Politics and defence R&D policies: the United States and Israel and lessons for the European Union

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Politics and Defence R&D Policies.

The United States and Israel and Lessons for the European Union

Dieser Beitrag verwendet das Bureaucratic-Politics-Paradigma zur Analyse von Forschungs- und Entwicklungsprogrammen des militärischen Sektors. Gegenstand der Untersuchung sind einschlägige Forschungs- und Entwicklungsprogramme in den USA und Israel sowie daraus ableitbare Schlussfolgerungen für die Europäische Union, wo gegenwärtig Bestrebungen zur Initiierung militärischer F&E-Programme auf Gemeinschaftsebene stattfinden. Das Bureaucratic-Politics-Paradigma ist ein tauglicher Ausgangspunkt zum besseren Verständnis politischer Prozesse der Innovation im Bereich nationaler Sicherheit: Es liefert einen systematischen Rahmen zur Erklärung, wie verschiedenen Elemente des Regierungssystems in einem politischen System, in welchem politische Macht bewusst fragmentiert und über eine große Anzahl von Akteuren verteilt ist, zu Entscheidungen kommen. Vor diesem Hintergrund kommt der Beitrag zu dem Schluss, dass politische Entscheidungsfindung im Bereich militärischer F&E-Investitionen auf einem Kompromiss zwischen unterschiedlichen Positionen verschiedener politischer Interessen, unter anderem im Bereich der staatlichen Bürokratie, basiert. Positionen der politischen Spitze steuern die Aktivitäten unterschiedlicher Elemente der Verwaltung einerseits zu einem gewissen Grad, andererseits werden diese nicht automatisch und eins zu eins in Maßnahmen umgesetzt. Zur Implementierung von F&E-Policies im Sinn ihrer Planung sind andauernde Verhandlungen und Wieder-Verhandlungen zwischen politischen Amtsträgern, der Bürokratie, dem Militär, der Industrie und anderen externen Interessengruppen notwendig.

Keywords: Sicherheitspolitik, Bureaucratic Politics, Forschung und Entwicklung, European Defence Agency, Militärtechnologie
Defence, bureaucratic politics, research and development, European Defence Agency, military technology

1. Introduction

This paper will utilize the bureaucratic politics model to analyze the defence R&D policies of two countries – the United States and Israel – and to make recommendations, based on this analysis, for the European Union as it initiates defence R&D programmes at the European level. It is not intended to make the case for or against defence R&D at one level or another, or to pass judgement on the case studies it describes. Rather, it is based on the recognition that defence R&D is a component of the national security and innovation strategies of many countries, and as such it is important to understand the mechanisms through which policies are created that affect it. Given the rise in recent years of the U.S. defence R&D budget (from just under $50 billion in 2001 to over $70 billion in 2005, which is 15 percent of the entire U.S. defence budget), the prominence of defence R&D in Israel's national security strategy (specific figures are not made public), and the initiation of the first pan-European defence R&D programs in the fall of 2005 (worth approximately 3 million Euros, and expected to rise in the next few years), the time seems right to ini-

tiate a dialogue on how defence R&D policies are implemented.

The choice to use the bureaucratic politics paradigm stems from its usefulness for understanding the politics of national security, including innovation activities related to national security, particularly those of democratic governments where power is intentionally fragmented and dispersed among a multitude of actors. By viewing policy as something that is formulated and implemented in a bargaining arena rather than a command structure, through a process that is fragmented and non-hierarchical, the paradigm offers a systematic conceptual framework that takes into account all relevant actors in the defence policy realm.

The U.S. and Israel present interesting case studies for analyzing defence R&D policies. In both countries, political decisions were made to create, train and equip national military forces for both defensive as well as offensive tasks ranging from full-scale war to various types of low-intensity conflict. In both countries, the political decision was taken to be as self-sufficient as possible in defence equipment so as to procure as much of it as possible on the domestic marketplace. While each country had different reasons for reaching this decision, the end results were similar: today, both boast national industrial bases that are not only capable of supporting a large share of their defence requirements, but also constitute an important element of their economic, defence and foreign policies. Since there are striking differences in the economies, defence budgets, national security strategies and government types of the two countries, analyzing both is useful for the EU, which is currently formulating a defence R&D policy for a diverse Union of Member States. If the examples of the U.S. and Israel show that bureaucracies are key actors in defence R&D policies, this would strongly suggest that they will be key for European defence R&D policies too.

