

# 5. Arms production

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## I. Introduction

Despite the global economic recession, the global arms industry has continued to prosper. The arms sales of the largest arms producers have risen, and high-value acquisitions have returned to the industry.

Major developments in the arms industry in 2009 and 2010 are discussed in section II of this chapter. This overview is derived from the SIPRI Top 100 arms-producing companies as presented in appendix 5A and on the industry's mergers and acquisitions as presented in appendix 5B. This analysis focuses on companies with the largest arms sales and on the highest-value acquisitions. Although the majority of these companies are based in the United States and Western Europe, several companies appearing in the SIPRI Top 100 are based in smaller economies in other regions.<sup>1</sup>

This chapter explores the reasons why such countries may pursue indigenous arms industries despite the expense and difficulty in developing and maintaining a domestic arms industry. Section III discusses the motivations for and barriers to the development of indigenous arms industries. Sections IV–VI present case studies of the arms industries in three smaller members of the Organisation for Economic Co-operation and Development (OECD) with companies that appear in the SIPRI Top 100—Israel, South Korea and Turkey. The case studies present each country's arms industry framework within which the arms producers act. The studies also describe the overall structure of the arms industries that manifest within these environments. Section VII concludes by examining how the underlying technological and industrial infrastructure, technology transfers, arms exports, and military research and development (R&D) funding have influenced and bolstered the arms industries in these three countries.

## II. Developments in the arms industry, 2009–10<sup>2</sup>

Despite the financial crisis of 2008 and the ensuing global economic recession, arms producers and military services companies continued to

<sup>1</sup> The internationalization of the arms-producing industry means that companies based in one country often belong to a company or group with headquarters in another country. In this chapter, a country designation refers to the location of a company's headquarters.

<sup>2</sup> Further details of the developments covered in this section are presented in appendices 5A and 5B.

increase arms sales in 2009.<sup>3</sup> Specifically, the total 2009 arms sales of the SIPRI Top 100 arms-producing companies (excluding those based in China) increased by \$14.8 billion to reach \$401 billion. Between 2002 and 2009, the total arms sales of the Top 100 increased by a total of 58 per cent in real terms.<sup>4</sup>

Also indicative of overall growth is that, while in 2009 no mega-deal acquisitions—deals with a value over \$1 billion—were completed in the arms industry, in 2010 at least three were completed.<sup>5</sup> In general, companies sought to fill gaps in product lines, diversify into related sectors or divest non-core activities. Acquisitions of firms related to cyber security and intelligence continued in 2010. Acquisitions of military services companies were also prominent. In addition to acquisitions within and between member countries of the OECD, several acquisitions were completed by companies based in non-OECD countries, such as India and the United Arab Emirates, in the United States and Western Europe.

For some states, including Turkey, domestic arms production grew as overall economies shrank. Other indicators were not uniformly negative. Some arms producers increased their workforces, whereas others decreased them owing to changes in arms procurement priorities or because of losses in civilian sales caused by the recession.<sup>6</sup>

Exemplifying the trend of increased arms sales and continuing its dominance as the largest arms market, the USA increased its spending on arms procurement from \$117 billion in financial year (FY) 2008 to \$129 billion in FY 2009. It increased further to \$134 billion in FY 2010.<sup>7</sup> The comptroller of the US Department of Defense (DOD) predicted that US spending on weapons up to 2016 would grow faster than overall US military spending.<sup>8</sup> The proposed defence budget includes \$78 billion in cuts to US military spending over the next five years. However, the majority of the planned cuts are in overhead costs, and up to \$100 billion in additional savings will be reinvested in the military, mostly to purchase new equipment and to modernize and refurbish used equipment.<sup>9</sup> Notably, some weapon programmes that are scheduled for cancellation will be replaced. For example,

<sup>3</sup> The late publication of the accounts of many companies means that 2009 is the most recent year for which arms sales figures are available. Discussion of merger and acquisition activity in this section refers to developments during 2010.

<sup>4</sup> This trend is for the Top 100 in each year, i.e. including different groups of companies each year. See appendix 5A, table 5A.1.

<sup>5</sup> See appendix 5B, table 5B.1. In many transactions the terms of the deal remained undisclosed.

<sup>6</sup> See also appendix 5A, section II.

<sup>7</sup> US Office of Management and Budget, *Budget of the US Government, Fiscal Year 2012* (Government Printing Office: Washington, DC, 2010), table 3.2.

<sup>8</sup> Capaccio, T., 'Weapons budget grows amid Obama cuts, pentagon comptroller says', *Bloomberg Businessweek*, 6 July 2010.

<sup>9</sup> Gates, R. M., US Secretary of Defense, 'Statement on department budget and efficiencies', US Department of Defense, 6 Jan. 2011, <<http://www.defense.gov/Speeches/Speech.aspx?SpeechID=1527>>.

the US Marine Corps' Expeditionary Fighting Vehicle will be discontinued, but the DOD will budget for cheaper alternatives.<sup>10</sup> Such changes in programme focus will probably affect individual arms producers' arms sales figures in the future, but overall US weapon procurement is likely to remain near current levels.<sup>11</sup>

Revised defence budgets have also influenced arms procurement in other regions. In light of proposed military spending cuts in Western Europe, France and the United Kingdom have agreed to defence cooperation. Their Declaration on Defence and Security Cooperation includes bilateral cooperation in some arms procurement and open access to each other's arms markets.<sup>12</sup> One aspect of the agreement specifically addresses the arms industry, stating that the two governments have reached a 10-year strategic plan regarding the complex weapon sector (e.g. anti-surface and cruise missiles) that will 'work towards [establishing] a single European prime contractor' while trying to achieve up to 30 per cent in efficiency savings.<sup>13</sup> This cooperation comes after the UK announced cuts to its aircraft carrier programme in which only one of the two ordered carriers will become operational. The move possibly reflects the two countries' broad pessimism regarding European Union-wide defence cooperation and their desires to protect national arms industries and maintain their own capacities.<sup>14</sup>

### III. Motivations, barriers and capability in arms production

Although weapons may be purchased on the international arms market, many smaller countries invest their resources in developing, and subsequently maintaining, their own arms-production capabilities.<sup>15</sup> This section examines the motivations behind this choice and the barriers to its implementation.

