The civil paradox: Swedish arms production and export and the role of emerging security technologies

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Abstract: How is the notion of 'civil security' at work within and for arms companies? What are its technological and socio-political roles? The article analyses the early 2000s transformations of the Swedish arms industry with focus on its largest company Saab, and how civil security technologies have become assembled into ambiguous 'systems' that through a logic of scalability can move between different areas of practice; from refugee detention to policing to border surveillance. It concludes that arms companies increasingly absorb their most sophisticated technologies from civil (rather than military) R&D, and that they can use these for piecing together 'one-stop shop' packages of security- and defence products. The notion of civil security also serves as a socio-political façade of 'innovation' and 'neutrality' with which the industry can masquerade an interest in human rights, attract young professionals, and obscure the negotiations of arms trade delegations abroad.

Keywords: arms industry; civil security; border control; scalability; dual-use; Sweden; nation-branding; innovation; human rights; arms export.

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Our vision: it's a human right to feel safe.

Our mission: to make people safe by pushing mental and technological boundaries.

-Saab (2018c)

1 Introduction

This article argues that so-called 'civil security' technologies have acquired a multifaceted and increasingly significant role within and for arms companies. Although defence industries still benefit predominantly from researching, developing, producing, and selling armaments and weapon systems, many arms firms – not least in Europe – have realised the benefits of moving into emerging security technologies and the development of products for, e.g., counterterrorism and border control. In what follows, I will investigate some of the reasons behind this, and more specifically, how the notion of 'civil security' has a strategic function to play in certain arms production and export contexts, from a technological as well as a socio-political point of view.

What does the notion of 'civil security' refer to? A commonsensical definition is difficult to find, and the technical distinction between civil- and military innovations remains messy, but 'civil security' can nonetheless be said to signify products and systems with which practitioners may identify, monitor, and pre-empt contemporary threats to 'civil', 'societal', or 'homeland' security, such as terrorism or major crime. Some technologies, particularly those developed and implemented in a European context, are also used more specifically for border control and migration management, like products and systems for the surveillance of border zones and coastlines, for running interoperable databases, and for policing at distance. Civil security products are often based on so-called emerging technologies, including recent breakthroughs in areas like sensors, optics, telecommunications, computing, algorithms, unmanned vehicles, robotics, artificial intelligence, virtual- and augmented reality, and more. Some civil security technologies have a 'dual' application, i.e., can be used for both civil and military purposes – and therefore become subject to specific technical- and export regulations.

Arms industries have a had a peculiar and growing interest in civil security technologies in recent years. Certain scholars even argue that the expansion into beyond-military technology has been one of the most fundamental changes to European arms industries in recent decades [Guittet and Jeandesboz, (2010), p.237; Hoijtink, (2014), p.466]. Multinational arms companies such as Thales in France, BAE Systems in the UK, Leonardo in Italy, and Saab in Sweden have all, for their own various reasons, supplemented their core of military products and services with emerging, dual-use, and/or civil security technologies. As will be discussed below, this expansion can be explained by a combination of (at least) two factors. On the one hand, in the early 2000s, security firms as well as arms companies began responding to the EU's increased demand in tools for counterterrorism- and border surveillance tools by entering into the new R&D programmes established precisely for this purpose. On the other hand, many arms producers also saw civil security innovations as an increasingly promising area for advanced R&D and for boosting (not necessarily balancing out) turnover in the face of falling domestic orders due to the end of the Cold War.

However, this article does not argue that it is in revenue or amount of sales that the civil security-trend should be primarily measured. Rather, here I investigate some more underlying explanations as to why and how arms industries have come to associate themselves with this product segment, and to a certain extent rebrand their firms from strictly military producers to, e.g., 'security- and defence firms'. Civil security, I argue, can be approached strategically and wielded by particular arms companies through its

technological function in relation to civil-military innovation on the hand, and its socio-political function in relation to arms trade on the other hand.

More specifically, when it comes to the technological role(s) of civil security, I ask: how did it emerge within certain firms, and what technologies constitute it? In what way does this product segment mobilise technological components that can move transversally between different practical and jurisdictional areas? How does its 'scalability' affect the traditional role of technological regulations, arms classifications, and export controls? When it comes to its socio-political role(s), I ask: what are the links between civil security, arms export, and human rights? In what ways can the notion of 'civil' be wielded in trade negotiations and arms export contexts? How does civil security create the appearance of a transition from strictly military R&D, to seemingly 'softer' and 'less militarised' (and thus less contentious) areas of technological development?

To explore these questions in depth, this article takes as its case the transformations of the Swedish arms industry since the early 2000s, its involvement in EU-funded security R&D, and its understanding and use of civil security. Empirically, it departs first and foremost from a series of interviews[1] with public officials, industry representatives, and high-level employees from its largest company, Saab – arguably, the most influential player in the overall game of Swedish arms production and export. Secondary sources have also been consulted, alongside journalistic accounts of recent military export affairs in Sweden. As will be shown, this study object – namely, the late modern Swedish arms industry and the company Saab in particular – is rooted in a rather specific and peculiar socio-historical context, but when studied empirically and in sufficient detail, it can serve to advance an argument and theoretical critique of the contemporary logic(s) and use(s) of civil-military security technology, as well as disrupt the doxa concerning how this issue has been traditionally understood, particularly in relation to the arms production and export of certain liberal and 'progressive' democracies in the Western world. Moreover, this article seeks to contribute to the current debate on the increasingly blurry intersection of civil-military technologies as well as internal-external security strategies; however, it will do so without reinforcing evolutionist ideas that these different elements are simply conflating or coalescing into a grand and 'total' security model. Emerging security technologies are per definition peripheral and remain largely subordinated to dominant military technologies; thus, it is more fruitful to highlight how civil security technologies are contesting advanced military systems, and how these different practical areas remain in a dual logic, in tension and competition. Finally, this article aims to contribute to current debates on the transformations of EU arms industries, but it will do so without falling into the reductionist trap of studying the 'EU level': previous work in this area, as we will see, has tended to depart from the EU's recent R&D programmes, but without sufficiently studying the position-takings of some of the actors and firms involved therein. Indeed, there are still few empirically driven accounts that think transversally about how the notion of 'civil' is at work within and for specific arms firms, both within and outside the Schengen area.

In the second section of this article, I will begin by offering a brief background regarding the conditions for Swedish arms production and export, and how certain firms like Saab have come to occupy such a strong position in the field. I will then introduce when and how the notion of civil security first emerged in this firm, and more precisely, how this expansion was situated in the larger context of European security research in the early 00s. In the third section, I will position the case of Saab more directly in relation to civil security and analyse precisely how some of their products in this area have emerged,

where they have been developed and diffused, and how they can be understood as scalable systems; as platforms adaptable in terms of scope and application, enabling multiple enactments of violence and control, in the prison as well as at the border. Here, I argue that advanced civil engineering innovations are increasingly absorbed by military producers today, enabling a kind of reversed technological spin-off which cannot be sufficiently interpreted with the traditional dual-use framework, and which has complications from an export regulation point of view. Indeed, in some important respects, civil innovations have come to largely surpass military innovations in terms of their novelty and complexity. In the fourth section, before concluding the article, I will expand the discussion, situate it in an arms trade context, and give examples of how industry- and state representatives have been able to wield the flexible and porous notion of 'civil' socially and politically, as way to attract professionals and avoid controversies, e.g., with regards to trade negotiations, export promotion campaigns, and personnel recruitment. Here, I conclude that the notion of 'civil security' serves as a façade with which arms firms can eschew attention and controversy, and behind which they can continue to promote and sell other and far more profitable military products, especially in fragile regimes in the global south.

