POLICY BRIEF

Acquiring and Absorbing New Military Capabilities:

Defence Technology Acquisition for Defence-Aspiring Asia Pacific Nations Through Technology Policy and Bilateral Partnering

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Executive Summary

Acquiring and absorbing new military capabilities – Defence technology acquisition for defence-aspiring Asia-Pacific nations through technology policy and bilateral partnering

This policy brief suggests an approach for creating a new military capability in a nation through import of defence technology and the bilateral partnering that comes with it.

The paper addresses the following questions:

- What are the sources of input to national defence innovation systems?
- How can a nation analyse how to create a new military capability through defence materiel import?
- How can a *technology policy* and *bilateral partnering* help to improve the process of developing new military capabilities in a nation?

Few, if any, nations have independent, indigenous defence technology development. Nations obtain emerging technologies and create military capabilities through defence import. The selling company and nation will have a long-term offset obligation, implemented through extensive collaboration with the buying nation's defence companies, defence-related authorities and military. A technology transfer and creation of a military capability are overarching goals. Buying nations should have a realistic technology policy for the implementation of the acquired technology.

Sweden is one of the world's leading defence exporters. The paper describes changes and trends in Sweden's defence acquisition and defence industry and the implications of these changes are discussed against importing nations' needs and conditions.

In order to have realistic ambitions for establishing a new or clearly augmented military capability, aspiring Asia-Pacific nations must accept a technology follower position, and not formulate unrealistic ambitions that are not matched by domestic qualities and size of their defence innovation system, and of accessible financial resources. These nations should formulate a balanced technology policy in order to define goals, ambitions for new military capabilities. Furthermore, in order to have a long-term stability of this plan, it should create long-term bilateral partnership based on knowledge and technology fit with sophisticated, exporting nation(s) and develop synergies in military; defence R&D; government; industrial; and innovation collaboration based upon the defence materiel import.

Introduction

Sweden has been an oft-cited example of a smaller nation that has produced a wide assortment of cutting edge defence systems – many times producing substantial advances in emerging technologies.

The Swedish defence companies rank among the most R&D-intensive in Sweden's overall very export-oriented industry. Saab, which accounts for close to two thirds of the aggregate defence turnover in Sweden, had an R&D share of 25 per cent (2012). Of this R&D, 30 per cent is internally generated funds. The Swedish defence export has roughly tripled in the last ten years. Sweden is the 12th biggest defence exporter globally in the period between 2003 and 2012, and has the highest defence export per capita in the world.[1] The Swedish defence companies on average have a 60 per cent export share, and around 20 per cent R&D as share of turnover.[2] These facts point out that defence products developed in Sweden receive considerable demand globally – these products are however increasingly developed in international innovation networks. Sweden is just an example of a nation with a developed defence innovation system that Asia Pacific nations could collaborate with.

Asia Pacific nations in general have a much shorter history of domestic defence innovation and relatively a less developed domestic defence innovation infrastructure. They could learn from the Swedish example on how to organise and implement an efficient defence innovation process, and they could also find mutually beneficial (for the military, government, industry and academia) interaction through partnering with defence-exporting nations.

In this paper, I will exemplify with the on-going transformation of the Swedish defence acquisition and relation to the domestic defence industry. Sweden is presently in practice decreasing its autarky ambitions, going in the opposite direction compared to certain Asia Pacific nations like South Korea, China and India. The Swedish example is used in order to suggest how Asia Pacific nations can partner with certain defence technology-wise developed nations such as Sweden.[3]

The purpose of this paper is to suggest a systematic approach for creating a new military capability in a nation through import of defence technology and the bilateral partnering that comes with it.

In doing this, the paper aims to respond to the following questions:

- What are the sources of input to national defence innovation systems?
- How can a nation analyse how to create a new military capability through import of defence materiel?
- How can a *technology policy* and *bilateral partnering* help to improve the process of developing new military capabilities in a nation?

Emerging Technologies

Few, if any, nations have independent, indigenous defence technology development; they are in part, or mostly dependent on inflow of technologies. Nations also must be cost-efficient and have an assured long-term access to technology. If they want to truly access 'emerging technologies', this brings with it considerable economic and technology risks. If they cannot access emerging technologies through indigenous development, they must find other ways. They may acquire existing operative defence materiel.

