

NATO and the Economic and Financial Crisis

by Keith Hartley and Binyam Solomon¹

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There is some consensus among economic forecasters and international economic organizations that the world economy is stabilizing after the worst global contraction since the end of the Second World War. While it is difficult to ascertain empirically whether the massive fiscal policy support played a role or not, the improving credit conditions and the return of demand in the housing market in North America and the UK point to some evidence that the stimulus is providing the necessary short-term boost. Nonetheless, there remain significant challenges that may constrain a quick recovery including the decline in household wealth (debt-laden consumers rebuilding their savings), persistent unemployment and deleveraging (decreasing the amount of debt a firm holds by paying it off) in the financial system together with future long-term prospects of inflation.

In fact, most economic forecasters now expect a slow recovery highlighted with rising unemployment and weak Gross Domestic Product (GDP) growth. In addition, the massive stimulus packages have resulted in soaring public debt which need to be addressed next as nations dig themselves deeper into debt. This may lead to serious cuts in future government spending, including defence.

As a collective defence alliance, the North Atlantic Treaty Organization (NATO) is reliant on the member states' contributions and thus will be affected by such cuts. The impact may manifest itself in the disproportionate share of the defence burden among the allies or if there are certain private benefits (reduction of immediate threat to own borders, etc.) expected from the alliance then the impact might be ameliorated. This study examines the consequences of the current economic and financial crisis, which is often called the great recession, on the North Atlantic Treaty Organization (NATO). Specifically, the article critically assesses the implications to NATO member states' defence budgets, defence industrial policies and contributions to the common NATO budget.



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The Economic Outlook

We begin this section by assessing the consensus forecast of the major international economic organizations such as the Organization for Economic Cooperation and Development (OECD) and the International Monetary Fund (IMF). While there are a number of macroeconomic indicators one can use to assess the state of the business cycle, we focus on three broad measures that directly impact government finances and hence defence spending. The first measure is the annual growth rate of a nation's Gross Domestic Product (GDP). Since government revenues are based on corporate, personal and sales taxes, a change in the total economic activity impacts government's ability to raise revenue to fund various statutory and discretionary spending.

According to International Monetary Fund forecasts of GDP growth, approximately half of the NATO member states (12 out of 25) are expected to register negative growth into 2010². Furthermore, most of Central and Eastern European member states are expected to decline the steepest during the rest of 2009 and 2010 (Table 1). On the other hand, the Slovak Republic and Slovenia are expected to register strong growth by 2010. Of the larger NATO member states, only Canada is expected to show modest growth by 2010.

Table 1: GDP Growth Forecast

	2008	2009	2010
Belgium	1.1	-3.8	0.3
Bulgaria	6.0	-2.0	-1.0
Canada	0.5	-2.3	1.6
Czech Republic	3.2	-3.5	0.1
Denmark	-1.1	-4.0	0.4
Estonia	-3.6	-10.0	-1.0
France	0.7	-3.0	0.4
Germany	1.3	-6.2	-0.6
Greece	2.9	-0.2	-0.6
Hungary	0.6	-3.3	-0.4
Italy	-1.0	-5.1	-0.1
Latvia	-4.6	-12.0	-2.0
Lithuania	3.0	-10.0	-3.0
Luxembourg	0.7	-4.8	-0.2
Netherlands	2.0	-4.8	-0.7
Norway	2.0	-1.7	0.3
Poland	4.8	-0.7	1.3
Portugal	0.0	-4.1	-0.5
Romania	7.1	-4.1	0.0
Slovak Republic	6.4	-2.1	1.9
Slovenia	3.5	-2.7	1.4
Spain	1.2	-4.0	-0.8
Turkey	1.1	-5.1	1.5
United Kingdom	0.7	-4.2	0.2
United States	1.1	-2.6	0.8

Source: IMF World Outlook, 2009

The second measure of importance is the unemployment rate. This directly affects the number of people that the government can tax and indirectly through a reduction in consumer spending. Unemployment rates are expected to increase steadily well into 2010 for all NATO member states except Luxembourg (Table 2). As pointed out in the beginning of this article, household spending is a key factor for a robust recovery. Household spending, in turn is affected by income and wealth. Home prices are a major determinant of household wealth in many NATO countries and recent data show that these appear to be stabilizing. However, the slow pace of job creation does not bode well for household incomes. If the unemployment forecasts hold, the recovery may be slowed further.

