

An Insurance System for Peace

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1. Introduction

Two approaches or research strategies can be distinguished from which useful contributions to peace science can be expected.

Rigorous Analysis of Well Defined Problems. This type of work is nowadays the rule in economic theory and is very quickly gaining ground in peace research (Lambelet 1971; 1972). Its final goal is the testing of hypotheses. While its advantages are obvious, it should not be overlooked that this type of analysis favours the following tendencies: (1) large and increasing distance from practical problems and reality; i.e. theorizing becomes an end in itself; (2) the "well defined" problems treated may in a larger context turn out to be irrelevant and their solution may even lead to an overall suboptimum; (3) the analyses may contribute little towards the achievement of peace, i.e. are too little action-minded.

Speculative Analysis. This second type of peace research strategy is concerned with the "grand" issues and is little interested in neat theorems and solutions. Its main goal is to open new avenues for thinking and to advance unconventional ideas (Galbraith 1958; 1967).

The present paper endeavours to make a contribution to the second type of peace research—being well aware that *both* types are necessary and that one alone is not sufficient. The following four basic ideas are combined in the concept of a *World Insurance System*.

In the international system practically only *negative sanctions* (e.g., boycotts) are used, though both theoretical and empirical work shows that they work inefficiently and are a major threat to peace. It is proposed that *positive sanctions* should be used which have shown excellent results, especially in federal states.

The international system may be analysed as a Prisoners' Dilemma of game theory. It can be shown that the only stable equilibrium consists in mutual armaments, i.e. a configuration in which every country concerned is worse off than in a world without armaments; a situation which economists

call Pareto-suboptimal. The problem consists in finding ways and means to change the pay-offs such that the stable equilibrium occurs at a Pareto-optimal situation. It is suggested in the paper that a "guarantee" for territorial integrity given by the International Insurance System to those nations paying a premium could achieve this purpose.

The international bodies in today's world (such as the UN or the Red Cross) are concerned too much with *ex post* intervention after war has broken out or has already ended. Effective peace action should, however, be directed *ex ante*, before the clash has occurred. It is suggested that this may be achieved by positive sanctions in the form of subsidies for disarmament.

Much development aid goes directly and (more importantly) indirectly into armament which acts as a serious impediment to the urgently needed rise out of material misery. The paper proposes that development policy should be joined with peace policy by linking aid to disarmament which will increase the efficiency of both policies.

The analysis and peace plan developed are realistic in that (1) it is not simply assumed that an international body has sufficient power to coerce nations to behave peacefully. Rather it is suggested that peacefulness can be induced also by positive sanctions, and it is shown how the proposed World Insurance System can muster sufficient resources for coercive action (negative sanctions) in those few cases deemed necessary. (2) Neither is it assumed, of course, that peace can be achieved simply by admonitions and moral suasion. Reality has often disproved hopes in such easy solutions.

2. The Basic Problem of Armaments

The mutual armament of nations can be interpreted in a great many different ways such as psychological factors or the inherent "badness" of political leaders or of whole peoples. This view is not followed here: it is assumed that each nation looks for its own advantage, that it is neither particularly benevolent nor malevolent.

Mutual armament is viewed as the outcome of social action of interacting nations. The Prisoners' Dilemma of game theory (Luce and Raiffa 1957; Rapoport and Chammah 1965) gives an excellent picture of the situation. Despite its strong simplifications (especially that only two players—here nations—are considered) it is able to bring to the open essential interdependencies leading to armament and, finally, open aggressions.

The Prisoners' Dilemma in the International System

Consider two nations which may either be armed or disarmed. "Armament" is defined here as the (exhaustive) government expenditure

| | | Nation 2 | |
|----------|--------|--------------------------|----------------------------|
| | | Disarm | Arm |
| Nation 1 | Disarm | -500 -1 000 -500 | -300 -1 500 -1 200 |
| | Arm | -1 200 -1 500 -300 | -1 000 -2 000 -1 000 |

FIGURE 1

for what is usually called "defense." It is taken to amount to 1,000 MU (monetary units, e.g., 1,000 million dollars) per year. "Disarmament" is not taken to mean that there are no expenditures for defense at all, but rather that they amount to only 500 MU per year. For simplicity, it is further assumed that a given decrease in armament expenditures leads to an equivalent increase in civilian production, i.e. the size of GNP is independent of its composition.¹ If both countries are simultaneously in a state of "Armament" (A) or "Disarmament" (D) no net transfer of income (or wealth) is assumed to take place. If, however, only one country arms, the disarmed country is "exploited" either economically (e.g. by the imposition of unfavourable terms of trade or plain robbery) or psycho-