In abstract terms, 'security of supply' explains why smaller countries may seek their own arms industries. This security protects them from dependence on imports and against risks such as an arms embargo.<sup>16</sup> In addition,

<sup>10</sup> Gates (note 9).

<sup>11</sup> Capaccio (note 8). See also chapter 4, section II, in this volume.

<sup>12</sup> British Ministry of Defence, 'UK–France defence co-operation treaty announced', 2 Nov. 2010, <<http://www.mod.uk/DefenceInternet/DefenceNews/DefencePolicyAndBusiness/UkfranceDefenceCooperationTreatyAnnounced.htm>>.

<sup>13</sup> UK–France Summit 2010, Declaration on defence and security cooperation, 2 Nov. 2010, <<http://www.number10.gov.uk/news/statements-and-articles/2010/11/>>. See also chapter 7, section IV, in this volume.

<sup>14</sup> Brunnstrom, D., 'EU urges defence collaboration, UK blocks budget', Reuters, 9 Dec. 2010.

<sup>15</sup> Brauer, J. and Dunne, J. P. (eds), *Arms Trade and Economic Development: Theory, Policy and Cases in Arms Trade Offsets* (Routledge: London, 2004).

<sup>16</sup> Baek, K. and Moon, C., 'Technological dependence, supplier control and strategies for recipient autonomy: the case of South Korea', eds K. Baek, R. McLaurin and C. Moon, *The Dilemma of Third*

ensuring security of supply means countries can minimize the political consequences attached to weapon purchases from external sources, which in turn decreases constraints.<sup>17</sup> Another political motivation is the central role that military preparedness still plays in national security policy: national leaders and populaces alike overwhelmingly believe that well-fortified armed forces are integral to achieving military security.<sup>18</sup> For certain smaller states, particularly those in politically charged regions or with regional power ambitions, an indigenous arms industry can tip the balance of power in their favour and engender prestige and nationalist pride. In some cases, these arms industries are sustained by high growth in national gross domestic product (GDP), which can stimulate governments to initiate military modernization programmes. Because the maintenance of these arms industries increasingly depends on developing domestically sourced, highly sophisticated arms technology, smaller countries often seek technology transfers from established arms producers. Another motivation is that smaller countries expect to reap economic gain from developing an arms industry, but growing evidence debunks the economic argument as a justification.<sup>19</sup>

As well as varying motivations, there are many barriers to building and sustaining an indigenous arms industry. Advanced modern arms industries are capital intensive, thus requiring developed infrastructures, which if not already in place are difficult and expensive to establish.<sup>20</sup> Because the base level of technology in the arms industry has risen over time, the current level of technological sophistication and its concomitant high costs have inhibited many countries from developing comparable weapon systems. This in turn pressures governments to participate in licensed production, joint ventures and partnerships.<sup>21</sup> In order for these countries to absorb imported technology, a well-educated populace must be combined with this infrastructure.<sup>22</sup> However, because more established arms producers are able to develop the next generation of technology, arms producers that

*World Defense Industries: Supplier Control or Recipient Autonomy?* (Westview Press: Boulder, CO, 1989), pp. 153–83.

<sup>17</sup> Yeo, E., 'Technological capabilities of our defence industries', *Pointer: Journal of the Singapore Armed Forces*, vol. 25, no. 2 (Apr.–June 1999).

<sup>18</sup> This assumption supports the national security exception in multilateral trade agreements, allowing for governments to request trade-distorting conditions, such as offsets in arms trade contracts. Jackson, S. T., 'The national security exception, the global political economy and militarization', eds K. Gouliamos and C. Kassimeris, *The Marketing of War in the Age of Neo-Militarism* (Routledge: London, forthcoming 2011).

<sup>19</sup> See e.g. eds Brauer and Dunne (note 15).

<sup>20</sup> eds Brauer and Dunne (note 15).

<sup>21</sup> Dunne, J. P., 'Defence industry—visions of the future', European Monitoring Centre on Change, European Foundation for the Improvement of Living and Working Conditions, May 2006, <<http://www.eurofound.europa.eu/emcc/content/source/eu06020a.htm>>.

<sup>22</sup> Yeo (note 17).

rely on technology transfers are even more technologically disadvantaged.<sup>23</sup> For smaller countries with lower military spending, and therefore smaller national market size, achieving economies of scale in their arms industries is challenging. Export uncertainties also arise from the oligopolistic structure of the global arms market. Similarly, exports of military equipment containing US technology face restrictions on third-country sales because of the US Arms Export and Control Act (AECA) and International Traffic in Arms Regulations (ITAR).<sup>24</sup> While US export permission is decided on a case-by-case basis, the ITAR stipulates what terms are required in contracts and licence agreements.<sup>25</sup> Possibly, recent changes in arms export rules in the USA and Western Europe will have implications for smaller arms industries in terms of weapon availability and technology transfers, although it is too soon to ascertain how, along with the degree and impact.<sup>26</sup>

While the SIPRI Top 100 list is dominated by established arms-producing companies based in the USA and Western Europe, a number of countries outside these regions have companies with arms sales high enough to be included. Most of these countries have smaller economies, which has implications for their defence procurement processes, and this in turn affects the type of arms industry framework they establish.<sup>27</sup> Three cases are studied here: Israel, South Korea and Turkey, each of which is a smaller OECD member country outside the Euro-Atlantic region which has one or more arms-producing companies in the SIPRI Top 100 for 2009.<sup>28</sup> These three countries also feature linkages that complicate and advance the theoretical underpinnings set out above. For example, all three countries are closely engaged with the USA and through this relationship have access to much of its highly technological military capabilities. In addition, the development and use of dual-use technology has allowed for a lucrative integration of military and economic interests in these three countries. This has assisted their arms industries in overcoming such barriers as a limited resource base (e.g. in competing with civilian sectors for desirable personnel) and political bilateral limitations (e.g. US export laws or restrictions in domestic arms production).

The following sections present a general overview of the current environments in which the three countries' arms industries operate. Each

<sup>23</sup> eds Brauer and Dunne (note 15).

<sup>24</sup> Baek and Moon (note 16), p. 168.

