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Economic Causes of an Eventual Rearmament

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With the collapse of the socialist experiments in Eastern Europe and the Soviet Union, a process of disarmament emerged at the end of the 1990s. Most scholars have searched for the economic dividends of this emerging peace. Globally, military expenditures were reduced by a third in the course of a decade, principally in Russia and the United States, but also among other countries, especially those experiencing considerable economic downturns. The empirical conclusions are not so clear, because if USA obtained very good economic results, it was not the case for Russia. "During the " Cold war ", Soviet military expenditures are estimated to have amounted to nearly 20 to 30 percent of GNP in terms of planification prices but probably more than 60% in terms of market prices[1], who add that 75% of scientific investment was for ultimately military use. The military-industrial complex (VPK) was made up of 1100 production enterprises and about 920 research agencies controlled by nine military ministries which were themselves under the control of the military-industrial commission of the USSR Council of Ministers. An important part of the VPK production, about 40% before the budgetary cuts, was made up of civilian goods (civilian planes and ships, 15% of tractors, 80% of motorcycles, 80% of washing machines, optical equipment, televisions... and several production units controlled by civilian ministries produced goods for the VPK (clothes, furnishings, transport, hospitals...). The extent of military coverage is therefore great if one estimates that about 15 million people worked directly or

indirectly for the defence sector ; in total more than 20 million were employed by the VPK of the Soviet Union, if one includes those producing civilian goods. For the sole production of arms systems, the estimates are of about 5 million people[2].[3]

After the Cold war, the conversion program was not a success, because the break-up of the Soviet Union and the reforms with very tied budgetary policies under the first governments of the 90's decade. The defence industry has been in a very difficult position, caused by the decrease in budget allocations, the loss of its research, technological and production potentials and the weakness of the State[4].

Table 1 –General economic indicators of the Russian economy

	1992	1993	1994	1995	1996	1997	1998	1999	2000 (e)
GDP %[1]	-14.5	-8.7	-12.6	-4.2	-3.8	1.0	-5,0	3.2	8.2
Industrial Production %	-18.2	-14.2	-20.9	-3.0	-4.0	1.9	0.1	8.1	9.0
Fixed investment %	-40.0	-12.0	-27.0	-13.0	-18.0	-5.0	-6.2	1.0	17.7
Unemploy-ment %	1.0	1.5	3.1	4.4	5.1	4.3	4.4	2.9	2.4

Source : Goskomstat

The disarmament led to the destruction of the old economic system as well as of the social equilibrium in the former USSR countries, through a profound economic crisis, which yielded investment deficits. Following the global collapse of production since 1991 (the level of military production represents in 1997 between 15 and 17% of the volume in 1991[6],[7]), conversion in Russia has perhaps become, if not a secondary question, then most definitely a question which accompanies that concerning the preservation of the technological and scientific intellectual level of the personnel engaged in the conception and the production of equipment.

The question of the maintenance or the salvaging of the technological potential of the Russian defence complex is a systemic political and

social problem of extreme importance because the collapse in volume production has taken place with a more or less constant use of manpower.[8] The conversion process had at the beginning of the nineties a profile which is difficult to justify because it lacked an accompanying industrial policy specifically adapted to different products and regions, a policy adapted to the specific constraints of the work force.

The absence of a more " dirigiste " and especially more pragmatic interventionist policy, to offset the budgetary policy of economic restraint, inexorably led to collapse - a chain reaction which is criticised today even by the liberals who had promoted the policy: one rouble less spent on military expenditure has resulted, according Glybin, in a loss of between 1.5 and 2 roubles in industry in general. This phenomenon is not reversible and can be understood as a confirmation of the extreme militarisation at the heart of the former Soviet industrial system.

The conversion programmes of the defence industry in the years 1993-1995 had as their objective a combination of a minimum reduction in employment with a maximum utilisation of the scientific and technological potential of the military-industrial complex in developing civilian applications : the programme priorities were oriented towards agricultural equipment, energy, naval construction, aviation, medicine and light industry. But the theoretical objectives were not translated into political policy or practical measures. Only the desire to progressively substitute national production for imports through support given to dual technology has been defined with any finer degree of detail: precision tools for diamond cutting, liquid crystal screens, fibre optics, medical equipment, etc. There has even been a tentative start made to seeking international certification for certain products.[9] Nevertheless, taken as a whole, the period suffers from a drastic fall in production and a very limited number of new activities linked to the defence sector.

The programmes for 1995-1997 and even after have been thought out in total concordance with the previous one but with a clearer statement of the need to develop civilian capacity in matters of transport and communication. The new aspect is however the recognition of the necessity to preserve a technological core in the defence industry itself, if only primarily for questions of maintenance. Around four hundred firms have been taken out of the privatisation programme and remain

in the sphere of federal government property. These enterprises are intended to constitute the key elements in Russian science and the base of national technology. It is not however sure that the prolonged absence of a clear vision in the matter of industrial policy can be immediately compensated by such privileged key elements when they are composed of sectors which are far removed from, and hardly sensitive to, the signals coming from the market economy.