Companies can also strive to become parts of internationalised networks and collaboration networks. Such networks could be through bi-, tri- or multilateral collaborative projects such as through a joint development of a missile, ship, radar or other weapon systems.

Concept pairs as continuous-discontinuous, sustaining-disruptive, incremental-transformational, minor-radical

[1] Sipri arms transfer database, 2013.
[2] E-mail survey to Swedish defence companies.
[3] In this paper, 'emerging technologies' are treated as military capabilities in the Asia Pacific region that are new to a nation, and possibly to the region.

and evolutionary-revolutionary constitute tools for describing the 'continuum of military innovation'. Most military innovation is continuous and undramatic, and can be handled through established routines.[4] The concept 'emerging technologies' denotes that the technology is immature, new, exploratory and with an uncertain future and application. Thereby the challenges and uncertainties become larger and harder to plan for when developing a new military capability.

The United States is one of the very few nations – perhaps the only one – that can invest broadly in most technologies, and finance competing corporate structures as in the case of the competition between Lockheed Martin and Boeing for Joint Strike fighter. For a technology leader like the United States, the technological risks taken become immense. For an Asia Pacific nation acquiring new technology in order to radically increase its military capability – or to add a new one – the challenges to reach that capability become substantial. It must possess an ability to exploit and operate the possibilities of this new military capability.

National Defence Innovation

Innovation within a nation can be said to exist in a combination of technologies, institutions and organisations; what can be labelled 'systems of innovation'. Through this view, innovation and technological change can be studied as a source of continuous development. Innovations are for the most part, new combinations of existing elements. This process is characterised by complicated feedback mechanisms and interactive relations involving science, technology, learning, production, policy and demand.[5] The 'triple helix' perspective points to the synergistic effect of the relations of university-industry-government, and enhances the importance of the university sector as having a central role in national innovation.[6] An issue relevant for the transfer of technology and the build-up of military capabilities is the issue of 'absorptive capacity', i.e. to what extent a company or an organisation has the capacity to make use and exploit technologies and its operative use.[7] For the analysis of military innovation and how it is intended to develop a nation's military capabilities, a military innovation triad perspective can be used with three components that create the conditions for military innovation: technology, doctrine and organisation.

For the nation aspiring to attain a new military capability, a consideration must be made regarding the technology absorption capacity of indigenous companies, concerned organisations (e.g. in procurement and research) and most of all, the military. If the domestic defence technology infrastructure is not sufficiently sophisticated and adaptive, there might be a tremendous challenge to implement the intended capability addition. Ideally, a synergistic effect should be attained through the triple helix effect of the combined contributions of academia, industry and government. In the previous paragraph, there were different emphases in the analysis of innovation: the systems of innovation model seeing the state as having the leading role and the triple helix model having academia as the central enabler of innovation. The most obvious perspective would be to see defence companies as the nexus of innovation.

Another perspective on the sources of innovation is the increasing importance of non-defence technology development for military innovation – this will be discussed below under the section 'Globalised Production in Networks'.

In the perspective of this paper, 'government' consists of on one side the military and on the other, defence-related government agencies (e.g. defence research, procurement, testing facilities). Since the role distribution and separation between the military and various government agencies highly differ between nations, an analysis of specific nations' defence innovation infrastructure would be needed in order to understand its dynamics.

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[4] Ross, 2010.
[5] Edquist, 1997.
[6] Etzkowitz & Leydesdorff, 2000.
[7] Zahra & George, 2002.

An importing nation can together with the exporting nation interact and collaborate on the development of the new military capability. In each nation there will be a nation-specific composition of: (i) defence industry or industry that can participate in manufacturing or development of defence materiel, (ii) a military organisation, (iii) certain defence-related government agencies, (iv) academic institutions and R&D institutes. Together with these two separate infrastructures, each nation will have a certain military doctrine.