Table 2: Unemployment Rate Projections

Member Country	2008	2009	2010
Belgium	6.8	9.5	10.5
Canada	6.2	8.4	8.8
Czech Republic	4.2	5.5	5.7
Denmark	1.7	3.2	4.5
France	7.8	9.6	10.3
Germany	7.3	9.0	10.8
Greece	7.6	9.0	10.5
Italy	6.8	8.9	10.5
Luxembourg	4.4	6.8	6.0
Netherlands	2.8	4.1	5.0
Norway	2.6	3.7	4.7
Portugal	7.8	9.6	11.0
Slovak Republic	9.6	11.5	11.7
Slovenia	4.5	6.2	6.1
Spain	11.3	17.7	19.3
United Kingdom	5.5	7.4	9.2
United States	5.8	8.9	10.1

Source: IMF World Outlook, 2009 and OECD Outlook No.85, June 2009

The third measure is government balance and net government debt in proportion to GDP. Net debt is the sum of all government liabilities (residents and non residents) minus all government assets (domestic as well as foreign). If a government is highly leveraged (indebted) future discretionary spending is likely to be cut. The forecasts on government balances for the NATO member nations are particularly stark (Table 3). With the exception of Norway, which is sitting on a healthy fiscal balance, all member states are expected to spend more than they generate in revenues through at least 2010. In particular, the larger NATO member states, particularly the US and the UK are expected to register deficits in the range of 10-14% of GDP in 2009 and 2010. France, Germany and Spain are also expected to run deficits well into 2010 to the tune of 5-8% of GDP.

Given the magnitude of the financial crisis, the stimulus

² In the spring of 2004 Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia, and Slovenia became members of the Alliance.

and bailout packages were obviously large. If the worst of the crisis is over, as most analyst expect, the impact of these large deficits may be a short-term phenomenon (although there will be lag effects over the medium to long-term). However, the recovery is also expected to be slow and most of the statutory spending is tied to the so called “automatic stabilizers”. Automatic stabilizers are transfer payments and government purchases that increase when income drops. Examples include employment insurance, income supplements for the poor, and purchases of services for the poor. In slow economic times, there are more poor people eligible for these transfers and services, so spending on them increases. This may certainly exacerbate the already worsening government balance forecasts.

Table 3: General Government Balance

Member Country	2008	2009	2010
Belgium	-1.2	-4.7	-5.6
Canada	0.4	-3.4	-3.6
Czech Republic	-1.5	-4.1	-4.2
Denmark	3.0	-2.0	-4.8
France	-3.4	-6.2	-6.5
Germany	-0.1	-4.7	-6.1
Greece	-3.7	-4.5	-5.2
Italy	-2.7	-5.4	-5.9
Luxembourg	1.4	-3.4	-4.4
Netherlands	0.8	-3.2	-4.0
Norway	18.8	9.8	11.0
Portugal	-2.6	-5.9	-6.1
Slovak Republic	-2.2	-2.9	-2.9
Slovenia	-0.3	-4.2	-3.7
Spain	-3.8	-7.5	-7.5
United Kingdom	-5.4	-9.8	-10.9
United States	-6.1	-13.6	-9.7

Source: IMF World Outlook, 2009

Another important and related variable is the total indebtedness of a nation as measured by the net debt to GDP ratio discussed above. This measure includes accumulated deficits of all levels of governments (federal, state/provincial, etc.) over the years. Figure 1 illustrates the net debt to GDP ratio for the larger NATO member nations. According to the data, Canada is the only NATO member nation with sufficient fiscal room to weather a slow growth or another recession. At the other extreme, Italy’s debt to GDP ratio of 117% implies that at best it will have to pay a considerable premium (very high interest rate on its sovereign bond) or worse, risk defaulting (declare bankruptcy). The remaining large NATO member countries exhibit debt to GDP ratios in the range of 60-71% indicating that spending cuts are almost certain in the short to mid-term.

