83} However, so long as macro securities prices depend on GDP, countries may have a strategic interest in misrepresenting GDP. For example, countries with a short position in securities based on their GDPs could profit by shading GDP figures down. More specifically, individual political leaders—particularly in smaller countries with fewer economic freedoms—may have an incentive to skew GDP figures according to their personal holdings, or to force others to do so. Therefore, macro securities may engender corruption.

Even if securities prices are based on reliable GDP figures, the problem of "insider trading" remains.\textsuperscript{84} Politicians, government officials and corporate officers may have "material nonpublic information" regarding the direction of national incomes. Only adequate securities regulation can inhibit "insider trading" based on such information, but Shiller does not specify who would police macro markets.\textsuperscript{85} National securities regulators, like the United States Securities and Exchange Commission, probably do not have resources sufficient to monitor huge macro markets.\textsuperscript{86} By the same token, international securities regulators

\begin{itemize}
\item \textsuperscript{81} \textit{See generally} Alex Berenson, \textit{The Number: How the Drive for Quarterly Earnings Corrupted Wall Street and Corporate America} i–xxiv (Random House 2003).
\item \textsuperscript{82} \textit{See} Shiller, \textit{The New Financial Order}, \textit{supra} note 5, at 129.
\item \textsuperscript{83} \textit{See} id.
\item \textsuperscript{84} \textit{See} James D. Cox et al., \textit{Securities Regulation: Cases and Materials} 945 (3d ed. 2001) (defining "insider trading" as "a term of art referring generally to any unlawful trading by persons possessing material nonpublic information, whether or not the trader is truly a corporate 'insider'").
\item \textsuperscript{85} \textit{See} Shiller, \textit{The New Financial Order}, \textit{supra} note 5, at 175 (stating that "an international agency" could coordinate between countries but not identifying which agency).
\item \textsuperscript{86} \textit{See} Stephen Labaton, \textit{In Stormy Time, S.E.C. Is Facing Deeper Trouble}, N.Y. Times, Dec. 1, 2002 (reporting that officials close to the S.E.C. say that the enforcement staff lacks resources).
\end{itemize}
may face problems in terms of jurisdiction, coordination and enforcement.\textsuperscript{87}

Finally, Shiller may underestimate the public resistance to novel financial markets based on politically and emotionally charged events—swings in GDP, changes in occupational incomes and housing prices. We have a recent precedent. In summer 2003, the Pentagon's Defense Advanced Research Projects Agency (DARPA) tried to create a futures market in which investors could take small positions settled on the occurrence or non-occurrence of specified political events in the Middle East.\textsuperscript{88} Immediately, politicians and the news media framed the plan as a "betting parlor."\textsuperscript{89} Politicians sought to outdo one another in denunciation, and the plan was quickly "terminated."\textsuperscript{90} In a series of postmortems, some reputable economists concluded that the program

\begin{quote}
\textsuperscript{87} See generally Patricia A. McCoy, Musings on the Seeming Inevitability of Global Convergence in Banking Law, 7 CONN. INS. L.J. 433, 443 (2000).


\end{quote}
was a good economic idea stymied by bad press. At a minimum, the episode suggests that public relations could be as important as economics in selling macro markets to the investing public.

B. Information and Global Risk Information Databases

Information technology, Shiller argues, provides the critical infrastructure through which financial innovation can help enhance efficiency and mitigate gratuitous inequality. All of the ideas in NFO require vast amounts of financial information about individuals, organizations and assets, but that information does not exist today in a workable and reliable form. Accordingly, Shiller proposes the creation of global risk information databases to provide “finely detailed, continuously updated, widely available data on incomes and asset prices as well as aggregated data on these and other values relevant to the risks faced by individuals, organizations, corporations, and governments.”

GRIDs would be the product of joint public-private initiative. On the public side, governments would have two main roles. First, governments would have to establish a legal framework. Such a framework would include rules regarding permitted, prohibited and mandatory information on GRIDs, rules on enforcement of contracts settled based on GRIDs, and, importantly, rules regarding privacy of information on GRIDs and remedies for violations of privacy rules. Second, governments might have to subsidize the gathering of the information on GRIDs. Once governments have set standards and put in place the infrastructure for collecting the relevant information, private companies could develop competing systems for accessing and using

92. See Varian, supra note 91.
94. Id. at 189–90.
95. See id. at 191.
96. See id.
In addition, private firms could develop and refine the technology used to guard the information on GRIDs.

Shiller describes the range of information that may be collected on GRIDs and suggests some potential applications. GRIDs could store complete and current information on the incomes (and components and correlates of incomes) of individuals, families, corporations and governments. In this sense, GRIDs would simply expand the scope and application of information already provided, in the United States, to the Internal Revenue Service (in the case of individuals and corporations) and to the Securities and Exchange Commission (in the case of corporations).

At the government level, income information on GRIDs could be used to refine national income or GDP figures, and could be used to compute alternative definitions of national income.

As for applications, Shiller suggests that GRIDs could be integrated with the current tax system or with his proposed inequality insurance. Such integration, according to Shiller, would permit the tax system to become substantially more complicated without imposing additional compliance costs on taxpayers; the tax system could thereby function more effectively as a risk management device. Also, GRIDs could facilitate charitable giving and simplify estate planning.

Shiller notes in passing that the information gathered in GRIDs would be public goods, but does not elaborate on the point. Public goods have two main characteristics: non-rivalry of consumption and non-excludability of benefits. Non-rivalry of consumption means that consumption of the good by one person does not diminish the opportunities of others to consume the same good. Non-excludability of benefits means it is prohibitively costly to prevent people who have not

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97. See id. at 192 (explaining that GRIDs should be designed with a standard "data socket"—or protocol for accessing the data—so that private software designers could compete on product features that are important to end users. By analogy, all stereos made for use in the United States have the same type of plug to put into a power outlet, permitting stereo makers to compete on items more important to consumers, such as sound quality, features and appearance).

98. See id.

99. See id. at 193–94.

100. See id. at 194–98.

101. See id. at 194.

102. See infra Parts III.A and III.C.

103. See SHILLER, THE NEW FINANCIAL ORDER supra note 5, at 199–201.

104. See id. at 191.
paid for the good from consuming it." Provision of public goods by private firms would be subject to the free rider problem: most people would consume the good without paying for it. Thus, private firms would under-produce public goods. Where the market fails to provide valuable public goods, the government provides them or subsidizes their provision by a private firm—and charges the consumers via the tax system.

A common example is national defense. To evaluate the workability of GRIDs, a better example might be Coase’s lighthouse. In a classic study, Coase showed that lighthouse services in Britain and Wales were financed by tolls levied on ships and collected at ports by agents of Trinity House, the lighthouse authority. The government’s role was limited to the establishment and enforcement of property rights in lighthouses. The problems faced by Trinity House in enforcing lighthouse dues were no different than for private suppliers of goods and services to ship owners. By analogy, the information in GRIDs may be understood as a “lighthouse good.” The government would collect (or subsidize the collection of) the information, then, presumably, sell the raw data to database and index designers. One would expect these buyers to include the institutions that design and market risk management products to end users. Thus, the end users of the information would pay for it, and finance the initial information gathering.

The GRID idea seems to make economic sense. Yet in practice, the information gathering entailed in the proposal may encounter a big political hurdle: privacy. Shiller acknowledges the necessity of ensuring privacy of the information on the GRIDs and seems sanguine that statutes and technology can do the job. Other devices not mentioned

108. See id.
110. See id. at 191–92.
by Shiller—including the threat of common law remedies, contracts and norms—may be employed to protect private information on GRIDs.  

But even with layers of protections, human error remains. Witness the recent privacy fiasco at Jet Blue. Moreover, the conventional ex post remedies for negligence, breaches of contract and statutory violations may be insufficient to cabin the damage of a wrongful sharing of private information. More important than the actual threat of harm from privacy breaches is the subjective fear of breaches and resulting harm, especially where genetic information is concerned. Most people underestimate their individual risk of adverse events: to them, the immediate disutility of sharing private information may outweigh the uncertain and attenuated benefits of long-term risk management. Privacy advocates may exaggerate the likelihood of unauthorized sharing or the magnitude of the resulting harm, thereby exacerbating people’s distaste for sharing. Support for the necessary information gathering could be politically untenable, and without government intervention, the private information on which GRIDs are based could not be produced at the requisite scale.

C. Moral Hazard, Adverse Selection and Indexes

To understand how Shiller’s indexes would affect insurance markets, we need to review the operation of insurance markets. This section first describes the conventional explanation of the demand for insurance, then discusses moral hazard and adverse selection. Moral hazard may be described as the tendency of insureds to invest less in loss prevention as more of their losses are covered by insurance.
Adverse selection may be defined as "the proclivity for people of greater than average risk to purchase greater than average amounts of insurance."\textsuperscript{115} Shiller's proposed insurance products must contend with these issues. As this section argues, index-based settlement can go a long way toward eliminating moral hazard and adverse selection in certain insurance markets.\textsuperscript{116} As such, index-based settlement may well be the most significant innovation in NFO.

1. Insurance Demand

To determine whether people will demand livelihood and home equity insurance, we first need to understand why people demand any kind of insurance. The economic theory of insurance demand is a story of risk aversion: people prefer a lower certain income to a higher uncertain income.\textsuperscript{117} For example, consider long-term disability insurance. Assume A is self-employed, and makes $100,000 per year. A estimates that there is a 5% chance this year that because of injury or sickness, he will not be able to work; if he does not work he earns no income, and A has no income from other sources. Therefore, the expected monetary value (or more accurately, cost) of long term disability is $( -100,000 \times 0.05 ) + ( 0 \times 0.95 ) = -$5000. Assuming A is risk averse, he would prefer to pay an insurance premium of slightly more than $5,000 to avoid the risk of loss of his entire income.\textsuperscript{118}

The assumption that people are risk averse is based on the declining marginal utility of wealth: as wealth increases, the utility of incremental


\textsuperscript{116} In the interest of parsimony, this section analyzes the incentives created by settlement based entirely on an index. However, as noted above, certain of Shiller's proposals contemplate settlement based partially on an index and partially on individual experience. The greater the proportion of individual experience involved in settling policies, the greater the potential for moral hazard and adverse selection to undermine the workability of the proposals.

\textsuperscript{117} See COOTER & ULEN, supra note 106, at 49–50.

