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# The Global Arms Trade
## A Handbook

Editor: Andrew T. H. Tan

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Routledge
Taylor & Francis Group
LONDON AND NEW YORK

First published 2010 by Routledge

Published 2014 by Routledge

2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN
711 Third Avenue, New York, NY 10017 USA

*Routledge is an imprint of the Taylor & Francis Group, an informabusiness*



ISBN 978-1-85743-497-2 (hbk)
ISBN 978-0-203-85145-6 (ebk)

*Europa Development Editor:* Cathy Hartley



Typeset in 10/11.5pt Baskerville by Taylor & Francis Books

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# Acknowledgements

The editor wishes to acknowledge the invaluable assistance rendered by several individuals who helped to locate and put the team of writers together. Elisabeth Sköns of the Stockholm International Peace Research Institute (SIPRI) was generous with her time and contacts in locating highly specialized writers for several important topics, and also recommended several of her colleagues at SIPRI to participate in this project. Victor Sumsky suggested Alexander Pikayev to write the important chapter on Russia. Eunsook Chung introduced Yong-sup Han to write the chapter on North Korea. My colleague at the University of New South Wales, Jeffrey Levey was kind with his suggestions and contacts which led to the participation of several top analysts from Israel.

The editor wishes especially to thank Cathy Hartley (Europa Development Editor at Routledge), who has done an immense and superb job in overseeing the editing and production of this important volume. Indeed, this work would not have been possible without Cathy's support, encouragement and vision, which led to the commissioning of this work. The editor also wishes to acknowledge Professor Michael Rainsborough, Department of War Studies, King's College London, for his valuable support and advice for this project, which has been much appreciated.

The most important contribution comes from the writers themselves, who took the time and effort to write superb chapter contributions for this volume. The writers are as follows: Riad A. Attar, Desmond Ball, Sibylle Bauer, Richard A. Bitzinger, Mark Bromley, Michael Brzoska, Malcolm R. Davis, J. Paul Dunne, Iñigo Guevara, Yong-sup Han, You Ji, Andrew D. James, Ephraim Kam, Yaacov Lifshitz, Harsh V. Pant, Malcolm Hugh Patterson, Sam Perlo-Freeman, Alexander A. Pikayev, Martin Rupiya, Elisabeth Sköns, Thomas Teichler, Mehmet Uye, Brad Williams, Siemon T. Wezeman and Isaiah Wilson, III.

The editor also wishes to thank the University of New South Wales for providing the needed support for this project. As recipient of the Strategic Priority Fund, the editor was exempted from teaching in order to undertake projects such as this. The editor wishes especially to thank the following individuals from the university for their invaluable support: Professor James Donald, Dean of the Faculty of Arts; Professor Roger Bell, Convenor for International Studies (until June 2009); Associate Professor Rogelia Pe-Pua, Head of the School of Social Science and International Studies; and Professor Mark Wainwright, former Vice-Chancellor.

The editor wishes to add his personal appreciation to loved ones who have provided so much support and encouragement for his endeavours. They include his mother, sister Lily, and his beloved wife, Angela Wong. Without family and God, we are truly nothing.

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University of New South Wales
October 2009

# Foreword

The global arms trade is an important, but under-researched, area of academic enquiry. Despite the end of the Cold War, arms expenditure as well as arms procurement have not, as a whole, declined. Instead, the trends suggest that aside from Western Europe, the rest of the world has not reaped a peace dividend from the end of the Cold War. Globally, the increase in military expenditure has led to the procurement of increasingly sophisticated weapons systems as well as the refurbishment of old ones. This has ensured the continuation and expansion of the global arms trade. The international supply of arms is also backed by the existence of a sophisticated arms industry that has gradually become a globalized industry.

Some key questions include: What have been the trends in arms procurement? What accounts for defence procurement? What are the key issues in arms procurement? What are the future prospects for the global arms trade? How has the arms industry adapted to the end of the Cold War and the emergence of globalization? Furthermore, what are the key issues in the global arms trade?

Some key issues that come to mind include: the trade-off between defence spending and development, the undue influence of the 'military industrial complex', the control of the proliferation of conventional arms, insurgencies and their impact on arms procurement, the privatization of force, and future war and weapons systems.

Written by a team of international arms experts, *The Global Arms Trade: a handbook* is divided into sections that examine the demand for arms, the supply of arms and the key issues in the global arms trade. Although this is a refereed volume, its comprehensive and in-depth treatment of the subject will make this a standard reference for years to come. This volume is 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 arms trade.

Andrew T. H. Tan
University of New South Wales
October 2009

# Abbreviations

| | |
|---|---|
| AA | anti-aircraft |
| ACDA | Arms Control and Disarmament Agency |
| AFCON | Advanced Frigate Consortium |
| AIFV | Advanced Infantry Fighting Vehicle |
| AIP | air independent propulsion |
| AMRAAM | advanced medium-range air-to-air missile |
| AOI | Arab Organization for Industrialization |
| APC | armoured personnel carrier |
| APM | anti-personnel mines |
| ASAT | anti-satellite |
| ASEAN | Association of Southeast Asian Nations |
| ASTOVL | advanced short take-off and vertical landing |
| ASW | anti-submarine warfare |
| ATE | Advanced Technologies and Engineering |
| ATT | Arms Trade Treaty |
| ATR | Avions de Transport Régional |
| AWAC | Airborne Warning and Control |
| BAE | British Aerospace |
| BBC | British Broadcasting Corporation |
| BGT | Bodenseewerk Geratetechnik |
| BMD | ballistic missile defence |
| bn | billion |
| BVR | beyond visual range |
| BWC | Biological and Toxin Weapons Convention |
| C4ISR | command, control, communications, computers, intelligence, surveillance and reconnaissance |
| C4ISTAR | command, control, communications, computers, intelligence, surveillance, target acquisition and reconnaissance |
| CASA | Construcciones Aeronauticas SA |
| CCM | Convention on Cluster Munitions |
| CFE | Treaty on Conventional Forces in Europe |
| CFSP | Common Foreign and Security Policy |
| CIA | Central Intelligence Agency |
| COCOM | Co-ordinating Committee for Multilateral Export Controls |
| COMINT | communications intelligence |
| COTS | commercial off-the-shelf |
| CPI | Consumer Price Index |
| CSIS | Center for Strategic and International Studies (Washington) |
| CVF | Carrier Vessel Future |

