

**EU Non-PROLIFERATION CONSORTIUM**

*The European network of independent non-proliferation think tanks*

# Conventional strategic military capabilities in the Middle East

PIETER D. WEZEMAN

Background paper

EU Seminar to promote confidence building and in support of a process aimed at establishing a zone free of WMD and means of delivery in the Middle East

Brussels 6–7 July 2011

The EU Non-Proliferation Consortium is a network of independent non-proliferation think tanks to encourage discussion of measures to combat the proliferation of weapons of mass destruction and their delivery systems within civil society, particularly among experts, researchers and academics. Any opinions expressed in this document are the sole responsibility of the author and do not necessarily reflect the views of the EU Non-Proliferation Consortium or any of its individual institutes.



July 2011

## Contents

I. Introduction	1
II. Access to arms	1
III. Conclusions	12

## About the author

Pieter D. Wezeman is a Senior Researcher with the SIPRI Arms Transfers Programme. He rejoined SIPRI in 2006, having previously worked at the institute from 1994 to 2003. From 2003 to 2006 he was a Senior Analyst for the Dutch Ministry of Defence in the field of proliferation of conventional and nuclear weapon technology.

## Abbreviations

ABM	Anti-ballistic missile
AEW	Airborne early warning
ASM	Air-to-surface missile
C4ISR	Command, control, communications, computers, intelligence, surveillance, and reconnaissance
EU	European Union
GDP	Gross domestic product
NATO	North Atlantic Treaty Organization
SAM	Surface-to-air missile
SLV	Space launch vehicle
SSM	Surface-to-surface missiles
UAE	United Arab Emirates
UN	United Nations

## I. Introduction

The Middle East is a part of the world with many unresolved issues that could lead to both conflict within and between states. The pursuit of political objectives using violent means has been a common element in the recent experience of the region. Even though the pattern of conflict in the region in recent years has been dominated by violence within states, the risk of armed conflict between states remains high. Inter-state relations in the region are complex, and as Peter Jones notes in his paper ‘The Arms Control and Regional Security Working Group: still relevant to the Middle East?’, they cannot be reduced to the discussion of relations between Israel and other countries in the region. A balanced discussion of the military capabilities of all actors involved has to be a central element of a regional security dialogue.

This paper provides an introductory discussion of a key element in military capabilities in the Middle East that relates to the risk of inter-state violent conflict: the conventional military assets available to destroy or disrupt strategic targets such as military or political control centres, key infrastructure deep inside the territory of adversaries, or to use terror as a weapon by attacking civilian population centres. Such capabilities depend on the resources available to attack targets and the resources available to defend against such attacks. As an introduction to the issue this paper looks at how the conventional strategic capabilities have developed over the past 20 years in the countries in the Middle East.<sup>1</sup>