The forecast data and trend analyses of the preceding paragraphs provide a reasonable snapshot on the state of the macro economy in NATO member states. All the member states are expected to reach the lowest point of

the recession by the end of 2009 and half the group (12 out of 25) is expected to show positive, albeit small, growth by 2010. However, there is a strong likelihood that it is going to be a jobless recovery with a highly burdened government sector looking for cuts to future discretionary spending. Defence is unlikely to be immune from pressures to cut government spending especially with voter-preferences for preserving government social welfare spending (health; education; support for the elderly).

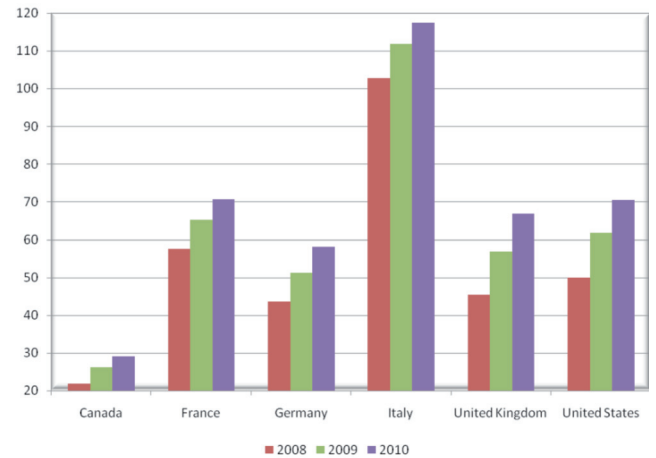


Figure 1 Net Debt as a % of GDP

Source: IMF World Outlook 2009

This possible downward pressure on the defence budgets of the member nations, as a result of the economic and financial crisis, is further affected by the fact that most of the member nation have not met the minimum NATO commitment of defence to national income (GDP) ratio of 2%. As figure 2 shows, only five member nations met or exceeded this threshold in 2008. Currently the average NATO contribution is roughly 1.7% of GDP.

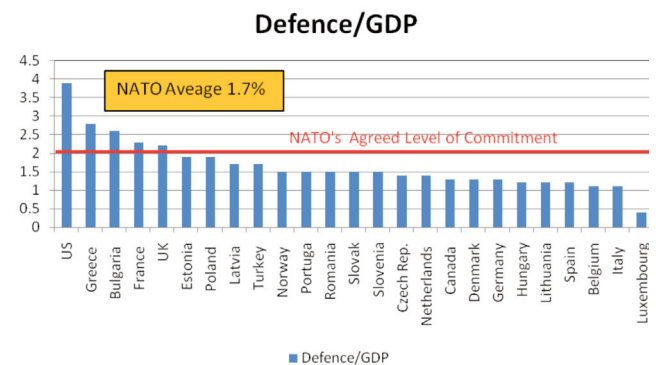


Figure 2 Defence to GDP Ratio 2008

Source: NATO http://www.nato.int/cps/en/natolive/topics_49198.htm (accessed August, 2009)

In subsequent sections economics theories and tools

are presented to assess the impact of the expected reduction in discretionary spending including defence on NATO. In particular, the assessments focus on burden sharing, member states' defence industrial policies and on the common-funded NATO budgets such as the NATO Security Investment Program which was approximately \$US900 million in 2008.

