NUCLEAR WEAPONS: PROLIFERATION OR MONOPOLY?[1]

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Abstract

The problem of nuclear proliferation is an old one dating back to the first offensive nuclear detonation in 1945 when the United States used nuclear weapons on Japan[2]. The problem resurfaces each time a new nation develops nuclear weapons: the Soviet Union in 1949, the UK in 1952, France in 1962, China in 1964 and India in 1974. Israel claims to have nuclear weapons. Brazil, South Africa, Egypt, Argentina could but have stopped development; and Iran, Iraq, Libya, North Korea, Syria and probably others have express the desire to have them. The development of a nuclear black market is well known over the past four decades. Iran and to a lesser degree India remain active customers by using procurement networks to supply its nuclear programmes via the private sector notes the International Institute for Strategic Studies (IISS). [3]

If nuclear weapons in the hands of governments present a real or perceived threat of intrusions or invasions among neighbors, we can expect smaller nations to move to protect their territory and political independence through nuclear weapon production or acquisition. The French government used this last argument against the American nuclear program when Charles De Gaulle came to power in 1958. At the same time technological and political changes have reduced the cost of acquiring weapons. Further, the technological progress should make possible the miniaturization of these weapons. Small organizations could someday have access to them. This possible proliferation is currently considered as a curse, not as a blessing. Why? Mainly because everyone fears that such a proliferation of weapons of mass destruction combined with advanced means for their delivery intensifies "the problem of ensuring global security" as Dagobert Brito and Michael Intriligator[4] wrote recently in *Economic Affairs*.

This claim that the proliferation of any weapons- small or large, in the hands of the ordinary citizen or politicians- is a general threat is, in fact, the first step in the centralization and monopolization of power. It is through the argument, that proliferation itself is dangerous, that individuals, in being forbidden to own weapons of their choice, have been deprived of the basic right of self-protection by (and from) the tyrants governing their own countries.

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[2] Remember that the US government of the time uses the nuclear bomb twice Hiroshima and Nagasaki.

[3] *Nuclear Black Markets : Pakistan, A.Q. Khan and the rise of proliferation networks. A net Assesment*, IISS Strategic Dossier 2 may 2007.

[4] D.Brito and M.Intriligator 1997 "Deterring nuclear weapons proliferation" in *Defence Economics* , Economic Affairs IEA (December)

Part of the problem is fear instilled in others when one possesses weapons. Imagine a situation in which miniature nuclear weapons with great power are available and affordable for ordinary citizens. I could give the French government an ultimatum as they sometimes do with other government. My ultimatum might be: "if you take my resources through taxation and invasion of my property, I will destroy Paris". Or worse "The residents of Paris must pay me a tribute or face annihilation" [5]

Facts and common sense contradict this simplistic argument. In France, in 2010, there were 4936 arrests for possession of illegal arms, and only 437 homicides. Knowing that a third of homicides is committed with guns, shotguns or hand-held weapons, the probability of use of restricted weapons is low – around 3 percent, and knowing arrests involve only a fraction of persons carrying or possessing legal or illegal weapons, the real probability of forbidden weapons being used is very low. And of course, the only time in the history where the nuclear weapons were used was when the United States was able to do it without fear of retaliation.

In this paper we will challenge three following views usually held by experts and the public opinion: 1) Proliferation increases the probability of a global nuclear war; 2) nuclear weapons are unjust means used to reach a just end: ensuring global peace; 3) the fight against proliferation is a good thing.

Proliferation and the Probability of war.

To challenge the first view, we need to establish a correlation between arms possession and the number of assaults. Does legally or illegally arming additional people increase the probability of aggression, or decrease it? Does the probability of nuclear war increase when additional countries develop nuclear weapons? Brito and Intriligator through a cardinality theorem, tried to show such a correlation[6]. Their thesis was traditional in that the dominant factor was not the proliferation of nuclear weapons *per se* but the increase in accidents or inadvertent launches by those possessing them. Alternatively, the nonproliferation case often focuses on the irrationality of the marginal actor who can destroy the "terror equilibrium of nuclear weapons"—a classical argument used to justify a cartel.
Imagine there is only one armed person. The temptation for aggressive behavior instead of peaceful conflict resolution for this person would be strong—because he has a comparative advantage. Now imagine two similarly armed people (or States). The fundamental question is whether either will use an aggressive (Hawk) strategy, or a cooperative (Dove) strategy, in a conflict. If the use of weapons will lead to a deadly war in which both sides likely will lose not only their property but their lives, an aggressive strategy is not the preferred one. If we suppose that both are rational entities, they will adopt Dove behavior over Hawk behavior only if the expected gains from using the Dove strategy exceed those of the Hawk strategy. The complication is that future gains from either strategy for one player depend on the behavior of the other player. There is a nonzero probability of armed conflict, though this probability is much lower than in the case in which a party faces no risk of retaliation.

