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WAR DAMAGE INSURANCE

Jack Hirshleifer *

IF the United States becomes engaged in a new major war, we must expect that enemy aircraft will attack our cities and industry with nuclear weapons of mass destruction. That we cannot wholly prevent such attacks from being launched or intercept them before enormous damage may have been inflicted upon us is a matter of common knowledge. In these circumstances, *passive defense* — actions designed to minimize the consequences of bombing on the assumption that the enemy will have at least partial success in getting his planes and bombs through to the targets — becomes a vitally needed supplement to our active defense weapons.

People tend to think of atomic bombs as absolute weapons, pulverizing whole cities at one blow, overwhelming all possible defenses. While the effects of such weapons are in fact enormous, it does not follow that we are helpless in devising protective measures. For example, much of the destruction in the past has been due not to the atomic blast itself but to the general conflagration which followed; fire-resistant construction and strengthening of city fire departments may yield great returns by reducing this latter risk. In addition, shielding can be of great utility in protecting vital machinery, and the reduction of flying glass hazards equally vital for the protection of personnel.

Despite these considerations, as of this moment practically nothing has been done in the way of passive defense. There are several sound arguments which may partially explain this neglect. First of all, there is the question of alternative uses of the money and resources which might be expended on passive defense — perhaps it would be better to spend that money on bombers or on tanks. Secondly, even if it is generally agreed that something should be spent on passive defense, we can come to no concrete decision until we have some idea how far to go in this direction. Finally, the propo-

nents of passive defense have possibly harmed their case by laying excessive emphasis upon relocation, especially dispersal, which is only one of several methods of reducing vulnerability, and by no means always the best.

It is the contention of this paper that at least a partial way out of the present impasse concerning passive defense would be to offer *war damage insurance* to protect property-owners from the chance distribution of losses due to enemy action. It will be shown that an appropriate method of insuring property against war damage can be expected, over a period of years, to encourage purely *private* actions which will, aside from any governmental measures, tend to reduce the physical and economic vulnerability of our cities and industry to enemy bombing. This crucially important effect seems never to have been noted in any of the public discussions of war damage insurance.¹ The desired effect can be achieved by providing the war damage insurance according to a schedule of differential rates — allowing, e.g., relatively cheap insurance to property located in safe areas, possessing bomb-resistant structure, and built of noninflammable materials; and only relatively expensive insurance to property located in dangerous areas, not of sound construction, and susceptible to fire. The subject of this paper is of particular urgency because, as will be shown, alternatives now under consideration would have a positively harmful effect on vulnerability.

The overall objective of such an insurance program is to induce socially desirable private behavior through the mechanism of the price system. Under this proposal, private calculations of profit and loss in terms of differential insurance costs will minimize the role of administrative fiat in encouraging the vitally needed reduction of vulnerability to bombing. Lest hopes be raised too high, it should be pointed out immediately that a number of qualifications make this proposal no short-cut to national

* The author would like to express his appreciation to A. P. Lerner, H. J. Barnett, P. A. Samuelson, and C. J. Hitch for criticisms received in discussions of this problem dating back to early 1951.

¹ Except for a letter to the *New York Times*, July 29, 1951, signed by Professors E. S. Mason, P. A. Samuelson, J. Tobin, and C. Kaysen, which argues in the same direction as does this paper.

safety. (1) The desired objective will not be attained in the short run; a definite improvement may be attained in perhaps ten years, but hardly in one or two. (2) It follows from (1) that, at least for urgently needed improvements, administrative fiat cannot be entirely dispensed with. (3) The argument along welfare lines which is used in this paper is only correct to a rough approximation, since the insurance premiums to be charged will be far from perfect estimates of risk. (4) In addition, there are administrative problems which must not be minimized, as well as serious political objections on the part of interested groups.^{1a} These difficulties will be discussed in detail below. While they undoubtedly weaken the case for the proposal made here, it will also be shown that no available alternative — including doing nothing — is free from objections which, in the author's opinion, are even more damaging.

