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Defence spending, economic burden and disarmament

Jacques Fontanel
Séminaire UNIDIR, 1992
Rapport préparatoire

Economic Aspects of Disarmament. Disarmament as an Investment Process
UNIDIR, United Nations, 1992

Summary : Usually, economists regard military expenditure as unproductive, a burden expressed by the famous choice between « guns or butter ». However, this analysis is not confirmed in fact, at least in the short term, due to the difficulty of converting the arms industries, the reduction in national research and development efforts, employment issues, but above all difficulties in ensuring a national security strong enough to avoid the predation of other countries. The power of states exerts a considerable influence on international economic relations. Security between states cannot always be maintained without the armed forces. Analysis of the defence effort often gives contradictory econometric results, notably concerning investments, consumption or inflation. A negotiated disarmament process can, however, lead to more satisfactory economic results in the medium run, provided that they are distributed equally, a concept which is not shared by the economic actors of multinational firms and banks, or even of the States. Disarmament for development is an interesting idea, but arms producers in developed countries will suffer significant losses that States will probably have to reimburse all or partially, even though aid will have to be given directly to developing countries, aggravating thus the crisis. The reduction in military spending must first be seen as an investment to improve the lives of all parties.

Les économistes considèrent que les dépenses militaires sont improductives, selon le fameux dilemme entre le beurre et le canon. Cependant, cette analyse n'est pas confirmée dans les faits, au moins à court terme, du fait de la difficulté de conversion des industries d'armement, de la réduction des efforts de recherche-développement, des questions d'emploi, mais surtout des difficultés d'assurer une sécurité nationale suffisamment forte pour éviter la prédation des autres pays. La puissance des Etats exerce une influence considérable sur les relations économiques internationales. Les rapports de puissance s'exercent et la sécurité entre les Etats ne peut pas toujours être maintenue sans forces armées. L'analyse de l'effort de défense donne souvent des résultats économétriques contradictoires, concernant notamment les investissements, la consommation ou l'inflation. Un processus de désarmement négocié peut cependant conduire à moyen terme à des résultats économiques plus satisfaisants, à condition qu'ils soient répartis également, une conception qui n'est pas partagée par les acteurs économiques des firmes et des banques multinationales, voire des Etats. Le désarmement pour le développement est une idée intéressante, mais les producteurs d'armement des pays développés subiront des pertes importantes que les Etats devront sans doute rembourser tout ou partiellement, alors même qu'une aide devra être apportée directement aux pays en développement, aggravant ainsi la crise. Il convient alors d'imaginer la réduction des dépenses militaires d'abord comme un investissement destiné à améliorer la vie de toutes les parties.

Disarmament, military expenditure, development, defence effort, investment, GDP, mercantilism, peace, war

Désarmement, dépenses militaires, développement, effort de défense, investissement, PIV, mercantilisme; paix, guerre.

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Generally, economists regard military expenditure as unproductive, a burden expressed by the famous choice between « guns or butter ». In consequence, a disarmament process is considered as a benefit for economic growth. It is a rough analysis that forgets the national security interest for the economic development of a country, the incitation of military sector for the national growth of research-development and industrial activities. Brazilian and Indian arms industries are supposed to develop an import substitution policy able to reinforce their national industrialisation. Strictly speaking, there is no economic theory of disarmament; there are contradictory main conclusions (Fontanel, 1990). What are the main conclusions? They depend of the economic foundations of armament and disarmament theories, the analyses of the variations of military expenditures on the major macroeconomic variables, the economic impact of disarmament and disarmament on developed countries and the process of the armament for development in favour of the developing countries.

1. The economic Foundations of Armament and Disarmament

Reasoning in the usual way for cosmopolitan economics, modern economic science tends to obliterate all non-economic conflicts, despite the fact that these states strategies do exert some influence on international economic relations as a whole. In a world of sovereign States, the security of Nation is both a priority and a constraint that economists have not always viewed in the same way. The history of economic thought is instructive in this context (Fontanel, 1987).

A- Armed Defence as a Factor of development

For mercantilism, the power of the Prince is the basic objective of any national economy. Under these conditions, the best solution for an economist has no intrinsic significance pour la puissance du Prince, since it is always preferable for a Nation to be less rich if the others States are proportionally even poorer. The defence of a country encourages the national feeling and victorious wars enrich the State. Under such conditions, a national disarmament makes no sense. For the German historical school, notably Frederic List, an advocate of the

national system of political economy, who suggests that liberal laissez-faire leads to the domination of the strongest and that Nations must protect themselves against foreign domination. Most current thought on economic warfare can be traced back to these lines of thought. In modern analyses of game theory applied to international relations (Brewer & Shubik, 1979), the thesis of unequal exchange (Emmanuel, 1969), the theory of underdevelopment as a product of the development of the great powers (Freyssinet, 1969), and concepts of economic warfare (Baldwin, 1985) are all examples of reasoning that perpetuate this economic analysis in terms of power.

Bouthoul (1961) regards war as a necessary evil that permits a harsh solution to excessive population growth. It is irreplaceable in that it carries out the functions of socio-demographic rebalancing and readjustment. This suggestion is expanded on by Mandel (1975), who considers that conflicts or threats of war eliminate unemployment by creating an artificial shortage and that they accelerate technical progress. In the view of Galbraith (1968), disarmament accompanied by a reduction of international tension would be liable to have adverse effects on the American economy and society because the subordination of its citizens is dependent on international security, the threat of war is essential in keeping social discord and antisocial trends under control, and the factors likely to be associated with the social functions of armed conflicts and relations of dominance over other States are essential to the wealth of the great powers. Jacques Attali (1978) even regards war as an extreme manifestation of industrial competition, the creation of demand and the employment of the factors of production. Conflict provides a stimulus to production and transforms the patterns of consumption and social habits. Thinking along the same lines, Marc Guillaume (1976) distinguishes the code of capital and the code of power; the former demonstrates the social significance of commodities as the basis of their value; the inequalities that this occasions lead to a continuous struggle against scarcity and have the inevitable result of maintaining class demarcations in a highly oppressive capitalist system. The code of power, on the other hand, is built up from the bureaucratic hierarchy and the monopoly of knowledge, and is the will for power. If civil war is inherent in the code of capital, international war is written into the code of power. To sum up: any disarmament procedure that does not confine itself to the reduction of excess levels of armament does not necessarily make for human and economic progress.

B) Armed Defence as a Political Constraint and as Economic Wastage

For the classical British economists, State intervention in the economy should be kept to the minimum because individuals have complementary interests in generalized freedom of trade. War and preparation for war are explicit variables of the monopoly spirit, on which grounds both Adam Smith (1776) and David Ricardo (1817) were to condemn mercantilist thought dominated by the hegemonic drive of the ruler. Armed conflicts are analyzed exclusively as political phenomena. Nevertheless, it is advocated that armed forces be established to ensure the sovereignty of States threatened by less developed economies. The disarmament processes of rich countries are dangerous, having regard to the covetousness with which they are regarded, a covetousness that may possibly be given a military expression, depending on the relations of armed force. Nevertheless, Ricardo

wishes for negotiated disarmament, since he considers that the uninterrupted growth of military expenditure leads inevitably to war. Malthus (1803) analyzes war as being the result of the inadequacy of economic development to population growth. He even recognizes that, in the short term, an increase in military expenditure may increase overall demand and may therefore have positive effects on the economy as a whole. In the long term, however, the pauperization to which it inexorably gives rise is a basic source of conflict. For the classical British economists, generalized development precedes development (sic). These ideas were to be picked up by the French liberals - once in a while does no harm - with Jean-Baptiste Say (1816) at their head taking the view that a policy of free trade is conducive to disarmament and vice versa. The utopian socialists (Saint-Simon, Fourier, Proudhon) of the 19th century were to consider, in general, that the material well-being of the populace was at odds with the development of military expenditure. They even developed the idea that war was tending to disappear with the emergence of the industrial class, because it was eliminating pauperism, the true cause of wretchedness.

Generally speaking, most liberal economists considered that the military function should be kept to the minimum so as to improve the performance of national economies in the struggle against scarcity. Nef (1949), for example, thinks that peace stimulates the economic activity of States, while Seymour Melman (1971), in counterpoint, stresses the harmful effects of military expenditure on the American economy: loss of competitiveness, development of the bureaucracy, reduction of productive investment, and the appearance of military-industrial complexes. On this view, disarmament is conducive to development but, conversely, generalized disarmament is impossible in the absence of universal economic development.

C) The Inherent Contradictions of the Capitalist System Make a Disarmament Procedure Illusory

For Marx and Engels (1860), peace and, by extension, disarmament have no intrinsic moral virtue. War and conflicts relate to the superstructure and are conditioned by antagonistic social relations. Disarmament is desirable only if capable of producing economic development induced by the radical break with capitalism and the emergence of socialism, since it is not truly compatible with the continued existence of capitalism. These analyses were continued by, in particular, Rosa Luxembourg (1913) and Lenin (1916). The former considered military investment to be very useful for the development of capitalist economies, in the first instance as a catalyst of primitive accumulation; then as an instrument of colonial domination; and lastly as a hegemonic factor of the struggle between the capitalist countries to divide up the world. Lenin also thought that imperialism, the highest stage of capitalism, necessarily stigmatized by total wars and the capitalist exploitation of the world, ruled out any non-economic disarmament process without the advent of socialism. These theses have been taken up by contemporary authors.