In that case, the Hawk strategy would dominate for the armed player.

[5] Of course, at present, only governments, through massive taxation, are able to afford nuclear weapons
[6] *D. Brito and M. Intriligator. "Proliferation and the Probability of War."* Journal of Conflict Resolution *(March 1996): 206 14.*

Let's formalize[7] this interaction between John and Peter, two individuals or princes representing their countries, both possessing nuclear weapons:

		Peter			
		1-λ(2)		*λ (2)*	
John		Dove		Hawk	
Dove	*λ (1)*	V/2	V/2	0	V
Hawk	*1-λ(1)*	V	0	(-C)	(-C)

V measures gains from a conflict. C is the cost of war. If they both use the Dove strategy, they divide gains, V/2, If there is a balance of power, nuclear weapons make war very costly. When both make war, the use of nuclear weapons imposes only losses, -C for John and for Peter. In the case that John has a monopoly in nuclear weapons, he has no fear of retaliation: here, there are only gains (V > 0) for John and no losses or gains for Peter, as he surrenders.
If John has a monopoly, the dominant strategy for him is the Hawk strategy[8] In the case of a balance of power, each party will adopt the Hawk strategy if and only if he is sure the adversary will play the Dove. If both play the Hawk strategy, losses are the only outcome. If John plays Hawk and Peter plays Dove, John will get the totality of gains, V. In the opposite case his gain is zero. The game is symmetric since both sides have the same weapons. We can see that the Hawk strategy is not the most attractive behavior as the outcome (-C) is negative. But the Dove strategy is dubious since V > V/2. Thus, John plays Hawk only if Peter plays Dove. In the absence of perfect foresight, John has to predict Peter's behavior. From John's perspective, λ{2) is the probability that Peter will adopt the Hawk strategy and 1-λ(2) that Peter will adopt the Dove strategy. And for Peter, λ(1) is the probability that John will adopt the Hawk strategy and (1-λ(1) the Dove strategy.

Future expected gains for John in adopting the Hawk strategy are:

[7] This model is a variant of the Hawk and Dove model of modern game theory first developed by J.M. Smith, *Evolution and the Theory of Games* (Cambridge, U.K.: Cambridge University Press, 1982).

[8] Asymmetries, imbalance of power, and hierarchy of political forces are usually the sources of political power. In the analysis we assume perfect symmetry of forces as a result of the spread of nuclear weapons: Military technology is available or accessible at a certain price for individuals or groups. Let's drop this hypothesis. We introduce asymmetry between John and Peter. Costs and gains for them are divergent. The matrix looks as follows:

		Peter	
		Dove	Hawk
	Dove	V/2, v/2	0, v
John			
	Hawk	V, 0	(-C). (v-c)

We give Peter an advantage in aggression, v-c > 0. John is aware that Peter will play Hawk due to this advantage. Because Peter definitely will play Hawk, John's strategy will be to surrender to Peter, since 0 > -C. Peter beats John. This interaction will lead to domination by one party, which strangely is praised by political scientists. The origin of such domination lies not necessarily in asymmetry itself, but in the belief in it on John's part. This helps highlight the role of misinformation as military strategy as well as the role of technology in multinational conflicts

(1) $E(U)_H = (1-\lambda(2))V + \lambda(2)(-C)$

If he plays the Dove they are:

(2)$E(U)_D = \{1-\lambda(2)\}.V/2 + \lambda(2).0 = (1-\lambda(2)).V/2$

Thus he plays the Dove if and only if

(3)$E(U)_D = (1-\lambda(2)).V/2 > E(U)_H = (1-\lambda(2)).V + \lambda(2).(-C)$

and he will play Hawk when:

(4)$E(U)_D = (1-\lambda\mathbf{(2)}).V/\mathbf{2} < E(U)_H = (1-\lambda(2)).V + \boldsymbol{\lambda}(2).(-C)$

He will be indifferent between the two strategies when:

