1. Understanding the arms trade

Andrew T.H. Tan¹

THE ARMS TRADE AS A GLOBAL SECURITY ISSUE

While the arms trade is an important area of academic enquiry, it has been under-researched. After the end of the Cold War, the study of this important sub-field in security studies and international relations in fact fell into decline due to the anticipation of a peace dividend following the end of superpower rivalry between the Soviet Union and the United States. Moreover, the reversion to state sovereignty and high tensions between China and the United States in the wake of the COVID-19 global pandemic in 2020 makes this enquiry even more relevant, given that the underlying dynamics of the arms trade, such as interstate tensions and great power rivalries, remain important.

Despite early hopes, the reality has been that arms spending and procurement have continued to increase in the post-Cold War period. Indeed, post-Cold War trends strongly confirm that apart from Europe the rest of the world did not in fact reap any real peace dividend. Instead, the end of the Cold War released states from the straitjacket of superpower competition that had imposed restraints on localised and regional conflicts. Since 1989, there has been a noticeable increase in the number of conflicts, for instance, in the former Yugoslavia, the Middle East and Africa. A particularly deadly conflict was the Congo Wars from 1996–2009 that involved several states and the deaths of around 5.4 million people since 1988, making it the deadliest conflict since the end of World War Two 1945.²

This has all happened despite emerging norms, regimes, international laws and institutions that optimistic scholars and practitioners alike hoped would make the world more stable and banish the spectre of conflict and violence. Even as various conflicts broke out after 1989, there was still hope that the international community would get its act together and work collaboratively to intervene and stop conflicts before they became deadly. Thus, following the genocide in Rwanda in 1994 that killed 800,000 people, the international community was finally shamed into adopting the “Responsibility to Protect” principle in 2005, under which “the international community, through the United Nations ... has the responsibility to use appropriate diplomatic, humanitarian and other peaceful means ... to help protect populations from genocide, war crimes, ethnic cleansing and crimes against humanity.”³

While internal conflicts still killed millions, interstate conflict also broke out after the end of the Cold War. This was epitomised by the Gulf War in 1990, during which a US-led international coalition of states freed Kuwait from Iraqi invasion and occupation, and restored the status quo. This was followed by the US-led invasion and occupation of both Afghanistan and Iraq in 2001 and 2003 respectively, following the seminal terrorist attacks on 11 September 2001 in the United States.

Soon, however, the United States found itself bogged down in insurgent wars in both countries, sapping its strength, morale and capacity for global leadership. The erosion of its post-1945 global legitimacy was accentuated by the Global Financial Crisis in 2008 that was

sparked by the sub-prime housing loan crisis in the US. Since then, isolationist sentiments in the United States have steadily gained ground, culminating in the election of Donald Trump as its president in 2016 and the emergence of an “America First” foreign policy as the US tires of its global role and leadership. This, together with the rise of China and the serious challenges it is posing to the current Western-dominated international system, has led to what appears to be the end of the post-1945 world order. This world order, established through victory over Germany and Japan in World War Two, had been underwritten by the United States and dominated by the Western powers, providing the systemic stability that led to sustained growth and prosperity in the post-war decades. The more recent breakdown of this post-1945 order, however, has resulted in the re-emergence of an international system resembling the great power competition that existed prior to the outbreaks of the two world wars, when states emphasized self-help, increased reliance on deterrence and, ultimately, greater emphasis on military power. At the time of writing, it was not clear what a post-COVID-19 pandemic world order would look like, but tensions between China and the US have markedly increased, with the possibility of a new Cold War. As well, the leading military powers, namely, the US, China and Russia became engaged in an accelerating arms race to develop emerging new technologies that could transform the battlefield, including the use of Artificial Intelligence (AI) and autonomous weapons, and epitomised by the development of hypersonic missiles and energy-directed weapons.

Epitomising the trends, US allies such as those in NATO have come under pressure from the Trump administration to increase their defence spending in order to stop their “free-riding” on US defence spending and capabilities. However, it is rising Asia that is leading the increase in global arms spending and procurement. Asia’s dramatic economic rise, to the point where it is today the most important economic region in the world, has been led by China and India, which have dramatically increased their defence spending as a result of rapid economic growth.

According to the authoritative Stockholm International Peace Research Institute (SIPRI), the top ten importers of conventional arms from 2009–2018 include five Asian states from the region. India, which imported around US\$32 billion in arms, was the world’s top importer. This was followed by China, which ranked third with US\$12.7 billion, and then Australia and Pakistan, both of which were ranked fourth and sixth at around US\$11.7 billion and US\$10.6 billion respectively. In eighth place was South Korea at US\$9.4 billion. In total, these five states imported just over US\$76 billion of arms over the ten-year period. This is significant in that this means that these five states from one region alone accounted for the bulk of defence spending on imported arms.⁴