The two nations are connected by the technology and the defence systems that are to become a part of the importing nation's doctrine, form the basis of a new capability and be used by the military. A fundamental factor for such a bilateral export partnership becoming constructive and successful is the perceived fit between the two national infrastructures and the military doctrine that guides them. If the defence companies in the respective nations see a fit between the project goals and their corporate long-term strategic goals, the probability for success is much higher. Reversely, if a collaborative structure is forced upon the companies by government actors (could be the military or defence ministries), the collaboration runs a much higher risk of being cancelled or running into implementation problems.[8]

Technology Policy

A nation or an organisation must define its relationship to the constant flow of technology, to innovation and how its ambitions and resource conditions must harmonise with its actions. The following discussion concerning a technology policy for military technology acquisition is partly based upon studies in 2011 and 2012 for the Swedish MoD regarding a technology policy for C3I in the land arena.[9]

In order to transform and reposition a national defence technology acquisition, one tool is to define a *technology policy* that reflects the position a nation (or a company) wants to achieve and perfect. A *policy* constitutes fundamental principles for action and is therefore a framework for decision making. A technology policy can be described as principles for choices of technology and adhering questions as levels of knowledge, level of investment, frequency of renewal, implementation processes and organisational demands. A technology policy, thus, comprises a portfolio of choices – of decisions – that will enable the fulfilment of goals and also to deal with upcoming threats and opportunities.[10]

Technology refers to the knowledge about techniques. Technology denotes the art of mastering techniques. Technologies relate to each other in different ways.[11] Technology exists and acts in an ever evolving interaction with military doctrine. Doctrine may push development of further technology perfection that enables certain capabilities, but technology may also offer new doctrinal possibilities.[12]

The starting point for a technology policy should be an overarching direction and relationship for what position that is desired vis-à-vis the relevant parts of the environment – given the limitations of the accessible resources (financial, organisational and competence-wise). It is thus not meaningful to formulate a policy that is not realistic. For a national government, or its Armed Forces, the technology policy strives to take a comprehensive take in order to reach positive effects that otherwise might be overlooked. It is also fundamental to strive for a cost-effective technology acquisition. In the formulation of a technology policy, the following six areas are central in the policy:[13]

[8] Axelson & Lundmark, 2010.
[9] Axelson & Lundmark, 2011; Axelson, Karlsson, Khan, & Lundmark, 2012.
[10] Maidique & Patch, 1988.
[11] Axelson, Karlsson, Khan, & Lundmark.
[12] Barnaby & ter Borg, 1986.
[13] Maidique & Patch.

1. *Technology areas, specialisations and their integration into the systems where they should bring effects;* In order to define the level of ambition a suitable taxonomy is to use five 'performance objectives': *quality*, *delivery assurance*, *speed*, *flexibility* and *cost*. These five must form a balance, and be in sync with what the military needs and what funds that are at hand.[14]
2. *Proximity to the development front*; e.g. ambition level for the technology developments. How to combine and organise efforts at different technology development levels.
3. *Sources of technological capability*; to what extent do you possess the sufficient and relevant technology competence? Sources could be e.g. domestically, abroad, academia, collaborative partners, and network partners.
4. *Level of investment in R&D*; e.g. which technology areas, investment in organisation and competence, facilitating resources; degrees of flexibility and risk-taking.
5. *Timing for investment*: When should you invest in a technology; e.g. be technology leader, early adopter, follower, late follower?
6. *Organisation*: What should the domestic institutional structures be, and what should concerned organisation's roles be? How do you structure processes in and between institutions? What are the incentive structures? How should certain decisions and choices be made? How will intellectual property be handled, shared and protected?

These six areas are not independent. If the conditions are altered in any of them they will affect the other areas. How they relate varies depending on ambition, resources and the demands given by the environment. The six areas must form a balanced wholeness, and decisions in one area (in the above order) set conditions for the next. The military procurement, capability creation and sustainment must over time have a balance vis-à-vis its conditions, and the technology policy offers a tool for creating such a balance.

Some of the most frequent problems are cost over-runs, delayed delivery and failure of the delivered product in meeting the quality specifications. A technology policy limits the risks associated with such problems.

Swedish Transformations

In order to set the use of a technology policy in perspective, Sweden's changes in defence matters the last decades will be discussed. Three aspects will be focused upon:

- The repositioning of the Swedish defence posture
- The present transformation of the Swedish defence acquisition
- The development of the Swedish defence companies' export

Repositioning of Sweden's defence posture in the last decades

Sweden has as many other nations had several upheavals and transformations in its military structure, size, doctrine and not the least its relationship to other nations and actors in other nations. Sweden had during the Cold War a high level of self-reliance in defence materiel and an unusually large and sophisticated defence industry compared to the size of the nation. The threat assessment was stable with the Soviet Union just over the Baltic, and Sweden had, despite its non-membership of NATO, favourable defence technology relations with the United States. Sweden had ambitious standards for its domestic defence technology development, and has been repeatedly studied as an interesting example of a smaller nation with a surprisingly advanced defence industry.