\textsuperscript{118} See id.
For example, an additional $1,000 will add more to one’s total utility if one’s wealth is $10,000 than if one’s wealth is $40,000. Since additional wealth is worth relatively more when wealth is lower, it follows that people would want to “ship” wealth from states of the world (i.e., personal economic circumstances) where wealth is high to states where it is low. Insurance may be understood as the vehicle by which wealth is shipped from high-wealth (and low utility) to low-wealth (and high utility) states of the world. Returning to A, in a no-accident, no-sickness state of the world, A’s wealth is high and the cost of the premium (in utility terms) is low. If A gets sick or is injured, A’s wealth falls, and the utility of the payout under the disability policy is quite high.

The economic theory of insurance demand predicts that any risk averse person will purchase full insurance so long as it is priced at the actuarially fair premium. In fact, the prediction is almost tautological: risk aversion may be defined as the insured’s willingness to purchase

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119. But see Matthew Rabin, Diminishing Marginal Utility of Wealth Cannot Explain Risk Aversion, in CHOICES, VALUES, AND FRAMES 202 (Daniel Kahneman & Amos Tversky, eds., 2000) (arguing that “economists often reach misleading conclusions by invoking expected-utility theory to explain substantial risk aversion in contexts in which the theory actually predicts virtual risk neutrality”).

120. Declining marginal utility of wealth usually is illustrated by a curve concave to the origin. See, e.g., COOTER & ULEN, supra note 106, at 47.


122. In the absence of market imperfections, the actuarially fair premium will be slightly in excess of the insured’s expected loss. See KENNETH S. ABRAHAM, DISTRIBUTING RISK: INSURANCE, LEGAL THEORY AND PUBLIC POLICY 11 (Yale Univ. Press 1986). In addition, premiums could contain a useful informational component: the prices of livelihood and home equity insurance premiums, which themselves would be closely related to indexes, could provide valuable information to people deciding which occupations to enter or where to buy a home. See Goran Skogh, The Transaction Cost Theory of Insurance: Contracting Impediments and Cost, 56 J. RISK & INS. 726, 727-28 (1989) (observing that an important function of insurance companies is to monitor and price risks, and therefore insurance premiums contain information regarding risk of loss and avoidance costs). Shiller observes that that the price of macro securities can send important signals about the underlying asset or income flow—jobs, home values, national income—but he does not make this point about insurance premiums. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 133.
full insurance at the actuarially fair premium.\textsuperscript{123} If insurance is underpriced, people may purchase too much insurance and not invest enough in loss prevention methods such as safety precautions or reduction of production or activity levels. If insurance is overpriced, people may purchase too little insurance and invest too much in loss prevention.\textsuperscript{124}

Of course, these predictions, and the economic theory of the demand for insurance, assume that individuals are fully rational, and can predict with reasonable accuracy their individual probability and magnitude of loss: a potential insured can only compare the premium to his expected loss if he knows his expected loss.\textsuperscript{125} However, individuals are not always fully rational. Research in the overlapping fields of cognitive psychology and behavioral economics suggests that at least in some contexts, individuals exhibit bounded rationality, bounded will power and bounded self-interest.\textsuperscript{126} People are overconfident and underestimate the probability that bad things will happen to them, especially when risks accumulate gradually over long periods of time; people’s choices often are strongly influenced by the way the choices are framed; and people are seriously limited in their ability to accurately estimate probabilities.\textsuperscript{127} Specifically, in the context of insurance

\begin{itemize}
\item \textsuperscript{124} See ABRAHAM, supra note 122, at 11–12. Paraphrasing Guido Calabresi’s famous formulation of the function of accident law, Abraham suggests that insurance law promotes efficiency whenever it is structured to help reduce the sum of the costs of insurance and loss prevention. Therefore, counterintuitive though it may seem, excessive investment in loss prevention sometimes can be inefficient. From an economic point of view, it is possible to be “too safe.” \textit{See id.}
\item \textsuperscript{125} See id.
\item \textsuperscript{126} See Christine Jolls et al., \textit{A Behavioral Approach to Law and Economics}, 50 STAN. L. REV. 1471, 1471 (1998).
\item \textsuperscript{127} See, e.g., JUDGMENTS UNDER UNCERTAINTY: HEURISTICS AND BIASES (Daniel Kahneman et al. eds., 1982); Jolls et al., supra note 126. Jolls and her coauthors “emphasize that these problems are not ones of insufficient information per se; they are ones of insufficient ability to process accurately the information one possesses insofar as that information bears on one’s own risks.” \textit{Id.} at 1542. This insight may call into question the famous aphorism of Louis Brandeis, that “[s]unlight is said to be the best of disinfectants; electric light the most efficient policeman.” LOUIS D. BRANDEIS, \textit{OTHER PEOPLE’S MONEY} 92 (Augustus M. Kelley Publishers, Reprints of Economic Classics, 1914 (1971)). More information may not yield more effective protection.
\end{itemize}
purchases, consumers' insurance decisions may be based on distorted perceptions of risk and alternative framings of premiums and benefits.\textsuperscript{128} For example, consumers will pay more for flight insurance when they can call to mind vivid images of airplane disasters.\textsuperscript{129} Likewise, consumers will pay more for a policy in which the deductible is added to the premium and returned (if unused) as a rebate than for an initially less expensive policy with a conventional deductible.\textsuperscript{130} The evidence would seem to suggest that even if insurance is priced according to objectively reasonable estimates of risk, the demand for insurance nonetheless may be skewed by pervasive cognitive distortions.\textsuperscript{131} In other words, people simply may not want to buy the new insurance products Shiller has in mind, even if in some sense these products would be good for them.

Shiller is well aware of all this. His chapter "The Science of Psychology Applied to Risk Management" covers a lot of territory in a few pages: the importance of framing, anchoring, loss aversion, the tendency to focus on small or unlikely risks and ignore large or likely ones, commitment, consistency, reciprocity, fairness and naming.\textsuperscript{132} The thrust of his psychology chapter is that people typically underestimate the risks they face. In particular, people underestimate risks that gather slowly and therefore lack the visibility of well-publicized disasters.\textsuperscript{133} In short, many of the psychological phenomena he describes would seem to undermine the demand for any of his new products such as livelihood or home equity insurance. Shiller recognizes this too: he notes that "[p]erhaps the biggest obstacle to effective risk management is psychological. The public does not see its biggest risks and tends to focus more often on inconsequential risks that seem to them more

\begin{footnotes}
\footnote{128. See Eric J. Johnson et al., \textit{Framing, Probability Distortions, and Insurance Decisions}, \textit{in} \textit{CHOICES, VALUES, AND FRAMES} 224 (Daniel Kahneman & Amos Tversky, eds., 2000).}
\footnote{129. See \textit{id.} at 228.}
\footnote{130. See \textit{id.} at 231–35. This demonstrates another well-documented phenomenon: loss aversion, or the tendency to place a higher value on a loss than on a gain of the same magnitude. See, \textit{e.g.}, Daniel Kahneman et al., \textit{Experimental Tests of the Endowment Effect and the Coase Theorem}, \textit{in} \textit{ADVANCES IN BEHAVIORAL ECONOMICS} 55, 71–72 (Colin F. Camerer et al. eds., 2004).}
\footnote{131. See SHILLER, \textit{THE NEW FINANCIAL ORDER}, \textit{supra} note 5, at 88–89.}
\footnote{132. Shiller's bestseller, \textit{IRRATIONAL EXUBERANCE}, \textit{supra} note 2, at 135–68.}
\footnote{133. See SHILLER, \textit{THE NEW FINANCIAL ORDER}, \textit{supra} note 5, at 87–89.}
\end{footnotes}
salient. Nonetheless, Shiller remains sanguine that research, experimentation, advocacy and appropriate framing can promote effective demand. Given the evidence he cites, his optimism seems to require additional explanation.

2. Moral Hazard

Index-based settlement realigns the incentives created by traditional insurance. In a traditional insurance contract, the insured retains some control over the insurable interest. For example, a farmer who insures his farm can, in theory, burn down the farm and collect the proceeds on his property-casualty policy. Of course, insurance companies recognize this problem and have developed devices to combat it, including deductibles, co-payments, claim verification, and experience and feature rating. Under index-based settlement with properly designed and updated indexes, however, the behavior of the insured has a very attenuated effect on the performance of the index. For example, in the case of livelihood insurance, an individual insured’s decision to shirk would lower her income, but because she was only a small participant in the labor market, it would not, by itself, have any effect on the index of labor market outcomes. Similarly, with home equity insurance, the insured’s decision to stint on maintenance would not, by itself, depress the index, which is calculated on a broad base such as all of the homes in a large neighborhood.

In this sense, purchasing a livelihood insurance or home equity insurance policy is analogous, in terms of incentive effects, to buying shares in a large corporation. Corporations are characterized by the oft-bemoaned separation of ownership and control: numerous dispersed shareholders have no effective way to monitor the day-to-day activities of managers. Even owners of a sizeable number of shares in a large corporation usually own only a small percentage of the equity. Thus

134. Id. at 269.
135. See id. at 222–27, 269–76.
136. Such an unfortunate eventuality is known in certain circles as a “friction fire”—so called because the fire is said to result from the friction caused by the insured rubbing the deed (or mortgage) against the insurance policy.
137. See ABRAHAM, supra note 122, at 2, 72.
138. See id. at 14–15, 61.
139. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 119.
agency costs, a species of transaction costs, remain an intractable problem facing corporations.140 Similarly, owners of livelihood or home equity insurance policies would have no effective control over the index on which their policies are settled. Owners of such insurance policies wishing to affect the index also would face insurmountable transaction costs.141

Paradoxically, however, in the insurance context, such transaction costs would be advantageous because they reduce moral hazard. For example, consider a homeowner with a home equity insurance policy. By stinting on maintenance, that homeowner will decrease the value of her own house but likely will not affect the index. Recognizing this in advance, the homeowner would have no incentive—at least no incentive created by the policy itself—to engage in activities adverse to the insurer's interests.142 In fact, there would literally be no such activities that the homeowner could undertake, because the insurance policy only covers declines in the neighborhood housing index, not declines in the price of the individual insured's house.

The incentives created by index-settled insurance also may be illustrated by an analogy to the economic theory of torts. Commentators have contended that the compensatory function of tort law should follow the insurance choices individuals would make in actuarially fair markets.143 In a sense, such commentators argue, torts should follow

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141. For example, in the livelihood insurance context, such costs might involve finding everyone who started in a given occupation and persuading them to shirk in their current occupation. In the home equity insurance context, such costs might involve locating all property owners whose houses make up the index and convincing them to cease maintenance on their houses, or convincing a large local employer to leave an area.


insurance. It can be shown that in terms of incentives, index-settled insurance will follow torts. The goal of the tort system is to get both parties—injurer and victim—to take the efficient level of care. That is, if the legal standard of care is set equal to the efficient level of care, the goal of the tort system is to get both parties to take the standard of care. A negligence rule accomplishes this by making each party responsible for 100 percent of the accident costs at the appropriate level of care. When the injurer takes less than the standard of care, the injurer is liable for 100 percent of the accident costs. When the injurer takes the standard of care, the victim becomes liable for 100 percent of the accident costs. Therefore, once the injurer takes the standard of care, the victim faces the full costs of precaution and any accident costs, and will trade those costs off optimally.