In 2019, Asia and Australasia had a 24.5 per cent share of global defence expenditure compared to 16.6 per cent for Europe, 10.3 per cent for the Middle East and North Africa, 4 per cent for Russia and Eurasia, 3.4 per cent for Latin America and 1 per cent for Sub-Sahara Africa. While North America remains the region with the largest defence spending, at 40.2 per cent of total global defence spending in 2019, this is skewed by the United States, which continued, in 2019, to spend some \$684.6 billion on defence, the highest in the world.⁵ Thus, in spite of the best hopes of globalists and advocates of human security, swords did not, metaphorically speaking, transform into ploughshares following the end of the Cold War in 1989. Indeed, globally, total global military expenditure, measured in constant US dollars in 2017, grew from US\$1.163 trillion in 1992 (i.e. just after the end of the Cold War) to US\$1.816 trillion in 2018, a more than 50 per cent rise.⁶

KEY ATTRIBUTES, CAUSES AND ISSUES

This dramatic increase in military expenditure has been accompanied by the procurement of weapons systems of increasing range, capability and sophistication, thus ensuring not just the continuation but also the expansion of the trade in arms. Of significance are the key attributes of this trade. In Asia and the Middle East, they include its increasing technological sophistication, such as in the use of C4 ISR systems (command, control, communications, computers, intelligence, surveillance and reconnaissance), electronic warfare aircraft, AWAC (Airborne Warning and Control) systems, multi-role combat aircraft (including fifth-generation stealth combat aircraft) and advanced missiles, such as long-range cruise missiles and long-range anti-ship missiles. Another interesting attribute has been the acquisition by states of new capabilities that they previously did not have, such as Main Battle Tanks, self-propelled medium-range artillery, multiple rocket launchers, ballistic and cruise missiles, AWAC aircraft, air superiority combat aircraft, Unmanned Aerial Vehicles (UAVs), modern surface combatants (e.g. frigates, destroyers and aircraft carriers), modern amphibious warfare vessels (such as Landing Platform Docks) and submarines.⁷ By 2020, the leading military powers, such as the United States, China and Russia, were engaged in a drive to exploit a wide range of emerging technologies for military purposes. This included the use of AI and autonomous weapons, and has been epitomised by the development of hypersonic missiles and directed-energy systems.⁸

Another characteristic of the arms trade has been the rise of local defence industries, often expensively developed and supported by states in the quest for greater self-reliance in defence systems and technology. This has meant that while the large arms industry conglomerates in the United States, Europe and Russia remain viable and competitive (though often after rationalisation through mergers and acquisitions) following the end of the Cold War, they have been joined by the arms industries of a number of smaller states, such as Israel, Sweden and South Korea, as well as emerging powers, such as China. Indeed, the global arms industry has now become very competitive, with a number of defence companies vying to sell modern weapons systems of increasing range, capacity and sophistication.

Another interesting attribute has been the expansion of naval power. This has accompanied the increased pace of globalisation, which has meant greater reliance on the sea, as 90 per cent of global trade is carried by sea. The increasing importance of sea-lines of communications (or SLOCs) to key markets and resources such as oil and gas, and the increasingly valuable maritime real estate that has to be defended following the United Nations Convention on the Law of the Sea (UNCLOS) which became effective in 1994, has led to the growing emphasis on naval power.⁹ In addition, states have found that navies are very useful instruments of the state, since they can support foreign policy very effectively due to their unique characteristics, namely mobility, endurance and operational flexibility. Thus, navies are able to fulfil a number of functions. Aside from keeping good order at sea in peacetime, they are able to support a range of foreign policy objectives through deterrence, coercion, warfighting, defence exercising, confidence-building and the delivery of humanitarian aid and disaster relief.¹⁰ In addition, navies also fulfil a valuable symbolic function in representing the interest or concern of a state. Thus, the US navy, with its battle carrier groups, is able to demonstrate the muscular presence of the United States in various parts of the world, and send a symbolic message to target states, as it did, for instance, in deploying a battle carrier group near the Taiwan Strait during the Taiwan Strait crisis in 1996 in order to deter China in its attempts to intimidate Taiwan.¹¹ Today,

a rising China that is dissatisfied with the current status quo has thus emphasized the building of a powerful navy.

What, then, are the causes of the international arms trade? Apart from the changes to the post-1945 international system described earlier, they are varied, and include: economic growth (especially in Asia), great power rivalries, the presence of interstate tensions, the requirements of maritime surveillance and protection, the proliferation of arms suppliers, prestige, domestic political factors, corruption (an under-appreciated and under-researched area) and the lack of effective arms control mechanisms, among others.¹² In addition, as Barry Buzan had demonstrated, the continuing technological revolution and spread of technology generates its own dynamic that also drives the arms trade.¹³ At the time of writing, the impact of the COVID-19 global pandemic that broke out in early 2020 on the arms trade remained unclear. However, the underlying dynamics that have driven the international arms trade are likely to continue to be relevant. This means that the phenomenon, with all its attendant problems and challenges, will remain.

STATE OF THE LITERATURE

This work is therefore timely, on account of the continuing, even rising emphasis on state deterrence and therefore the acquisition of arms, and the accompanying lack of in-depth academic literature on the subject matter. Indeed, the reversion to state sovereignty and high tensions between China and the United States in the wake of the COVID-19 global pandemic in 2020 makes this work even more relevant, given that the underlying dynamics of the arms trade, such as interstate tensions and great power rivalries, remain important.

