

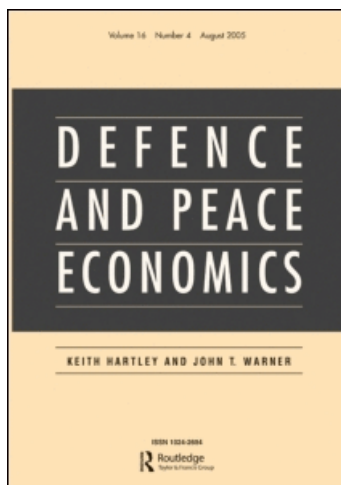
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### THE FUTURE OF EUROPEAN DEFENCE POLICY: AN ECONOMIC PERSPECTIVE

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## **THE FUTURE OF EUROPEAN DEFENCE POLICY: AN ECONOMIC PERSPECTIVE**

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European defence policy has been dominated by politics. This paper shows how economic principles can be used to derive guidelines for the formulation of European defence policy. The inefficiencies of the EU's existing defence arrangements are identified. It is shown that there is scope for efficiency improvements in the EU's Armed Forces and its defence industries.

*Keywords:* EU defence markets; Efficiency; Armed Forces; Europe's defence industries; Industrial policy options

### **INTRODUCTION: POLICY INITIATIVES**

The European Union (EU) aims to develop a Common European Security and Defence Policy (CESDP). A major move towards such a policy was agreed by the European Council meeting at Helsinki in December 1999 with the agreement to create an EU rapid reaction force by 2003. This force provides a European military capability designed for the Petersberg tasks of conflict prevention, crisis management, peace-making and peace-keeping, including rescue missions, disaster relief and humanitarian aid. It will comprise 50,000–60,000 troops able to be deployed within 60 days and sustained for at least one year. Past examples of possible missions for the new EU rapid reaction force include Bosnia, Kosovo and UN-led missions in Burundi, East Timor, Rwanda, Sierra Leone and Somalia. Under the Petersberg tasks, collective defence against external aggression remains the exclusive preserve of NATO (HL 101, 2000).

The creation of an EU rapid reaction force is likely to lead to harmonisation and standardisation of equipment requirements and to new demands for defence equipment as the EU identifies gaps in its ability to undertake the Petersberg tasks (*e.g.* heavy airlift; satellite surveillance, reconnaissance and communications; smart weapons). In addition to these changes which affect the demand side of defence markets, there have been initiatives affecting the supply-side of the market. The Six Nation Framework Agreement of July 1998 was signed by France, Germany, Italy, Spain, Sweden and the UK. This Agreement was designed to facilitate defence industry re-structuring in Europe and reflected a desire to maintain European industry's relative competitiveness in response to disarmament following the end of the Cold War and the major re-structuring in the US defence industry. Under the

Agreement, the six nations aimed to remove some of the barriers to cross border defence industry re-structuring (*e.g.* security of supply; exports procedures; security of classified information; harmonisation of military requirements: HCP 115, 2001). Following the Agreement, there was major re-structuring involving both national and cross-border mergers. Examples included BAE Systems (UK), EADS (France; Germany; Spain), MBDA (France; Italy; UK), Thales (France; UK) and Agusta-Westland (Italy; UK: Neal and Taylor, 2001).

European nations have considerable experience of major collaborative projects, especially in aerospace (*e.g.* combat and transport aircraft; helicopters; missiles). With such projects, two or more nations share development costs and combine their production orders. Examples of European collaborative programmes include the two nation Multi-Role Armoured Vehicle, the four nation Eurofighter combat aircraft, the six nation Meteor air-to-air missile and the seven nation A400M transport aircraft. To improve the efficiency of collaborative projects, a quadrilateral armaments agency was created in 1996, involving France, Germany, Italy and the UK. This agency is known by its French acronym OCCAR (Organisation Conjointe de Cooperation en matiere d'Armement: HCP 69, 1999). Membership is open to other European nations, subject to their involvement in a major project with at least one of the OCCAR partners and acceptance of the agency's policies.