The paper first looks at political rationale for defence R&D investment using the bureaucratic politics paradigm. This paradigm views decisionmakers as actors in the game of politics whose positions on political issues are determined by bureaucratic interests. Actors promote those interests as part of a competition for various stakes and prizes. Political decisions and policy outcomes, according to the bureaucratic politics paradigm, are reached through a compromise between different positions held by the various actors. Next, the paper describes the American and Israeli defence R&D frameworks and uses the bureaucratic political paradigm to examine a case study in defence R&D programmes within these frameworks. Lastly, lessons for Europe are drawn from the U.S. and Israeli examples, specifically for the European Defence Agency as the entity within the EU that tackles defence R&D programmes at the pan-European level.

2. The bureaucratic politics paradigm and defence R&D

The bureaucratic politics paradigm is valuable for understanding the politics of national security, including innovation activities related to national security. George Appleby and Norton Long pioneered the model in the 1940s and 1950s as a reaction to the politics-administration dichotomy, which presented politics and policy administration as two separate realms, with politics the domain of the selected office holders and administration that of the professional civil servant (Appleby 1949; Long 1952). In the 1960s, Francis Rourke developed it further (Rourke 1984), and in the 1970s and 1980s it was Guy Peters (Peters 1989) as well as Graham Allison and Morton Halperin who refined it to depict the political process as unfolding in a government structure that is more like a confederacy than a hierarchy and argued that it is appropriate to treat organizations as well as individuals as single policy actors. In these instances, they claimed, an organization's mission – like a decision-maker's bureaucratic position or job title – becomes a strong predictor of its policy stand on a particular issue (Allison/Halperin 1972). During the late 1990s, Allison and Zelikow applied the bureaucratic politics approach to foreign and defence policies (Allison/Zelikow 1999, 255–324). According to the paradigm, policy decisions are not made by

rational choice or by a unitary actor. Rather, they are made by various actors that promote their own interests as they compete for various stakes and prizes. Positions on political issues are determined by interests of actors, and political decisions and policy outcomes are reached as a result of a negotiated compromise between different positions.

To bureaucratic politics theorists, bureaucracy is anything but the mechanical and neutral implementation of policy. Although politics and policy execution involve different roles and work cultures, responsibilities are often blurred. The bureaucracy has at its fingertips information and expertise that elected officials often lack. As a result, bureaucrats are often delegated authority from politicians, and can indirectly make policy through consulting and advising. Bureaucracy is not subject to the rules of debate and questioning as are legislators and does not have to be sensitive to political pressures from constituents, which makes it less restricted in its decisionmaking. Furthermore, bureaucrats are driven by the interests of the ministries and agencies with which they are affiliated, and they constantly build, maintain and attempt to increase their political support. In effect, they compete with one another for budget resources, personnel slots, morale, access to key decisionmakers, autonomy of action, and scope of missions and roles. This competition produces within each of the actors a common bureaucratic culture, which in turn results in a pattern of recurring behaviour. This behaviour, commonly referred to as "Mile's Law"[1], can be summarized by the adage: "Where you stand [on political issues] depends on where you sit [within the bureaucracy]." In other words, policy positions are determined by – or are a function of – the players' perspective as developed by their bureaucratic culture (Halperin/Kantor 1973, 3).

Certain resources and strategies are associated with successful bureaucratic politics. The mere fact that bureaucratic politics occur suggests that players do employ a variety of strategies to maximize their rewards. Some bureaucracies are more successful than others in employing their assets – such as their expertise and their responsibility for implementing policy – in an effective manner. Rourke believes that bureaucratic actors are more likely to succeed if they possess socially appreciated expertise, the support of their clientele or constituency group, good leadership and organizational vitality and energy. Thus, the acquisition, maintenance and expansion of these four characteristics become an objective of all organizations as they engage in bureaucratic politics (Rourke 1984, 91).

The policy decisions made in an environment of bureaucratic politics is characterized by negotiation, accommodation and compromise. Decisions are made less through an executive process and more through one of bargaining. They also involve strong political ties to clientele groups, to which bureaucracies look for political security and support. Such ties are based on an understanding that in return for the clientele's political support, which enables the bureaucracy to prosper, it receives a say in policymaking through the bureaucracy. Clientele in bureaucratic politics refers not only to politicians and their constituencies, but also to external interest groups such as private companies.