The study of the international arms trade remains an under-researched area of academic enquiry, as this topic of enquiry in security studies and international relations fell into decline in the face of the anticipated peace dividend following the end of the Cold War in 1989. Since the end of the Cold War, international relations and security studies have also shifted to post-positivist approaches that look askance at any empirical analysis of the global arms trade, thus vacating the space to other disciplines, notably economics. Thus, the study of the international arms trade after 1989 became dominated by defence economics. The resulting academic work has not been easily accessible to other scholars or indeed the general scholarly community, due to the use of technical and quantitative language as well as methodologies derived from economics, specifically econometrics. As demonstrated above, however, arms expenditure has increased substantially since 1989. Moreover, the trajectory of the current international system is towards great power rivalries and the enhancement of military deterrence, and not the normative peace that international relations theorists had hoped. One key objective of this work is thus to revive the study of arms spending and procurement in security studies, where it ought to have a prominent place in view of the continued salience of states and the intensification of interstate tensions and rivalries as the post-1945 international system breaks down.

There exist primary resources published by the International Institute for Strategic Studies (IISS) through its annual *Military Balance*, and the Stockholm International Peace Research Institute (SIPRI) through its annual SIPRI Yearbook. Both institutions painstakingly assemble authoritative data on the military expenditure, arms procurement and the international arms trade. However, there remains a noticeable dearth in the analysis of this primary data by the academic community. Indeed, several broad questions arise. What are the key trends and

attributes of the international arms trade? What are the factors that have resulted in the continued salience of the global trade in arms? What might be the key issues or challenges? Few of these questions have been analysed in any depth. Until the end of the Cold War, there existed those who studied the arms trade using the methodology of analysing defence expenditure and procurement. However, analyses using positivist approaches and empirical data within security studies died a natural death given the shift in the discipline towards post-positivist approaches. There has thus been a gap in the political science literature on the subject matter, arising from the lack of empirically-grounded study of the arms trade. This is a serious omission, as understanding the international arms trade and its related issues is an urgent imperative due to the increased potential for conflict as a result of the intensifying pursuit of military deterrence capabilities.

KEY QUESTIONS

Thus, the key questions (that will be addressed in this work) are: What are the key drivers of the arms trade? What have been the trends in the arms trade? What are the key issues? In sum, the key drivers include: the continued salience of deterrence, the insecurities of small states in an increasingly realist world of power politics, the continued presence of conflict which drives military spending, technological change and the presence of corruption. The key trends in major regions in the world will also need to be addressed, namely, Asia, Europe, the Middle East, Africa and Latin America, as well as key defence markets, such as the United States, China, India, Russia and the UK. Finally, some of the key issues that require analysis include: US grand strategy and arms exports; the future of the defence industries of China and Europe; the future of air and naval power and their implications for the arms trade; the impact of emerging technologies including the rise of autonomous systems; and the prospects for arms control.

A comprehensive study of this nature, covering the key drivers, trends in defence spending and procurement, and the key issues, will be especially useful to scholars, policy analysts, those in the arms industry, defence professionals, students of international relations and security studies, media professionals, government officials and those generally interested in the phenomenon that is the arms trade. Such a study is also timely, given the re-emergence of great power rivalries and the seeming breakdown of the post-1945 international system, as well as the growing emphasis on self-help, the reliance on deterrence and arms and the rising perception of the state's basic insecurity in an increasingly anarchic world, one which appears to have worsened as a result of the COVID-19 global pandemic that broke out in 2020. At the time of writing, while the impact of COVID-19 on the international order was unclear, the underlying dynamics driving the arms trade remain relevant. If anything, key drivers such as interstate tensions and great power rivalries have become even more significant.

The contributors of this work are an international team of defence and arms experts, drawn from across the globe: SIPRI (Stockholm International Peace Research Institute – the world's leading research institute on disarmament), Macquarie University's Department of Security Studies (one of Australia's largest institutions for the training of security professionals) and other institutions, such as: King's College London, the University of São Paulo, the International Institute of Strategic Studies (IISS, London), the Australian Defence Force Academy/University of New South Wales (Canberra), the Australian Strategic Policy Institute, Bradford University, the Doha Institute for Graduate Studies (Qatar), the University of Sydney,

Nanyang Technological University (Singapore), the US Naval War College, Tufts University, the African Centre for Constructive Resolution of Disputes (ACCORD), the Norwegian Institute for Defence Studies, the Research and Information Group on Peace and Security (Brussels), Universidade Federal de Santa Catarina (Brazil), Hampshire College (USA) and the Center for Strategic and International Studies (CSIS) in Washington, USA.