1. Being a professional economist the author is aware that this need not necessarily be so. However, the thrust of the paper being different, the simplest case possible is taken. Moreover, studies of disarmament have proved that with the help of modern fiscal and monetary policy negative effects of disarmament on the level of GNP can be neutralized. (See Benoit and Boulding 1963; Council of Economic Advisers 1965).

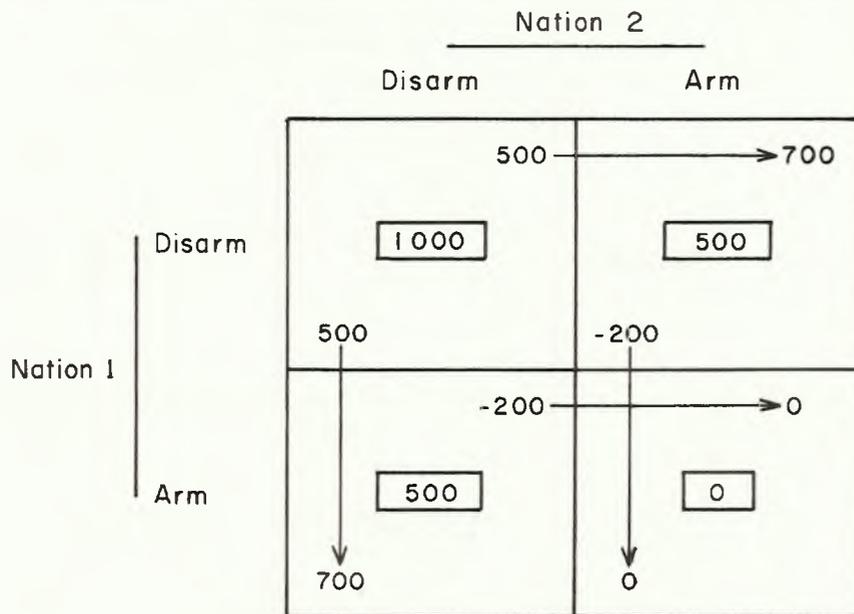


FIGURE 2

logically. The monetary equivalent of this exploitation amounts in the numerical example to 700 MU.

The two countries are thus confronted with the following situation:

The numbers (pay-offs) to the left and on the bottom refer to Nation N_1 , indicating the resource loss in monetary units, the ones to the right and on top to Nation N_2 , and the ones framed and in the center are their sum. A "disarmed" country expends 500 MU for defense, to which a further loss of 700 MU is added if it is confronted with an armed other nation, thus totalling—1,200 MU. An armed country expends 1,000 for defense, which is reduced by 700 MU if it can exploit a disarmed other nation, totalling—300 MU.

In the following mutual armament will be considered the reference case (as it corresponds to reality), so normalization implies the addition of +1,000 MU to each member in Figure 1, giving Figure 2 in which the reference constellation of mutual armament is composed of zeros.

As is well known, and indicated by the arrows, stable equilibrium obtains with mutual armament, in which total pay-off amounts to zero and is the worst situation possible. The Pareto-optimal situation of mutual

disarmament (total pay-off + 1,000) is unstable; each nation has an incentive to deviate and to arm. Game theory proves that the same unfortunate outcome obtains with repeated plays (Luce and Raiffa 1957). Empirical (laboratory) tests have come to a somewhat different result (especially because the element of trust and learning comes in), but it still turns out that the Pareto-optimal situation is unstable and that there is always a tendency to end up in the worst possible state.

A way out of the Prisoners' Dilemma only seems possible if the reward structure is changed such that it is no longer advantageous to deviate from the Pareto-optimal situation. This paper endeavors to devise a scheme for that purpose.

3. Negative and Positive Sanctions

Negative Sanctions

In the international system the orthodox and most often used instrument to get nations to behave "peacefully" is negative sanctions. It may take the form of economic boycotts and/or the exclusion from normal political, diplomatic, cultural and sport contacts. This instrument is used not only by individual nations (such as the U.K. against Rhodesia) but also by international organizations such as the League of Nations and the UN which are especially designed to further world peace.