The Background

The term "war risk insurance" is frequently used to refer to several different types of insurance coverage: (1) insurance of ships and cargoes in war zones, (2) life insurance where enemy action in war is the cause of death, (3) re-insurance of carriers of workmen's compensation insurance where injury or death due to enemy action is suffered while on the job, and (4) insurance against property losses due to enemy action. In this paper, we shall be discussing only item (4), property insurance — hence the term "war damage insurance," rather than the broader "war risk insurance."

The subject is limited in this way in order to keep the paper within reasonable bounds, and there is no intention to minimize the importance of other types of war risk insurance. Insurance against death or injury due to enemy action in war is a particularly important and pressing problem, especially since an insurance program

can be designed to encourage measures tending to reduce human casualties as well as property damage. Such a program could be combined and administered jointly with the program of war damage insurance proposed here. This type of insurance raises, however, various special difficulties which it was thought best to leave aside at this time.

Both the United States and Great Britain had war damage insurance programs in effect in World War II. In each case the program did not become effective until after war had begun, and so did not have time to bring about a more favorable passive defense situation.² Besides these two, a number of other nations had war damage insurance or indemnity programs. An indemnity program is one of government compensation for war damage without any prepayment insurance feature. France and Germany both had plans of the indemnity type.³

The steadily worsening international situation, especially after the opening of hostilities in Korea, led to a demand in the United States for a new program of war damage insurance. A number of bills to reinstitute the World War II program were introduced in both the Eighty-first and Eighty-second Congresses, though none has yet become law.⁴ From our point of view, their most important characteristics were: (1) As in the World War II program, the financing of the proposed War Damage Corporation was restricted to \$100 million of capital stock to be subscribed by the RFC and an advance of not more than \$1 billion from the same agency; and (2) The Corporation was directed to establish uniform rates for each type of property according to an estimate of risk. The House report on H.R. 9802 in the Eighty-first Congress interpreted "uniform rates" to mean uniform with respect

² The American program is described in *Encyclopedia Americana*, 1950 ed., xxviii, 677. For the U.K. program, see *The Economist*, cii (December 15, 1945), 883; and *Monthly Labor Review*, lxxi (August 1941), 371-73.

³ Comparative data and analysis of the war damage insurance or indemnity programs of various countries are available in two studies by the United States Chamber of Commerce. They are entitled: "War Damage Indemnity" (September 1950), and "Analysis of War Damage Indemnity Laws" (October 1950).

⁴ War Damage Corporation Act of 1951, Hearings Before a Subcommittee of the Committee on Banking and Currency, U.S. Senate, Eighty-second Congress, First Session (U.S. G.P.O., 1952).

^{1a} Regional objections to dispersal of war plants have been a stumbling-block for passive defense proposals in the past. As a matter of fact, dispersal (in view of its enormous cost) seems less promising in many (perhaps all) instances than less radical alternatives like shielding machinery. While war damage insurance would offer a cheaper rate to safer areas, it would also give credit to these alternative measures. It is hoped, therefore, that regional objection will be less intense than it was to dictated dispersal programs.

to geographical location. These bills cannot be considered satisfactory since, as will be shown: (1) Financial resources limited to \$1 billion would be quite inadequate, and (2) The restriction to geographically uniform rates would weaken the favorable effect on vulnerability which an insurance program could bring about.

During 1951, the Budget Bureau, on behalf of the executive agencies, opposed all war damage insurance legislation. The Bureau proposed that, instead of a war damage insurance measure, Congress pass an act authorizing the President simply to grant compensation up to the amount of \$22 billion to indemnify those suffering losses from enemy action.⁵ The proposal of the Bureau has the considerable advantage of administrative convenience, since little need be done until the bombs fall. It will be shown, however, that simple compensation programs of this type tend actually to discourage private actions which would reduce vulnerability, thereby *increasing* the over-all national risk. In the author's opinion, if the harmful effect on vulnerability of the Bureau's proposal can be shown, this should be considered a fatal objection to the proposal. In its criticisms of war damage insurance, the Budget Bureau totally missed the favorable effect on vulnerability of insurance and the harmful effect of their own proposal. It is remarkable that, so far as we have been able to discover, even the *proponents* of insurance failed to note this effect in the *Hearings*.