The incentives of the insured with index-based settlement may be analogized to the incentives of the victim under a negligence rule. An injurer who takes less than the standard of care is liable for all accident costs. Similarly, assuming settlement of an insurance contract based entirely on the index, the insurer is liable for any decline in the index. Note that the victim has effectively no control over the injurer’s investments in care, and the insured has effectively no control over the

144. What it means to take the efficient level of care varies with the context and the parties. Take the automobile context. For an automobile company, taking the efficient level of care may mean investing a certain amount in developing safety features. For an individual driver, taking the efficient level of care may simply entail wearing a seat belt. For a municipality, taking the efficient level of care may require the posting of signs or traffic lights at busy intersections.

145. Evidence suggests that the legal standard of care does in fact equal the efficient level. See COOTER & ULEN, supra note 106, at 313.

146. Decision makers can identify the efficient level of care when setting the legal standard using the famous “Hand Rule” developed by Judge Learned Hand in United States v. Carroll Towing Co., 159 F.2d 169 (2d Cir. 1947). The Hand rule states that an injurer is liable if the burden of adequate precautions (B) is less than the probability of the harm materializing (P) times the magnitude of the harm if it does materialize (L). So, the injurer is liable if \( B < PL \). Hand did not specify whether his variables refer to marginal values or total values. Assuming the former, the “marginal Hand rule” would state that the injurer is liable if the marginal cost of his or her precaution is less than the resulting marginal benefit. If an additional dollar of precaution would save more than a dollar of harm, the injurer is liable. At the standard of care, an additional dollar of precaution should save exactly one dollar of harm. Id. at 314.

147. Accident costs generally include the costs of precaution and the costs of harm.

148. See COOTER & ULEN, supra note 106, at 310.
index. Once the injurer takes the standard of care, the victim becomes liable for all accident costs. Similarly, above the index level the insurer makes no payout and the insured faces the marginal costs and benefits of any investment in the insured interest—for example, investments in effort at work or home maintenance. Therefore, just as a negligence rule gives victims the proper incentives to invest in precaution, index-based settlement of insurance contracts creates optimal incentives for investment.15

Moreover, both labor and housing markets may defy the usual supply and demand story. In both cases, falling prices may actually reduce demand because people fear further price declines. For example, when the "price" of labor, i.e., salaries, go down in a field, the field becomes less attractive and prices fall further. Similarly, when prices of houses fall in a neighborhood, demand also falls. An important function of livelihood insurance and home equity insurance would be to arrest these vicious cycles. Insuring incomes and home values would increase the demand for jobs and homes, respectively, and thereby reduce the risk of declining incomes or home values. If this supply-demand story is true, Shiller's new insurance products can have far-

149. Of course, in certain contexts, victims and insureds may have some effect on the injurer's precaution or the index level, respectively. For example, ex ante, potential tort victims can become consumer advocates or can lobby for stricter enforcement of various laws, such as consumer protection or vehicle and traffic statutes. Ex post, tort victims can boycott, more or less vocally, the products of tortfeasor corporations. Similarly, insureds can shirk at work or not invest in home maintenance. However, a collective action problem is likely to undermine any effort by dispersed groups to mount a coordinated effort to affect either the level of precaution or the index level. Cf. Kay Lehman Schlozman & John J. Tierney, Organized Interests and American Democracy 74-87, 111, 128, 387-89 (Harper Collins College Div. 1986) (noting that consumers, the most widely dispersed economic interest, remain underrepresented by lobbyists as compared to more concentrated economic interests).

150. See Robert J. Shiller & Alan N. Weiss, Moral Hazard in Home Equity Conversion, 28 REAL EST. ECON. 1 (2000) (demonstrating that under home equity insurance, as well as other forms of home equity conversion, the insured remains the marginal claimant for returns in excess of the applicable index); see also Nalebuff & Ayres, supra note 38, at 56 ("The advantage [of index-based settlement of home equity insurance contracts] is that it is clean and simple. You have every incentive to make your home worth as much as possible. If you sell your home for an extra dollar, you get to keep that dollar.").

151. See Nalebuff & Ayres, supra note 38, at 55-57.

reaching consequences. For example, to the extent that resegregation in neighborhoods is the result of a decline in expected property values, home equity insurance can enhance integration.\textsuperscript{153} Thus there could be an important public goods aspect to home equity insurance, which in turn might justify some government subsidization of companies, such as Case Shiller Weiss, Inc., working to create the necessary indexes.

3. Adverse Selection

Index-based settlement of insurance contracts also may help solve the adverse selection problem, assuming it really is a problem.\textsuperscript{154} First consider a market for livelihood insurance with settlement based on individual experience rather than an index. Assume there are 1,000 people in occupation A. Half are likely to shirk (the “Shirkers”), and half are likely to work hard (the “Workers”). Further assume that wages are responsive to effort, so shirking will result in $100 salary reduction if the Shirker is caught. Shirkers have a 60 percent chance of a salary reduction, and Workers have a 20 percent chance of salary reduction. Therefore, in any year, we expect a wage reductions of $30,000 for Shirkers (0.6 x 500 x $100) and $10,000 for Workers (0.2 x 500 x $100), or a total expected salary loss of $40,000 per year. Safejobs Insurance Co., the only livelihood insurer for occupation A (putting antitrust concerns to the side for the moment) must charge each employee in occupation A a $40 premium to cover expected payouts.

If (1) each employee in occupation A knows whether she is a Shirker or a Worker, (2) Safejobs cannot learn each individual’s type without prohibitive cost, and (3) Workers cannot credibly demonstrate their type, Safejobs will face an serious asymmetric information problem.\textsuperscript{155} If for regulatory or other reasons, Safejobs can only offer one livelihood policy, Safejobs will have to charge the “actuarially fair”

\textsuperscript{154} See Peter Siegelman, Adverse Selection in Insurance Markets: An Exaggerated Threat, 113 YALE L.J. (forthcoming 2004) [hereinafter, Siegelman, Adverse Selection].
\textsuperscript{155} The insurer here is in a position similar to the used car purchaser in George Akerlof’s classic article. See George A. Akerlof, The Market for ‘Lemons’: Quality, Uncertainty, and the Market Mechanism, 84 Q.J. ECON. 488 489–92 (1970).
premium of $40.\textsuperscript{156} A $40 premium will appear expensive to Workers, who expect to lose $20 in wages, and cheap for Shirkers, who expect to lose $60 in wages. Workers will not pay $40 to protect themselves against a $20 expected loss, and therefore will drop out of the insurance pool. Safejobs will be left charging $40 per person to a pool of Shirkers, who have an average expected loss of $60, and Safejobs will lose $20 per insured. Thus no "pooling equilibrium" is possible.\textsuperscript{157}

Alternatively, a "separating equilibrium" may be possible if regulations permit price discrimination in the livelihood insurance market.\textsuperscript{158} If Safejobs can charge a $60 premium for full coverage and a $20 premium for partial coverage, Shirkers will buy full coverage and Workers will buy partial coverage because for each individual, the premium will equal the expected loss.\textsuperscript{159} That is, offering a menu of contracts can force insureds to reveal their type, thereby violating assumptions (2) and (3) in the preceding paragraph. The information-forcing property of price discrimination by insurers solves to some degree the asymmetric information problem at the heart of adverse selection.\textsuperscript{160}

Like price discrimination, index-based settlement of insurance contracts can go a long way toward eliminating the adverse selection problem; Shiller alludes to this advantage but does not discuss it in

\textsuperscript{156} If the policy lost money, Safejobs would withdraw it; if it earned profits, a competitor would enter the market, offer an identical policy for a lower premium and steal the customers of Safejobs.


\textsuperscript{158} Kahan & Kamar write:

\textbf{[P]}rice discrimination occurs when a producer charges a higher price to consumers with a higher willingness to pay and a lower price to consumer with a lower willingness to pay. Products do not have to be identical in order for their sale to consumer at different prices to be discriminatory. What distinguishes price discrimination from regular price differences between products in competitive markets is that price discrimination is the sale of products by the same producer at prices that are in different ratios to the marginal costs of production. Marcel Kahan & Ehud Kamar, \textit{Price Discrimination in the Market for Corporate Law}, 86 CORNELL L. REV. 1205, 1215 (2001).

\textsuperscript{159} Assuming declining marginal utility of wealth, risk averse individuals—that is, most people—will buy insurance priced at the actuarially fair premium.

depth. Under conventional insurance, at a premium of $40, Shirkers (with an expected loss of $60) will buy the policy and Workers (with an expected loss of $20) will drop out of the pool. Under index-based settlement, the actuarially fair premium will remain $40, equal to the $40,000 expected decline in the income index divided by the 1,000 employees in occupation A.\textsuperscript{161} Shirkers still have an expected loss of $60, but the expected payout under index-based settlement is $40. Shirkers no longer have a $20 "arbitrage" profit at the $40 premium, but at that rate, they still can insure two-thirds of their expected loss. Assuming Shirkers are risk averse, and assuming no insurer offers a better policy, insurance at the actuarially fair premium is still a good buy for them. For Workers, the change from conventional to index-based settlement would not change incentives. Workers still have an expected loss of $20, so at a premium of $40, index-settled policies will be too expensive. Under this scenario, as in conventional insurance, the "bad risks" stay in the pool and the "good risks" drop out. But the crucial difference is that the index limits the liability of the insurance company. Settlement based on the index converts the "bad risks" into neutral risks: the actuarially fair premium covers the expected insurable loss for even the worst risks in the pool. Moreover, if the better risks are particularly risk averse, they may pay the actuarially fair premium even when it exceeds their expected loss—a kind of reverse adverse selection.\textsuperscript{162}

However, though the index may be a powerful tool against adverse selection at the individual level, insurers still may face macro-level adverse selection.\textsuperscript{163} Although livelihood and home equity insurance may be able to slow the decline of occupations and neighborhoods, even insurance cannot—and does not attempt to—thwart change altogether.\textsuperscript{164} Imagine that a new technology threatens the very existence of an entire occupational category. For example, a new fabricating technology

\textsuperscript{161} This assumes, for simplicity, that the presence of insurance does not affect the probability or distribution of loss. However, as we saw above, insurance for livelihoods and home values can decrease the probability of the insured event, and thus decrease the expected decline in the index.