The outcome of using negative sanctions in the international system must be judged an almost complete failure, if not in itself a source of increased world tension. This is shown by purely theoretical as well as by empirical considerations.

From the point of view of theory, negative sanctions of any kind are part of the threat system which has the unfortunate characteristic that it tends to turn into a negative sum game (i.e. all nations are worse off). Threats are only credible if they are sometimes put into effect just to prove that one is actually willing to employ them (Boulding 1969; 1970). Moreover, negative sanctions affect large sections of the population indiscriminately whether they are for or against the policy toward which the sanctions are directed. Especially authoritarian regimes do in this respect welcome such negative sanctions as they lead to solidarity within the nation. Those people suffering under the sanctions either economically or in their pride, have then little alternative but to stand behind their own government (Schelling 1963). Negative sanctions thus tend to set off cumulative movements towards armament and military conflict.

An empirical study on the effects of international economic sanctions against Rhodesia (Galtung 1967) confirms the theoretical reflections. A main reason for the bad outcome is that "the collective nature of economic

sanctions makes them hit the innocent along with the guilty" (390). It must be concluded that theory, empirical studies as well as historical experience all come to the conclusion that negative sanctions are ineffective and extremely badly suited to further peace in the International System.

Positive Sanctions

Another instrument to induce nations to comply, i.e. to make them behave "peacefully" and to disarm, is to reward such desirable actions. Positive sanctions (transfers) are one of the most important means to get federal subunits to act in the interest of the whole country. The fact that almost all nations are "federal" (in the sense that they are partially independent subunits, essentially steered and coordinated by transfers) gives some indication of the evident success of positive sanctions in reality.

The theory of externalities and of property rights (Mishan 1971; Furubotn and Pejovich 1972) which is concerned with the unaccounted for (negative) effects of one unit's behaviour on the other(s), heavily relies on transfers as an efficient means to reach Pareto-optimal conditions which would otherwise not be attained. It is the merit of these theories to point out that in any such situation two parties are involved, the one which harms and the other which is damaged. In fact it has been proved (Coase 1960; Buchanan and Stubblebine 1962) that it is irrelevant to the outcome whether the one harming compensates the damaged, or the damaged compensates the one doing the harm.²

Why Are Negative Sanctions Used?

It is not easy to explain why negative sanctions are so widely and consistently used (even by international organizations designed for peace) despite their obvious and repeated failure. There seems to be a pathological learning effect functioning.

Positive sanctions in the international system are against intuition because they seem to benefit those nations behaving "badly" (e.g. having armed up in the first place) which is repellent. The following sections want to show that these accepted and traditional views consider at best only one part of the problem.

4. The World Insurance System

Guarantees and Their Fulfilment

Having discussed that positive sanctions are by far preferable in the international system the problem is how such positive sanctions can be

2. This refers, of course, to the allocational outcome, only, not the distributional.

put into practice, especially how the necessary resources (money) can be raised.

Viewed in the context of the Prisoners' Dilemma model as applied to armaments, the task is to make it impossible that a disarmed country is "exploited" by an armed country. In terms of Figures 1 and 2, the boxes south-west and north-east must be made unattractive from the point of view of each individual country. This can be achieved by a "guarantee" given by an international body—in the following called *World Insurance System* (WIS)—in which any country willing to take the insurance can rely on for its physical and political integrity. This guarantee is secured by the World Insurance System by one of the following means.

Positive Sanctions. WIS will pay any country reducing its armaments and will "buy off" aggressive behaviour.

Compensation. Under some circumstances, the country(ies) damaged by aggressive nations due to their disarmament may be compensated for by equivalent territories or (more likely) by sums of money.

Negative Sanctions. Only if (a) and/or (b) do not achieve their purpose to protect the countries insured, negative sanctions will have to be used, i.e. military intervention by WIS to fight back aggressors.

All three instruments require resources (money). The income necessary is derived from the premium of countries insured. The World Insurance System is run by a decision-body (Council) in which the nations taking the insurance are represented in *reverse* proportion to their level of armaments and aggressiveness. This distribution of seats ensures that those nations with proved expertise in peaceful behaviour have the largest say in running WIS. As the insurance premium will be the lower, the less expenditures there are, the council of WIS will have an incentive to use the most efficient combination of instruments to secure the "guarantees." In particular, it has an interest to act before any conflict has actually led to violence and physical aggression, because in most cases the cost of intervention (mostly non-military) is lower in that preliminary stage.