| | |
|---|---|
| CWC | Chemical Weapons Convention |
| DASA | DaimlerChrysler Aerospace |
| DEW | directed energy weapons |
| DIB | defence industrial base |
| DIO | Defence Intelligence Organisation |
| DoD | Department of Defense (USA) |
| DPRK | Democratic People's Republic of Korea |
| EAC | European Airlift Centre |
| EADS | European Aeronautic Defence and Space |
| ECAP | European Capability Action Plan |
| ECJ | European Court of Justice |
| ECM | electronic counter-measures |
| ECOWAS | Economic Community of West African States |
| ECSC | European Coal and Steel Community |
| EDA | European Defence Agency |
| EDC | European Defence Community |
| EDEM | European Defence Equipment Market |
| EDSP | European Defence and Security Policy |
| EEC | European Economic Community |
| EEZ | Exclusive Economic Zone |
| EFTA | European Free Trade Association |
| ELINT | electronics intelligence |
| EU | European Union |
| EW | electronic warfare |
| FCS | Future Combat System |
| FDI | Foreign Direct Investment |
| FREMM | Frégates Européennes Multi-Missions |
| FY | Fiscal Year |
| GAO | Government Accountability Office |
| GDP | gross domestic product |
| GNP | gross national product |
| HIPC | highly-indebted poor countries |
| HPW | high power microwave |
| IADS | Integrated Air Defence System |
| IAI | Israel Aerospace Industries |
| ICC | International Criminal Court |
| IDF | Israel Defence Forces |
| IDP | internally-displaced persons |
| IEPG | Independent European Program Group |
| I&EW | information and electronic warfare |
| IFSEC | (USA-Japan) Industry Forum for Security Co-operation |
| IFV | infantry fighting vehicle |
| IGAD | Intergovernmental Authority on Development |
| IHI | Ishikawajima-Harima Heavy Industries |
| IISS | International Institute for Strategic Studies |
| IMF | International Monetary Fund |
| IMI | Israel Military Industry |
| IRBM | intermediate-range ballistic missile |
| ISI | Inter-Services Intelligence |
| JADI | Japan Association of Defence Industry |
| JDA | Japan Defence Agency |

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| JSDF | Japan Self-Defence Force |
| JSF | Joint Strike Fighter |
| km | kilometre(s) |
| LCA | Light Combat Aircraft |
| LFK | Lenkflugkorpersysteme GmbH |
| m. | million |
| M&A | mergers and acquisitions |
| MANPADS | man-portable air defence systems |
| MAST | Micro Autonomous Systems and Technology |
| MBDA | Matra BAE Dynamics Alenia |
| MBT | main battle tank |
| MCO | Major Combat Operations |
| MHI | Mitsubishi Heavy Industries |
| MIC | military-industrial complex |
| MoD | Ministry of Defence (United Kingdom) |
| MRAP | mine-resistant ambush-protected |
| MRBM | medium-range ballistic missile |
| NATO | North Atlantic Treaty Organization |
| NCW | network-centric warfare |
| NDPG | National Defence Program Guidelines |
| NGO | non-governmental organization |
| NIC | National Intelligence Council |
| nm | nautical mile(s) |
| NPDO | National Defence Program Outline |
| NPT | Nuclear Non-Proliferation Treaty |
| OAS | Organization of African States |
| OCCAR | Organisation Conjointe de Coopération en Matière d'armement |
| OMB | Office of Management and Budget |
| OODA | observe, orient, decide, act |
| OPEC | Organization of the Petroleum Exporting Countries |
| OSCE | Organisation for Security and Co-operation in Europe |
| PAAMS | Principal Anti-Air Missile System |
| PFI | Private Finance Initiative |
| PGM | precision-guided munition |
| PhD | Doctor of Philosophy |
| PLA | People's Liberation Army |
| PLO | Palestine Liberation Organization |
| PMSC | private military and security contractor |
| PNA | Palestinian National Authority |
| PPP | purchasing power parity |
| PSC | Peace and Security Council |
| QDR | Quadrennial Defense Review |
| RDT&E | research, development, test and evaluation |
| RECAMP | Reinforcement of African Capacity to Maintain Peace |
| RMA | Revolution in Military Affairs |
| ROK | Republic of Korea |
| RPV | rocket-propelled launcher |
| SALW | small arms and light weapons |
| SAM | surface-to-air missile |
| SIC | Standard Industrial Classification |
| SIGINT | signals intelligence |

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| SIPRI | Stockholm International Peace Research Institute |
| SLBM | submarine-launched ballistic missile |
| SLOC | sea lines of communications |
| SLV | space launch vehicle |
| SME | small and medium-sized enterprises |
| SRBM | short-range ballistic missile |
| SRO | stability and reconstruction operations |
| SRSAM | short-range surface-to-air missile |
| SSTR | stability, security, transition, reconstruction |
| TMD | Theatre Missile Defence |
| TRP | Technology Reinvestment Programme |
| UAV | Unmanned Aerial Vehicle |
| UCAV | Unmanned Combat Air Vehicle |
| UK | United Kingdom |
| UN | United Nations |
| UNODA | United Nations Office for Disarmament Affairs |
| UNSC | United Nations Security Council |
| US(A) | United States (of America) |
| WAPT | Wadi-Araba Peace Treaty |
| WEAG | Western European Armaments Group |
| WEAO | Western European Armaments Organisation |
| WEU | Western European Union |
| WMD | weapons of mass destruction |

# Part I

# Introduction

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# 1 The global arms trade

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## The global arms trade phenomenon

The global arms trade is a phenomenon that deserves special attention and in-depth analyses. It is a massive global industry that is built on the foundation of strong and continuing demand arising from military expenditure that includes the procurement of new weapons systems and the refurbishment of old ones.