This work has 26 chapters and is divided into four sections. The first section consists of this chapter, which provides an overview of the international arms trade. This is followed by the second section which has seven chapters and examines the key drivers and causes of the arms trade. Chapter 2, by Andrew Tan, examines the key drivers of the trade in international arms, such as: the technological imperative (a key independent variable); the presence of actual or potential interstate conflict due to significant tensions between states and the presence of territorial disputes; the process of globalisation which has driven global commerce and enhanced the importance of the sea thus leading to a greater emphasis on maritime security; Asia's dramatic economic growth in recent decades, which has enabled some states in the region to procure expensive, state-of-the-art weapons systems; the perceived need for defence self-reliance, which has led to the proliferation of local defence industries around the world; rising great powers which have joined traditional great powers in acquiring the expensive symbols of power such as large aircraft carriers and nuclear ballistic missile submarines; the impact of corruption, which is probably a much more significant factor than has been previously acknowledged; and the requirements for internal security, which generates its own demand for weapons, albeit mostly of the Small and Light Weapons (SLW) variety. According to Tan, these myriad and complex mix of factors explain the current international arms trade.

This is followed by Chapter 3, which examines the future of deterrence and the arms trade, written by Adam Lockyer. According to him, in the last half century or so, most countries have become increasingly reliant upon the international arms trade to build and sustain their defence forces, rather than redirecting domestic industry towards arms production. This has had a profound and understudied impact on traditional deterrence theory. His chapter thus examines immediate, general and extended deterrence strategies in these changed circumstances and focuses on the arms trade between the US and Taiwan in the context of an increasingly formidable China as a case study.

Magnus Petersson is the author of Chapter 4, entitled "Small State Survival Strategies and the Arms Trade". According to Petersson, small states are often viewed as "victims" in the international system, unable to take responsibility for their own security and being in the hands of the great powers' power politics. In the business of arms trade, it has been argued that this asymmetric relationship between small states and great powers is even more evident. However, Petersson argues that the reality is more complex. His chapter article attempts to demonstrate how small states can also apply armament policies as an element in their wider grand strategies, to increase security and survival in the international system. In the chapter, a small state's armament policy is analysed through three dimensions: political-strategic, technological and economic.

Chapter 5, by SIPRI's Nan Tian, examines the inter-relation between the arms trade, military expenditure and armed conflict. In 2020 the Stockholm International Peace Research Institute identified that over the period 2015–19 there were 68 countries that exported weapons and 161 arms importers. Yet, while almost every single country in the world either buys or sells weapons, there has been limited research and teaching on the topic of arms trade. Seeking to explain whether military expenditure and armed conflict are drivers of the trade of major

convention weapons, this chapter offers a much-needed summary on the complexities in the inter-relation between arms trade, military spending and armed conflict. Nan Tian provides an overview of the theoretical literature on the arms trade, discussing the intricacies of models and touching on both the demand, supply and security aspects of the arms trade. The chapter then explores the arms trade and its relationship between armed conflict and military spending separately, stressing the complications in each literature. It shows that military expenditure and armed conflict are not straight forward drivers of arms trade. Instead, both variables can be on either side of the equation, a consequence of arms trade or a driver of arms trade. An in-depth summary of the arms trade literature from the perspective of these two variables helps researchers understand the various dynamic relations at play when contributing to the literature and cautions superficial analysis that seems to show one type of relationship. With the development of empirical techniques and improved data, this chapter suggests some useful avenues for future research.

Chapter 6, entitled “Technological Change, Future Wars and the Arms Trade”, is written by Malcolm Davis. According to him, the strategic outlook for the 2020s will be dominated by intensifying strategic competition between the US and its allies against authoritarian major powers such as China and Russia. This is shaping a focus on new types of military technology that will shape the future of war. This chapter initially explores a spectrum of capabilities, ranging from the non-kinetic “political warfare” that is waged in the grey zone at a level below that which would justify a military response, through to three major step changes in military technology. It explores the growing importance of space and cyberspace as military domains, and then considers the role of AI and autonomous systems as a means to reintroduce mass through swarming, and finally explores the role of speed in warfare, considering hypersonic and directed-energy weapons. It examines these three aspects of future war against the operational context of a potential war between China and the United States, and considers the implications of anti-access and area denial (‘A2AD’) capabilities to undermine US ability to project forward presence into Asia, suggesting the possibility of a “Midway Moment” in military affairs as new technologies challenge traditional approaches to the use of force. The paper concludes by noting the potential for the rapid proliferation of these technologies via the arms trade, in a manner which could lead to fundamental shifts in geopolitical affairs.

This is followed by Chapter 7, which examines corruption in the arms trade, an under-appreciated and under-researched driver of the phenomenon. According to its author, Sam Perlo-Freeman, the international arms trade is one of the sectors of international trade most prone to corruption. In fact, in some sectors of major weapons systems, it appears to be almost ubiquitous. This is a factor of several features of the arms trade: the very large value of some deals, which means that even a small percentage bribe can have a life-changing impact; the technical complexity of deals, allowing bribes to be concealed within a complex overall package; the secrecy of arms deals and the general lack of transparency in matters related to national security; the crowded nature of the arms market, where a large number of countries seek to maintain their own autonomous arms production capabilities, competing for a relatively small number of major deals; and the status of the arms industry and trade as being seen as a matter of key strategic importance, with top political leaders frequently involved in both sides of major deals. According to Perlo-Freeman, the proceeds of arms trade corruption are frequently used for political finance, such as in funding political parties, election campaigns and sustaining political patronage networks, in both buyer and seller countries. The political importance of the arms trade has also tended to shield arms companies from meaningful legal consequences

for corruption, although there are signs that this may be changing, with increasingly large fines imposed on companies in certain cases. The US has a stronger record in this than most other countries, although major gaps remain. In particular, offsets remain a major corruption vulnerability in the arms trade, offering a greater level of distance and deniability between the exporting company and the corrupt benefits derived by recipients of offset transactions, potentially making detection and prosecution even more difficult than with direct bribes.