For the USA, the excellent economic indices were not undoubtedly directly related to the reduction of military expenditure. "In model simulations of defense reductions, there are noticeable declines in GDP during the early years of the cut (known as military-Keynesian effects). In the longer run, however, supply-side effects take over and GDP regains strength. World model simulations, for example, predicted that there would be more consumption by the public at large among leading NATO countries. This is a striking example of "guns or butter"[10]. The USA emerged from the Cold War as the military and economic superpower, while reducing substantially military spending and force levels. It obtained "peace dividends and investments", by the reduction of the pressures on the federal budget, the reduction of interest rates and the development of investments.

In spite of this global slowing of arms spending, Southeast Asian countries began to progressively accumulate new weapons systems and their expenditures grew correspondingly. One can find strong documentation of these basic trends in the databases maintained by the Stockholm Institute for Peace Research (SIPRI: http://projects.sipri.se/milex/mex_data_index.html) and the Arms Control and Disarmament Agency, now the department of Arms Control and International Security, a part of the US Department of State (http://www.state.gov/www/global/arms/).

We have witnessed six fundamental evolutions in the global military situation since the fall of the Berlin Wall in 1989.

1. Nuclear arsenal indeed reduced the possibility of a conventional war between nuclear states. There are a diminution of the nuclear menace to peace and the bad legitimization of nuclear weapons in the arena of international politics. However, recent developments gave rise to growing concern that progress in nuclear arms control and disarmament had stagnated, with the

US Senate reject of the ratification of he 1996 Comprehensive Nuclear Test-Ban Treaty (CTBT), the failure of the Conference on Disarmament to open negotiations on a global fissile material treaty (FMT), the Russian Federal Assembly denial to ratify START II Treaty and the controversy over ballistic missile defense.

2. A fundamental change in the nature of threats, which have changed from the bipolar, client based regional and territorial conflicts toward conflicts over national independence, terrorism, immigration, corruption, money laundering, and ethno-nationalism. Today, the transition process issued from the Soviet system collapse marked the end of the direct confrontation between nuclear superpowers. The main threats will now be mass destruction weapons proliferation, nationalities problems, the controversial consequences of the economic crisis and the globalization process, as well as the difficulty to reach an international agreement on political and strategic world rules. There is an emergent US consensus in favor of developing and deploying a limited National Missiles Defense designed to protect the national territory against attacks by a small number of long-range missiles launched by "rogue states", terrorists or mafias. However, interstate economic competition for world hegemony is over, as well as imperialist expansion in its primitive military forms[11].
3. The rise of intrastate conflicts, especially as it relates to violence to civilian populations committed by state actors, as in Bosnia, Kosovo, Somalia, Rwanda, Liberia, Sierra Leone, among others, is really worrying. For Collier and Hoeffler[12], the level of military expenditure is strongly influenced by the expenditure of neighbors. There exists an 'arms race multiplier' for low-income countries. Then, military expenditure is a 'regional public bad'. However, this effect must be deleted because rebellions are regionally contagious, but they are not deterred by military expenditure. For Peter Dunne and Sam Perlo-Freeman[13], the demand for military spending in developing countries depended on neighbors' military spending and internal and external conflict. Democracy and population both relate negatively to military burden, before and after the Cold War.

4. The development of a tactical and strategic focus on " zero death " tactics in western strategy of war and humanitarian interventions is still dominant for a lot of potential conflicts. Per day, there were 214 persons killed during WWII, 32 for the Korea war, 19 for Vietnam War, 4 for Panama and 0.7 for Persian Gulf.
5. For U.S. outlays, even after the cutbacks in procurement of the 1990s, real outlays fell no lower than levels in late 1970s-beginning 1980. Less equipment is required. However, a fighter aircraft R&D program ran about 7 billion dollars in 1980s and more than 20 billion dollars in 2000. The procurements of the US military budget is increasing at a rapid rate, mainly due to the cost of weapons ($170 million per F-22 aircraft). Then the economies of scale in the production of defense systems are reduced, resulting in much reduced equipment purchases absorbing proportionately greater share of a smaller budget. The obvious alternative is the reduction of the number of suppliers, limiting competition for defense contracts between two or three firms.

Table 2 - Prime Contractors in U.S. Defense Market Sectors

Sector	1990	1999
Tactical Missiles	13	4
Fixed Wing Aircraft	8	3
Expendable Launch Vehicles	6	3
Satellites	8	6
Surface Ships	8	3
Tactical Wheeled Vehicles	6	3
Tracked Combat Vehicles	3	2
Strategic Missiles	3	2
Torpedoes	3	2
Rotary Wing Aircraft	4	3

Source: General Accounting Office (1998); Under Secretary of Defense for Acquisition and Technology (2000)

6. There is a rebirth of economic means as a form of strategic conflict. The concept of globalization includes a lot of complex

conflicts that introduce the idea of the equivalent management for enterprises and countries[14].

In October 1999, French Prime Minister Lionel Jospin gave a speech at the French Institute for Advanced Defense Analysis, emphasizing the need to build a European system of security and defense as a means of advancing disarmament and consolidating advances in world politics toward a system controlled by peaceful norms and international law. He noted that France, along with many other countries, has undertaken to recalibrate its strategic and defense policies toward an environment focused on the future not on the past, accompanied by an active diplomacy that has focused on reduction in chemical, biological, and nuclear weapon stockpiles (and their atmospheric testing). He concluded by noting, "nuclear weapons will not become a battlefield weapon". It is clear from this official proclamation that France remains focused on and committed to a policy of disarmament.