According to the authoritative Stockholm International Peace Research Institute (SIPRI), world military expenditure in 2007 totalled an estimated US$1,339 billion. Over the 10-year period from 1998 to 2007, world military spending increased by 45% in real terms. The biggest increases in military spending occurred in a number of regions: Eastern Europe (particularly Russia), North America (mainly the USA), the Middle East (the Gulf States, Iran, Jordan and Lebanon), South Asia (mainly India), North Africa (led by Algeria), and East Asia (led by the People's Republic of China with its 202% increase, Indonesia and Malaysia). Both Western Europe and Central America recorded the lowest increase in military expenditure over the same 10-year period. Military expenditure by the top 15 countries alone accounted for 83% of total world military spending, with the USA leading the way with 45% of total world military spending (SIPRI Yearbook 2008, 175–8). Excluding domestic sales, global arms exports were estimated at $45.6 billion in 2006 (SIPRI Yearbook 2008, 295). During the period 2003–07, the USA was the world's leading supplier of major conventional arms, with a share of 31% of global arms exports, followed by Russia, Germany, France, the United Kingdom (UK) and the Netherlands. Other significant arms supplying nations during this period included Italy, Sweden, China, Ukraine, Spain, Israel and Canada, all of which exported more than $1 billion in arms over 2003–07. During the same period, the major recipients of conventional arms transfers were, in order of rank, China, India, the United Arab Emirates (UAE) and Greece, which all bought more than $7 billion in arms. This was followed by states that bought more than $3 billion in arms, namely the Republic of Korea (South Korea), Israel, Egypt and Australia (SIPRI Yearbook 2008, 321–5).

What is significant has been the fact that globally, arms expenditure as well as arms procurement have not declined despite the end of the Cold War in the early 1990s. The figures and trends instead indicate that whilst there have been declines in Western Europe, much of the rest of the world has seen increased military expenditure accompanied by the procurement of weapons systems that are also increasingly sophisticated. In turn, this has helped to sustain the global arms trade. A summary of the defence economics of various key regions in the 2008 edition of the authoritative Military Balance, published by the International Institute for Strategic Studies (IISS), reveals the continued salience of arms and military deterrence. The USA has led the way, with a steady increase in military expenditure since 2001. As a percentage of gross domestic product (GDP), defence expenditure increased from 3.02% in 2001 to 4.05% in 2006. The US Congress also approved $459.6 billion for fiscal year (FY) 2008, not counting military construction or the 'war on terror' in Iraq, Afghanistan and elsewhere. If this was counted, the total cost was estimated to be around $695 billion for 2008 (Military Balance 2008, 18–9). Spending on this scale sustains a vast defence industry and it is little wonder that the USA is the world's largest supplier of arms, though it imports comparatively few weapons systems from abroad. The USA is committed to a process of 'military transformation' based on the so-called revolution in military affairs (RMA), in which precision, stealth, information dominance and battlespace awareness would be melded through a systems approach using vast improvements in IT and communications. The RMA has evolved into the direction of 'network-centric warfare', essentially a systems of systems approach that would substitute mass with precision firepower, mobility and reach. However, this process has turned out to be very expensive to implement, relying on expensive electronics and weapons systems.

Moreover, questions have been raised over the long-term sustainability of US defence-related expenditure. The increasing cost of weapons systems, the size of the armed forces and the huge costs associated with the wars in Iraq and Afghanistan, impose a heavy economic burden on the USA, given rising budget deficits and economic recession. According to one study by Joseph Stiglitz, the true cost of the war in Iraq alone would top $3,000 billion, if all war-related costs are factored in (Stiglitz and Bilmes 2008). This suggests a classic imperial over-reach by the world's sole superpower, though the consequences of this on the future of the global arms trade are uncertain.

In contrast, according to *The Military Balance 2008*, military expenditure as a percentage of GDP declined in most parts of the world. This declined from 1.5% of GDP in 1997 to 1.3% of GDP in 2006 for the Caribbean and Latin America. The corresponding figures for Europe (defined as North Atlantic Treaty Organization—NATO excluding the USA) was 2.09% in 1997 and 1.74% in 2006. Non-NATO Europe declined from 1.79% in 1997 to 1.16% in 2006. Russia declined from 5.79% in 1997 to 3.72% in 2005, and then went up again to 4.11% in 2006, although *The Military Balance* noted the special difficulties in estimating Russia's military expenditure (*The Military Balance 2008*, 211). The Middle East and North Africa, too, declined, from a high of 7.73% in 1998 to 5.26% in 2006. In Central and South Asia, this declined from 3.33% in 1998 to 2.38% in 2006. In East Asia and Australasia, in contrast, it held steady at around the 1.5% level from 1997 to 2006.

However, a more accurate picture of regional military expenditure is reflected in SIPRI figures, which strongly suggest that overall, global arms expenditure has increased in real terms despite declining as a percentage of GDP. This can be attributed to the generally stable global economic growth that has been taking place since the end of the Cold War and the gathering pace of globalization. According to SIPRI, military expenditure in Africa, measured in constant 2005 prices and exchange rates, rose from $11.1 billion in 1998 to $16.8 billion in 2007. In North America, it rose from $340 billion to $562 billion over the same period. In South America, this rose from $23.3 billion to $32 billion. In Asia and Oceania, the increase was from $132 billion to $200 billion. Europe as a whole rose slightly from $276 billion to $319 billion, although Eastern Europe showed a marked increase from $15.6 billion to $40.8 billion over the same period. In the Middle East the increase was from $48.8 billion in 1998 to $79 billion in 2007 (SIPRI Yearbook 2008, 208). What these figures and trends tell us is that the world's biggest arms market remains North America. However, it is also clear that Asia and Oceania represent a rapidly developing arms market, whilst the Middle East remains an important market as it continues to maintain the highest burden in military expenditure, at around 5%–6% of overall GDP.