European defence policy has been dominated by politics. This paper shows how economic principles can be used to derive guidelines for the formulation of a European defence policy. It identifies major inefficiencies in the EU's defence markets and the scope for improving efficiency in the Armed Forces, defence markets and defence industries. Some of the problems and likely departures from an economically efficient EU defence policy are considered and future prospects for industrial policy are assessed. A starting point for the analysis is the defence economics problem.

### **The Defence Economics Problem**

Disarmament following the end of the Cold War has resulted in falling national defence budgets in real terms in Europe and elsewhere in NATO and the former Warsaw Pact (see Table I). Falling or at best constant real defence budgets have been subject to rising input costs for both capital and labour. Typically, equipment costs have risen at some 10% per annum in real terms resulting in a long run trend towards smaller numbers of equipment being purchased for the Armed Forces (reflecting the technical arms race: Kirkpatrick, 1995; Pugh, 1993). Similarly, for military personnel in an all-volunteer force, labour costs rise faster than wage increases in the civilian sector. This results from the net disadvantages of the military employment contract reflected in military law and discipline, conditions of service and the probability of injury and death. To attract personnel to an all-volunteer force requires that the disadvantages of military employment be compensated through pay and non-pay benefits (*e.g.* clothing; housing; medical support; education for dependents; transferable skills training; sports and recreation facilities; overseas travel: Hartley, 2000).

As a result of falling real defence budgets and rising input costs, policy makers cannot avoid the need for some difficult defence choices. Nations can choose between various options including a policy of 'equal misery' (*e.g.* less training; delays in new equipment programmes), or continued efforts to improve efficiency (*e.g.* competition; outsourcing; incentive budgeting), or a major review of a nation's defence commitments (*e.g.* withdrawal from being a world power). For European nations, another option is to re-examine the efficiency of their current defence arrangements and the opportunities offered by a European defence policy.

TABLE I Defence Budgets, Armed Forces and Defence Industries.

Country	Defence Expenditure		Armed Forces Personnel		Employment in Defence Industries	
	US\$ millions 1999	Index 1990 (1999 = 100)	(000s) 1999	Index 1990 (1999 = 100)	(000s) 1999	Index 1990 (1999 = 100)
Austria	1790	104	41	109	3	167
Belgium	3710	136	43	249	7	357
Denmark	2830	105	25	124	5	140
Finland	1810	119	32	98	10	100
France	40,380	110	421	131	263	146
Germany	34,490	143	334	204	90	267
Greece	5290	79	205	98	15	100
Italy	18,290	112	391	126	33	242
Luxembourg	140	71	1	100	na	na
Netherlands	6480	120	55	187	10	200
Portugal	2210	99	72	121	5	200
Spain	7530	111	155	169	25	400
Sweden	6590	99	53	122	25	120
UK	28,420	141	218	142	280	157
EU	160,800	122	2060	138	770	172
USA	254,630	136	1489	146	2240	139

Notes: Index numbers are for 1990, with 1999 = 100 based on military expenditure data in millions of US dollars, prices and exchange rate of 1993. They show changes since the end of the Cold War in 1990.

Source: BICC(2001).

### Inefficiency of Existing EU Defence Markets

In considering whether economics offers any guidelines for an EU defence policy, a starting point is to assess the efficiency of the existing EU defence markets. The military production function shows how the Armed Forces assemble inputs of technology, equipment (capital), personnel (labour) and entrepreneurship (military commanders) to provide defence outputs (military capabilities). Defence markets comprise Defence Ministries and the Armed Forces who are procurement agencies purchasing equipment from national and/or overseas defence industries and buying military and civil personnel typically from national labour markets. Military commanders perform the entrepreneurial role of converting factor inputs into a successful military capability (*e.g.* winning the war). Using this framework, it is argued that the EU's defence markets are inefficient in providing both Armed Forces and defence equipment.