Baran and Sweezy (1968) argue that military expenditure serves to absorb the economic surplus that monopoly capitalism secretes; on that view the arms race matches the logic of capitalism, which seeks to maintain a constant ratio between production and solvent demand through unproductive expenditure.

The surplus may be taken up through consumption by capitalists, through wastage, and through civilian governmental expenditure, but military expenditure is more effective in this role; in effect such expenditure is in line with capitalism in that it does not redistribute income to those whose productivity is low, while it does stimulate collective values. Disarmament is incompatible with capitalism, which constantly generates international tensions that find expression notably in armed conflicts or in the increased squandering of resources constituted by arms expenditure. The thesis of the economy of continuous arms (Kidron, 1970) takes the view that military expenditure exerts a positive influence on profits, on capitalist technology and on the demand for labour. Ron Smith (1977) disputes this analysis; he prefers to see capitalism's need of armaments in the struggle against communism, the maintenance of American hegemony and the will to maintain the existing international order. Lastly, Gundar Franck (1972) considers that colonialism is the original and lasting cause of underdevelopment. Military strength enables other nations to be exploited, either through the occupation of territory, or through intimidation, or through the giving of power to national collaborators. Conflicts are inherent in capitalism; only their forms change. The idea of disarmament is dissatisfying in the context of triumphant capitalism.

D) Negotiated Disarmament in the Context of Coexistence Between Rival Economic Powers

The Keynesian analysis is more concerned with the economic and social consequences of the arms race than with the social and political conditions of disarmament (Keynes, 1921). As Keynes saw it, military expenditure reduces the national investment potential, so that the choice between guns and butter remains in force in a situation of full employment. Military expenditure remains of use to improve international security and to confront the threat from planned economies, mainly the Soviet Union. By virtue of the excessive generalization of their analysis, the Keynesians reduced it to a purely political and economic concept of national security in which considerable scope remained for negotiated disarmament.

As far as neo-classical analysis is concerned, there is in every society a function of social well-being that is maximized under constraints. Expenditure on security contributes to the definition of this optimum. The arms race is rational only if it can counter socialist imperialism. The theories of models of the arms race such as the model of Richardson (Brito & Intriligator, 1967) demonstrate that budgets preparing for war increase the likelihood of war. Military force is an important instrument in the redistribution of consumer rights between countries. Although dissuasion may be conducive to the establishment of a stable equilibrium, it may also lead inexorably towards war.

2. The Main Economic Effects of Military Expenditure

Armed conflicts and threats of war are almost always omitted from economic analysis at the present time. Be that as it may, the choice of defence system may be influenced by the use of the direct or indirect effects of military

expenditure on the economy, leading to its relentless militarization (Smith, 1983). The results yielded by econometric analysis are often divergent. A synthetic approach to the impact of disarmament (expressed through a reduction of military expenditure) on the economy as a whole shows, on the one hand, that variations of military expenditure have little effect in the short term on the basic variables of the economy and, on the other, that the relationships arrived at by the econometric method are of a circumstantial and historical nature. It should be noted that whereas there are many studies of the effect of military expenditure on national economies, analyses specifically devoted to disarmament are less common. Macro-economic analysis of military expenditure is generally examined in relation to seven key economic variables: investment, growth, employment, the balance of payments, inflation, research and development, and economic development. The idea of economic growth does not take in socio-economic development, growth being a means towards development, i.e. improvement of the material quality of life, the flourishing of the rights of individuals and the establishment of the conditions for a qualitatively satisfying life as regards culture, sport and play.

A) Economic Growth

"The arms race represents a waste of resources,..., a hindrance to national development efforts and a threat to democratic processes... Military outlays have no long-term positive effects on economic growth" (United Nations Publication F.83.IX.2, paras 7 and 97). The armaments sector is assumed to be non-productive and redistribution in favour of the civilian sector can have only positive effects. However, the impact of military expenditure on growth is dependent on effective use of the production capacity of national economies. Some economists (Galbraith, 1968; Schmidt, 1974) consider military expenditure to be a safety margin with great inertia, partly destined to control the growth of the surplus. As a real economic regulatory instrument of capitalism, military expenditure is the organized squandering of resources, the creation of an artificial demand capable of disposing of the surplus (Baran and Sweezy, 1966). It has been considered in other analyses that the military sector has benefitted the civilian economy with important technological spin-offs, key innovations and productivity effects (De Grasse, 1983). In opportunity cost terms, civilian investment is, a priori, more conducive to economic development than is military investment. However, this is an assessment that needs qualification, partly because not all civilian investment is equally profitable (notably investment that prompts demonstration effects or effects stemming from a mistaken appreciation of the market), and partly because orders placed by the military sector may maintain the level of production and the competitiveness of entire branches of the economy, as is often the case for aeronautics, the computer industry and ship building. Through their inertial effects on economic flows, military budgets underpin the activity of whole branches of industry, providing them with an assured outlet and additional growth potential through the proliferation of economies of scale and possible effects of domination. The existence of a national armaments industry is a factor making against disarmament, especially when arms production is heavily integrated into the industrial fabric.

Econometric studies generally developed in the framework of a macro-economic model let it be understood that increased military expenditure appears to be associated with a weaker real rate of growth (Smith, 1978; Leontieff & Duchin, 1980 ; Deger & Smith, 1983; Biswas & Ram, 1986). This result has, however, been called into question by several empirical analyses (CBO Study, 1983; Benoit, 1978; Weede, 1983). The main debate is concerned with the multiplier effects of military expenditure. The Keynesian school regards military expenditure as a means of combatting the under-consumption crisis of market economies, the more so because the excess production cannot always be taken up by social expenditure which lowers the incentive to invest through an excessive reduction in inequalities of income. This view is moreover not accepted by Paul Samuelson (1964), who suggests that military expenditure has, at best, a neutral multiplier effect, that the ending of the cold war should even facilitate American economic growth and that it is better to promote public non-military expenditure. This view is more strongly defended by Dumas (1987), who thinks that the security of the United States is at least as much dependent on its economy as on arms, and that military expenditure squanders the work force, capital and technology of a private enterprise economy in a situation of harsh competition, thus detracting from its effectiveness in the long term and producing a bureaucratic and military organization that is little concerned with the rules of international competitiveness.

However, Browne (1988), who made a close examination of the American economy, did not find any clear indications of the responsibility of military expenditure in the low productivity of American industries, since there were only a few effects of the supplanting of technology and loss of jobs. In a recent study (Alexander, 1990), taking a sectorial model distinguishing exports, defence, government expenditure and the rest of the economy, it is considered that military expenditure does exert eviction effects between these sectors, but that the overall result does not necessarily indicate a negative connection with growth following an increase of military expenditure, even if the military sector proves, for all that, to be less productive and less economically efficient than the other sectors. This analysis leads us to assume that it may be difficult to analyze the negative effects of military expenditure on the national economy in the short term; it would gradually erode the very foundations of the economy, mainly by limiting its competitiveness.

The effects of military expenditure on economic growth are transmitted through four main channels, namely the possible reduction of investment, the effects of substitution of the work force (especially, skilled workers), the application of a military technology that has less respect for the economic rules of profitability, and the growth of effective demand. The expansionist effects of military expenditure have often been high-lighted. In a situation of underemployment, military expenditure boosts the economy, but at the same time it has inertial effects in the longer term that are capable of impeding future growth. Other expenditure could be envisaged to combat the recession. Whereas increased military expenditure is capable of promoting economic growth, it does not necessarily produce the cumulative effects that are a feature of economic development. Although it is possible to use the military infrastructure for civilian ends, it is rash to think that such a situation is optimal. Besides, it is paradoxical to note that economists have sometimes explained the growth of Germany and Japan between 1930 and

1940 by investment on armaments while explaining the economic miracle of the same two countries since the last world war by the weakness of their military expenditure. It has to be conceded that there are far more essential arguments to account for these two periods. On the other hand, the expenditure on imported arms of small countries that do not produce arms limits the reserves of scarce foreign exchange; military imports overtake productive imports and result in indebtedness. Should this military investment be financed by international aid, there will still be substitution costs. Under these conditions, military expenditure has a direct and very unfavourable effect on economic growth. In the case of developing countries, military expenditure redistributes the capital available for investment, and absorbs resources that may however increase internal demand and have a spin-off in modernization. According to Deger (1986), a percentage point reduction in military expenditure increases economic growth by a third of a point and completely eliminates the external capital requirement of the least advanced countries. The competitiveness of the economy is increased and the deficit on the trade balance is reduced. Furthermore, when real income is very low, military expenditure has a negative effect on growth. The effect is positive for countries with a medium income, and becomes negative once again for countries with a high income. The graph of the relationship is an inverted U.

Taken over all, military expenditure has positive effects in developing countries, but the net effects remain basically negative. Econometric analyses seem relatively incapable of providing indisputable information on the existence of the negative or positive relationship under consideration. The ultimate effect of military expenditure on economic growth depends on the functional combination of several parameters concerned in particular with its cause variables, namely investment, consumption, the balance of payments, inflation and unemployment.

