CHAPTER 6

Future Challenges

Abstract The survival of NATO depends on its ability to respond to future challenges from new threats. NATO’s distinctive attributes are an established alliance, an experienced command structure and capable military forces. Alternatives to NATO are assessed. Proposals for improving efficiency and enlargement are reviewed. Future battlefields and the future of the defence firm are explored.

Keywords Economic and military benefits • Defence economics • Enlargement • Standardisation

Introduction: Where Next?

NATO faces major future challenges which will determine its survival. The future is uncertain and no one can predict it accurately: today’s winners might well be tomorrow’s losers. Even if NATO survives, for how long and in what form? Will there be further enlargements (with whom?); what are the future benefits of NATO and what will be the future threats? These issues are addressed in this chapter. It shows how economic analysis can be used to provide insights into the future of NATO and the alternatives.
NEW THREATS

The future survival of NATO will partly depend on its ability to adapt and respond to new threats. China is an obvious and emerging superpower rival for the USA. At the end of World War II, the USA was the planet’s dominant nation; later it was victor of the Cold War. By 2020, the US global primacy appeared to be ending with China emerging as a superpower rival reflected in its economic growth, the size of its GDP, foreign investment and military spending some of which is on high technology defence equipment (e.g. aircraft carriers; combat aircraft; space satellites). At the same time, there is a view that no US major politician dares to tell their own people that their global supremacy is coming to an end (Mahbubani 2020). The US position on its future world power role will determine the future of NATO.

There will be other threats to NATO. These include the revival of Russia as a world power and its rivalry with both China and the USA. Other states will emerge as world powers over the next 70 years: these are not yet known but will eventually emerge. Further new threats will come from new technology and the nations which develop this technology. Again, this new technology and its origin nations have yet to emerge; but NATO has to be capable of responding and adapting to such threats from new and unknown technology. Much depends on defence and civil R&D spending in the USA and other NATO nations. Here, civil R&D spending might provide access to new technologies which might become future military threats to NATO.

Pandemics are a major threat: they have the ability to radically affect the performance of economies. The Coronavirus pandemic of 2020 resulted in the ‘lockdown’ of national economies with major implications for international travel, tourism, hospitality and health industries. Economies required massive increases in public spending to avoid recessions and to provide funds for the unemployed. In the long-term, such increased government pandemic public spending might mean reductions in other government spending including cuts in defence spending.

Climate change is another new threat. It might, for example, lead to resource shortages which become a cause of conflict (e.g. droughts and access to water resources). Other new threats include cyber warfare and the space domain. Space is a completely new domain for the development of weapons. The use of space for satellites and surveillance means that it cannot be ignored by Armed Forces. The destruction of a nation’s
satellites gives an attacker a military advantage: it destroys an enemy’s communications and surveillance capability. Overall, there is no shortage of threats both known and unknown which can be used to justify the retention of NATO. But more is required to justify its continued existence. Is the current form of NATO adequate or are there better alternatives where better embraces lower cost and/or more effective solutions? To survive, NATO has to demonstrate that as a collective military alliance it is the least-cost solution to providing protection and that it is a lower-cost solution than other national defence policies.

**NEW ROLES**

New threats might lead NATO to new roles and there is no shortage of possibilities for new missions. NATO has some distinctive attributes. It is an established international military alliance with an experienced command structure and trained and capable armed forces. These are valuable assets with a range of alternative uses. Examples include expanded roles in crisis management, humanitarian and disaster relief. Other opportunities include international peace-keeping and enforcing. Recreating these NATO assets and attributes would take time and be costly. But time and costs are not necessarily reasons for retaining NATO: national solutions might be more cost-effective. The case for NATO is based on the benefits of international collective action convincingly outweighing its costs.

**NATO MILITARY AND ECONOMIC BENEFITS**

NATO continues to offer military and economic benefits. It remains a military alliance providing collective security through its Article 5 military multiplier in the form of an attack on one member being regarded as an attack on all members. Economics enters the equation since the NATO alliance provides defence to its members at a lower cost than the alternative of national independence. On this basis, NATO is a ‘win-win’ for all members.