In lacking a clear threat after the Cold War, a search for new threat assessment occupied many minds. Around the turn of the century, Sweden whole-heartedly embraced network-based defence and reached global cutting-edge prominence on network-enabled capabilities (NEC) – at least on PowerPoint slides. These ambitions, however, came to very little compared to the very large funds that for a few years were directed towards NEC.

[14] For further information on this point refer Slack, Chambers, & Johnson, 2010. In 2011 and 2012, the author has participated in an assignment for the Swedish Armed Forces on how to use performance objectives in order to initiate and formulate balanced specifications for acquisition in early phases.

During the first ten years of the new millennium, Sweden dramatically redirected its military focus towards international peacekeeping operations through participation in Afghanistan under NATO coordination, in and around Africa under UN coordination (e.g. Ethiopia, Libya, Somalia, Sudan and Chad), and also in the Eastern Mediterranean. The homeland defence, which had been the focus during the Cold War, became less prioritised for a few years. In recent years, the pendulum has swung back, and presently more focus is being devoted on the capabilities for defending the Swedish territory. The recent ambitious modernisation of the Russian Armed Forces and defence industry[15] has further emphasized the focus on homeland defence, and can be understood as a strong incentive for the decision in August 2012 to upgrade the Gripen fighter to the E/F version[16] and to develop a new, indigenous submarine (A26).

From the mid-90s onwards, Sweden has also increasingly engaged in multilateral arms collaboration. Sweden had very limited experience from this, compared to the dominating European collaborating nations (that gradually and increasingly had developed its collaborative efforts since the 50s).[17] Naturally, this transition did not come easily. During the same period, many Swedish defence companies were also acquired from abroad – Sweden was very liberal compared to other nations in allowing foreign acquisition of defence companies.

The previous long-lasting tradition of sophisticated domestic arms development, followed by détente, multilateral arms collaboration, internationalised defence industry, international operations, and then back to more focus on homeland defence has in Sweden brought with it strong friction between indigenous traditions and constant but changing demands for change. The Swedish defence innovation infrastructure and doctrine has thus experienced considerable shifts of balances.

Present transformation of Sweden's defence acquisition

In recent years, the MoD has chosen not to establish a defence-industrial policy, something that most European states have established. A defence acquisition strategy has however been established (from the Armed Forces in 2007, and the MoD in 2009). This strategy declares that Sweden should as a *first* priority, aim to upgrade existing defence materiel, *secondly* to acquire already operative materiel, *thirdly* to develop in collaboration with other nations, and *fourthly* (and exceptionally) develop indigenously without partners. This constitutes a paradigm shift with previous traditions – a shift that is further supported by present EU reforms towards creating an open and level EU defence marketplace.

The Swedish MoD very clearly stated in a 2009 government bill that in the C3I Land Arena (the Army and resembling units in the Air Force and Navy) the most important focus must be that the defence materiel must be operative, operative *on time* when certain capabilities and units are promised to be operative, and also that technology ambitions should stay at '*good enough*'. In order to fulfil this, the C3I Land Arena must acquire solutions that are already operative in other nations, and *not* develop indigenous solutions. This was formulated by the MoD in a very straightforward manner, and reflected the uncertainties that prevailed in this area. The most striking change that this imposes upon the Armed Forces and the Procurement Agency concerns the issue of timing for investment, that the position must change from a self-picture of being a technology leader (without the funds to go with it, however) into becoming a *late follower* of the technology development.

Dominant technologies should be sought. This shift of position primarily means that Sweden should acquire, e.g., radio, communication and phone solutions that are already in use in similar nations. A clear problem here is that

[15] Oxenstierna & Westerlund, 2013
[16] The decision was to upgrade 40-60 Gripen C/D to E/F together with Switzerland, which may acquire 22 Gripens. The present decision (January 2013) is that the upgrade version will only be the E version, and not the F two-seater version.
[17] Axelson & Lundmark, 2010; Lundmark, 2011.

there are several immature technologies (e.g. broadband width and digital radio (JTRS)) and there are in several areas no clear, dominating technologies or companies. But with no funds for domestic new development, this must be sought. What we discovered in our study was that there was a number of acquisition programs that still were not delivered that had been initiated during periods with very different conditions. With a distinct shift towards expeditionary forces and operative products and capabilities *on time*, this constitutes a big challenge.