Section II of this work concludes with an econometric study by Hamid E. Ali entitled “Natural Resource Rents and Military Expenditures in the Middle East and North Africa: A Long-Run Perspective”. This chapter aims to investigate the long-run relationship between military expenditure and natural resource rents for 17 countries in the MENA region from 1960–2016. Using panel co-integration analysis, the results of the Dynamic Ordinary Least Squares (DOLS) and Fully Modified Least Squares (FMOLS) suggest the existence of a positive and statistically significant long-run co-integrating relationship between military expenditure and natural resource rents, particularly oil and forest rents, for the group of countries considered. According to the author, a 1 percent change in oil rents leads to a 0.4 percent increase in military expenditure per capita. The analysis reveals that acquiring weapons in the name of national security not only distorts efficiency in allocating resources, but also deprives society of vital resources for economic development.

Section III of this work examines defence spending and procurement in the major arms markets. All the regions in the world are covered, namely, Asia, Europe, Middle East, Africa and Latin America. There are also chapters focusing on five states in particular, i.e. the United States (the world’s top spender on arms), China (which has the world’s second largest defence budget), India (the world’s top importer of arms from 2009–2018) and two significant arms exporters, namely Russia and the UK.

The first chapter in this section (namely, Chapter 9) is on US defence spending and procurement – the United States being the world’s largest spender on defence. Written by Seamus P. Daniels, this chapter addresses trends in the United States’ defence budget from the end of World War Two to the present as well as the current outlook for US defence spending. It assesses US defence budget cycles in historical context and identifies trends in end strength, force structure and spending by title. It also discusses the impact of the Budget Control Act of 2011 on defence spending. In addition to this analysis, the chapter focuses on the alignment of the defence budget with the 2018 National Defense Strategy and its goal of modernizing the US military for strategic competition with China and Russia. The chapter concludes with a discussion of major acquisition priorities and the outlook for US defence spending given the current fiscal and budgetary environment.

Chapter 10, by Yves-Heng Lim, focuses on China’s defence spending and procurement. According to Lim, China’s military apparatus has undergone a radical transformation since the end of the Cold War. In three decades, the People’s Liberation Army has transformed into a major player in the East Asia and Asia-Pacific region, second only to the United States. This transformation has been supported by a massive investment in the modernization of China’s armed forces that has allowed the PLA to achieve generational leaps in the platforms and weapons it deploys. In this chapter, Lim examines the trajectory of China’s defence spending and the evolution of the PLA’s acquisition patterns in the last 30 years. It first clarifies the scope of Beijing’s investment in the Chinese military apparatus, in a context where the pervasive lack of transparency continues to generate major uncertainties. Focusing on sea, air

and missile capabilities, the chapter then examines changes in the PLA's patterns of acquisition, showing a decreasing reliance on foreign suppliers and a maturation of China's domestic production.

Chapter 11 focuses on India's defence spending and procurement, and is written by Rahul Roy-Chaudhury and Viraj Solanki. According to the authors, India's defence budget of US\$60.5 billion in 2019 was the fourth largest in the world. However, over half was spent on salary and pensions (US\$33.3 billion), as it had the world's largest standing army after China. As a result, only a quarter of the defence budget (US\$15.2 billion) could be allocated to the capital sector (including funding for new arms and equipment), which was lower than spending on defence pensions. As a result, the modernization programmes of all three armed forces have suffered, even though India was the world's second largest importer of major arms between 2014–18. Moreover, significant delays have taken place in the flagship "Make in India" initiative for defence. The authors thus conclude that this has affected the defence preparedness of India's armed forces operating in an increasingly complex and volatile neighbourhood.

Chapter 12, written by Petr Topychkanov, focuses on Russia's Defence Spending and Procurement. An analysis of Russia's defence spending and procurement suggests that its military policy is still oriented toward confrontation with the United States and NATO. The national military priorities largely contradict the economic interests of the country, and recent military reforms have not removed this contradiction. The mechanism for developing decisions on military programs, however, remains unclear, since these issues are discussed in a completely secret manner. In the context of military planning, when the task is to prepare for wars of any type and with any opponents, various lobbyist groups, personal connections at the highest level and random emotional factors can become influential. The failures of all previous armament programs and the lack of a free market for high-tech domestic technologies in Russia do not permit large defence enterprises to be left without state orders. However, the state defence industry does not merely exist as an instrument for equipping the armed forces, but also supports other industries, with cities and social infrastructure being dependent upon it. As such, it has been prioritised and given state support to ensure that they remain viable.