2 Swedish arms production and the emergence of civil security

Before developing the main argument of the article, some background will be provided as to why the Swedish arms industry has grown so large in recent years – not least in terms of *export*. In fact, since the mid 00s, Sweden is usually found somewhere in the global top three when arms export is estimated in size per capita (no. 1 in 2011).[2] Ranked by gross income alone, Sweden is still in the global top 15, normally ahead of prosperous countries such as Canada, Switzerland, and South Korea. What is more, the industry enjoys a high level of technological autonomy which could only be reasonably compared with the industries of mega-countries such as USA, China, and Russia. Quite illustratively, its largest firm Saab offers over 600 different products covering the full spectrum of defence and security – from 5th generation fighter jets and submarines to radar systems and drones – employing around 16,400 people in over 100 countries [Jackson, 2014; Åkerström, (2016), p.101; Saab, 2018a].

This significant width of the arms industry of such a comparatively small country stems to a large extent from the Swedish military doctrine of 'non-alignment' prevalent during the second half of the 20th century. Refusing to import munitions from either of the Cold War blocs, the 'neutrality'-stance demanded a more or less self-sufficient domestic industry and policies strongly favouring indigenous R&D in all categories of military supply. Over time, a public-private partnership of defence-related actors emerged which has been referred to (by critics, civil servants, and companies alike) as an 'alliance' including the Swedish Armed Forces (*Försvarsmakten*, the central customer), the Defence Materiel Administration (FMV, the acquisition agency), the Defence Research Institute (FOI, the R&D agency), and the industry (wherein the largest producer, Saab, became uniquely anchored in the domestic procurement system) (interviews: Rylander; De Laval; Küller). Reminiscing Mills' (1956) 'permanent war economy' in the USA, it is safe to say that a kind of public-private 'armed neutrality economy' became established in Sweden during the Cold War [see also Larsson, (2019), p.133].

Of course, to develop military arms on a scale necessary to ensure relative self-sufficiency is incredibly expensive, and would cost more than what could be justified politically. The government's solution to this dilemma, Åkerström (2016, p.15 [author's translation]) notes, became to "permit arms export from Sweden, and thereby allow orders from other countries to fill the gap between the industry's sales requirements and the Swedish Armed Forces' materiel needs." Ironically, then, arming other countries by means of export was posited by the state as a central means for national security; that is, as a necessary evil for maintaining technological competences and a 'credible neutrality' at home. By being equated with 'security interests', arms export thus became politically neutralised and legitimated to the extent that it was virtually an untouchable topic in parliament for decades.

In the mid-90s, however, as domestic military orders dropped significantly – not only in Sweden, but worldwide as a result of post-Cold War reconfigurations of security policy priorities – efforts to ensure industrial capabilities became even more export-dependent. As a result, regulations for assessing arms export permits were streamlined, defence agencies formed branches for 'foreign sales', systematic export promotion campaigns were put in place, and the Swedish industry was eventually opened up for private- and foreign proprietorship in the early 00s. "We were forced to internationalise", as put by Saab's current CTO (interview: De Laval), "not simply peck on 'mama-the-state' like a hungry baby bird, which was the kind of behaviour we had adopted in the old environment." In this struggle, the Saab corporate group, backed by its owner Investor,[3] purchased the majority of the domestic industry and thereby cemented its role as the largest manufacturer and exporter of arms in the entire Nordic region, and indeed, as a leading firm on the fiercely competitive European market (Åkerström, 2016).

In addition to exports, arms companies like Saab were also encouraged by Swedish state spokespersons to 'diversify' into different kinds civilian technologies. Diversification, or 'spin-off', refers to when new product lines emerge out of the core capacities of a defence firm, e.g., either when military innovations trickle down to some civilian application in society, or when they serve as the basis for the development of an entirely different commercial product. This tends to gain support both politically and from top managers in arms firms as they can "exploit their defence-subsidised technical advantages to gain entry into niche markets" while simultaneously being able to maintain its core staff and production capabilities [Feldman, (1999), p.9, pp.20–23]. Diversification may work like a legitimising tool and as a way of demonstrating to governments that arms firms can have a wider 'societal benefit'. To this effect, Saab initiated several diversification projects (with varying success) in civilian and commercial technologies during the 80s, 90s, and 00s, including automobiles, aircrafts, and wind turbines.

Saab's first organised attempt at expanding into not commercial, nor purely civilian, but *civil security* technologies came around 2005. Seeing emerging opportunities in this area, but also realising that they could not simply 'repaint camouflaged products' and 'call them civil' (interview: Jernbäcker) but needed 'clean sheets, new crayons' in order to be truly competitive (interview: Dahlgaard), Saab set up a dedicated sales unit, project leader, development budget, and product catalogue organised specifically around civil security. Their civil security project leader predicted in 2005 that:

> "[T]he future is not only defence but also societal security. Previously, it was about protecting national borders, but now it is about securing flows of people, goods, and information from terrorists, organised crime, and natural disasters." (Braconier, 2005)

This branching-out strategy did not come out of the blue. Rather, Saab's words mirrored, and to an extent anticipated, simultaneous developments taking place at the EU level, and echoed almost word for word the EU's recent security agenda and the 'group of personalities'-report from the same period (EU, 2003; Group of Personalities, 2004). Indeed, around the mid-00s, the European Commission had just started funding research and development (R&D) projects on the theme of 'secure societies', inviting security firms as well as arms companies to develop new products and solutions in the 'European Security Research Programme' (ESRP).

The ESRP was, one the one hand, a more or less direct response to the EU's increased demand in the early 00s for new tools with which to do security, counterterrorism, crisis management, and border control, including ethically sensitive and potentially controversial technologies like unmanned aerial vehicles (UAVs, or 'drones') as well as a range of computer(ised) solutions for conducting border checks and monitoring migrants within and at the frontiers of the Schengen area. The ESRP thus followed the general transformation of the supply and demand of (in)security in Europe, and contributed to the construction of the terrorist and the migrant as the new central threats to post-Cold War societies (Bigo and Jeandesboz, 2010; Leese et al., 2019; Martins and Küsters, 2019; see also Martin-Mazé; McCluskey, this issue).

Politically, this increased demand rested on the principal idea that *technology* is the key, the quick fix, and somehow the solution to all kinds of 'security problems'. The notion of technological determinism lies at the heart of EU security discourse and practice: 'threats' like terrorism are to be defined instrumentally, and 'security' is to be delivered in the form of technical solutions, systems, innovations, and products made and sold by an industry. This kind of technocratic politics inscribes security- and surveillance artefacts with intentions and functions "similar to legislative acts or political foundings that establish a framework for public order that will endure over many generations" [Dafoe, (2015), p.1053; citing Winner, (1980), p.29; see also McCarthy, (2013); Karampekios and Oikonomou, (2018), p.200].