The US model is used as the criterion for assessing efficiency in defence markets (there are alternative criteria and variants). Compared with the USA, the EU lacks both a single European Army, Navy and Air Force and a large Single EU Market for defence equipment. Instead, the Armed Forces of each EU member state are characterised by major duplication with each nation having its own defence ministry, a national army, navy and air force and its supporting infrastructure of training, logistics and bases. As a result, EU states are failing to obtain the economies of scale and scope from large-scale operations in the provision of Armed Forces (*cf.* US model). National Armed Forces in EU states are 'too small' and illustrate the costs of non-Europe in defence (nationalism). However, there is a lack of published data on the magnitude of the economies of scale and scope and the cost savings associated with larger EU Armed Forces.

Table I shows the relative sizes of EU and US Armed Forces. In aggregate, the EU's Armed Forces in 1999 were larger than the USA, but such a comparison is misleading since the EU does not provide a collective defence effort. Instead, each member state has its national Armed Forces with the largest concentrations of military personnel in France,

Germany, Italy and the UK, accounting for some 65% of the EU total. France has Armed Forces which are some 28% of the size of the US Armed Forces, whilst the UK's Forces are 15% of the US size. Numbers of military personnel are also an input whose productivity varies between conscript (many EU Forces) and volunteer forces (UK; USA) and is further dependent on the vintage of the stock of capital equipment. Such differences between the Armed Forces of the USA and EU member states has led to the conclusion that "...if you take the American effort as a hundred then the European effort is about 60 but the effect is about 15" (HCP390-i, 2001, p3).

Inefficiency also exists in EU defence industries and their associated equipment markets. Once again, compared with the USA, the EU defence industries are characterised by the duplication of costly R&D programmes (*e.g.* aircraft; helicopters; missiles; tanks; warships) and small-scale production for small national markets so that firms fail to obtain economies of scale and learning (hence the importance of exports). Combat aircraft are a good example where the EU is developing three different types, namely, the Gripen (Sweden), Rafale (France) and the Eurofighter Typhoon (four nations). The result is three R&D bills and production for small-scale national orders. However, if all six EU nations had combined their requirements and purchased one type of combat aircraft, there would have been savings in R&D expenditure and economies of scale and learning from an output of over 1000 units which is much closer to US scales of output. For combat aircraft, Table II shows the size of R&D expenditures and the scale of output for EU nations compared with the USA. It is, of course, recognised that if the EU nations selected one type of combat aircraft rather than three types, not all the duplication in R&D costs would be saved. There might need to be expenditure on competing prototypes and collaboration might involve inefficiencies. Table II also shows the potential scale benefits from collaboration as demonstrated by the combined production orders of four EU nations for Eurofighter (ranging from 87 aircraft for Spain to 232 units for the UK). Even with collaboration, European scales of output remain substantially below the US national purchases for its F-16 aircraft and the planned buy of Joint Strike Fighter for the three US Armed Forces (2852 units compared with 150 aircraft for the UK). However, collaboration is inefficient. Estimates show that the aggregate costs of collaborative development compared with national alternatives can be some 140% for two nations (*e.g.* Merlin helicopter), 161–179% for three nations (*e.g.* Tornado) and almost twice as high for four nations (*e.g.* Eurofighter). Despite higher aggregate development costs on collaboration, each partner only bears its share of these costs so that there are costs savings to the nations involved in collaborative development work. Similarly, inefficiencies on collaborative production have resulted in economies of scale and learning which are about half of those on national programmes (*e.g.* 5% savings compared with the 10%

TABLE II European and US Combat Aircraft.

	<i>R&amp;D Costs</i> (£ billion)	<i>National</i> <i>Output</i>	<i>Exports</i>	<i>Total</i>
Gripen	1.3	204	42	246
Rafale	6.1	294		294
Eurofighter	13.8	620	90 (?)	710 (?)
JSF (US)	13.7	3002 (150 for UK)	2000 (?)	5000 (?)
F-16 (US)	n.a.	2250	1750	4000+
F-18 (US)	4.0	1363	401	1764
F-22 (US)	15.2+	295	—	295

*Note:* R&D costs are estimates for different base years.

*Source:* Janes (2001); CBO (1997).

expected from a doubling of output). Usually, the cost penalties on collaboration result from inefficient work shares (*juste retour*), duplication of flight test centres and final assembly production lines, together with complex and bureaucratic government and industrial management structures (HCP 300, 2001).