Chapter 13 examines the UK's defence spending and procurement, and is written by Andrew Dorman and Matthew Uttley. The chapter investigates the determinants of United Kingdom (UK) defence budget setting and the performance of its weapons acquisition process. The analysis identifies the perennial tensions between the UK's aspiration to remain a "Tier One" military power and the financial resources necessary to retain this status against the backdrop of its relative decline as a global power since 1945. It focuses on how this factor has affected UK defence procurement choices, defence industrial strategies and reforms to the weapons acquisition process intended to align the "ends" of defence policy with the necessary budgetary "means". The primary conclusion is that the UK's post-2010 defence procurement reforms have failed, thus far at least, to remedy the recurring affordability challenges the UK has confronted in sustaining its Tier One status as a military power.

Chapter 14, written by Andrew Tan, examines Asia's defence spending and arms procurement. According to Tan, Asia's steady economic rise and the accompanying increase in military expenditure has led to the problem of the uncontrolled proliferation of conventional arms in the region. The key trends include: the acquisition of new capabilities where none had existed in the past; the acquisition of the latest and most sophisticated military technologies; the emphasis on naval power projection in the form of expanded maritime power; the renewed emphasis on airpower; and enhancements to land power. This increase in military power

projection capabilities has accentuated security dilemmas, in turn increasing the potential for misperceptions, miscalculations and accidental war. This suggests the urgent need for arms control and other confidence-building measures in order to ameliorate the consequences of Asia's relentless arms build-up.

Chapter 15, by Lucie Béraud-Sudreau, is entitled "From Economic to Strategic Crisis: European Military Expenditure and Procurement in the 2010s". According to Béraud-Sudreau, after the financial crisis of 2008, European military expenditure dipped. However, a change in the security environment and threat perceptions of Europeans, following Russia's annexation of Crimea in 2014, generated a new political consensus in favour of increased military spending. In a decade, the levels of military expenditure returned to their pre-financial crisis levels. However, even though the trend is general throughout the continent, defence policy priorities still differ widely, which is reflected in the procurement patterns of European states. While some are readying to face a peer-to-peer threat on their territory, others look to maintain capabilities across the spectrum of crises including power projection capabilities. This lack of alignment means that efforts for more joint programmes and acquisitions could remain limited, unless broader common defence policy objectives are agreed on.

Chapter 16, by Riad Alsalam Attar, focuses on defence spending and procurement in the Middle East and North Africa. According to Attar, since the early 1980s tensions and conflicts have increased across the Middle Eastern region. The turbulent situation in the region caused an increase in military expenditure and changes in the dynamic of procurement. In particular, the competition for regional hegemony has brought on a regional arm race. The rise of Islamist radicalism led to illicit global arm trade sponsored by regional hegemons. Military spending beyond reasonable limits have also been caused by autocratic regimes and poor institutional controls. In addition, an extra burden on military spending has emerged from poor procurement strategies.

Chapter 17, by Martin Revayi Rupiya, examines defence expenditure and procurement in Africa. According to Rupiya, African military expenditure as a percentage of GDP has been in decline during the last decade, until it increased due to competing developed nations offering through soft loans, debt relief or outright "free-grants". Procurement has included combat aircraft, mobile artillery, tanks, armoured troop carriers and communications vehicles, and individual soldier equipment, in countries such as Egypt, Niger, Burkina Faso, Chad and Djibouti, amongst others. The question then naturally arises that, to what extent are the recipient African member states able to repay the loans? This development has shown the limits of African national sovereignty versus international interests reflecting in the nature and character of contemporary rearmament. Rupiya argues that some African armies have become extensions of foreign military powers serving on the periphery.

The final chapter in Section III (Chapter 18) examines defence spending and procurement in Latin America and is written by Rafael Duarte Villa and Juliana Viggiano. According to the authors, military spending and procurement in Latin America have risen since the 2000s. This chapter shows that the modernization of military equipment contributed to the rise in defence expenditures, although in a moderate fashion. Favourable macroeconomic circumstances, increasing internal violence as well as functional and political adjustments of military institutions were contributing factors to the rise in military spending. This trend, however, seems to have no implications for prospects of interstate war in the region since arms spending has taken on a more symbolic and political character. The increasing involvement of the armed

forces in internal security issues, though, could represent a potential new security dynamic for Latin America.

The fourth and final section examines some of the key issues in the international arms trade. It consists of chapters on US grand strategy and arms exports by Paul J. Smith, the problems and prospects for China's defence industry by Jingdong Yuan, the future of Europe's defence industries by Aude-E. Fleurant and Yannick Quéau, bloc obsolescence of European air power by Ian Anthony, the future of naval power by Swee Lean Collin Koh, emerging technologies and the arms trade by Michael T. Klare and Andrew Tan, and the revolution of autonomous systems and its implications for the arms trade by Austin Wyatt and Jai Galliot. This section of the book concludes with a chapter by arms control expert Owen Greene, who examines the problems and prospects for the control of conventional arms.