<sup>25</sup> US Department of State, International Traffic in Arms Regulations 2010, 1 Apr. 2010, <[http://www.pmdtc.state.gov/regulations\\_laws/itar\\_official.html](http://www.pmdtc.state.gov/regulations_laws/itar_official.html)>, part 124.

<sup>26</sup> On changes in US rules see chapter 6, section II, in this volume.

<sup>27</sup> Markowski, S., Hall, P. and Wylie, R. (eds), *Defence Procurement and Industry Policy: A Small Country Perspective* (Routledge: London, 2010), pp. 1–8.

<sup>28</sup> These countries are classified as small according to their gross national income for 2009. See Markowski, Hall and Wylie (note 27).

case study examines the ownership structure and concentration, diversification and internationalization in the country's arms industry. However, for some of the indicators, data was not always available or of high quality. Each case study also describes the most relevant legal and institutional elements that constitute the arms industry framework. The legal aspect includes relevant laws and regulations, such as those pertaining to offsets and export policy. The institutional aspect covers both government agencies (e.g. arms procurement and government-sponsored financial agencies) and private institutions that have the potential to influence the government's decisions on the laws and regulations that govern the arms industry (e.g. aerospace and defence industry associations). These frameworks are presented in terms of the motivations and barriers described above, with special attention to underlying pre-existing technological and industrial infrastructure, technology transfers, arms exports and military R&D funding.

#### IV. The Israeli arms industry

Following the Six Day War in 1967, France—which had previously supplied the bulk of Israel's advanced armaments—imposed a unilateral arms embargo on Israel. This prompted Israel to regroup its indigenous arms industry and require it to supply the Israeli Defense Forces (IDF) with the advanced weapons that were embargoed.<sup>29</sup> Due to its small size, geopolitical position, on-going border hostilities and a security policy that relied on technological superiority, the Israeli Government increasingly sought to develop a technology-based arms industry in the ensuing years.<sup>30</sup> After weathering a severe domestic economic crisis in the 1980s, Israel re-emphasized its quest for state-of-the-art arms technology for niche markets (both domestic and export) and expanded its comparative advantage in the retrofit and upgrade market.<sup>31</sup>

In addition to a highly educated populace that can work in the technology sector, several other factors facilitated the development of Israel's arms industry.<sup>32</sup> First, weapon development is carried out in close cooperation with the IDF, regardless of the IDF's commitment to purchasing the equipment.<sup>33</sup> Second, the Israeli Government emphasizes military R&D

<sup>29</sup> Dvir, D. and Tishler, A., 'The changing role of the defense industry in Israel's industrial and technological development', *Defence Analysis*, vol. 16, no. 1 (2000), pp. 33–52.

<sup>30</sup> Dvir and Tishler (note 29); Lewis, D. A., 'Diversification and niche market exporting: the restructuring of Israel's defense industry in the post-cold war era', eds A. Markusen, S. DiGiovanna and M. Leary, *From Defense to Development? International Perspectives on Realizing the Peace Dividend* (Routledge: London, 2003), pp. 121–50; and Kagan, K. et al., 'Defense structure, procurement and industry: the case of Israel', eds Markowski, Hall and Wylie (note 27), pp. 228–54.

<sup>31</sup> Lewis (note 30).

<sup>32</sup> Dvir and Tishler (note 29).

<sup>33</sup> Kagan et al. (note 30).

funding.<sup>34</sup> Approximately 9 per cent of Israel's military spending is dedicated to R&D, compared to 5.4 per cent in South Korea and 1 per cent in Turkey.<sup>35</sup> Third, Israel's relationship with established arms industries in Western Europe and the USA encourage the sharing of technology. In particular, the USA, by positioning itself as an export market, has fostered development of the Israeli arms industry. In addition, the USA provides significant military aid in the form of Foreign Military Financing (FMF). More than 18 per cent of Israel's defence budget comes from FMF, and 26 per cent of this aid can be used to buy Israeli-made weapons.<sup>36</sup> This provides the financial capacity for Israel to focus on building domestic arms technology.

### Israel's arms industry structure

While publicly available figures on the overall arms industry in Israel are difficult to obtain, it is generally accepted that the arms industry represents a relatively high share of Israel's GDP.<sup>37</sup> There are over 200 arms-producing companies in Israel that are divided into three types of ownership: (a) large government-owned arms organizations (Israel Aerospace Industries, IAI, Israel Military Industries, IMI, and Rafael); (b) one large (Elbit) and several medium-sized privately owned arms companies; and (c) relatively small private companies that produce a narrow line of items.<sup>38</sup> In addition to the companies, the IDF's Division of Technology and Logistics runs large refurbishment and maintenance centres.<sup>39</sup>

Recent evidence suggests that Israel's arms industry is increasing its capacity in related sectors, including civil security. Also, technology that is developed in the arms industry is being applied to other industries. However, this does not necessarily indicate that arms producers are less

<sup>34</sup> Gordon, N., 'The political economy of Israel's homeland security/surveillance industry', New Transparency Working Paper 3, Queen's University, Surveillance Studies Centre, 28 Apr. 2009, <<http://www.sscqueens.org/resources/online-reports/>>; and Sharaby, L., 'Israel's economic growth: success without security', *Middle East Review of International Affairs (MERIA) Journal*, vol. 6, no. 3 (Sep. 2002).

<sup>35</sup> Kagan et al. (note 30), p. 238; and 'Seoul to increase defense R&D spending', *Korea Herald*, 30 Mar. 2010. The figure for Turkey is based on Turkish Defence Industry Manufacturers Association (SaSaD), 'Türk savunma sanayii anket sonuçları 1997-2009' [About the Turkish defence industry 1997-2009], 2010, <<http://www.sasad.org.tr/aday-uyeler/>>; and chapter 4, section VII, in this volume.

<sup>36</sup> Sharp, J. M., *U.S. Foreign Aid to Israel*, Congressional Research Service (CRS) Report for Congress RL33222 (US Congress, CRS: Washington, DC, 16 Sep. 2010). On the affordability argument see Lewis (note 30).

<sup>37</sup> Kagan et al. (note 30).