\textsuperscript{162} See Peter Siegelman, Adverse Selection, supra note 154; see generally David Hemenway, Propitious Selection, 105 Q.J. ECON. 1063 (1990).

\textsuperscript{163} See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 124–30.

\textsuperscript{164} See id. at 135–38.
begins to eliminate all steelworker jobs.\textsuperscript{165} In such a situation, there may be no "good risks." Over a reasonably short time horizon, the probability of loss of each insured would approach 100 percent, and the magnitude of the loss would increase. If the steelworkers union knew of the impending decline in the industry but the insurer did not—perhaps an unrealistic assumption given the sophistication of many insurance companies—the steelworkers union, acting on behalf of members, could time livelihood insurance purchases to coincide with the decline. This would exacerbate the downward trend and create a problem of adverse selection with respect to time.\textsuperscript{166} A similar asymmetric information problem could distort the market if corporate purchasers, such as real estate investment trusts or development companies, can purchase home equity policies (Shiller does not address the point). Such companies likely would have information superior to the insurer regarding real estate price trends in an area,\textsuperscript{167} and would only purchase policies when and where they predict imminent price declines. To compensate, corporate policies might be settled on different, broader indexes than consumer policies. Similarly, insurers may be able to diversify away some of this "macro" adverse selection by covering a variety of uncorrelated sectors.\textsuperscript{168}

In sum, index-based settlement can help cure adverse selection at the individual level, but at the macro level, adverse selection may tempt insurers to exit the very markets where novel risk management products are needed most.

\begin{itemize}
\item[165.] The price of macro securities on the steelworkers' incomes may forecast the decline, assuming the market is efficient. See Shiller, The New Financial Order \textit{supra} note 5, at 133.
\item[166.] See Jack Hirshleifer, \textit{War Damages Insurance}, 35 Rev. Econ. & Stat. 144, 150–51 (1953) (proposing several techniques for resolving the problem of adverse selection with respect to time, including time-varying insurance premiums and a mandatory waiting period of six to twelve months between the time insurance is purchased and the time when it would take effect).
\item[167.] See Skogh, \textit{supra} note 122, at 727 (noting that large corporations often are larger and more diversified than the insurers to whom they sell risks).
\item[168.] For example, diversification of covered sectors has enabled many insurers to survive numerous asbestos-related lawsuits.
\end{itemize}
4. **Income-Linked Loans, Moral Hazard and Adverse Selection**

The market for income-linked loans would also have to contend with the problems of moral hazard and adverse selection.\(^{169}\) Here, as with the insurance products, the use of an income index to determine repayments would help solve the problems. First consider the range of possible repayment scenarios. When a borrower takes out an income-linked loan, there are eight potential outcomes.\(^{170}\) The index can go up or down. If the index goes up, the borrower’s income can go up more than, equal to or less than the index, or the borrower’s income can go down. If the index goes down, the borrower’s income can go up, or the borrower’s income can go down less than, equal to or more than the index. Borrowers with incomes above the index will face a lower effective interest rate than borrowers with incomes below the index. Borrowers with incomes at the index will face the target rate.

For example, recall A, our DNA scientist. A takes out a 30-year income-linked loan requiring her to pay the lender 5 percent of the index of incomes of DNA scientists for the life of the loan. During the first year of the loan, the index is at $50,000, and our scientist makes the average income in the field. She will have to pay interest that year of 5 percent of the index, or $2,500, which equals 5 percent of her income. Now consider Scientist B. B is also a DNA scientist and takes out a loan on the same terms as A. Fortunately for B, he is promoted and makes $75,000 that year. B will also have to pay interest of $2,500, but for B, this equals an effective annual interest rate of 3.33 percent of income. A third scientist, C, takes out the same loan as A and B. Unfortunately, C works at a university facing a budget crunch, and C’s salary during the year falls to $40,000. C also has to pay $2,500 in interest, but for C, this equals an interest rate of 6.25 percent of income.

Notice how the use of the index addresses the twin concerns of moral hazard and adverse selection.\(^{171}\) The borrower who takes out an indexed income-linked loan assumes the risk of declining income

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170. In the interest of isolating the incentive effects of an index, the following assumes loan repayments determined entirely by the index. Basing repayment in part on personal income, as Shiller contemplates, would complicate, but not change, the basic story. *See Shiller, The New Financial Order* supra note 5, at 141.
171. Shiller adumbrates the following points, but does not elaborate on them. *See id.* at 140.
relative to the index. In the example above, each scientist owed the lender $2,500 regardless of what happened to that scientist's income. No individual would be able to affect the performance of properly defined indexes, and therefore taking out an income-linked loan would not create an incentive to work less hard. On the contrary, as demonstrated by the lower effective interest rate paid by B, an income-linked loan could encourage people to work even harder.

As in the insurance market context, adverse selection here is closely related to moral hazard. We should not expect those who suspect their incomes will fall below the index to take out income-linked loans. Recall C from the example above. The index puts a floor on the amount of interest, in dollar terms, the borrower owes under an indexed income-linked loan. Therefore, at the individual level, only average or better than average credit risks should be attracted to income-linked loans. However, at the macro-level, lenders do retain the risk that an income index, i.e., an entire occupational category, will decline faster than expected. Lenders can diversify such risks away by lending to borrowers in a broad range of occupations. Alternatively, if macro markets for occupational incomes exist, lenders could, in theory, hedge their index risk in the macro markets.

In addition, there may be cognitive obstacles to the practicability of income-linked loans. Debtors may overestimate their ability to earn income in the future. This could have the same effect as adverse selection—a higher proportion of bad credit risks in the pool—without

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172. Conceivably, it is possible that in a small enough field, the members could get together—for example through a union meeting or at a conference—and agree to stop working, thereby depressing the value of the index and reducing their loan obligations. This is also a potential problem with home equity insurance; there the institution for collusion might be a homeowners association or a town legislature. However, such an eventuality is unlikely for a number of reasons. First, even in the smallest fields, the collective action problem and the related hurdle of obtaining credible commitments from colleagues likely would undermine such a scheme. Second, it is unlikely that people would sabotage all of their income to save on loan repayments or to collect livelihood insurance proceeds. Third, indexes probably could be designed to compensate for such strategic behavior by, for example, tying repayment terms in small fields to an index broader than the field itself. Fourth, such a stratagem could be defined in the loan agreement or the livelihood insurance policy as an event of default giving remedies to the lender or the insurance company.

173. Once again, this assumes wages are responsive to effort.

174. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 141-44.
debtors affirmatively selecting against lenders. Note that with loans, the index might not counter this "residual" adverse selection as effectively as in the insurance context. With loans, the borrower has the money until default; with insurance, the insurer has the money until the loss occurs. The lender has to get its money back whereas the insurer has to pay its money out, and, as they say, "possession is nine-tenths of the law." Also, borrowers would have to learn how income-linked loans work, how to compare the terms of various loans, and how such loans could be advantageous. Debtor education can play a crucial role in reducing financial hardship, as is evident from the inclusion of debtor education provisions in bankruptcy reform bills passed in 2001 by both houses of Congress.

D. Indexes and Law

Though Shiller does not address the idea at any length, indexes can have a profound effect on various legal doctrines. In this section, I use examples from the law of nuisance, contracts and takings to demonstrate the potential of indexes to enhance fairness and efficiency. The examples are intended to be illustrative rather than exhaustive; indexes have the potential to improve the operation of a variety of doctrines beyond those discussed here.

175. The three major consumer credit rating agencies—Equifax, Experian and TransUnion—may be able to contain this problem by revising their rating systems.

176. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 141-44.

One of the major obstacles that impedes bargaining between a polluter and nearby property owners is the collective action problem. Theory predicts that the cost of organizing and coordinating town residents is prohibitively high, and therefore residents will not present a unified front across the bargaining table from the polluter. Residents are relegated to the courts, where the usual remedy for nuisance is a damages award rather than an injunction. Shiller’s home equity insurance plan also can help solve the collective action problem. Imagine a pristine town. American Insurance Group, or AIG, opens a branch in the town and sells a home equity insurance policy to each of the town’s 90 households when the average home value according to the index is $100,000. Then American Electric Power, or AEP, moves in and opens a smoke-belching factory. Within a few months, the index has fallen to $60,000. AIG owes each household $40,000, a $3.6 million loss that AIG will not suffer gladly. AIG pays the losses, and any nuisance claims of the town residents are automatically assigned to AIG through a process known as subrogation. Thus instead of 90

179. See Gideon Parchomovsky & Peter Siegelman, Selling Mayberry: Communities and Individuals in Law and Economics, 92 CAL. L. REV. (forthcoming 2004); see also Boomer, 257 N.E.2d at 871 (stating that the amelioration of a public problem like air pollution “is likely to require massive public expenditure and to demand more than any local community can accomplish and to depend on regional and interstate controls”).
180. See, e.g., Boomer, 257 N.E.2d at 875 (awarding an injunction to residents near a polluting factory with the option in the factory owner to pay damages and have the injunction vacated). Damages are the usual remedy because in high transaction cost settings—such as most public nuisance situations— injunctive relief is predicted to cause holdout and collective action problems, and thereby thwart the efficient allocation of resources. By contrast, damages remedies effectively give the polluter a call option: the polluter can purchase the right to pollute if the value of polluting exceeds the price of the call.
181. See 4 JAMES WM. MOORE ET AL., MOORE’S FEDERAL PRACTICE § 17.11[3][a] (3d ed. 1999) (“Subrogation is an assignment by operation of law. When one party’s claim is fully subrogated to another party, the subrogor relinquishes all interest in the subrogated claim. By operation of law, the subrogee becomes the real party in interest.”). Subrogation most commonly occurs “in an action by an insurance company seeking reimbursement for its payment to the insured . . . .” Id. “An insurer which has paid the full loss suffered by the insured is subrogated to the insured’s entire claim and becomes the sole real party in interest.” Id. See also United States v. Aetna Cas. & Sur.
disparate and uncoordinated nuisance plaintiffs, there is now one. Further, that nuisance plaintiff is a large, wealthy corporation that has the same interest as the townspeople: to stop the pollution. The collective action problem is solved, and town residents get a check from the insurance company—the equivalent of what they would get from a nuisance suit, but without the legal hassles. In the process, the insurer may even get a reputational boost for opposing large corporate interests on the side of individuals. In effect, the index operates here like a clause in a conventional insurance contract excluding reductions in value caused by insufficient maintenance, and restricting coverage to value-reducing acts that are not the fault of the owner.