Table 2. Effect of Military Expenditure on Economic Growth by Development Level (Deger, 1986)

Development level	Channels of military expenditure growth effect	Net effect
Weak	Resource distribution	Negative
	Modernization	Positive
Medium	Resource distribution	Negative
	Modernization	Positive
	Technical progress	Positive
	Utilization of capacity	Negative
High	Creation of demand	Positive
	Technical progress	Positive
	Utilization of capacity	Negative
	Creation of demand	Positive

B) Investment

The existence of a negative relationship between investment and military expenditure is a fairly old hypothesis, one that had already been advanced in his day by Pigou. Williamson (1983) has shown that the burden of the military expenditure of the Napoleonic wars caused investment to be appreciably reduced in Great Britain. Most econometric studies, which are, moreover, often confined to reduced forms, tend to provide empirical confirmation of this hypothesis (De Grasse, 1983; Deger, 1986; Percebois, 1986) and to give three explanations for it, namely the eviction effect, the objectives of social consumption, and the constraints of industrial capacity.

The taxes required to finance military expenditure depress private demand and reduce the profit hoped for from investment. Possible debts connected with the financing of the defence effort result in increased interest rates and are therefore conducive to a cutting back of private investment. Lastly, the defence effort reduces or slows down other government programmes, which are often free to be decided. These supplanting effects cannot be denied, but the extent of their impact varies with the time and place. Military purchases are the specialized output of certain specific industries, such as aeronautics, ship building and the computer industry, typically sectors producing capital goods. If military demand takes priority, these industries are no longer able to supply the civilian demand for capital goods, particularly in times of rapid rearmament. Under those conditions, military expenditure creates bottlenecks that reduce the possibilities of investment and cause inflationary trends. Gansler (1982) is of the opinion that the American aeronautical industry experienced considerable bottlenecks consequent upon the policy of military redeployment decided upon by Reagan.

The objective of social consumption raises the problem of division of social resources between current and future needs. Private or public consumption, such as expenditure on health, is a current "concern", whereas military expenditure does not yield immediate benefits except in a period of open conflict, and is therefore a "future" good. Private civilian priorities may cease to correspond to government priorities. Societies have a relatively stable objective for social consumption, with a fixed proportion of revenue devoted to the present. Within that proportion and independently from it there is a distinction between public and private property. The only adjustments possible are in the part devoted to investment (representing the future) and consumption (representing the present). It is therefore possible to substitute public consumption and private consumption, on the one hand, and military expenditure and investment on the other, but the substitutions between the two groups prove to be limited. This analysis is of interest because it can explain why the relationship of substitution between investment and military expenditure is not always operative. Should the economic effort of defence be perceived as a present need yielding immediate profits or responding to an urgent situation, military expenditure is substituted for global consumption. It is therefore the immediacy of danger and its national perception that determine the quality of the substitution between military expenditure and investment.

There are, therefore, four factors that may invalidate this relationship, namely social acceptance of the financial effort of defence, the structure of military expenditure (the ratio of personnel costs to capital or infrastructure costs), the level of economic growth (in a period of economic stagnation,

military expenditure is more directly in competition with investment), and the existence of a strong arms industry. If the population is prepared to accept the defence effort, in particular in a situation of oppressive and identified international danger, then, as has been stressed by Schultze (1981), it may make up its mind to reduce its consumption. The fact that the increase in military expenditure is not leading to a reduction of global investment at the present time, comes about because the citizenry do not yet see clearly that the danger of war is imminent. There is therefore a discrepancy between the needs expressed by economic interests and the attitude of the State, which may, moreover, be due to the availability of different strategic information. This provides a vindication of Boulding (1973), confirmed by the studies of Russett (1970) and Weidenbaum (1990), who has shown that although military expenditure in the United States in the years 1929-1969 adversely affected expenditure on personal consumption, there was only a slight down turn in gross investment. This was all the more so because the American arms industry had some dominating effects on all the industrialized countries. Lastly, Looney's analysis (1988) confirms the hypothesis that arms industries may benefit from an increase in military expenditure, and that this may have positive effects on the investment of developing countries. This analysis may, however, be contested on methodological grounds. The establishment of an infrastructure, the modernization of ways of thinking and education in national feeling and in the collective interest that are features of the militarization of economies make it possible for the less advanced countries to oppose the swallowing up of production capacity and the potential for innovation (Deger, 1986). It makes no odds that the effects of military expenditure must be analyzed more closely, having regard to the nature of outlays (personnel, conscription, current operations, R & D, investment) and the supplier (national, multinational or foreign undertaking). Given that military expenditure is incontrovertibly unproductive, it is difficult to see how, at least in opportunity cost terms, military expenditure can be the best possible investment for economic development, save perhaps when a conflict exists.

C) Employment

There is no real consensus on this matter. Boulding (1979), Smith (1978), de Grasse (1983), Szymanski (1973), Fontanel & Smith (1975), and Anderson, Frisch & Oden (1986) all consider that military expenditure tends to have a negative effect on employment. The general conclusions are, however, unsatisfactory. If the increase in military expenditure applies mainly to personnel costs, the effect on unemployment is liable to be positive, whereas an increase in military capital expenditure would not have a positive effect. Wider conscription is capable of reducing underemployment in the short term, but is a decision that may restrict the development potential in the long term, particularly if job losses lead skilled workers temporarily to leave the production sector; under these conditions it may lead to increased unemployment. Aben (1981) has, however, shown that a drastic reduction in military expenditure inevitable leads to increased unemployment, at least in the short term. This hypothesis is partly disputed by Smith and Dunne (1987), who are of the opinion that the adverse effect is brought into play only if there is no additional public expenditure to offset the reduced military expenditure. In a later work (1990), the same authors concluded from a simple dynamic macroeconomic equation model for the United States,

the United Kingdom and 11 OECD countries that the unemployment rate was not significantly affected by the proportion of the national product devoted to military expenditure. It may be concluded that military expenditure does not have to be specifically considered in an analysis of employment, but also that disarmament may not be systematically associated with a rise in the unemployment rate.

Adams and Gold (1987) think that the number of jobs created by military expenditure is not a good indicator of the impact of defence expenditure on the jobs market. Such expenditure creates jobs in some regions, but not in others, at certain levels of specialization or skill, in particular branches or industries, and for certain firms. The first effects to be felt are substitutions, the long-term effects of which are difficultly quantifiable. It is, in fact, of greater interest to consider which will be the regions and the sectors in which jobs will be created, and in whose favour? More generally speaking, the economic consequences of military expenditure on employment may be analyzed only by taking several cause variables into consideration such as the existence of conscription, the ratio of expenditure on personnel to capital expenditure, the relationship between military pay and wages in the civilian sector, the national arms production, the nature of the jobs in the arms industry or whether the employment situation is one of underemployment or full employment. If we confine our attention to public expenditure, it is clearly apparent that military expenditure "generates" less jobs than the education system. However, given that these two types of expenditure do not satisfy the same objectives, this answer is no more than a very general indication, an a posteriori gloss on the situation, it being understood that some social values such as equality, justice, legitimacy and security transcend the imperialist pretensions of the economist in collective choices. The fact of admitting that military expenditure does not create many jobs ought not to be seen as prescriptive.

D) Inflation

Two aspects must be considered in this type of analysis; the first involves considering price movements in the military sector, while the second lays the emphasis on the macroeconomic effects of a change in military expenditure.

The first effect tends to be inflationary in arms-producing countries (cost-push inflation). Skons (1983), Boulding (1979), Dussauge (1985) and Adam and Gold (1987) consider that military prices tend to rise faster than prices for civilian products. However, although considerable unexpected increases are indicated by analysis of some products, it is scarcely possible to arrive at adequate quantitative conclusions owing to the lack of information on and/or the secrecy surrounding military price indices and how they are calculated.

The second effect is more controversial. It is also dependent on the economic conditions of full employment or underemployment, on the production capacity of the arms industries, the arms effort required over a short period of time, changes in the remuneration received by military personnel, the social status of the military etc. Lester Thurow (1982) was of the opinion that only a significant deficit in the public budget could finance the defence

effort of the United States, and that it would contribute to great instability of the financial markets and the development of inflationary tensions. This situation could be the source of "compulsory saving" or of ostentatious consumption. Taken overall, military expenditure appeared to fan inflationary tensions. However, this relationship has not been clearly established for France (Percebois, 1986; Fontanel, 1981), or for the United Kingdom (Starr, Hoole, Hart & Freeman, 1979).

Actual economic situations differ too much over time and in space for it to be said that the existence of a necessarily positive relationship between price rises and the upsurge of military expenditure is a rule or an inevitability. On the contrary, rapid rearmament leads inescapably to inflation, as a general rule. Although there has not been any real study of the impact of disarmament on inflation, it is not obvious that effects directly in line with the increase in military expenditure would be obtained.

E) The Balance of Payments

Two aspects of the impact of the military effort on the balance of payments must be examined: Whether, on the one hand, arms exports or imports play an important role in the stability of the balance of payments, and how, on the other hand, the macroeconomic effects of the defence effort influence international trading and financial transactions. If the country is an arms importer, the arms imports worsen the situation of international transactions. If the country is an exporter, an account must be compiled of the imports induced by intermediate consumption and the time-lags between the payment of amounts owing and amounts due, a basic time-lag that may destabilize the national currency. However that may be, the arms-producing countries of the Third World are reducing their arms imports, according to Looney (1988), which justifies the policy of import substitution.