<sup>38</sup> Israeli Ministry of Defense, Defense Export and Cooperation Division (SIBAT), 'SIBAT—Export Services Center', <<http://www.sibat.mod.gov.il/sibatmain/sibat/about/export.htm>>. Recent merger and acquisition activity may continue, perhaps with the privatization of government-owned arms producers. Jackson, S. T., 'Arms production', *SIPRI Yearbook 2010*, pp. 251-83.

<sup>39</sup> Kagan et al. (note 30).

defence-dependent than before. Because the top producers have also increased their arms sales, arms sales as a share of total sales are relatively stable.<sup>40</sup> Examination of the top arms producers for which data is publicly available shows that diversification of production lines is minimal among these producers. Using arms sales as a share of total sales as a measure of diversification, the average level of diversification of the four largest Israeli arms producers in the years 2005–2009 ranged from a low of 62 per cent (for IAI) to 94 per cent (for both Elbit and IMI) and a high of 97 per cent (for Rafael).<sup>41</sup> These figures are nearly the same for the 10-year averages and do not vary much or at all from year to year. Because three of the largest Israeli arms producers have nearly 100 per cent arms sales, it is difficult to claim that the industry overall is diversifying.

Over the past three decades, Israel has expanded its arms exports significantly, reaching a value of approximately \$7.5 billion in export agreements in 2009.<sup>42</sup> This trend is due in part to increasing development of sophisticated systems and components.<sup>43</sup> Because the Israeli economy is relatively small, Israeli arms producers look to foreign markets. Exports sales comprise as much as 70 per cent of the total arms sales of Israeli arms producers.<sup>44</sup> In Elbit's case, export sales in the years 2008–10 were almost 80 per cent of total sales.<sup>45</sup>

During 2005–2009 the largest recipients of completed weapons by volume from Israel were Turkey and India; the largest supplier to Israel by far was the USA.<sup>46</sup>

### **Israel's arms production framework**

The three main actors in the arms procurement process in Israel are the Ministry of Defense (MOD), the IDF and the arms industry.<sup>47</sup> The IDF and the state-owned arms companies dominate this industry, with the latter receiving the majority of the procurement revenues.<sup>48</sup> In addition, the IDF and the MOD's Directorate of Defense Research and Development (MAFAT) work on R&D with the arms industry (including government-

<sup>40</sup> Lewis (note 30).

<sup>41</sup> Figures based on the SIPRI Arms Industry Database.

<sup>42</sup> Israel anticipates record defence sales in 2010', *Jane's Defence Weekly*, 9 June 2010, p. 33. See also appendix 6B in this volume.

<sup>43</sup> Kagan et al. (note 30), p. 242. The arms industries of other small countries, such as Sweden, have high domestic arms sales.

<sup>44</sup> Kagan et al. (note 30), p. 242.

<sup>45</sup> These are the most recent years for which Elbit's export data are available. Elbit Systems Ltd, '20-F annual and transition report of foreign private issuers pursuant to sections 13 or 15d', FY ended 31 Dec. 2010, 2009 and 2008, <<http://ir.elbitsystems.com/phoenix.zhtml?c=61849&p=irol-sec>>.

<sup>46</sup> SIPRI Arms Transfers Database, <<http://www.sipri.org/databases/armstransfers/>>.

<sup>47</sup> Kagan et al. (note 30).

<sup>48</sup> Lewis (note 30).

owned companies and research centres). On a case-by-case basis, the General Staff creates a special projects office (SPO) to manage major R&D or procurement projects and as a lobbying group to defend arms projects against critics.

The two principal avenues for Israeli arms procurement are the Directorate for Procurement and Production, in Israel, and the MOD's Mission to the USA, in New York and Washington, DC. The mission handles direct contracts financed by FMF and markets Israeli products in the USA.<sup>49</sup> Because of the emphasis on arms exports, export support plays a prominent role in Israeli arms procurement policy. In particular, the MOD has the Foreign Defence Assistance and Defense Export (SIBAT) and the Defense Exports Control (API) directorates and works on dual-use items with other agencies and ministries, including the Ministry of Industry, Trade and Labor.<sup>50</sup> The government funds the Israel Export and International Cooperation Institute in order to facilitate trade opportunities, joint ventures and strategic alliances between Israeli and foreign arms producers.<sup>51</sup>

In June 2010 the government-commissioned Harari Committee issued new export control guidelines that grant more authority to the MOD through its export control agencies. These guidelines allow the MOD to give preferential treatment for export licences to companies that produce items used by the IDF. This reflects the importance of the arms industry in perceptions of Israeli national security.<sup>52</sup> The guidelines are controversial to some in part because they may consolidate SIBAT and the API, counter to the urgings of the US Government.<sup>53</sup> In order to encourage international competition, the Israeli MOD also issued guidelines intended to reduce competition among domestic firms.

In addition, Israel requires that any contract for the acquisition of weapons worth more than \$5 million from a foreign company includes provisions for offset investment in Israel worth 50 per cent of the contract value. This also applies to related follow-on contracts worth \$500 000 or more made within five years of the original contract.<sup>54</sup> While exceptions

<sup>49</sup> Kagan et al. (note 30); and Israeli Ministry of Defense, 'Mission to the U.S.', <<http://www.gomod.com/departments/default2.htm>>.

<sup>50</sup> Pincu, E., Israeli Ministry of Defense, Defense Export Controls Directorate, 'Israeli defense export control', Presentation to the US-Israeli High Technology Forum, 9 Sep. 2008, <[http://www.ndia.org/Divisions/Divisions/International/Pages/U\\_S\\_-\\_Israel\\_High\\_Technology\\_Forum.aspx](http://www.ndia.org/Divisions/Divisions/International/Pages/U_S_-_Israel_High_Technology_Forum.aspx)>.

<sup>51</sup> Israel Export and International Cooperation Institute (IEICI), 'Services', <[http://www.export.gov.il/Eng/\\_Articles/Article.asp?CategoryID=4&ArticleID=514](http://www.export.gov.il/Eng/_Articles/Article.asp?CategoryID=4&ArticleID=514)>.

<sup>52</sup> Sjkuler, N., 'World divided between IAI, Elbit', Ynet News, 23 July 2010, <<http://www.ynetnews.com/articles/0,7340,L-3923979,00.html>>.

<sup>53</sup> Opall-Rome, B., 'Israeli exporters decry new controls', *Defense News*, 11 Oct. 2010.