$(1-\lambda(2)).V + \boldsymbol{\lambda}(2)\mathbf{(-C)} = (1-\lambda(2)).V/2$

that is when

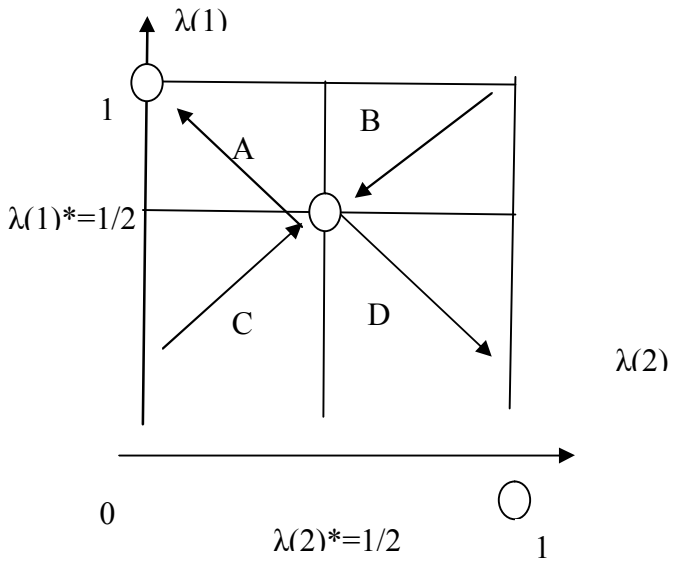
(5) $\lambda(2)^* = V/(2C + V)$

The interpretation of the ratio V/ (2C + V) is straightforward: It is the relation between the gain of the Hawk strategy, V, when the other plays Dove; and the opportunity costs of war (2C+V)[9] when the other plays Hawk, If John estimates that the probability, $\lambda[2)$ that Peter will play Hawk is less than this ratio, $\lambda\{2)^*$, John will play Hawk. Otherwise, if he estimates that this probability is higher than the ratio, John will play Dove. We also notice that as the damage from war compared to gains increases, the more likely John (or Peter) will adopt the Dove strategy, as the threshold probability is lower. If the ratio of gains over costs, from the war, approaches zero, which is the case with nuclear weapons, then the probability of peaceful conflict resolution increases drastically. Now, as the game is symmetric, we have $\lambda(1)^* = \lambda(2)^*$.

In such an interaction, $\lambda(2)$ and $\lambda\{1)$ are key variables in the decision to enter a nuclear conflict. Assume that John is convinced erroneously by a third party, Paul, that Peter will play Dove, or that Peter is very likely to play Dove (while Peter in fact is ready to play Hawk), Then John will adopt the Hawk strategy based on incorrect information. Nuclear war is then the outcome of this incorrect information. This explains why governments have developed direct communications between those who have the power to start a nuclear conflict, protecting themselves against such erroneous decisions, But as players are rational, they anticipate difficulty in predicting the behavior of others. A natural consistency requirement is that expectations are also rational.

The convergence of anticipations between John and Peter is crucial. Consider the following figure 1.

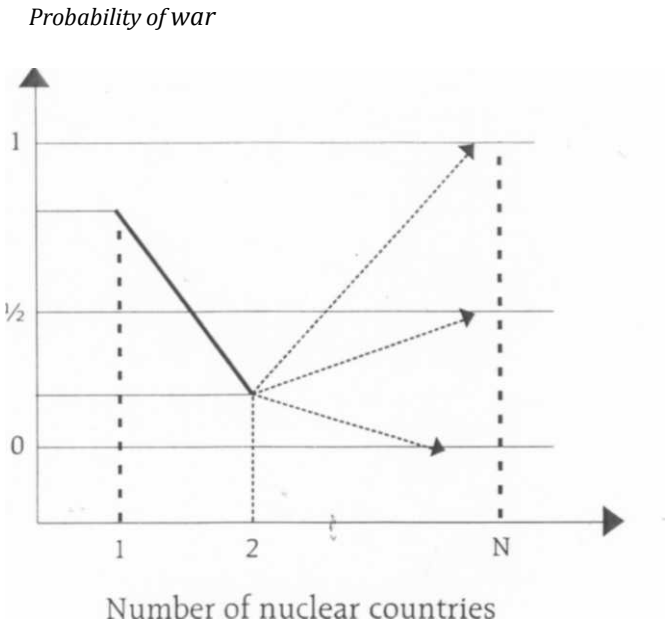
[9] (2C + V) measures for both players the sum of the direct cost of war. C, and the loss suffered by each player in losing the gain of the Dove strategy. V/2. 2(C+V/2) = 2C + V.



On the horizontal axis, we plot John's *expectations* of *Peter, λ(2), while on the vertical axis we plot Peter's expectations of John, λ(l). Assume we are in zone A, in that case, λ (1) > λ (1)*, while λ (2) < λ (2)*. This means Peter should play Dove as the best response to the behavior of John, as John rationally plays Hawk. For expectations in zone A, a stable strategy is the couple λ {1) = 1, λ {2) = 0. John plays Hawk and Peter plays Dove. In zone D, we have the opposite, λ {1) = 0, λ (2) = 1; John plays Dove and Peter plays Hawk. There are two pure strategies: Either John dominates or Peter dominates. In regions B and C, both Peter and John play the same strategy, either Hawk or Dove, as λ (1) > λ {1)* and λ (2) > λ (2)* (zone B), or λ* ***(l)*** *< λ (1)* and λ (2) < λ (2)*. The mixed equilibrium λ (1)* = λ (2)* is not in fact stable in regions A and D. But when C increases drastically, as with nuclear weapons, the value of λ (1)* = λ {2)* = V/(2C+V) approaches zero, such that regions of peace A, B, and D increase in size. This means an increase in the probability that the outcome of the interaction is peace.*