However, in France and around the world, the new military budgets of the Bush administration, both in their modest increases and in the scope of planned developments, has brought renewed attention to the potential rebirth of expensive and competitive armament procurement policies. In addition, the rapid growth in Asian military spending, the broad purview of the military in China, as well as the increasing tensions between China and its neighbors, as well as among other Asian societies have each fuelled fears of rapidly escalating military competition.

The three fundamental questions that have guided studies of the putative links between the economy and defense policy have also guided thinking about the economy and disarmament reemerge as salient :

1. Guns and butter ? What are the opportunity costs of military spending ? During periods of economic growth this question may appear to disappear, or to become less salient, but in period of economic downturn, these tradeoffs are more clearly put in relief. Thus, a reading of global, as well as regional and national economic conditions may be necessary to gauge correctly the severity of this tradeoff. A growing economy may actually reduce the pinch of such tradeoffs.
2. Bang for the Buck ? What new synergies between private and public enterprises will evolve and how will they affect the cost

structure of defense? Is the civilian supply of military goods produce an improvement of the economic efficiency, which allows obtaining more arms with the same amount of money ? It is easy to see rising costs, but equally easy to ignore some of the potentially transformative costs savings.

3. What is the right level of spending ? Given that societies have military as well as nonmilitary goals, but relatively limited resources, even if they are growing, how much should governments allocate to defense even in an epoch in which the overall level of threat is diminished, but the uncertainty of particular threats is high? It is the main question of the policy of arms race.

Using these yardsticks, can we see evidence for a renewed competitive armaments process, or, as many may argue, are current modest increases in spending a simple counter-cyclical process ineluctably brought about by the last ten years of disinvestments? We examine these questions in terms of the fundamental theoretical issues connecting the economy and the military during periods of investment as well as disinvestments. We conclude by examining the course of rearmament as well as the transient and cumulative character of these new investments.

New arms race or counter-cyclical institutional spending ?

Has the basic trend of disarmament toward global levels of military spending that have been reduced by a third changed in the last few years ? After a period of clear downward evolution in military spending, is a new trend emerging ?

The Disarmament Process

We highlight five strong tendencies in military spending since the end of the cold war:

1. The reduction of military spending has been important and significant. The resultant cuts have persisted in part because the military requirements have changed so dramatically. As a result however, there has been a sharp decline in military R&D.
2. The arms industries themselves reeled under these cuts, coupled with overproduction and market constraints. In some case, arms exports were "pauperizing", with real prices inferior to real costs. A few companies survived this crisis, in fact were

strengthened and became dominant. But many were eliminated or could no longer be heavily subsidized.

3. Industry-government joint ventures aggregated operations in order to create and maintain economies of scale in such market conditions, particularly in Europe
4. The consolidation of the American arms industry was rapid and profound, in spite—if not because—of the reduction of military spending around the globe. This was achieved partially through the normal process of merger and acquisition dominant in contemporary markets. Indeed 30 of the largest 100 defense firms from a decade ago are no longer independent, recognizable players in the market.
5. The US federal government lent considerable assistance (2 billion dollars over the period) to this rationalization process, along with the accompanying programs for cost reduction. The policy of concentration brought about a concentration as well of research and development at a level beyond that found in other countries. Indeed, the government serves as a monopolist of sorts, allocating market shares and anointing official suppliers for different types of weapons systems, a process that once instituted is inoculated for a while at least from pervasive competition. These measures brought strong profitability to the increasingly concentrated defense sector, despite a shrinking market. In Western Europe as well, state intervention in the defense market remains strong, even in spite of accumulating market regulation in Europe. France, for example has over 10,000 subcontractors in the defense sector, but has only 25 sizable companies in this sector, five of which account for two-thirds of all the business.

Is military spending on the rise ?

According to SIPRI (as shown in Table 1) from the end of the cold war until 1998, world military expenditure decline significantly. Asian expenditures grew about 27% during this period, but Russia and former members of the Soviet Union saw aggregate expenditures fall as much as 90%, by some accounts, while in real terms the US spending fell from almost 400 Billion $ to around 250, by the end of the 1990s.

Table 3 – Military Spending of the Largest Countries, to nearest billion of 1995 dollars

Country	1989	1992	1994	1996	1998	1999
USA	374	331	296	264	256	259
Russia	240	48	40,5	23,4	18,1	22,4
China	10	14	12	13,7	16,9	18,4
France	52	51	50	47	46	47
UK	43	39	37	34	33	32
India	8	7	8	8	9	10
Pakistan	3	3,6	3,4	3,6	3,2	3,3
South Africa	5,2	3,4	3,2	2,9	2,3	2,2
Japan	47	49	50	51	51	51
World	1050	817	762	708	704	719
Africa	12,2	9,8	9,5	8,9	9,5	10,6
America	406	339	326	294	287	294
Asia/Oceania	104	124	127	134	137	139
Europe	483	275	253	226	221	226
Middle East	37	50	47	46	49	49

Source: SIPRI Yearbook 1999 and 2000

This reduction has continued, but primarily in Russia (which saw a reduction of 55% in 1998 alone, in real terms).