Chapter 19, by Paul J. Smith, examines arms exports and US grand strategy. US arms exports are a key element of US foreign policy. Such exports advance US national interests in at least three major areas: the tendency of such exports to promote military interoperability and to improve defence capacity among allies; the propensity for such exports to solidify political relationships with countries that advance US geopolitical goals; and the economic advantages that accrue from such exports, particularly as they facilitate maintenance of America's defence industrial base. Two major mechanisms for US arms exports are Foreign Military Sales (FMS) and Direct Commercial Sales (DCS). In addition to exploring the US legal regime associated with arms transfers, the chapter examines the issue in the context of specific countries or political entities, namely Saudi Arabia, India, Turkey, Afghanistan and Taiwan.

Chapter 20, written by Jingdong Yuan, focuses on China's the accomplishments and future challenges of China's defence industrial base. For over six and half decades, China has built a defence industrial complex that is comprehensive in its ability to manufacture and provide a broad range of conventional and nuclear weapons systems to its military. The past two decades have witnessed major reforms being conceived and implemented to enable it to overcome some of the bottlenecks and deficiencies, and make advances in a number of sectors such as shipbuilding, missiles and space, and to some extent, military aviation. This chapter reviews and analyses China's defence industrial base from its beginning in the mid-1950s to the present. Specifically, it evaluates its major achievements and challenges since the 1990s and assesses its future trajectory and prospects. It argues that China's defence industry is among the world's top-tier cohort in terms of sales and revenues but still lags significantly behind its counterparts in terms of innovation, management, productivity and the ability to produce the most sophisticated weapons systems.

Chapter 21 examines Europe's defence industries and is written by Aude-E. Fleurant and Yannick Quéau. This chapter covers three decades of European arms industry evolution, from the 1990s to the 2010s. For each decade, it presents major defence and security developments at the regional and national level, their impacts on the arms industry as well the arms industry influence on procurement plans and projects as well as its proximity with the national MOD. The three-decade review highlights the importance attributed to the production of armaments by European states, as well as the intertwined relationships between the states and their national arms companies. The chapter also shows that despite 30 years of development in the security environment, national military markets continue to display long-standing characteristics, such as persistent fragmentation of arms production along national borders leading to competition between European suppliers, very close relationships between the national MOD and domestic companies, continued priority of self-sufficiency and significant companies influence

and agency in the national market, pushing agendas for more domestic programmes and for exports. The conclusion explores whether the late 2010 major modernization programmes announced in cooperation will materialize and the costs associated to these projects.

Chapter 22 is entitled “Bloc Obsolescence: Case Study of European Air Power”, and is written by Ian Anthony. After a prolonged period of limited investment European states are launching programmes to modernize the air power that plays a pivotal role in modern conflict. These programmes will impact on the force structures and capabilities of European states for several decades to come. National procurement must fit with collective defence needs in a coherent manner, and deliver capabilities within a relatively short time frame. However, while choices are constrained by what is available and affordable today, the ways in which air power is delivered are changing. The level of investment needed to build the next generation of air power will promote joint projects implemented by increasingly integrated trans-national companies. However, European states need to continue thinking about how these new capabilities will be used in defence cooperation frameworks that still emphasize coordinating national armed forces. The computing power and digital communication systems on aircraft in future could process and fuse data such that tactical command and control, counter air and interdiction missions are planned as well as implemented more quickly at lower command levels. In future “optionally manned” aircraft armed with precision-guided stand-off missiles could operate in tandem with unmanned air vehicles carrying a variety of payloads and a “swarm” of relatively small and relatively cheap unmanned systems carrying kinetic and non-kinetic weapons along with a range of sensors and communication capabilities.

Chapter 23 examines the future of naval power and the arms trade, and is written by Sweet Lean Collin Koh. This chapter uses a quantitative, cross-regional method to examine trends and patterns of the naval arms trade. It sheds light on the different priorities between four distinct regions, namely the Asia-Pacific, Latin America, Middle East and North Africa, as well as Europe and North America, in their naval force development processes. The findings of this chapter demonstrate that, first, naval modernization does not take place across all categories of systems. There is clearly a trade-off underpinned by prevailing priorities – funding and strategic – for certain naval assets over the other. Second, naval modernization is also dependent on the threat perceptions and underlying doctrines of different countries in different regions, which gives rise to the need to view certain platform acquisitions and quantitative increases in perspective. Finally, this chapter argues for the need to look beyond naval recapitalization – that is, more than just acquiring hardware and software, it is equally important for governments and navies to emphasize force capacity and readiness, especially given the contemporary challenges faced especially by advanced navies over manpower constraints.

Chapter 24 focuses on emerging technologies and the arms trade. Written by Michael T. Klare and Andrew Tan, this chapter set out to examine the technological factor in the arms trade, and argues that the technological imperative, as an independent variable, remains a compelling dynamic that is driving the trade in arms though its impact on budgets and procurement priorities, at least amongst the biggest defence spenders. Moreover, recent geostrategic developments, which have led to the emergence of great power competition involving the United States on the one hand and China and Russia on the other, have added increased potency to the search for military transformation through emerging technologies that could provide the crucial strategic edge. The emergence of new technologies, comprising those of a dual-use character with military applications and those developed primarily for military use, will have a substantial impact on the nature and conduct of war. Yet, an important caveat must be that

while the technological imperative remains a key driving force in the arms trade amongst some of the great powers, not all countries in the world will be able or even want to acquire the latest military technology.