WIS' activities can be split up in two major groups: (i) the setting of rules concerning the premium for insurance, compensation and positive sanctions (subsidies) for disarmament; and (ii) Discretionary action with respect to positive and negative sanctions covering all extraordinary cases of potential threats to the "guarantees" which cannot be adequately handled by predetermined rules.

The Point of View of Individual Countries

Every country may decide according to its own advantage whether it wants to participate in the Insurance System. It compares the "guarantee" given by WIS (and its likely failure) with the premium it has to pay.

A second decision closely linked to the above one is whether a country

should disarm. Here the comparison is between the subsidies received for disarmament and the loss of its own military power. It is to be expected that a nation which does not find it worthwhile to ensure neither disarms (or at least will not take the initiative; but if many other countries disarm it might follow). A nation, however, which considers the insurance advantageous, will find no reason to keep up its own army at the previous strength and will strongly benefit by taking the subsidies paid out for disarmament.

It might appear that it is impossible for WIS to make the insurance and subsidies sufficiently attractive (i.e. to keep premiums low enough and subsidies high enough) to induce many countries to join. It will be shown that there is good reason to assume that this is indeed possible, the clue being that the present situation of mutual armament is Pareto-suboptimal and that disarmament frees huge resources from which only a relatively small part needs to be taken for the scheme proposed.

5. Subsidies and Premium

This section will be devoted to the rules set up by WIS with respect to positive sanctions and premiums. Little general comments can be made about its discretionary actions which are by definition unforeseeable and atypical. One point is obvious, however: when the WIS "buys off" aggressive behaviour at special terms it must be careful to make such subsidies unpredictable because otherwise it would constitute an incentive for any country to seemingly "play aggressive" in order to receive the correspondingly higher subsidy for subsequent disarmament.

The Rules for Disarmament Subsidies.

The subsidies should meet two requirements.

They should be large enough to induce countries to reduce their level of "Aggressiveness" A . (Efficiency requirement).

They should not be such that it is advantageous for countries to first increase armaments in order to reduce it all the more thereafter. This would be counterproductive to WIS' goal of reduction of armament and aggressiveness. (Systems stability requirement).

The regular subsidy will be composed of two kinds of transfers depending on different factors:

(a) a subsidy $S_{\Delta A}$ given for an absolute decrease in "Aggressiveness" A :

$$S_{\Delta A,t} = \phi[-\Delta A_t]; \quad \phi' > 0 \quad (5.1)$$

(b) a subsidy $S_{\bar{A}}$ given for an "Aggressiveness" level A below the country's own recent history \bar{A} :

$$S_{\bar{A}} = \Psi [(A - \bar{A}), t]; \quad \Psi'_1 < 0 \quad (5.2)$$

This subsidy serves to reward nations which keep their current level of "aggressiveness" consistently below what they have been used to in the past. Function Ψ will also take into account the length of time over which this continuous disarmament effort has been going on: the longer, the higher the subsidy. This will ensure that (i) it does not pay to rearm in order to receive a higher disarmament subsidy later on; and (ii) auto-dynamic forces arise which make further disarmament easier as people and social units become more and more used to it (e.g. expectations are oriented in this direction making the necessary economic adaptations easier).

The Definition of "Aggression"

It is now high time to define what is "aggressiveness." "(Current) aggressiveness," A , is an index composed of two main indicators.

Physical Aggressiveness. This may in turn be potential only, mainly consisting of the size of armaments, measured, e.g., by expenditures in MU or the number of soldiers and the many different kinds of hardware. The size of armaments expenditure is the most important component of the index of A , in the sense that much is achieved for world peace and world welfare if it can be reduced. It is also relatively simple and objectively measurable. For this reason aggression and armament are often used exchangeably in this paper. Actual physical aggression consists in the use of potential A ranging from small "unfriendly acts" to all-out war.

Mental Aggressiveness. Mental aggressiveness is less important than physical aggressiveness because it does not directly consist in the waste of resources and physical violence. It could, e.g., be measured by screening official documents, government leaders' speeches, semi-official newspapers, etc., for their "friendliness/unfriendliness" content towards other nations. Besides these there are many other possibilities, into which there is no need to go into here, but which are (partly) already currently analyzed by peace researchers and political scientists.