### Improving Efficiency in EU Defence Markets

Economic analysis offers a number of policy guidelines for improving the efficiency of European defence markets embracing both Armed Forces and defence industries. For Armed Forces, four economic principles can be formulated:

- a. *There are benefits from collective action: lessons for the EU rapid reaction force.* Some weapons and force structures provide collective defence benefits to all member states (public goods). Examples include nuclear deterrence, ballistic missile defence, satellite communications and surveillance and airborne early warning systems. Whilst the principles are clear, there remain problems of free riding and the relationship with NATO and the US provision of public goods to the Alliance (Guyot and Vranceanu, 2001).
- b. *There are gains if each nation specialised by comparative advantage in providing Armed Forces.* Contributions to an EU rapid reaction force or to a single EU Army, Navy and Air Force could be based on comparative advantage. Possible examples might include France and the UK providing aircraft carriers and nuclear deterrence; Germany providing armoured forces; Belgium and the Netherlands providing naval escorts for the aircraft carriers; and the UK providing naval, amphibious and specialist forces.
- c. *There are economies of scale and scope from large-scale operations by the Armed Forces.* There are various methods of achieving such economies, ranging from the formation of joint forces between two or more EU states to the creation of a single EU Army, Navy and Air Force. Already, there have been some bilateral and multilateral initiatives among the Armed Forces of European countries. Examples include the Eurocorps, the European Amphibious Initiative, the Anglo-French air group and the EU rapid reaction force (Hartley, 2002; Sandler and Hartley, 1999).
- d. *Military personnel: the economics of an all-volunteer force versus conscription.* A number of EU states continue to rely upon conscript forces. The economic case for an all-volunteer force (AVF) is that such a system reflects the market price of military personnel (their relative scarcity: Hartley and Sandler, 2001, vol II). Under an AVF compared with conscription (the draft), military personnel become relatively more expensive leading to incentives to substitute cheaper for more expensive inputs. As a result, there will be substitutions between equipment and personnel and between military personnel and cheaper civilians. The overall outcome of an AVF is an improved allocation of resources, with labour costs reflecting the unique features of military employment contracts. Even so, there are problems of an AVF, especially recruitment and retention. Such recruitment and retention problems can be solved in various ways. For example, by 'running-on' highly-skilled and trained personnel (*e.g.* retirement at 65 rather than 55); by using reserves and civilians to replace regular personnel; and by equipment replacing personnel (*e.g.* air forces replacing armies).

Similarly, there are two major economic principles for improving the efficiency of EU defence equipment markets and defence industries:

- a. *There are gains from creating an EU Procurement Agency.* There are various scenarios ranging from expanding OCCAR to creating an EU Procurement Agency which would replace national defence ministries and would buy standardised equipment for a single EU

Army, Navy and Air Force. An EU Procurement Agency would be a big buyer, able to use its buying power to obtain economies from large-scale purchasing. As a first step, an EU Agency with a more restricted role could be introduced into the current arrangements of national Armed Forces. Initially, such an Agency might operate on a voluntary basis, showing national defence ministries the economic benefits of pooling their orders for a complete range of defence goods and services. For example, if all EU states agreed to pool their national orders for tank tracks, the EU Procurement Agency would be able to use its buying power to achieve lower prices and each nation would continue to receive track specially designed for its Armed Forces (*i.e.* under this scenario, standardisation is not required).

- b. *There are gains from creating a Single European Market for defence equipment.* This proposal would extend the existing Single Market for civil goods and services and civil public procurement to defence procurement. It would require the abolition of Article 296 (formerly Article 223: HL 101, 2000). Studies have been undertaken of various Single Market scenarios which show estimated cost savings for defence equipment in the range of 10% to almost 20% (lower bound estimates: Hartley and Cox, 1992). Each scenario assumed a liberalised competitive Single Market either restricted to firms from EU member states or open to firms from the rest of the world. Scenario one comprised a liberalised competitive market with national procurement by national defence ministries in which firms from all EU member states would be able to bid for national defence contracts in other member states (some equipments might be excluded from this scenario – *e.g.* nuclear systems). Alternatively, if the Market were open to the world, firms from countries outside the EU would be able to bid for defence contracts in EU states. Scenario two is the other extreme. It involves an EU centralised procurement agency replacing national defence ministries and buying common standardised equipment. Effectively, this scenario assumed a single EU Army, Navy and Air Force, so resembling the US model. It is the most attractive scenario economically, but it is regarded as ‘politically impossible’. Scenario three is the ‘twin track’ model. This involves competition for small to medium projects (*e.g.* small arms; small missiles) and collaboration for major air, land and sea systems. Two assumptions were made about work shares on collaboration, namely, work allocated on the traditional basis of *juste retour* or on the basis of competition. The estimated cost savings from the three scenarios are shown in Table III.