The international supply of arms is backed by the existence of a sophisticated arms industry, which has gradually become a globalized industry just like any other commercialized industry today. This arms industry originated as national defence industries designed to reduce dependence on foreign arms supplies, but the end of the Cold War and the globalization of this industry has resulted in a process of rationalization, consolidation and niche specialization (Bitzinger 2003). According to SIPRI, companies in the USA and Western Europe dominate the list of arms sellers, numbering 76 out of the top 100 if China is excluded (due to the lack of readily accessible information). Of the top 10 arms-producing companies in the world, (excluding China) in 2006, six are US companies with the other four being European companies. They are: Boeing, Lockheed Martin, BAE Systems (UK), Northrop Grumman, Raytheon, General Dynamics, European Aeronautic Defence and Space (EADS, in Europe), L-3 Communications, Finmeccanica (Italy) and Thales (France). SIPRI also confirmed the trend towards further consolidation, which has resulted in the emergence of larger companies at the top through mergers and acquisitions, and a concomitant decline in competition. To sustain expensive defence industries, governments have also had to collaborate on defence projects with other states as well as encourage arms exports. According to SIPRI, arms sales of the top 100 companies increased by 32% over the period 2002–06 if measured at constant 2006 prices and exchange rates (SIPRI Yearbook 2008, 255–77). This confirms the overall global trend towards greater military expenditure and arms procurement, which has contributed to the global arms trade phenomenon.

## The study of the arms trade

Given the importance of the subject matter, as the consequence of the arms trade are arms races and conflict in the form of interstate and civil wars, it is surprising how little academic attention is actually paid to it. As the above discussion demonstrates, there are excellent primary resources maintained, on the one side by the IISS in the form of the annual Military Balance and, on the other, by the peace and disarmament institution, SIPRI, in the form of the annual SIPRI Yearbook. Both contain authoritative data, information and analyses on the international arms trade, military procurement and military expenditure.

These two institutions represent different approaches: the IISS takes a state-centric perspective in terms of providing some measure of military power through an assessment of expenditure, procurement and arms transfers. SIPRI assesses the trends in expenditure, procurement and arms transfers with a view to improving the prospects for arms control and disarmament, and generally takes a more human security perspective. Similarly, strategic studies institutes using state-centric realist perspectives, and peace research institutes with a greater focus on human security and peace, are throughout the world churning out studies and volumes focusing on: the use of military power; conflict and the management of conflict, including interstate wars, civil wars, insurgencies and terrorism; and on multilateral mechanisms for arms control. What is interesting, though, is that there has been little competitive analysis of the primary facts and figures painstakingly gathered by both the IISS and SIPRI. A number of questions, arising from the demand and supply of global armaments, for instance, come to mind. What have been the trends in arms procurement? What accounts for defence procurement? What are the key issues in arms procurement? What are the future prospects for the global arms trade? How has the arms industry adapted to the end of the Cold War and the emergence of the global interlinked economy (a process better known as globalization)? What are the prospects for the global arms industry? Furthermore, what are the key issues in the global arms trade? What are the problems and prospects of these issues?

Some key issues that come to mind include: the trade-off between defence spending and development, the undue influence of the military industrial complex (MIC), the control of the proliferation of conventional arms (particularly to non-state actors), insurgencies and their impact on arms procurement, the privatization of force, and future war and future weapons systems.

Where before the end of the Cold War there existed those who studied the arms trade using the methodology of analysing defence expenditure and procurement, these traditional realist-oriented analysts have died a natural death (some literally) and have not been replaced. This can be attributed to the end of the Cold War, which resulted in a refocusing on the expected peace dividends of that seminal event, in the form of the rise of post-positivist approaches and the emergence of human security. Thus, to cite an example from the Asian context, Chin Kin Wah's excellent edited volume entitled 'Defence Spending in Southeast Asia', published in 1987, remains one of the few in-depth analyses of the subject matter and, indeed, has been reprinted several times. Desmond Ball's article 'Arms and Affluence: Military Acquisitions in the Asia-Pacific Region' published in *International Security* in 1993/94 expands beyond defence spending and remains the most thorough analysis of the arms trade in Asia to this day. Other attempts to add to this appeared in a much-cited working paper on 'Force Modernization in Asia: Towards 2000 and Beyond' (Dibb 1997), and the excellent IISS Adelphi Paper entitled 'Arming East Asia' (Huxley and Willett 1999), on defence spending, arms procurement and the defence industry. However, these are sporadic works focusing on a specific region, albeit one of major importance to the arms trade, with no attempt at a comprehensive, in-depth analysis of the global arms trade phenomenon. Instead, the ground in international relations/security studies shifted to post-positivist approaches. Defence spending itself became the domain of Defence Economics and has resurrected itself into a highly specialized field in economics that studies the arms industry from an econometrics perspective, often using quantitative analyses.

There is, thus, a gap in mainstream international relations and security studies, arising from the lack of a more positivist analysis of defence spending, arms procurement and the defence industry, one which will provide a better description of the current phenomenon that is the arms trade, identify practical issues of concern, and assess problems and prospects in a way that will deepen our understanding of the global arms phenomenon. A comprehensive study of this nature, utilizing an empirical focus and written in clear, positivist language, will have a much broader impact and readership than Defence Economics or the post-positivist peace studies literature accessible only to those who can master the specialized language. Such a study, which is the focus of this book, will, therefore, 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 global arms trade.

## The demand and supply of arms

During the period 2003–07, the top recipient of major conventional arms was China, which imported $13.4 billion worth of weapons systems. This was followed by India, which spent $9.1 billion on foreign arms (SIPRI Yearbook 2008, 321). The global arms trade is to a large degree underpinned by the strong demand for arms in Asia and the Middle East, the two largest arms export markets in the world. Despite major efforts by some developing countries such as China and India in developing their indigenous arms industries in order to ensure greater self-sufficiency, the dependence on imported arms has not decreased. Thus, Herbert Wulf's conclusion in 1985 still holds true: 'for developing countries, the implications of the technological lead of the major industrial countries in arms production are that, for modern sophisticated weaponry, dependence upon one or more of the major arms-producing countries cannot be avoided' (SIPRI Yearbook 1985, 320).