The ESRP was also, on the other hand, part and parcel of a larger attempt by the EU – or more specifically, the European Commission hand-in-hand with certain lobby organisations – to revamp defence- and security industries that were struggling after the Cold War. R&D programmes were to serve as the driving force behind the so-called 'emerging market for civil security' [ECORYS, (2009), p.3] and for what was envisioned to become a "lucrative and globally competitive 'homeland security' industry in Europe" [Hayes, (2006), p.13; see also Hoijtink, 2014) which did not, despite its name and appearance, exclude arms producers. Here, the EU opened up a new market space for security- and defence firms, offering if not substantial profits, then certainly critical resources for R&D in an area not too far from the military core of many of its participating companies (Jones, 2017; Hayes, 2009; see also Baird, 2017).

In fact, the EU's 'emerging civil security market' – far from balanced or for that matter purely 'civilian' – has arguably always leaned towards the specific interests of arms producers. For example, from the group of personalities and onwards, arms company CEOs and lobbyists have been invited by EU officials in various 'high-level

expert groups' for shaping the early stages of the civil security R&D programme (Calvo Rufanges, 2016; Jones, 2017; Vranken, 2017). To some, the programme appeared from the very beginning "as a stepping stone, crossing the line between (civil) security and military research, with applications that can serve both sectors" [Akkerman, (2018), p.351]. By moving into security R&D in the early 2000s, not only did arms firms explore spaces for 'spinning off', 'diversifying', 'spilling over' into related technologies, but some argue that their involvement also was a way to politically 'test the waters' and pave the way for EU's forthcoming (and even larger) *defence* research programme – a full-fledged military R&D initiative which will explicitly break the 'long-held mantra' of 'exclusively civilian' R&D priorities [Karampekios et al., (2018), p.2; James, 2018].

Indeed, as argued by, e.g., Jones and Johnson (2016), civil and military R&D have come to be 'two sides of the same coin'. They find evidence for this in the area of border security, and write that since borders are not simply lines on a map, but in reality constitute vast stretches of land and sea, their management have become an increasingly *militarised* affair in which radars, sensors, cameras, drones, barbed wires, and concrete walls are combined with, e.g., interoperable digital databases for policing at a distance. This creates an environment which practitioners like to perceive as a model "for 'total awareness' and 'effective control' over the entire border zone" (p.194), but which is perhaps more an ongoing process of diffusing and displacing different forms of control and coercion across territory. Similarly, and again in the context of post-Cold War border governance, Follis (2017, p.1003) argues that traditional techniques for monitoring frontier zones (e.g., watchtowers and remote tracking) *in coalescence with* new facets of border control (e.g., biometrics) have rendered a form of 'transterritorial vision', a surveillance-based 'system-of-systems' involving security agencies, private manufacturers, and public decision-makers.

Although scholars like Akkerman (2016) are right to point out that arms firms have profited substantially from refugee crises and the hardening of the Schengen borders in recent years, this is not to say that the emergence of civil security R&D has caused field to undergo some strict 'to-from' kind of transformation: *from* Cold War military practice aimed at defending sovereign territory *to* internal security practices aimed at preempting terrorist attacks by hindering mobility. Defence companies, as well as their clients, have not made a radical turn, a total reconfiguration, nor did new security SMEs suddenly replace the old military multinationals. Rather, these two different forms of practices, actors, and technologies seem to have been *coupled*, forming a space organised around a kind of double violence: today there are, on the one hand, certain logics of scope, deterrence, coercion, the physical, the 'military'; on the other, certain logics of speed, preemption, smartness, the virtual, the 'civil'; two logics that, while still different and distinctive, are now increasingly put to work together and simultaneously in Western societies. The transformation of defence- and security industries, as the case of the ESRP illustrates, has in fact not been about a *transition* from one logic to another, but rather an *entanglement* of different technologies that are applicable interchangeably by both military and police, for both external and internal use. As persistently argued by Bigo (2014, 2016), the field of security professionals today is a fundamentally heterogeneous one, constituted by both 'dominants' and 'challengers', and embeds and intertwines different logics and techniques of control and violence that put fundamental freedoms and rights (not least those of mobility and citizenship) out of the equation.

For Saab and many other European arms firms, the push towards civil security was initially perhaps less of a conscious spin-off strategy, and more of an experiment and a reaction to the wider trend of shrinking military orders and changing procurement norms towards an 'off-the-shelf'-logic *in combination with* the emergence of R&D instruments like the ESRP. In Sweden, for instance, a 2006 government decision essentially blocked indigenous military R&D funding, urging actors like Saab and the and research agency FOI to look elsewhere, towards international partnerships and transnational research consortiums, precisely like the ones offered by the EU. The following section will begin by taking a look at Saab's involvement in such projects, before discussing at length how the notion of 'civil security' came to be defined and developed within this firm as a 'scalable' form of technology.

3 Civil security as scalability: detention, policing, borders

Many arms companies, including Saab and other multinationals like Thales and BAE Systems, have worked hard to rebrand themselves into a defence and security firm in recent decades; as not only a fighter jet-, tank-, or cannon manufacturer, but also as key suppliers of various crisis management- and counterterrorism tools. Beyond arms-classified products, their civil security[4] niche have come to be, perhaps naturally, products for 'critical applications in society' including national borders and 'ports of entry' (e.g., harbours, airports, container terminals), as well as prisons, detention centres, and police organisations (interview: De Laval). By focusing on 'system-critical' functions, they could engage in state-funded civil R&D projects, and begin developing products that in fact were not too far from their core of technologies with military legacies. This is exactly what occurred when the Swedish industry entered into the European security R&D programme, as Saab and FOI became the country's largest recipients of EU funding.

For example, Saab coordinated one of the most extensive consortiums of the ESRP, 'integrated mobile security kit' (IMSK), which ran between 2009–2013. Developing products for area surveillance, riot management, checkpoint control, CBRN(E) detection, and 'VIP protection', IMSK sought to produce "a mobile system for rapid deployment at venues and sites (hotels, sport/festival arenas, etc.)" (CORDIS, 2013) and in 'asymmetrical situations' such as "Olympic Games, EU summits and other medium- to large-scale events requiring temporary enhanced security." The project saw an arms company mobilising 'police and counterterrorist operatives from several EU nations' for 'field trials', such as a simulation of an EU summit in Chelmsford, UK, during which 3D facial recognition and sniper scope detection sensors were introduced alongside a new radar that could see through walls (Saab, 2012; Army Technology, 2012). Another EU project where Saab was a key stakeholder developed technologies for remotely overtaking control of civil airplanes from an air traffic control tower in case of terrorist hijacking (Braconier, 2005). Finally, Saab and several other European arms firms including Airbus, Boeing, and Indra also participated in the major project PERSEUS ('protection of European seas and borders through the intelligent use of surveillance') which focused on "maritime surveillance system integrating existing national and communitarian technologies and enhancing them with innovative technologies", or as

Akkerman (2018, p.350) notes, 'basically what EUROSUR is about' (see also Suchman et al., 2017; Hayes and Vermeulen, 2012; Heller and Jones, 2014).