For the Europeans, consider the alternatives to NATO. First, Europe could develop an independent strategic nuclear deterrent under its own control and rely upon it to deter other nations from attacking Europe. Second, each Member State could rely on its conventional forces to provide adequate national defence. The absence of a military alliance would
mean no national contribution to collective defence and the end of burden-sharing debates.

Nations would have to assess the costs and risks of non-NATO. Consider the option of a European strategic nuclear deterrent. This will be costly but could be based on the French (and UK) nuclear deterrent. It is likely to be a small nuclear force based in Europe and close geographically to Russia so that protecting these forces from a Russian surprise attack will be extremely costly and difficult militarily. Europe’s vulnerability to a Russian nuclear attack might also be greater since the probability that the US strategic nuclear force will respond will be lower once the USA has withdrawn from any Article 5 commitments. Effectively, Europe would be trading a small increase in its nuclear threat to Russia for a massive decrease in the threat to Russia from the US nuclear deterrent. If Europe is unwilling to rely on an independent nuclear deterrent, it might prefer conventional forces but still rely on US nuclear forces to deter war (assuming a US willingness to provide its nuclear deterrent). Without a military alliance, this is a risky option but attractively cheap.

In assessing a non-NATO option, European nations will evaluate the costs and benefits of alternative defence policies. These range over strategic nuclear capabilities to various types of conventional military capabilities. Here, the options include ‘strong’ conventional forces (modern army, navy and air force) or role specialisation within a European defence force. Assessing the costs of these options is relatively easy; but the benefits assessment is much more problematic. Assessing the benefits of defence requires some measure of defence output. Typically, economists refer to defence output in such broad terms as peace, protection and security; but any cost-benefit analysis of defence policy options requires a money valuation to be placed on defence output. No such money valuation exists. Instead, the traditional solution was to assume that inputs equalled outputs which is not a satisfactory solution. Alternative approaches have focused on the military capabilities of various levels of defence spending. For example, a defence budget of SX billion might ‘buy’ the capability to deploy specific numbers of soldiers, tanks, warships and combat aircraft in some overseas region for a specified period of time. But, no money valuation is attached to such a military capability so that the costs and benefits of various defence policy options cannot be evaluated and the defence economics problem remains.
THE DEFENCE ECONOMICS PROBLEM

A future of rising unit costs and either falling or stable defence budgets in real terms means that difficult defence choices cannot be avoided. The Augustine scenario of a single tank army, single ship navy and Battlestar Galactica for the air force might become reality for all NATO forces. Costs, economics and efficiency will become more important in the future NATO. Cost and budget pressures will lead national military forces to search for efficiency improvements. Continued membership of a military alliance appears cost-effective and there are further opportunities for efficiency improvements within alliances. Within an alliance, internal efficiency can be improved through standardisation and improved collaboration.

STANDARDISATION

Weapons standardisation is attractive to a military alliance. It involves two or more members of an alliance using identical equipment. Standardisation increases the military effectiveness of the alliance armed forces. For example, the armies of two or more members of an alliance would all use the same tanks so allowing them to be re-armed with common ammunition and repaired at any military base throughout the alliance. Aircraft would take-off in one country and land at an airfield in another Member State where they could be refuelled and re-armed ready for another mission.

Economics predicts that standardisation provides industrial benefits of lower unit costs from large-scale production. Larger orders allow fixed development costs to be spread over larger outputs and greater quantities lead to lower unit production costs from economies of scale and learning (see Fig. 5.1). Whilst standardisation is attractive, it encounters barriers of nationalism as each Member State prefers independence with the ability to use its armed forces independently with the reliability of re-supply in conflict. Furthermore, diversity of weapons and non-standardisation has some military benefits since it presents different threats to rival nations in a conflict.