The exact composition and the weights must be determined through a political act by the WIS council. One of its most important tasks is to specifically state which actions in the international systems are "unfriendly," "hostile," "war" etc. The official statement of the Council is of considerable consequence to the nations involved because (as has been seen) subsidies depend on it and also (as will shortly be seen) insurance premiums.

Besides "(current) aggressiveness," A_t , of a country there exists a long run or normal level of aggressiveness \bar{A} which is a geometrically declining weighted sum of past current aggressiveness, A_{t-j} , ($j = 0, 1, 2, \dots$).

$$\bar{A}_t = (1 - \lambda) \sum_{j=0}^{\infty} \lambda^j A_{t-j}, \quad 0 \leq \lambda \leq 1, \quad (5.3)$$

or, after a Koyck transformation,

$$\bar{A}_t = \lambda \bar{A}_{t-1} + (1 - \lambda) A_t. \quad (5.4)$$

For $\lambda = 1$, $\bar{A}_t = \bar{A}_{t-1}$ and the long run level of Aggressiveness stays constant; for $\lambda = 0$, $\bar{A}_t = A_t$, and the long run equals the current level of aggressiveness, i.e. there is immediate adjustment.

The Insurance Premium

If the analogy to private insurance were taken, one would be tempted to set the premium according to a country's danger of being damaged by aggression by other countries. This would, however work completely against the goal of the whole scheme, namely to reduce aggression. Those countries disarming would be punished by having to pay the highest premium (and the reverse).

If international politics is looked at as a unified system as is done here, it becomes clear that the rate must be set according to the insured country's own level of aggressiveness. The higher a country's A , the higher the premium to be paid. Looked at system-wise, and taking into account the Prisoners' Dilemma model, an increase of a country's aggressiveness induces an increase in other country's armaments (aggressiveness) which in fact decreases the security level of the first country. Each country is thus made responsible for the reactions which its own actions call forth by an appropriate insurance premium. Externalities are internalized.

Thus

$$P_{it} = h(A_{it}, O_{it}); \quad h'_A > 0 \quad (5.5)$$

O_i is a set of "objective factors" which also influence the size of the premium P_i of country i . It is composed of elements such as the respective country's land size, its size of population, and, most importantly, its per capita income.

The premium can be paid either in money or in terms of soldiers and military hardware. The Council of WIS sets the relative prices of the latter so as to have the right mixture between money necessary for positive sanctions and compensation and military means for negative sanctions.

6. Numerical Example

Assumptions

In order to illustrate the ideas suggested a very simplified numerical example is presented which highlights some aspects while necessarily leaving other aspects out of account. The purpose is to show the following.

It is possible that WIS has such a high premium income that after having paid out "normal" positive sanctions there is a considerable surplus which may be used for "extraordinary" subsidies and for the financing of negative sanctions.

The rules for granting subsidies for disarmament may be set such that it does not pay a country to first increase armament in order to be able to reduce it all the more later on.

The following strongly simplifying assumptions are made:

(1) There are only two countries (N_1 and N_2) of which N_2 maintains a constant level of armament of 1000 MU p.a.

(2) "Aggressiveness" A consists solely of armament expenditures such that no measuring problem arises.

(3) Only "normal" positive sanctions are considered.

(4) The period looked at only covers ten years.

(5) The rate of interest is nil.

The explicit formulae for the determination of the two kinds of subsidies and the premium are:

$$S_{\Delta A, t} = \alpha(-\Delta A_t)$$

$$\alpha = 0.30$$

$$S_{\bar{A}, t} = -\beta \cdot \gamma_t (A_t - \bar{A}_t)$$

$$\beta = 0.05$$

$$\gamma_t = 1, 1.2, 1.4, 1.6, \dots$$

for each consecutive time period in which armament is reduced by more than 10% ($\Delta A/A < -0.10$)

$$P_t = -\mu A_t$$

$$\mu = 0.15$$

(disregarding the influence of other factors combined in O)