Vulnerability and Differential Rates

In order to influence vulnerability in a favorable sense, it is proposed here that as far as possible war damage insurance rates be based on the risks involved in insuring different types of property. For example, certain locations will be safer than others; certain types of construction will be more resistant to blast and others less; and some materials will be less likely than others to burn and to ignite other structures and materials. In all these cases, it would be desirable to insure the safer property at a relatively low rate, and the poor risk at a high rate. This obviously makes sense from an insurance point of view, though a Fed-

eral War Damage Corporation would not have to be bound by ordinary commercial insurance practice.

Rates and incentives. What is more important is that such a schedule of differential rates will, through the price system, tend to encourage voluntary private actions in the direction of reducing vulnerability to bombing. For every possible step in this direction, an appropriately reduced insurance premium would (ideally) be offered. Clearly, rational self-interest would lead to the adoption of all measures such that the private cost of change is less than the private gain in terms of reduced premiums. When these conditions apply, we may say that, at least as a first approximation, the social cost of change (diversion of resources) is less than the social cost (the risk of destruction) of maintaining the status quo. While movement in the opposite direction (the abandonment of protective measures where the cost of maintaining them is greater than the gain in terms of insurance premiums) is also theoretically possible and will undoubtedly occur to some extent, it is not believed that this will be very important in practice — always assuming that the premiums are correctly adjusted. Underlying this opinion is the belief — based on empirical observation — that our economy has not as yet taken sufficiently into account the new bombing risks. The insurance program should, therefore, lead on balance to a net reduction of vulnerability. As a matter of fact, wherever the costs of maintaining protective measures are greater than fair insurance differentials received, there is a *prima facie* case in favor of abandoning those measures on the ground that the social cost exceeds the social gain.

It may then be asked: Would not the absence of insurance lead to exactly the same result? The answer to this question is yes — in principle — but only under the assumption that the government's policy will be *not to offer compensation for war damage*. In the author's opinion, in the absence of an insurance program, it will be politically impossible for the government not to compensate for damage.⁶

⁶ In the Budget Bureau proposal already mentioned, simple compensation was put forward as an alternative to insurance. The inequity of the fortuitous distribution of

⁵ *Hearings*, pp. 171 ff., 211 ff.

Simple compensation without insurance tends to discourage private efforts designed to reduce vulnerability, since those making the expenditures involved do not gain relative to those who leave their property in a highly vulnerable condition. In fact, simple compensation will encourage the abandonment of any protective measures of nonzero cost as already exist. In terms of the effect on vulnerability, therefore, war damage insurance will be superior to simple compensation. Whether or not it would be superior to no insurance combined with a policy of *not* compensating is a much more doubtful question. Since the combination of no insurance with no compensation is considered close to impossible politically, the question is more of theoretical than practical importance.

The two main feasible methods for spreading the burden of loss are, then, a simple program of government compensation or a scheme of war damage insurance.⁷ It should be noted that partial compensation, being a compromise between simple compensation and no compensation at all, would have consequences for vulnerability intermediate between the harmful effect of the former and the favorable effect of the latter. The improvement with respect to vulnerability, however, is purchased at the expense of the inequity of forcing unlucky individual property-owners to bear the uncompensated fraction of losses due to enemy action.

Participation: Voluntary or compulsory? Should the insurance coverage be completely voluntary? A compulsory insurance program would solve many difficult problems. In particular, there need be no worry about adverse selection of risks (the tendency of poor risks to take out insurance and of good risks to self-insure), because no one has the option of remaining outside the insurance program. In

addition, under a compulsory program it would be possible to make better estimates and projections of the inflowing revenue and better guesses of the probable liability. Perhaps most important of all, 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.

The chief argument against compulsion, of course, is that the latter is always undesirable in principle and might prove unacceptable to the American people in this case. It is possible that some compromise may be adopted, applying the compulsory principle to certain classes of risks and leaving others in the voluntary category. In the remainder of this paper it will be assumed (unless otherwise specified) that a purely voluntary program is in effect. Even in this case, it will be argued, the insurance program will have a beneficial effect.