Weapons standardisation can be achieved in various ways. Member States could all import the same type of weapon, such as NATO Member States buying US equipment (e.g. F-16 and F-35 combat aircraft). Or, a degree of standardisation can be achieved through two or more nations
agreeing to cooperative purchasing of the same equipment or through international collaboration on the supply-side.

**IMPROVING EFFICIENCY: ALTERNATIVE MODELS OF COLLABORATION**

There are at least three alternative models for European arms collaboration. First, the US F-35 model; second, the Airbus model and third, the economics model.

*The US F-35 Lightning II programme* is one model. The US government is the major buyer of this multi-role combat aircraft for the three US services. The F-35 resulted from a competition between Lockheed Martin and Boeing with Lockheed Martin winning the competition for the Joint Strike Fighter (JSF). The project is mostly funded by the US government with further contributions to its development costs from international partners. The UK is the only Level 1 partner contributing some 10% of the original planned development costs. Level 2 partners include Italy with a contribution of $1 billion and the Netherlands with a contribution of $800 million. Level 3 partners making smaller financial contributions to the project include Australia, Canada, Denmark, Norway and Turkey.

Lockheed Martin is the prime contractor with Northrop Grumman and BAE Systems (UK) as major industrial partners. Northrop Grumman has a work share of about 25% on the project, including work on the centre fuselage. BAE Systems has been awarded a 13% to 15% work share on each aircraft (comprising the rear section) with estimates suggesting support for some 25,000 UK jobs. But the project has not been problem-free. There have been cost overruns estimated at $163 billion, delays of 7 years as well as performance problems. Critics have suggested that the project is too costly to cancel!

*Airbus* is another alternative model for European arms collaboration. Many critics regard Airbus as a classic example of a successful European collaboration. It is a world-class firm forming a duopoly with Boeing in the world market for the supply of large civil jet airliners. Airbus is an international company with two major partner nations (France and Germany with Spain as a minor partner). In comparison, Boeing is a one nation and privately owned company which is not state-owned and is not subject to governance by two or more partner nations. Airbus has achieved US scales of output for its major jet airliners to become a world-class firm.
and rival to Boeing: it demonstrates that multinational collaboration can be successful.

There are, however, differences between Airbus and other European military aerospace collaborations. First, Airbus market success has been in civil aircraft markets where there are large numbers of buyers, many being privately owned profit-seeking firms. In contrast, arms collaborations involve a few procurement agencies and their national partner governments funded on cost-based contracts providing soft budget constraints. Second, Airbus specialises in civil jet aircraft which are not as technically advanced as military combat aircraft. Third, Airbus is a European company with a permanent existence compared with the typical ad hoc project-specific consortium for European arms collaboration. The result is an established European company which acts as a single prime contractor representing companies in three nations. Finally, Airbus has a small number of partner nations which might demonstrate the success of collaborations based on small numbers of partners. But the Airbus model is not all success. The performance of its Defence Division on the A400M airlifter has been far from successful (Hartley and Braddon 2014).

Economics offers guidelines for an alternative model of efficient arms collaboration. Economic theory predicts that efficient solutions require profit-seeking private firms operating in competitive markets, where efficiency results from competition in product markets and the ‘policing’ and monitoring role of capital markets (i.e. threats of takeovers and bankruptcy). This suggests some radical changes to existing arrangements for European arms collaboration. Competition is required to select a single prime contractor which should be a private firm subject to hard budget constraints (i.e. a fixed price contract). The prime contractor would be responsible for selecting its major suppliers with work allocated on competitive criteria rather than juste retour. Partner nations would buy shares in the project similar to the US F-35 project but there would be a lead nation (c.f. USA for F-35). The economic principles for efficient arms collaboration are clear but politics will intervene. Nations will not agree to a single lead nation and a single prime contractor for a project: all partner nations will demand a major role in project management and the involvement of their national champion firms.
FUTURE EUROPEAN DEFENCE INDUSTRIAL POLICY