Consequently, the arms race between two nuclear countries to establish a power equilibrium should decrease the odds of an armed conflict. The more deadly the weapons become, the more they are dissuasive. The next question is: Does the introduction of additional participants increase, decrease, or leave unchanged the probability of conflict? Refer to the next figure: 2.
On the vertical axis is plotted the probability of war and on the horizontal axis the number of countries or governments with nuclear weapons. With a monopoly the probability of war approaches 1. With two players the probability nears zero. Adding participants either lowers this probability to zero or increases it until we reach pure uncertainty[10] *(the probability of war is ½) or pure certainty (the probability of war approaches 1).*

[10] Brito and Intriligator recognize the monopoly and duopoly cases, but they argue that an increase in the number of players will increase the probability of errors. In that case the probability of conflict increases to .*50*—that is to complete uncertainty.



Adding one player to the interaction implies a new game with three players, each always having two strategies to play, Hawk or Dove:

Patrick	Hawk (λ{2})		Dove (1-λ{2})	
Peter	Hawk (λ(3))	Dove (1-λ(3))	Hawk (λ(3))	Dove (1-λ(3))
John	-C.-C.-C	o. v. o	-C.-C.-C	V. 0. 0
Hawk λ{1) Dove 1-λ(1)	o. o. v	V/3.V/3.V/3		
	-C.-C.-C			
	-c.-c.-c			

Patrick plays either Hawk or Dove. Then Peter plays either Hawk or Dove, conditional on whether Patrick has played Hawk or Dove. Then what is John's strategy? In a nuclear conflict, if two players play Hawk the destructive power of nuclear weapons is such that the other actor who plays Dove may be destroyed as well[11]. In fact, gains occur for one or for all when only one actor plays Hawk while the others play Dove, or when all play Dove. Consequently, knowing this matrix, John will calculate the expected value of adopting the Hawk strategy versus the Dove by anticipating the aggressive behavior of the two other players.

[11]One thought is that the third party who does not take part in the nuclear conflict will be the last survivor and will profit from the destruction of his competitors in the fight for resources. Actually, this strategy moves the third player to autarky, which implies losses compared to the present situation of no conflict. Further, we can add an externality problem-collateral damage-with nuclear war due to the destructive power of nuclear weapons.

Hawk strategy:

(6) $E(U)_H = \lambda\{2)\lambda(3)(-C) + \lambda(2)(1-\lambda(3))(-C) + (1 -\lambda(2)(1-\lambda(3))V$

Dove strategy:

(7) $E(U)_D = \lambda(2)\lambda(3)(-C) + (l-\lambda(2))(l-\lambda(3))(V/3)$

John will play Hawk when

(8) $E(U)_H = \lambda(2)\lambda(3)[-C) +\lambda(2)(1-\lambda(3))(-C) + (1-\lambda(2))(1-\lambda(3)).V > E(U)_D = \lambda(2)\lambda\{3)(-C) + (1-\lambda(2))\{1-\lambda(3))(V/3)$

He will be indifferent when:

(9) $E(U)_H = \lambda(2)\lambda(3)(-C) + \lambda(2)(1-\lambda(3))(-C) + (1-\lambda\{2))(1-\lambda(3)).V =E(U)_D= \lambda(2)\lambda(3)(-C) + (1-\lambda[2))(1-\lambda(3))(V/3)$

As the game is symmetrical, and knowing that expectations are rational (that is each player's expectations of the others coincide with actual choices the others intend to make), we can write: $\lambda (1) = \lambda(2) = \lambda\{3) = 3\lambda$ where 3λ is the threshold with three players. Solving equation (9) for 3λ, we find:

(10) $3\lambda = V/ (3C + V)$

The threshold on which John bases his strategy is lower with three players than with two. Adding N players in this game leads to a threshold on which all players base their strategy:

(11) $N. \lambda = V/ (NC + V)$

Increasing N to infinity reduces the threshold to zero. Each nuclear power will be incited to play Dove. Adding N players implies N pure strategies where one is dominant (that is. plays Hawk while all others play Dove) and one mixed equilibrium $\lambda(l)^*=... = \lambda.(N)^* = V/(NC + V)$. In the N-dimensional space of the λ (i), the corresponding C area in the two-dimensional space shrinks to zero, insuring high stability of peace.[12]

To an outside observer, the frequency with which a nuclear conflict can emerge is given by