Structure of rates. According to the arguments developed above, rates should be based on the risks involved in order to achieve the desired effect on vulnerability. The over-all levels of rates should reflect the over-all degree of risk, and relative rates should reflect relative riskiness of different properties. In this section, we shall emphasize relative rates as between properties of differing degrees of risk. The absolute level of rates will be discussed in connection with the financing problem.

What type of actions do we wish to encourage? These fall roughly into three general categories concerning location, construction, and other protective measures. With respect to location, we frequently hear demands for the utmost in the way of dispersal of cities and industry. Even aside from the costs involved, it is by no means clear that dispersal is always wise from the point of view of defense. For example, if a certain limited area could be made invulnerable, it might well be best to concentrate our vital facilities within that area. In general, the advantages in the way of concentrating the defense must be weighed against the increase in attractiveness of the target resulting from concentration. In practice, we would probably like to spread vital facilities far enough apart so that only one at a time would

losses is so generally recognized that the only practical question seems to be whether to spread risk through an insurance program or without such a program.

⁷Differential insurance rates are not the only method for achieving the desired effect. An appropriately differentiated special "passive defense tax" might be levied, or there could be differentiated compensation schemes in which the proportion of loss to be redeemed for various types of risks might be announced to property-owners in advance, to encourage them to reduce vulnerability. These proposals, unlike simple compensation, would all work in the right direction. They have been rejected on grounds of administrative or political impracticality.

fall within the lethal area of a single bomb — but it would be quite doubtful whether we should want to encourage a general migration to the Great American Desert. Popular belief seems to be that dispersal necessarily means relocation in some remote part of the country, whereas mere spreading out of industrial concentrations into the neighboring countryside may be more desirable from the defense point of view.⁸

As far as construction is concerned, it is quite clear that we would wish to encourage the building of new structures and the improvement of existing ones so as to increase the number which will survive the blast and fire dangers associated with atomic bombing. In the book, *The Effects of Atomic Weapons*, prepared under the direction of the Los Alamos Scientific Laboratory, design suggestions for new buildings and for improving existing buildings are made.⁹

In addition to location and construction, we would wish to encourage certain protective measures, both individual and community-wide, which could greatly ameliorate the vulnerability situation. The improvement of municipal fire-fighting organizations (with special attention to the protection from the bomb explosion of the organization itself and of the water supply) and the construction of adequate firebreaks are examples of such measures.

To reflect the degree of risk and to influence behavior appropriately, the rate structure should take all these factors into account.¹⁰ It appears that, for large properties at least, the presently existing schedules of fire insurance rates can be used as a starting point. This is possible because fire is one of the chief agents of destruction. It is also convenient, as it is

likely that the detailed administration of the plan will have to be handled largely through private fire insurance companies (as in the World War II program). In addition, some account would have to be taken of the blast risk as well as of the fire risk. Secondly, and far more importantly, the differential *bombing* risk (depending upon enemy strategy) would have to be superimposed upon the pure fire risk dependent on chance factors.

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 be afraid of. We shall not get optimality, but we can expect improvement.¹¹

The practical effect. The question might well be asked: Will the effect of the proposed program be substantial enough to produce a noticeable reduction in the nation's vulnerability to bombing? It must be remembered, first of all, that the proposal made here aims at a long-run effect — it will not make the United States invulnerable tomorrow. Even granting this, it might be thought that insurance differentials will be only a very small element in the whole complex of factors which influence a firm's decision to locate, for example, in one city or another. Similarly, a typical person will not be inclined to change his place of residence merely because he can get cheaper war damage insurance on his household goods in a different locality.

Arguments of this sort fail to take into account the fact that changes in economic circumstances always influence only persons and firms on the margin. It is not an effective argument to say that a typical firm will not be influenced to move solely by insurance differentials. The *typical* firm may not be induced to

⁸ See National Security Resources Board Document No. 66, "National Security Factors in Industrial Location," July 22, 1948.

⁹ Los Alamos Scientific Laboratory, *The Effects of Atomic Weapons* (September 1950), pp. 376–86.