TABLE 1
Numerical Cases of the Functioning of WIS
(numbers refer to Monetary Units (MU) over a decade)

| | | case 1 Reference case | case 2 Constant disarmament | case 3 First arm then disarm | case 4 Repeated armament and disarmament |
|--|---------------------|-----------------------------|--|---|---|
| 1. Armament expenditures over time (from $t = 0$ to $t = 10$) | A_t | constant 1000 | 1000, 900, 800, 700, 600, 500, then constant 500 | 1000, 1200, 1400, 1000, 700, 500, then constant 500 | 1000, 1200, 1400, 1800, 2000, 1000, 1200, 1400, 1800, 2000, 1000 |
| 2. Disarmament subsidies: | | | | | |
| (a) for absolute decrease | $S_{\Delta A}$ | 0 | 150 | 270 | 600 |
| (b) for long run decrease | $S_{\bar{A}}$ | 0 | 216 | 212 | 86 |
| (c) total | S | 0 | 366 | 482 | 686 |
| 3. Gain through armament reduction | $\Sigma_t \Delta A$ | 0 | 4000 | 2700 | -4800 |
| 4. Total "Gross Gain" (sum of 2 and 3) | | 0 | 4366 | 3182 | -4114 |
| 5. Insurance Premium | P | 0 | 900 | 1095 | 2070 |
| 6. "Net Gain" | | 0 | 3466 | 2087 | -6184 |
| 7. WIS "surplus" (=5 minus 2) | $(P - S)$ | 0 | 534 | 613 | 1384 |

$$A_t = \lambda \bar{A}_{t-1} + (1 - \lambda) A_t$$

$$\lambda = 0.80$$

Various typical cases

Four cases are distinguished (see Table 1).

Case 1: The Reference Case. N_1 maintains constant defense expenditures of 1000 MU p.a. and does not participate in the insurance.

Case 2: Constant Disarmament of an Insured Country. For five periods, country N_1 reduces its defense outlays by 100 MU each year, thus going from 1000 MU down to 500 MU, thereafter holding it constant. As is shown in Table 1, the subsidies received for continually staying below its own armament record ($S_{\bar{A}}$) are larger than those received for once for all reductions ($S_{\Delta A}$). Total positive sanctions amount to 366 MU over

ten years, to which comes the huge gain due to the additional resources usable for civilian purposes by reducing defense outlays (4000 MU over the decade). The insurance premium comes to 900 MU over the whole period such that the "net gain" to country N_1 reaches 3466 MU. The World Insurance Company has an income of 900 MU, and expenditures for positive sanctions of only 366 MU.

Case 3: First Arm, Then Disarm. It is now tested whether N_1 can under the particular assumptions made outwit WIS by first building up arms (from outlays of 1,000, 1,200 and 1,400 MU) in order to reduce them thereafter (to 1,000, 700 and finally 500 MU in Period 5) then holding them constant for the remaining time. Indeed, the subsidies for disarmament received are larger than in Case 2 ($S = 482$ MU), due to a larger $S_{\Delta A}$. However, the premium ($P = 1095$ MU) is also much higher and the resources freed from defense are lower (only 2700 MU).

The "net gain" amounts to 2087 MU over the decade, being smaller than in Case 2 (3,466 MU). WIS receives a higher surplus of income over subsidies (613 vs. 534 in Case 2) which should allow it to meet also the increased danger to world peace brought about by the initial armament increase.