If all the arms purchases of a State are imports, its trade balance is adversely affected by the defence effort, at least in the short term. In fact, the economic proposal should take into account the comparative advantages or what accrues to the factors of production on the understanding that a country may improve the situation of its balance of trade by not producing its own arms and by specializing in other, more profitable activities. The recipient is multiply dependent on the perception of the danger, its degree of autonomy over arms purchases, its capacity to initiate or step up national arms production, the diversification of arms supply, the availability of alternative sources of supply from which to purchase, the reliance placed on foreign suppliers regarding spare parts, the degree of training and the maintaining of self-sufficiency. It is, however, true that, other things being equal, importing countries are only the main beneficiaries in the short term, when there is a concerted reduction in military expenditure, if their imports have been linked to national exports by an intergovernmental agreement. A recent econometric study (Pearson, 1989) has given prominence to the variables relating to arms imports by geographic zone, by testing the following five hypotheses: national characteristics (e.g. area, population), government (military State or democracy), military characteristics (such as defence budgets), economic characteristics (such as the degree of wealth or the level of trade), and international characteristics (such as the international disputes in which these countries could have been involved).

In general, it is military considerations that dominate the explanation of how arms imports are determined (especially the level of military expenditure), as well as the inertial effects that highlight a veritable market with buyers and sellers involved practically every day in negotiations. Brzoska (1983) has demonstrated that the total indebtedness of Third World countries would be something like 20 per cent less were there to be no arms imports. A disarmament drive would possibly be able to reduce this dangerous connection, even if there is always the risk in the short term of an arms enterprise seeking to resell the surpluses that the developed countries, held back by international agreements, would be led to disregard.

On the other hand, arms exports make it possible to develop learning effects, to improve economies of scale, and to apportion fixed costs to larger series; they are an active component of foreign policy and defence policy which establishes links of interdependence at both the military and the commercial level. Such exports often look like support for the existing political system, but arms exporters must take imports of intermediate consumables into consideration, along with payment periods and non payments, and the effect of the time lags between delivery and financial settlement on exchange rates and the competitive position of the national economy. Exporting is not necessarily a lucrative activity for industrialized countries (Smith, Humm and Fontanel, 1985) and it does not reduce the national armament effort despite the possible economies of scale, which seem rather to favour the importers. Examination of the forms that purchases take shows that the economic arguments in favour of the protection of national arms industries are quite open to dispute.

Thurow (1981), Melman (1974) and Rothschild (1973) all consider that military expenditure reduces industrial competitiveness and promotes a trade deficit. Adams & Gold (1987) even think that military expenditure, being inherently inflationary, is bound to weaken the competitiveness of American enterprises and may lead to a worsening of the trade balance. Under these conditions, the international arms market would be less congested. It is now being asserted that the arms industries have weak industrializing effects, notably because the spin-off from military technology is relatively limited for the civilian sector and because the arms export war is probably as costly for the community as it is profitable for the many middlemen (Schmidt, 1984). Looney (1988) considers that the arms-exporting developing countries come out of the situation better than their importing opposite numbers, in particular because of an improvement in their balance of trade. It is quite difficult to arrive at any final conclusions concerning the impact of military expenditure on a trade balance subjected to influences that are as different as they are opposing.

F) Military Research and Development

Military research and development constitutes more than a third of civilian R & D in the United States. Given that there has now been half a century of almost continuous involvement in military and space R & D, the United States government has forgone the equivalent of nearly 20 years of civilian R & D. What contribution this wastage has made to the loss of competitiveness of the American economy is a question that has been widely debated. Mary Kaldor (1982) referred to baroque technology because the weapons were so

sophisticated that they were bound directly or indirectly to have harmful effects on civilian technology. However, Browne (1988) thought that there was little to indicate that military expenditure would have a pernicious effect on American innovativeness; nevertheless, no relationship could be established for the short term spin-off of military technology onto its civilian counterpart. Weidenbaum (1990) additionally considered that military R & D did not enter into competition with civilian R & D, and that the two sectors were mutually independent in their operation. There was therefore no financial switching of amounts allocated to one or the other. This presentation is, nevertheless, still ambiguous. There are many relationships between military technology and civilian technology in which the former naturally utilizes the results of the latter, whereas the latter, restricted by secrecy and by the considerable difference of highly sophisticated products manufactured in small series, is only indirectly influenced by the major decisions taken by the State in the main branches of basic research. Thus, should the government opt for nuclear weapons, the two sectors will have the benefit of atomic energy, but the civilian sector will find that its own freedom of choice regarding energy will be restricted by the very size of the research contracts awarded to nuclear technology.

The arguments put forward in condemnation of the influence of the military sector in modern technology are not however always consistent between those who consider both that the civilian applications of military research and development are very slight (the baroque arsenal theory) and that present day societies are undergoing a militarization of the economy (the theory of the military-industrial complex), and those who take the view that military research is an essential vector of present economic development (the theory of human capital and training) while at the same time considering that it must be protected against civilian diffusion that would be bound in the long run to favour the evil designs of potential adversaries (the theory of unequal exchange). These ambiguities in analysis are explicable by the diversity of the necessarily close relationships between military technologies and their civilian counterparts at the sectoral, regional and national levels, and over time. Because there is no a priori reason for military rationality to be in phase with economic rationality, opportunity costs may prove to be very high in a world of scarcity, notably because the adding of additional constraints modifies the conditions for realization of the economic optimum (Fontanel, 1989).

G) Development

Development is a broader concept than growth; it also introduces the idea that well-being is irreversible or that entitlement is flourishing (Sen, 1983). The question is one of knowing whether or not a prolonged military effort is a brake on economic development. Comparison of the recent experiences of the USSR and the United States with those of Japan and Germany seems to provide an answer, although one that is not as clear as might seem a priori. Deger (1986) thinks that there is a negative relationship between socio-economic development and military influence, even if this basic hypothesis is not always supported by oversimplifying econometric studies. There are at the present time four main approaches to economic development: the seeking of comparative advantages through the easing of restrictions on

trade; development based on exports; the expansion of industrializing industries; and the policy of import substitution.

The easing of restrictions on trade affords little opportunity for developing countries to attain their own independent advanced arms industry. Liberal theoreticians take the view that the opening of economic frontiers is egalitarian in promoting economic and social progress and favourable to peace. Every country ought to specialize in products for which it is reasonably cost-effective. It is pointless to produce arms for their own sake, because the trader and the manufacturer ought to supplant the warrior. The production of the arms essential to security ought to be carried out in allied States that have the best comparative advantage. Vernon's theory of the product cycle (Fontanel & Saraiva, 1976) stresses the progressive transformation of the world economic landscape, a feature of which is the irreversible trend for some sectors of industry of the developed countries to shift to the developing countries. In its first phase the new product is manufactured in the developed countries, which are havens of scientific and technical research and are the principal purchasers. The developed product is better known, and demand for it increases considerably owing to the diffusion of technology and the appearance of new competitors. The product becomes increasingly international and the conditions are established for the manufacture of the standardized product, the features of which are a good knowledge of the manufacturing processes and their simplification. If the labour input of the product is heavy, the price elasticity high and the transport cost low, the developing countries are able to gain a place in the market. These products even have a tendency to drift outwards. The manufacture of traditional weapons that change little, are not shrouded in military secrecy and do not require sophisticated manufacturing processes may follow Vernon's cycle. In that context, however, the developing countries are unable to take on production of the arms needed for their security on their own and their production responds above all to purely economic considerations and is confined to ordinary munitions. The United Kingdom of Mrs Thatcher accepts these new constraints, but it is also experiencing additional economic difficulties in the short term and definitely a loss of control over its own defence (Dunne & Smith, 1991). Were one or two countries to prove to be the most competitive in this sector, it is likely that after several years of near monopoly they would progressively use this power to subjugate all their customers. The arms industry is not an activity like all the others, but one that calls security and freedom into question.

The policy of import substitution seeks to replace imports by a product manufactured within the country. It was at the outset a matter of ensuring the manufacture of imported intermediate goods and consumer durables. The principle of the theory is a simple one: given that an internal demand exists, what has to be done is to produce locally what is bought abroad. In this sense, the pursuit of endogenous development is opposed to liberal theories based on comparative advantages and the contributions of factors. Early in the seventies there were many agreements for the manufacturer of arms under licence. If it be true that arms production is favourable to national supply industries, it also permits the penetration of foreign capital and the conversion of military industries into transnational industries. This policy is nevertheless estimated to economize on scarce foreign currency. Purchases of munitions abroad place a heavy strain on the trade balance; they are

sometimes the source of a deficit that may have grievous consequences through its effects on speculation, worsening of the terms of trade, and the emergence of cumulative effects that aggravate the deficits and inflationary tensions. Nevertheless, the arms industry does not really promote economic growth and even less does it promote industrial integration because the multiplier effects are, empirically, fairly weak, having regard to the divorce between civilian activities and military activities, the fact of military secrecy, and the economic dislocation. It may lead to a very considerable increase in costs, to dependence for intermediate consumables and patents, to a break between the protected military sector and a civilian sector in a competitive situation, and to eviction effects, notably at the level of employment and finance capital, to the advantage of military activities etc. The influence of scientists has upset international strategies. In the absence of good military research and development, the security of countries is under constant threat, unless it is covered by a military alliance. Technological competition, which is unending, accelerates obsolescence. That is why it is difficult for developing countries to assert their economic independence, since they are obliged to seek foreign licences - generally for the production of what is already on the way to obsolescence for the equipment essential to their defence. It is easier to import sophisticated equipment than to obtain the licences required for its production. Under these conditions, national production may even run counter to the very security of the country.