### Problems and Departures from Economic Efficiency

The economic approach to EU defence policy has been criticised as simplistic and politically unacceptable as nations prefer independence and some oppose a Federal United States of Europe. However, such critics cannot ignore the estimates of cost savings from different

TABLE III Single EU Market Scenarios.

Scenarios	Annual cost savings for EU defence equipment procurement	
	EU only	Open to world
1. Liberalised Competitive Markets	9%	11%
2. EU Procurement Agency	15%	17%
3. Twin Track Model	11%	14%

Source: Hartley and Cox (1992).

EU defence policy scenarios which highlight the costs of the existing inefficient arrangements (independence is costly). Such cost penalties also mean less effective Armed Forces (from costly equipment) and sacrifices of social welfare spending. Nonetheless, it has to be recognised that there are major problems in applying economic principles to EU defence policy and that actual policy is likely to involve departures from the 'ideal' of economic efficiency. Some of the likely problems include:

- a. *Burden sharing and free riding.* The creation of an EU rapid reaction force will create burden sharing issues between EU member states. With such a force, there will be incentives and opportunities for free riding with defence and peace-keeping burdens borne by the larger and richer member states (e.g. France, Germany and the UK). In 1999, the EU median defence share of GDP was 1.6% which ranged from defence burdens of 2.5% to 2.7% for the UK and France, respectively to under 1% for Austria and Ireland (Greece at 4.8%: SIPRI, 2001). There are also questions as to whether the EU rapid reaction force can be funded from existing defence budgets or whether it will need increased funding and will the EU states be willing to pay?
- b. *Efficiency gains are not costless.* Creating an EU rapid reaction force or single EU Army will involve transaction costs reflected in the costs of reaching agreements which will require agreed voting rules and decision-making criteria. Similarly, creating a Single Market for defence equipment will involve adjustment costs and will take time. These costs will be reflected in job losses and plant closures with some companies and regions being losers. Predictably, interest groups in the military-industrial-political complex will oppose efficiency improvements which are likely to make them worse-off. Lobbying by interest groups will create pressures for *juste retour*, protectionism and 'Fortress Europe'.
- c. *Relationships and potential conflicts with NATO.* Care has been taken to stress that the EU rapid reaction force will not be involved in collective defence which remains the preserve of NATO. However, much depends on the US view as to whether the EU rapid reaction force is seen as supportive and complementary to NATO or as an alternative. Moreover, potential conflicts between an EU defence policy and NATO assume the continuation of NATO. Questions have to be asked about the long-term future of NATO: will it survive to, say, 2025 and beyond?
- d. *Defence industrial base issues.* Two issues arise. First, EU states face challenges in retaining a defence industrial base requiring highly specific assets and human capital. Examples include nuclear-powered aircraft carriers and submarines; strategic bombers; and modern battle tanks. Gaps in development and production work make it difficult and costly to retain such industries within EU member states. Options include mid-life up-dates or 'shut-down and restart' (Hartley, 2001). Second, the challenge of maintaining competition. Industrial re-structuring in the EU and the USA has created domestic monopolies and duopolies so confronting policy-makers with the task of maintaining competition. The case for a competitive procurement policy is that it results in lower prices and profits together with innovation in both equipment and industrial organisation. Of course, nations could maintain competition if they were willing to buy from abroad. Where competition is not possible, there arises the problem of determining the profitability of non-competitive defence contracts. For such contracts in the UK, the 1968 Profit Formula Agreement aims to provide defence contractors with a rate of return on capital equal on average to the return earned by British industry (e.g. 22% on historic capital in 1998/99). Critics of this Profit Formula believe that it offers 'too high' a profit rate; that there are insufficient efficiency incentives; and that it fails to reflect the new developments in financial economics and in the theory and practice of privatisation and regulation (Hartley, 2001; Arrowsmith and Hartley, 2002, vol II).