Sweden presently strives to find economies of scale and scope through adopting existing standards and try to create shared, multilateral acquisitions or the latest fad: pooling and sharing. In parallel, Sweden and the selling companies try to find win-win technology synergies with export customers.

Every nation must have a technology and product inflow of defence technology. Not even the United States is self-reliant in defence technology. The United States is also dependent upon access to certain critical components (e.g. components which performance is optimised towards what can be achieved through the use of rare earth elements) that are not produced in the U.S., and that are typically produced in China.

Sweden's foremost priority as defined by the MoD in 2009 (and repeatedly iterated since) is thus that the priority of Swedish defence procurement is to predominantly procure mature and proven technologies and defence materiel. An importing nation by definition imports an already developed defence technology. The technology and the defence system must in all import cases be modified in order to fit with the importing nation's specific demands, doctrine and existing defence infrastructure. In this modification process, the separate domestic defence innovation infrastructures must interact.

Development of the Swedish defence export

As stated previously, the defence companies for a long time predominantly produced and sold to the Swedish Armed Forces. In the last fifteen years, three important changes have been put upon the defence industry in Sweden:

1. Several defence companies have been acquired from abroad (Hägglunds, Kockums, and Bofors) in the period 1996-2005.
2. Sweden to a much lesser extent indigenously develops its defence materiel, and also increasingly acquires defence materiel off-the-shelf
3. Defence R&D has decreased with more than 50 per cent in the last 7 years (due to shifts of funds to international operations).

These three strands of development could intuitively point to that the Swedish defence companies should have faced a gradual decrease of competitiveness and attractiveness. However, the overall defence export increased over the period 2002-2011. Sweden has become the number one defence exporter per capita in the world; the export-import ratio was in 2011 7:1; Sweden was the world's tenth largest defence exporter in the period 2002-2011; and the defence export tripled in the period 2002 to 2011.[18] This export-based position may well be questioned and criticised, but what it nevertheless clearly suggests is that the Swedish defence companies' products meet considerable demand in the global marketplace.

Sweden has chosen to largely abandon indigenous development in certain technology areas (esp. radar, battle tanks and missiles) while companies that sell such products are supported with export support. In several other technology areas the ambitions are lowered and/or are supported through multilateral arms collaboration (e.g. Meteor, Iris-T, Neuron). In only two areas, there is still a firm commitment to cutting edge development: submarines and fighters. Regarding submarines, there

[18] Sipri, 2012.

is limited collaboration, and Kockums is to some extent strategically hamstrung through the main European competitor Thyssen Krupp Marine Systems owning Kockums. Added to the submarines, torpedo development is also performed domestically, tailored to Swedish military demand. Regarding fighters (i.e. Saab 39 Gripen), there was a major decision in August 2012 to upgrade 40-60 Gripen version C/D to E/F. This upgrade was made possible through Switzerland buying 22 Gripen; the MoD had in 2011 set a condition that an upgrade to E/F could only occur if "Brazil, or another nation acquires Gripen". It appears, however, that despite the lowered ambitions in defence materiel development, Sweden's national defence innovation system has withheld its aggregate ability for system integration.

For the defence companies in Sweden, export has become much more important. Most of them had very little export until the early 90s. By now the average export share has grown to around 60 per cent, in certain areas close to 100 per cent.[19] In most cases, the defence export is associated with a defence export obligation. Such an offset obligation typically concerns 150-200 per cent of the order value and also, increasingly, complex structures of technology transfer to defence companies in the buying nations. A company that cannot convince prospective customers that its offset and technology transfer design is competitive, in most cases does not stand a chance against its competitors. Defence export typically brings with it long-term bilateral collaborative structures (often ten years) across the entire spectrum of military, government, research and corporate organizations.[20] Thus, in Sweden and in several other nations, defence export compared to domestic technology development has become much more important for the companies. The large increase in export and export share as well as the foreign ownership paired with the increased defence materiel development collaboration has in aggregate made defence companies in Sweden globalised into international networks.

