

2002

A New Old Look at Terrorism Insurance: Jack Hirshleifer's War Damage Insurance after Fifty Years

Peter Siegelman

University of Connecticut School of Law

Follow this and additional works at: https://opencommons.uconn.edu/law_papers



Part of the [Insurance Law Commons](#), and the [Law and Economics Commons](#)

Recommended Citation

Siegelman, Peter, "A New Old Look at Terrorism Insurance: Jack Hirshleifer's War Damage Insurance after Fifty Years" (2002). *Faculty Articles and Papers*. 359.

https://opencommons.uconn.edu/law_papers/359

HEINONLINE

Citation: 9 Conn. Ins. L.J. 19 2002-2003



Content downloaded/printed from
HeinOnline (<http://heinonline.org>)
Tue Aug 16 13:11:08 2016

- Your use of this HeinOnline PDF indicates your acceptance of HeinOnline's Terms and Conditions of the license agreement available at <http://heinonline.org/HOL/License>
- The search text of this PDF is generated from uncorrected OCR text.
- To obtain permission to use this article beyond the scope of your HeinOnline license, please use:

[https://www.copyright.com/ccc/basicSearch.do?
&operation=go&searchType=0
&lastSearch=simple&all=on&titleOrStdNo=1081-9436](https://www.copyright.com/ccc/basicSearch.do?&operation=go&searchType=0&lastSearch=simple&all=on&titleOrStdNo=1081-9436)

A NEW OLD LOOK AT TERRORISM INSURANCE: JACK HIRSHLEIFER'S *WAR DAMAGE INSURANCE AFTER FIFTY YEARS*

*Peter Siegelman**

TABLE OF CONTENTS

INTRODUCTION.....	19
I. A VERY BRIEF OVERVIEW	20
II. LOOKING BACKWARD.....	22
A. PUBLIC CHOICE	22
B. MORAL HAZARD	25
C. ADVERSE SELECTION	27
D. WHY ISN'T THIS ARTICLE A CLASSIC?	29
III. LOOKING FORWARD.....	30
A. PUBLIC CHOICE AND COMPENSATION	31
B. INSURANCE AND THE INCENTIVES FOR MITIGATION	35
C. CAN THE GOVERNMENT PRICE ACCURATELY?	36
D. PRIVATE INSURANCE?	37
CONCLUSION	39

INTRODUCTION

The “shelf-life” of most social science is depressingly short. The community rarely pays attention to articles that are more than a few years old because most theories, findings or techniques are only relevant for a short while—if at all. There are rare exceptions, of course: path-breaking pieces whose status as classics warrants the continued attention of scholars decades after they were published. But it is even more rare to find a fifty year old article that: (a) seems to have been almost completely forgotten; (b) was

* Associate Professor, Fordham University Law School, psiegelman@law.fordham.edu. I thank Gideon Parchomovsky, Gene Bardach and Philip Siegelman for very helpful comments. I would also like to thank Professor Bernard Saffran of Swarthmore College for teaching me how interesting and important economics can be. I feel his influence in everything I write.

intellectually so novel that it reads like an introduction to many of the major trends of the next fifty years; and (c) speaks directly and cogently to a policy issue of immense current importance. *War Damage Insurance*,¹ published by Jack Hirshleifer in 1953, is precisely such an article, and I am thrilled to be able to bring it to the attention of those modern readers who (like me, until a few weeks ago) do not know of its existence.

In this brief comment, I will approach the article in two ways: first, I want to situate the piece in the context of the fifty years of economic thinking that followed it. I will argue that the article foreshadows many of the most important insights in economics between 1950 and today. For instance, economists now take concepts of moral hazard and adverse selection for granted in analyzing insurance markets—and virtually every other kind of market as well. Hirshleifer's 1953 article is one of the earliest serious treatments of these ideas. That is more than enough for any paper, but the article anticipates other important intellectual developments as well, including the analysis of "Public Choice" or imperfections in governmental policy-making. The only puzzle is why this article has not achieved the classic status it deserves. I briefly consider this question.

My second goal is to consider the substantive content of Hirshleifer's analysis in the aftermath of the economic policy problems posed by the terrorist attacks of September 11, 2001. Here, I will claim that much of the article is as relevant today as it was fifty years ago, although I will also point out some qualifications and implementation problems that are likely to present themselves.

I. A VERY BRIEF OVERVIEW

The article begins by noting while that the threat of (limited) nuclear attack can be countered by various *military* means, there are also precautions that *civilians* can take that will lessen the damage caused by an attack if one does occur.² (These include mitigation efforts such as building stronger buildings, dispersing development outside of large cities that are especially vulnerable to attack, installing better fire-prevention systems, and so on). The concern of the article is to devise a system that will provide the proper incentives for civilian precautions or mitigation efforts.³ Almost all of what Hirshleifer had to say about the threat of limited nuclear attack fifty years ago

1. Jack Hirshleifer, *War Damage Insurance*, 35 REV. ECON. STAT. 144 (1953), 9 CONN. INS. L. J. 1 (2002).

2. *Id.* at 144, 9 CONN. INS. L.J. at 1.

3. *Id.*

is relevant to the threat of terrorist attack today, yet another way in which the article is eerily *au courant*.

Hirshleifer begins by noting that if there were an attack on one or two cities, the political system would inevitably respond by providing substantial aid for the rebuilding of the affected areas.⁴ Knowing this response, forward-looking decision-makers will alter their behavior accordingly. They will take fewer precautions—exercise less “care”—than they would in the absence of a predicted bailout because precautions are costly and they know that much of their losses will be recouped from the government, regardless of the level of precautions they take.⁵ In other words, when they know that compensation will be forthcoming in the event of an attack, builders will have less reason to locate outside of large cities, or to install fire-prevention equipment, because these steps are all costly and yield no real benefit, since the government will compensate them for any losses they sustain. As a result, buildings will be more clustered together, and less structurally sound, than would be optimal.