2. Contracts

Shiller's indexes also can help resolve the so-called "paradox of compensation" that affects many areas of private law. This may be illustrated with examples from contracts and takings. In contracts, the promisor must invest in performance. The promisor has optimal incentives to invest in performance when she fully internalizes the promisee's loss from breach. At the same time, the promisee must rely on the contract. The promisee internalizes the costs of performance when he receives no compensation for breach. Since compensation paid by the promisor for breach must equal compensation received by the promisee, contract law would seem incapable of providing efficient incentives. However, contract law has evolved at least two doctrines to resolve the paradox: expectation damages and liquidated damages. With expectation damages, promisees are only compensated for foreseeable reliance; excessive reliance remains uninsured. With liquidated damages, the contract stipulates an amount to be paid in case

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Co., 338 U.S. 366, 380–81 (1949) ("If the subrogee has paid an entire loss suffered by the insured, it is the only real party in interest and must sue in its own name.").


183. See id. at 246.


of breach; the promisor is only liable for the liquidated damages, while the promisee is liable for his actual damages.\(^\text{186}\) Therefore, both expectation damages and liquidated damages are said to be invariant with respect to reliance: under both, damages are based on some measure external to the promisee's reliance.\(^\text{187}\)

Shiller's indexes could be used in conjunction with these devices to create efficient incentives for performance. In calculating expectation damages, courts can look to the index to determine what reliance is "foreseeable" in a particular context. For example, imagine A is a builder who contracts with B to build a store by the first of January. Suppose A fails to complete the store by the first of January as promised, and B has to rent temporary space elsewhere. The court may consider it foreseeable that if A failed to finish on time, B would have to rent alternative space; the court might award damages based on the additional rent. But what's stopping B from renting luxury space and thereby increasing his damages? An index of rental prices for retail space in the area could be a useful reference for the court in determining whether B's actual rent equals the foreseeable rent. Alternatively, the contract between A and B could have specified liquidated damages in terms of the index. For example, the contract could have stipulated that for each day the store remained uncompleted past the first of January, A would have to pay B liquidated damages of, say, 3 percent of the index of monthly retail rental prices.

Similarly, indexes can enhance the precision of the common law duty to mitigate damages for breach of contract.\(^\text{188}\) The usual remedy for breach of contract is expectation damages. The goal of expectation damages is to give the non-breaching party the benefit of her bargain, that is, to put her in the financial position she would have been in had the contract been performed according to its terms (as construed by the court).\(^\text{189}\) However, the non-breaching party has a competing duty to mitigate her damages. The non-breaching party cannot recover damages for losses that, with reasonable effort, she could have avoided once she


\(^{188}\) See CHIRELSTEIN, supra note 184, at 147.

\(^{189}\) See id. at 142.
became aware of the breach. In effect, the plaintiff's damages are offset by the value of any mitigating contract.

By analogy, for the insurance products proposed by Shiller, the index operates like a mitigation requirement, reducing or eliminating altogether the proceeds the insured would collect if the policy were settled based on individual experience. In the example above, imagine that A fails to complete the project by the first of January, and the court decides to award damages based on B's additional rent. B rents luxury space for $5,000 per month, but the index of retail real estate rental prices is at $3,500 per month. This suggests that with reasonable effort, B could have rented sufficient space for $3,500 per month. B's damages will be restricted to the index amount, and the excess $1,500 per month in rent will remain "uninsured."

3. Takings

Takings also demonstrate the paradox of compensation. If the government compensates property owners for all takings—more precisely, if government actions that arguably are regulations are instead characterized as compensable takings—owners have an incentive to make excessive improvements. In effect, owners will be reimbursed for any expenditures, a kind of moral hazard. On the other hand, if government pays no compensation for takings, the government has an incentive to overregulate private property. In the takings setting, the

190. See id. at 147 ("In effect, the injured party is under a legal obligation to take (or else be presumed to have taken) reasonable steps to avoid waste and minimize the cost of breach."); Charles J. Goetz & Robert E. Scott, The Mitigation Principle: Toward a General Theory of Contractual Obligation, 69 VA. L. REV. 967, 967 (1983) ("The duty to mitigate is a universally accepted principle of contract law requiring that each party exert reasonable efforts to minimize losses whenever intervening events impede contractual objectives.").

191. Similar "offset" principles operate in the field of tort law. For example, the related doctrines of contributory negligence, comparative negligence and assumption of risk all reflect the idea that even if the defendant's actions have caused harm to the plaintiff, the defendant need not compensate the plaintiff to the extent that the plaintiff's own actions were a contributing cause of her injury. See COMMERCIAL DAMAGES A GUIDE TO REMEDIES IN BUSINESS LITIGATION § 4.02 (Charles L. Knapp ed. 2004).


paradox of compensation is resolved when the government buys an option from the property owner. The government can trigger a taking at any time within the option period, and "just compensation" will be the price specified in the option contract. The property owner bears the loss of any improvements in excess of the option price.194

An index of real estate prices can create incentives similar to an option. Suppose courts adopted a rule whereby just compensation would be determined by reference to an index of real estate prices in an area. Assuming the index was properly constructed, no individual property owner would be able to affect the value of the index, and so the property owner would have no incentive toward excessive improvements in anticipation of a taking.

A related point is that index-settlement of home equity insurance could mitigate the unfairness of "derivative takings." A derivative taking is present whenever a physical or regulatory taking diminishes the value of surrounding property.195 Owners of taken property are compensated for the taking while owners of surrounding properties are not compensated for the reduction in property values caused by the taking.196 The decrease in surrounding property values, while not compensated by the government, nonetheless would depress the index of real estate prices. The decline in the index would trigger payouts to surrounding property owners under home equity policies. In effect, home equity insurance settled on an index would enable the government to externalize on insurance companies the costs of derivative takings.197

194. See Cooter, supra note 187, at 22.
196. See id. at 280.
197. Efficiency requires the government to internalize all the costs of takings. Id. Thus while home equity insurance could mitigate the inequity of derivative takings, it would offer less of a corrective to the inefficiency of derivative takings.
As in the nuisance context, an insurer probably is better equipped than a group of dispersed property owners to oppose an inefficient taking. However, a cautionary note is in order. At least two factors suggest that calculating just compensation by reference to an index of real estate prices might lead to systematic undercompensation of victims of takings (or derivative takings). First, an index of fair market values likely would not capture idiosyncratic private valuations or the subjective value property owners derive from living in a close-knit community. The second is loss aversion, or the tendency of people to be hurt more by losses than helped by gains of the same magnitude. The subjective value of homes to their owners may be higher than the fair market value of their homes as measured by the index. On the other hand, index-based compensation may be an improvement over the present system.

198. On a related note, William Fischel has analogized zoning to insurance, arguing that zoning is the “insurance mechanism” by which property holders protect the value of their homes. See William A. Fischel, The Homevoter Hypothesis: How Home Values Influence Local Government Taxation, School Finance, and Land-Use Policies 9-11 (2001). However, zoning can only provide limited “insurance coverage.” For example, if the Federal Government decided to construct an Interstate through a neighborhood, a local zoning board could not do very much to overturn the decision. By contrast, index-settled home equity insurance would, in theory, compensate owners whose property values are decreased by proximity to the Interstate. Thus, as compared to zoning, index-settled home equity insurance may offer more comprehensive insurance against derivative takings.

199. See Parchomovsky & Siegelman, supra note 179.

200. See id.

201. See ADVANCES IN BEHAVIORAL ECONOMICS 5 (Colin F. Camerer et al. eds., 2004) (“[W]e suffer more... when we fall from a better to a worse situation, than we ever when we rise from a worse to a better.” (quoting Adam Smith, The Theory of Moral Sentiments 311 (Bell 1892) (1759)).

202. See William A. Fischel, The Offer/Ask Disparity and Just Compensation for Takings: A Constitutional Choice Perspective, 15 INT’L REV. L. & ECON. 187, 193 (1995) (observing that the writers and ratifiers of state constitutions were aware, as property owners themselves, that paying market value for property taken by eminent domain would undercompensate owners). Nonetheless, lawmakers restricted compensation for takings to market value because paying above-market compensation would require forgoing certain public works, and increasing taxes to pay the asking price might itself entail a taking.
E. Implementing the Ideas

Shiller, in NFO, claims to approach risk management from behind a Rawlsian "veil of ignorance." That is, NFO sets out to address the question: if people did not know their "class position or social status," their "fortune in the distribution of natural assets and abilities," their "intelligence," or their "strength," what risk management system would they choose? Shiller’s answer consists in a dramatic expansion of the risk management products available for private purchase. However, given human decision-making errors confirmed in scores of experiments, and accepting that the risks identified by Shiller are serious and real, I think merely expanding the array of offerings may not go far enough. From behind the veil of ignorance, people might in fact welcome certain inroads on freedom of choice.

An emerging strain of scholarship offers a means of reconciling intervention in individual choices with a concern for autonomy. The idea, known variously as “asymmetric paternalism” or “libertarian paternalism,” suggests that planners (government or private) can increase social welfare by setting default rules that create benefits for those who make errors but impose little or no harm on those who are fully rational. For example, in retirement savings, the current default rule is that workers contribute nothing to their 401(k) plans unless they affirmatively elect to participate. If the default rule is changed so that workers are assumed to contribute unless they affirmatively choose not to, contributions increase dramatically. Such a plan creates benefits for those who fail to save while imposing minimal costs on those who allocate earnings to current consumption.

206. See Sunstein & Thaler, supra note 205, at 1159–60.
207. See Camerer et al., supra note 205, at 1227–28 (discussing the perception among policy makers that people are not saving enough for retirement and noting that participation in retirement savings plans is significantly higher when the default option is automatic enrollment).
Asymmetric or libertarian paternalism can help put Shiller’s private sector ideas into practice.\textsuperscript{208} For instance, the default could be set to require employees to “purchase” a certain amount of livelihood insurance,\textsuperscript{209} and to allocate any income contributed to 401(k) plans to a diversified portfolio of macro securities. Similarly, banks can require mortgagors to take out home equity insurance, just as they currently require certain mortgagors to take out private mortgage insurance.\textsuperscript{210} And the default personal loan can be linked to income. In each case, individuals could choose to opt out. Planners can change the likelihood of opt out by altering the associated cost; requiring a little more paperwork likely would yield a lot less opt out. The asymmetric/libertarian paternalist approach to the new financial order has the following advantage: consumers who do not understand the products but would benefit from them will, while consumers who do understand the products but choose not to purchase them incur only the minimal costs of opting out.\textsuperscript{211}

III. PUBLIC SECTOR IDEAS

This section describes and critiques Shiller’s public sector ideas. I first describe and critique Shiller’s domestic policy proposals—his proposals for reform of the tax, social security and money systems. I then describe and critique his foreign policy proposal. Overall, Shiller’s private sector ideas seem better-developed and more practicable than his public sector ideas. While the private sector ideas have to contend with

\textsuperscript{208} This assumes, of course, that Shiller intends his ideas to be put into practice. However, it is also possible to understand NFO not as a blueprint for change, but as a work of theory concerned with pointing policy makers in the right direction rather than implementation. I think the better reading is that NFO evinces a serious commitment to practical change; as such, the book demands and deserves an assessment of its real-world practicability.