<sup>54</sup> Israeli Ministry of Industry, Trade and Labor, 'The Knesset's Constitution, Law and Legal Committee unanimously approves the Compulsory Tenders Regulations (Mandatory Industrial Cooperation) 5767-2006', 14 Mar. 2003, <<http://www.tamas.gov.il/NR/exeres/D965D740-0B33-4426-AFD5-B616AD31FE3E.htm>>; and Israeli Ministry of Industry, Trade and Labor, 'Guidelines for

exist for acquisitions from US companies made under the FMF programme, negotiations in 2010 involving the Joint Strike Fighter programme show that Israel will possibly gain \$4 billion in production benefits, which could be classified as offsets.<sup>55</sup>

## V. The South Korean arms industry

In the early 1970s in response to a deteriorating security environment on the Korean Peninsula along with the Nixon Doctrine—under which the USA required its allies to take on responsibility for their own defence—South Korea sought to develop self-sufficiency in its arms industry.<sup>56</sup> Pre-existing heavy capital investment, developed industrial infrastructure and a skilled labour force facilitated this government-led process. Like Israel, however, South Korea has relied on technology transfers from the USA.<sup>57</sup> Also, both countries' relationships with the USA have resulted in direct military aid, equipment and an active arms trade. The continued presence and influence of US forces in South Korea has contributed to the development of the domestic arms industry from the onset, especially through shared technology. This development initially manifested itself through the reverse engineering of US military equipment in the early 1970s. Over the decades, this gave way to licensed production and joint ventures as well as indigenously designed equipment. Much of the sophisticated weapon technology used by the arms industry in South Korea has been in subsystems and components that have been produced under licence or imported.<sup>58</sup>

Over the past decade, an aggressive government push for domestic procurement combined with improved industrial capabilities in related areas such as information technology and aerospace technology has made it possible for South Korea to begin relying on its own R&D and to increase local content in some areas.<sup>59</sup> Partly due to government support in the form of designated funding, there are high localization rates in communication and electronics, precision guidance weapons, aerospace, armoured vehicles and naval vessels. The Asian financial crisis in the late 1990s hindered arms industry development, although at that time arms exports grew as a result

industrial cooperation in Israel', [n.d.], <<http://www.moital.gov.il/NR/exeres/85C96324-328D-40FC-9E8A-78B6CC5F6E7E.htm>>.

<sup>55</sup> Opall-Rome, B., 'Israel reaps work share bonanza for F-35', *Defense News*, 23 Aug. 2010.

<sup>56</sup> Baek and Moon (note 16); and Lee, Y. and Markusen, A., 'The South Korean defense industry in the post-cold war era', eds Markusen, DiGiovanna and Leary (note 30), pp. 224–53.

<sup>57</sup> Baek and Moon (note 16).

<sup>58</sup> Lee and Markusen (note 56).

<sup>59</sup> Moon, C. and Lee, J., 'The revolution in military affairs and the defence industry in South Korea', *Security Challenges*, vol. 4, no. 4 (summer 2008), pp. 133–34.

of the introduction of high-cost exports such as military ships and missile parts.<sup>60</sup>

Over the past decade, South Korea has pursued a 'dual procurement' policy that promotes local growth in technological expertise (especially for aerospace and electronics components for export) coupled with purchasing expensive, technologically sophisticated military equipment from abroad.<sup>61</sup> This policy has contributed to the increased number of firms involved in activities related to arms production.<sup>62</sup> The government has also implemented an industrial policy aimed at increasing arms industry employment and arms exports, the latter of which is expected to increase South Korea's international prestige.<sup>63</sup> South Korea has been trying to expand its supplier base to lessen its dependence on the USA in part because of the restrictions on exporting weapons with US technology imposed by the USA's AECA and ITAR.<sup>64</sup> South Korea is actively increasing its role in the industrializing world's arms market.<sup>65</sup> This growth is made possible and fostered by civilian industries that are already globally dominant in their respective sectors: shipbuilding and electronics.

### South Korea's arms industry structure

As of 2008, there were 91 arms producers in South Korea with approximately 4000 companies that can act as subcontractors.<sup>66</sup> South Korea allows conscripts to perform alternative service by working in the arms industry.<sup>67</sup> Arguably, the most distinctive characteristic of South Korea's arms industry is the dominance of *chaebol* in the national economy.<sup>68</sup>

The *chaebol* are family-owned conglomerates that have historically benefited from strong state support, especially under the military regime of President Park Chung-hee (1961–79), who directed heavy investment in

<sup>60</sup> Harris, S., 'Coping with pressure: South Korea's defense restructuring and the impact of the recent economic crisis', *Korean Journal of Defense Analysis*, vol. 12, no. 2 (winter 2000).

<sup>61</sup> Lee and Markusen (note 56).

<sup>62</sup> Moon and Lee (note 59).

<sup>63</sup> 'Korea's dream of becoming a major world arms exporter', KBS World, 20 Oct. 2010, <[http://world.kbs.co.kr/english/news/news\\_commentary\\_detail.htm?No=20032](http://world.kbs.co.kr/english/news/news_commentary_detail.htm?No=20032)>.

<sup>64</sup> Cho, M., *Restructuring of Korea's Defense Aerospace Industry: Challenges and Opportunities?*, Paper 28 (Bonn International Center for Conversion: Bonn, 2003).

<sup>65</sup> Brewster, D., 'India's developing relationship with South Korea: a useful friend in East Asia', *Asian Survey*, vol. 50, no. 2 (Mar./Apr. 2010).

<sup>66</sup> Paek, J., 'Defense science and technology of the ROK and desirable directions for relevant R&D policies', *Korean Journal of Defense Analysis*, vol. 22, no. 2 (2010); and Suh, J. J., 'Allied to race? The U.S.–Korea alliance and arms race', *Foreign Policy in Focus*, 17 May 2010, <[http://www.fpiif.org/articles/allied\\_to\\_race\\_the\\_us-korea\\_alliance\\_and\\_arms\\_race](http://www.fpiif.org/articles/allied_to_race_the_us-korea_alliance_and_arms_race)>.