To solve the problem of inadequate incentives to take care, Hirshleifer proposes a system of government-provided war damage insurance, in which insureds pay premiums that reflect their actual risk of loss, and are compensated—in the event of loss—out of the premiums collected.⁶ Under this system, buildings located in large cities that are the most likely targets of attack (or those built without substantial fire-prevention infrastructure) would be charged higher insurance premiums, which act as both an incentive and a signal. Lower rates in safer areas would give decision-makers a reason, at least at the margin, to locate away from large cities—lower insurance costs outside of major metropolitan areas. Put another way, premium differentials would signal which actions are appropriate, because interested parties could compare premiums for various designs or locations, and thereby obtain an

4. *Id.* at 144, 9 CONN. INS. L.J. at 1-2.

5. As we will see, this is a standard moral hazard problem that arises from the incompatibility of insurance and incentives. Of course, some losses will not be “insured” by a government bailout, and firms will still have an incentive to take precautions that reduce such losses. However, the *overall* incentives to take care are reduced by a bailout program that eliminates any part of the total cost of an attack. In other words, if a firm expects to have uninsured losses to personnel of one hundred and uninsured losses to property of seventy-five, it will have more reason to take more precautions than if it expects only the former, with the latter being covered by the government.

6. Hirshleifer, *supra* note 1, at 147-52, 9 CONN. INS. L.J. at 7-15. The design of the system is given considerable attention, and I will discuss it in detail below.

implicit estimate of the hazards involved in whatever choice they are considering.⁷

II. LOOKING BACKWARD

Hirshleifer's piece was far ahead of its time. Reading it today, one can see that it anticipated many of the most important and interesting results in economics over the next fifty years, many almost as an aside.

A. Public Choice

Consider first the issue of Public Choice or endogenous policy-making. At mid-century, most economists believed that the appropriate role of government was to correct various forms of market failures, which classically included externalities (e.g., pollution), failures of competition (monopoly), or the provision of public goods that markets would under-produce (e.g., national defense). The paradigm for doing economics was relatively simple: (1) identify a market failure (pollution); (2) show how governmental intervention could solve the problem (by taxing or regulating pollution); and (3) go home satisfied with a day's work well done.

Economists have since come to realize, however, that government may not act as a benign and omniscient social planner—that it may not do exactly what we would like it to do. Instead, policy will often reflect the political agendas of those in charge, rather than economists' efficiency-minded solutions. As such, it may not solve the problems to which it is ostensibly addressed, and will sometimes create *new* inefficiencies. This insight has blossomed into a whole sub-field of economics—Public Choice—and has been widely influential.⁸

Hirshleifer makes the Public Choice point almost offhandedly. The article begins with the insight that providing compensation after the occurrence of a

7. See Goran Skogh, *The Transaction Cost Theory of Insurance: Contracting Impediments and Cost*, 56 J. RISK & INS. 726 (1989). Skogh notes that large corporations are often bigger and more diversified than the insurers to whom they sell risks. Their demand for insurance is thus not plausibly based on risk-transfer. Instead, insurance is desired because of the specialized loss-control services that come with it, and because premiums provide information on avoidance costs. Because their job is to monitor and price risks, insurance companies are ideally positioned to acquire and disseminate this information.

8. The pioneering work in economics is George J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. 3 (1971). Other early contribution in this genre include Gary S. Becker, *A Theory of Competition Among Pressure Groups for Political Influence*, 98 Q. J. ECON. 371 (1983); Sam Peltzman, *Toward a More General Theory of Regulation*, 19 J. L. & ECON. 211 (1976); Richard Posner, *Taxation by Regulation*, 2 BELL J. ECON. 22 (1971).

disaster is so politically attractive that the government will invariably find it impossible to resist. As Hirshleifer puts it, "in the absence of an insurance program, it will be politically impossible for the government not to compensate for damage[since] . . . the inequity of the fortuitous distribution of losses is so generally recognized"⁹ Hence, although a policy of *no* compensation for war damages or terrorism would provide the proper incentives for care or mitigation,¹⁰ such a "no compensation" policy is not feasible because policy-makers always find it in their interests to provide compensation.¹¹ Politics, not economic theory, drives policy outcomes.

Suppose, however, that policy makers were more interested in efficiency and incentives than Hirshleifer gives them credit for. Imagine that the federal government, aware of the perverse incentives created by compensating victims of terrorist attacks, went so far as to announce that it will not pay any compensation in the event of a future attack. Even so, the Public Choice problem is likely to reassert itself. The reason is an application of a classic problem first explicitly analyzed by Thomas Schelling, that of

9. Hirshleifer, *supra* note 1, at 146-47, 9 CONN. INS. L. J. at 6. Hirshleifer has long been interested in the limits of economic analysis in policy-making, and the important role of "political" factors. In a famous assessment of water policy, he concluded that policy makers had completely ignored the advice of economists and instead embarked on grossly inefficient schemes for pricing and allocating water when much better alternatives were available. He ended the article by suggesting that "the agenda for economists, at this point, should place 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." Jack Hirshleifer & J. W. Milliman, *Urban Water Supply: A Second Look*, 57 AMER. ECON. REV. 169, 178 (1967).

10. This point foreshadows an important insight in the economics of negligence law: in a world where the only productive precautions can be taken by victims, optimal care requires a rule of no-liability. The reason is that when victims face the full costs of an accident, they will necessarily reap the full benefits of every dollar they spend on prevention or mitigation, and will thus have an incentive to spend up to the point where the marginal dollar of precaution just covers its expected savings in accident costs. See, e.g., ROBERT COOTER & THOMAS ULEN, *LAW & ECONOMICS* 272-75 (2d ed., 1997).