(12) $f (H)= \sum N_{\lambda} + \prod(N_{\lambda})^N$

Looking at the matrix with three players, we see there are three cases with two players at war and one case with all players at war. But the product of a probability raised to the power N is negligible. Then the frequency of a nuclear war in a matrix of N players is reduced to:

$$(13) \quad f(H) = \frac{NV}{NC + V} = \frac{V/C}{(1 + V/NC)}$$

[12] The underlying idea is simple: if k players anticipate that (N- k) players will play Dove, $\lambda(i) < \lambda(i)^*$. then their best strategy is to play Hawk. But if they all play Hawk at the same time, the outcome is a generalized conflict and their own disappearance due to the externalities of a nuclear conflict. Knowing that each of the k players anticipates that the (k -1) other players will have the same bet, they will play Hawk only if they are sure that all others will play Dove This possibility diminishes drastically as the number of players increases.

As N approaches infinity, the frequency of nuclear war is the ratio of gains V over the cost of war C. With nuclear weapons, C is very high compared to V, which predicts that the frequency of nuclear war will approach zero. The lesson from this formal analysis is that the more armed players there are, the more the threshold probability to have armed conflicts depends only on the ratio V/C. The more dissuasive the means is, the less the chances for conflict. Formalization can always be suspect of rhetorical trickery, and the present demonstration is no exception. At least, the formal model appeals to reason and not passions. If the model is correct, then it is important to liberalize the right to have extremely dangerous weapons and accept their dissemination among nations or individuals.

Nuclear weapons : Unjust « in Bello », just « ad Bellum » ?

In a society where the individuals are free, the organisation of the protection of individual rights is in the hands of each one, since each one has full sovereignty on himself. The organization of this protection has only one purpose: the protection of the self-ownership and of the goods an individual acquired "in a just way". For reasons of compatibility of the individual rights, this protection cannot use violence or the principle of aggression or coercion to reach its private ends. The principle of non-aggression or non-coercion is the base of a theory of the personal freedom and thus also of a theory of the just war. That implies two things: on one hand the only purpose of an “offensive” war is restitution of physical goods or private territories "unjustly" appropriated by the attackers and/or the compensation for the damages caused by them. On the other hand, a military organisation which respects a general principle of non-coercion recognizes the possibility for each individual of ensuring his own defence as he thinks is the best for him. When this individual joins others to protect his fundamental rights, he joins a political society, and does this in the spirit of article 2 of the French Declaration of the Rights of Man and of the Citizen of 1789:

"The purpose of all political association is the preservation of the natural and inalienable rights of man. These rights are liberty, property, security and the resistance to oppression"

This point is crucial in answering the question of who must say when a war is just or not. It goes without saying that in this approach, there will be neither a national government, whatever its political regime (dictatorial or democratic), nor a cartel of governments under the cover of an international bureaucracy that dictates the terms of a “just” war. When this individual has weapons or pays men-at-arms, it does it to ensure the protection of these fundamental rights and not to ensure the timelessness of a government in place. He accepts to die to preserve his freedom, his life or his property as the freedom, life and property of those whom he loves and not to preserve the life of the members of a particular group of individuals in power. He might even wage a “just” war against his own government. In this vision, the victims or their entitled beneficiaries will require compensation, not in an arbitrary way but through a private system of justice. Thus, the judges or the referees will dictate what will be a "just war" and the principle which emerges from this system is the self-defence and restitution.

The Principle of Self-Defence: “Jus ad bellum”

Using the armies implies protection against an aggression. This aggression is characterised by a failure in the obligation to respect the fundamental rights of the individuals (for example

plundering a territory which is the property or the joint ownership of the individuals who live there), by creating a measurable damage and connecting the failures to respect the obligations to the damages. The first - *the failure to respect an obligation* - must cause the second – *the damage*. This excludes the "aggressions" like the attack on the honor, the insults, and the injustices other than those implying a violation of the individual rights. That excludes the wars whose aim is to impose a spiritual, social or religious ideal. That also excludes any intervention under the only pretext that the supposed attacker would have the intention to attack others or would have dangerous weapons. The army intervenes in self-defence, and if there is damage, it goes after the aggressors to obtain reparations. There, for example, we have a simple and unambiguous answer to the intervention announced by the USA in Iraq in 2003 compared to that of 1991 called "desert storm" following the 1990 invasion of Kuwait by the armies of Saddam Hussein. For the moment Iraq neither "aggressed" nor caused any damage to U.S. citizens contrary to the case of the Twin Towers. The army's mission is simple and clear. It's a body of professionals specialised in a particular protection: protection against the predators who would come in mass and who couldn't be stopped otherwise. The other types of threats call upon other professionals in charge of the security and protection of the individuals' fundamental rights or to the abolition of a the state interference in the economic and social life. The principles of self-defence and pursue of the aggressors responsible for the damage are the pillars of any military intervention. This is why the decision of a military intervention should be put in the hands of judges and not in the hands of politicians ready to use an army to satisfy the private interests of those who helped them to be elected and to consolidate their own political power. The "judge" or the "referee" and the insurers dictate the terms of the "just war" and the compensation. There is no difference between an ordinary crime and an aggression made by the statesmen.