Due to a general lack of commodification and direct profit coming out of the EU's consortium-led projects, many arms companies eventually started to invest their own funds into security-related R&D. Saab, who invest a quite tangible 23% of their annual income into R&D, did precisely this, for instance by establishing a university collaboration in Australia involving around 400 engineers for the development of, among other things, new camera-, sensor-, and network technologies. Assembled into a maximum surveillance system called 'OneView', this package was marketed and sold extensively to the booming Australian prison- and refugee detention industry. It was also offered to other 'critical' or 'high-risk' sites such as government agencies, embassies, power stations, casinos, and military bases. Used in on-site or remote control rooms, OneView is a 'high security facility management' system for controlling any function of any building requiring visual awareness and strict perimeter control. The functions can include, e.g., doors and gates, lighting and heating, intercoms and alarms, audio- and video streams from CCTV and body-worn cameras, facial recognition, searchable personal records databases, and virtually anything carrying a sensor. Indeed, like bringing the hardware concept of 'plug-and-play' into the surveillance world, the OneView parent-hub integrates all of these subsystems into a single encrypted workstation and interface, giving the operator (near) real-time control of the site's inhabitants (Saab, 2017b; Security Electronics and Networks, 2011; Saab, 2017c; interview: Adolfsson).

Since the early 2010s, this panopticon-esque system has been installed by Saab in around 30 government buildings and prison complexes in Australia and New Zeeland, including the Grafton site which will become the largest prison in the region (Saab, 2018b, see also 2014). Furthermore, Saab has also trained guards to operate the very same system at refugee camps such as the Northam Immigration Detention Centre, or 'Yongah Hill', which holds a mix of criminal convicts, asylum seekers, visa 'overstayers', and Hazara, Tamil, and Bangladeshi boat refugees transferred from the Christmas Island camps (Sontec, 2012; DeRosa, 2012). Yongah Hill has seen a series of violent protests by detainees (Young, 2015; Echonetdaily, 2015), and the Australian Refugee Rights Action Network has accused the government of deliberately turning "what is meant to be a non-punishment detention centre into a prison" (Perpitch, 2017), e.g., by procuring not only maximum surveillance systems from Saab, but also electric fences, concrete walls, and 'hardened beds' to reduce 'criminal elements' (Diss, 2017).

Redeveloped for EU markets, the OneView-system was scaled up into 'SAFE', a closely related 'incident control system' drawing on the same rationale of integrating subsystems into a centralised hub. SAFE works on a far wider scale than OneView, though, as its application area is not an isolated facility or campus, but an entire city or region. Correspondingly, the customer is not a single prison or security firm, but entire councils or boroughs. Sold to UK police organisations in Cheshire, Warwickshire, West Mercia, Cumbria, and London, the SAFE surveillance hub is complemented with detailed area maps and live traffic data, mobile applications for officers in the field, and the ability to link up with additional surveillance databases, including criminal records. A key function in the UK specifically is that SAFE is able to integrate the country's enormous CCTV network, transferring the electric eyes of the city to a single screen in the control room, giving the operator the ability to take over live camera feeds from car dashboards, guard vests, and CCTV posts from any street corner or square in the city, at

any time (interview Dahlgaard; see also Saab, 2010, 2016). A similar version of SAFE was also installed in other countries ahead of various mega-events, e.g., the 2010 FIFA World Cup in South Africa where the platform was linked up with Saab-manufactured 'Skeldar' UAVs, and became the central tool for synchronising over 16,000 police officers for scenarios like violent hooliganism and terrorist bombings (Saab, 2015b; SecurityWorldMarket.com, 2009; see also Loader, 1999; Jones and Newburn, 1998; Berndtsson, 2012).

In terms of their 'plug-and-play' setup, the site-specific or city-wide surveillance systems can be associated further with long-range radar systems for border surveillance. For example, Saab's 'CoastWatch' package (initially developed as 'NetCentric' and strongly resembling the PERSEUS project and the logic of EUROSUR) works through the very same open architecture design of linking up and integrating different sensors and feeds into a common infrastructure, relaying not CCTV cameras but wireless data from, e.g., watchtowers, ground- or naval-based radars, drones, and airplanes. Described as an, again, scaled-up version of OneView and SAFE, and marketed specifically for border police and Mediterranean coast guards, this system operates in 'high risk areas' and uses 'dense surveillance systems, multi-sensors, watchtowers, and UAVs'. Furthermore, "solutions can be applied in the most difficult topographical areas *especially in Southern and Eastern Europe*" (SecurityWorldMarket.com, 2008 [emphasis added]; Saab, 2017a).

Unable to share specific contract details, Saab spokespersons claim to have 'sold several systems' akin to net centric/CoastWatch, including 'radars and optics', to both national coast guards as well as to EU agencies with the explicit purpose of surveillance of the 'green' (land) and 'blue' (maritime) Schengen borders (interview: Jernbäcker). What is likely also included or considered in these deals are Saab's different 'airborne early warning and control' (AEW&C) systems (i.e., Ericsson-built radars, mounted on-top of the turboprop plane Saab 340/2000). These have recently been updated with the capability to identify small sea vessels and 'low-flying targets'. For example, at a Brussels seminar on EU's external borders in 2013, Saab showcased this aircraft including its "high-resolution TV-camera and electro-optical sensors capable of detecting … people at sea", and invited Frontex' head of capacity building to explain how to combine these surveillance technologies with 'remotely piloted aircraft' (drones) in order to create a so-called 'common pre-frontier intelligence picture' including '[satellite] data collected as far away as Libya, Syria or Mali' (Nielsen, 2013). Packaged as 'Erieye' or 'GlobalEye', this AEW&C system is simultaneously sold to, and used by, regimes like Saudi Arabia and the United Arab Emirates as an airborne military control station and missile guidance tool.

Asked about the future of civil-military technologies, both in terms of development and application, interviewees envision a convergence of exactly this kind, that is, an intermeshing of different technologies (radars, multi-sensors, optics, control hubs) for the policing of borders against refugees or 'less advanced antagonists' (interviews: Adolfsson; Jernbäcker). This 'technology-creep' can be linked to the military term 'mission-creep', referring to battlefield operations that receive new objectives and take directions that were not originally intended. For example, this is how the DHS' 'fusion centres' have been described; originally intended as an information sharing centre across various levels government strictly for counterterrorism purposes, they have now mutated 'into 'all-crimes' and 'all- hazards' organisations', as mass surveillance centres potentially violating the civil rights of US citizens (Monahan, 2009).

In fact, Saab's chief technology officer claims that after only a rough decade on the societal security market, their engineers already find it easier to depart from civil technologies and 'add layers of security' to these products. Or, to reuse an analogy from earlier, rather than 'repainting military products', Saab increasingly prefers to develop something as a civil security solution to begin with, and then militarise or 'scale up' such technologies by adding higher levels of encryption and reliability. For Saab, the foundations for their current security- and defence systems have come increasingly from civil R&D projects which have been 'more or less separated from military development', e.g., via their engineering offices or their cybersecurity firm Combitech (interview: De Laval). Furthermore, they claim:

> "If you look at how we build our military control systems, we make use of more and more civil technology. We are forced to do this in order to keep up … We see an amazing development linked to Amazon,[5] Google,[6] and others, and their investments into these large data centres … so today, we build most of our cutting-edge control systems for military application based on such data centre technologies. We use more and more open-source code, and try to adopt exactly the work methods and technologies coming out of this strong development, with the logic that if not, we would be totally smoked … Then you could say that we add layers of security on this foundation, as you are required to take that aspect up a notch when it comes to military application … What we will see in front of us, I believe, is a gradual migration, where we, if we succeed, may have a common platform for both our military and civil systems." (Ibid.)