11. Hirshleifer's recommendations are also an interesting example, again (slightly) ahead of its time, of so-called "second-best theory," a general equilibrium analysis of policy choices when the government is not able to choose the optimal policy instrument. See Richard G. Lipsey & Kelvin Lancaster, *The General Theory of Second-Best*, 24 REV. ECON. STUD. 11 (1956). Here, the first-best policy might be to refuse compensation to everyone, but that strategy is ruled out by the political context; in the presence of such constraints on government behavior, insurance is second-best.

"commitment."¹² This problem occurs whenever long-run and short-run interests diverge and there is no way to bind one's self now to take the optimal policy in the future.

Consider the policy of paying ransom to hostage-takers. Governments will always find it in their interest to declare resolutely that they will not pay ransom. It is of course the right thing to say, because if kidnappers are certain that no ransom will be paid, they will not find it attractive to take hostages in the first place. The problem is that once hostages are taken, everyone knows that the government's short-run interests lie in not letting its citizens languish in captivity: it is simply too damaging politically, and the rewards for freeing the hostages are too great, for any government to ignore.¹³ Hence, even if the government initially promises *not* to pay ransom, its promise is not credible because when the future ultimately comes around, it will not be in its interest to keep its promise. Knowing all this, kidnappers will see through the promise not to pay ransom, and hostages will continue to be taken.

Schelling's analysis highlighted the strategic value of "hands-tying" or commitment devices.¹⁴ In the hostage situation, for example, the President might state explicitly that if he were ever found to have negotiated with terrorists, he would immediately resign from office. Hearing this, kidnappers might then believe that the President would indeed refuse to negotiate with them, since the personal cost of his doing so would be too high. This kind of self-imposed constraint on future behavior can, as Schelling saw, be used to sustain promises that are otherwise not credible.

While Schelling should be credited for naming and analyzing this kind of commitment problem, Hirshleifer deserves recognition for implicitly suggesting that governmental provision of insurance can serve as a kind of

12. THOMAS C. SCHELLING, *THE STRATEGY OF CONFLICT* (1960). Schelling's book has achieved classic status—its ideas are still discussed today, even though it was published more than forty years ago. Interestingly, Hirshleifer has himself explicitly addressed these issues in recent work. See Jack Hirshleifer, *Game-Theoretic Interpretations of Commitment*, Ch. 4., in RANDOLPH M. NESSE, *EVOLUTION AND THE CAPACITY FOR COMMITMENT* (2001).

13. This is precisely the behavior of President Reagan in the so-called Iran-Contra affair: while denying that he was negotiating for the release of the American hostages held in Iran, the administration was in fact making a deal for their release. See, e.g., *The Iran-Contra Report; Key Sections of the Document: The Making of a Political Crisis*, N.Y. TIMES, Nov. 19, 1987, at A14.

14. The myth of Ulysses, who wanted to hear the Sirens' deadly song, is a paradigmatic example of strategic self-constraint. Jon Elster, *ULYSSES AND THE SIRENS: STUDIES IN RATIONALITY AND IRRATIONALITY* (1984). Ulysses had his crew tie him to the mast, plugged up their ears with wax, and sailed past the Sirens' cave. Only by thus binding himself and his men, could Ulysses listen to the Sirens' song without perishing.

commitment or hands-tying device that could reduce the problem of suboptimal policy choice.¹⁵ By announcing a program of premium-based insurance, the government effectively increases the cost of paying gratuitous compensation, making a promise not to do so more credible than it would otherwise be. The rationale seems to be that insurance inherently offers a link between compensation and premiums: only those who have paid for their insurance have a legitimate claim to receive compensation. Thus, governmental provision of insurance could act as check on the temptation to hand out compensation indiscriminately and at no cost to its recipients.¹⁶

In sum, Hirshleifer not only recognized early on that there are such things as predictable policy failures, but also saw that an insurance program can be used to overcome them by committing the government not to do the wrong thing when the time comes.

B. Moral Hazard

Another important theme in Hirshleifer's article is moral hazard, which can be crudely described as the tendency of insureds to reduce their own precautions as more of their losses are covered by insurance. Moral hazard is now an essential part of the game-theoretic or analytical toolkit of economists; it is used to understand any situation in which one party can take actions that are unobserved by another and which affect the payoffs to both. Insurance markets are only one example, since this kind of asymmetric information is present in virtually every strategic interaction.¹⁷ Indeed, it is hard to overstate

15. See Hirschleifer, *supra* note 1.

16. Although Hirshleifer does not explore this issue in any detail, we might ask why this should be so. The "discipline" provided by insurance—its role as a commitment device to check excessively generous compensation—seems to have both a political and moral dimension. Politically, it is easier to deny compensation for the uninsured if there are many who have *purchased* their insurance and could be mobilized to oppose the free provision of something they had to pay for. But the prophylactic effect of insurance also has a *moral* aspect: it seems less as inequitable or wrong to deny compensation to a victim who had a chance to purchase insurance, but turned it down, as it does to leave someone to suffer the random bad luck of being a victim of an enemy attack when no insurance was available. The former can be said to have assumed the risk of the misfortune in a way that the latter cannot, and seem to have less claim to our sympathies as a result.

17. The canonical reference is Kenneth Arrow, *Uncertainty and the Welfare Economics of Medical Care*, 53 AMER. ECON. REV. 941 (1963). Arrow stresses the importance of the "moral" dimension to moral hazard in his reply to Professors Pauly's comment on this article. See *The Economics of Moral Hazard: Further Comment*, 58 AMER. ECON. REV. 537 (1968). See also Tom Baker, *On the Genealogy of Moral Hazard*, 75 TEX. L. REV. 237 (1996), which surveys the intellectual history of this term.

the importance of moral hazard in contemporary economic theory—it has become one of the central concerns in the discipline.