What accounts for the strong demand for imported arms, especially from Asia and the Middle East? Apart from the lack of a technological base to produce the most sophisticated weapons systems, other reasons cited in a vintage 1971 study by SIPRI concluded that there were five factors that explain the demand for arms. The first is conflict, especially in the Middle East and in East Asia (referred to as 'the Far East'); the second is nationalism, which has been a driving force behind the wars for national liberation in an age of decolonization; the third is the role of the armed forces – the armed forces being the most important modernizing force in many Third World societies; the fourth is the size of foreign exchange earnings, which enable the purchase of foreign weapons systems; and finally, the interests of the major powers, which is a major determinant (SIPRI 1971, 41–4).

In 2009, some of these factors remain relevant. For instance, areas of conflict, such as in the Middle East revolving around Israel, the tensions over Iran's regional ambitions, the Indo-Pakistan conflict over Kashmir, the Taiwan Straits, and in the Korean peninsula, continue to underpin a strong demand for military forces and capabilities, which rely on expensive, sophisticated weapons systems, some of which have to be imported, as no single nation can produce a broad range to ensure self-sufficiency. Nationalism continues to be an important force in international relations, in an international system that continues to be in many ways anarchic, in the sense that there is no supra-national authority that can impose law and order on states. The end of the Cold War brought about heightened expectations that global norms and institutions, as well as globalization, would help to usher in a new world order in which the state would be diminished and conflicts ease, but this has not happened. On the contrary, shorn of superpower restraints imposed during the Cold War, there has been a massive outbreak of civil conflict. The emergence of non-state actors, such as al-Qa'ida and global terrorism, epitomized by the seminal terrorist attacks on 11 September 2001 in the USA and the subsequent 'war on terror', has introduced a new global security challenge. The unilateralism of the USA and the subsequent marginalization of the United Nations (UN), particularly in the wake of the 11 September attacks, have resulted in a drift in the international system, which appears to be evolving into a concert of powers with the state still the most dominant player (Bell 2007).

In explaining 'the new Asian arms race', Desmond Ball argued in 1993 that 'military and geostrategic factors, such as threat perceptions or arms race dynamics, have generally been less determinate than other considerations' (Ball 1993, 79). These other considerations or factors include: economic growth and increasing resources for defence; the requirements for enhanced self-reliance; the drawdown of the US presence and capabilities in the region; fears of the increasing power projection capabilities of China, Japan and India; the increasing salience of regional conflict (given the increasing prominence of maritime conflict issues); the requirements for exclusive economic zone (EEZ) surveillance and protection in an era of 200-mile EEZs; the broadening of regional security concerns to include transnational crime and environmental issues, which require better maritime surveillance capabilities; weapons being acquired as symbols of national prestige; technological acquisition and transfer; and corruption, which has been a significant factor behind the arms build up in some Asian countries (Ball 1993, 79–91).

Ball also identified 'supply side pressures' as a significant factor in the demand for arms. The factors influencing the supply of weapons were considered in SIPRI's study in 1971. According to the study, the desire to impose and maintain great power hegemony is a principal factor. The supply of weapons reinforces hegemony in the following ways: first, arms are supplied to enable local forces to perform military tasks that are in the interests of the supplying country; second, the supply of arms serves to strengthen the relationship between the supplying country and the recipient government; third, the supply of arms may provide an opportunity to influence the recipient government, particularly through the military, which tends to be an important and influential institution in many countries. The same study also concluded that 'the importance of exports to the domestic defence industry has been stressed in all European countries'. This was due to a number of advantages, such as economies of scale, lengthening of production runs, reduction in per unit costs of increasingly expensive weapons systems, and the filling of surplus capacity. An alternative to exports would be international collaboration, which, though, paradoxically increases total costs and results in duplication as well as excess capacity since each partner nation would demand delivery priority (SIPRI 1971, 17–31; Buzan 1987, 40–1).

According to Ball, writing in the post-Cold War era in 1993, the end of the Cold War had resulted in arms manufacturers in the West having to seek new export markets in order to compensate for the decline in their home markets. Thus, Russia was 'willing to sell virtually anything to anybody with the cash to pay, or even the products to barter', citing China's purchase of Su-27 jetfighters, and Malaysia's purchase of MiG-29 jetfighters (Ball 1993, 91). The gathering pace of globalization has also resulted in the arms industry gradually becoming a globalized industry just like any other commercialized industry today, as it seeks more capital, cheaper labour and new markets. Thus, arms industries that originated as national defence industries have, in the post-Cold War era, undergone a process of rationalization, consolidation and niche specialization (Bitzinger 2003). This has also included greater international collaboration to increase the economies of scale and to share development costs, the outsourcing of parts production to contractors around the world in a bid to keep costs down, and the search for new export markets. The new economic rationalization that is part of emerging globalization has changed the face of the arms industry. Thus, Wulf presciently observed that 'in a desire to finance arms industries, many countries find it natural to seek markets abroad and to subordinate arms sales policies almost exclusively to economic considerations' (SIPRI Yearbook 1985, 320).

## Arms and technology

Another important factor in the global arms trade is the role of technological revolution. According to Barry Buzan, the arms trade is part of the process of the spread of technology around the world (Buzan 1987, 9). He argued that technology has defined much of the contemporary strategic agenda. Pointing out that the increase in firepower has been a historical development, Buzan also noted that this has been enhanced by increases in the range and accuracy of delivery systems. Precision-guided munitions, in particular, have reduced the need for both volume of fire and weight of destructive capability delivered to the target. In addition, there have been enormous advances in mobility, communications and intelligence (Buzan 1987, 17–26). This technological advancement is spread around the world through the global arms trade. Leading powers must keep to the front of technological advance to maintain their rank and status, whilst aspirants to first power must acquire the capability to compete at the leading edge.

Thus, 'because the leading edge of technological advance sets the standard for the international system, its continuous forward movement exerts pressure on the whole process of spread'. Where rivalries exist between states, the level of technology becomes a crucial strategic issue. Thus, states that can afford to do so will attempt to buy modern weapons systems to either maintain parity or gain an edge; those that cannot will have to make do with the second-hand market (Buzan 1987, 37–9). In order to gain advanced military technology, states must buy. In order to sustain domestic arms industries as well as a host of other economic and political reasons, supplier states want to sell. Because of this potent community of interest between suppliers and buyers in maintaining the arms trade, Buzan thus concluded that the trade will remain a durable feature of the international system (Buzan 1987, 42).