The strategy of development through exports is extremely dangerous when applied to the military sphere. The trade balance will not necessarily benefit, at least not initially, since allowance must be made for the imports required for the manufacture of national equipment (more than 30 per cent of the cost of the military equipment exported by France), for the price competitiveness of nationally produced arms in relation to their foreign counterparts (on pain of temporarily replacing a deficit of the trade balance by a budget deficit or of redistributing public expenditure), and for time-lags (purchases from abroad are rarely paid for in cash, but imported components for military equipment are, which may cause unacceptable bottlenecks). The need to export in order to cut costs by economies of scale also gives rise to economic dependence. The exporting of arms is often regarded as a highly lucrative activity, although few studies have been specifically concerned with this point. In fact, this function appears to have been quite poorly fulfilled for several years past. Sales are in effect accompanied by credit conditions that are especially favourable to the purchaser, and at times they do not involve any reciprocal financial transactions, notably for heavily indebted or developing countries: furthermore, some equipment is on occasion sold more cheaply abroad than to the country's own armed forces, and there is such a thing as impoverishing exportation, i.e. exports that tend to weaken the country economically, notably when they are a factor in worsening the terms of trade. Lastly, having regard to the requirements of purchasers, the economies of scale expected to accrue from serial production are not always very great, except for very ordinary equipment from which little profit is expected, by virtue of the competition. It should be recalled that munitions have the highly specific attribute of being goods that are destroyed. Furthermore, a decision to disarm would then be highly prejudicial to the national economy as a whole. Under these conditions, there would evidently be less scope for the application of policies of import substitution or of the principle of industrializing economies and the return on investment would be bound to be sufficiently disturbing to cause serious

problems regarding the survival and conversion of companies (moreover, companies that are often nationalized).

Arms industries as industrializing industries or poles of development are an idea that has been strongly developed in Brazil and India. Economic development must be brought about through stimulating investment, since it is impossible, initially, to achieve harmonized and balanced development. What is therefore needed is to invest in activities that have the effect of providing an impulse through sequences of induced investments that ensure vertical and/or horizontal complementarity of the country's industry. The effectiveness of investment is measured by these induced knock-on effects. In this sense, military industry is a pole of development either through the backward linkage effect, which reveals the increased demand of all the production sectors feeding the sector in which the investment is made, or through the forward linkage effect, which is felt further down the line. Production of military equipment stimulates the civilian sector through the purchase of intermediate consumables on the internal market and through the creation of new jobs. Nevertheless, these stimulating effects are not decisive for development, since there is considerable risk of obsolescence in an economy in which there is already little innovation, there is considerable risk in exporting to achieve acceptable economies of scale, except for products that provide little stimulus, the risk of penetration by foreign capital is far from negligible, and military industries make great demands on capital, which a scarce factor of production for Third World countries. The policy of import substitution - i.e. the creation of a national supply corresponding to an expressed internal demand for imported products - may be selected in this case so as to promote internal industrial supply. Arms production leads to militarization of the economy and reduces the disarmament potential. It cannot be denied that whole groups of national industries may go rapidly into recession unless military orders are replaced without delay by civilian orders, but it is also logical to expect that positive effects will emerge from disarmament, possibly in other sectors or other regions. This is probably one of the reasons that led the Soviet Union to be so keen for a pause in the arms race. Mikhail Gorbachev developed this idea when he asserted that development and international relations were modified by the arms race and the militarization of ways of thinking. Reconversions scarcely seem to pose major problems in the short term in planned economies, having regard both to the urgency of measures to boost the economy and to the civilian activities of most of the arms industries. Half the Soviet Union's steel, a quarter of its railway equipment and more than a fifth of its consumer goods are in fact produced by the military sector (Cooper, 1988).

How arms-producing Third World countries cope with the existence of technical and human capital made obsolete by a political decision and a new international situation after heavy investment has already been made in that sector will be instructive regarding the intentions of the developing countries, and even perhaps, in a broader context, of the real potential for lasting disarmament. Furthermore, the changeover from military activities to civilian activities right on the industrial site often proves to be a particularly delicate operation, having regard to the fact that the equipment is unsuited to the constraints of civilian demand, so that there has to be a compromise between technical specifications and cost. Two basic economic reasons are usually advanced to justify arms industries: the saving in scarce

resources and the industrializing effects. Analyses of import substitution policies and of industrializing effects are not very encouraging in this respect. The opportunity costs of using highly skilled personnel in the military sector, the heavy investment involved, the pace of innovation and the rapidity of obsolescence in the military sector, the imports necessarily occasioned, the length of the production cycle, the intervention of multinational corporations, and the weakness of the industrial base needed if the best-performing products are to be competitive are deterrents at the purely economic level against national production of arms in developing countries.

3. The Economic Impact of Disarmament in Developed Countries

There are two complementary types of analysis: simulation by economic models of varying degrees of complexity and statements of economic policy based on what must be done in the context of disarmament.

A) National Economic Models

Whereas a number of economic models have been constructed to analyze the impact of increased military expenditure, there are few formal analyses of the economic effects of disarmament. The application of simulations based on the reduction of military expenditure involves the hypothesis that the effects on the national economy of an increase or a decrease in the economic effort of defence will be to some extent homothetic. Now, it is probable that threshold effects will emerge to render such a generalization questionable, above all effects of stocks or of property. There are few economic studies on the economic effects of disarmament on national economies, and they are not always applicable to the present situation of contractual disarmament by mutual agreement desired by the great military powers, faced with the failure of the socialist system tried out for more than seventy years by the Soviet Union.

As regards France, a very simple model focusing on chronological series (Fontanel, 1980) shows that progressive disarmament has a weakly positive effect on the gross domestic product of France. This impact is due mainly to reduction of the inflationary tensions to which the armament effort gives rise and to the appreciable increase in national investment. Above all, however, the essential idea which is rather poorly developed in most economic models and is present in this analysis is consideration of the dual nature of military expenditure: as public expenditure it exerts important effects on global demand and is therefore capable of exerting Keynesian multiplier effects; as military expenditure in the strict sense it must be analyzed in comparison with other forms of public and private expenditure. Under these conditions military expenditure has quite high opportunity costs, notably because it reduces the public and private investment potential for production. The effects of a 40 per cent reduction of military expenditure on the main sectors of the economy and on employment were studied in another model of input-output type (Aben, 1981). The following results were obtained: a reduction without the substitution of civilian expenditure for military expenditure led to an appreciable decline in national production (34 per cent for the armaments sector, shipbuilding and aeronautics and 3 per

cent for smelting and metal working) and a loss of 400 000 jobs (300 000 for the military sector alone); when civilian expenditure can be substituted for public civilian expenditure, several hypotheses were envisaged depending on the structure of the new allocations. None of the possibilities for the reconversion of defence activity made it possible to avoid a worsening of the employment situation in the short term (a loss of the order of from 140 000 to 213 000 jobs). This conclusion must, however, be heavily qualified, on the one hand because conscripts are not very costly and would readily find work in the civilian sector at an equivalent price, and on the other hand because very few economic activities subjected to such a reduction of their credits would emerge with such a satisfactory result (the loss of between 13 and 20 per cent of their labour force). Lastly, with the exception of the sensitive sector of armaments, shipbuilding and aeronautics, no sector received more than 2 per cent of its direct and indirect orders from the military sector in 1980. The harsh, disturbing result of the enforced loss of jobs resulting from disarmament in France is therefore considerably tempered on the one hand by the relative lowness of the figures obtained and, on the other hand, by the positive effects in the medium term of the replacement of military expenditure by more efficient civilian expenditure, unless the State should decide to make economies on extravagant items of expenditure or on expenditure as unproductive as defence costs.

As regards the United Kingdom, Dunne and Smith (1984) are of the opinion that disarmament is more of an opportunity than an economic problem. Using the CGP model (CGP = Cambridge Growth Project, Warwick University) they made several simulations of the economic impact of disarmament in Great Britain. They tested two hypotheses of a reduction of one billion pounds (1970 prices) in military expenditure. In the first (hypothesis A) the reduction was offset by public expenditure; in the second (hypothesis B) there was no compensation. The results are interesting. The first type of disarmament produced a slight improvement in the balance of payments, a limitation of inflationary tensions of the order of one per cent (which abated from the second year onward), the creation of new jobs connected with the labour-intensive nature of the defence expenditure relative to the civilian governmental expenditure, and additional growth, of the order of 0.5 per cent, starting with the first year. Policy B, on the other hand, led to a reduction in the GDP of the order of 1.46 per cent, a fall of 0.15 per cent in the price index, and a worsening of the jobs situation (with 149 000 new unemployed in the first year and 200 000 at the end of 5 years). This situation was, however, brought about more by the deflationary policy than by the actual reduction of military expenditure (Table 3).