Although he does not mention it by name, Hirshleifer clearly recognizes that moral hazard is likely to occur when (everyone believes that) the government will compensate all war damages. Why bother to reinforce your building or move your business to a less desirable location if the government will fully compensate you for your losses in the event of war? It is precisely this notion that leads Hirshleifer to conclude that “simple compensation programs . . . tend actually to discourage private actions which would reduce vulnerability, thereby *increasing* the overall national risk.”¹⁸ Although this may not be the first serious discussion of the incentive effects of insurance, it does appear to be one of the earliest treatments of this issue in mainstream economics.

Economists have mixed views about insurance. On the one hand, insurance is welfare-enhancing because most people are usually risk-averse. This means they prefer to reallocate wealth from “no accident” states of the world (where wealth is high and the marginal utility of wealth is low) to those states where an accident *does* occur, wealth is diminished, and the marginal utility of wealth is therefore higher.¹⁹ Insurance is nothing more than a mechanism for “shipping” wealth from good times (when the marginal dollar is worth relatively less) to bad times (when it is worth relatively more).

On the other hand, the provision of insurance will rarely leave the behavior of the insured unaffected. The typical conclusion of economists is that insurance is the enemy of incentives. Full insurance, by definition, implies that the insured suffers no risk of bad consequences, and therefore has no reason to undertake costly precautions that lower the probability (or cost) of the adverse event being insured against.²⁰

Hirshleifer’s paper offers a novel twist on this insight, suggesting that insurance can *support* or reinforce incentives, at least when the choice is between appropriately-priced fee-based insurance and free compensation.²¹

18. Hirshleifer, *supra* note 1, at 146, 9 CONN. INS. L. J. at 5 (emphasis in original).

19. Hirshleifer pioneered this vocabulary for analyzing insurance. See J. Hirshleifer, *Investment Decision under Uncertainty: Applications of the State-Preference Approach*, 80 Q. J. ECON. 252 (1966).

20. An extreme version of this insight is illustrated by the joke about two Vermont farmers. The first tells the other: “I just bought fiah and flood insurance on my bahn.” The second pauses, and then says, “I understand about the fiah, but how do ya’ staht a flood?”

21. Economists are famous for believing that nothing is ever really free. Compensation for victims of terrorist attacks has to come from somewhere, and assuming it is financed out of tax revenues, there are significant distortionary effects to be reckoned with. Indeed, the

C. Adverse Selection

Like moral hazard, adverse selection is another concept originally borrowed from the insurance literature which has had a profound influence on mainstream economics, especially in game-theoretic analysis of strategic interactions.²² The basic idea is that adverse selection is likely to occur whenever:

- (a) one party (A) offers to transact with another (B), and B can choose to accept or reject A's offer;
- (b) B has information about the value of the transaction to A that A does not have; and
- (c) B is most likely to accept A's offer when B's information is "bad" (i.e., *adverse*) to A.

For example, imagine a stylized world in which there are only two kinds of used cars, "good" (worth 100 to the seller and 110 to the buyer) and "lemons" (worth 20 to the seller and 22 to the buyer), each of which comprise half of the total. Owner/sellers know the true quality of their car, but buyers do not, and cannot verify the quality. The average car is worth 66 to the buyer; but at a price of 66, the only cars that owners will be willing to part with are the lemons. At any price above 100, all cars will be put on the market, but of course buyers are guaranteed to lose-out on average, since they will be spending 100 for something with an average value of 66. Knowing all this, buyers will never agree to offer more than 22, and thus, the only cars that can be sold are the lemons. This is true even though each car is worth 10 percent more to a buyer than to its owner. Bad cars have driven good cars out of the market.²³ I was able to find only twelve cursory mentions of the phrase "adverse selection" in the economics literature before 1953, none of which contained anything like a sustained analysis of the problem. Hirshleifer's discussion of adverse selection in the market for war damages insurance is thus a candidate for the first significant treatment of this topic in the

conventional wisdom is that the true economic cost of raising one dollar in tax revenues is roughly thirty cents. I ignore these considerations in the rest of the paper.

22. The concept is now deeply entrenched in economic analysis. The 2001 Nobel prize shared by George Akerlof was awarded largely on the basis of his article, *The Market for 'Lemons': Quality Uncertainty and the Market Mechanism*, 84 Q. J. ECON. 488 (1970), which offered the first formal model of adverse selection.

23. This is a simplified version of Akerlof's story. Akerlof, *supra* note 22, at 489-90. Of course, we can expect that institutions will develop to handle this kind of problem, including warranties by sellers, dealers with a reputational interest in selling high-quality cars, inspection services, and so on. Nevertheless, the example is compelling on its own terms.

economics literature. Even if it did nothing else, this would be quite an achievement for any article!

Why would adverse selection be an issue in war damages insurance? Hirshleifer gives three reasons. First, when participation in the insurance pool is voluntary, there will be a "tendency of poor risks to take out insurance and good risks to self-insure . . ."²⁴ This in turn would make it more difficult to establish appropriate premiums, since the actuarially fair (break-even) rate for those who sign up for insurance will necessarily be higher (but by an unknown amount) than for the population as whole.