A chief lobbyist representing the Swedish arms industry claims, in turn, that defence companies now "try to pick up and absorb [technology] from universities and the civil market to see how to integrate it", so as to not miss out on innovations that would otherwise go into the police or coastguard, or even the customs enforcement and emergency services (interview: Limmergård). The same spokesperson also predicted that the future arms manufacturer would in fact primarily be seen a 'system integrator', as someone contracting specialists in, e.g., high-technological sensors, who in turn are indifferent to whether these are installed on driverless cars or combat vehicles (ibid.). With the increased importance of system integration skills, a civil engineering company like ÅF in Sweden, with otherwise little to no involvement in the defence industry, "could very well be the next supplier of a fighter jet, since it is no longer about being able to manufacture, for instance, the landing gear … but about understanding how to integrate everything" (ibid.). Beyond industry representatives, innovators from the FOI research agency themselves confirm this R&D trend, stating that in certain areas like autonomous vehicles and AI, "civil technology has taken the lead in development" (FOI, 2018; see also Boulanin and Verbruggen, 2017b).

'Civil security' is rarely, if ever, delimited or defined by arms companies, nor are their product catalogues split into neat categories of 'civil' and 'military' offerings. Rather they prefer to talk about 'security issues', 'application areas', or simply 'client needs'. Thus, depending on the type of business opportunity at hand, a radar plane like Saab's GlobalEye or a drone like Skeldar could be presented both as a military product for battlefield reconnaissance, as well as a scaled down 'civil' or 'hybrid' application for the monitoring of coastlines, migrant routes, power grids, pipelines, or guerrilla groups (Wennberg, 2006; interview: Adolfsson). Here, again, the notion of *scalability* can be used as a key heuristic device for exploring arms industry incentives to re-package or

cross-market products between different market segments; indeed, as the underlying logic that enables the transversal movements of these technologies between practical areas.

Surveillance-oriented command and control systems, in particular, are telling examples of both the focus on modular integration as well as the ambiguity by which technologies can traverse back and forth between various applications. These systems receive different names depending on context and customer, move transversally through different operational- and jurisdictional areas, and connect and combine both civil and military technological legacies. This opens up for a situation wherein public funds (which were de facto never supposed to trickle into military production) are able to go into development of modular technologies – the 'raw ingredients' of a system, such as sensors, detectors, or software – which can then in turn be absorbed and transferred around internally within a major arms firm, scaled up, and added with 'security layers' for military optimisation. Conventional logics of diversification and spin-off have in other words been reversed, or at least given a new departure point. Where previously it may have been the intention to pacify military technology, to find uses for it elsewhere in society, it seems just as much the case today that arms firms rebrand themselves, consecrate so-called 'civil security'-segments, and look towards these technologies partly because they form necessarily new sources of profit and R&D funding, but also because of their rapid development, increased sophistication, and fundamental relevance for military production.

Arguably, the traditional role and application of the dual-use[7] framework also becomes disturbed, as this is a case not of civilian technology potentially ending up with destructive effects, but of military firms actively and increasingly looking towards, absorbing, drawing out or replicating, adding layers to, and scaling up apparently non-destructive civil innovations (e.g., sensors) to a level of violent application (e.g., border management). Relatedly, how are techno-legal assessments of weaponised systems with regards to international law affected when new systems increasingly consist of parts and technologies that are experimental, immature, or at best, still in emergence? Indeed, as Boulanin and Verbruggen (2017a, p.7) conclude in a SIPRI report, legal professionals conducting Article 36 reviews,[8] for example, can no longer rely on conventional expertise but must now, 'in order to do their job properly', have "a good grasp of computer science, robotics, biotechnology and neuroscience [and] sufficient understanding of the underlying technologies in the weapons."

In sum, the line between what is military and what is 'civil' or 'dual' cannot be drawn with a technical or even legal definition, but should be seen as always in flux, always at stake in socio-technical struggles, perhaps becoming visible only in the brief moments when such technologies play out their effects in practice. This dilemma is far from new, as Hagelin (1985, pp.152–53) notes, drawing attention to the historical example of the Swedish airplane MFI-9 which was exported to Nigeria during the Biafran War in the 1960s. The main purpose of these planes was to drop humanitarian supplies in war zones, but it turned out that the MFI-9 could very easily be modified for dropping bombs instead.

This section has studied the role of 'civil security' in the development, framing, and assembling of certain technologies into concrete products for a company like Saab. I have made two central points. First, arms firms make no secret of their intentions of profiting from the late modern border- and surveillance society and the booming demand of policing- and surveillance tools, immigration detention systems, long-distance border

patrolling, as well as 'port of entry' control. Second, a closer examination showed how Saab, in particular, are able to diffuse these technologies in integration-friendly 'hubs' or 'platforms' or 'systems' that via the logic of scalability manage to travel rather indiscernibly between practical applications and normative and legal frames; or more specifically, from close inspection of detainees, to policing of urban environments, to surveillance of boat refugees, to military reconnaissance and missile guidance.

Like most arms companies exploring and experimenting with civil security technologies, however, Saab never moved beyond its military core, and civil security will most likely remain a peripheral '15%-segment' in terms of annual revenue. The point here is not to claim or argue that security-related R&D and sales have overtaken military R&D and sales in arms-producing countries (or that the general trend is pointing in such a direction), or that revenue and profit is the main reason as to why certain actors have expanded into this area. Turnover remains small and peripheral in relation to exports of major weapon systems such as fighter aircraft or military frigates, and the security market as such remains fragmented and heterogeneous. Rather, civil security, as an engineering- and technological phenomenon, has a key role to play in terms of teasing out more and more cutting-edge innovations and for examining their potential use, scalability, and transfer into other practical areas, closer to the military core of arms producers. Moreover, the notion of civil security may provide major socio-political opportunities, as it can serve as a façade behind which firms can continue to focus on arms trade. The next section will turn to this issue.

4 Arms export, human rights, and wielding the 'civil'

When it comes to arms trade negotiations and export promotion campaigns, the notion of civil security has a central function. Arms export promotion in Sweden is currently undertaken by a coalition of actors meeting regularly under the loose label of 'Team Sweden', including spokespersons from the ministry of foreign affairs, embassies, private industry, and a public-private export organisation called Business Sweden (interviews: Rudebark; Bengtcén). Team Sweden is used as the central marketing-, branding-, and communication platform for the industry, as well as the main channel through which to handle direct business requests from foreign customers. The Team Sweden group uses 'civil security' centrally as a way to emphasise the 'key selling point' of its industry abroad, namely, its technological width, industrial comprehensiveness, and high level of innovation, claiming that:

> "From a size- and population perspective, [Sweden] is a midget [sic] globally, a nobody … If you look at innovation, on the other hand, we're an international giant … especially when it comes high-tech businesses such as defence and security, people tend to listen to Sweden … What [Team Sweden] can do, business-wise, is to highlight the brand-name 'Sweden' … so that, if [companies] enter the market under our Team Sweden-flag, people go "oh, here come the Swedes"." (Interview: Rudebark)

In practice, this means that Team Sweden often organises 'pavilions' at trade fairs like Eurosatory in Paris, DSEi in London, LAAD in Rio de Janeiro, and MSPO in Kielce. To these, they invite a selection of SMEs with a civil security or dual-use focus to exhibit products and services such as police- and military uniforms, red-dot scopes, border fences, risk consultancy, and more. In addition to a pre-mapping of

customers and a tailored meeting schedule, Team Sweden offer to put participants on display in a pavilion cluttered with Swedish flags and other national symbols.[9] Placing their pavilion right next to Saab's large exhibition booth, they can pass clients amongst each other. This arrangement between Saab and the security SMEs seeks to enhance the image of a comprehensive 'team' of cutting-edge military and civil applications (ibid. Business Sweden, 2016a, 2016b; Army Recognition, 2016; SOFF, 2015, 2017a, 2018; see also Jackson, 2017).