One last notion of the bureaucratic politics paradigm is worth mentioning, as it is important for analysing the politics of defence R&D. This is the concept of reform in bureaucratic policies. A major percept of the bureaucratic politics paradigm is that proposals for change are neither technical nor neutral exercises, but rather political phenomena generating intense political pressures, conflicts and turmoil. Reorganizations have political purposes, and they are proposed and adopted for political reasons and with political motives (Seidman 1976). As a result, proposals for change and reform view organizations and bureaucracies as political objectives and objects, while the bureaucracies themselves will have their own positions on reorganization issues and their own plans for what best serves the organizational interest.

The bureaucratic politics paradigm is useful for studying the politics of defence R&D due to the systematic framework it offers. Particularly when analysing democratic governments, where power is intentionally fragmented and dispersed

among a multitude of actors, a paradigm that explains how the different elements in government make decisions is required. In an area such as defence R&D, requiring specific expertise and skills, the paradigm claims that policy will be heavily influenced by experts yet involve intense debate, consultation and compromise. Declaratory policy steers and guides, but is not automatically translated into programmes and actions; these require continuous negotiations and re-negotiations. Policy will be made through a process that is fragmented, non-hierarchical and non-monolithic. Politics, bureaucratic professionalism, particularism, parochialism and external interest groups colour this process, and decisionmaking requires coordination and the integration of various components and an awareness of fiscal, organisational, political and cognitive constraints. It also requires attention to the fact that there is a lack of accountability to the electorate by professional bureaucrats. Lastly, in defence policy too, reform issues are intensely political and raise questions of authority, influence and access (Kozak 1988, 15).

3. U.S. and Israeli defence R&D: a view through the bureaucratic politics prism

3.1. The United States

Throughout U.S. history, the country's political agenda has swung repeatedly between one that demands participation in international affairs – as was the case when decisions were reached to participate in the two World Wars – and one that calls for isolationism, which was extremely prevalent after the failure of Wilsonianism and during the years of the Great Depression, for example. Since World War II, however, the U.S. has adopted a political agenda of intensive international involvement with a strong focus on overseas presence – specifically military presence – and a belief in the country's role as leader of the "Free World". It has committed troops to dozens of conflict areas, and fought several large-scale wars, including Korea, Vietnam, and the Persian Gulf, all the while prepared for confrontation, including the possibility of a nuclear confrontation, with the Soviet Union.

The understanding that a strong military is necessary in order to implement the nation's policies overseas was translated into a research agenda that emphasized defence R&D. Technology was viewed by the U.S. policymaker as enabling the exchange of capital for labour: the better the technology available, the fewer soldiers the military will need to draft and deploy, and the fewer casualties it will sustain. In addition, advanced technology was deemed as providing the capability to achieve swift and decisive victory on the battlefield. As early as 1945, the Vannevar Bush report "Science – The Endless Frontier" spurred the creation of a system of public support for science and engineering research following the realization that "scientific research is absolutely essential to national security", as the experience of World War II was deemed to have proven. During the Cold War, victory was believed to be achievable if the race for defence technology superiority over the Soviet Union were won. And in the years following the collapse of the Soviet Union, U.S. defence planners continued to stress the need for technological superiority and to warn that a

> failure to understand and adapt [new technologies] could lead today's militaries into premature obsolescence and greatly increase the risks that such forces will be incapable of effective operations against forces with high technology (U.S. Joint Chiefs of Staff 1996, 11).

A defence R&D policy – a coherent, formal strategy for the support and exploitation of scientific research for defence purposes – was never formulated, however, except during World War II. Instead, the relationship of the federal government with the defence scientific community and the defence industrial base are guided by a set of arrangements and understandings developed in response to particular needs and endure for as long as they successfully accommodate the interests of the parties involved (Morin 1993, 171).

The Department of Defence is the largest supporter of R&D in the federal government, although the Department of Energy, which han-

dles defence-related nuclear research, and the newly created Department of Homeland Security, also play important roles. Today, the Department of Defence accounts for more than half of the total federal R&D portfolio. It is the largest supporter of R&D in the U.S., its $75 billion budget outstripping even the top players in the private sector: Ford Motor ($7.5 billion), Pfizer ($7.1 billion), General Motors ($5.7 billion) and IBM ($5 billion) (Lawrence 2004). In the 1980s, the Department of Defence supported nearly two-thirds of total federal R&D, but defence cutbacks following the end of the Cold War greatly reduced this share. Since 2001, however, defence R&D spending has again increased dramatically.