This is (by now) a standard analysis of adverse selection in insurance markets, and while it is substantially ahead of its time, I find Hirshleifer's second reason to be even more interesting. He argues that mandatory "universal coverage (not achievable under a voluntary plan) would entirely eliminate the problem of demands for compensation sure to arise after bombing on behalf of those who have failed to take out insurance."²⁵

Once again, we have an intriguing mix of political economy and moral theory. It is not just that universal coverage prevents the good risks from dropping out of the pool *ex ante*, as in the standard adverse selection story. Rather, Hirshleifer recognizes that victims of substantial random catastrophes have an ethical claim on the rest of us for compensation, so that there can also be *ex post* adverse selection (with negative incentives for future behavior). Thus, even if we want to deny compensation to those who are injured on efficiency grounds, we find it (appropriately) difficult or impossible to do so because we do not wish to turn our backs on people who have been injured in this way.

Finally, there is a potential problem of adverse selection with respect to time, which could occur because when participation is voluntary, "people will be tempted to speculate on the probability of war. That is to say, they may not take out insurance until the international situation becomes very threatening . . ."²⁶ This is an unusual type of adverse selection, which to my knowledge is not widely discussed in the literature. Hirshleifer cleverly proposes several techniques for resolving this problem, 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.

I find it interesting that, in spite of his perceptive analysis of the adverse selection problems that would plague voluntary war damage insurance,

24. Hirshleifer, *supra* note 1, at 147, 9 CONN. INS. L. J. at 7.

25. *Id.*

26. *Id.* at 151, 9 CONN. INS. L. J. at 13.

Hirshleifer seems to prefer a voluntary plan to compulsory insurance. At least he assumes in the remainder of the article that participation will be voluntary. It is hard to know whether this reflects an actual commitment on his part to freedom of contract (absence of coercion), or whether he is simply making a kind of *a fortiori* argument: war damage insurance is such a good idea that it can succeed even if we choose a method of implementation that is subject to seriously adverse selection problems.

D. Why Isn't This Article a Classic?

I haven't done justice to all of the article's provocative ideas. For example, Hirshleifer suggests, "[w]ithout extended argument," that the objective of war damages insurance should be

to restore the *relative* position of those who lose property by the bombing so that they are no worse off than the nation as a whole. Since the bombing will reduce the real national wealth, the restoration of the *absolute* position of those who lose property would mean an actual gain for them relative to the rest of the community. It follows . . . that . . . if, for example, 10 percent of the national wealth is destroyed in the bombing, the real value of the compensation should be at the rate of 90 percent of the real value of the loss.²⁷

This is a novel and interesting idea at many levels. It is now standard to think about co-insurance requirements as a deterrent to moral hazard: they require the insured to keep part of the risk of loss, and thus offer at least some incentive for him to take care. That a portion of an insured's loss that would be uncompensated under Hirshleifer's fairness criterion might therefore also have a desirable incentive effect.²⁸

Given all this, I am puzzled that the article does not seem to have the reputation it deserves. Maybe I am just idiosyncratic. But I suspect the answer is two-fold. First, although it draws on and develops many deep and important ideas, the article does so in order to further the analysis of a real policy problem. Hence, it might have been easy to overlook its insights because they are so clearly in the service of the problem at issue, and are not trumpeted or even highlighted in any way. Moreover, there is no formal

27. *Id.* at 152, 9 CONN. INS. L. J. at 15.

28. Moreover, the emphasis on the *relative* economic position of those who suffer losses resonates with all kinds of debates in political theory, as well as with a growing literature in economics on the importance of relative standing and relative preferences. See, e.g., ROBERT FRANK, CHOOSING THE RIGHT POND: HUMAN BEHAVIOR AND THE QUEST FOR STATUS (1985).

model deployed—the insights are developed entirely verbally. And economists tend to place a high value on formalism, sometimes almost as an end in itself.

A second explanation is that the topic of how to mitigate the effects of bombing (either from nuclear war or terrorism) is a rather morbid one, as we now know all too well. Even economists probably preferred not to think about the loss of major cities to a nuclear attack, just as most of us now prefer not to dwell on the risks of terrorism. I suspect the article's reputation may therefore have suffered because of its unpleasant subject matter.

Pathbreaking as it was, I think the article suffers from another problem, at least in the eyes of non-economists. Viewing compensation for war damages, or damages from terrorism, as a purely economic problem seems to me to miss something important about the way most people think about the issue. The reason is that collectivizing the harms from war damages by compensating victims out of governmental revenues has "expressive" as well as economic consequences.²⁹ In other words, voluntarily compensating victims by spreading or "socializing" the risk *says something* about us as a country, as a culture, and as a foe of whoever is attacking us. What it says is that the country is united, that an attack on one is an attack on all, and that we will willingly share the harms from any attack, even though many of us are unaffected in any direct or material sense.

This sense of unity is an important thing to convey, for many reasons. Most obviously, it is important to say because it is true, as the hundreds of impromptu shrines and memorials around New York City in the wake of September 11th attest: people *do* care about each other. The message may also have important strategic consequences: if anyone thinks they can blow up New York and that Californians or Iowans will not care, the willingness of Californians and Iowans to compensate victims is proof that this is not true. If instead of voluntarily-provided compensation, we substitute a kind of pay-as-you-go insurance system, in which the victims only get out what they have (in expected value terms) already put in through their premiums, the expressive element of compensation is now largely missing. This may be a serious drawback, both from an expressive *and* strategic perspective.

III. LOOKING FORWARD

Instead of looking backward at the last fifty years of economics, I now want to address the issue of whether *War Damage Insurance* remains a useful

29. Thanks to Gideon Parchomovsky for this significant insight.

piece of public policy analysis in today's environment—one in which the United States is once again under threat of attack, this time from terrorists. I conclude that it does, with some caveats.

A. Public Choice and Compensation

As noted earlier, a key assumption underlying Hirshleifer's argument for the government's provision of insurance against property loss due to war (or terrorism) is that in the absence of such insurance, the political system will nevertheless find it impossible to avoid providing significant compensation to owners of damaged property.³⁰ Fully-covered insureds will then have improper incentives to take care (moral hazard), especially if their coverage is provided for free. One benefit of a *formal* fee-based insurance scheme is thus that it can forestall the provision of *gratuitous* compensation that would distort or eliminate any incentives to mitigate the harms from terrorism.