The Defence Economics Problem

Economics is the ideal tool to examine government policies at the macro level because it is the study of allocating scarce resources which have alternate uses. In our present context, military budgets are at best constant (and are most likely to fall in real terms) as governments have to contend with other priorities, such as the bailouts of the financial sector and the rising entitlement programs including health care. Further pressures on defence budgets result from rising input costs of equipment and military personnel (for nations with an all-volunteer force). The result is that difficult defence choices cannot be avoided. As governments make these difficult choices, the first likely impact on NATO will be the equitability of defence burden among allies. Burden-sharing has been an inveterate theme in NATO and it will remain the main focus in the near future.

Defence as a Public Good

Nations will join or remain in a club which specializes in providing collective defence as long as it makes economic sense (i.e. is beneficial). Thus neutrality or national independence is less desirable if membership provides more protection at an affordable cost. If the type of protection that is provided by the club is a public good, it will have interesting implications to the cost sharing in the club. Public goods have two distinct aspects—"non-excludability" and "non-rivalrous consumption." During the NATO era of Mutual Assured Destruction (MAD), the US nuclear deterrent protected additional allies without diminishing the protection available to existing allies (non-rival). Furthermore, once nuclear deterrence is provided it is available to all allies (non-excludable).³

The implication for cost sharing is that the public good provides incentives for a nation to free-ride since the other nations will provide sufficient collective defence. The other implication from the economic theory of military alliances is that while NATO's doctrine of mutual assured destruction (MAD) of the 1950s and 1960s provided a public good that increased the disproportionate sharing of defence burdens, the subsequent Flexible Response doctrine attenuated the problem. The reason was that the Flexible

Response doctrine required nations to rely on a full spectrum of forces, both conventional and strategic (nuclear). Conventional forces provide not only protection and limit damage limitation if deterrence fails, but also other country-specific benefits such as national search and rescue and aid to civil authority capabilities. Thus the more country-specific benefits of defence spending that accrue to a nation, the more likely it will fund such spending and free-riding is less prevalent.

Defence and Political Markets

Limited defence budgets also have implications to NATO member states defence industrial policies and future defence procurement decisions. Defence choices are made in political markets which are dominated by voters, political parties, governments, bureaucracies and producer interest groups. Each of these groups will pursue its self-interest (e.g. voter benefits; vote maximization; re-election; budget maximization; profits or rents). Another economic model that can address issues related to political-military-industrial complex is the public choice model. Voters as principals are ill-informed about defence choices so such choices are made by politicians, Government Ministers, civil servants and the Armed Forces (as agents) influenced by defence contractors seeking lucrative contracts. Governments will be influenced by the vote-consequences of defence choices (e.g. base closures; awarding contracts to firms in marginal constituencies). Bureaucracies in the form of the Defence Ministry and the Armed Forces will aim to maximize their budgets and will do so by over-estimating the threat and under-estimating the costs of their preferred policies and preferred defence equipment (e.g. tanks rather than lorries; aircraft carriers rather than mine sweepers; combat aircraft rather than helicopters and transport aircraft). Overall, the principal-agent and public choice analysis explains the behaviour of the agents making defence choices and it identifies the various interest groups which will oppose change. Such analysis is highly relevant to nations faced with major economic and financial crises and the threat of cuts in military spending.

NATO's Common-Funded Budgets

Finally, economic theories and models can also be applied to assess the impact of cuts to member states' discretionary funding on NATO's common-funded budgets. NATO budget decisions are based on consensus decision-making among the member nations and there are no penalties for late or under payment. NATO common funding comprises the NATO Security Investment Programme which funds NATO infrastructure projects; the military budget sup-

³ Todd Sandler and Keith Hartley. "Economics of Alliances: Lessons for Collective Action", Journal of Economic Literature, Vol XXXIX, Sept 2001, pp 869-896.

porting NATO's military commands, its staff and committees; and the civil budget supporting NATO headquarters, its staff, and committees and planning groups. How the common-funded budgets should be divided among the member nations is an economic question that utilizes the same tools as that for burden sharing and tools and concepts discussed in this section will form the necessary grounding for the assessments that are articulated in the next section.⁴