European defence industrial policy has two components, namely, the creation of a Single Market for defence equipment and the formation of a European Defence Technology and Industrial Base (EDTIB). Immediately, there are potential conflicts between these aims. A genuinely competitive Single Market will conflict with the aim of creating an EDTIB. Competition will allocate scarce resources between different regions and nations within the Single Market but this might mean some regions losing defence technology and production capabilities and such losses might be regarded as politically and socially undesirable. Nor is the concept of an EDTIB problem-free. Its key components and capabilities have to be identified and agreed between partner nations. For example, decisions are needed about the location of the major design, development and production facilities for air, land and sea systems (which nations?) with the locations likely to be determined by governments. Funding has to be arranged and agreed between Member States which will raise new burden-sharing debates. Also, financial support has to be provided during troughs in development and production work for defence plants. Solutions to troughs in defence work include the development of cheap prototypes and technology demonstrators, limited production orders and the mothballing of plants. Inevitably, the Single Market and EDTIB will be dominated by the desire of governments, bureaucracies and producer groups for ‘managed competition’ (managed by vested interest groups) which public choice analysis predicts will depart from economic efficiency principles.

Despite political constraints, continued pressures on defence budgets mean that economic efficiency principles cannot be ignored. There are considerable opportunities for improving the efficiency of NATO and European arms collaboration and their Armed Forces. The efficiency of arms collaboration can be improved by applying the lessons from Airbus and the US F-35 programme. Also, collaboration might be extended beyond acquisition to include all aspects of a project’s life-cycle. Examples include extending collaboration to include training, repair and maintenance as well as mid-life updates. Collaboration might also be extended to include nations from outside Europe (e.g. Australia; Brazil; Canada; Japan; South Africa; South Korea).

Opportunities exist for improving the efficiency of NATO and EU Armed Forces. Examples include extending military outsourcing and avoiding wasteful duplication in acquiring, owning and sharing costly
military assets (e.g. anti-ballistic missile defence; duplication of nuclear forces; duplication of aircraft carriers; air tankers; specialist surveillance aircraft). More radical changes arise from applying the economic principles of substitution and specialisation by comparative advantage. Substitution possibilities include reserve forces replacing regular forces; civilians replacing military personnel; drones replacing manned combat aircraft; and nuclear forces replacing conventional forces. Applied to the EU’s Armed Forces, the economic principle of specialisation by comparative advantage would mean Member States providing those Armed Forces where they have a comparative advantage. Germany might specialise in armoured forces; France and the UK might provide aircraft carriers and nuclear forces; and the Netherlands might provide escort vessels for the aircraft carriers. Trust is a major constraint on achieving such specialisation: in a conflict, will allies providing the specialist military capability turn-up? Trust is also a problem when sharing costly military assets. Sharing appears attractive but it ignores some fundamental problems. Who will ‘own’ the asset and have the ‘right’ to use it in a conflict; and how will the costs of ownership be shared between the ‘owners’ (a burden-sharing issue)? Next, there are future challenges for NATO in enlargement through possible new members.

**NATO Enlargement: New Members and the Limits to Membership?**

For analysis of NATO expansion, the alliance can be regarded as a club where Member States join so long as membership is expected to be worthwhile. Benefits and costs are viewed from the perspective of existing members and from the perspective of the new member. For existing members, benefits might take the form of the new entrant providing additional military forces supplying a range of defence outputs (joint products) and contributing to joint costs. New members also involve costs in the form of additional risks of conflict and increased transaction costs associated with more Member States. Decision-making rules might have to be changed with choices between unanimity and majority voting rules. Whilst recognition of benefits and costs is a useful guide to expansion, it provides no indication of whether there is a limit to the size of NATO and what that limit might be.
New members involve additional costs and benefits which also extend to existing members. If all existing members and the new entrant view an enlargement as providing net benefits, then the admission of the new ally should proceed. Net benefits require an assessment of both additional costs and additional benefits for two groups, namely, existing members and the new entrant. NATO provision for enlargement involves Article 10 of the Treaty which allows entry to any European state which furthers the principles of the Treaty and contributes to the security of the Atlantic area. Potential new members might include Bosnia and Herzegovina, Georgia, Ukraine, Serbia, Finland and Sweden. Some of these potential applicants are also members of NATO’s Partnership for Peace programme.