The case for government-provided insurance is therefore most convincing when the political system will inevitably decide to compensate a substantial fraction of all losses—the greater is coverage, the smaller are incentives to undertake mitigation. Hirshleifer implicitly makes the assumption that the politically-motivated “loss-replacement rate” will be close to 100 percent.³¹ Fortunately, there was never a nuclear attack on the United States that would have put the governmental response to the test.

But the recent terrorist attacks do provide a test of Hirshleifer's “Public Choice” assumption about governmental behavior. We should thus look at the governmental compensation provided in response to the September 11th attacks, and ask how generous it actually was. If it replaced only a small fraction of the property losses, the case for fee-based insurance as a device that will commit the government *not* to hand out gratuitous benefits after an attack seems less compelling.

What do we know about the governmental response? The Congressional Budget Office (CBO) estimated that Congress authorized about \$40 billion of additional emergency supplemental appropriations in the immediate aftermath of the attacks.³² Of this amount, CBO suggests that roughly \$10.2 billion will

30. Hirshleifer, *supra* note 2, at 149, 9 CONN. INS. L. J. at 10.

31. Hirshleifer, *supra* note 2, at 146 n.6, 9 CONN. INS. L. J. at 6 n.6.

32. CONG. BUDGET OFFICE, THE BUDGET AND ECONOMIC OUTLOOK: FISCAL YEARS 2003-2012, Chapter 7, Box 7-2 (Jan. 2002) [hereinafter OUTLOOK]. The \$40 billion comes from the 2001 Emergency Supplemental Appropriations Act for Recovery from and Response to Terrorist Attacks on the United States (Pub. L. No. 107-38) and the Department of Defense and Emergency Supplemental Appropriations for Recovery from and Response to Terrorist Attacks on the United States Act, 2002 (Pub. L. No. 107-17).

go to New York City, "providing both support to business and individuals and support to state and local governments."³³ Aid to victims' families could add another \$6 billion to this amount over nine years.³⁴

It is very difficult to know how much of this money can or will be used to compensate for (potentially) insurable property losses, as opposed to other economic losses (e.g., from disruptions to business activity), or as pure compensation to families of victims. But suppose we assume, generously, that the entire \$10 billion will be paid to compensate property losses. We might then crudely estimate the total property losses from the attacks at \$20 billion.³⁵

By this rough estimate, governmental compensation seems to have replaced only about one-half of the property losses. The one-half figure is probably too high, since not all of the governmental aid will likely compensate property losses, and these losses are likely to be larger than \$20 billion.³⁶

Imagine now that you are a private decision-maker, considering what kind of precautions to take against terrorism. For this stylized example, we will collapse all of your precaution decision to one variable—where to locate your new office building—although there are of course many other margins on which precautions can be taken. On the one hand, you expect that losses from terrorism are more likely to occur if you locate in New York than in, say, Dubuque. On the other, you figure that if a terrorist threat does indeed materialize, you can count on the federal government to pick up some fraction ϕ of your losses, which we can term the replacement rate. If ϕ were equal to one, all losses would be covered, and you would have no reason to care about them at all—this is the extreme version of moral hazard. But for a

33. OUTLOOK, *supra* note 32 at 118.

34. *Id.*

35. Immediately after the attacks, the Global Disaster Information Network, on the basis of a sophisticated actuarial model of New York City property values, estimated that the property losses from the attacks would be in the range of "\$7 to \$11 billion, including building, contents, and direct business interruption losses generally associated with property claims. . . . [This excludes] contingent business interruption, aviation, casualty, and liability losses for this disaster." World Trade Center Disaster, RMS Special Report (Sept. 18, 2001), *at* <http://www.gdin-international.org/wg/wtc.pdf> (last visited Nov. 9, 2002). More recently, the ISO estimated that *insured* property losses from the attack stood at \$16.6 billion as of March 11, 2002. See http://www.iso.com/studies_analyses/study018.html (last visited Nov. 9, 2002).

36. On the other hand, I have ignored funds provided by state agencies and by private entities; I suspect that most of these funds were not designated to replace lost property, however.

replacement rate of $1/2$, you will absorb 50 cents of each dollar of loss, what amounts to a fifty percent coinsurance rate.³⁷

Table one lays out a stylized example that develops this comparison, assuming arbitrarily that the probability of attack is 10 percent in New York and 6 percent in Dubuque. Suppose there is no governmental compensation, (and no insurance at all), so $\phi = 0$, as in column one. Expected wealth is 4.4 percent higher if Dubuque is chosen over New York since the probability of attack is lower in Iowa. If instead the government were to replace 50 percent of each dollar lost, as in column two, Dubuque would still dominate New York, but its relative advantage shrinks by more than half, to only 2.1 percent.³⁸

Of course, this example does not prove that everyone should move from New York to Dubuque. What it shows is that in a world in which no compensation is forthcoming, those for whom the benefits of staying in New York *apart from the risk of attack* are less than four should (and will) move; the threshold for staying falls to two when the government compensates half of all losses. Hence, someone at the margin (for whom the benefits of staying are, say, three) will move if there is no compensation, but will stay if they expect compensation to be provided.

In sum, even if the government only compensates one-half of all losses due to terrorism, there might still be a significant diminution of incentives to choose the less-risky location or undertake other mitigation expenditures. However, this is not the end of the story.

37. Of course, ϕ is uncertain—you can never be sure if the government will compensate forty percent or sixty percent of your loss, or more, or less. But this uncertainty should either have no effect, or should serve to reduce the “effective” expected compensation rate if one is risk averse.