Globalised Production in Networks

A development of a new military capability concerns many years of development and use. Issues of life cycle costs have come more in focus, at the same time as being difficult to calculate in a satisfactory way. As the life of a product or an installation extends, it becomes increasingly elusive to predict how it will be used or how the product itself will behave. Innovation in general, and also in defence, is becoming increasingly dispersed into cross-border networks. Companies must create creative links with innovative and cooperative partners that can maximise revenues at the same time as controlling risk and uncertainty; in order to manage complex cooperation and innovation 'strategic sourcing' has become more important.[21]

The conditions for production of defence materiel have fundamentally been altered through the general globalisation of production in society. Highly sensitive defence systems like precision-guided munitions, sensors and electronic warfare depend upon the access to components that are produced in China – and it is not economically feasible to for example, produce certain components based upon rare earth metals outside China; it would not be profitable by far. However, China is dependent upon an undisturbed flow of goods to industrialised nations, and most such components are not defence-specific. For European and U.S. defence companies the design and system integration into the final defence system remains with them. China however steadily moves upwards in the complexity hierarchy and strives to be able to produce defence equipment of ever higher sophistication.[22]

The technological building stones of 'RMA, NEC, Transformation' etc. are more elusive than the technologies that underpinned the defence innovation a few decades ago. A well-known fact is that defence innovation no longer leads technology development in general, and that all production has become more globalised. Furthermore, the cycle times and life expectancy of each technology generation is becoming faster and faster.

[19] Information sourced through author's e-mail survey to the Swedish defence companies
[20] Axelson & Lundmark, 2010.
[21] Andersen & Katz, 1998; Howard & Caldwell, 2011.
[22] Khan, Lundmark, & Hellström, 2013.

Defence systems are, however, first planned for several years, procured for some more years, delivered and tested for some period and finally in service (with upgrades) for a decade or two. With an emerging technology, there are inherent uncertainties and hence profound technological and economic risks. There is thus a clear mismatch between the overarching planning and implementation cycles of defence procurement compared to generic technology development. Example, the Swedish Armed Forces had communication capability uncertainties a few years ago and invested strongly in funds and planning into the U.S.-led Joint Tactical Radio System (JTRS), and when this programme was abruptly cancelled in October, 2011, a new start had to be taken. If compared to a technology policy, Sweden suffered the consequences of investing into immature technologies. A problem in state-of-the-art C3I is that there is no dominant technology, and no mature solutions. So what should really be followed?

Defence procurement must become more flexible and have shorter cycles, since non-defence production and innovation defines the pace and will not accommodate to defence incentives. A nation like the U.S. will continue to be the foremost innovator in defence, but lesser nations must accept that they should be late adopters overall, and early followers at best. In narrow niches (e.g. cryptography, electronic warfare, countermeasures and C3I system integration) they might be forced to find nation-specific solutions due to arms legacy and national organization solutions. For a cost efficient defence procurement process, the guiding principles for technology priorities should in most nations be 'good enough', proven technologies and assurances of operative in time. For an Asia Pacific nation aspiring for new military capabilities, the good enough posture, or at least not the technology leader posture, should be taken. By importing and modifying existing defence technology, this becomes the case. The often high-strung rhetoric of the capability to be acquired, must however reach its pragmatic solution on the ground.

Implications and relevance to the Asia Pacific region

So what about the importance of a technology policy, emerging technologies and the military situation in the Asia Pacific region? If we assume that a certain number of states in the Asia Pacific region strive to increase their military and security significance, what are their prospects and conditions?

A number of nations have after WWII, and especially in the past decades strived to become highly self-sufficient in arms procurement through developing an indigenous, highly sophisticated defence industry. Nations like Brazil, India, South Korea, Indonesia, Singapore, South Africa, South Korea and Israel have been highly ambitious in this regard. Israel has been most successful in this group, albeit with a very strong support from the United States. Perspectives on the prospects of actually succeeding in creating strong national defence industries that are able to produce defence systems at internationally cutting edge level vary greatly. Several nations, such as India and Brazil, have so far not by far reached their ambitious goals for indigenous self-sufficiency. There is a large discrepancy between the ambitions and expected socio-economic effects compared to the actual results of most such national aspirations; there are many complex and interrelated issues that affect the outcome.[23]