Economic theory offers guidelines on enlargement, carefully distinguishing between new and existing members. The benefits for a new member might include increased peace and stability, democratic reforms and improved relations between neighbouring states. Further benefits for the new member might include greater protection provided by an international military alliance. A new member also brings benefits to existing members through, for example, increased arms sales by NATO arms producers, especially the USA. Increased arms sales lead to economies of scale and learning resulting in lower unit costs and lower unit prices. A new member might also contribute additional protection for existing members. Established members will also receive a monetary gain from the greater sharing of NATO common infrastructure costs associated with the new member.

Membership of NATO involves an entry path starting with a Membership Action Plan (MAP) where a country has to declare an interest in joining the alliance. A prior entry point is the Partnership for Peace programme (PfP), created in 1994 involving partnerships between NATO and countries from the Euro-Atlantic area, the Mediterranean and Gulf region. There are also individual dialogue-cooperation relationships with countries such as Australia, Japan, South Korea and New Zealand (Partners across the globe). Countries wishing to join NATO are required to participate in the PfP as a prerequisite to joining the Membership Action Plan.

New entry and expansion involves costs. For new members, there are increased costs where NATO membership requires force modernisation, additional training, standardisation expenses and the costs of modernising military bases. Direct enlargement costs include upgrading command, control, communications and intelligence facilities and extending NATO infrastructure (e.g. pipelines; airfields; ports). New members will also be
required to contribute towards NATO’s common infrastructure costs and to provide military bases for use by NATO forces. Only those costs which arise from NATO expansion should be included: costs which would be incurred without NATO entry should not be included as an expansion cost (Belkin 2019).

There are three further costs which are difficult to measure but might be the most important. First, a new ally might increase the risks of conflict for the whole alliance. For example, a new member might provoke Russia. Second, expansion might lead to greater force thinning as a given size of conventional forces is allocated to defend longer borders. Third, expansion means that decision-making may be slower and more difficult to reach a conclusion. For example, a larger alliance makes it more difficult to reach speedy and agreed conclusions on crisis management where military action requires a rapid response. This raises the more general question of the ideal size and composition of NATO. Economists suggest that the ideal economic size of NATO occurs where the additional costs of enlargement equal the additional benefits for existing members and the new entrant (Sandler and Hartley 1999).

There are no published studies of the costs and benefits of NATO expansion. In view of the expansions which have occurred, this is surprising and a major flaw and deficiency in any economic assessment of NATO. Benefits are difficult to measure in money terms: how do you value peace and security? However, one economic benefit has been identified. It has been estimated that NATO membership and partnerships have had a positive impact on a country’s economic growth (Gonzalez et al. 2019).

Costs of NATO expansion are relatively easier to identify, measure and value. For example, studies have estimated the costs of US troops in Europe. A 2018 study estimated the costs of the US military presence in Europe at between $24 billion and £35.8 billion per year (IISS 2019); and a 2019 US study estimated the costs of US military forces in Europe at $10.4 billion per annum (Belkin 2019). The cost estimates vary widely depending on the definitions of costs. Moreover, these are estimates of the costs of US military forces in Europe only which do not indicate the full extent of costs borne by all NATO allies.