Table 4 - Russian military expenditures as a percentage of GDP

Years	Total military expenditures in billion current rubbles	GDP (billion current rubbles)	Total military expenditure as % of GDP
1992	1.05	19.1	5.5
1993	9.04	171.5	5.3
1994	35.9	610.7	5.9
1995	63.2	1540.5	4.1
1996	82.5	2145.7	3.8
1997	105.0	2521.9	4.2
1998	85.6	2684.5	4.1
1999 (e)	171.1	4476.0	3.8
2000 (e)	212.0	5350.0	4.0

Source: SIPRI Yearbook 2000

Table 5 - Russia output and employment in the defense complex

Years	Military output	Civilian output	Total output	Total employment
1991	100	100	100	100
1992	49.5	99.6	80.4	90.3
1993	32.5	85.6	64.6	79.9
1994	19.9	52.6	39.2	78.2
1995	16.6	41.3	31.2	67.1
1996	12.8	29.1	22.7	58.6
1997	9.4	28.7	19.7	52.7
1998	9.9	26.5	19.2	47.3
1999	13.5	34.1	25.5	44.4

Source : SIPRI Yearbook 2000.

If we examine the share of GDP devoted to military spending, it has declined from 6% in 1985 to about 3% currently in the US. This observation however leads us to notice two small glitches in this analysis. The first concerns the accurate estimation of defense spending, long a sore point among defense analysts. SIPRI uses constant prices to show a decline in spending, whereas NATO finds a growth during the same period, owing to the use of current prices. The second glitch is the factor composition of defense purchases, which have not been constant over the period examined, but have adapted to the new strategic environments. Privatization of R&D, for example, permits growth in procurement, even in the face of declining budgets. This aspect of military spending is hidden by these kinds of aggregate analyses. In this sense (see Table 5) some have argued[15] that there has been a substantial augmentation of arms spending in the United States, as the military has become more broadly funded. The last figures from the Clinton exercise do not confirm this hypothesis. However, the Bush government seems to be decided to improve military expenditure, in particular with the AMB program. This trend is even more accelerated in China, as the People's army takes on a variety of civil functions, ranging from banking to building technology infrastructure.

Table 6 – US Military Spending Projections, in constant 2000 prices, proposed by Clinton administration

Expenditures	1999	2000 Adopted	2001 Reques-ted	2002 Planned	2003 Planned	2004 Planned	2005 Planned
Total	268.9	287.9	291.1	288.6	288.2	288.3	288.9
Personnel	73.6	76.1	75.8	76.0	75.7	76.0	76.0
Operations & Maintenance	99.8	108.7	109.3	105.5	105.0	105.4	105.3
Purchases	49.8	55.1	60.3	62.0	64.4	64.0	65.8
R&D	37.3	39.0	37.9	37.7	36.3	35.4	33.7

Source: SIPRI, 1999, p. 281

The budget approved for FY 2001 is $310 billion, which is very closed in constant dollars to the average annual budgets during the Cold War. During the presidential campaign, George W. Bush considered the possibility of an increase defense spending by $45 billion over the next ten years for the modernization of existing weapons and for more lethal and mobile new generation weapons.

The military research and development have also fallen sharply. In 1998, the R&D total was 60 billion dollars (including 38 for the USA, 49 for NATO, and 53 for the OECD countries). This reduction came to an end as the US decided to increase their efforts, focusing on research in the area of ballistic defense. In the United States, aviation and avionics account for 45% of the effort of R&D, about the same amount as the BMD and the nuclear program combined. The US spending on military R&D for example exceeds 7 to 8 times that of France, its closest "competitor" in this area.

Table 7 – R&D Expenditures on the Military sector, 1986-1997
(millions of 1995 dollars at 1995 exchange rates)

Country	1986	1989	1992	1995	1997
USA	51000	51000	44000	37000	38000
France	6200	7100	6800	5200	4600
UK	5400	4100	3500	3300	3300
Germany	2300	3100	2400	2000	2100
Japan	800	1100	1400	1600	1800
Italy	540	750	600	560	

SIPRI Yearbook 1999

Finally, in 1998, international weapons sales reached almost 22 billion dollars for conventional weapons, a market roughly equal to that last seen in 1994, but far reduced from its highs during the Cold War.

This rough reading of the raw data—to the extent that any data is raw—does not support an impression of a re-emerging and dangerous arms race, even if there is some small amount of disquieting information. If the data don't support the notion of a resuming arms race, one has to question what aspects of the theory are not supported.

Are the theoretical bases of and Arms Race present or anticipated ?

Dominant economic thinking considers economic development to be a pre-condition disarmament. However, the arms race model introduced by Richardson to explore the arms buildup leading to the First World War shows a different understanding of the potential positive and negative influences of economic development on the course of a competitive arms process.

Arms Race Models

War is no longer the principle security concern in contemporary societies, even if the threat of violent conflict is always present. Capitalism has, for a long time, considered communism a major threat. Indeed during the cold war it was considered enough of a threat to help define and mold the identity of the so-called capitalist block. Having disappeared as a threat, the prime motivation for armaments at then current levels was undermined. This resulted in several trends, often described by those in the defense industry as crises :

1. First and foremost a crisis in terms of the drastically falling demand for weapons systems ;
2. A crisis of national identity, especially as it related to the corresponding globalization of economic interactions.
3. A technological crisis resulting from the need to compete in the private sector, without huge subventions to distort the competition, with organizations often more flexible, with reduced cost structures.

The first arms race models demonstrated that defense budgets will grow in preparation for war, and showed how this growth would be reinforcing across rival countries. Intriligator and Brito[16] posed this question differently, asking whether an arms race would ineluctably lead toward war. The examined three major aspects, each of which operates simultaneously with the other, in their analysis, now considered classic.