Defence-industrial globalisation is an uneven process. Most regional defence industrial bases lack the necessary design skills and technological expertise in order to truly innovate; they can import goods or license to assemble, produce lower-end goods – but they lack the complex, interdependent capabilities in research, industry and organisation – the absorptive capacity – to be able to design and produce state-of-the-art defence materiel, and at best these countries act as late innovators when it comes to armaments production.[24]

A decision to develop a new military capability not only rests upon the performance of the product, but also on price, technology transfers, and offset obligation

[23] Boutin, 2009.
[24] Dombrowski & Ross, 2009; Bitzinger, 2012.

setup. One important factor is also the security policy implications the defence acquisition brings with it. An acquisition of a major defence system and the creation of a new, decisive military capability constitute a security policy handshake between the seller and the buyer. The companies are situated in the middle of the implementation of the transaction, but it can never take place without blessing of the two nations. If the buying nation foremost values to belong to the U.S. global sphere of security interests, that will become a decisive factor. A nation might also actively strive to *not* become dependent upon the United States in defence technology. For others, a dependence upon, for example, France or Russia might be seen as out of the question. The choice of defence technology thus does not solely rest upon price and performance; arguably the technology transfer and the offset obligation are more important. Security interests will underlie all factors, and at an early stage out rule certain alternative, contending defence systems.

For Asian nations striving to improve their military capabilities, but do not possess a broad and sophisticated defence-industrial base, they could partner with sophisticated but smaller defence-industrial nations such as Sweden. Sweden's domestic defence industry has performed such partnering with Singapore (submarines and certain other naval technology areas), Thailand (fighters), and in some areas also with South Korea. If there is an indigenous defence industry, the offset obligations tend to nowadays create company-company relations that are strategically attractive for both the seller and the buyer. With the high stakes in defence export, the buyers also have a strong bargaining position towards the seller in order to create attractive technology transfer.[25]

If we compare such aspiring nations to Sweden, Sweden has overall decreased its level of self- sufficiency and also lowered its ambitions for indigenous development. Broadly, one can say that they are transforming in opposite directions, which may create windows for partnering. Finally, to comment upon the questions formulated in connection to the paper's purpose:

What are the sources of input to national defence innovation systems? The sources come from a complex network of: companies, militaries, government agencies, academia and research institutes – domestically but also from abroad. Asia Pacific nations can benefit from the innovation resources of the exporting nations and find synergies between mirroring organisations.

How can a nation analyse how to create a new military capability through defence materiel import? This paper suggests a systematic approach based upon the suggestion that the nation buying defence materiel should partner with the selling nation, and aim to find synergies and nodes of collaboration with the selling nations' innovation system's focal organisation (military, government, academia and defence industry).

How can a technology policy and bilateral partnering help to improve the process of developing new military capabilities in a nation? A technology policy can be seen as one important tool for being able to define ambitions, possibilities and challenges, and strategic fit between the concerned nations in a bilateral partnering in an export-import relationship.

Conclusion and Recommendations

In order to have realistic ambitions for establishing a new or clearly augmented military capability, aspiring Asia Pacific nations must accept a technology follower position, and not formulate unrealistic ambitions that are not matched by domestic qualities and size of its defence innovation system, and of accessible financial resources. These nations should also formulate a balanced technology policy in order to define goals, ambitions and how to get to the goals of the new military capability. Furthermore, in order to have a long-term stability of this plan, it should create long-term bilateral partnership based on knowledge and technology fit with sophisticated, exporting nation(s) and develop synergies in military, defence R&D, government, industrial, and innovation collaboration based upon the defence materiel import.

[25] Axelson & Lundmark, 2010.

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About the Project on Strategic Stability in the 21st Century Asia

Since June 2012, this project by the Institute of Defence and Strategic Studies (IDSS is a constituent unit of RSIS) has been engaged in identifying and analysing the key sources of strategic stability and instability in contemporary Asia. We sought to augment the prevailing understanding of how forces that stabilise Asia can be strengthened, and how forces that destabilise Asia (or have the potential for doing so) can be managed, and their adverse effects mitigated or contained.

The project addresses three key research concerns: First, examine major power relations in Asia. Second, analyse interstate dynamics within the maritime domain. And finally evaluate the impact of new and emerging military technologies in Asia. To that end, we organised three workshops during January-February 2013. We also commissioned a number of policy briefs, research papers, monographs, and edited volumes on critical security issues that have the potential to affect the security order in Asia over this decade.

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