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The Significance of Defense Research for National Security

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National security is fundamentally about our Swedish interests; what threatens them and society's ability to meet those threats. Defence and security research plays a vital role in building the capability and readiness needed to ensure our national security, since accessible knowledge defines the limits of both military operational capability and society's general preparedness. Nonetheless, national funding of defence research has decreased by more than 50 per cent in the past ten years. The deterioration in the regional security situation has made the long-term consequences of reductions in defence research more apparent and pressing. The 2016 government inquiry into defence research proposed an increase in research funding. If the results of increased research funding are to have any effect in the near future – that is, within the next defence bill period, 2021–2026 – on the capacity to deal with threats to national security, funding needs to be increased immediately.

National security

The Swedish government's National Security Strategy states that the external threats to society are complex and that predicting exactly which threats will arise is almost impossible. Therefore, to strengthen society, continued knowledge-building, research and technology development must be assured in the long term. In other words, research is central to national security.

One way to perceive national security is as the absence of threats against our values, and the ability to ensure that, as a state, we ourselves dictate how society develops. In addition, national security is the absence of fear that our values and way of life will be attacked. National security issues must therefore include strategies for reducing such threats and for being able to return to a condition of normalcy once a threatening development – such as a natural disaster, terrorist attack, military action or some form of economic or diplomatic pressure – has taken place.

The concept of national security can be confusing because it cannot be easily categorised within one single or clearly defined policy area. An issue of national security often originates as an issue of defence, infrastructure or foreign policy and then gains in significance as an issue of national security after it has intersected with other policy spheres. A recent example is how the outsourcing of day-to-day IT operations at Swedish government agencies became an issue of national security. The case illustrated the intersectionality of national security and its relevance at the forefront and as a basis of policy development. Research that supports national security is therefore found in a range of fields. Defence and security research have a prominent role but are by no means alone.

Challenges tied to national security and the role of research

Ultimately, national security is about our values and interests, the threats against them, and society's capacity to meet those threats. This entails specific challenges, where research is an essential part of the solution:

- Society's ability to create national security is defined relative to the perceived threat. If the threats increase while society's capacity is static, capability declines. In other words, it is not enough to maintain capability merely by relying on earlier achievements;
- Society's ability to address threats suffers from a delay. Decisions about developing the appropriate capability must often be made far in advance. Seeking better readiness and increased capability when the need has already become apparent is futile;
- Decisions about future capability requirements are thus by default made in conditions of uncertainty with respect to actual needs. Planning and capacity development in defence and security occur in the face of an unknown and unpredictable future. Structures for working with uncertainty are therefore of crucial importance;

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- Society's ability to create national security involves much more than the capabilities of the armed forces. National security is a context in which several different policy areas interact and cannot be managed by the defence authorities alone.

Defence research has a decisive role in satisfying the knowledge needs that arise from the challenges associated with national security. It does this from three different perspectives. The most obvious perspective is to create more and deeper knowledge in areas of known defence capability needs in order to maintain or increase a *capability* over time. This involves advanced, high quality research that moves cutting edge research forward and creates leading experts in diverse disciplines. The results of this research are of vital importance for increasing defence capabilities within the respective areas.

Research, however, is also a tool for creating freedom of action in the face of today's unknown challenges and dealing with uncertainty. Such research is an important complement to research directed at known capability needs, to prepare for unknown threats. This research is not based on clearly defined defence needs, since uncertainty makes it impossible to identify those needs completely accurately. Instead, the research seeks to develop sufficiently good *knowledge* assets in selected areas so that when a capability gap can be identified, that knowledge can be converted into developing capability. Both these research perspectives are important for capability development, and it is important that they can coexist.

Research is also undertaken from a third perspective, where the aim is to create a *deterrent* or *threshold* effect rather than to create knowledge, research findings or problem-solving capability per se. The research, from this perspective, creates a credible picture of a state's potential operational capability. Advanced research of high scientific quality makes it credible that a specific capability might be developed, or that maybe it already exists.

The role of defence research in developing protections against military threats is obvious, but its significance for other dimensions of national security becomes increasingly clear in the boundaries between the civil and the military. This is clear in information and cyber security, for example, where civil society is becoming more and more connected and dependent on the Internet for its everyday functions, while the Internet is also developing as a military arena. Several articles in *Strategic Outlook 7* discuss this and related questions.

The particulars of defence research

Defence research has a long tradition. In the 20th century, defence scientists were recruited from academic fields such as chemistry, physics and mathematics. Today, defence research is more specialised and normally focuses on areas not covered by other research providers: war studies, operational analysis, intelligence analysis and research on weapons and electronic warfare, to name a few. This means that defence research acquires a particular importance for national security, since it develops insight in areas where society has no other sources of knowledge.

In the same way that civilian research keeps changing pace with new findings, the defence research area undergoes continuous development. Examples of new fields in defence research include cybersecurity and influence operations as well as the development of unmanned (driverless) aerial vehicles for the military arena. Defence research is "integrity-critical", since it aims to develop operational capability and is often classified. This secrecy stems not only from the requirements of capability development, but also because the research deals with knowledge that is not suitable for general dissemination, for example for security reasons.

Civil knowledge development is making great advances in some areas that are also critical to defence research. At the same time, however, there are specific defence needs that cannot be met by civilian research institutions. This is partly for integrity and security reasons, but also due to the need for *domain knowledge.* Domain knowledge – knowledge about the environment and activities that will eventually utilize the research results – is in many cases crucial if the research is to generate impact. Specialised research fields, integrity and domain knowledge are reasons why significant aspects of defence research need to be conducted in specialized research environments.