In 2003, 2004 and 2005, record defence R&D budgets were allocated, rising to $65 billion, $72 billion and $75 billion in those years, respectively (Koizumi 2005). In U.S. defence R&D, however, expenditures differ from most R&D funding processes in that the distinction between basic and applied research and development, testing and evaluating is very sharply drawn. The majority of funds ($57 billion, or 75 per cent in 2005) have traditionally gone to the latter type of activities, while an almost stagnant funding stream of approximately $14 billion annually is directed at basic and applied research (ibid.). In addition, most types of defence related research have more than one potential funding source. For example, the Defence Advanced Research Projects Agency (DARPA), the Army Research Office, the Air Force Office of Scientific Research, and the Office of Naval Research all fund research on unmanned aerial vehicles (UAVs). This ensures that no area of research is dependent on one funding source for its continued support.

The V-22 Osprey aircraft is a recent programme that provides an interesting case study for using the bureaucratic politics paradigm to understand how funding is allocated to defence R&D programmes in the U.S. It is a tilt-rotor aircraft – one that takes off like a helicopter and flies like a plane – that is designated to replace the Marine Corps' aging helicopters. The programme has had a long and troubled R&D history since its initiation in 1986. In 2000, fatal crashes of two prototypes claimed the lives of 23. By 2004, the programme had absorbed $8 billion in federal funding without producing a single plane for regular military duty, and had fallen years behind schedule. The Pentagon's original plan to purchase 913 planes has been cut in half, and the cost per unit, which has leaped from $29 million to $44 million, may yet rise to $60 or even $80 million (Jones 2001, 46–7). Despite these facts, Congress, the Marine Corps, and the private sector have repeatedly joined forces to ensure the V-22 remains an ongoing R&D effort.

Jones (2001) finds that consistent with the central assumptions of the bureaucratic politics paradigm, the decision to fund the development of the V-22 Osprey emerged from a policy process pervaded by role-based politics. The positions of the key actors within this decision-making environment – the Department of Defence, Congress, Marine Corps, and the defence companies involved in the development – were directly related to the specific missions of their organizations. These missions caused the actors to have different interests and, therefore, disparate reasons for supporting or opposing the V-22 programme. Conflict arose between the executive and legislative branches, because the Department of Defence and Congress had competing interests as well as opposed policy goals. At one point, the Department of Defence challenged congressional budget authority by refusing to spend V-22 appropriations. Conflict also arose within the bureaucracy; the Office of the Secretary of Defence, the civilian side of the Department of Defence, strongly opposed the programme while the Marine Corps, the main customer for the aircraft, supported it.

The success of the Osprey's proponents is largely the result of the ability of one part of the bureaucracy – the Marine Corps within the Department of Defence – to rally the support of Congress, which had enough formal authority to control the program's budget process, and of the defence companies involved. To date, Congress has invested billions of dollars in the program, and its continuation affects the constituencies of key members in relevant committees. For example, the aircraft's fuselages are

manufactured in Boeing's Ridley Township plant, which is in the district of Rep. Curt Weldon (R, PA), vice chairman of the House Armed Services Committee and chairman of the Tactical Air and Land Forces Subcommittee, which oversees the V-22 program. Boeing employs 4,700 people in this plant, and full production is expected to add another 500 over the next decade (Parmley 2005). Other defence contractors and the smaller companies that work for them have thousands of jobs deeply tied to building the Osprey and designing civilian spin-off models, and a long history of solidarity when it comes to lobbying for programs (Walker 1999, 180). Marine helicopters have aged to a point where they are near the end of their life cycle with no ready replacement except the V-22. Moreover, the Marine Corps considers the Osprey well suited for the missions that it is expected to perform in the new global security environment. These actors, therefore, have a strong interest in ensuring the program's survival. Even if the aircraft's rising cost and most recent problems finally lead to its demise, it has managed to survive as an R&D programme for nearly two decades.

3.2. Israel

The Israeli political agenda was born out of the Zionist ideals held by the Jewish leadership in Palestine during the British Mandate. It stressed the creation and sustaining of a Jewish homeland that would be as self-sufficient as possible. Since it was understood that the State of Israel, when born, would be poor in natural resources, in capital and in manpower, and since it was clear from the start that its Arab neighbours would do their utmost to destroy it, a key political goal was – and to a great extent still remains – the creation of a national economic base that could supply as many of the country's needs in a time of emergency as possible. War for Israeli decisionmakers is an extension of politics by other means to the extent that their political agenda is centred on the issue of ensuring the nation's survival as a Jewish State.