Implications for NATO

Defence is unlikely to be immune to public spending cuts. In inflation adjusted terms, defence spending has been increasing at about 2% in NATO and by 4.2% in North America since 2004. However, real (adjusted for inflation) defence growth stalled at about 0% in 2008. In addition, critics claim that defence inflation exceeds the GDP deflator (economy-wide inflation) so that apparent small real terms increases in defence spending are really cuts in real terms. As an example, the inflation adjusted Obama defence budget for fiscal year 2010 is about \$US1.2 trillion dollars less than the previous 10-year projection offered by the Bush administration.⁵

Burden Sharing

The current NATO doctrine of crisis response puts a considerable emphasis on the projection of power outside the borders of NATO member states. Such doctrinal shifts are key to the burden sharing calculus given the lessons from the economic theory of alliances discussed above. Crisis management outside of Europe implies the need for heavy investment in strategic air and sea transport to project peace-keeping. This will place a heavier burden on the large NATO allies since these nations have made the necessary capital investment in these areas. NATO's current and future geo-strategic realities are characterized by a confounding array of features, ranging from transnational terrorism to rogue nations which impact on the provision of national defence and international security. The key message is that altering the publicness of the NATO services (as articulated in the doctrine) can have significant influences on the allocation of scarce resources within NATO.

The fact that the new NATO doctrine and to some extent the expansion of membership may result in disproportionate burden sharing was predicted by various ana-

lysts in the past and our own statistical analysis, using the standard empirical tools, has confirmed the situation.⁶ While the economic and financial crisis may constrain available resources for NATO, it will provide the necessary conditions for the alliance to reformulate its strategic concept. For example, doctrinal shifts towards activities that increase the private benefits of members such as investment in the hardening of targets, specialization and intelligence can result in the equalization of burdens and a more stable budgetary environment for the organization. On the other hand, such shifts will be at the expense of NATO public goods activities.

In terms of providing a reasonable extrapolation on the possible reductions in defence spending as a result of the economic and financial crisis, the economic theory of alliances provides some guidelines. In particular, the theory provides clues towards a statistical relationship between defence spending and factors such as income (GDP), allied spending, threats and country specific factors such as defence policies or political parties. In addition, depending on the type of estimation method employed, one can also assess the short and long run reaction to changes in the factors discussed above.

While the financial crisis may limit available resources (income) the main inference from these models is that the impact can be attenuated by a member nation's reaction to threats, established defence policies and its assessment of the value of the alliance to own security. For example, the recent decision by the Canadian government to establish predictable long term defence funding implies continued growth in defence spending at least in the short run. On the other hand, the UK may find the economic and financial crisis as a launch point to search for cost reductions as part of another major review of its defence policy.⁷

In essence, the next UK Defence Review is likely to lead to further marginal changes rather than a radical review (e.g. the UK abandoning its world military role). For example, there might be a reduction in the UK's capabilities from a commitment to fight up to three small to medium conflicts to a commitment to fight up to two such conflicts. There will be further cuts in the size of front-line forces (e.g. warships, submarines, and combat aircraft); more imports of defence equipment; more military outsourcing and more base closures. The carrier order could be reduced to one carrier and reduced numbers of Joint Strike Fighter (JSF) aircraft (with the USA providing additional carrier

⁴ For further discussion on policy formulations from an economics perspective see Tisdell, Clem and Keith Hartley, *Microeconomic policy; a new perspective*. Edward Elgar Publishing, 2008.

⁵ United States Office of Management and Budget. *Budget of the US Government Fiscal Year 2010; Updated Summary Tables May 20*.

⁶ Sandler T. and J. C. Murdoch (2000) On Sharing NATO Defence Burdens in the 1990s and Beyond *Fiscal Studies* (2000) vol. 21, no. 3, pp. 297-327. On the methodology employed for burden sharing calculation see for example, Binyam Solomon NATO Burden Sharing Revisited, *Defence and Peace Economics*, Volume 15, No. 3, 251-258, 2004

⁷ Hartley, K and MacDonald, P. The United Kingdom, Country Survey, *Defence and Peace Economics*, forthcoming.

capability and the UK providing combat troops in any alliance military intervention). With such marginal and sub-optimal changes, the effect of reduced defence spending will be reduced defence capability.