Table 3. The Main Macroeconomic Effects of a Reduction in Military Expenditure of the Order of 35 per cent (difference by comparison with the "normal" situation of no disarmament)

Variables	Simulation A		Simulation B	
	Year 1	Year 2	Year 1	Year 5
GDP (%)	0.57	0.43	-1.46	-1.28
Prices (%)	-0.95	-0.42	-0.15	-1.51
Jobs	200000	257000	150000	190000

More detailed analysis suggested that there would be more than 250 000 jobs thus affected by disarmament, but a comparable reduction in the public sector would have led to a severe worsening of unemployment involving something like 350 000 jobs. The structural changes were, however, mainly of a microeconomic and mesoeconomic order and highly heterogeneous. Several questions were then raised concerning the appropriateness of a national arms industry, its export capacity, its global effects on the balance of payments, its technological competitiveness, and the existence of dual commodities. The adjustments came up against inertial effects, mainly at the level of individuals, the region, the company and the industry itself. These structural effects are difficult to demonstrate in a macroeconomic model that is necessarily an overall synthesis. However, the authors assert that the results are in line with the historical experience of the United Kingdom and with studies that stress the effects of substitution of military R & D to the detriment of civilian products (Kaldor, 1980), poor use of military technology (Maddock, 1983), and the crowding out effects of investment (Smith, 1980a). Disarmament eases the constraints on financial policy, the scarcity of technological ability, capital formation and the balance of payments; this, according to the authors, represents a major contribution to the regeneration of the British economy. Hartley's more qualified study (1987) emphasized the difficulty of actually determining the reductions of military expenditure, the fact that there need not necessarily be a correspondence between disarmament and the reduction of military expenditure, and the somewhat negative effect of military expenditure on the growth of the United Kingdom, an effect also manifested by health expenditure.

The impact of disarmament on the Canadian economy has been analyzed (Bernard and Truchon, 1980; Galligan and Herring, 1987) using the macroeconomic model of the Canadian Institute of Statistics (National and Inter-Regional Input-Output), which is based on the structure of the purchases of each sector and the distribution of the various demands for a given year. There are, therefore, no time relationships, which detracts considerably from the significance of the study, given that disarmament is a process that is necessarily progressive and dynamic. The results lay stress on the serious difficulties of the aeronautics industries, shipbuilding and communications equipment, the decline in the productivity of the industries concerned and the regional heterogeneity of the effects of military expenditure. At the national level, the multiplier of military expenditure over national expenditure would be of the order of 1.75 in 1985. The results obtained undoubtedly lack clarity in the context of an examination of disarmament.

The decline of the American economy has been emphasized over the last few years by the way in which innovation has lagged, low productivity, the twin deficits, and problems of competitiveness. Paul Kennedy (1987) formulated the hypothesis that these problems could be due to too high a level of military expenditure in the United States. The argument is certainly not a new one, but econometric analysis does not yield any very clear results in its support. The statistical data do not provide irrefutable proof of a negative relationship between capital formation and military expenditure, and the productivity problems of American industry cannot be ascribed to the defence effort alone. The available scientific tools are inadequate to support

such propositions (Gold & Adams, 1990). Kinsella (1990) demonstrated by the use of an autoregression vector that no substantial causal relationship existed between military expenditure and prices, unemployment and the interest rate. A direct positive relationship (without time lag) did exist between military expenditure and national output, but only for monthly or quarterly information, notably when the economy was in bad shape and thus was under the effect of the Keynesian multiplier. The fact that no delayed relationship between the national product and the economic effort of defence was significant pointed to the weakness of the causal relationship between these two variables. Huang and Mintz (1990) confirmed this analysis. Atesoglu and Mueller (1990) thought that there was a positive relationship between military expenditure and economic growth, but that the multiplier was very small. Unless reduction of military expenditure was very considerable and abrupt, the effects of highly progressive disarmament on American economic growth would be negligible. This relationship might imply that the United States had relatively too few opportunities for investment and that the increase of military expenditure was a Keynesian opportunity of increasing creditworthy demand.

A study by Ward and Davis (1990) demonstrated the multiplier effects of governmental, military and civilian expenditure on the national economy and revealed the existence of contradictory effects, the resultant of which was dependent both on the magnitude of defence expenditure in the economy of the United States and on the importance of the military effort in the State budget. The relative weight of military expenditure in the national economy is a burden for the economy, whereas public non-military expenditure tends to have a positive effect. In other words, periods of increased defence effort tend to restrict economic growth. Conversely, by virtue of the difference in the productivity of governmental expenditure itself, the share of non-military expenditure in government expenditure tends to have a negative influence on growth, unlike that of military expenditure. It must be pointed out that the State often has to be responsible for activities that are not very productive but are necessary for society as a whole, and that cannot be handed over to the private sector for economic considerations of profitability or the principle of public service. Thus, the defence of justice, freedom and the rules of democracy does not always make sense in terms of economic value added, even if these principles are superintended by administrations that have to satisfy the criteria of good management within the restricted framework of their constraints. Ward and Davis concluded that the global effect of American military expenditure during the period (1952-1988) had been very slightly positive, but that its contribution to national productivity had declined, in contrast to that of governmental civilian expenditure. Lastly, a simulation relating to a 5 per cent reduction of military expenditure indicated that were investment and employment to remain constant, growth ought not to be affected in the short term. This brings us back to the hypothesis of Atesoglu and Mueller (1990). Furthermore, Aschauer (1989), who applied an empirical test to productivity, was of the opinion that whereas the expenditure of the State infrastructure had very positive effects on growth, the same could not be said of military capital expenditure.

To sum up, it seems that military expenditure has tended to have a very slightly positive impact on the national economies of developed countries, quantitatively speaking. In terms of opportunity cost, however, it does not appear that the defence effort is the best economic investment in today's

world, and this may explain the progressive loss of competitiveness of countries that maintain a raised level of military expenditure over long periods. A distinction should also be drawn between arms-producing countries (for which the effects of disarmament may be positive or negative in certain cases), great powers (which may benefit from effects of domination) and middle-level powers in their desire to maintain adequate national security. Lastly, let us stress that, as a process, disarmament is not symmetrical to armament, since the effects of stocks are very different. When the capital of the military sector is underemployed, disarmament indisputably increases the sectorial crisis of armament, whereas when the situation is one of its full employment, the effects may be positive, thanks to the easing of market conditions. At the global level, on the other hand, the freeing of resources in a situation in which there are favourable opportunities for investment may have positive effects on the economy as a whole. Situations in which military expenditure rises are not necessarily comparable to disarmament situations. Substitution effects appear when there is full employment. In a period of underemployment military expenditure exerts a Keynesian growth influence that could equally well be exerted by other public expenditure (Colard, Fontanel & Guilhaudis, 1981).

B) Analysis of Economic Policy

Were the situation of the possible disarmament of the major nuclear powers to be rapidly analyzed, the effects would differ globally in accordance with the actual situation of each national economy. Paul Kennedy (1987) was of the opinion that the United States had to confront the dilemma of the military obligations of a great power and of industrial decline aggravated by agricultural problems, the twin deficits and progressive loss of international competitiveness. Under those conditions, peace dividends from disarmament could appear as much in favour of social programmes as of national productivity. The reduction of defence expenditure did further the competitiveness and the productivity of American enterprises, all the more so since the technological spin-off from the military sector was considered to be inefficient and costly (Melman, 1974). Joshua Goldstein (1988) suggested that war and prosperity were closely connected in a relationship of repulsion and that one per cent of American military expenditure relative to the GDP destroyed 1.5 per cent of annual economic growth. It should be added that disarmament by the United States would be of global significance (certainly of structural significance) only provided that the allies did not increase their own military effort under an agreement for the sharing of the defence burden (Sandler, 1987). Furthermore, a changing economic situation is sometimes the source or the cause of new potential for conflict and rearmament (Russett, 1983).