<sup>67</sup> Feffer, J., 'Ploughshares into swords: economic implications of South Korean military spending', Korea Economic Institute, Academic Paper Series vol. 4, no. 2 (Feb. 2009), <<http://www.keia.org/report.php?id=prg10068>>. The law for the draft exemption was issued in 1970. Baek and Moon (note 16).

<sup>68</sup> Lee and Markusen (note 56), p. 230.

shipbuilding, steel and electronics. These civilian sectors were engaged with arms production, initially in ships and heavy machinery, although the *chaebol* were and continue to be predominantly civilian conglomerates. More recent government plans take advantage of top *chaebol* that are already dominant players, especially in the global technology industry. Thus, while South Korea's arms industry is completely privately owned, most of the top firms (including the five largest) are subsidiaries of the *chaebol*, for which government support remains strong.

All of the top arms producers are engaged in civilian production—most likely supported by their parent companies—that reportedly has positive spin-on effects for arms production.<sup>69</sup> The total arms sales of the five largest weapon producers comprised 70 per cent of the total arms sales of South Korea's arms-producing companies in 2009.<sup>70</sup> This concentration shows how the oligopolistic *chaebol* have nurtured the domestic arms industry, most likely through their sizable R&D and skilled personnel resources and by providing their subsidiaries with an entry-point into international markets.

The South Korean Government has not allowed the *chaebol* to specialize in arms production. Instead, it has pursued policies that encourage diversification, including R&D programmes and dual-use technology policies that are aimed at fostering dual-use producers and possibly for expanded exports, although small companies that are more specialized are more dependent on arms sales.<sup>71</sup> At the same time, there is a structural separation between civilian and weapon R&D. South Korean arms producers see more profit in, and therefore focus on, civilian sectors.<sup>72</sup> A subsidiary position within a *chaebol* is likely to support this duality. As a result, South Korean arms producers have a high level of diversification with a relatively stable overall arms share of 8.5 per cent of total company sales in 2009, up slightly from 8.0 per cent in 2002.<sup>73</sup>

In 2009 the South Korean arms industry made 8769 million won (\$6.9 billion) in arms sales.<sup>74</sup> Over 2005–2009, the largest recipients by volume of South Korean arms were Indonesia and Turkey; the largest suppliers to South Korea were the USA, Germany and France.<sup>75</sup> Arms exports from South Korea amounted to over \$1.1 billion in 2009, 17.3 per cent of

<sup>69</sup> Moon and Lee (note 59), p. 130.

<sup>70</sup> SIPRI Arms Industry Database. The arms sales figures for South Korea are based on defence division figures and are likely to contain a marginal amount of civilian sales while leaving out a marginal amount of arms sales made by commercial divisions. See appendix 5A for information on the largest individual arms companies in South Korea.

<sup>71</sup> Lee and Markusen (note 56).

<sup>72</sup> This pursuit has long been supported by the South Korean Government. See Sköns, E. and Gill, B., 'Arms production', *SIPRI Yearbook 1996*, pp. 411–62.

<sup>73</sup> SIPRI Arms Industry Database. See also note 70.

<sup>74</sup> SIPRI Arms Industry Database.

<sup>75</sup> SIPRI Arms Transfers Database (note 46).

total arms sales and an increase of \$850 million since 2007.<sup>76</sup> In addition, since the majority of the arms industry is based on government programmes that depend on imported technology, the arms industry in South Korea does not have many of the core technologies required to produce sophisticated weapon systems, and its overall dependence on foreign sources for this technology and related parts remains quite high even with higher localization rates.

### **South Korea's arms production framework**

The South Korean Government is a key actor in military R&D and in basic support for the arms industry.<sup>77</sup> Starting in 1970, South Korea set up the Agency for Defense Development (ADD), South Korea's national R&D agency for arms technology.<sup>78</sup> In 2008 the ADD had an annual budget of \$943 million, and 84 per cent of its 2522 employees were directly engaged in R&D.<sup>79</sup> However, the role of the ADD decreased in 2009–10 because the government began encouraging private companies to shoulder military R&D. As a result, companies are reconsidering their own strategies.<sup>80</sup>

In 2009 the South Korean Government initiated restructuring in the South Korean arms industry by removing the preferential treatment system for companies designated as arms producers. This designation had guaranteed these companies the right to participate in arms industry capability improvement projects that aimed to increase the levels of technology in the arms industry. This system was abolished for several reasons including the entry barriers for non-designated companies and the slow pace of technological development within arms-producing companies.<sup>81</sup>

South Korea prefers arms trade offsets in the form of technology transfers and training.<sup>82</sup> The offset threshold is \$10 million for military-related procurement, and offsets are set at a minimum of 50 per cent of the contract value, although this amount can be lowered to 30 per cent when the

<sup>76</sup> Paek (note 66).

<sup>77</sup> Harris (note 60), p. 221.

<sup>78</sup> Moon and Lee (note 59).

<sup>79</sup> Innovation Norway Korea, 'Korea defense industry', Oct. 2008, <[http://www1-invanor.no1.asap-asp.net/Internasjonalisering\\_fs/Utekontorer/Korea/Defense Sector Korea 2008\\_INK.pdf](http://www1-invanor.no1.asap-asp.net/Internasjonalisering_fs/Utekontorer/Korea/Defense%20Sector%20Korea%202008_INK.pdf)>.

<sup>80</sup> 'Korea's dream of becoming a major world arms exporter' (note 63). For a company example, Doosan Infracore of Doosan Group spun-off its arms division into a wholly owned subsidiary. See Doosan DST, 'About us: history', 2010, <<http://www.doosan.com/doosandst/en/aboutus/history.page>>.

<sup>81</sup> Paek (note 66).