This question raises another point : what is the responsibility of the politicians who start the aggression or who finance wars ? They do not act by themselves but they order, give commands. Is this a full responsibility or is it partially or entirely put in the hands of those who carry out their commands? The answer is that this responsibility is entirely in the hands of those who execute the commands and not in the hands of those who give orders. Those who carry out orders should be sanctioned because they are responsible for their acts and they should disobey the orders when these violate the individual rights of innocent third parties. Civil or military disobedience is the rule that the individuals must follow to prevent a government from starting an "unjust" war.

The Limits of Self-Defence: "Jus in bello"

From the general principles, "jus ad bellum" one can goes by to the practical rules of the use of weapons, "jus in bello". Things are never as simple as we would like them to be wrote E. Mach [13]! The use of an army is never as selective as it would be wished. An army on active service is not a gun with sights. Is it acceptable to kill innocents (or to threaten to kill innocents), who have nothing to do with the conflict, to fight (or to dissuade) the aggressors?

The use of a nuclear bomb, (or the threat of using it) as of any bomb, even if the bomb was used by a "terrorist" has collateral effects on the innocents. Can one kill the Iraqi soldiers who would invade our land knowing that they were enlisted by force? Aren't they also innocent? Can one make a preventive military intervention as the United States did it, against the Iraqi and Libyan dictators as some would have wished it, a posteriori, against Hitler's Germany? Can one sacrifice all the moral principles with the only aim of winning the war? Can one torture the aggressors, the accomplices or the innocents to obtain informations supposed to be vital for

[13] E.Mack 1995, " Rights, Just War, and National Defense" in *Liberty for the 21st Century,* ed. T.Machan and D.Rasmussen, Rwoman & Littelfield, Inc

continuing the combat? Can one execute his own soldiers if they refuse to obey ike the French commandeur in chief have done in the Firts World War? The self-defence is a response to an aggression against goods and/or people. It is a question of preventing the aggression or of pursuing the aggressor so that he repairs the damages caused to the victims.

The first moral constraint imposed by the self-defence is *proportionality* in the response. Imagine Australia invading Tahiti. The Australians decide to act because they had enough of our nuclear tests in their sphere of influence. Can the French Army use the atomic bomb on Sydney, to protect Tahiti from the Australian invasion? The second moral constraint imposed by the self-defence is that the response should not strike innocent persons. This is the *discrimination principle*. The victim of an aggression cannot be held responsible for the unforeseeable collateral effects induced by his response but can be held responsible if these effects are foreseeable. It is obvious that if you know that in the counterattack, you can wound or to kill somebody, an innocent, you become aggressor. The principle of self-defence applies only to the aggressors. The self-defence will be unjustified. However, if the victim of an aggression must put in balance his life and that of an innocent or if the aggressor seeks impunity, like the Hamas, attacking in the vicinity of innocents, the decision to counterattack or not, remains in the hands of the victim. When the aggressor seeks this impunity, he takes in hostage the innocents. The hostages, the innocent third parties, become victims[14]. But can one take an hostage in order to dissuade a possible aggressor to act or a real aggressor to continue his aggression? Who attacks whom? Can one threaten a tax inspector to poison his children so that he ceases his permanent aggressions on the wallet of the taxpayers? Can one take hostage the entire population to dissuade the terrorists to act? The answer seems clearly negative. When the Germans take hostage the French population to dissuade the resistance to act and to kill the German soldiers, their behaviour is immoral because they are the aggressors. If the French government took hostage the Moslem population to dissuade the Talibans to put bombs in the Parisian subway, the French government would be the aggressor. And if the Moslems took French hostages to release their imprisoned companions, they would behave like aggressors with regard to the population. The nuclear dissuasion resembles much to this type of dilemma. The victims - those who are taken hostages - are in a state of self-defence. Therefore, they can answer back to the aggression.