However, Martin van Creveld noted the extraordinary complexity of modern warfare compared with all its predecessors. The revolution in military technology gave rise to complexity, particularly the vast amounts of information needed for effective military decision-making. He thus envisaged the emergence of computerized warfare (van Creveld 1989, 235–6). Both Buzan and van Creveld were, thus, in some respects addressing the process of technological transformation known as the RMA. Begun in the USSR as the Military Technology Revolution, the RMA in the USA originated with the concept of the 'systems of systems' developed by Admiral William Owens. Such a new way of warfare would be made possible through a revolution in surveillance and electronic capabilities that could dispense with the age-old problem of the 'fog of war', by providing superb battlefield awareness, thus enabling one to locate the opponent as well as to know the disposition of one's own forces in real time. Together with precision strike capabilities and an integrated systems approach to ensure seamless harmony amongst all the different parts of the vast US military, this would enable devastating precision attacks over long distances, thereby reducing time and space as constraints. The opponent within an expanded battlespace could thus be attacked simultaneously and continuously. As Krepinevich noted, 'the new structure of warfare integrates and synchronizes redundant, multi-service war-fighting systems in simultaneous attacks on the enemy throughout his entire depth and in the space above him as well' (Krepinevich 1994, 30). The Gulf War of 1990–91 appeared to prove the efficacy of the evolving RMA, as a partially RMA-equipped US armed forces took on the Iraqi armed forces and easily overwhelmed it. When the ground offensive began after weeks of massive precision air and missile strikes, Iraqi units disintegrated or simply fled. Fears of being bogged down in a long conflict with Iraq's armed forces, at the time one of the world's largest, did not eventuate as the US-led coalition easily defeated Saddam Hussain's shell-shocked forces.

The RMA captured the imagination of the world's armed forces. Thus, according to Paul Dibb, states in Asia have participated in the RMA to varying degrees. According to him, there are four tiers to RMA participation in Asia. Tier 1 consists of close allies of the USA and is characterized by a high capacity to absorb the RMA. These include Australia, Japan and South Korea. Tier 2 consists of states with a high threat perception and a moderate capacity to absorb the RMA, such as China, Taiwan and Singapore. Tier 3 includes states with a moderate-to-low perception of external threat and/or generally with a low capacity to absorb the RMA, such as Indonesia and Viet Nam. Tier 4 consists of states with a very low capacity to absorb the RMA, such as Myanmar, Cambodia and Laos (Dibb 1997).

However, van Creveld warned that the very concept of technological superiority is misleading when applied to the concept of war. Noting that sub-conventional warfare, such as terrorism and insurgency, is more far reaching in political effects than conventional wars, van Creveld argued that the best military technology is not what is superior in an absolute sense, but what neutralizes the other side's strengths whilst exploiting its weaknesses. He thus warned against the common habit of referring to technology in terms of its capabilities, as what is even more important is what it cannot do (van Creveld 1989, 299 and 311–20). Van Creveld has been proved prescient in the light of the USA's overwhelming conventional capabilities and its demonstrated weaknesses in guerrilla and terrorist theatres in Iraq and Afghanistan after the 11 September attacks.

## The arms dynamic, arms races and wars

The arms dynamic is a useful conceptual framework that can be applied to further understand the global arms trade phenomenon. The arms dynamic refers to 'the whole set of pressures that make states both acquire armed forces and change the quantity and quality of the armed forces they already possess'. This exists along a spectrum, with arms racing being the most extreme manifestation of the arms dynamic, when states engage in major competitive expansion of military capabilities. At the other extreme, there is the maintenance of the status quo (Buzan 1987, 73–4).

According to Colin Gray, there are four basic conditions for an arms race: there must be two or more parties, conscious of their antagonism; they must structure their armed forces with attention to the probable effectiveness of the forces in combat with, or as a deterrent to, the other arms race participants; they must compete in terms of quantity and quality; and there must be rapid increases in quantity and/or improvement in quality (Gray 1972, 41). Gray has also pointed out that it is possible for arms races to develop even in the absence of any serious political antagonisms. A fairly autonomous arms increase, undertaken for a variety of reasons, might be matched by a fairly disinterested party solely as a precautionary move, and, thus, spark off a cycle of close or intermittent armament interactions. Previously unacknowledged political antagonisms might then occur. Indeed, while arms races are evidently run between mutually perceived enemies, arms racing behaviour – that is, a process of interactive or competitive arms acquisitions – can also be discerned among even formal allies, whether out of prestige or the need to maintain a relationship of equality. Interactive arms acquisitions of this nature, coupled with conflicting claims over territory and other issues, could result in the security dilemma, conflict spirals, heightened tensions and eventually lead to conflict, thereby destroying the very security that arms acquisitions were meant to ensure.

Three processes explain the arms dynamic. The first is the process of action-reaction, which rests on the proposition that states strengthen their armaments in response to external threats that they perceive from other states. The second is the domestic process, in which internal domestic factors are important. In this process, the institutionalization of research and development is one of the drivers for technological innovation, and the arms modernization. Others include strategic doctrine, geographical location, the structure of government and the balance of power between its agencies, and interest, in which major defence decisions are merely rationalizations for the domestic interests of decision-makers (Gray 1972, 74–7). The third is the process of technological change. In this respect, the issue is whether technology drives military expansion or vice versa. Buzan is definitive in his evaluation though, in that 'a large percentage of the behaviour that is commonly identified as arms racing stems directly from the underlying process of technological advance'. According to him, if states do meet the challenge of keeping pace with adversaries, they will embark on a process that produces an endless flow of new weapons. Thus, the technological imperative is an important independent variable that also affects the process of action-reaction and domestic factors, as it forces states to behave in a way that looks like arms racing (Buzan 1987, 105–13).