The Case for Defence

Each alliance member nation will have to conduct some form of a defence policy review as part of a government-wide resource re-allocation exercise in the post financial crisis environment. Such a review needs to address the basic question of 'what is the case for defence: is it a worthwhile investment'? The answer depends on the benefits and costs of defence, to include consideration of free-riding possibilities. Benefits are difficult to assess and depend on voters' willingness to pay. Costs are much easier to identify. In 2008, the total NATO defence spending was about €622B or 2.6% of GDP. Questions then need to be asked as to whether benefits are at least equal to the costs of defence.

The benefits of defence spending include the protection of a nation's citizens and their assets, the protection of international trade and of individual national interests and political/foreign policy/international prestige benefits. In addition to these benefits, there are further benefits and costs from country-specific issues such as closer ties to the largest economy and super power. For example the UK's world military role (international operations) probably costs slightly less than half of its defence spending or about 1% of its GDP (compared with Germany and Italy). In return, there are additional benefits including its role in the UN Security Council, a leader in NATO, protection from the US special relationship, and the avoidance of conflict in the UK.

For the US, the future defence budget and policy will not only be constrained by the economic and financial crisis but also by the high costs of paying for people and military operations. An all-volunteer force (in US, UK, Canada and increasingly in European NATO allies) experiences rising costs as military personnel have to be paid a premium to attract and retain their services compared with civilian jobs. This premium is required to compensate for the net disadvantages of the military employment contract (discipline; deployment abroad for long periods; possibility of injury and death). This implies that there may be a re-allocation of resources away from equipment towards people with significant implications to defence industries. It is likely that big-ticket weapons systems like the F-35 joint strike fighter may face reductions while systems adaptable to counter-insurgency operations such as intelligence and surveillance capabilities such as Unmanned Aerial Vehicles (UAVs) may find favour in future defence capability and policy reviews.

The economic and financial crisis could lead to major changes in each nation's Armed Forces including a re-allocation of resources both within and between each of the Armed Forces (e.g. a shift from armoured units to infantry units within armies and between, say, air and naval units such as air force maritime patrol aircraft replacing naval anti-submarine warships).

Defence Industries

Typically, equipment costs rise by up to 10% per year leading to smaller numbers being procured; thus resulting in small production runs for defence industries and smaller front-line forces for the Armed Forces.⁸ Like the US, a number of NATO member states have an ambitious forward equipment program which is under-funded leading to delays, cost overruns and reduced production numbers (UK examples include Type 45 destroyer numbers reduced from 12 to 6; Nimrod MR4 numbers reduced from 21 to 9 aircraft). In the UK, all major political parties have promised a Defence Review after the next election (to be held by June 2010 at the latest). Such a Review will affect front-line units and major new equipment programmes involving reduced numbers or cancellations. From an economics perspective, the criteria for the cancellation of new equipment programmes should include:

- I. The size and timing of cost savings from cancellations: the focus needs to be on future and not past spending
- II. Cost savings are available on an annual basis and are not all available now
- III. There are cancellation costs and costs of purchasing possible replacement equipment.
- IV. Not all the savings will be spent on alternative defence projects.