Such notions of 'width' and 'comprehensiveness' have also been used for promotion purposes at embassies. In partnership with Team Sweden, embassies play an essential role for incentivising arms trade, e.g., by mapping local decision makers, identifying potential partners and customers, and notifying Swedish firms about upcoming procurement deals. Embassies also organise meetings with local defence ministers and state officials responsible for military procurement, arrange sales pitch seminars for particular companies, and facilitate business-to-government (B2G) negotiations (interview: Bengtcén). For example, the Baltic countries are currently in the process of hardening their eastern Schengen borders with Russia and Belarus, investing around EUR 100 million in a range of commodities, from physical barriers to digital systems (interview: Rudebark). As Team Sweden became informed by local trade secretaries and its ambassador to Estonia about the upcoming border contracts, they began curating a 'package' of Swedish companies, products, and services, putting together what they called a 'one-stop shop', that is, an entire infrastructure, for border security.[10] Presented to Baltic border enforcement agencies, the package consisted of Saab, Ericsson, eight different SMEs. Together, they offered net centric/EUROSUR-styled systems, including scanning equipment for cars and bags, guard uniforms with bodycams, so-called 'smart fences' with heat sensors distinguishing human- from animal movement, drones, and more. The one-stop shop strategy used by Swedish export promotors works in line with how many private security companies (G4S, for instance) are trying to create the perception of an 'all-rounder', taking care of everything from armed missions to VIP-protection, maritime surveillance, UAV maintenance, and humanitarian assistance [Prem, (2018), p.66]. For this to work for an arms industry, however, the notion of 'civil' has to be carefully wielded.

Another selling point of the Swedish industry related to civil security is the country's 'good reputation'[11] as not only technologically comprehensive, but also as a progressive, humanitarian, moral superpower which is somehow still 'neutral': "not too close to the Americans, not a post-Soviet state" (interview: Rudebark). For example, a Swedish Trade Council (2012) survey on defence- and security exports concludes that "[o]ur respect for human rights and our relative neutrality makes it easier to work in an international environment", and a ministry of foreign affairs spokespersons claims that as a security supplier Sweden signals 'quality, transparency, long-term relations', and that its 'tradition of being a peace-building and multi-lateral actor' is an important tool for promoting arms (interview: Bengtcén). These nation branding strategies function precisely like 'strategic communication' in the corporate world: "coordinated use of activities designed to make the corporate entity 'look good', such as marketing, advertising, public relations, and community relations." Of course, "marketers needn't care if their product is 'good' (or healthy, or durable, or safe, or whatever) – their goal is simply to make sure people buy it, regardless of its actual value" [Brooks, (2016), p.84].

In information folders, on their website, and all over the LED-screens in their office foyer, Saab's corporate 'vision' is presented as 'it is a human right to feel safe'. Ignoring the fact that 'feeling safe' is not included in the UN articles of human rights, or that security is not a 'feeling' but a tangible practice, Sweden's largest arms company frames itself discursively in their marketing material precisely like the Team Sweden group by drawing on, and reproducing, the same nation brand of being human rights-advocates and historically 'neutral'. In order to achieve their vision of 'keeping society and people safe', Saab's mission then turns into one of 'pushing mental and technological boundaries' (Saab, 2018c). As noted in the previous section, technological boundaries are 'pushed' through the overall ambiguity and scalability surrounding modern security technologies, and the 'mental' boundary is pushed through the perversion of words: by presenting themselves, a weapons dealer, as a supplier of safety and human rights. As Prem (2018, p.52) notes, this kind of discursive framing – here exercised by both public and private actors – is a sign that arms industries and other military actors are "actively seeking to influence public perceptions about what or who they 'really' are", as an attempt to vindicate their reputation "by purveying a feel-good image as 'new humanitarians'."

One of the clearer ways in which the 'civil' is wielded for arms export purposes is in international trade delegations. Government-led delegations travel frequently from Sweden to countries like India, Indonesia, Philippines, parts of Africa and the Middle East, as well as to other EU member states. Amongst the delegation participants are not only ministers, civil servants, and agency officials, but usually also representatives from the Investor-sphere and some of its largest firms in the arms sector. To avoid controversy and critical media- and NGO scrutiny, however, when an arms company is travelling side-by-side with state representatives to countries in the global south, which can very well be unstable or semi-democratic regimes or outright dictatorships, it tends to masquerade as having purely 'civil' intentions. Delegation representatives frequently stress that Saab, for instance, are following along only to explore opportunities related to the tourism and travel industry, airport security, traffic management, or critical infrastructure more generally. Precisely this occurred in 2016, when a delegation including Saab travelled to the Philippines for trade talks and for the opening of a new embassy in Manila. The Philippines, it should be noted, is an increasingly brutal regime with numerous reports of human rights violations[12] in recent years such as torture and extrajudicial killings in the infamous drug war, attacks on protestors and journalists, child labour, discrimination based on sexual orientation or gender identity, and is led by an autocratic leader in President Duterte who is frequently using violent and misogynistic rhetoric. Confronted by the media on why Sweden was apparently not only complicit in, but actively seeking to contribute to the arming of such a regime, the local ambassador downplayed the magnitude of the regime's human rights abuses, and the press secretary of the Swedish minister for enterprise and energy[13] stated that "this was a business trip *with only civil elements*" wherein Saab's role was to "try to sell technology for the civil aircraft industry" (Forssblad and Mannheimer, 2016 [emphasis added]). During the subsequent two years, however, it became clear that the long-term aim of the trade talks was the upcoming Philippine procurement of 12 new fighter aircraft, as Saab admitted that their new Manila office (literally in the same corridor as the new embassy) had been set up for exactly this purpose, and that sales of 'civil' security solutions, air traffic management, and surveillance systems were simply a first step towards more extensive trade talks (ibid. Resare, 2016; see also Government of Sweden, 2017). As negotiations on Swedish fighter jets to the Philippines continue, the Swedish export regulation agency

ISP granted new arms export permits to the Philippines in February of 2018, including missile guidance- and radar systems (i.e., Saab's GlobalEye and Giraffe systems) (Holmqvist and Resare, 2018).

In response to these developments, the Swedish Peace and Arbitration Society concluded that "fostering the Swedish arms industry's sales requisites was, in practice, more important than human rights and democracy" (Lundström, 2018). A former arms export promotion officer admits, moreover, that there is always a hierarchy at work in these cases, and regardless of how 'civil security' is framed politically or technically, the 'foundational question', even today, is still always about how Swedish defence capabilities could be maintained by means of export (interview: Küller). Sales of civil security- or dual-use technologies are therefore only truly relevant for the 'bigger picture' if they can, somehow, contribute to larger deals.

> "This recent trip to India [in 2018], for example… It's not always that you highlight a specific key business deal – usually you just talk about a 'broad industrial cooperation' – but in this case, it was definitely about the [JAS] Gripen affair, which could be a colossal breakthrough." (Ibid.)