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Research: knowledge-based readiness

Research creates an impact when the results – the new knowledge or tools created – are translated into activity. The results do not create a singular, isolated impact but lead to multiple impacts in various places at different times. The impacts of some research are immediately apparent, while in other cases it can take years, or even decades, for the real value to become apparent. There can be no simple predictions about impact or outcomes, and no single measure of impact. Research creates a bank of knowledge – a knowledge readiness – that can be used to resolve various problems at various times. Defence research should thus be considered a readiness, or insurance, to be able to resolve future problems. This implies that a reduced commitment to research entails an increase in future risk.

The use of research results is frequently confused with the research itself; a researcher solving a problem is considered to be conducting research, when he or she is instead applying his or her expertise. The two activities are related but not the same, and one – research – is not the same as the other – problem-solving. Problems can be solved by means of the knowledge readiness that has been accumulated over a long period. Without knowledge readiness, however, current problems would be left unsolved.

If research and problem-solving are confused, this makes it easy to conclude that expertise here and now should have a higher priority than long-term research. This would jeopardise knowledge readiness, and increase future risk-taking as a result. The long-term nature of research also means that it takes a long time for the negative effects of reductions in research on the knowledge base to become apparent.

The erosion of future readiness

Research cycles often have different timelines to policy cycles. Decisions on defence research taken in the context of one defence bill will not achieve their full impact until a later defence bill period. In recent decades, Swedish defence research has experienced major cutbacks, due to assessments of the then current security climate. Many of the effects of these decisions are only becoming obvious now, in a different security context, while others have yet to reach their full impact.

The 2000 defence bill represented a transition from a larger defence system aimed at opposing invasion, to a downsized structure adapted primarily to international operations. The government assessed that the basically positive security situation in Sweden's neighbourhood would prevail, even if some uncertainty remained regarding Russia's political development. The fundamental improvements in the security situation implied that defence expenditure could be reduced without diminishing defence capability. This direction was reinforced in the next defence bill, when it was decided to reduce military defence expenditure even further, including cutbacks on research. Decisions were taken to implement substantial cost cutting in defence research and technical development.

The 2009 defence bill, which was passed after the war in Georgia, identified increased pressures on operational capability and that resources would need to be freed up for this purpose. This meant even further reductions in the funding of research and development. The budgets for 2012 and 2013 also proposed cutbacks on research and development funding.

In total, these reductions have meant that research and development on defence has been cut by more than 50 per cent since 2005, and that long-term research, which is the foundation for the development of future operational capability, has been drastically cut in favour of operational capability here and now. That it has been possible, despite these substantial reductions, to provide any knowledge in support of the development of operational capability is due to the long-term character of research. The knowledge that is the basis for today's capability development contains significant elements of research undertaken in earlier defence bill periods.

The current situation

The world has seen enormous changes since 2000. Threats have developed and today there are advanced military capabilities, as well as the capacity for cyber and influence operations, in our neighbourhood. Current Swedish defence policy designates, as a highest priority, increasing the operational capability of combat units and increasing the aggregate capability of total defence. To ensure the ability of the armed forces to defend Sweden against attack, financial allocations to defence have increased. Before August 2017, however, none of these increases applied to research allocations.

Nonetheless, increasing the operational capability

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of Sweden's national defence and Sweden's ability to address other threats to national security implies a need to increase research commitments. The 2016 Swedish Defence Research Inquiry concluded that, in the light of developments in the global situation, an increase in resources for Swedish defence research was needed. The Inquiry recommended that allocations to defence research of at least SEK 400 million (around €40 million) should be added to the 2021–2026 defence bill in order to strengthen the capabilities of the armed forces and the aggregate capacity of total defence. The Inquiry also noted that if global developments deteriorated still further, the funding allocations might need to be shifted to an earlier date.

How to reduce Sweden's risk-taking

Global developments have hardly improved of late. If defence research is to have a full impact on capability development during the period covered by the next defence bill, the increase in financial allocations needs to be implemented as soon as possible. A new political agreement to increase defence research allocations from 2018 was reached in August 2017. This agreement cancels the most recently announced cutbacks in defence research and opens-up for recovering also earlier cutbacks.

Increased commitments to defence research entail the creation of sustainable research environments that are allowed the time they need to develop new knowledge in areas specific to defence. Increased knowledge production and research results do not happen overnight, just as increasing the number of teachers, doctors or lawyers cannot be achieved without first increasing the number of students admitted to universities.

Research is all about developing new knowledge or breaking new ground in a certain field. Unfortunately, there are no shortcuts. Well-designed collaborations can contribute to a faster process of knowledge development and provide valuable access to a greater pool of knowledge, but creating viable research environments takes time. Once results have been produced, they must be translated into military capability development, which – like research – is a sophisticated endeavour that cannot be rushed.

Therefore, an increase in defence research must proceed sustainably, with the point of departure being to allow research development the space it needs for the effects of the commitment to become fully apparent. A year or two without any visible impact does not mean that effects will never emerge, but is instead a consequence of the inherent nature of research. To halt the depletion of knowledge – and the long-term security risk-taking that is the effect of reducing knowledge readiness – the increases in defence research and development allocations that have been announced must be carried on for the long-term and from a sustainable perspective.

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