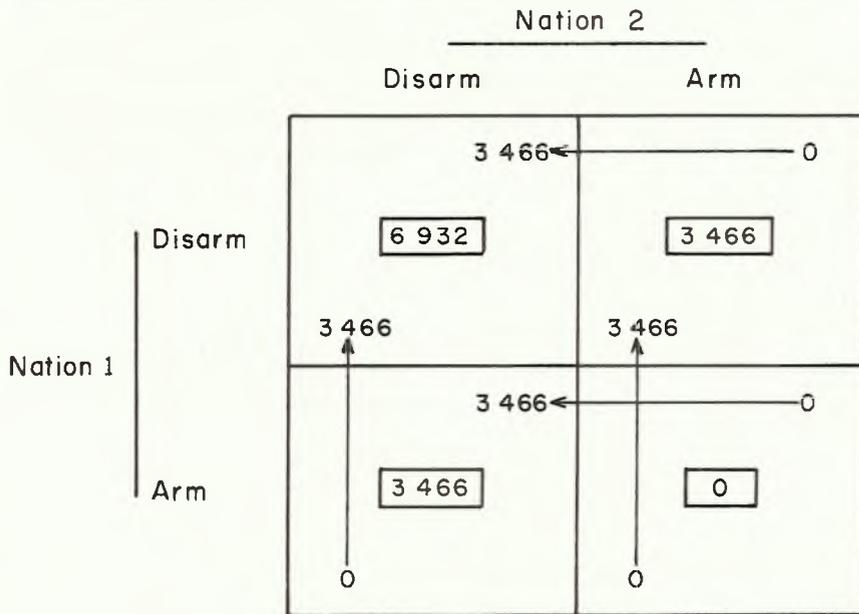


FIGURE 3

Case 4: Repeated Armament and Disarmament. Here it is assumed that N_1 increases defense expenditure from 1,000 up to 2,000 MU in Period 4, to drastically reduce it to 1,000 in Period 5, and then to increase it again up to 2,000 in Period 9, with 1000 MU in the last period.

These sudden spurts of disarmament lead to considerable positive subsidies of the one kind ($S_{\Delta A} = 600$ MU), but little of the other ($S_{\bar{A}} = 86$ MU). Instead of a gain, there is a loss of resources for civilian use of 4,800 MU. The insurance premiums are much higher ($P = 2,070$), such that the "net gain" is strongly negative ($-6,184$ MU over the decade). WIS makes an even higher surplus ($2,070 - 686 = 1,384$ MU).

It may be argued that a country which is on average arming up (with N_2 staying put) does not need to insure. Due to the heavy loss of civilian resources, the tactic of increasing defense to reduce it thereafter is neither worthwhile for N_1 in this case: there is still a "net loss" of 4,114 MU.

Discussion of the Numerical Example in the Prisoners' Dilemma Framework.

The results of the previous section may now be discussed using the Prisoners' Dilemma. Assume for that purpose that the two players (countries)

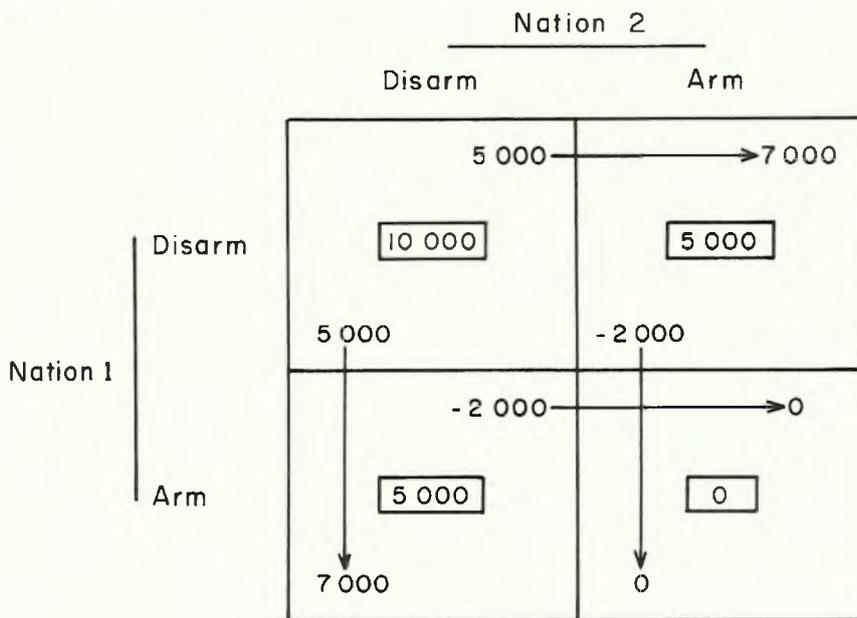


FIGURE 4

behave symmetrically, and that—if there is disarmament—the development of Case 2 applies.