Lawrence Klein thinks that the effect of disarmament on the American economy will be bound to be positive (Klein, 1990a). The production of civilian capital goods will be very useful when it takes the place of military production, because the former creates new income flows, whereas the latter is used to destroy or to be destroyed without any economic return. Thus, a motorway will still have utility far beyond the expenditure period and will further the expression of other utilities. Where military equipment is concerned, the first condition is not always guaranteed, and the second hardly ever. All conversion of the civilian to the military leads, a priori, to

an indisputable economic gain, even if certain situational or regional problems may sometimes arouse a hint of doubt. However, the reduction of military expenditure ought not to result in a limitation of global demand, and the government ought simultaneously to pursue a policy of compensatory public expenditure or reduction of the budget deficit. Thus, disarmament that did not involve international transfer of the whole or a part of the savings made would inevitably lead the government of the United States to pursue a policy of limiting the public deficit (thought to be critical), restoring national savings and progressively reducing interest rates. Under those conditions, the entire world economy is likely to experience profound transformations. Should the American deficit decrease, the eviction effects of civilian investment will be reduced, at the same time as the pressures on interest rates will tend to diminish. In the short term, however, some major national enterprises will suffer a considerable reduction in their public orders, notable McDonnell Douglas, General Dynamics, General Electric, Teneco and Raytheon, which together have a total of more than 130 billion dollars worth of Pentagon contracts. In the medium term, lower interest rates will lead to more investment, and that situation will favour both international trade and reduction of the public deficit. It is noteworthy that changes of interest rates would be bound to have important effects on the exchange market. Lastly, military expenditure exerts undoubted inflationary pressures, because the economy provides salaries without a flow of goods being produced in exchange. The result, in addition to the situational, regional and structural problems of the conversion or the closing down of certain armament activities, should therefore be an increased propensity for investment. Furthermore, the changes in interest rates, the confidence shown by international financial operators in this change in international relations, and the very nature of the disarmament procedure will inescapably produce effects on exchange rates, the non-mechanistic nature of which makes it impossible, a priori, to evaluate the structural modifications that will occur in the comparative value of currencies. As far as the United States is concerned, Klein therefore recommends a progressive reduction of the public deficit, the initial consequence of which would be reduction of the interest rate, followed by a limitation on the cost of the debt, and ultimately by an improvement in exporting situations. The LINK model posed the question of what the effect would be of a 3 per cent reduction in military expenditure, accompanied by a more flexible monetary policy. The main answer was that there would be an appreciable reduction, of the order of 2 per cent, in interest rates. There would then be a revival of heavily indebted economies, that would receive a real subsidy from the reduction of interest rates and would then be in a position once again to import American products.

Charles Schultze of the Brooklyn Institute is putting forward a plan for a progressive reduction of military expenditure of the order of 50 billion dollars over five years (falling from 287 to 237 billion between 1989 and 1994); the "savings" thus made would be compensated and one fifth would be devoted to Federal civilian expenditure for high-priority programmes, while the rest would go to reduce the public deficit. It was the case a few years ago that when the United States had a cold, the western countries contracted bronchitis. Now Europe is progressively becoming the economic centre of the world and its regular process of integration should have important positive effects for the whole of the world economy. The government of the United States no longer plays the dominant economic role that it has had

since the last world war, and the developing countries can hope only for indirect effects from a reduction of the military expenditure of the United States, principally through the channel of the progressive reduction of interest rates.

For Hormats (1992), the so-called "peace dividend" will be insufficient by itself to cure the structural ills afflicting the U.S. economy. The peace dividend is not real money, it is an accounting fiction, because even with massive cuts, the USA will still have a very large budget deficit. For a lot of observers, it is urgent to use it for deficit reduction in order to slow the increase in the U.S. federal debt, for the reduction taxes for individuals or for the using the savings for other federal programs, such as health care and Social Security. Under current program projections, the anticipated "peace dividend" will go almost entirely in two federal programs, Medicare and Medicaid. "If these costs can be contained, the long-term interests of the nation will be best served by investing the peace dividend in a stronger capital base, the development of a talented and well-educated work force, and in generating more savings to finance investment"¹. Hormats prefers to create incentives to savings and investment and to strengthen U.S. educational system, because the most important problems facing the U.S. economy are the insufficient investment, the inadequate national savings and the deficient training methods. It is then useful to reduce capital gains taxes, in order to increase the willingness of people to take the risk of starting up a new business and investing in new technologies. A portion of the peace dividend would be allocated for civilian research and development and an other one in the infrastructure development and maintenance. Finally, "having underscore the need to invest in America, it is also crucial to provide timely assistance to the nations of the former Soviet bloc and to the reforming republics of the former USSR. Having spent millions of millions of dollars to defeat communism in these countries, the United States should now invest a few thousand million more to help these nations consolidate democratic and market reform"²

The countries of the East are currently confronted by two basic problems: the restructuring of their economy and the reduction of military expenditure. For a long time the USSR pursued an approach of "paradoxical militarism" (Sapir 1989), in which the strategic accent was on the ostentatious aspect of strength whose political and strategic end was often realized to the detriment of the real efficiency of the armed forces. At the present time the Soviet Union does want ongoing disarmament, because the economic impact of military expenditure is too onerous for an economy of scarcity. Mikhail Gorbachev has given clear expression to this wish in asserting that "development and international relations have been altered by the arms race and the militarization of ways of thinking". That is an essential point of the new Soviet strategy. Klein considers that a 5 per cent reduction of military expenditure in Poland is associated with a 3 per cent expansion in civilian expenditure on consumption. Having regard to the fact that the arms markets operated on a highly developed quota system, there is a new opening

¹HORMATS Robert D. (1992) : "Priority uses for the Peace Dividend". Washington Economic Reports, published by the United States Information Agency, March 4. page 7.

² Ibid.

for international trade that should strengthen interdependence and solidarity. However, we do not know of any econometric or quantitative studies from which to demonstrate the economic point of disarmament in the countries of eastern Europe. Reconversions scarcely seem to pose short term problems in the context of a planned economy, even though the urgency of measures to revitalize the economy makes most changes both tricky and necessary. Furthermore, conversion should raise less problems than in the western countries because many military enterprises are already working in the civilian sector. Cooper (1988) asserts that half the electric steel, a quarter of railway equipment and more than a fifth of the consumer goods are already being produced by the military sector, a fact which shows that there are good prospects for reconversion in a country in which private consumption remains quite modest and wide open for development.

It is, therefore, not enough to say what form disarmament will take. We must also indicate the economic policy that will provide the support that should enable the national economy to withstand the shock of the increased obsolescence of national investment without great harm to economic growth.

4. Disarmament for Development in Favour of the Developing Countries

Disarmament and development are two essential objectives of our time. What we need to know is whether it is desirable that they should be linked. It may be recalled that successive French governments have frequently called for the establishment of an international fund of disarmament for development that would enable the amounts saved on arms to be used to develop productive activities that would speed up economic development and extend it through aid arrangements to the developing countries (Klein, 1990; Fontanel & Smith, 1987). Consideration must be given to the negative consequences of military expenditure for security itself, it being understood that the measures that ensure the defence of one country are seen as a threat by the others; the non-productive nature of the arms race is asserted under those conditions. However, in the absence of confidence in the balance of forces, national strategy cannot be satisfied with such a proposition. Demilitarization of the economy frees additional resources, the reallocation of which calls for strategic decisions and an economic policy reconciling the objectives of growth and the redistribution of resources to the benefit of the least well endowed. Disarmament for development is generally analyzed, on the one hand, in the absence of any international transfer of the resources saved through disarmament and, on the other, in the context of increased aid for the most destitute countries.

A) The Internal Effect

If military expenditure is unproductive, it follows that anything that tends to reduce it while maintaining an equivalent level of security is economically desirable. Nevertheless, it cannot be denied that considerable problems may arise as a result of ongoing disarmament: increased unemployment for young conscripts who are not called up; a reduction in the number of jobs for military personnel whose abilities are sometimes too specialized to be easily fitted into the civilian economy; reduction in the activity of garrison

towns and arsenals, and so on. It is assumed in the reports of the United Nations that the arms race reduces world growth potential and limits the scope for economic development by its squandering of scarce resources. It is, nevertheless, likely that increased military expenditure is made possible by the high growth rate of the economy, and not vice versa. The well known study by Benoit (1978), partly confirmed by Frederiksen and Looney (1982), which suggested that military investment would be conducive to industrial modernization, to training and knowledge, to the improvement of infrastructures, to full use of the productive capacities of the economies of developing countries, and to the sense of order and discipline, and which also suggested that the desire for independence would not be an obstacle to their economic development, has been strongly questioned both as regards its form (Deger & Smith, 1983) and its content. This relationship is basically highly disputable, because there is a considerable difference between the modernization of defence forces and of the economy. It even happens frequently that competition develops between the military sector and the civilian sector over the hiring of the best skilled personnel, and under those conditions the effects of eviction reappear as strongly as those initially affecting the formation of civilian capital. The analysis of Deger and Smith (1983), while disputing the form of Benoit's analysis, arrives at opposite results by the use of a small, three-equation model. Whereas military expenditure has a positive effect on growth in the short term, by reducing savings, it has a negative impact on economic development in the longer term.

There are three substitution effects in countries in which resources are scarce: temporal (the choice between the present and the future), sectorial (the choice between the military and civilian spheres) and by category (the investment eviction effect caused by defence expenditure). Augusto Varas (1986) considers that the effect of military expenditure differs with the development level of countries, influencing the material well-being of Third World countries and the growth of developed countries. The militarization of developing countries is not conducive to their economic development in the long term, despite the mobilization of the surplus to which it may give rise. The theory of the diversion of resources (Melman, 1974) sets out the view that an economy in which a large amount of critical resources is allocated to unproductive activities considerably reduces its capacity for efficient production, either because the national industry becomes less competitive, or because of the corrupting effect of the behaviour of economic agents. Under those conditions disarmament does eventually improve the national average standard of living and increase the world economic development potential. The substitution relationship between investment and military expenditure which is henceforward quite generally accepted for developed countries, at least when the strategic threat is quite weakly perceived by the private sector, is less accepted for the developing countries, which suffer the pangs of chronic underconsumption. Other effects may be involved. Thus, military infrastructures may be suitable for civilian production, and demobilized soldiers back in civilian life are capable of improving national productivity. Nevertheless, Gyimah-Brempong (1989) is of the opinion that the military expenditure of African countries is not capable of being passed on to economic growth, since the positive effects often instanced are largely offset by the reduction of investment occasioned by this defence effort.