## FUTURE PROSPECTS: INDUSTRIAL POLICY OPTIONS

In future, three industrial policy options are likely to become more important, namely, international collaboration, offsets and military outsourcing. Typically, European collaborative defence equipment programmes have been characterised by inefficiencies resulting from *juste retour*. There are opportunities for improving the efficiency of collaborative projects by allocating work on the basis of competition. An example for future collaboration is the Joint Strike Fighter (JSF) model. This is a Trans-Atlantic collaboration involving the USA, the UK and other European states. The UK Government is a full partner in the JSF programme with a requirement for 150 aircraft and contributing some 10% towards its development costs (US Forces have a requirement for 2852 aircraft). Other European states are likely to be involved as associate partners in the programme (e.g. Denmark; Italy; Netherlands; Norway each contributing 2% to 5% of development costs). Competing prototypes were built by two industrial teams comprising Boeing and Lockheed Martin, Northrop Grumman and BAE Systems (UK). Each US prime contractor selected UK suppliers on the basis of commercial-competitiveness criteria (cf. *juste retour*). In most cases, UK suppliers were involved in both US teams (i.e. win-win), but BAE Systems JSF Project Team had an exclusive agreement with Lockheed Martin (win-lose). Under this agreement, Lockheed Martin will provide BAE with a minimum of 10% of the work on all phases of the JSF programme for all customers (total sales estimated at 5000 aircraft). Final selection between the two competing prototypes was on the basis of 'the winner takes all' and in late 2001, the Lockheed Martin team was declared the winner of the JSF competition.

European nations which import defence equipment usually require some industrial participation or offset. There are increasing demands for higher work shares for the importing nation's industry. Offsets appear attractive, but appearances are deceptive. There are various reservations about offsets:

- a. *The extent of new work.* Is the offset genuinely new business which would not otherwise have been obtained? UK experience suggests that only some 25% to 50% of the total offset is genuinely new business (Hartley, 2001(a)).
- b. *The amount of high technology work.* Purchasing directly off-the-shelf means that there few opportunities for high technology work within the offset.
- c. *Temporary or permanent work.* Is any offset work short-term only, restricted to the duration of the offset?
- d. *The costs of offsets.* Do offsets involve a premium or are they 'free lunches'?
- e. *Incentives to exaggerate.* Both overseas firms bidding for defence contracts and national defence ministries have incentives to exaggerate the benefits of offsets (e.g. saving national jobs and the defence industrial base).

Military outsourcing provides new market opportunities for Europe's defence industries. Armed Forces have the choice of undertaking work 'in-house' or using outside contractors: the make v buy choice (e.g. repair and maintenance work; training). Estimates show that competitive tendering can result in cost savings of from 5% to 40% (Arrowsmith and Hartley, 2002, vol I). UK examples of Public Private Partnerships and Private Finance Initiatives include air-to-air refuelling capability and military flying training (Hartley, 2002a). These are cases of defence activities (public goods) being privately-provided and privately-financed. Military outsourcing provides extensive opportunities for introducing competition into activities traditionally undertaken 'in-house' by the EU's Armed Forces.

## CONCLUSION

EU defence policy is topical and dominated by politics. This paper has shown that economists can make sensible contributions to the debate and to knowledge. It has been shown that the EU's existing defence arrangements are highly inefficient. There is scope for efficiency improvements in the EU's Armed Forces and defence industries with efficiently organised military alliances offering benefits to their members. Efficiency improvements mean benefits to the Armed Forces and taxpayers, but costs for some of the EU's inefficient defence industries. The long-term future might be the creation of a Trans-Atlantic market for defence equipment (*i.e.* USA and EU).

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