1. The military spending of *rivals* will stimulate military spending via a positive feedback relationship. Today, this evolution has been obviated, however. If rivals are not threatening, it seems implausible that spending patterns will escalate in a competitive fashion. As a result the levels of military spending of rivals and potential enemies is not especially informative in a period, which enjoys a *détente* of considerable scope and extent. Further, in a new era, it is not entirely clear who potential enemies are, even if it does become clear that old enemies are no longer threatening. Moreover, we learned from the scholarly literature on arms races that the theory did not always correspond clearly with the idea of a lock step competition in any case. Military budgets are often determined as much by internal domestic political considerations as by foreign policy. In the area of foreign policy, even, policy choices are often constrained and enabled by strategic as well as tactical decisions made in consultation with allies.
2. The cumulative effect of military spending has been conceptualized as a burden on the economy. Though this is not entirely clear in all cases—spending can of course stimulate the economy as well—to the extent that there is a burden, it will be harder to carry during a period of economic difficulty. In the

present of GDP growth rates around the world that are almost universally positive, this burden becomes lighter. If we believe that military spending stimulates economic productivity, we reach a similar conclusion : it is easier to support higher levels of spending if they are desired.

3. All national governments motivate their military spending on the basis of national interest and the existence of real and potential threats to the nation or the world. Today, the major powers pose few threats one to another, especially compared with earlier, historical periods. This means that disagreements and conflicts that do emerge are less likely to pit major powers against one another in the first place, and less likely to broaden to a global from a regional scale, something that was decidedly not characteristic of the Cold War era.

Thus, of the three conditions for an arms race, only one is plausibly met. There is no strategic competition among rivals in the arms sector. Nor is there a high level of grievances or long-standing threats. It is true however that the burden of military spending is reduced by widespread growth in the global economy.

The economic factors of armament or disarmament

Military expenditures can be considered as partially exogenous and partially endogenous to reveal several important facets of the economic determinants of military spending. Since a strong economy produces sizable tax revenues for the state, it becomes easier for decision makers to allocate resources to the military in prosperous periods. This is counterbalanced by the distaste generally held by the public for military spending. However, it is clear that there is a synergy, especially in wealthy times, between the non-military and military parts of the federal budget. In lean times this relationship may be strongly reciprocal, with spending in one crowding out the other. But in richer periods, the budget constraint is less tight, and crowding out may not always occur. In general, however there is always some constraint, one expressed by the stylized fact of a necessary choice between guns and butter. If there is more than enough butter to go around, this constraint may become very weak.

In general, the wealth effect is likely to permit—but not require—a growth in the military budget. As speculative values are augmented—via petrodollars or transferable equities or currencies—this tendency may be augmented. Thus, the presence of a wealthy, functioning capitalist economy may actually be beneficial at a host of levels for the health of the military budget. At the same time, wealth and legitimacy may also be symbiotic. For liberal theorists of globalization, democracy, institutional order, and commerce will drive out the unwanted monster war. If trade flows across the globe, it is less likely that soldiers and missiles will have to make the same circuit. The trumpeted victory of globalization may also carry with it heavy burdens not entirely apparent, if it doesn't also solve the problems of inequality and poverty. Yet these monsters also appear to be on the run, despite much protest to the contrary.

Indeed, new information technologies will create a new form of foreign policy that reinforce the beneficial effects of trade, reduced military spending, and increased productivity. But all of this may be for naught, unless we recognize that most violent conflict around the globe today is not conflict between sovereign nations, but rather is ethno-national, civil, or communal. Rather than the threat of regional client conflicts spilling over into to a global domain, we are rather more faced with the threat of widespread outbreaks of civil and ethno-national conflicts in localized arena, but at levels that are very intense (with millions of victims in a short period of time). These conflicts pose perhaps the gravest threat.

Some see in these trends the seeds of rearmament, however wrongheaded that response may appear. Yet, nothing herein would support the notion that there is a new arms race, but more of a creeping growth of arms spending in response (often misguided) to general problems.

The presence of creeping rearmament

A period of so-called *creeping rearmament* is supported by several factors: economic, political, strategic, and even ideological. Increased economic competition brings with it a reduction of the costs, better information of the fundamental requirements for defense, the search for greater levels of active international cooperation, frequent a privatization of national companies, and an intense search for economies

of scale. These scale effects interact synergistically with a very much larger set of potential gains from collaboration, as the number of potential allies is enlarged and as the threats and disincentives are virtually eliminated. Thus, it seems obvious now that the theory of alliances is especially important in peacetime, maybe even more so than during periods of conflict.

Three new factors need to be examined, however, in any contemporary evaluation: the invention of new weapon systems, new management tools, and new strategies. All three characterize the contemporary epoch.

New Weapons Systems

Old weapon systems have not disappeared; indeed they are extensively present, especially in Russia and other countries where the costs of disarmament have been more severe than predicted[17]. Indeed reliance on a nuclear weapon defense has several lynchpins. First, it is cheaper than conventional weaponry, once the sunk costs of development are paid. It can be implemented without large labor costs. Moreover, since the goal is conflict avoidance/deterrence, the costs of war fighting are essentially nil and do not engender any spending. Finally, as the superpowers finally recognized, but France and other nations long recognized, we can implement a nuclear strategy with only a few nuclear weapons; more isn't always better. So, even small amounts of ancient weapons stocks can be useful in the long term but also during a transition to newer weapons systems under development.