\textsuperscript{210} See NALEBUFF & AYRES, supra note 38, at 54–56 (explaining why banks will require some borrowers to take out private mortgage insurance and describing the risks of the housing market).

\textsuperscript{211} See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 139–42.
market forces—and seem to do so in novel and often ingenious ways—the public sector ideas have to deal with complicated political variables that can scuttle even the best economic policies. A discussion of politics and institutions seems like a necessary supplement to Shiller’s public sector proposals, but NFO omits any such discussion.

A. Inequality Insurance and the Tax Code

What Shiller calls “inequality insurance” is in fact a proposal to overhaul the tax system to lock in a legislated level of income inequality. Under the current U.S. tax system, Congress sets the marginal tax rates and tax brackets. Congress delegates to the Treasury Department and Internal Revenue Service the authority to administer and enforce the provisions of the Internal Revenue Code. Shiller proposes that instead of legislating marginal tax rates and tax brackets, Congress could legislate the total amount of taxes raised and a target level of after-tax income inequality.

To explain inequality insurance, Shiller first illustrates his concept of inequality by describing (verbally) a Lorenz curve (so named after its developer, Max O. Lorenz). The Lorenz curve is a graph that shows the percentage of national income received by percentage of households. The percentage of households is plotted on the horizontal axis and the percentage of income is plotted on the vertical axis. Thus, the Lorenz curve demonstrates graphically a statement such as “the bottom 50

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212. See id. at 149 (“The idea for inequality insurance presented here is that government should set by legislation the level of income inequality . . . and create a tax system that prevents inequality from getting worse.”).


214. See DAVID M. HUDSON & STEVEN A. LIND, FEDERAL INCOME TAXATION 29 (7th ed. West 1998) (“The Treasury Department is the executive agency which has the authority and responsibility to administer and enforce the provisions of the [Internal Revenue] Code, and it is generally the Internal Revenue Service [the I.R.S.] within the Treasury Department which deals with the income tax.”); see also Administrative Procedure Act, 5 U.S.C. § 559 (2003).

215. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 149–50 (explaining how the inequality insurance payments would be calculated, distinguishing the system of taxing according to a rate schedule from a system that would define a total dollar amount to be raised).

216. The inclusion of some graphs in NFO may have clarified an often technical discussion.
percent of households receive 20 percent of national income.”

In a perfectly equal society, 10 percent of households would have 10 percent of income, 50 percent of households would have 50 percent of income, and so on. Such a state of affairs would be depicted as a straight Lorenz “curve” with a slope of one: at every point along the curve, the percentage of households would equal the percentage of national income received by that percentage of households. This straight line is aptly called the “line of perfect equality.” Any inequality would cause the Lorenz curve to sag below the line of perfect equality. The greater the “sag,” the more inequality. This sag is measured by the Gini coefficient (so named after its developer, the Italian statistician Corrado Gini), which is the ratio of the area between the line of perfect equality and the Lorenz curve to the entire area (the triangle) under the line of perfect equality.

Under a system of inequality insurance, Congress would legislate a target Lorenz curve, from which a target Gini coefficient could be derived. Congress would delegate to the Treasury Department, the duty to calculate the tax liability of each household so that the actual after-tax Lorenz curve matched the legislated target.

The process used by the IRS annually to recalculate the tax liability of each household might be envisioned as “a gigantic spreadsheet with millions of rows.” Column A would list the pre-tax income of every household in the country, sorted from lowest at the top to highest at the

219. In other words, if the area between the line of perfect equality and Lorenz curve is A, and the area underneath the Lorenz curve is B, the Gini coefficient is A/(A+B). This is often expressed as a percentage. See ScienceDaily, Gini Coefficient, at http://www.sciencedaily.com/encyclopedia/Gini_coefficient (last visited Dec. 11, 2003) (quoting Wikipedia The Free Encyclopedia, Gini Coefficient, at http://en.wikipedia.org/wiki/Gini_coefficient (last visited Mar. 10, 2004)).
220. Note that while the target Gini coefficient would measure total inequality, the target Lorenz curve would define both total inequality and the specific distribution of income.
222. See id. at 151.
bottom. The sum of these incomes would be the national income. Total
taxes would be subtracted from total national income to yield after-tax
national income. Column B would allocate this after-tax national
income according to a formula: each household would receive an
amount equal to the total after-tax national income multiplied by the
difference between its percentile on the target Lorenz curve and the
percentile on the target Lorenz curve of the preceding household in
Column A.223 Column C would show each household’s total tax liability,
equal to Column A minus Column B. Column C would constitute that
year’s tax schedule, and would replace the marginal tax rates and tax
brackets currently found in Section One of the Internal Revenue Code.224
The process would be repeated annually.225

Shiller also contemplates variations on the basic idea. A plan of
inequality insurance could take account of government transfers and
other taxes, as well as demographic changes and medical
expenses.226 To effect its equitable goals, the animating legislation could permit the
distribution of income to become more equal.227 Similarly, to counter
any disincentive effects of high effective marginal tax rates, an upper
limit can be imposed on such rates.228 Finally, to prevent the timing of
income from having a distortionary impact on lifetime taxes and saving,
inequality insurance could take the form of a tax on consumption as
opposed to income.229

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223. For illustration, consider the unrealistic situation in which gross national
income is $10,000,000, and Congress decides to take a quarter in taxes, so after tax
national income is $7,500,000. Household X is in the 48th percentile of income, and
the preceding household (in Column A of the hypothetical spreadsheet) is in the 47th
percentile. Household X would have after tax income of 1% of $7,500,000, or $75,000.
225. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 151.
226. See id. at 153.
227. See id. at 153–54 (explaining how Congress could “legislate that the income
distribution is allowed to become more equal . . . in accordance with basic standards of
fairness and incentives”).
228. See id. at 153, 160–62.
229. See id. at 154; see also JOEL SLEMROD & JON BAKIJA, TAXING OURSELVES: A
CITIZEN’S GUIDE TO THE GREAT DEBATE OVER TAX REFORM 172 (2d ed. MIT Press
2000) (“The key distinction between an income tax and a consumption tax is that
income taxes have a negative impact on the incentive to save, whereas consumption
taxes do not.”).
Shiller stresses that his idea of inequality insurance is based in "concepts of human psychology rather than in pure economic or political theory."²³⁰ He predicts that calling the proposal "insurance" rather than a "tax" should make it more palatable to more people.²³¹

B. Intergenerational Social Security

The proportion of retirees to non-retired workers is poised to increase dramatically in the coming decades, threatening the viability of social security systems worldwide.²³² Numerous factors are contributing to the "old age crisis." The "baby boom" of the late 1940s, the introduction of the birth control pill in the 1960s (which lowered birth rates), increasing life expectancies, and the structure and capitalization of social security systems.²³³ The "pay-as-you-go" social security system used by the United States and many other countries is not sustainable at current contribution and benefits rates.²³⁴ Various reform proposals have attempted to circumvent the politically unpalatable

²³¹ See id. at 155–56.
²³² See id. at 165 ("Either the relatively small number of the younger people who are still of working age will take on a large burden of caring for these elderly, or many of these elderly will be facing a miserable existence.").
²³³ World Bank, Averting the Old Age Crisis (Oxford Univ. Press) (1994) (noting that in 1990, there were five hundred million people in the world over the age of sixty and by 2030 there will be 1.4 billion).
²³⁴ Under the U.S. "pay-as-you-go" system, employees pay (or "contribute") a social security tax of 6.2 percent of income up to $84,900 (in 2002), and employers pay a social security tax of 6.2 percent of the income of each of their employees up to the same maximum. See Shiller, The New Financial Order, supra note 5, at 166–67. Retiree benefits are calculated according to a formula whose only inputs include age at retirement and average indexed monthly earnings. Benefits are indexed to the Consumer Price Index, so inflation does not erode the real buying power of benefits. In any year, the contributions collected are paid directly as benefits to current retirees. Contribution and benefits formulas are designed so that contributions roughly equal benefits. The Social Security Trust Fund has been set up to compensate for any discrepancy between contributions and benefits. However, the Trust Fund does not contain assets sufficient to fund all Social Security liabilities. See id.; see also Sylvester J. Schieber & John B. Shoven, The Real Deal: The History and Future of Social Security 388. (Yale Univ. Press 1999). ("Even with the optimistic projections of [the 1983 Social Security Amendments], the reformed system would run large deficits, beginning with the second decade of the twenty-first century.").
options of cutting benefits or increasing contributions (i.e., raising taxes). The most prominent reform proposals would allow (or require) workers to invest all or part of their contributions in individual accounts which the account holder could invest in stocks, bonds, or other instruments. Shiller derides individual account proposals as fiscally irresponsible, and instead proposes what he calls "intergenerational social security."

He observes that the family has been the traditional institution for sharing risks among generations, permitting flexibility in response to changing income needs. However, relying exclusively on the family for intergenerational risk sharing provides only limited risk spreading, and introduces the risk of family instability. Intergenerational social security would preserve the flexibility of the family and spread intergenerational income risk to all of society.

Whereas the current system transfers all of the income risk of retirees to workers and their dependents, intergenerational social security would allocate available labor income among workers and retirees according to a more equitable standard. Under one simplified scheme, each working person would "contribute" to social security a percentage of her annual income (after other taxes) equal to the percentage of current retirees in the population. Currently, about 11

235. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 168.
237. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 173 ("Those who advocate these individual accounts appear to have drawn the wrong lessons from modern finance.").
238. See id. at 170–72.
239. See id.
240. Thus social security, as presently constituted, would appear to be plagued by a moral hazard problem. Recognizing this, the designers of the current system have built in certain devices for mitigating moral hazard. For example, social security benefits are offset in many instances by income from other sources. Such offsets may be viewed as analogues to the deductibles and co-insurance schemes used by private insurance companies to combat moral hazard. See ABRAHAM, supra note 122, at 2 ("A deductible provision specifies a sum to be deducted from the amount an insurer would otherwise be obligated to pay the insured; a coinsurance provision specifies the percentage of a loss an insurer must pay the insured.").
241. See SHILLER, IRRATIONAL EXUBERANCE, supra note 2, at 170.
242. See id. at 169.
percent of the United States population is retired, so under this system, each worker would pay a social security tax of 11 percent of income. Retirees would receive a benefit proportional to their average indexed earnings during their working years.