In terms of defence objectives, some of the NATO enlargements are difficult to justify. They appear to reflect an objective of maximising the number of members rather than increasing net protection. For new entrants, the question needs to be asked: what does the new member add
to NATO collective defence and at what cost? Decision-making rules also need to be reviewed. Not all members are equal and a rule of one member one vote and majority voting means that the dominant member militarily can be easily out-voted by a number of smaller states with small military forces. Similarly, choices are needed between majority voting and a unanimity rule. Unanimity means that all members have to agree on a choice but the costs and time needed to reach a unanimous decision for 30 members might be substantial with an inconclusive outcome seriously weakening the effectiveness of a military alliance needing to respond rapidly to a crisis situation.

NATO expansion is one dimension of size, but the possibility arises of exit from NATO. Withdrawal from NATO involves Article 13 of the Treaty. The procedure for exit requires that the departing country informs the USA which then informs other members. After a one year wait, the departing country formally leaves and ceases to be a member. Exit from NATO or any military alliance will depend on the costs and benefits of exit versus remaining a member. One determinant of exit or remaining might be the likely form of the future battlefield.

**Future Battlefields**

NATO faces massive uncertainties about the future battlefield over the next 50 to 70 years. Will future conflicts be similar to recent battles or will they be radically different? History suggests the possibility of massive changes. The Second World War was drastically different from the First World War (e.g. the Second had a major role for aircraft, tanks and submarines compared with WWI). Massive change will need corresponding changes in Armed Forces and the end of some traditional military roles: for instance, manned tanks might be replaced by remotely controlled armoured vehicles.

Technical change has typified warfare. Bows and arrows were replaced by rifles; cannons replaced castles; sail-powered galleons were replaced by battleships and aircraft carriers; nuclear weapons replaced large concentrations of troops; and inter-continental ballistic rockets and cruise missiles replaced large conventional bomber forces (c.f. RAF Bomber Command in WWII). Nations which fail to introduce new military technologies might be defeated in conflict. Even non-state actors such as terrorist groups, are changing and adjusting to new technology. Following the wars in the Persian Gulf, Afghanistan and Iraq, terrorist groups concluded that
it was not sensible to confront the USA and its Western allies on their own terms. Instead, the West’s enemies have responded to its military superiority in air warfare by learning new lessons, such as how to communicate effectively with their friends without alerting western intelligence agencies (Kilcullen 2020).

To illustrate future battlefield prospects, consider two scenarios, namely, the Augustine weapons scenario and the cheap drones scenario. The Augustine scenario continues the historical trend of ever more technologically complex and costlier weapons with rising real unit costs. These weapons are so expensive that there are forecasts of single ship navies, single tank armies and Battlestar Galactica for the air force (Augustine 1987). Battlefields will be automated with robot soldiers and remotely controlled air, land, sea and space weapons. Augustine weapons will be so costly that future wars will be short duration, high intensity conflicts. Armed Forces will have to fight with their existing stocks of weapons since replacing stocks via new production will take considerable time. For defence industries, there will be fewer new development projects and shorter production runs reflecting smaller quantities for the Armed Forces.

The alternative scenario is one of swarms of cheap drones. These can be bought off-the-shelf (e.g. in toy shops) by terrorists and other violent extremist groups (Lyle 2019). They enable terrorists and non-state groups to acquire air power cheaply without the need for all the supporting inputs required for a modern air force. Drones are cheap, priced at $200–500, with relatively large numbers of suppliers. Drones are easier to operate, easy to modify and cheaper to buy which makes them the opposite of the costly and rising unit cost of the Augustine weapons. The drones scenario is especially worrying with anti-drone technology being so costly: interceptor missiles in Israel’s Iron Dome cost US $100,000 and are a costly solution to threats from US $200 drones (Lyle 2019). Of course, the future battlefield might combine both scenarios with costly Augustine weapons managing and controlling fleets of cheap drones. Next, questions arise about the future of the defence firm in NATO.

**The Future NATO Defence Firm**

At the outset, questions arise about whether the NATO defence firm has a future: will it exist in 50–70 years time in, say, 2070–2090? Long-term forecasts are most likely to be wrong but some broad generalisations are possible. There will continue to be a need for defence firms so long as
military threats remain. Barring an unprecedented outbreak of world peace, defence firms will be needed to respond to threats to national peace and security. Even with world peace, there will remain a limited demand for weapons from international peace-keepers.