Saadet Deger (1986) and Nicole Ball (1988) regard national armament as a cause of underdevelopment, whereas Robert Looney (1988) thinks that this relationship can really be accepted only for countries that are not arms producers. Looney's econometric results indicate that: (1) political and administrative influences do more to determine military expenditure than do international rivalries; (2) the substitution effects are greater in arms producing countries than in countries that merely import the arms that they need for their defence; (3) military expenditure has made only a slight contribution to the increased indebtedness of Third World countries, notably those in the Southern Hemisphere. Be that as it may, military expenditure has not, according to Ball, played the essential role that some would have wished, a posteriori, to have seen it play, since national arms production has some advantages, such as the savings on scarce foreign currency, technological expertise and the possible introduction of an industrialization policy stemming from military investments that would not, in any case, have been made for civilian purposes. Nevertheless, no Third World country is capable of sustaining such a policy unless it already has a sufficiently strong and diversified industrial sector (Wulf, 1983). David Whynes (1983) even suggests that only large developing countries, notably Brazil and perhaps Indonesia, in the area investigated, are really in a position to derive sufficient multiplier effects from their military effort to exceed the eviction effects that the military sector undoubtedly exerts on the civilian sector. Lastly, the growth of arms industries in the developing countries also leads to an increase in military expenditure liable, in the long term, to raise serious difficulties in national economic development (Fontanel and Saraiva, 1986). Even so, Michael Ward (1991) demonstrates that the military programmes in Brazil and India are tending to be globally positive. If account is taken of the fact that other public expenditure is even more satisfactory for growth, opportunity cost is a question that still has to be considered. This hypothesis has, however, encountered objections that cannot be resolved either by the analysis made by Lakhmi (1986) or by that of Looney (1986), predisposed to the establishment of a military industry in the developing countries, having regard to the descriptive approach and the empirical statistics that they employ exclusively and systematically.

In the absence of transfers, for countries that do not have an arms industry, the effects of a reduction of military expenditure will be positive even in the short term, provided that they are not offset by an equal or greater expenditure on the maintenance of internal order or on the purchase of imported luxury goods, since they make for the more efficient use of scarce resources. For arms-producing countries, disarmament may have perverse effects in the short term, notably for the industries and regions directly involved in the industrial activities of armament. The economic impact should be positive in the long term, provided that the situation of economic decline triggered by the reduction of internal arms purchases does not lead to irreversible effects, notably as regards conversion of activity. It is even likely that good management of the reduction of military expenditure would have positive long-term effects on civilian research and development, on the real productivity of national economies, and on confidence in international trading relations that cannot be quantified by econometric studies, that in general apprehend only short-term developments in which the past (characterized by the arms race) is repeated in the future. However, although many developing countries do devote a not inconsiderable part of their resources to military purposes, the large sums tied up in armaments

should be concentrated in a small number of countries. Basically, disarmament appears to have favourable effects on the national economy in Third World countries, even if the arms-producing countries risk experiencing some difficulties over conversion in the short term, which will be largely offset by the reduction in imports relating to the military industrial effort and by the matching increase in civilian public expenditure.

The effects of disarmament cannot be measured in isolation from the economic policies implemented by governments. A voluntary reduction in military expenditure cannot be satisfied with reasoning of the "all other things being equal" type. The theory of underdevelopment as a product of development takes the view that the economic situation of Third World countries may worsen if, for example, reconverted enterprises in the developed countries enter into competition with national products, or if the developed countries cease to buy the raw materials that constituted the greater part of their export resources. This latter fear would not appear to have been borne out, since the model of Leontieff and Duchin (1980, 1983) reveals the increase in the demand for raw materials that should result from ongoing disarmament. The conversion from military to civilian activities may, however, lead to a search for new outlets and to increased competition for the products of Third World countries. Similarly, a reduction in expenditure on military research and development to the benefit of the civilian sector may widen the technological gap and lead ultimately to greater economic inequality.

B) International Aid

The question is differently analyzed when the military effort is accompanied by assistance from a developed country. In that case, the effects of modernization may have free play, without the economic constraints of limitation on investment being apparent. Partial transfers of the resources economized by a reduction in the military expenditure of the Great Powers may have positive effects on Third World countries. Irrespective of the improvement in international relations that would stem from disarmament and improvements in international interdependence, aid linked to disarmament, if expressed in convertible currencies, should normally have the same effects as existing traditional forms of aid. There are no grounds for expecting its influence to be greater or less, except perhaps at the level of the size of transfer, which may exceed the threshold above which the solidarity accorded has significant economic effects. It should, however, be noted that not all transfers are equally favourable to the economic development of destitute countries. Disarmament can have favourable effects on economic development only if the saving that it makes possible is not confiscated by a social grouping that decides to devote it to unproductive uses (exports of capital or imports of luxury goods, for example). In other words, a transfer makes economic sense only if it finds expression in a highly productive activity. A transfer may on occasion be capable of having an adverse effect, notably by aggravating inflationary trends owing to the appearance of demonstration effects. A resource transfer may also be the occasion of new markets for the developed countries and new dependence for the poor countries. Thus, James Lebovic (1988) succeeded in demonstrating that political and military considerations were just as uppermost in American

foreign aid during the presidency of Carter, with its heavy emphasis on defence of human rights, as during that of Reagan, when the pursuit of the military might essential to American security was a strong influence. Transfer therefore satisfies political and military considerations, in the first instance, then the economic interests of the donor, and only lastly the economic development needs of Third World countries. The developing countries must therefore avoid the transfer being, on the whole, impoverishing. Should the transfer be made in a nonconvertible currency, the recipient country will be obliged to buy from the donor country, which may take advantage of this to reintroduce unequal trade flows. Should the transfer be in kind it may not be evident that the product concerned satisfies the development needs of the recipient countries; for example, if the aid relates to a commodity that competes directly or indirectly with the national industry of the poor country, the end result may perhaps be very negative for the Third World, the more so because every product bears the stamp of a culture and the dominant values of the society in which it was created.

Lastly, aid from developed countries may lead to distorted development, especially if it is not disinterested. Some forms of transfers prove ultimately to be costly, notably in operating costs, and political constraints are rarely absent from such an undertaking by rich countries. Furthermore, "aid to developing countries may be devoted to prestige expenditure, to the increasing of social inequalities, and to furthering the development of societies in which human rights are not necessarily respected. Transfers may also be the subject of sordid calculations of interest tending to accustom populations to a type of consumption that renders them dependent on the industrialized countries..." (Fontanel, 1984). Taken overall, the results are favourable to disarmament for development because, although the developed countries may experience a slight reduction in their growth rate in the short term, the effects tend to be positive in the longer term, even if not very significantly so, statistically speaking. The result is to narrow the disparities in growth that would exist in the absence of such a transfer. The question then becomes one of whether the developed countries desire such an outcome, it being understood that disparities of income are interesting indicators of the satisfaction of the needs of populations. These effects are felt more deeply and more rapidly if there are existing measures for the easing of market restrictions and the freeing of the currency, but the possible gains may also disappear because of changes in the terms of trade, in national interest rates and in debt repayments. In fact, the statistical significance of the models is relatively weak in this context, it being understood that the hypothesis of all other things being equal that prevails in the application of econometric techniques is largely brought into question by the exceptional event that real ongoing disarmament would be.

A reduction of military expenditure has been simulated in several models of the world economy, five of which yield interesting results.

1. The transfer of resources to poor countries furthers their economic development in the model of Leontieff and Duchin (1980a,b, 1983). Ongoing disarmament would have a positive effect for all the regions of the world and the transfers of resources would clearly increase consumption and the per capita GDP of the arid countries of Africa, and the low-income countries of Asia and tropical Africa. Nevertheless, the econometric results obtained do not seem to us to be very significant. They give only a very global idea of what the economic impact of disarmament means.

2. Capelin, Bjerkholt and Gleditsch (1982) make several simulations of the World model, applying the same methods. These simulations yield the same types of results and conclusions as those of Leontieff and Duchin, and the same criticisms may be levelled at them.

3. A simulation based on the UNITAD world model (Royer, 1985) simultaneously examines the economic impact of disarmament and of disarmament for development. In an initial scenario disarmament is not accompanied by an international redistribution of the amounts saved, while a second type of simulation studies a policy based on the satisfaction of basic needs, with the promotion of small-scale, highly productive economic activities in the developing countries. The situation for the developing countries should be very appreciably improved.

4. The results yielded by the LINK model are not without interest. For example, a 10 per cent reduction of military expenditure accompanied by an improvement in international assistance put at 0.7 per cent of the GNP of the developed countries is capable, in the best case of a transfer relating exclusively to capital goods, of leading to a 1.7 per cent growth of the GNP in the developing countries and an 0.2 per cent growth in the developed countries. However, assistance is not always used advisedly. Should it be squandered, the growth rate of the developing countries would not experience any negative shock in the short term, but the developed countries would experience a negative effect of the order of 0.3 per cent of their annual growth. For this transfer to be positive for all parties (donors and recipients), 60 per cent of the aid must be expended on capital goods.

Despite the negative effects on the short run, it is possible to say that disarmament is a very good investment for economic development, *ceteris paribus*.

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