<sup>82</sup> US General Accounting Office (GAO), *Military Exports: Offset Demands Continue to Grow*, GAO/NSIAD-96-65 (GAO: Washington, DC, Apr. 1996), p. 29.

projects are either government-to-government or the equipment is to be purchased from a single contractor.<sup>83</sup>

The Defense Acquisition Program Administration (DAPA) was established in 2006 to streamline the acquisitions process and to support the arms industry. Its 2008 annual budget was \$10.4 billion (37 per cent of total national defence budget) in part for direct spending on force improvement.<sup>84</sup> In 2009 DAPA established the Korea Trade-Investment Promotion Agency (KOTRA) to assist Korean companies in arms export promotion.<sup>85</sup>

The Korean Defense Industry Association (KDIA) is a civilian non-profit organization that works to promote the interests of South Korean arms producers in a variety of ways. For example, it is a member of the US–South Korean Defense Industry Consultative Committee, which covers arms industry cooperation between the two countries in areas such as technology transfers.<sup>86</sup>

## VI. The Turkish arms industry

The Turkish Government focused on arms industry development in the 1970s following Turkey's invasion of Cyprus in 1974 and the subsequent US arms embargo.<sup>87</sup> In the 1980s Turkey began arms industry-related governmental reorganization aimed at military modernization, although a severe economic crisis hampered Turkey's ambitions throughout the 1980s and 1990s. There have been several iterations of a military modernization project since 1985, one goal of which is to increase the share of domestic production in arms procurement.<sup>88</sup> Turkey's official reasons for developing a domestic arms industry are threefold: to provide weapons that the Turkish Armed Forces (Türk Silahlı Kuvvetleri, TSK) can use independently (strategic aim) and that the TSK needs (operational aim), and to establish the ability to support weapons domestically (logistical aim).<sup>89</sup> In this way, Turkey is trying to achieve self-sufficiency. As in the cases of Israel and South Korea, Turkey ultimately has received much of its technology from the USA, and US companies have become an integral element in the Turk-

<sup>83</sup> South Korean Ministry of Defense, Defense Acquisition Program Administration, '2009 Korean defense offset program guidelines', <[http://www.dapa.go.kr/eng/Acquisition/e\\_Offset\\_Program.jsp?oscd=4](http://www.dapa.go.kr/eng/Acquisition/e_Offset_Program.jsp?oscd=4)>.

<sup>84</sup> Innovation Norway Korea (note 79).

<sup>85</sup> Chang S., 'Building the best defense', *Invest Korea Journal*, Dec. 2010.

<sup>86</sup> National Defense Industrial Association, 'US–ROK defense industry consultative committee (DICC)', <[http://www.ndia.org/Divisions/Divisions/International/Pages/US-ROK\\_Defense\\_Industry\\_Consultative\\_Committee\\_\(DICC\).aspx](http://www.ndia.org/Divisions/Divisions/International/Pages/US-ROK_Defense_Industry_Consultative_Committee_(DICC).aspx)>.

<sup>87</sup> Günlük Şenesen, G., 'An overview of the arms industry modernization programme in Turkey', *SIPRI Yearbook 1993*, pp. 521–32.

<sup>88</sup> Akça, I., *Military-Economic Structure in Turkey: Present Situation, Problems, and Solutions* (TESEV: Istanbul, 2010).

<sup>89</sup> Anatolia News Agency, 'Turkey's defense industry seeks to utilize domestic potential', *Hurriyet Daily News*, 5 May 2010.

ish arms industry.<sup>90</sup> Part of the relationship Turkey has developed with the USA is based on the high levels of military aid that the former has received from the latter over the years. Turkey is working to diversify its foreign partners to include OECD countries such as Israel and South Korea, among others.<sup>91</sup>

Until efforts over the past decade to provide more support for R&D centres and other infrastructure projects, Turkey has lacked an overall infrastructure established enough to support the development of a technologically sophisticated arms industry.<sup>92</sup> It has had a small technological base and can generally purchase equipment for less cost than it can build it itself.<sup>93</sup>

### Turkey's arms industry structure

Turkey has 10–12 sizable companies that act as prime contractors and approximately 100 smaller companies in specialized segments.<sup>94</sup> Companies in the arms industry may be owned by the government, the Turkish Armed Forces Foundation (TSK Güçlendirme Vakfı, TSKGV) or privately. The TSKGV-owned companies, which can be considered government-owned, are some of the largest in Turkey and include Aselsan (electronics) and TAI (aerospace).

In 2009 the Turkish arms industry recorded \$2.3 billion in turnover.<sup>95</sup> Limited availability of data across firms in the arms industry hinders measuring concentration and diversification. However, an examination of Turkey's two largest arms producers reveals a high level of concentration. At \$643 million in arms sales in 2009, Aselsan had a 28 per cent share of the total turnover of Turkey's arms producers. Adding in TAI's estimated arms sales of \$255 million brings the share for these two companies to 38.7 per cent of Turkey's total arms sales.<sup>96</sup> According to official estimates, these two companies combined accounted for 24 per cent of Turkish arms exports in 2009.<sup>97</sup>

Diversification levels vary by company. Aselsan's arms sales share of total sales was fairly consistent over the period 2000–2009, ranging from under

<sup>90</sup> Sarıbrahimoğlu, L., 'The defense industry', eds A. Bayramoğlu and A. Insel, *Almanac Turkey 2006–2008: Security Sector and Democratic Oversight* (TESEV: Istanbul, 2010).

<sup>91</sup> Cooperation between Turkey and Israel became strained in 2010 when IDF members raided a Gaza Strip-bound aid flotilla, killing some of the Turkish citizens onboard. Egozi, A., 'Turkey halts Israel UAV talks in wake of Gaza flotilla action', *Flight International*, 21 June 2010.

<sup>92</sup> Kemal, L., 'Turkish arms industry faces dilemma', *Today's Zaman*, 12 June 2008.

<sup>93</sup> McGregor, A., *Arming for Asymmetric Warfare: Turkey's Arms Industry in the 21st Century* (Jamestown Foundation: Washington, DC, June 2008).

<sup>94</sup> Turkish Defence Industry Manufacturers Association (note 35).

<sup>95</sup> Turkish Defence Industry Manufacturers Association (note 35).

<sup>96</sup> SIPRI Arms Industry Database.

<sup>97</sup> Turkish Defence Industry Manufacturers Association (note 35).