Civil- and hybrid systems also serve a key role for upholding the controversial business relation and export channel to the oppressive dictatorship of Saudi Arabia. As part of a weapons factory contract in 2011, Saab also attempted to sell the SAFE system; a policing tool which, in a state where political organisation and public protests are banned, could have been used for citizen surveillance and crowd control (Julander, 2012; see also Karlsson, 2012). Despite these obvious issues, Saab and the Swedish state downplayed SAFE as a mere 'public safety'-system for 'blue-light personnel', and saw no problems in trying to include this in the larger deal which primarily concerned the GlobalEye package. GlobalEye, in turn, is classified by the Swedish ISP agency as belonging to the rather porous and flexible export permit category of 'other munitions', which is supposed to include technologies of 'non-destructive effects', and which is therefore more freely exportable than outright weapon systems. As noted, it is a radar- and sensor-based system which may be used both in warfare as well as for high-technological yet more 'everyday' and 'civil' contexts like border surveillance and counterterrorism. It is currently sold to not only Saudi, but also the United Arab Emirates whom together with Kuwait and Qatar form a Saudi-led coalition in their war with Yemen. In the Yemen war – 'one of the largest humanitarian catastrophes today' according to the Red Cross, with countless reports of civilian houses, schools, and hospitals being bombed – GlobalEye is strongly suspected to be used for missile guidance purposes (Tigerberg, 2018; Wintour, 2017; Al Jazeera, 2018). 'The most obvious tasking for [GlobalEye]', a defence industry reporter commented at the time of contract signing, "is along Saudi Arabia's disputed border with Yemen. The system's ability to track low and slow-moving targets, along with its overland and maritime surveillance capabilities, is immensely valuable to the kingdom" (Hewson, 2010). Despite the 'democracy criteria' recently introduced into Swedish arms trade legislation as well as the general criteria of the Arms Trade Treaty (ATT), lobby campaigns and export permits to the Saudi coalition continue to be in place (Walan, 2017), and Saab even signed a new deal in 2019 for future deliveries of GlobalEye (Svenska Freds- och Skiljedomsföreningen, 2019).

Finally, the notion of 'civil' is also strategically wielded within the research- and higher education sector. Here, Saab representatives admit that they use this product

segment as a way to 'soften' or 'pacify' their military core, for recruiting staff from policing firms like Securitas (interview: Jernbäcker), and for attracting young and talented civil engineering students.

> "I sense a new dawn when it comes to civil security. It feels new, fresh, it has a public benefit. It is something to attract new co-workers with … How are you thinking as a young person starting your employment at Saab? Is it 'okay' to work in arms manufacturing? … I therefore believe that when you have these [civil] products and offerings, you see much clearer that Saab actually works towards increasing societal security in general, making military products only one of our components … SAFE and these societal security-related products are rather pleasant to work with, and for luring in young people who may think that 'Saab are only fighter jets'." (Interview: Rylander; see also Strand, 2017)

Again, in certain contexts, arms firms may necessarily want to downplay or even obscure some of their activities and interests; for example, by reframing their products from weapons or arms, to something far more vague and multifaceted. Indeed, branding something 'civil'- or 'societal security' allows arms firms to stay undefinable and aloof towards their critics since "if nobody knows exactly what you do, then it's hard to protest to or object to what you do" [Prem, (2018), p.68].

A contributing factor here, of course, is that with the increased focus on system integration and civil technologies, the arms industry has largely abandoned its old core of factory-based, blue collar workers and moved towards an office-based, white collar class of employees focusing on, e.g., assembling modular technologies into 'systems' or 'platforms'. Such white collar entities, as noted already in the work of Mills (1951, p.141), tend to be made up by individuals with very specialised training, engaging in the provision of limited and circumscribed services, usually under strict supervision and within tightly defined project frames. Like other technically driven firms, arms companies thus acquire a bureaucratic logic by which everyday tasks are 'parcelled out', leaving its employees, e.g., naïve civil engineers – with limited authority, understanding of, and influence over the overall organisation and interest of the company, even being discouraged of using their own independent judgement.

Arms firms can then masquerade as 'technical experts', 'IT professionals', 'instructors', or 'educators' [Prem, (2018), p.68]. In line with this, Saab established their own pre-college high school programme in Arboga, Sweden in 2009. Here, company employees teach students aged 16–20 in engineering, mathematics, and business economics, and arrange a series of company visits and internship opportunities. Thereby, a distinct career path is carved out for teenagers who in turn are 'expected to share the company's values'. Nowhere in the curriculum are the words 'military' or 'defence' mentioned, rather, Saab is portrayed as a company working strictly with 'security from a societal perspective', focusing on, e.g., 'integrated systems', 'aerotechnics', radar-, electrooptic-, microwave-, and communication technologies [Arboga Kommun, 2015; see also Åkerström, (2016), 51].

5 Conclusions

Drawing on recent transformations of Western defence- and security industries, particularly with regards to the political context of Europe and specific actors from Sweden, this article has explored how arms manufacturers – forced to compromise and

expand into related product areas in recent decades – have found a niche in 'civil security', and how this segment has proven to be, if not a major new source of income, then certainly an opportunistic new area of technological innovation. It has also come to serve a critical socio-political function, not least in the context of arms trade.

The first part of the analysis explored some examples of civil security products offered by the arms firm Saab. Their traits can be summarised in terms of *scalability* of scope of vision and control, referring to how the products – developed by Saab's engineers not as weapons, but as 'systems', 'platforms', or 'solutions' – are able to traverse back and forth between defence- and security contexts. The surveillance-hubs of OneView, SAFE, and net centric, for instance, are all designed around a similar logic of modular integration of subsystems ('plug-and-play'), around a technical core which can be scaled up or down depending on customer needs or application area; be it a refugee camp or the entire Mediterranean Sea. Indeed, even beyond the specific case of Saab's civil-military R&D nexus, 'scalability' can be taken away from this discussion as a fruitful analytical device for exploring the incentives and strategies of arms industries when it comes to reconfiguring and cross-marketing certain products across different market segments.

Out of this, questions emerged – from both technical and socio-legal points of view – whether these systems are civil, military, dual-use, or neither? What exactly 'is' a technological arrangement of different sensors, images, circuits, and signals, if it can be used interchangeably, with some alterations, as tool for traffic management and perimeter control, as well as for aerial awareness and missile guidance? If it is truly the case that arms firms today actively and increasingly seek to absorb sophisticated solutions from the civil sector – or even from open-source software – how can the technology be controlled? If arms firms receive public funds to develop what they see as purely 'civil' solutions, what stops them from transferring the raw technologies around internally within the company or corporate group; rescaling, repackaging, and renaming them for military markets, adding camouflage patterns and robustness layers?

If a particular innovation developed in, say, an EU civil security R&D project becomes a component in a weapons system, should the development process then not be deemed illegal according to EU law? According to Mörth (1998, p.7, p.14), when the EU was drafting its 5th framework programme for R&D funding in the late 90s, the commission was in fact already prepared to tolerate that some such projects could result in products with 'dual' functions. This was not seen as a significant risk at the time, but more as an opportunity for 'synergy effects' and for what became referred to as civil-to-military 'spin-in' (as opposed to spin-off). During the 90s, of course, 'spin-in' would have been seen more as a potentiality and exception, but with today's rapid development in civil engineering, computer science, and related fields, it should rather be seen as an emerging trend. As military firms are now actively looking towards, teasing out, drawing on, and scaling up civil innovations to a level of potentially violent application, this trend, this 'undertow' of civil engineering into military production, will be very challenging to predict, monitor, and regulate. If these companies continue to 'push mental and technological boundaries' by 'integrating into systems' rather than building outright armaments, the legal concept of dual-use may become too slim, reductive, and ineffective. Unsurprisingly, lobby groups see the dual-use framework as simply a 'list of prohibitions' that 'hinders innovation' at the civil-military intersection. If removed, defence and security could blend into a genuine 'grey area', they argue, in

research, marketing, sales, as well as application (SOFF, 2017b; SACS, 2015; interview: Limmergård).