This is why the armaments, and their use, must be selective. These weapons must strike the aggressors as much as possible. Using nuclear dissuasion in a strategy oriented against the inhabited areas is immoral. Bombardments at high altitude too. From this point of view, the military technology made huge progresses because a bomb can strike a ministry in a town like Belgrade without any collateral damages. But what is worth this ethical approach towards a predator who thinks the human beings can be treated like animals and killed as the chickens or the cows are killed in the name of protecting the consumers or the people, a race or a religious ideal or a social class? Then it seems difficult to reject a consequentialist argumentation, state the partisans of dissuasion. The self-defence *must* be effective i.e. to lead to the desired result**:** *the protection of the individual rights.* And if the only way of stopping the aggressor is to take hostage the innocent thirds, must one deprive oneself of this radical instrument in the name of a certain professional ethics? The characteristic of a ethical argumentation is to prohibit the use of an instrument which, even if it is very effective, violates the self-ownership of innocents. However, it remains to be demonstrated that nuclear (or some other type of weapons) dissuasion violates the rights of innocents. Let us return to taking hostage an individual, third party in the conflict (the children of the tax inspector or the Muscovites in nuclear strategy oriented against the inhabited areas during the cold war). The principal characteristic of dissuasion by the

[14] E.Mack (op.cit.)

hostage-taking is that the victim, who seeks to be protected from the aggressor, announces that he has the *conditional intention* to kill millions of innocents, if the aggressor acts. But to have the conditional intention to commit a crime, does not mean to commit the crime**.** What is wrong, is to commit the crime, not to have the intention of doing it.

When the victim, to put an end to the aggression, takes hostages innocents that the predator is very fond of and that his threat is credible, he points out to the aggressor the real opportunity cost of his act of aggression. He also points out to the hostages having a link with the aggressor that it is up to them, to discipline the aggressor with which they have links. This dissuasion is there to prevent a violation of individual rights, not to cause it or to threaten the life of the hostages. It announces in advance the price which will be required to the aggressor as compensation for the created damage. It will be noticed that the hostages in question are not innocent third parties. They are third parties who accept predators among them or who agree to put their destiny between their hands. Therefore, there is not necessarily incompatibility between the deontologic morality and efficiency of the development of nuclear weapons.

Nuclear Proliferation is a Blessing and not a Curse: the Cartel Hypothesis

Yes it is. Why? Because things that are good for us are good for others. The terror equilibrium was a guarantor of peace in Europe during the cold war. Without it, the Soviets might have been tempted to invade Europe. When there are no nuclear weapons there are classic wars, which can result in massacres comparable to those seen with the use of conventional weapons in the world wars. The Iran/Iraq war is a case in point: If both sides had had nuclear weapons, they might have hesitated to enter the conflict, saving millions of lives.

Possession of nuclear weapons by all players is a good and not a bad. Indeed, the more countries possess such dissuasive weapons, the wider will be the territory of peace and stability as experienced in Europe throughout the cold war. There have to be serious reasons to prohibit certain countries from owning such means of dissuading potential aggressors.

This sort of support of nuclear arms proliferation is natural for economists but heretical for non-economists. The countries who are members of the nuclear club form a cartel that is looking to protect its monopoly in respect to other countries. They even use violence in order to prevent countries they do not like from obtaining nuclear technology. If nuclear weapons reduce the possibility of armed conflicts, i.e., protect human lives and territory from external invaders and violence, it means nuclear weapons possession is efficient.

Nuclear weapons possession will become more necessary as the costs of nuclear technology decrease. Competition between countries to defend themselves against external aggressors will lead to the proliferation of nuclear weapons. The cartel of members of the nuclear club (Russia, England, France. China and the United States) will fail as more countries develop weapons. There are two major forces in this process. Club members have reason to cheat by giving nuclear weapons to other countries (e.g., France and Iraq, China and Iran); and other countries can enter the market on their own (e.g., India. Pakistan, Israel, Iran. Iraq, North Korea). Remember also that Kazakhstan, Belarus, and Ukraine inherited nuclear weapons from the USSR even if Kazakhstan restitutes its nuclear weapons to Russia in exchange of aid. South Africa, Japan, Germany, Brazil, and Argentina could, in the near future, have nuclear weapons if they do not already have it by undertaking covert nuclear weapons development despite of being part of an agreement not to develop such military programs.

This point of view is increasingly shared by Western military strategists, many of whom believe countries willing to obtain such weapons should be helped and not considered outlaws.

An article by J. Fitchett in the International Herald Tribune[15] notes this change in opinion among military advisers. But Fitchett claims that if proliferation prevails, the risk of conflict increases due to everyone's inability to control everyone else's dissuasion. Pentagon experts note that when communication between the USSR and the U.S. was limited, it minimized provocative behavior. Fitchett continues: With territories like Asia and the Middle East, nationalistic passion and irrational behavior are reality. Those leaders frequently are autocratic and are ready to destroy their countries in a nuclear conflict just to satisfy their interests or territorial appetites. Even though the 1991 Iraq conflict showed the opposite (Saddam Hussein did not dare use chemical weapons under the nuclear threat of Israel and the U.S.), we cannot extrapolate this to a world where nuclear weapons are commonplace. We should not forget that nuclear conflict is not local and it can affect, as did the Chernobyl nuclear disaster, uninvolved third parties. This argument is not new—it is similar to the one used by French medical doctors, who in the name of protecting consumers are impeding the sale of drugs in supermarkets. Another argument holds that competition in airline services leads to an increase in accidents due to airlines' failing to invest sufficiently in safety under the pressure of competition. This has proven to be false. All defenders of monopolies and cartels use such arguments, including the one concerning nuclear weapons.