The future defence firm will be different. It will be as different as today’s defence firms are as different from those of 1945 and 1914. For example, in 1914, the aircraft industry was a new entrant industry which was just emerging; by 1945, it was building rockets and early versions of cruise missiles (V-1 and V-2 rockets); and by 1969 it had become an aerospace industry building rockets for lunar travel.

For the future, there will be a smaller number of larger defence firms. These are likely to be international firms with sales of a range of air, land, sea and space systems involving mergers between US and European defence firms. The future NATO defence firm will probably be ‘too big to fail.’ Giant firms will also create regulatory challenges for national governments as they have to determine the prices and profitability of major defence contracts. Nor can national governments ignore the future challenge and costs of retaining a national defence industrial base. National defence industries will face troughs in development and production work and the costs of retaining defence industrial capacity during such troughs. Policy options include funding technology demonstrators, awarding limited production contracts to retain capacity or ‘mothballing’ industrial facilities. None of these options are costless.

The future NATO defence firm will diversify by acquiring a large civil business. The aim will be to reduce a defence firm’s dependence on military business and its dependence on national government as a single or major buyer. But, even more challenges arise since governments will have to decide whether they prefer competition to monopoly in national defence markets. Competition requires alternative suppliers which means either supporting a number of rival firms in national defence markets or allowing foreign firms to bid for national defence contracts.

**Conclusion**

The future of NATO requires three questions to be addressed. First, what is known about NATO; second, what is not known; and third, what needs to be known for making sensible public choices on the future of NATO? The answer to all three questions is that much is known, a lot is unknown and more needs to be known.
Starting with the knowns, there are considerable data on the facts about NATO. There are time-series and cross-section data by country on military expenditure, numbers of military personnel and the allocation of defence budgets between equipment, personnel and other inputs. There are also data on NATO’s defence industries and its major arms firms.

There is much which remains unknown. More data are needed on the size of NATO defence industries measured by both sales and employment and on defence industry supply chains. Defence R&D data by NATO members is lacking as well data on industry and firm performance measured by labour and value-added productivity, profitability and exports. Insights into the gains from improved efficiency in NATO require data on unit cost curves for different types of weapons (e.g. combat aircraft; tanks; warships) and the impact on unit costs of larger scale production.

There is much which needs to be known. National defence markets and their procurement, competition and contracting policies need to be identified and evaluated. NATO decision-making has to be assessed for its efficiency and cost-benefit studies are needed of enlargement. An evaluation framework needs to be established and then used to evaluate applications for new entry. Comparisons of procurement policies in NATO enable the identification of those which are successful and those which are failures where the successes provide policy guidelines for further improvements in NATO efficiency.

For the future, there are a range of policy options for achieving lower costs and improving the defence effectiveness of NATO. First, a more effective military alliance would be achieved with the addition of Sweden as a new member. Other candidates as new members include Australia, Japan and South Korea all of which might be suited to respond to the emerging threat from China. Second, various options exist for improving the efficiency of NATO. These include the creation of a NATO Single Market or a Free Trade Area in defence equipment; or the creation of more efficient collaborative programmes; or strengthening the Single European Defence Equipment Market; or improving NATO’s decision-making apparatus.

Economics provides an analytical framework for thinking about the future of NATO. It is valuable in raising the resource question of what are the costs of NATO and what are its benefits? It directs analysts to seek answers to questions but it does not provide answers: these are matters of judgement by analysts. Typically, economics is not the only method of analysing the future of NATO. Other disciplines are relevant including
politics, strategic studies, international relations, sociology, military analysis and theology. Some of the issues for the future of NATO involve morality. For example, the morality of using nuclear weapons which can affect the future of civilisation and is as equally important as the debates about climate change.

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