The second part of the analysis extended these findings by exploring the notion of 'civil' as something wieldable in socio-political contexts related to arms trade. In the example of Swedish export promotion campaigns, it was illustrated how civil security becomes a kind of 'glue' for piecing together holistic packages and comprehensive 'one-stop shop' offers where defence- and security products complement each other. Here, the industry has not undergone a strict to-from movement, from arms to counterterrorism, but rather these products are coupled and put on display side-by-side, just like at MSPO or Eurosatory. This way, the industry has acquired a chameleon-like character as they are able to deliver 'total mission', 'holistic', 'end-to-end', 'seamless', 'integrated', 'full-spectrum', and 'self-sustaining' solutions [Prem, (2018), p.67]. As holistic security suppliers, and by adding 'civil' offerings alongside military ones, arms firms can more easily reframe themselves as 'neutral' in the sense that they are dealing mostly with different technologies for 'solving' security 'problems'. Arguably, they put up a façade: with it, they can attract personnel and research funders, masquerade as being interested simply in innovation and 'human rights', and thereby profit equally from talking peace and fuelling war. Behind it, they can continue to negotiate major arms export contracts in the global south.

This article has shown how technology is inseparable from social struggles, from language, power, and authority. Correspondingly, manufacturers of arms are finding more and new ways to gain recognition, redefine themselves, exploit emerging technologies, and creatively work around certain regulations, standards, and norms. Arms export legislation in Sweden, as elsewhere in Europe, may have been rigorously investigated and revamped in recent decades, but despite certain improvements it continues to be weak and vaguely formulated; still unable to block trade with dictatorships, authoritarian governments, and unstable or warring regimes. Emerging technologies and so-called 'civil security', I finally conclude, simply *increases this ambiguity*, hindering effective regulation, transparency, and insight into what goes on in practice.

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Notes

1 The obtaining and handling of interviewee material has complied with relevant ethical committee guidelines. Translations of transcripts and any other source material into English have been undertaken by the author. Interviewees did not request to be anonymised.

2 According to 2014 data from SIPRI and the World Bank:
   a Israel, GBP 73.56 per capita
   b Russia, 43.45
   c Sweden, 39.94
   d Belarus, 26.88
   e Switzerland, 19.29 (Jackson, 2014).

3 Via Investor, the arms industry has direct links to the wealthiest segments of the Swedish society and financial world. Founded by the Wallenberg family's industrial empire a hundred years ago, Investor is the largest shareholder of most major Nordic-based international companies today, including defence- and security firms like Saab and Ericsson (The Economist, 2016; see also http://www.investorab.com/about-investor).

4 While this segment is labelled 'civil security' in the English versions of Saab's annual reports, online press releases, and information pamphlets, it is often referred to in Swedish as 'societal security' ('samhällssäkerhet'), presumably in order to be aligned products with prevalent EU and domestic policy discourse [see, e.g., Saab, (2015a), p.3]. This product segment constitutes around 15–20% of the annual revenue, or up to GBP 500 million per year (Saab, 2018a, 2015a; interview: Adolfsson). A company representative claims that while multi-billion deals such as the JAS 39 Gripen fighter jets are difficult to predict, civil security sales – these so-called "bread and butter-deals that bring in from one up to about ten million [SEK]" – are a small but reliable part of Saab's turnover (interview: Rylander).

5 A company until recently not recognised as 'security-related', Amazon 'officially entered the surveillance business' in 2018. 'Rekognition', a facial recognition technology powered by artificial intelligence, which can "identify, track, and analyse people in real time and recognize up to 100 people in a single image [and] quickly scan information it collects against databases featuring tens of millions of faces", is currently sold to law enforcers and state agencies seeking to track 'persons of interest' (Cagle and Ozer, 2018).

6 More and more non-defence companies are conquering large shares on the security- and military markets today, including everything from construction- and infrastructure firms to the 'tech-giants' in countries like the US (GAFAM) and China (BATX) (Chevré, 2019; see also Bures and Carrapico, 2017).

7 As part of the so-called Wassenaar Arrangement, the current dual-use framework was designed and established in Europe around 1995. It consists of a detailed, ever-expanding list of technologies, usually developed in civil contexts for civilian application (e.g., infrared optics for heat detection), but which may also be applied in military or violent contexts (e.g., installed on a drone for target detection), and which should there be subject to national export controls.

8 Article 36 of the 1977 Additional Protocol to the 1949 Geneva Conventions obliges governments to review whether "in the study, development, acquisition or adoption of a new weapon", its use would "in some or all circumstances be prohibited by international law" [Boulanin and Verbruggen, (2017a), p.3].

9 The draft design of the pavilion, shown in Team Sweden's invitation letter to security- and defence companies, includes an image of the famous Swedish children's book character 'Pippi Longstocking' (Business Sweden, 2016a). This small yet peculiar detail reflects Team Sweden's overall intention to brand the Swedish arms industry as 'small but strong'.

10 Similar hand-picked infrastructure packages including the 'whole palette' of civil-, military- and dual-use products have been showcased also at the embassies in Portugal and Spain, addressing the Gibraltar border (interview: Rudebark).

11 For example, the 'Reputation Institute', which claims to measure social- and economic policies as well as 'ethics and perception of corruption, aesthetic-beauty, and 'feel-good' factor', crowned Sweden as 'the most reputable country in the world'. In line with Team Sweden's marketing strategies, the institute claims that "the more you can integrate around a common theme, cultural values, around a common backstory on what your country stands for, the more effective the message, and ultimately the more powerfully that will be translated into your reputation" (Pitofsky, 2018).

12 See, e.g., https://www.hrw.org/world-report/2018/country-chapters/philippines.

13 Shortly after the embassy opening, press secretary Ann Wolgers became recruited by Saab as head of their press centre.

Appendix

Table A1 Interviews

Individual	*Role/function*	*Date*
Adolfsson, Ann-Kristin	Chief Strategy Officer, *Saab*	07/12/17
Bengtcén, Anders	Head of Security and Defence Export Promotion, *Ministry of Foreign Affairs Sweden*	14/11/17
Dahlgaard, Klaus	Marketing and Sales Director of SAFE, *Saab UK*	14/03/18
De Laval, Pontus	Chief Technology Officer, *Saab*	23/04/18
Jernbäcker, Lars	Strategy and Portfolio Manager and former Project Leader Civil Security, *Saab*	26/04/18
Küller, Leif	Former Head of Sales and Export, *FMV* and former Head of Market Relations, *FXM*	23/04/18
Limmergård, Robert	Director, *Swedish Security & Defence Industry Association SOFF*	03/03/17
Rudebark, Ulf	Strategy and Business Development of Security, Defence & Cyber, *Business Sweden*	05/10/17
Rylander, Joakim	Director of Marketing and Sales, *Saab UK*	14/03/18