Even if the putative geostrategic ambitions of the US are not clear, it is evident that this country has a staggering military superiority. Even so, if the US wishes to play the role of a policeman to the globe, it has insufficient resources and capacity. Moreover, it may be that the strategy of the Desert Storm type of operation: massive aerial strikes followed by massive ground action will prove to be of limited widespread availability and use. Even if this strategy worked in Bosnia—along with the assistance of the Croats—it will not always be an appropriate plan of action. Allies will not always be so willing to enjoin these activities. In particular, the political environment may not always permit such a large coalition to coalesce. Particularly uncertain are the roles that China and even Russia will play should such possibilities arise in the future.

Today, the art of warfare will be influenced more by the evolution of the international politics than by technological progress. Instead of fighting between them, or to even threaten each other, the great powers are more likely to get drawn into the localized conflicts, on economics, sectors and regions. This strategy is not completely exclusive, unique, it is well competed with the opportunity for a superpower to use its temporary supremacy to deter new arms race or to another one to exacerbate its aggressivity in order to obtain some military or economic advantages. In the same way, the difference between offensive and defensive weapons has its clear meaning only in theoretical situations, even if the surprise and the tactical exercises keep their efficiency. A conflict that is not may become a war of attrition. Because of the transformation of the political strategic environment, it becomes essential again to take into account threats that may weigh on the civilian economies and enterprises. This, of course, brings us full circle to reflect some similarity to the early 20th century as well, where commercial interests were especially paramount. In this sense, the American strategic situation is more troubling for its European and Asian partners than its purely military superiority.

For proponents of the "revolution in the military affairs" (RMA), strategy requires an especially effective use of the military, materiel, and information systems, while minimizing or elimination the loss of life. At the same time, to be successful, one has to be relatively independent of allies as well. Clearly the source of this revolution has been the massive and rapid development of new technologies, often funded initially by the government, but widely adapted and reinvented by commercial enterprises. It is essential to have in place powerful new networks of information, which themselves may transform the day-to-day mission of the military. There is a large share of defense output accounted for electronics.

President Bush is strongly committed to deploying Missile Defense (MD)[18]. An announcement is expected later this year, containing the form of MD to pursue, a commitment of more money for research and development and to a larger investment in a wider range of missile defense-related technologies. The longer-term goal is the elimination of the threat posed by ballistic missiles to USA. Deployment would remain many years hence. The MD system will not be deployed before

2007 for the system of land-based interceptors and 2011 (at the earliest) for the sea-based systems Aegis. Space-based directed-energy weapons would be even further in the future. For Bush, this system must be deployed at the earliest possible time for USA and the Asian allies. The program would cost about $100 billion dollars, mainly for the developing missiles capabilities of North Korea and Iran. This means a new generation of weapons, a new space arms race and expensive R&D outlays. However, the deployment is not imminent and it is not inevitable, taking account of the reduced threat from "rogue" states, budgetary and technology constraints, national political changes and the positions of China, Russia and allies.

Thus, information becomes more important than materiel. Three technologies stand behind this development: quantification of strategic and logistic information, computer programs capable of easily handling this information across networks in real time, and an global system of geo-positioning information available to decision makers as well as commanders at a moment's notice. This system of defense presupposes that the cost benefit structure held by potential adversaries is identical to that held by potential defenders. If such a premise is not justified, the liabilities of such an approach become more apparent. If the loss of human life is relatively unimportant or if the current international norms are not adhered, suicide missions to inflict collateral damage become more meaningful threats. Indeed, it is this kind of threat that has provoked the US into major new (or renewed) initiatives to combat "terrorism" as well as ballistic missile systems.

New management tools

The new management is based on an opening of markets, cooperation, and a rationalization of cost structures in framework of a market system. We no longer live in a world in which commercial concerns produce solely for the Pentagon, for example, which has a budget that has been reduced by a third. As a result many things that were previously developed solely for the defense market are now developed with an intended private and global market. These business have been converted into more purely private concerns, oriented to the market, while at the same time keeping their governmental and defense contracts. In the US one of the peace dividends has been the conversion of defense industries into more profitable enterprises which have a broader range

of goods and services that they produces as well as a broader and more extensive set of clients. The use of civilian contracting approaches by the Pentagon, in the US, has accelerated this transition, and annealed these concerns to a fluid marketplace.

Since the production of weapons is not only characterized by high profits but also by extreme costs for research and development as well as large economies of scale, exports of weapons systems can help to reduce unit costs, increasing the effects of training and subsidizing part of the new strategy of independence. The essential argument in favor of the national monopoly of the defense industry rested on the idea of the supremacy of national interests. Moreover, a strong industrial base was regarded as an essential condition of national political independence and political power. However, the autarkical production of weapons is both costly and dangerous, and inaccessible to most countries unless they are willing to forego economic growth, which may itself endanger their safety in the long run. European countries, for example, have to make significant economic choices in this regard, as the budget constraint appears to be tighter for them than for the US. One strategy would simply be to rely on the Americans. Another might be to adopt a position of relative neutrality. However, cooperation is a third possibility. Hartley and Cox (1992) show that a liberalized competitive market, with common purchases by a specialized Agency would lead on average to savings of about 6%.