To achieve this political goal in the face of continued threats against its very existence, the Israeli Defence Forces (IDF) relies on superior training, military intelligence, mobility and firepower to achieve swift and decisive victories. Technology has traditionally been seen as a major ingredient for providing these critical capabilities. Initially dependent on foreign imports, Israeli decisionmakers decided that it should strive to be as self-sufficient as possible when it came to defence technologies. From the first days of its independence, therefore, Israel's political-military reality has forced it to adopt R&D policies that ensured it could supply the majority of technological advantages to its defence forces. On the demand side, the quantitative advantage of Israel's Arab adversaries impelled it to develop qualitative advantages in the form of high technologies. On the supply side, it was its skilled labour, available in relative abundance, which enabled it to develop these technologies. In addition, it was expected that investments in defence R&D would eventually lead to significant spin-offs to other sectors of the economy, and were thus viewed as being of strategic importance from an economic point of view as well as a military one (Teubal 1993, 484–5).

Despite some – occasionally quite vehement – objection from several government agencies and ministries, from the late 1940's to the Six Day War of 1967, the Israeli defence R&D and industrial base was expanded. This was done largely through the creation of government firms and laboratories, each responsible for a different range of defence technologies. During this period, however, the nation remained heavily reliant on foreign suppliers for weapons platforms – tanks, ships and airplanes – whose development and production required sophisticated technical know-how and enormous resources that Israel did not possess. Czechoslovakia, the first major arms supplier to Israel in 1948, severed its economic ties with the Jewish state, which was deemed to be aligning itself too tightly with the West. It was supplanted in the 1950s by France, who became the leading exporter of arms to Israel and was responsible for the country's first modern aircraft and nuclear facilities. When France declared an embargo on Israel in the summer of 1967, the Is-

raeli government decided that losing a critical source of weapons twice within two decades was quite enough, and initiated a defence R&D programme aimed at becoming as self-sufficient as possible in military capabilities. While a policy of self-sufficiency in military equipment was economically questionable for a country so young and so poor, it was perceived to be a sound political-military strategy that was in line with the need to maintain a technological advantage over potential enemies. An increase in defence R&D spending was begun, much of it targeted at the development, re-engineering, upgrading and producing of weapons platforms and systems. Large-scale technology programmes, such as the Lavi (Hebrew for lion) fighter aircraft and the Merkava (Chariot) tank, were undertaken in the hopes of fulfilling the country's key military requirements (Ben-Ari 2006).

The Lavi jet fighter aircraft is an example of bureaucratic politics at work in the Israeli defence R&D environment. Originally intended to be a small, cheap aircraft for ground-support missions, it swiftly ballooned into a large and very expensive multi-role aircraft. Senior officials in the Ministry of Defence, led by defence minister Moshe Arens, supported the Lavi to boost the country's defence industrial base, as did the right-wing Likud party of the Israeli parliament, who also viewed it as an important manifestation of Israel's power and technological achievement and as a way of ensuring Israel's continued autarky in weapons production. The programme was led by Israeli Aircraft Industries, a government-owned company and one of the nation's largest employers. In addition, many other Israeli defence firms were involved in its development, thus giving it the support of a significant share of the country's industrial base. The Israeli Defence Forces, however, and especially the Israeli Air Force, preferred the American F-16 aircraft, which they considered no less capable and much cheaper to procure. So too did senior members of the Labour party, including Itzhak Rabin (later to succeed Arens as defence minister) who focused on the financial burden the project would place on the national budget (Perras 1989, 190). Two additional important actors in the fight for the Lavi were the U.S. government and the American defence industrial base. Worried that the Israeli government was developing an alternative to the F-16 that would not only be bought by the Israeli Air Force but also compete with the American aerospace industry on the global market, Washington proceeded to apply pressure on Israel to cancel the Lavi programme (Sadeh 2001, 70–1). This included refusing Israel any financial assistance for work related to the programme, as well as a restructuring of the annual military grant funds to Israel to enable the purchasing of Israeli-made systems with up to 25 per cent of those funds.[2] Despite strong opposition, the Lavi programme was cancelled in 1987 after a close 12-to-11 vote by the Israeli cabinet (Zackheim 1996, 252).