It can be seen that unlike when there exists no insurance (Figure 4), all movements are towards the Pareto optimal situation (box north-west in Figure 3) which is a stable equilibrium. Each nation finds it advantageous for itself to move from "armament" to "disarmament" quite irrespective of what the other nation does. It is clear that besides the positive subsidies the "guarantee" given by WIS to insured and disarming countries plays a crucial rôle. This is also reflected in the fact that the sums of pay-offs are everywhere *smaller* in Figure 3 (and equal in the reference case of mutual armaments) because there must be finance available for potentially necessary negative sanctions. A comparison of the outcome shows, however, for the insurance system proposed a much more favourable result for all nations taken together, as well as for each individual country taken individually.³

Disarmament and Aid to Developing Countries

A considerable part of the aid given to developing nations either for humanitarian reason or to further the material standard of living is used for military purposes. This may happen directly (which is obvious) or, more importantly, indirectly: civilian imports (e.g. investment goods) are not *pro tanto* increased as aid is received. The level of civilian imports brought up by the country itself with its own effort is reduced and the foreign exchange saved is used for imports of military goods. This happens whether development aid is in money or in kind (Frey 1974). There are two possibilities within the scheme discussed which act against the unfortunate tendency to use development aid for military purposes. The insurance premium payable by developing countries may be set at a very low level such that these nations can "buy" the security "guarantee" at even more advantageous conditions than other nations. This reduces the necessity to keep up or even increase defense efforts.

Developing aid may be given (wholly or partly) following the same criteria as subsidies for disarmament ($S_{\Delta A}$ and $S_{\bar{A}}$). This constitutes another positive incentive to reduce defense expenditures. As individual donor nations often pursue quite direct political purposes (to which also counts that the developing countries should arm themselves) aid giving on this basis requires at least some centralization. The Council of WIS—which as will be remembered is composed of the most peaceful nations—would

3. In a written comment on this paper, Nigel Howard suggests that one should not compare the situation in which neither nation insures (Figure 4) with a situation in which both nations do (Figure 3), but rather consider the game in which one nation insures and the other does not. According to classical game theory there is in that situation no equilibrium point. Metagame theory offers, however, solutions in which insurance and disarmament of both nations is a stable equilibrium.

be the best institution to distribute the aid. As this runs against the national interests of each donor country, development contributions must be expected to fall (even stronger than in the past). This may in turn be counteracted by a decrease of the insurance premium or increase in subsidies for disarmament corresponding to the amount of development aid channelled through the Council of WIS.

8. Some Problems

The reader will be struck by the enormous number of difficulties with which the outlined World Insurance System is confronted. This is not necessarily a negative aspect, however. Disarmament and Peace are difficult to achieve, and a scheme which promises world peace without any problems must be looked at with utmost suspicion.

The difficulties and problems are so many that it is impossible to list them up here. Only three shall be mentioned. First, armaments have several purposes only one of which is to fight (potential) aggression from outside. As stressed by Marxists, but also by others (Lewin 1967), an army also serves the purpose of stabilizing internal conflicts in the interest of the ruling groups. This applies everywhere, and as experience shows, particularly also for the nations of the Third World. The "guarantee" against external aggression and the subsidies given for disarmament will do little or nothing to reduce incentives to keep up an army for this particular purpose. However, this does not change the fact that probably by far the largest part of armaments are thought as defense against external aggression and that much is gained if at least this part can be reduced, all the more as the establishment of WIS does not hinder efforts to overcome other aspects of peacelessness such as structural violence.

Second, the "guarantees" given by WIS to the countries insured are based on the *status quo* which is, of course, not necessarily "just." Any peace plan is confronted with this major difficulty, because there does not seem to be any other natural date in the past in which national territories can be taken to be "given" and "just."

Third, it may appear doubtful whether WIS can really fulfil the "guarantees" by military intervention if positive sanctions and compensations have turned out to be ineffective. No answer is possible without even more speculation than so far. It seems obvious that WIS must remain ineffective if all the major world powers actively oppose it. However, if they tolerate it (for some reason) there seems to be a reasonable chance that sufficient financial and military potential can be brought up by the insured nations to make it effective. It should not be forgotten that there already exist some geographical areas of the world which are "peaceful," e.g. the Scandinavian nations, Canada and other Commonwealth nations

such as Australia and New Zealand, and (hopefully) soon the whole European Community.

Concluding Remarks

It should be well kept in mind that the present paper is no more than an exploratory study intending to open up some new avenues of thinking by proposing a World Insurance System which may be able: (1) to benefit from the fact that mutual armaments are a huge area of Pareto-suboptimal allocation; (2) to mainly use positive instead of negative sanctions; (3) to take ex ante actions for peace instead of intervening after violence and war has broken out; and (4) to safeguard that development aid is really used for peaceful purposes instead of for armaments.

The ideas proposed should not in any way be considered a worked out peace plan; for that purpose much more thought and empirical analysis must be employed.

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