Chapter 25, entitled “The Revolution of Autonomous Systems and its Implications for the Arms Trade”, is written by Austin Wyatt and Jai Galliot. Beyond the – admittedly significant – ethical, moral and legal issues raised by increasingly autonomous and remote-operated weapons, it is also important to consider the question of how the proliferation of increasingly Autonomous Weapon Systems (AWS) would influence and, in turn, be propagated by the global arms trade. As the core enabling technologies for AWS (chiefly various forms of AI) mature, the barriers of entry for potential adopters will continue to fall. The negative consequences of terrorist groups gaining the capacity to remotely strike previously protected targets, of insurgents to offset the traditional military advantages of states, or of smaller states to interfere in the domestic affairs of their neighbours, are becoming increasingly clear. This chapter demonstrates that the avenues for AWS proliferation are already in place and argues that, short of an increasingly unlikely pre-emptive ban under international law, policymakers must act to establish the mutual understandings, definitional agreements and bilateral control regimes that will be necessary to limit the negative impacts of uncontrolled AWS proliferation.

This work concludes with Chapter 26, written by arms control expert Owen Greene. Although many conventional arms control agreements only have limited and indirect significance for the arms trade, an important feature of developments since the 1990s has been the substantial strengthening of international commitments and programs on arms transfer controls. Recently, underlying geostrategic shifts plus tensions with Russia have created a sense of crisis in some aspects of conventional arms control. However, there are good grounds for expecting that the present set of international agreements relevant to the arms trade retain sufficient international support to continue to be significant, even if the prospects for negotiating further agreements are not good for the foreseeable future. The combined effects of this set of global conventional arms agreements have been significant in terms of developing norms, capacities and cooperation mechanisms to enable improved national controls on arms transfers and to facilitate confidence-building and transparency measures. There is substantial evidence that many countries now conduct more systematic risk assessments before authorising transfer licences, and that denials of licences for problematic transfers to fragile, authoritarian or conflict-affected areas became more common during the two decades since the early 1990s, though in recent years these trends may have stalled. This does not imply that there has been an overall increase in restraint: it is still predominantly a buyers’ market, and there are often alternative suppliers willing to turn a blind eye to risks of misuse, destabilisation or diversion to illicit markets. Moreover, continuing tolerance of diversion risks by many governments, combined with wide corruption and fragile stockpile security in some regions, means that there continue to be major problems in this area.

REFERENCES

1. The author gratefully acknowledges the contribution of all other contributors to this volume, who provided chapter abstracts which form part of this chapter article.
2. Butty, James (2010), “A New Study Finds Death Toll in Congo War too High”, *Voice of America*, 20 January, www.voanews.com/africa/new-study-finds-death-toll-congo-war-too-high, accessed 1 August 2019.

3. BBC (2019), "Rwanda Genocide: 100 Days of Slaughter", 4 April, www.bbc.com/news/world-africa-26875506, accessed 1 August 2019, and United Nations (2005), Responsibility to Protect, www.un.org/en/genocideprevention/about-responsibility-to-protect.shtml, accessed 1 August 2019.
4. SIPRI, *SIPRI Arms Transfers Database*, www.sipri.org/databases/armstransfers, accessed 6 November 2019.
5. IISS (2020), *The Military Balance 2020* (London: IISS), 21.
6. SIPRI, *Military Expenditure by Region in Constant US Dollars, 1989–2018*, www.sipri.org/sites/default/files/4_Data%20for%20world%20regions%20from%201988%E2%80%932017.pdf, accessed 5 November 2019.
7. Tan, Andrew T.H. (2014), *The Arms Race in Asia: Trends, Causes and Implications* (London: Routledge), 8–10.
8. Mizokami, Kyle (2019), "Russia's New Hypersonic Weapon Flies at Mach 27", 30 December, www.popularmechanics.com/military/weapons/a30346798/russia-new-hypersonic-weapon-mach-27/, accessed 5 February 2020. See also BBC (2019), "In Pictures: China Shows off Military Might at 70th Anniversary Parade", 1 October, www.bbc.com/news/world-asia-china-49891769, accessed 5 February 2020.
9. United Nations (1992), "United Nations Convention on the Law of the Sea", www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf, accessed 1 August 2019.
10. Tan, Andrew T.H. (2014), *The Arms Race in Asia: Trends, Causes and Implications* (London: Routledge), 138.
11. Cole, J. Michael (2017), "The Third Taiwan Strait Crisis: The Forgotten Showdown Between China and America", *The National Interest*, 10 March, accessed 1 August 2019.
12. Tan, Andrew T.H. (2014), *The Arms Race in Asia: Trends, Causes and Implications* (London: Routledge), 105–150.
13. See Buzan, Barry (1987), *An Introduction to Strategic Studies: Military Technology and International Relations* (London: Macmillan).