A bureaucratic politics analysis of the debate whether or not to continue the Lavi project highlights how, like in the U.S., the Israeli defence bureaucracy does not speak with a single voice. As in the U.S., the end-users of the system being developed were able to out-manoeuvre their policy-setting colleagues in the defence bureaucracy by rallying the support of key political and industrial actors, both local and foreign. In fact, the cancellation of the Lavi programme marked a watershed in the primacy of the local defence industry; its traditional role as the chief developer and supplier of weapons to the Israeli Defence Forces was questioned. Eventually, the replacing of defence minister Moshe Arens, who was an ardent supporter of Israeli self-reliance in defence capabilities, with the more collaboratively oriented and pro-American Itzhak Rabin shifted the balance away from large-scale, expensive R&D programmes.

In the case of the Lavi, political decisions and policy outcomes were also the result of a compromise between the positions of the various actors, albeit hotly contested one. While the bureaucracies of the defence firms and of the government ministry that controlled many of them were not able to leverage sufficient socially appreciated expertise, support from their constituency group, and good leadership to implement the policy they were advocating, they were able to reach an acceptable agreement. Though

few saw it at the time, Israeli security and the Israeli industrial based benefited greatly from the cancellation of the project. Components manufactured by Israeli firms were installed on F-16 aircraft sold to Israel, and the U.S. paid Israel $100 million in offshore funding and an undisclosed amount in termination liabilities. More importantly, the U.S. agreed to fund the majority of a collaborative R&D project on an anti-ballistic missile system[3], and signed a memorandum of understanding with Israel that applied many elements of the civilian U.S.-Israeli free trade agreement to commerce in defence equipment (ibid., 254).

As a result of the decision made on the Lavi project, the role of the Israeli industry in supplying the IDF was scaled down and its power as an actor on the political scene diminished. Today, the government continues to rely on locally-developed systems to guarantee the IDF's qualitative edge, but instead of contracting with them to build large weapons platforms, attention was shifted to smaller, R&D-intensive programmes that would guarantee superiority in the battlefield through technologies that were not available from other sources. These smaller programmes include unmanned aerial vehicles, electro-optic and infrared sensors, radars, communications, and command and control systems. The industries initially resented this approach, claiming they required a steady stream of orders from the Ministry of Defence for all types of military products in order to maintain a skilled workforce and a healthy industrial infrastructure, but eventually adapted to the shift in government policy (Lifshitz 2003).

4. Lessons for the European Union

Unlike the U.S. and Israel, most European governments have not viewed defence R&D as a strategic element in their defence policies. After World War II, European military strategies became heavily focused on territorial defence against a possible attack by the Soviet Union and its allies. Since the U.S. was an assured partner in the event of an invasion, it could also be relied upon to provide not just manpower, but also equipment in defence of its European allies. When the Cold War ended, defence investments were reduced, including those for innovations in military technologies. As a result, defence R&D investments in Europe today are only one-fifth of those in the U.S. (Adams et al. 2004, 122).

Recent developments in the international security environment are beginning to change this trend. As the defence strategies of many European nations are shifting from territorial defence to expeditionary security and humanitarian relief operations, certain capability shortfalls are becoming apparent. These include the inability of European forces to interoperate with the U.S. in the first Gulf War, communications and interoperability problems among partners in the Bosnia peacekeeping forces, difficulties encountered coordinating the NATO air campaign over Kosovo, problems in force coordination in Afghanistan, disagreements and interoperability issues over the invasion of Iraq, and challenges of assisting in tsunami relief operations in Southeast Asia. These events have given rise to a sense in many European governments that they need a common, operational capability that can be deployed swiftly and that can operate without the support of the U.S. (Flournoy et al. 2005, 17).

While there continue to be many disagreements on this matter, a number of steps have been taken since 2003 toward making it a reality. In the summer of 2004, the EU announced the Headline Goal 2010, which builds on the Helsinki Headline Goal of 1999 and expands and deepens EU commitments to strengthening its military and civilian capabilities with a strong emphasis on overseas coalition operations. At the same time, the European Council established the European Defence Agency, a European-level agency responsible for armaments policy and oversight of the Member States' military capabilities. It also proclaimed the creation of thirteen EU Battlegroups, each made up of 1,500 troops, which can be deployed within five days and operate for thirty days in a range of scenarios. Several independent European operations were also undertaken: a policing operation in Bosnia, a military peacekeeping mission

in Macedonia, and a short peacekeeping operation in the Democratic Republic of the Congo. Therefore, despite the inability in the summer of 2005 to ratify the European Constitution, it seems clear that the EU is looking for capabilities that will enable it to participate more effectively in overseas operations, whether these are high-intensity wars or peacekeeping, conflict prevention or humanitarian relief operations.