Using a UK example, possible candidates for cancellation include the Astute submarines; the Trident replacement; the Type 45 destroyers; the two aircraft carriers and their Joint Strike Fighters (JSF); the balance of the Typhoon program; and the A400M airlifter. Within this list, two projects are in their early stages, namely, the carrier program and the Trident replacement so that cancellation offers substantial savings. However, complete cancellation of either or both programs will be radical and unlikely. Instead, there are possibilities for achieving some worthwhile savings by reducing the carrier buy to one carrier and a limited number of JSFs initially (with the option of buying a second carrier when the UK budget improves) and reducing the Trident replacement to three rather than four submarines. Interest groups in the political-military-industrial complex will favour such

⁸ The end of the Cold War has made no difference to unit cost escalation; it has continued.

solutions rather than complete cancellations. For the US defence industrial base the Obama's defence budget emphasis on current missions and personnel may seem bleak for future revenues but there are opportunities. For example, other aspects of the budget's theme revolve around procuring advanced weapon systems for both fighter planes and rotorcraft, and enhancing UAV's and surveillance capabilities. The performance of the defence and homeland security sector has been relatively solid. For instance, a composite index of defence firms (DSX) has grown by 29% since the financial markets hit the lowest point in the spring of 2009. This is broadly comparable with the wider Standards and Poor (S&P) 500 index which grew by 34% during the same period.⁹ There is also a strong possibility that this broader defence and security sector will engage in mergers and acquisitions to widen its exposure to key Department of Defense (DoD) initiatives. The biggest obstacle for defence industries in both the North America and Europe is not the financial crisis but the irrational reaction to globalization and governments' decision to protect industries and reduce reliance on global markets. There are substantial opportunities for industrial re-structuring in European defence industries.

European and UK Defence Industries

The EU is pursuing two defence industry policy initiatives: to create a European Defence Equipment Market (EDEM), and to create a European Defence Technology and Industrial Base (EDTIB). Basically, the EU defence industries are at a competitive disadvantage compared with the US defence industrial base (DIB) reflecting their duplication of costly R&D (e.g. three modern combat aircraft, namely, Gripen, Rafale and Typhoon) and small scale production runs. The EU has too many relatively small defence firms with considerable opportunities remaining for mergers and industrial re-structuring. The UK Defence Industrial Strategy (DIS) introduced in 2005 has major implications for the development of the EDEM and EDTIB. The UK DIS identified 'key' industrial capabilities to be retained in the UK.¹⁰ These are being retained for 'operational sovereignty', through life capability management, for responding to urgent operational requirements and for maintaining intelligent customer-supplier relationships. The UK's key defence industrial capabilities will be retained through the Ministry of Defence (MoD) offering protected and guaranteed markets to preferred suppliers based on long-term partnering agreements.

The key defence industrial capabilities to be retained in the UK include nuclear-powered submarines; core war-

ship building; ammunition; and cryptography. Also, support capabilities will be retained for fixed wing combat aircraft; helicopters; and armoured fighting vehicles. Effectively, these areas are protected from overseas competition and hence from the EDEM: they are Article 296 products.¹¹ They can also be interpreted as parts of the UK DIB which will be retained within any future EDTIB.

Some defence industrial capabilities will not necessarily be retained in the UK with MoD reserving the option of buying from overseas. These sectors include large aircraft, trainer aircraft, helicopters, missiles, torpedoes, and where more than the core warship load is needed. These are areas where the EDEM can apply; they are also areas where the UK would accept an EDTIB capability to supply such equipment.

The UK DIS faces some difficult choices:

- i) The Strategy is not costless. In seeking economies, the next Defence Review might favour more imports of defence equipment with adverse impacts on the UK DIB.
- ii) The absence of competition creates procurement challenges in providing efficiency incentives for monopoly suppliers.
- iii) Retaining capacity. Some defence industry capabilities are highly specialised and only capable of defence uses (e.g. tanks; nuclear-powered submarines; stealth aircraft). The challenge facing the UK and the EU is to devise cost-effective policies to retain such capabilities during troughs in development and production work.

NATO Common Funded Expenditures

While the common funded NATO budget represent roughly 1% of the aggregate NATO defence expenditures, it supports the organization's military structure, staff, committees and infrastructure (such as communication networks). Since NATO operates a less-integrated structure with nations maintaining their own policy and discretionary power over military expenditures, the full and timely funding of the common budget is not certain. In addition, there are no penalties for defaulting or late payment.