¹⁰ They should not be revised, however, to take into account the pattern of active defenses. The theoretical justification for this position (there are practical justifications as well) is that the active defense which must be provided for highly vulnerable areas confers an unearned benefit on a special group at a cost to the entire nation. If we lower insurance premiums because of the active defense provided, we lessen the incentive to undertake those vulnerability-reducing measures which would tend to remove the need for active defenses in the area concerned.

¹¹ Space limitations prevent an adequate discussion of this problem, but in support of the above view it should be noted that a considerable body of experience has been accumulated by this date (in actual warfare or experimentation) on such risk elements as the blast and heat effects of atomic and conventional explosives, strength of structures, inflammability of materials, etc. 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.

move, but there will be some firms, perhaps atypical, who were close to the margin of moving anyway. The extra inducement of the insurance will, for such firms on the margin, be sufficient to swing the balance toward change. In fact, if any firm is not induced by profit-and-loss calculations to move, there is a *prima facie* case in favor of the proposition that it *should not move*, since the economic advantages of its present site remain dominant even considering the bombing risk. Furthermore, as we have pointed out, relocation is not the only way, and probably not the most effective way from the national point of view, of reducing vulnerability to bombing; effective and less costly methods of protection will also be encouraged by the insurance differentials.

It will be cheaper, in general, to incorporate vulnerability-reducing features in new construction than to add them to already existing buildings. This is especially clear for drastic changes like relocation, which may require abandonment of such plant, fixtures, and machinery as cannot conveniently be moved. Therefore, it is to be expected that the most powerful influence of the differential insurance rates may be upon the location and construction of new facilities for expansion or for replacement of worn-out or obsolete equipment or plant. In 1951, gross private domestic investment amounted to \$59.1 billion.¹² In addition, there was a substantial amount of investment under the auspices of federal, state, and local governments. It is evident that an enormous amount of new investment will, over a number of years, be subject to the influence of the differential insurance rates.

The costs of change. The various risk-reducing measures to be encouraged by the proposed insurance program all involve certain social costs. These costs are of two types: the direct cost of making the change (e.g., abandoning a still useful plant in a vulnerable area), and the continuing cost either in terms of direct outlay (as in maintaining fire-protection equipment) or loss of economic efficiency (e.g., producing at a safer but economically inferior location). The question before us now is the consideration which should be given to such costs as an argument against attempting to influence vulner-

ability through an insurance program. This objection is, in a sense, opposite to the above argument that the program may not have *enough* effect. Assuming that the insurance rates can be made to reflect the risks, it is maintained that this argument should be given no weight whatsoever.

The reason for this assertion, which may seem extreme, is simply that the existence of the threat of atomic bombing has changed the peacetime situation with respect to the economic efficiency of, say, one location as against another. In all economic calculations from now on, the threat of bombing is a factor which should be given weight. The insurance program does not influence vulnerability by *creating* a new set of incentives; rather, it *reflects*, by inserting the new data into the price system via an insurance mechanism, the situation already created by the threat of bombing. The costs of change represent the normal adaptation of the economy to a changed situation and, presumably, would not be undertaken unless they were less than the costs of maintaining the status quo in the face of the changed situation.

The problem of equity. There is a possible objection on equity grounds to a war damage insurance program embodying a schedule of differential rates based on the risk of loss through bombing. After all, it might be argued, is it fair to charge, for example, safer rural properties lower insurance rates than more dangerous urban ones? Aren't the armed forces supposed to protect the entire country, and don't city dwellers pay their share of taxes?

The counter-argument here is the same as the answer to the objection about the costs of change: differential insurance rates proportioned to risks do not *create* any inequity which may exist, they merely *reflect* it. The "inequity" here is that vested interests are disturbed by the new threat of bombing; they are so disturbed in the absence of any insurance at all. Whether or not there is insurance, a man with vulnerable property is in a poorer position than a man with safe property, although property values may not yet have changed to take this fully into account. We could, of course, attempt to restore the previous status of vested interests by providing insurance either free or without rate differentials according to risk.

¹² *Survey of Current Business* (March 1952), p. S-1.