In order to undertake such operations effectively, however, the EU is aware that it still lacks certain critical technologies, such as unmanned aerial vehicles that can reconnoitre an area of operations for extended periods of time, communications systems that can interlink radio systems from different countries into a single mobile network, and navigation, timing and positioning satellites for radio-navigation, tracking and surveillance. Though some international collaboration to develop these technologies will take place, particularly with the U.S., the majority of the work on obtaining these capabilities will be done solely amongst the EU's Member States. To date, collaborative defence R&D has been undertaken within the framework of multinational entities such as the Western European Armaments Group (WEAG), the Western European Armaments Organisation (WEAO), and the Joint Organisation for Cooperation on Armaments, known by its French acronym OCCAR (*Organization Conjoint pour la Cooperation en Matiere d'Armament*). Some security-related R&D has also been undertaken under the auspices of the European Commission's Framework Programme (James 2004, 98–106).

The key player in guiding and coordinating future European defence R&D, however, will be the European Defence Agency. Since its creation in July 2004, it has begun to integrate the R&D activities of WEAG and WEAO, and there is talk of it incorporating OCCAR (Tigner 2004, 4). In July of 2005, the Agency's Research and Technology (R&T) Directorate announced that it had identified the research areas for its first round of R&D projects, both of involve developing long-endurance unmanned aerial vehicles. The research focus will be on vehicle survivability in operations and on digital data links between the vehicles and their control stations, technology fields that are not addressed by currently ongoing European R&D programmes. The Agency will fund the projects out of its own budget, which is made up of contributions from each Member State (except Denmark, which has chosen not to be involved in any defence related EU activity). In addition, the R&T Directorate identified more than ten other critical technology areas, and these may be addressed separately by ad-hoc cooperation projects by Member States, by future studies funded by the Agency, or by initiatives within the private sector. In December 2005, Javier Solana, EU High Representative for Security and Defence Policy, announced the need for boosting and coordinating defence R&D spending amongst all 25 Member States, and recommended to EU leaders that the EDA lead this effort (European Defence Agency 2005, 1).

As the European Defence Agency initiates its first R&D projects and takes on those of its predecessors, it would do well to learn the lessons that bureaucratic politics – as seen in the case studies of the U.S. and Israel – can teach.

One key lesson is that the defence bureaucracy, which includes defence planners and military leaders, does not always speak with one voice. Political decisionmakers may be required to resolve disputes between defence policy formulators and the operational elements tasked with policy implementation. Despite the fact that it is the latter that will ultimately operate the end product in exercises and missions, they may not share the strategic visions of their civilian counterparts. In both the Osprey and the Lavi examples, the primary customer – the U.S. Marine Corps in the former and the Israeli Air Force in the latter – was able to make its voice heard despite pressures from the civilian part of the bureaucracy by rallying its clientele and convincing decisionmakers at the highest levels, but this need not always be the case. The bureaucratic politics paradigm teaches us that a defence organisations interests are guided by its own bureaucratic culture, and not necessarily by the requirement to successfully enforce political decisions through military operations. Therefore, it is not enough for political leaders to for-

mulate defence policies and expect programmes to emerge that will develop equipment to meet the capability requirements of those policies. Politicians must understand that constant negotiations and compromises with the various elements of the defence bureaucracy are crucial if R&D programmes are to remain in line with their broader defence policies.

Another key lesson is that the industrial base supporting defence will be changed by decisions affecting large defence R&D programmes, and that these decisions will therefore involve industry interest groups. American aerospace companies and the sub-contractors they work with would have suffered a significant blow had the Osprey programme been terminated, and much of the research undertaken for the programme would have been cancelled. This would have been contrary to the U.S. defence policy described earlier in this paper, which views the nation's ability to produce innovative military technologies as a strategic asset. In Israel, the decision to cancel the Lavi had far-reaching consequences for the domestic industrial base's ability to design and develop manned fighter aircraft, and it is unlikely that the capacity to do so remains today. However, this too was in line with the new national defence strategy that viewed the U.S. as a reliable partner from whom certain military technologies could be procured. In parallel, Israel managed to shift much of the codified as well as the tacit knowledge base from the Lavi programme into adjacent technology areas, including avionics, missiles and unmanned aerial vehicles, and today has secured its position as a world leader in these fields.