C. Revamping Tax and Social Security?

Shiller proposes major overhauls of two of the largest institutions in the United States and other countries—tax and social security—yet does not accompany his proposals with any theory of legislation. Can his proposals pass muster under any plausible understanding of the political process?

In an influential book, Farber and Frickey concluded that "[o]ur best picture of the political process . . . is a mixed model in which constituent interest, special interest groups, and ideology all help to determine legislative conduct." In a trenchant study of tax legislation in the 1980s, David Shaviro added a fourth category, closely related to constituent interest and ideology: legislator self-interest. Shaviro concluded that legislation provides a language by which legislators communicate symbolically with members of the general public, and offers a means of increasing their personal prestige. Legislation therefore promotes reelection; any real-world effects are incidental to legislators' self-interest.

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243. See id.

244. For example, imagine (unrealistically) that 2004 social security contributions totaled $10,000,000 and that the averaged indexed monthly earnings of X, a retiree, constituted 0.01% of the total average indexed monthly earnings of all current retirees. X would receive social security benefits for 2004 of $1,000.

245. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 4 (commenting that "[a] major role of advocacy must fall to our governmental leaders" but making no recommendations of specific steps those leaders should take).


248. See Shaviro, supra note 247, at 8.

249. See id. at 8–10.
Constituent interest in Shiller's tax and social security plans would depend, of course, on the preferences of the constituency as understood by legislators. This tautology does not help us determine the two plans' likelihood of political success. In any case, Kenneth Arrow famously proved that in general, individual preferences cannot reliably be combined into a coherent societal preference. The "public interest" is not "out there" to be discovered, though legislation still can claim to represent the public interest when certain standards of fairness and stability are met.

The interest group theory argues against the likelihood of passage of Shiller's ideas. The brunt of the inequality insurance burden threatens to fall on those with relatively more political clout—those with more to lose, in money terms, and hence more willing to spend on organizing to oppose the legislation. Intergenerational social security would shift a portion of the income risk to retirees, whereas under the current system retirees face no income risk (though they do face systemic risk—the chance that the system will become insolvent). Retirees have an organized interest group—the AARP—whereas the broad and diffuse group of non-retired workers has no such group. Moreover, currently non-retired workers ultimately will retire; even in the presence of "hyperbolic discounting," workers may be disinclined to support a program that helps them today but will hurt them tomorrow. Therefore, one can expect coordinated opposition to intergenerational social security.

251. See Farber & Frickey, supra note 246, at 58–59.
252. See id. at 19–20 ("The activities of organized interests build into the American political system a minoritarian counterweight to some of its more majoritarian tendencies," and "the minorities thus benefited...are disproportionately but not uniformly affluent ones.") (citing K. Schlozman and J. Tierney, Organized Interests and American Democracy (1986)).
254. Hyperbolic discounting refers to the tendency to discount the future at an unreasonably high rate. Under hyperbolic discounting, even a substantial sum to be received a few years from now is essentially worthless today. See George Loewenstein & Richard Thaler, Intertemporal Choice, in The Winner's Curse: Paradoxes and Anomalies of Economic Life 92–106 (Richard Thaler ed., Princeton Univ. Press 1992).
As for ideology, it may be assumed that quite a few members of Congress are concerned with inequality, and would in theory like to do something to limit wealth disparities. Similarly, it is safe to assume that no member of Congress would like to see Social Security go bankrupt. However, these ideological concerns may be trumped by the factor identified by Shaviro: legislator self-interest.\textsuperscript{255} Would any self-interested politician purposefully alienate better-off voters or the growing ranks of retirees? Probably not, despite ideological predilections.

In sum, the political process often can obstruct even the best economic ideas.\textsuperscript{256} For Shiller's tax and social security proposals, politics may prove an insurmountable hurdle, especially when the substantial costs of switching to new systems are considered. Incremental improvements may prove a more practicable means to similar ends. For example, use of the earned income tax credit can be expanded to reduce inequality. Similarly, individual accounts with a default allocation to a portfolio of macro securities (with a right to opt out of the allocation) may offer a way for the ideas in NFO to supplement, rather than supplant, social security reform proposals that already have some political traction.

Cognitive theory suggests another criticism of Shiller's tax and social security ideas.\textsuperscript{257} Shiller takes for granted that Congress would be able to legislate a "target" level of inequality. Similarly, Shiller assumes that Congress could legislate a sliding scale whereby social security contributions change with the percentage of retirees in the population. However, the target rate and the annual percentage likely would become salient in the public imagination, just as the top marginal income tax rate

\textsuperscript{255} See Shaviro, supra note 247, at 9 ("[S]ucceeding legislatively is a means of exercising and demonstrating one’s power. It is inherently gratifying (as when an emperor enjoys seeing statues of himself), and it increases one’s prestige and status in political circles. Thus, without regard to its actual effects, legislation can promote self-interested goals apart from reelection.”).

\textsuperscript{256} See Jack Hirshleifer & J. W. Milliman, Urban Water Supply: A Second Look, 57 AMER. ECON. REV. 169, 178 (1967) (“The agenda for economists, at this point, should place a lower priority upon the further refinement of advice for those efficient and selfless administrators who may exist in never-never land. Rather, it should focus on devising institutions whereby fallible and imperfect administrators may be forced to learn from error.”).

\textsuperscript{257} See McCaffery, supra note 209, at 408.
is particularly prominent under the current revenue code. The rate and the percentage might become proxies for the underlying ideas, thereby obscuring the merits of the plans and diverting attention from the issues of equality and shared risk. In addition, even if it were possible, "locking in" the current level of inequality—or any level of inequality—might be inconsistent with the notion of social mobility fundamental to our political culture.

Under both proposals, substantial opposition could develop if rates became too high. This could happen if inequality worsens or if many people retire. For the tax plan, Shiller notes that marginal rates might be capped. But capping rates would undermine the very redistributive purpose of the plan. For social security, high contribution rates could engender resentment against retirees. Moreover, the tax burden imposed by both plans would be cumulative. While retirees and the least well-off taxpayers could benefit, others could wind up paying a majority of their incomes in tax, at marginal rates well above the "Maginot Line" thought to exist at a rate of 40 percent. Finally, the proposal aims to effectuate Shiller’s concept of vertical equity—how the tax burden should be distributed among people of different levels of wealth—but does not address horizontal equity, or whether there may be justifiable grounds for assigning different tax liabilities to people of equal wealth.

258. *See id.* ("[T]he nominal income tax rate structure set out in Section 1 of the Internal Revenue Code and well publicized in the financial and general press, especially when Congress changes it, is particularly prominent. More specifically, the single highest rate bracket is socially prominent, whereas each person’s individual highest bracket is individually prominent.").

259. Under Shiller’s inequality insurance plan, relative wealth will remain the same only within the jurisdiction of the tax. However, relative standing between the inequality insurance jurisdiction and other tax jurisdictions could change. *See ROBERT FRANK, CHOOSING THE RIGHT POND: HUMAN BEHAVIOR AND THE QUEST FOR STATUS* 34–38 (Oxford Univ. Press 1985) (discussing the importance of relative standing in subjective perceptions of wealth).

260. *See SHILLER, THE NEW FINANCIAL ORDER, supra* note 5, at 161 ("People may react with anger and a sense of injustice if forced to give most of the income they earn above a certain level to the government.").

261. *See McCaffrey, supra* note 209, at 416. This may engender more “tax planning,” off-shore incorporation and similar efforts to circumvent the reach of the IRS.

262. *See SLEMROD & BAKUA, supra* note 229, at 51–84 (describing vertical and horizontal equity). In any case, determining the relative fairness of different tax systems is infamously difficult. *Id.* at 53.
similar vein, the proposal would effect a redistribution of wealth among taxpayers, but not among taxpayers and those who do not earn enough to pay income tax. Therefore, the least well-off in society—those who do not pay taxes—would not benefit directly from the proposal.

D. New Units of Measurement and Electronic Money

"Money illusion"—the tendency to think of value in nominal terms rather than in terms of real purchasing power—has a long tradition in economics. Irving Fisher dedicated an entire book to it in 1928, and in 1965, Don Patinkin argued that an individual can be said to be suffering from money illusion if his demand for commodities depends on anything other than relative prices and real wealth. Edlar Shafir and colleagues have argued that "money illusion is a widespread phenomenon in the United States today."

Shiller partakes of this tradition, and stresses that inflation can cause dislocating redistributions of wealth. For example, inflation can shrink the real value of dollar-denominated debt, thereby hurting creditors such as holders of government bonds. To mitigate money illusion, Shiller proposes the introduction of indexed units of account, or as he denominates them, "baskets." One indexed unit of account or "basket" would purchase a market basket of consumer goods and

263. See Eldar Shafir et al., Money Illusion, in ADVANCES IN BEHAVIORAL ECONOMICS 484 (Colin F. Camerer et al., eds., Princeton Univ. Press 2004) (speaking generally about IRVING FISHER, THE MONEY ILLUSION (1928)).
264. See id. (paraphrasing DON PATINKIN, MONEY, INTEREST, AND PRICES 22 (2d ed. 1965)).
265. See id. at 483 (noting that "money illusion could manifest itself in a reluctance to sell a house or shares of stock at a nominal loss, or a reluctance to accept nominal wage cuts"). Shiller is sensitive to the potential negative psychological effect of nominal wage cuts, even when reduced wages would retain their purchasing power. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 217–20.
266. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 202–03.
268. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 206.
services. That is, regardless of the price of the market basket in dollars, one basket (the unit of account) would always be equal in value to the market basket; put yet another way, the purchasing power of the basket would remain constant. The baskets could be implemented in conjunction with an expanded electronic payment system so that the ultimate means of payment—dollars, euros, gold or anything else—would be of little concern to individuals.

Like the GRIDs, the creation of baskets would involve both governments and the private sector. First, governments would have to create the legal framework. This would involve defining the baskets, affirming their status as legal tender, enforcing contracts based on baskets, and specifying the conversion ratio between baskets and the country’s currency. Second, the government would have to produce indexes reflecting changes in the price of the market basket of goods and services. In the United States, the Department of Labor, Bureau of Labor Statistics, already performs a very similar function in producing the CPI. On the private side, Shiller suggests that firms also can compile and analyze statistical data, both to compete with the government-produced indexes and to serve as a check on the government’s credibility. Private companies also can create and refine electronic payment systems for use with baskets.

269. The United States Department of Labor, Bureau of Labor Statistics, uses a similar “market basket” concept in calculating the Consumer Price Index. The Consumer Price Index measures the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services. See http://www.bls.gov/cpi/cpifaq.htm#Question_1 (last visited Mar. 12, 2004).