Finally, there is the ultimate reason for the global arms trade: wars and preparations for war. Why are wars fought? There are political wars, in which war is used as an instrument of state policy in order to accomplish certain political objectives; wars of justice, in order to right a perceived wrong, such as wars fought to restore the status quo; ideological and religious wars; and wars fought for the existence of a state. Thus, van Creveld concluded, there is a plethora of reasons why wars are fought, and not just for policy or interests alone (van Creveld 1991, 124–56). However, often the causes of war are not easy to uncover, given the many cases in which the reasons for war 'were not only hopelessly intertwined but ill understood by the belligerents themselves' (van Creveld 1989, 298). War, whether conventional or non-conventional, is a condition of the anarchic international system. As van Creveld concluded, 'it must be recognised that there exist today, and probably will continue to exist in the future, some states, some groups, and some people, who are not content with the existing state of affairs or, indeed, with any conceivable state of affairs', and who are determined to use force to change the status quo, using whatever means are available (van Creveld 1989, 309).

## The global arms trade: demand, supply and key issues

This volume is divided into four sections, and is written by a team of international arms experts. The first section consists of this introductory chapter, which developed the general conceptual framework by providing an overview of the global arms trade and explaining the nature of the arms dynamic. The second section focuses on the demand for arms, namely in terms of defence spending, procurement and modernization. It contains 13 chapters that explore regional arms modernization after the end of the Cold War. The regions covered include: Asia, Europe, the Middle East, Latin America and Africa. The specific countries covered include China, India, Japan, the Democratic People's Republic of Korea (North Korea), Russia and Iran.

The third section, consisting of six chapters, focuses on the supply of arms, i.e. the evolution, development, problems and prospect of the arms industry. Two chapters provide an overview of the global arms trade and industry. Another four chapters focus on the arms industry in Europe, the USA, the UK and Israel.

The fourth and final section discusses the key issues arising from the arms trade phenomenon. This section has six chapters, which cover the following issues: the MIC (i.e. the links between government and the arms industry), defence spending and development, the post-Cold War control of conventional arms, the impact of insurgencies on arms procurement, the privatization of force, and future warfare and its impact on the shape of weapons to come.

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# Part II

# Arms modernization after the Cold War

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# 2 Defence spending and procurement trends in South-east Asia

*Andrew T. H. Tan*

## Arms and military revolutions in South-east Asia

In the context of the general post-Cold War reduction in arms spending in Europe, the Asia-Pacific region has become an especially crucial export market for arms manufacturers. Within this vast region, South-east Asia is particularly important despite its comparatively small arms market (around US$3 billion annually), as it is open and competitive compared with the captive markets in Japan and the Republic of Korea (South Korea) (both dominated by the USA), and India and the People's Republic of China (dominated by Russia). Moreover, with its general economic development, strategic waterways (especially the Straits of Malacca) and the desire by states in the region to modernize their armed forces, South-east Asia presents an interesting case study of the promise and potential of an emerging market for the global arms industry.

South-east Asia began to attract attention after security analysts observed in the 1990s that there was a clear trend towards a military build-up in the region (Huxley and Willett 1999). Since the end of the Viet Nam War in 1975, arms modernization and military expansion programmes that were begun as a response to US retrenchment from the region in fact continued in the 1990s despite the end of the Cold War and the rapprochement between the non-communist states comprising the Association of South East Asian Nations (ASEAN) and the communist states of Indochina. Although the Asian economic crisis of 1997–98 affected some states in the region and resulted in a halt to arms modernization and military expansion programmes, this proved to be temporary. Indeed, since around 2001, the region as a whole has resumed procuring modern weapons systems as part of their ongoing military modernization.

The caveat, though, is that defence spending and arms procurement do not equate to military effectiveness, as military power is not merely the sum total of military budgets and weapons systems. As Andy Marshal pointed out in 1966, mere tabulations of military forces are not meaningful estimates of military power, which is always relative to the military posture of some other country or alliance (Marshall 1966). Moreover, as Hans Morgenthau noted, military power is only part of broader political power. According to him, national power is a function of factors such as military preparedness, geography, natural resources, population, industrial character, national morale and diplomacy (Morgenthau 1948). Thus, meaningful estimates using official figures and tables are often difficult. Any quantitative approach will need to be supplemented by qualitative analysis. These caveats aside, though, estimating the military effectiveness of regional armed forces is not within the scope of this study.

Instead, this essay will focus on examining the trends in defence spending and arms procurement in South-east Asia. Whilst defence spending and the numbers of key weapons systems do not equate with military effectiveness, they are indicative of security perceptions and the amount of resources that states in the region are prepared to spend in order to meet perceived security threats and needs. An examination of such trends will give some indication of their future trajectories.

In doing so, this essay also aims to shed light on two key issues in defence spending and procurement in the region. The first of these is whether there is a regional 'arms race'. The answer to this question will indicate the intensity of defence spending and arms procurement patterns. The second is the region's level of participation in the USA-led revolution in military affairs (RMA). The answer to this will indicate the level of sophistication in arms procurement. To assess these two issues, this chapter will use quantitative data to better understand the trends in arms modernization and expansion programmes. However, it will also conclude that although using quantitative data provides useful insights, a more holistic qualitative approach taking into account relevant political, economic and social factors would be required for a more comprehensive explanation and analysis.

## An arms race?

There is compelling evidence of an ongoing process of military modernization in South-east Asia since 1975. The military build-ups, particularly on the part of the ASEAN states, increased in the 1980s and 1990s. Although they slowed due to the Asian financial and economic crisis in 1997–98, they have, since around 2001, picked up momentum. This phenomenon, namely the concerted regional arms build-up, has caused some to express concerns about the prospects of an 'arms race' in the region (*The Economist*, 20 February 1993), but is there real evidence for this?