Therefore, despite strong opposition by interest groups as part of the bureaucratic politics process, some of Europe's defence industrial capacities must be allowed to diminish. As security requirements change, so too should the defence strategies and, subsequently, the industrial bases supporting these requirements. The security requirements of the EU are still in the process of being formulated, and the EDA ought to continuously compare them to the capacities of the European industrial base and evaluate the ability to provide them. For example, if the European security strategy no longer foresees the need to defend the continent from a massive offensive by ground forces from its Eastern neighbours, the utility of preserving the industrial capacity to manufacture large numbers of battle tanks and armoured personnel carriers must be questioned. At the same time, since the EU wishes to become more active in crisis management and conflict resolution operations far from its borders, new capabilities for intelligence gathering, long-range transportation and logistics must be developed. Pressure from European defence companies in the form of alliances with certain parts of the defence bureaucracy must be anticipated and addressed.

A third key lesson for the EU is that the science and technology elements in a defence R&D programme are usually not objectively supported. Instead, these programmes operate in what has been termed a "procurement culture"[4], where success is measured by the development, acquisition and fielding of platforms and systems. Defence ministries, militaries, political leaders, legislators and defence companies debate which platforms and systems should be given priority in the current budget, and not about the proper balance between immediate and future needs. Legislators accept this process, since they can use it to control the inflow of money and the rise of employment for its constituents (Morin 1993, 56–7.). In both the Osprey and the Lavi programmes, the scientists and engineers working for the government or military had little say in the decisionmaking process, although they were probably those with the most knowledge about how long the programmes would take and what scientific and technological breakthroughs they would demand. In order to assess the scientific and technical elements of a defence R&D programme, in effect remaining a "smart customer", the government itself must maintain skilled technical personnel. It cannot rely exclusively on the private sector for this, since it is the private sector that will also be supplying the product. The EDA must therefore build a cadre of scientists and engineers, which it could directly employ or approach as consultants, to provide it with objective, expert advice on planned and ongoing R&D efforts. By removing the scientific and

technological expertise from the bureaucratic politics game, a neutral assessment of defence R&D activities can be made available to all actors.

5. Summary

An analysis of defence R&D using the bureaucratic politics paradigm can provide crucial insights into the decision- and policy-making processes affecting innovation. Since government use their militaries as a means to achieving political ends, then government decisions to invest in defence capabilities are reflections of political agendas that incorporate the possibility of using force in support of national strategies. However, a closer look at the bureaucratic politics paradigm and at examples from the U.S. and Israel tells us that there is more to investments in defence R&D than political decisions taken by heads of state. Decisions made by political leaders will steer and guide the actions of bureaucracies, but are not automatically translated into accomplishments. In the case of defence bureaucracies, there is not one but two group of actors in this game: the civilian defence strategy and policymakers, and the uniformed implementers of those policies. For policy to be implemented in the manner desired by political leaders, continuous negotiations and re-negotiations with the defence bureaucrats and the industry and political leaders they turn to for support are needed. All these actors will attempt to affect the final policy that is formulated so that it maximizes the benefits to the constituencies they represent.

Thus, defence R&D policy takes place in a bargaining arena rather than in a hierarchical command structure, through a process that is fragmented and erratic. Decisionmakers must coordinate the various components and integrate them effectively. They must also possess an understanding of the fiscal, organisational, political and cognitive constraints that each of the actors faces.

An awareness of the bureaucratic politics paradigm can shed new light on decisions made on the U.S. Osprey and the Israeli Lavi R&D programmes. It can also serve as a wake-up call to European defence R&D planners, especially those of the European Defence Agency, and provide them with a preview of what to expect as they initiate the first EU-run programmes. The actors in the European defence sector know that in order to affect the defence R&D decision-making process, they must influence the institutions formulating this process. European political and defence policy leaders must recognize how this influence is brought to bear, and how they can steer it in the direction that their constituents have mandated them to follow.

ANMERKUNGEN

1 For the origin of "Mile's Law" see Neustadt/May (1986, 157).
2 Until then, all funds provided by the United States had to be used to purchase defence equipment manufactured solely in America.
3 Work on this system continues to this day within the framework of the Arrow program.
4 The term was first used by James Fallows (1981, 62–9).

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