Aside from the harmful effect on vulnerability which such a program would entail, it could not wholly succeed in restoring the status quo. To the extent that transactions exchanging properties have already taken place at values reflecting the new pattern of risks (reports have been made in the press that the threat of bombing has been a factor in the rise of prices of farm land relative to city properties), the gains and losses occasioned by the changed pattern of risk have already been realized, and the attempt to restore the status quo will result in windfall losses and gains to new owners.

Furthermore, as long as the insurance plan remains voluntary, it is hard to see what valid objection can be brought on equity grounds. The government is not *imposing* a new set of property values; it is rather offering a simple business proposition: does or does not the property-owner want insurance at rates reflecting risks? Assuming that the rates are correctly set — and that is not in question here — is there any justification for a man with a poorly-built house demanding as cheap insurance as a man with a well-constructed house? If the rates failed to discriminate against the poorer risks, the owners of safer properties might well have equally valid grounds for complaint. So long as the program is voluntary, either has the option of not taking out insurance.

The Financing Problem and Average Premium

An attempt will be made to give the roughest sort of guess as to the probable liability of a war damage insurance program. The term "probable liability" is used as opposed to "potential liability"; the latter is the entire value of policies issued, while the former is an estimate of the damage likely to be suffered in actuality by policy-holders. In order to have an average rate level reflecting the degree of risk, the probable liability must be corrected by a factor representing the probability of war, and then divided by the total of policies outstanding. The result of this calculation is the average annual premium.

Since we only want orders of magnitude, we shall simply guess here at figures of \$800 billion in March 1952 dollars of potential coverage.¹³

¹³ This figure assumes full participation of eligible property in the plan. It was arrived at by using \$502.4 billion as the

a 10 per cent damage level,¹⁴ and a 10 per cent risk of war occurring in a given year.¹⁵ Then to get an approximately correct effect on incentives, rates should be set capable of accumulating one-tenth of a fully paid-up fund in the given year. (We wish to set the rates *as if* we were accumulating such a fund; whether or not to establish a reserve fund is a separate problem.) One further modification is that, for reasons to be explained later, at a 10 per cent damage level it will only be desirable to compensate at the rate of 90 per cent for losses.

This calculation would require \$7.2 billion to be paid in during the given year. (No adjustment for interest is made.) Since the figure for total wealth insured is \$800 billion, this implies an annual premium of 0.9 per cent of value on the average. The rate could conceivably go up to almost 10 per cent for property whose complete destruction was certain in the event of war and, on the other hand, would be essentially zero for exceptionally safe property. It will be noted that the fiscal problems involved in handling such collections will be of the first magnitude.

These problems are in one respect mitigated but in others made worse by the probability that the plan will be, as discussed here, voluntary rather than compulsory. The fact that no one needs to sign up will mean that the potential liability, the probable liability, and the required premium income will all be less by an unknown but probably large factor. This will reduce the magnitude of the financial problem, but will leave the average rate required as high

value of reproducible tangible assets in the United States in 1946 (in R. W. Goldsmith, "A Perpetual Inventory of National Wealth," *Studies in Income and Wealth*, vol. xiv, published by the National Bureau of Economic Research, p. 18), other types of property being considered uninsurable. A March 1952 figure was arrived at by the rough device of assuming that this element of national wealth was in the same proportion to current gross national product at that date as it was in 1946. The exact figure derived by this procedure was \$807.7 billion.

¹⁴ Such a figure seems too high for the current situation, but as atomic stockpiles of potential enemies mount it becomes more reasonable.

¹⁵ While guessing at this figure for each year is particularly dubious, such a procedure is implicit in our recurrent budgetary decisions on national defense; for example, deciding to what extent we should invest in increasing productive capacity for the future as an alternative to building up military stocks today involves much the same estimate of probabilities.

as before. In fact, the element of adverse selection will tend to raise the average rate required.