Faced with reduced budgets the NATO bureaucracy will also have to make difficult choices. The organization may choose a sub-optimal option of "equal misery" (or the fudge it option) where each of the departments within the organization experience budget limitations, reflected in reduced training, delaying capital acquisition

⁹ <http://www.spadeindex.com/> accessed July 27th 2009.

¹⁰ Cmnd 6697 (2005). Defence Industrial Strategy, Ministry of Defence, TSO, Lond

¹¹ Article 296 of the European Commission treaty offers an exemption to defence equipment where these items are excluded from the single market public procurement provisions.

or betterment and fewer attrition buys. The result would be a gradual reduction in organizational effectiveness. The bureaucracy may also take opportunity to review its mission and mandate at the same time as the organization is reviewing its doctrine. Efficiency gains are always a solution as long as one accepts reduction in output.

From an economics perspective there are some simple but effective principles for making resource choice. These principles are equally applicable to national defence resource allocations. First, budget reviews tend to focus on inputs as opposed to final output. Inputs imply full time clerical staff or, for the military case, infantry regiments. But the relevant output question is what the contribution of these inputs is to defence (organization) output in the form of peace, protection and security? Moreover, economists also focus on the impact of marginal (small) changes: for example, what is the impact on defence output of a slightly smaller or slightly larger civilian staff or army? This type of analysis is necessary to identify both the benefits and the opportunity costs of potential tradeoffs.

Second, there are alternative methods of achieving protection or bureaucratic efficiency. For example, reserves might replace regulars; civilians might replace service personnel (military outsourcing); attack helicopters can replace tanks; and anti-submarine aircraft might replace anti-submarine frigates. Such substitutions require financial incentives and output indicators and will encounter opposition from established interest groups. For example, each military service or bureaucratic entity has a vested interest in maintaining its monopoly position. As discussed earlier, principal-agent and public choice model provide clues on how to design contracts and incentive structures to allow economically-efficient trade-offs.

A more radical solution involves the formation of an economically-efficient NATO based on role specialisation by comparative advantage and a NATO infrastructure replacing the duplication of national defence organisations. For example, the USA might provide nuclear deterrence, space systems and anti-missile defence whilst NATO forces would jointly undertake training at fewer military establishments. Predictably, such economically-efficient proposals encounter political objections, especially sovereignty concerns associated with national interests and trust between member states.

Conclusions

The consensus forecasts suggest that NATO member states have reached the 'bottom' of the current economic and financial crisis following the deepest decline since the Second World War. However, the subsequent recovery is likely to be weak, fragile and prolonged with some of the larger NATO member nations facing considerable

debt burdens. The implications to future discretionary spending, such as defence, are not promising. Fortunately, the magnitude and severity of the impact on NATO need not be acute.

First, member nations' demand for military spending is not dependent solely on income but on a host of factors including threats and other country-specific exigencies. Second, the financial crisis may spur NATO to re-evaluate its doctrine and future role. A policy shift towards activities that increase the private benefits of members can engender the equalization of burdens and a more stable budgetary environment for the organization; but this might be at the expense of desired collective defence efforts. Third, defence policy reviews and resource allocations should be based on economic principles of emphasizing defence outputs instead of inputs and substitution principles. Substitution principles provide opportunities to exploit synergies among member nations and increase the aggregate benefits of remaining in the alliance.

Similarly, the crisis may allow the organization to entertain bold visions such as an EU defence policy that includes the development of a genuine single EU/NATO market for defence equipment. The creation of an EU defence industrial base and more efficient international collaborative programmes may also result in robust security arrangements that more than mitigate the expected cuts in defence budgets. Again, attractive though such proposals appear, the reality of political and national interest considerations will dominate and likely obstruct efforts to achieve such improvements in economic efficiency.

There are further possibilities for creating a single EU Army, Navy and Air Force with opportunities for weapons standardization and role specialization between EU Member States. Such bold decisions, however, would require that nations continue to emphasize the benefits of globalization and tight integration in the post financial crisis environment instead of protectionism.