38. Dubuque has a lower standard deviation of wealth as well as a higher mean than New York. With no compensation, Dubuque clearly dominates (unless the firm is risk-loving, which seems highly unlikely). Introducing a fifty percent compensation rule lowers the standard deviation of wealth by an equal percentage amount in both New York and Dubuque. Hence, unless firms are extremely risk averse, the relative variability induced by a move from no compensation to fifty percent compensation should be of only second-order importance in the choice of where to locate.

Table 1: Incentive to Locate in New York and Dubuque
Under Various Insurance/Compensation Schemes

	Assumptions			
Asset Value	100			
Prob. of Total loss, NYC	10%			
Prob. of Total loss, Dubuque	6%			
	<i>Policy Regime</i>			
	No	"Free"	Perfectly	Imperfectly
	Compensation	Gov't	Priced	Priced
		Compensation	Insurance ^a	Insurance ^b
"Replacement Rate, ϕ"^c	0	50%	100%	100%
Expected Wealth, NYC	90	95	90	92
Std. Dev. of Wealth	30	15	0	0
Expected Wealth, Dubuque	94	97	94	92
Std. Dev. of Wealth	23.8	11.9	0	0
% Incr. in Expected Wealth from Move to Dubuque	4.4	2.1	4.4	0
% Decr. in Std. Dev. of Wealth From Move to Dubuque	20.8	20.8	0	0

^aPremiums are actuarially fair for each city.

^bPremiums are actuarially fair for the country as a whole, but do not reflect city-specific risks. Fifty percent of firms are located in New York and fifty percent in Dubuque.

^cShare of lost wealth that will be compensated by the government.

B. Insurance and the Incentives for Mitigation

Suppose that the alternative to “free” governmental compensation (for fifty percent of losses) is actuarially fair insurance for one hundred percent of losses, with premiums based on city-specific risks. I call this “perfectly-priced insurance,” in the sense that the premiums perfectly reflect the risks in each location. In this case, shown in column three, the premiums would be ten in New York and six in Dubuque, and expected wealth would be the same as in column one of table one (although of course the standard deviation of wealth would be zero under full insurance). Hence, full insurance with appropriate pricing of risks would maintain (almost) all of the inter-city incentives of a no-insurance world.³⁹ That is, the savings in insurance premiums from moving to Dubuque under full insurance (with perfect pricing) would just equal the savings in expected wealth from moving if there were no insurance at all.

What happens, however, if we are unable to set premiums at the city level? Suppose we instead assume a single actuarially-fair premium is charged for the country as a whole (and further that there are equal numbers of firms in the two cities). Participation is mandatory, so there are no adverse selection concerns. Thus, per table one, the average risk for the country as a whole is eight percent, and every firm is charged a premium of eight percent, regardless of location.

When there is full insurance and a single premium for all risks, regardless of location, Dubuque would no longer have *any* advantage over New York at all. By contrast, even free governmental compensation for fifty percent of loss preserves at least *some* of Dubuque’s appropriate advantage over New York. This is all a long-winded way of saying something quite simple. When $\phi < 1$, so that the government does not replace one hundred percent of each dollar of loss, the superiority of a premium-based insurance system depends critically on how accurately the government can price risks.⁴⁰ If Dubuque and New York risks are priced the same—a single rate for the entire country—then the free fifty percent compensation provides *better* incentives for mitigating the harm of terrorist attacks than pay-in-advance insurance does. If each city’s risk is priced separately and accurately, then insurance provides the superior

39. Full insurance does slightly diminish Dubuque’s advantage over New York, since full insurance eliminates any variance in outcomes in either city, and Dubuque has a smaller variance than New York in the absence of any insurance. Assuming firms are approximately risk-neutral, this should be a small effect, however.

40. Hirshleifer acknowledges the importance of accurate pricing of risks, e.g., Hirshleifer, *supra* note 1, at 153, 9 CONN. INS. L. J. at 17, but does not consider the possibility of less than full compensation and the problems it poses for choosing the best insurance scheme.

incentives for mitigation. Whether “free” partial compensation offers better incentives for mitigation than “pay-in-advance insurance” then turns out to be an empirical question, one that depends critically on how accurately the government can price the risks in each location.⁴¹

C. Can the Government Price Accurately?

The obvious question then becomes, how accurately do we think the government can price risks? We need to think about two kinds of inaccuracies in pricing, which we can loosely term actuarial and political.

Hirshleifer acknowledges that there are all kinds of actuarial problems with setting rates. It is very difficult to estimate the probability of a terrorist attack, how it varies by city or region (or even by block), the likely damage it will cause (by type of building), and so on. But he claims that even partial steps to price insurance along these dimensions, even if inaccurate, will *inevitably* be better than what amounts to free insurance.⁴² He is right—but only if we assume that there will be full coverage in the absence of premium-based insurance.

Moreover, there are further difficulties in pricing that Hirshleifer does not explicitly acknowledge, difficulties that are essentially “political” in nature. For many of the same reasons that the government would be under pressure to provide free compensation to those who suffer property losses in the absence

41. Hirshleifer's comments suggest that he is aware of the problem, but since he assumes that there will inevitably be full compensation ($\phi = 1$), he minimizes its importance.

If . . . [premiums are not set accurately enough], we are at least going in the right direction, while simple compensation would be pushing us in the wrong direction. We might . . . [set premiums with too large a differential across risks], but in view of all the administrative and political pressures in favor of the status quo, the danger of [encouraging too much mitigation] seems quite slight.”

Hirshleifer, *supra* note 1, at 151, 9 CONN. INS. L.J. at 14. When comparing partial compensation to inaccurately priced insurance, however, the incentive effects are not so clear.