The chief problem connected with a voluntary insurance program, however, is the fact that 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 — especially since the premium rates will necessarily be rather high. In theory, the check on this should be variation of rates over time to take account of the changing risks. Another check, and one that might well be very effective, would be the granting of policies which do not become effective except after a waiting period of perhaps a year or six months. Such a provision would make speculation on the probability of war very dangerous, since one would have to guess about the situation six or twelve months from now, and not about the very immediate future. These and other devices should enable the War Damage Corporation to hold down speculation on the probability of war (adverse selection in respect to time) to a tolerable level.

The loss figures shown above assume complete coverage. Let us say that only 50 per cent of potential coverage is written. This may come about because some property-owners fail to take out policies or because some or all policies may be written with a coinsurance feature (where the insured continues to bear part of the risk, only a fraction being covered by the insurance policy). If the rate remains about the same,¹⁶ annual premium income will be about \$3.6 billion, reflecting potential liability of \$400 billion and probable liability of about \$36 billion.

The proposed War Damage Corporation Acts of 1950 and 1951 would have given the Corporation resources of \$1.1 billion. These figures show that, unless our estimates are wildly in error, the scope of the program was completely misconceived. In fact, a single bomb in certain highly valuable and concentrated areas might create valid damage claims in excess of a billion dollars.

The Budget Bureau's simple compensation proposal referred to earlier called for authority to expend up to \$22 billion for compensation

purposes. This figure corresponds to our \$80 billion of probable damage to the entire economy, if we can assume that the Budget Bureau figure represents an estimate of over-all national loss. Without an extensive study, it cannot be decided whether our guess or the Budget Bureau's estimate (if it is such) is likely to be closer to the truth.¹⁷ Accepting the Budget Bureau's figure for probable damage while retaining our other assumptions would reduce the annual premium income with full coverage and the average rate of premium required by a factor of about four — that is, to about \$2 billion and 0.2 per cent of value, respectively. This lower premium rate would certainly make the insurance more palatable, though less powerful in reducing vulnerability. The lesser effectiveness of lower rates is not necessarily an argument against them, for the optimal effectiveness depends on the unknown true degree of risk.

At this point the reader may quite justifiably be worried. We have made blind guesses at the over-all probable loss and the probability of war, but will anything better than a blind guess ever be possible? If not, we might set rates so as to push people into less vulnerable situations ten times too fast relative to the true risks, or else not one-tenth fast enough!¹⁸ This objection is undoubtedly a serious one and it further weakens — to the vanishing point, some will think — the force of the welfare arguments used initially.

Nevertheless, we must always view the problem in terms of the alternatives, and especially the leading alternative — simple compensation. If we do not move fast enough, we are at least going in the right direction, while simple compensation would be pushing us in the wrong direction. We might indeed move too fast, but in view of all the administrative and political pressures in favor of the status quo, the danger of moving very much too fast seems quite slight.

It should perhaps be noted that any attempt

¹⁷ It will be remembered that our figure was based on 10 per cent damage, an estimate which was considered high for the immediate future but possibly low for the more distant period.

¹⁸ There is a further complication in that the true risks are not constant but depend on enemy strategy, which may well be affected by our decisions on passive defense.

¹⁶ The element of adverse selection will tend to increase it, while coinsurance tends to decrease the rate required.

to reduce vulnerability, whether or not through an insurance program, would face the same difficulty of deciding how quickly the change should take place. In fact, some estimate of the probability of war and the over-all risk of loss is implicit in all decisions relevant to national defense. The necessity of setting an over-all level of risk for war damage insurance would only force this estimate to be made explicitly.

Reserves and compensation. We cannot here enter into a discussion of proper reserve and compensation policy, but it will be useful to make clear what the fundamental objective of this policy should be. Without extended argument, we shall assert that the objective—which we shall call the Equitable Principle—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 from the Equitable Principle that the proportion of actual loss compensated should be 1 minus the over-all proportionate loss of national wealth; if, for example, 10 per cent of the national wealth is destroyed in the bombing, the real value of the compensation should be at the rate of 90 per cent of the real value of the loss. This calculation assumes that money and other claims to wealth are not destroyed, or else that such assets are separately insured under a parallel program, as they were in World War II.