The ongoing phase of merge and acquisition in the aeronautics field is well known and important. Frequent joint marketing and development agreements among the American, Chinese, Russian, and European manufacturers of these technologies are no longer exceptions to the rule. Lockheed-Martin has worked jointly with Brounitchev and Energia to market Proton markets around the globe. Boeing has similar agreements with Ukrainian Zenit. In these agreements, it may be that the Americans take a dominant role, just as the Germans did in the merger of Daimler-Benz with Chrysler. One result for sure has been the increasing domination of a small number of defense firms globally: Lockheed-Martin-Loral, Boeing-McDonnel-Rockwell, Raytheon, Texas Instrument- Hughes provide some salient examples. In a continuing situation of excess capacity, such aggregation is likely to persist in the short run, even if they entail the normal risks to over concentration in

the long term. Moreover, the level of productivity that this approach demands builds on a resource base and infrastructure that by and large is already paid for. It would simply be too expensive and prohibitive to start afresh from ground zero.

Satellites provide a good example, in which in a reversal of classic roles the military is able to piggyback on commercial endeavors, saving lots of money in the bargain. But this raises the question of whether the firms themselves are actually acquiring massive amounts of military capacity, which they alone control, even if they are willing to rent it occasionally to the military. Before 1990s, he dual-use of hi-tech was dominated by military sector, now it is by civilian sector. There is an explosive growth in space-based commercial communications systems over the last decade, but surprisingly the military share of missiles and space vehicles has increased. Today, less than half of the U.S. aircraft industry's sales went to military customers, which never appear since the 1930s. However, Pentagon expresses the idea to replace former satellites by commercial ones. The important synergy effects produce a reduction of costs (scale economies), an enlargement of the technologic choices, a new research of profit-earning capacity and a best economic flexibility. Reduction of costs allows the purchase of more products with the same outlays, in order to improve "the bang for a buck". Generalization of this situation is not possible for two main reasons. First, shipbuilding industry, because of its strategic capabilities, such as nuclear-powered propulsion or submarines, is clearly a defense industry in the United States, with little commercial activities. Second, the globalization of the American firms can reduce their own feeling of patriotism and give them an exorbitant military power in the choice of their costumers. The risk does not exist today. But what about this risk for tomorrow?

The implications for Russia's industrial policy and its military-industrial complex are far-reaching. Russia's high-tech sector must prepare itself to enter the global innovation networks where large corporations form alliances to market their innovations[19]. Russia has to offer a large potential market and qualified manpower. To realise this potential seems to be a question of courageous corporate concentration within Russia capable of joining the global "players". Any attempt to seek a "late-comer" path shielded by protectionist policy

would be self-defeating because the volumes of risk capital which are internationally invested in innovation are several times larger than any late-comer can hope for to be able to invest under the best circumstances. Russia's defence sector urgently needs the industrial policy background that will allow to exploit the potential of civil-military synergies which other comparable countries increasingly rely upon[20]. Though admittedly this step requires not only in Russia a change of political attitudes and of the techno-political culture in the defence sector[21].

An error could be created if the idea of international co-operation is side-tracked and if technological improvement is to be undertaken outside the normal civilian processes.

The Russian process as to be linked to :

- structural changes
- overall modernisation of the country on a technological base,
- the maintaining and improving of the overall level of technology
- the continual flow of minor innovations.

The objective from here onwards consists in several points which relates the concept of the conversion of the armament industries in Russia to the general question of the transformation of the whole system and questions of social policy and employment:

- it concerns maintaining a high level of security from the point of view of maintaining equipment ;
- the preservation and modernisation of high-level technology is necessary ;
- the training of management and scientific personnel who continue to under-estimate the complexity of market reflexes and the necessity to re-think institutional development and the legal framework ;
- governmental monitoring over the co-ordination and stimulation of technological development.

All these points taken together should be viewed in the framework of a differentiated and pragmatic industrial policy which takes account of grass-root conditions (in the sense used by E. Mason), of the preservation and development of technology oriented towards civilian outlets, and

also takes into account the need to obtain the certification and quality recognition of products. [22] The involvement of regional authorities is essential in this respect in order to reactivate the principle of localised certification (" Abaroncertifika ")[23]. The Governement must as a matter of urgency announce a scientific and technological state programme in order to arrest the intellectual haemorrhage and avoid a situation in which regional behaviour (in breaking with the Centre with monetary and industrial policies which are well removed from the general interest) puts in peril the Federation.

New strategic thinking

The US is the world's unrivalled superpower. The challenge is to preserve national competencies and capabilities in face of fewer and fewer programs. Incentives of R&D are problematic, with the large uncertainty about the nature of DoD demands, the need of a radical acquisition reform and the industrial bets for defense contractors. There is the idea to reinforce the role of Europe for the global security management, but a stronger Europe will undoubtedly change the balance of power in transatlantic decision-making. Russia is still a major power that matters, with its nuclear investment. It has the industrial and scientific capacity to diffuse conventional and unconventional technology around the world.

Table 8 - START I aggregate numbers of strategic nuclear delivery vehicles and accountable warheads, 2000.

Category	Russia	Ukraine	Ex USSR	USA	Final limits 5 December 2001
Strategic nuclear delivery vehicles	1338	59	1397	1451	1600
Total treaty-accountable war heads	6472	526	6998	7763	6000
ICBM and SLBM	5876	270	6146	6185	4900

SIPRI Yearbook 2000, p. 456.