42. See Hirshleifer, *supra* note 1, at 148, 9 CONN. INS. L.J. at 9.

Setting the insurance rates will involve judgment and, therefore, the differential rates will not have the ideal effects on incentives which could be claimed for the true rates. Nevertheless, we believe that this is a case where judgment would have to go very far astray to produce really perverse effects on incentives, which is all we need to be afraid of. We shall not get optimality, but we can expect improvement.

Id. “Nor would the element of judgment involved here be unique, since private insurance rates for fire, theft, and other contingencies also are ordinarily based on informed judgment.” *Id.* at n.11.

of insurance, there will likely be intense political pressure to modify or homogenize rates across risk categories. To see this, one need only imagine the reaction of New York's Senators if the War Damages Insurance Corporation were to set rates for New York at sixty-six percent higher than in Dubuque. It is likely that there would be considerable public outcry at such "discriminatory" behavior, and substantial political pressure to narrow the rate differentials between the two cities. But this would have precisely the effect of diluting the incentives for mitigation that the insurance program was designed to protect.

Part of what makes Hirshleifer's proposal so attractive is that he adopts a technocratic solution to what is in large part a political problem. But—ingenious as it is—there is no reason to think that insurance pricing would be any less subject to political influence than the decision to provide compensation in the first place. Insurance does not provide a point of leverage "outside the system," from which its vulnerability to political manipulation can be overcome. Instead, the politicization of compensation would likely be transformed into the politicization of rate-setting, with the same attenuating effect on incentives to undertake harm-reducing activities that Hirshleifer so cogently and presciently identified. At the very least, therefore, a successful insurance program would have to be carefully designed so that it could operate with minimal political interference, although this raises obvious concerns about non-democratic discretionary decision-making.

D. Private Insurance?

I want to turn, finally, to a question that Hirshleifer does not address—why do we need a *governmental* insurance program?⁴³ Could we rely on private anti-terrorism insurance to provide the appropriate signals about how to mitigate the harms of terrorism and to spread these risks fairly and effectively?

Although relying on private markets has some obvious appeal—at least to an economist—the prospect does not seem promising in this situation, for two reasons.

First, private markets may not be able to solve the Public Choice problem, the fact that the political system will likely respond to any terrorist attack by

43. There has been a dramatic increase in the relative size of the insurance sector since Hirshleifer wrote. Insurance carriers' share of GDP rose six-fold, from 0.3 percent in 1950 to 1.69 percent in 2000, according to the BEA National Income and Product Accounts. The industry is now vastly more sophisticated, with much greater access to reinsurance markets and other methods of spreading risks, which might explain why Hirshleifer did not consider private insurance fifty years ago.

offering substantial compensation to victims. One of the important reasons Hirshleifer favors government-provided insurance is that it helps commit the government not to provide blanket compensation, for reasons discussed earlier.

Wouldn't a viable private market in anti-terrorism insurance forestall some demands for governmental compensation, for the simple reason that many victims' losses will be covered already? Perhaps so, but the story is more complex than this because the demand for private insurance will be greatly reduced if everyone knows the government will bail out those who are injured. Why buy insurance when you can get (at least partial) compensation for free from the government? To the extent that the problem lies precisely with the government's response to the problem, private insurance is likely to be ineffectual.

More generally, there are a whole set of additional reasons to be skeptical about private provision of catastrophe insurance, of which anti-terrorism insurance is a close cousin.⁴⁴ First, catastrophic risks (hurricanes, earthquakes, terrorist attacks) are not statistically independent as are, for example, automobile accidents. Hence such risks are hard to diversify-away. The same terrorist attack (or earthquake) will likely cause damage to a substantial number of any company's insureds at the same time, so adding more insureds does not protect against this risk in the same way that adding another automobile policy does. Of course, there are means for laying-off parts of such risks, including the use of reinsurance markets, but there are problems here as well.

Second, the potential losses due to terrorism are large, highly uncertain, and difficult to describe statistically. Who knows whether the probability of another terrorist attack in the next year is one percent, five percent, or twenty-five percent? Under these conditions, insurers might justifiably not want to be on the hook for such large and highly variable damages. Finally, there are important difficulties in accumulating the large pools of cash necessary to provide insurance for substantial disasters, as Jaffe and Russell persuasively argue.⁴⁵

44. There is a large and growing literature on this subject. See generally *THE FINANCING OF CATASTROPHE RISK* (Kenneth A. Froot, ed.) (1999). A provocative article on a theme similar to Hirshleifer's is Harold Kunreuther, *Mitigating Disaster Loss through Insurance*, 12 J. RISK & UNCERTAINTY 171, 171-87 (1996).

45. See Dwight M. Jaffee & Thomas Russell, *Catastrophe Insurance, Capital Markets, and Uninsurable Risks*, 64 J. RISK & INS. 205 (1997), or more recently, Dwight M. Jaffee & Thomas Russell, *Extreme Events and the Market for Terrorist Insurance*, available at <http://www.nber.org> (last visited Nov. 9, 2002). A case for public provision of anti-

CONCLUSION

War Damage Insurance anticipated many of the most interesting and important developments in economics over the following fifty years, and it did so in an accessible and cogent fashion. As if that were not enough, the topic of insuring against substantial attacks on the U.S. is once again of tremendous current importance. While it may not have the last word on these issues, I cannot imagine a better place to begin thinking about the economic issues involved than with Hirshleifer's article. It deserves to be acknowledged as a classic contribution to economic analysis.

terrorism insurance, based on the externality that results when my precautions shift the risk of terrorism to someone else, is made by Darius Lakdawalla and George Zanjani, *Insurance, Self-Protection and the Economics of Terrorism*, National Bureau of Economics Research, Working Paper 9215 (Sept. 2002) (on file with the author).