An analysis of the trends in defence spending using local currency (Table 2.1) as published in the SIPRI Yearbook 2007 seems to indicate a general upward trend in defence spending from 1997 to 2006, despite the impact of the Asian financial and economic crisis of 1997–98. The trend appears particularly evident in the case of Myanmar, Indonesia, Malaysia and Singapore, which all appeared to register a steep increase in defence spending. However, as the Stockholm International Peace Research Institute (SIPRI) noted, there are limitations to such data. For instance, there are varying definitions of military expenditure, as important items (such as military construction, and research and development) can be hidden under non-military budget headings or can even be financed entirely from outside the government budget. In some countries, actual expenditure may in fact be higher than the published budgeted expenditure. Indeed, as SIPRI noted, 'the most appropriate use of military expenditure data, even when reliably measured and reported, is therefore as an indicator of the economic resources consumed for military purposes' (SIPRI Yearbook 2006, 338).

Indeed, in the cases of Indonesia and Thailand, the massive devaluation of the rupiah and the baht, respectively, following the 1997–98 Asian economic crisis meant that there was, in fact, a very steep decline in defence spending in the years following 1997.

*Table 2.1* Military expenditure by country (local currency) 1997–2006

| *Country* | *Currency* | *1997* | *1998* | *1999* | *2000* | *2001* | *2002* | *2003* | *2006* |
|---|---|---|---|---|---|---|---|---|---|
| Brunei | m. dollars | 548 | 492 | 438 | 421 | 390 | 405 | 424 | 449 |
| Indonesia | bn rupiahs | 8,336 | 10,349 | 10,254 | 13,945 | 16,416 | 19,291 | 27,446 | 40,491 |
| Cambodia | bn riel | 447 | 481 | 474 | 455 | 417 | 407 | 411 | 498 |
| Laos | bn kip | 53 | 66.5 | 224 | 278 | 325 | n.a. | n.a. | n.a. |
| Malaysia | bn ringgit | 5,877 | 4,547 | 6,321 | 5,826 | 7,351 | 8,504 | 10,950 | 11,734 |
| Myanmar | bn kyats | 29.4 | 37.3 | 43.7 | 58.8 | 63.9 | 73.1 | n.a. | n.a. |
| Philippines | m. pesos | 29,212 | 31,512 | 32,959 | 36,208 | 35,977 | 38,907 | 44,440 | 52,657 |
| Singapore | m. dollars | 6,618 | 7,475 | 7,616 | 7,466 | 7,721 | 8,108 | 8,230 | 9,849 |
| Thailand | m. baht | 98,172 | 86,133 | 74,809 | 71,268 | 75,413 | 76,724 | 77,774 | 85,936 |
| Viet Nam | bn dong | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |

Source: *SIPRI Yearbook 2007*, p.306

*Table 2.2* Military expenditure by country (US$) 1997–2006, in constant US$ m. (2005 prices and exchange rates)

| *Country* | *1997* | *1998* | *1999* | *2000* | *2001* | *2002* | *2003* | *2006* |
|---|---|---|---|---|---|---|---|---|
| Brunei | 334 | 301 | 269 | 254 | 234 | 249 | 260 | 268 |
| Indonesia | 2,653 | 2,079 | 1,710 | 2,242 | 2,367 | 2,486 | 3,319 | 3,695 |
| Cambodia | 147 | 138 | 131 | 127 | 117 | 110 | 110 | 114 |
| Laos | 44.3 | 29.1 | 42.9 | 42.5 | 46.1 | n.a. | n.a. | n.a. |
| Malaysia | 1,858 | 1,365 | 1,847 | 1,677 | 2,087 | 2,370 | 3,020 | 2,996 |
| Myanmar | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| Philippines | 828 | 818 | 807 | 853 | 794 | 833 | 920 | 901 |
| Singapore | 4,153 | 4,703 | 4,791 | 4,634 | 4,745 | 5,002 | 5,051 | 5,868 |
| Thailand | 3,006 | 2,440 | 2,113 | 1,982 | 2,063 | 2,087 | 2,077 | 2,045 |
| Viet Nam | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |

Source: *SIPRI Yearbook 2007*, p.313

Table 2.2 is more meaningful in that military expenditure is compared using constant US dollars in 2005 prices and exchange rates. Despite variations in exchange rates, this does provide some indication of the trends in defence spending. According to this table, there was a real fall in defence spending in Indonesia following the financial and economic crisis of 1997–98, followed by a gradual recovery and a real increase after 2002. Thailand, too, was severely affected by the crisis and Table 2.2 indicates that in 2006, unlike Indonesia, the defence budget had not recovered and remained in real terms substantially below 1997. Malaysia recovered much quicker from the crisis, with real defence spending in 1999 not dissimilar to 1997, but this reflected the fact that the crisis affected Malaysia much less severely than Indonesia. After 1999, Malaysia's defence spending increased in real terms. Singapore is an interesting case as its defence spending was not affected at all by the crisis, but this reflects the fact that the economic difficulties had only a minor effect on the country. Moreover, defence has been a national priority since it became independent in 1965. The case of Myanmar is difficult, as rampant inflation and the wildly fluctuating exchange rates between the kyat and the US dollar have made any effective comparison almost impossible. One can only examine the size of its armed forces in terms of military personnel and acquisition of key weapons systems to gauge if there has been any increase over the years.

It is, thus, clear that defence spending figures provide a very limited picture. A more useful approach is to ask a different question: has defence spending translated into military personnel and the acquisition of major weapons systems?

Tables 2.3–2.5 examine this question. Table 2.3 comprises key statistics in 1975, at the end of the Viet Nam War. Table 2.4 comprises key military assets in 1990, at the end of the Cold War and the rapprochement in the region between non-communist ASEAN and communist Indochina. Table 2.5 measures the key military assets in 2007.

Table 2.3 indicates that the then-ASEAN states of Singapore, Malaysia, Indonesia and the Philippines could be described as militarily weak, with small numbers of major weapons systems. Thailand was an exception; as the frontline state against communist Indochina, it had the support of the USA, which provided substantial military aid.

Table 2.4 indicates that 15 years after the end of the Viet Nam War, the various states in South-east Asia, especially the non-communist ASEAN states, had made great efforts to develop their own military capabilities. There is a substantial increase in the numbers of key military assets, such as military manpower, tanks, armoured personnel carriers (APCs), long-range artillery, missile-armed naval vessels and combat aircraft. This is particularly evident in the case of Myanmar, which had to deal with ethnic minority insurgencies along the periphery; Indonesia,