New strategic thinking cannot focus solely on the politics among sovereign states. Certain threats do have a state based nature, and must

not be ignored. For example, in the US, Libya, Iraq, and North Korea fit this criterion. And these threats command a lion's portion of strategic budgets. At the same time, peace maintenance may be equally difficult and important, but currently commands less than 1% of contemporary budgets. Human rights and democratic institutions serve also to perpetuate peace. Thus, strategic interactions may move more properly to an arena of dissuasion, enforcement (war criminals, embargos, for example). Peacekeeping activities have new alternative means of responding to emerging crises. There are economic costs and benefits from a financial resource point of view. For Klein and Marwah[24], a standing army will cost between 50 to 100 billion dollars per year. For Parai[25], standby forces prided by Member States to the UN appear to be economically the most efficient means of providing UN peacekeeping, compared with a feasible alternative to a UN standing army or police force. They require no major additional new resources for peacekeeping. A draft budget and the contribution of participating members reimbursed the Member States that contribute to a peacekeeping forces mission. A UN standing army remains unacceptable to many members States. Moreover, Klein and Marwah do stress the issues whether the UN peacekeeping efforts are sufficient, compared with the forces of the main nuclear superpowers and the lack of political will.

In a fundamental way, the new American strategy is founded on success of globalization. In his State of the Union Address (January 27, 2000), former U.S. President William J. Clinton noted that a new defense would be predicated on new networks of nations at which he saw the US as the center : "We must admit that we cannot build our future without helping others to build theirs."

Three things are required. First one needs to gain a consensus on the expansion of international commerce, especially as it pertains to the opening of markets in less developed societies. At the same time, local norms and standards may stand in the way of such opening, as evidenced by the "battle of Seattle" and other extensive anti-WTO protest movements. It is the heart of the new strategic thinking. National security is a fundamental part of the economic policy of the USA (funds given by IMF, arms transfers, decisions on the capital volatility, etc.). Second, institutions that establish, promote, and guard democracy as well as domestic tranquility must be supported. There is some difficulty

to mobilize democratic states in the regional wars. The main problem is the superpowers recognition of their mutual responsibilities and interests. Integration of former adversaries into such international organizations must be accomplished quickly. Finally, it will be necessary to achieve some degree of agreement on the moral order. This will be difficult, for in spite of globalization, a wide diversity of goals and opinions still are evident. Indeed it is exactly the confluence of democratization and globalization that has nourished this diversity.

Perhaps for Clinton—and even for Bush—each nation is like a large company in competition on the world market. The concept of defense thereby expands beyond the military sector, and widely beyond what are conventionally thought of as weapon systems. Defense includes technological domains as well, especially as they relate to information and information management. There is a significant decline of U.S. weapons systems procurement in the 1990s and a reduction in the number of prime contractors. However, most U.S. defense industries seem to have experienced a modest decline in their sales, with a boom in exports, and a jump in concentration. The U.S. defense industry does not seem to be mired in economic crisis.

Conclusion

Technological change has forced upon contemporary decision makers the requirement to reorganize world politics. The postindustrial society, especially steeped in the information society, will significantly modify the institutions that were inherited from the industrial age. This holds true for the institution of the arms race. The arms race of the future will not be a returning of the arms race of the past. In these terms, it is easy to reject the notion that an arms race has returned. The fundamental hostilities and grievances that motivated the fear and threat behind the arms race during the last half of the 20th century simply either no longer exist or are considerably muted below any appreciable threshold. On the other hand, contemporary strategies and weapons are less centered in the public and military domain and derive more clearly from private sector strength. As a result of this technological imperative, technological as well as political economic grievances may emerge anew. However, it is clear that many of the tools

of future competition will have dual uses, the primary uses of which and broadest markets for will reside in the private sector. As these capabilities diversify, it is easy to see that the transformation costs of taking private technologies into public domains, such as defense, will not be considerable relative to developing them afresh in isolation.

It is not correct to talk about a new global arms race, because at the global level, the United States has convincing and overwhelming military superiority. To have a race—in a proper sense—at least two contestants must show up at the starting line. At the dawn of the 21st century, despite the many projections to the contrary during the last part of the 20th century (vide, P. Johnston) the U.S. stands alone in terms of military strength. Asia may be a small exception to this at a regional level, where accelerating arms spending seems widespread as well as competitive. But it is unclear if these have enormous global implications as yet. The main point however is that recognizing that there is no (old) arms race reemerging, even if it is displaced, does not prohibit the considerable potential for a newer form of rearmament which is based on entirely new strategies and technologies, many of which were primarily based in the private and commercial sector, even if they were frequently paid for by central governments.

Economic problems will play a central role in the shaping of future international relations. Indeed, wars are caused by nationalism's, racism's, genocide, but also by inequalities, domination, pauperization and inequities. Without a real will for world democratization and poverty eradication, the planet Earth will remain insecure and disarmament an eternally recurring hope, regularly reappearing in economists thoughts. Conversion and disarmament ensure peace only if a long-term economic development is established. The short-term goal for disarmament is not economic prosperity, but peace and in the long run it requires international solidarity. Development is certainly a condition for peace. Disarmament will be a stage on the road to development, if it allows inequalities and domination effects reduction, and increases the level of satisfaction of human needs (the " entitlements ")[26].

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