80 per cent to over 90 per cent, with an average of 86 per cent over the period. TAI's arms shares are more variable, ranging between 44 per cent and 97 per cent without a consistent trend over the same period.<sup>98</sup>

In terms of import dependency, the official statistics give the domestic share of arms production at 44.2 per cent in 2009.<sup>99</sup> However, this figure may not be accurate because the bulk of the projects that it covers will not start until at least 2013.<sup>100</sup> Turkish arms producers also hope to join multinational projects that lend themselves to technology transfers, domestic production and potential export opportunities. Since 2004 Turkey has applied a new technological production model that encourages technology transfers through international arms production partnerships in order to provide arms design and development skills to domestic arms producers as well as to increase export opportunities.<sup>101</sup>

Turkey's officially reported arms exports for 2009 were \$669 million, a 16 per cent increase over 2008 and a 444 per cent increase since 2000.<sup>102</sup> Arms exports are 28.8 per cent of total arms sales. In 2005–2009 the recipients of the largest volumes of Turkish arms were Iraq and Pakistan; the largest suppliers to Turkey were Germany, Israel and the USA.<sup>103</sup> Turkey's export volumes are significantly lower than Israel's and marginally less than South Korea's.

Total company-sponsored R&D has greatly increased in recent years, with a 90 per cent increase between 2007 and 2008 and an increase of 256 per cent between 2004 and 2008.<sup>104</sup> These total figures mirror the available data on R&D spending by the largest arms producers in Turkey. For example, Aselsan increased its company-sponsored R&D spending from \$1 million in 2001 to \$45 million in 2009, and TAI increased its spending from \$1 million to \$199 million.<sup>105</sup>

### **Turkey's arms production framework**

In the Turkish arms production framework, the government is the most powerful player, with the Turkish Ministry of National Defence as the lead governmental body. For instance, the ministry has the sole legal authority to grant arms production licences to manufacturers and the responsibility

<sup>98</sup> SIPRI Arms Industry Database.

<sup>99</sup> Turkish Defence Industry Manufacturers Association (note 35).

<sup>100</sup> Sariibrahimoğlu (note 90), pp. 153–56.

<sup>101</sup> Akça (note 88).

<sup>102</sup> Turkish Defence Industry Manufacturers Association (note 35). See also appendix 6B in this volume.

<sup>103</sup> SIPRI Arms Transfers Database (note 46).

<sup>104</sup> Turkish Union of Chambers and Commodity Exchanges (TOBB), *Türkiye Savunma Sanayi Sektör Raporu 2009* [Turkey defence industry sector report 2009] (TOBB: Ankara, May 2010), p. 32.

<sup>105</sup> SIPRI Arms Industry Database.

for controls on arms exports and re-exports, among other things.<sup>106</sup> The ministry's Defence Industries Undersecretariat is the main arms procurement authority and is tasked with developing a modern indigenous arms industry.<sup>107</sup> In 2009 its authority over single-source tenders was extended to give it the sole right to make adjustments to signed contracts.<sup>108</sup> It also fully controls the Defence Industry Support Fund, which provides a constant flow of financial resources, enabling the undersecretariat to operate without bureaucratic restrictions.<sup>109</sup>

The TSKGV is a military-run charitable trust that is financed from outside the national budget. It is considered a key force in the development of the Turkish arms industry and is obligated to spend 80 per cent of its annual gross income (65 per cent of which is allocated to TSK projects and 35 per cent directly to investments in the arms industry).

Offsets related to the Turkish arms industry are required for projects valued at \$10 million or more.<sup>110</sup> Contractors are required to commit at least 50 per cent of procurement agreements.

The main industry association, the Defence Industry Manufacturers Association, has over 100 members and works to coordinate industry activities with government authorities and more generally promote the industry.<sup>111</sup> It also produces semi-official statistics on the arms industry.

## VII. Conclusions

Arms-producing companies displayed resilience, even increasing overall arms sales in 2009, despite the ongoing economic recession. This is true of both companies in North America and Western Europe, which dominate the global arms industry in terms of arms sales, and companies in some of the smaller economies with advanced arms industries, such as Israel, South Korea and Turkey.

<sup>106</sup> 'Control of industrial enterprises producing vehicles and equipment of war and arms, ammunition and explosive material', Turkish Law no. 5201, accepted 29 June 2004, *TC Resmî Gazete*, 3 July 2004. See also United Nations, Programme of Action Implementation Support System, 'Turkey: national report on the implementation of the United Nations Programme of Action to Prevent, Combat and Eradicate the Illicit Trade in Small Arms and Light Weapons in All Its Aspects', Apr. 2008, <<http://www.poa-iss.org/CountryProfiles/CountryProfileInfo.aspx?CoI=198&pos=1000>>.

<sup>107</sup> Undersecretariat for Defence Industries, 'Law no. 3238', <<http://www.ssm.gov.tr/home/institutional/Sayfalar/law3238.aspx>>.

<sup>108</sup> Turkish Council of Ministers, Decision 2009/15108, 30 May 2009, *TC Resmî Gazete*, 8 July 2009.

<sup>109</sup> Undersecretariat for Defence Industries (note 107); and Sarıbrahimoğlu (note 90). See also chapter 4, section VII, in this volume.

<sup>110</sup> Turkish Ministry of National Defence, Industrial participation/offset directive, 14 Feb. 2007, <<http://www.ssm.gov.tr/home/institutional/Sayfalar/regulation.aspx>>.

<sup>111</sup> Turkish Defence Industry Manufacturers Association (note 35).

While developing and maintaining a domestic arms industry is an expensive and difficult endeavour, several factors motivate these smaller economies with arms industries. Security of supply, especially as an impetus for domestic arms industry growth, has played a key role in motivating such countries to invest their resources in an arms industry capable of producing technologically sophisticated weapons. In each case, the underlying technological and industrial infrastructure, technology transfers, arms exports and military R&D funding have shaped arms industry development, adapted to individual desires and limitations. The varying levels of technological and industrial infrastructure have determined when and to what extent technological developments are integrated into domestic arms production and whether the integration leads to indigenous technological sophistication. Access to arms technology via transfers is also a key factor in the development of domestic arms industries. A requirement for offset investment in return for large arms procurement contracts can lead to technology transfers, although limitations are imposed by the USA on re-exports of US technology. In contrast, domestically funded military R&D allows national control over the resulting technology. Another equally important motivation rests on the perception that an arms industry contributes to national prestige.

As the economic recession continues and countries begin to challenge the level of their spending on arms purchases, it is unlikely that the industry overall will experience a large setback in 2010 and 2011 arms sales. While individual programmes might be cancelled or delayed, these changes in priorities are likely to have no overall impact on the global arms industry in the next year or two.