270. As for real world precedents, Shiller tells the story of the Chilean unidad de fomento (“UF” or unit of development), the world’s first indexed unit of account. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 204–18. Chileans use the UF for real estate sales and rentals, payments of mortgages, taxes, child support and alimony. However, wages and goods prices are still denominated in pesos. Id. at 205. Five other Latin American countries also have established indexed units of account. Id. at 211.

271. See id. at 205.

272. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 212 (describing the “easy” steps governments can take to alleviate the effect of inflation on individuals).


274. See SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 214–16 (cautioning that a substantial percentage of people in both developed and developing countries distrust the reliability of inflation indexes produced by the government).

275. See id. at 216.
Shiller concludes by suggesting the creation of a variety of indexed units of account for use in the payment of wages. For example, an indexed unit of account called the "common hour" could be created to reflect the average wage rate for employees in a specific area and industry. A variation on this theme is the "professional hour," reflecting the average wages of a designated group of professionals. As an alternative to common hours or professional hours, units may be based on indexes of labor productivity or GDP. Finally, "senior baskets" could be created to reflect the market value of a basket of goods regularly consumed by the elderly.

A fair and administratively efficient deployment of baskets would seem to require their uniform adoption. Consider wages and taxes under the current tax regime. If wages are indexed but taxes are not, nominal wage gains will push taxpayers into steeper brackets, or higher along within their current top bracket, so that their real tax burden increases. This failure to index, characteristic of the current income tax system, is known as "bracket creep," and offers the legislature a conveniently insidious method of raising taxes. If taxes are indexed but wages are not, nominal increases in tax brackets will cause fixed salaries (between raises) to slide into lower brackets, or backwards in their current top bracket—taxpayers' real tax burden and Treasury receipts both would decrease. Of course, if both wages and taxes are indexed, both will keep pace with inflation and the real tax burden will equal the legislated one; this would force legislators to "internalize" the political costs and benefits of any changes in the bracket and rate structures. In short, a piecemeal rollout of "baskets" could have unintended distributional consequences. Or under a more callous view, those consequences may be intended and exploited by policy makers.

276. See id. at 217–18.
277. See id. at 217.
278. See id.
279. See id. at 217–18.
280. See id. at 217.
281. See McCaffrey, supra note 209, at 412; see also SHILLER, THE NEW FINANCIAL ORDER, supra note 5, at 210 (alluding to this phenomenon in the context of indexed government debt, but not addressing the problem of indexing wages without at the same time indexing taxes).
282. See McCaffrey, supra note 209, at 413.
As the tax example illustrates, indexed units of account have a potentially powerful application in statutory drafting. Statutory fines and penalties, licensing fees, and various legislated rates all can be drafted in terms of indexed units of account rather than in absolute dollars. This could obviate the requirement of legislatures periodically to revisit statutes, and thus could serve as a self-correcting counterweight to the problem of statutory obsolescence.

Finally, it should be noted that various methods already exist to hedge inflation risk, some of which Shiller mentions. In 1997, the U.S. Treasury Department introduced Treasury Inflation Protected Securities, or TIPS. These are U.S. government bonds in which the principal is adjusted (upward but not downward) for inflation. Corporations have also issued inflation-linked debt. In addition, parties can swap inflation risk in over-the-counter markets, and, as of recently, buy or sell exchange-traded futures contracts based on the U.S. Consumer Price Index. However, as Shiller observes in discussing the benefits of macro securities over perpetual futures, existing methods of hedging inflation, such as the foregoing, may not be accessible to most

286. See id. at 210.
287. Earlier this year, The Wall Street Journal reported:
   The amount of TIPS outstanding grew to $176 billion last year from $121 billion in 2000, according to the Bond Market Association trade group. On Monday, the bond-market trade group sent a letter to Treasury encouraging the government to expand TIPS sales to include a 20-year bond. Most TIPS currently have maturities of 10 years or fewer.
288. See id. (reporting that Fannie Mae sold inflation-linked bonds in 1997, and noting that “investors expect to see more corporate inflation-linked deals in the coming months”).
people. Baskets effectuate the same goals without the daunting complexity of bonds, swaps and futures.

E. International Agreements for Risk Control and Foreign Aid

No individual or group can make credible, long-term commitments on behalf of a whole society. As a result, robust international risk sharing requires action by governments on behalf of their citizens. In the new financial order, government would enter “international agreements for risk control” resembling the swaps familiar to financial markets. An “international agency” (Shiller does not specify which) would match countries or blocks of countries; ideally, the counterparties would be unequal in terms of level of development and geography. Contract design would proceed in three phases. First, the parties would specify expected growth rates for GDP. Second, the parties would specify a schedule of annual payments whereby the country whose growth rate relative to expectations is higher makes payments to the country whose growth rate relative to expectations is lower. Third, the parties would assign weights to the parties to the contract based on the relative magnitudes of the parties’ risks, their relative per capita GDP, and their relative populations.

As an alternative to the swap structure, the international agreements could be structured as a pair of contracts, one between each side and the international agency that helps arrange the deal. Shiller notes that such a structure may be more politically palatable. Alternatively, the international agreements may be framed as parallel or “back-to-back” loan agreements. Under such a structure, obligations under the loans

290. See Shiller, The New Financial Order, supra note 5, at 126 (noting that certain derivatives exceed the understanding of the average investor).
293. See id. at 184–85 (“Risk sharing is generally more potent among dissimilar parties than among similar parties.”).
294. See id. at 178.
295. See id. at 177.
296. See id. at 175.
would appear as simple debts, and therefore would be more comprehensible and more likely to be honored.\textsuperscript{297}

Besides explicitly transferring wealth, such international agreements could have a positive ex ante economic value: contracts could improve welfare and enhance risk taking by entrepreneurs in the party countries.\textsuperscript{298} Such international agreements, Shiller concludes, would be vastly superior to the self-interested, informal, and non-contractual foreign aid arrangements in place today.\textsuperscript{299}

Like contracts between private parties, Shiller's international agreements for risk control are subject to default. But unlike contracts between private parties, there is no authority with power adequate to enforce the international agreements—no court, as it were, backed by the power of the state.\textsuperscript{300} Shiller does not identify the agency he envisions for administration and enforcement; the United Nations comes to mind, but its resources are patently unequal to the task of enforcing long-term, high value agreements.\textsuperscript{301} Recognizing the near impossibility

\begin{footnotes}
\footnotetext[297]{See \textit{id.} at 179.}
\footnotetext[298]{For example, Shiller and a colleague designed a hypothetical 10-year contract with India on one side and a group of more developed nations on the other. They found that the ex ante economic value of the contract for India would be over 10 percent of a year's GDP in India. That is, the mere existence of the contract—before any payments—would increase India's expected economic welfare by 10 percent. \textit{See id.} at 180. For the United States, one of nine more developed countries on the other side of the hypothetical contract, participating in the contract yielded an ex ante economic value of 0.2 percent of a year's GDP. \textit{Id.} at 181.}
\footnotetext[299]{See \textit{id.} at 182–83.}
\footnotetext[300]{In a classic article, Calabresi and Melamed suggested that the state's monopoly on the legitimate use of force stands behind various legal arrangements. Calabresi and Melamed wrote:

When a loss is left where it falls in an auto accident, it is not because God so ordained it. Rather it is because the state has granted the injurer an entitlement to be free of liability and will intervene to prevent the victim's friends, if they are stronger, from taking compensation from the injurer. The loss is shifted in other cases because the state has granted an entitlement to compensation and will intervene to prevent the stronger injurer from rebuffing the victim's requests for compensation.... In any given dispute... the state must decide not only which side wins but also the kind of protection to grant.

\footnotetext[301]{See, e.g., Alix M. Freedman & Bill Spindle, \textit{Rescue Mission: Now at the Top of the U.N.'s Agenda: How to Save Itself}, WALL ST. J., Dec. 19, 2003, at A1 ("The U.N. has been through ups and downs in its 58-year history but rarely has it been so hobbled}
of ensuring enforcement through any means short of war, countries will find it difficult to make credible commitments to make future payments, and without credible commitments, there can be no contracts.\footnote{302} Shiller suggests that risk sharing can be most effective among countries separated by geography and economic conditions.\footnote{303} However, it is precisely these differently situated countries that are most likely to have varying contractual cultures—varying degrees of familiarity with obligations, differing norms regarding default and its consequences. Thus the best opportunities for risk sharing are most susceptible to the risk of default.

Even assuming enforcement is possible, a significant political problem remains. Shiller addresses the concern that poor nations may default on their obligations, even if circumstances improve in those poor nations, by citing evidence that India repaid its debts to certain of the former Soviet republics after the fall of the Soviet Union.\footnote{304} However, Shiller misses a potentially much bigger problem—the likelihood of international pressure on rich nations not to demand payment under the agreements from poor nations if circumstances in the poor nations improve. Even if payment is forthcoming, Shiller does not address the "infrastructure" problem: how, especially in less developed nations, is the money paid under international agreements supposed to get from the government coffers to the people? Particularly in countries with fewer economic and political freedoms, one can easily imagine corrupt government officials fudging GDP numbers then pocketing the payments.

Even if the agreements did work as expected, still they would have to confront a moral hazard problem. If people in a country know that any drop in national income beyond expectations is "fully insured," they will have less of an incentive to work hard to increase national income. As for adverse selection, basing settlement on changes in GDP relative
to expectations, rather than on absolute changes in GDP, should in theory mitigate the problem. However, the story may be different in practice. Politicians seeking reelection would like to tell their constituents that circumstances are improving. It would be difficult for a politician to pose as an optimist and at the same advocate a national insurance policy. Similarly, assuming, as seems plausible, that improving economic conditions are accompanied by pervasive overoptimism, it would be difficult to sell voters an agreement whereby a large part of their gains are taxed away with no immediate local benefits. In short, the countries most likely to want to enter international agreements are those that think they need to—those with private information suggesting worse times are ahead. Adverse selection remains.

CONCLUSION

Ultimately, I understand NFO as a work in progress—as an invitation into a provocative discourse on the potential of financial ideas to improve peoples’ lives, but by no means the last word on the subject. And I think Shiller would agree; he notes that “[i]t to make the ideas for risk management work, we need more than has already been outlined.”305 One leaves NFO with a powerful sense of the ability of financial ideas to inform democratic ideals. Shiller is to be commended for framing the discourse on the direction of finance in terms of justice.

305. To facilitate the process of research and advocacy, Shiller has set up a website at http://newfinancialorder.com/ containing links to many of the articles cited in the book.