An ordinary insurance company must have a reserve fund in order to maintain solvency in periods when cash outgo may exceed cash income. For war damage insurance, in the period before war comes there will be only income and no outgo; should war occur, however, outgo is likely to exceed income by far. If, therefore, the War Damage Corporation is to operate on sound insurance principles, it might seem absolutely necessary that the Corporation build up a reserve fund to meet its future liabilities. However, there is a fundamental difference between liabilities of private individuals or corporations and liabilities of the government, and so it does not necessarily

follow that the War Damage Corporation—an instrument of the federal government—must or even should follow sound business practice appropriate for a private insurance company. By its taxing power and its ability to create money, the government is in a position to call into existence assets to meet its own liabilities. With respect to war damage insurance, this means that after the bombing the government can create purchasing power in favor of those who have lost property in the bombing or can tax the rest of the population so as to achieve the Equitable Principle of restoring the relative position of the former—without accumulating any reserve at all.

Whether it would be wise to conduct the insurance program without a reserve can only be determined by an exploration of the likely consequences of the several different possible policies, which cannot be done within the limits of this paper. We may merely mention that, in the absence of a reserve, the appropriate procedure to redistribute the remaining national wealth would involve a capital levy. In all probability, a very considerable inflation would be unavoidable. To the extent that a reserve exists, of course, assets will be available for meeting compensation claims without calling on the general credit of the government.

The Proposed Program and Alternatives

There are a number of possible actions the government might take which are not alternative to the insurance program and so are not precluded by it. These actions include making some specified reduction of vulnerability a condition for the granting of government contracts, certificates of necessity for accelerated tax amortization, or priorities and allocations under the defense production program. Such direct measures will be appropriate where special circumstances (e.g., new construction of a facility in a highly critical industry) make reliance upon the milder generalized pressure of the insurance program insufficient. The Committee Staff of the Congressional Joint Committee on the Economic Report has proposed the use of such devices.¹⁹ Unfortunately, the report proposed them only in connection

¹⁹ Eighty-second Congress, First Session, Joint Committee Print, "The Need for Industrial Dispersal."

with dispersal, which is only one of the aspects of the vulnerability problem. Because of the dangers involved in arbitrary *ad hoc* decisions varying from case to case, direct intervention should probably be limited to special situations concerning critical industries.

Even after all qualifications are made, this review indicates, in the opinion of the author, that a great opportunity to influence vulnerability in a favorable direction will be lost if we fail to provide a suitable type of insurance for war damage. In the absence of such a program, political realities will probably require compensation for damage. The expectation of compensation will encourage a socially harmful type of behavior with respect to vulnerability.

On the other hand, even if we do offer an insurance program, the effect on vulnerability may not be favorable unless rates are proportioned to risk. Such differentiation of rates was done only in the most perfunctory fashion in the World War II program. At that time, the fault was not important because (1) the risk was not very great, and (2) the effect on vulnerability can be only a long-term one, and the insurance program was not put into effect until after war had begun. Nevertheless, the element of adverse selection, which always appears when rates are not properly proportioned to risk, was very conspicuous in the

World War II program.²⁰ For a prospective future war, neither of the factors mitigating the failure to differentiate will apply. The risk of damage due to enemy action is liable to be great, while on the other hand war may not come for a number of years or may not come at all. Therefore, we have both a great need for insurance and an opportunity to introduce it early enough to have a large effect on vulnerability. This effect will not be achieved unless considerable care is exercised in establishing rates according to risk, and this will not be done unless the connection between the insurance and the vulnerability problem is recognized by the federal government. Such has not been the case up to the present time.

Finally, it should be recognized that the financing problem will be of an entirely greater order of magnitude than it was in World War II. This problem merits the close attention of those responsible for fiscal policy and for the over-all behavior of the economy. The results may be positively dangerous if the program is narrowly conceived as only a special form of insurance, and left solely in the hands of a small agency with purely insurance responsibilities.

²⁰ A tabulation of the policies issued shows a highly disproportionate amount of policy coverage in the coastal states (the most vulnerable regions) as opposed to, say, the Midwestern States. See *Encyclopedia Americana* (1950 ed.), xxviii, 677.