It is difficult to believe that a taxi drivers' monopoly protects consumers. But when a medical board announces that a monopoly benefits consumers, the public is persuaded. Indeed, reasoning is distorted when the arguments relate to our lives. In this manner, when we think about nuclear weapons we often lose our ability to think clearly.

Let's return to the economic argument. Before 1989 there was nuclear parity between the USSR and the U.S. We can regard this situation as a Cournot bi-polarity. The essential question of that time was the arms race in nuclear missiles. For a given level of Soviet armament, U.S. production of missiles, to match it, was profitable, measured in dissuasion capacity. The same way, for a given level of American offensive capacity matching it with nuclear warheads in the USSR was advantageous.

The intersection between these two functions is the Cournot equilibrium. The number of missiles being produced was very high. It was possible to improve outcomes for both adversaries through mutual arms reduction. If both parties agreed to reduce their arms while retaining dissuasion capacity, it would have been optimal for them not to miss the opportunity. From the beginning of the cold war we witnessed conferences on arms reduction and treaties on nonproliferation. Each side in such an agreement would have maintained a certain quota of missile production or brought stockpiles down to a level that maximized profits for borTi parties.

All those conferences between superpowers were simple agreements to optimize the tradeoff between costs and dissuasion. The failure of such agreements is intriguing. Why did they fail? Because agreements have to be respected. The majority of such treaties not only gave exact details concerning quotas but also the means to verify whether the quotas were respected. In other words, the issue of agreement or cartel created a prisoner's dilemma. An advantage was gained by the one who cheated while the other respected the agreement. This incentive not to respect the agreement explains the continuous failure of such agreements. The cold war was characterized by missile production at the Cournot point with attempts to reduce these arms, at the equilibrium point. Only the disappearance of the USSR ended this strategic interdependence—the bi-polar structure disappeared.

[15] *International Herald Tribune, http://www.iht.com/diplo.*

Two Directions of Future Development

The U.S. retains a monopoly on nuclear dissuasion and plays the part of world enforcer, excluding international exchanges for countries seeking nuclear weapons. Such a position is costly, and the U.S. has no legitimate claim to such a role.

We should allow more and more countries to develop nuclear weapons. The first lesson ot history is that in the absence of an enforced monopoly, no agreement or cartel, even one organized by States, can survive. One of the best known examples is the oil cartel. The second lesson is that competition is the means by which we maximize our exchange profits. Nuclear arms possession is the most efficient defense of territory because it produces fear. It reduces armed conflicts and does not require many personnel. Such technology, as it becomes more affordable, will face increasing demand from countries with fewer resources. Such democratization is the result of competition.

I use the term "democratization" rather than "dissemination" to make a point. For many, "democratization" has a positive connotation. If a poor Iraqi or Pole can benefit from such protection it is "democratization." For a rich Frenchman or American it is "dissemination." For an economist it is competition.

The argument that an Iraqi, Pole, Iranian, Syrian or Libyan is more irrational than a Frenchman is fundamental. This is the argument used against nuclear arms proliferation. It was evoked during the Gulf War. Saddam Hussein is not one of us, he does not share our values, and he is a murderous dictator, but he is not irrational or crazy. But those who share this point of view insist that we cannot extrapolate from Saddam Hussein's case. Yet if we follow their logic we will have to demonstrate that non democratic political systems constantly have as their leaders irrational and crazy persons. There is no proof of this. It would also have to be proven that democratic systems are immune to such phenomena. Hitler and National Socialists came to power through democratic mechanisms. Thus, this argument fails also.

We can link this theory to the one that prohibits citizens to carry firearms. The problem with this prohibition is that citizens are defenseless and the only armed persons are police, who often do not know how to shoot, or turn their arms against innocent civilians; or gangsters, who use their arms against citizens who have been disarmed by the State. We also see that within any given territory, relaxing gun laws leads to a reduction in crime. The mechanisms proposed to account for this trend, shown most notably by John Lott[16] are the same ones I propose will decrease violent multinational conflict, like in the middle-East, following the free proliferation of nuclear weapons.

[16] John R. Lott. Jr.(1998), *More Guns, Less Crime: Understanding Crime and Gun Control Laws* Chicago: University of Chicago Press