## II. Access to arms

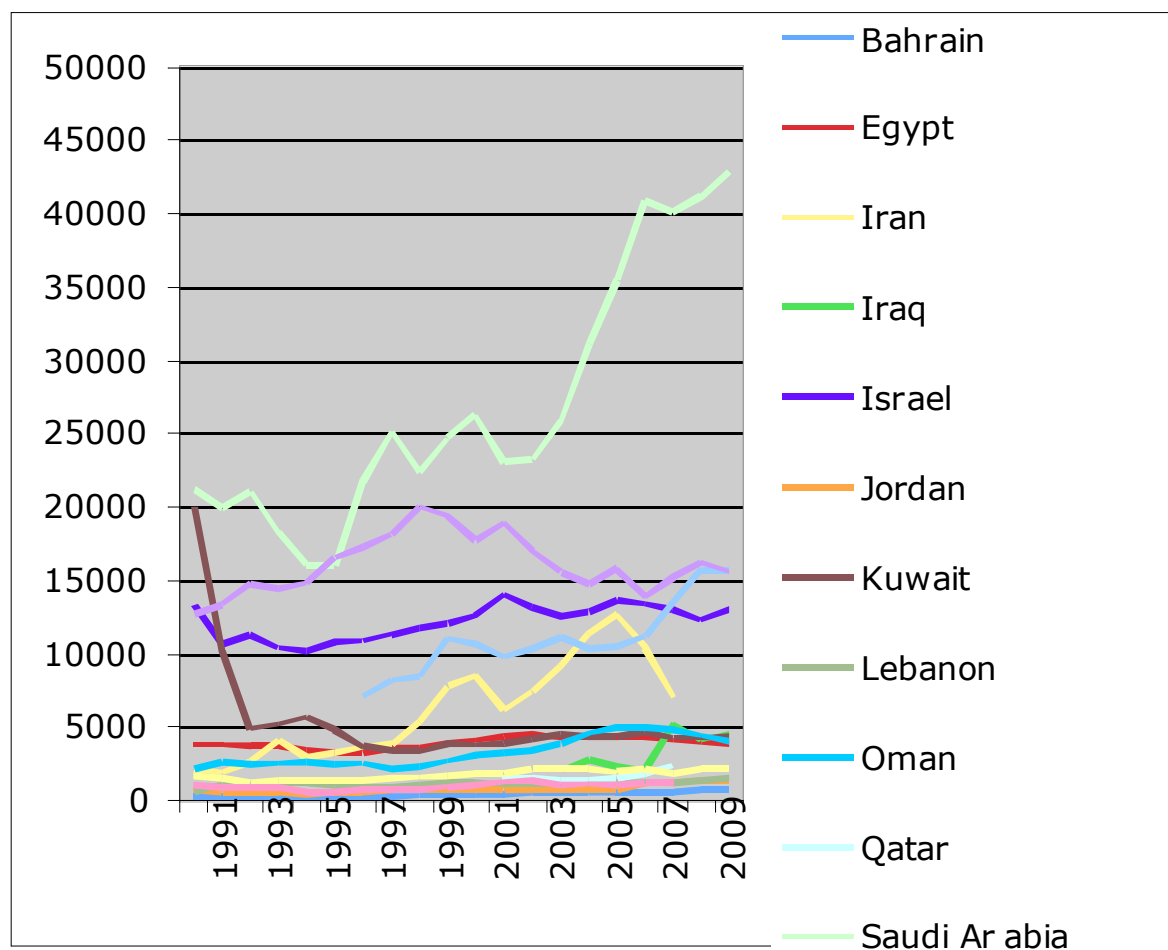
Countries in the Middle East have highly varying access to weaponry, both in quantity and quality. Such access is determined by their economic resources, the size and technological level of their industrial bases and their relations with arms supplying states.

### **Military expenditure**

Figure 1 provides estimates of military spending for the discussed countries. Although available data is highly uncertain, the estimates indicate major disparities. Countries in the region with a high per capita Gross Domestic Product (GDP) allocate large budgets to military spending. For example Saudi Arabia spent in 2010 an estimated \$45.2 billion on its military, 11.2 per cent of its GDP. Saudi Arabia’s large oil revenues are key to its high military spending and its ability to procure advanced weapons. Similarly, the UAE’s thriving economy is key to its substantial investment in advanced military equipment in the past two decades and its estimated military expenditure of \$15.7 billion in 2010. On the other end of the scale, Syria, for example, does not have the economic strength to maintain military spending of more than an estimated \$2.3 billion in 2010.<sup>2</sup>

<sup>1</sup> Though generally excluded from the terms of discussion of a WMD-free zone in the Middle East, Turkey is included in this paper because of its major role in the area and its emerging strategic military capabilities.

<sup>2</sup> SIPRI Military Expenditure Database.



**Figure 1.** Military expenditure 1991–2010 in the Middle East

Figures are in constant (2009) US\$ m. For some years no data is available for some countries.

Source: SIPRI Military Expenditure Database, <<http://www.sipri.org/databases/milex/>>.

### Arms industries

Few countries in the Middle East have significant indigenous arms industries, although many have set up production lines for a variety of military equipment. Israel has the most advanced industry, being able to produce modern military equipment such as guided missiles and surveillance equipment and to customize major platforms procured abroad to Israeli specifications. The level of development of the Israeli arms industry is reflected by its successes in exporting advanced military equipment to, for example, Europe and the USA.<sup>3</sup> Turkey is investing heavily in developing its arms industry and may in the near future be able to provide for some of its own needs in arms, including more advanced arms such as guided weapons.<sup>4</sup> Other countries in the region produce weapons for their own arms forces, to a large extent based on imported technology and components. In particular, Iran and Egypt have created arms industries, which among other things assemble rockets and, in the case of Iran, medium range ballistic missiles. Iran regularly claims to have made major progress in the

<sup>3</sup> For an overview of Israeli arms production see: Jackson, S.T., 'Arms production', SIPRI Yearbook 2011, pp. 236-240.

<sup>4</sup> For an overview of Turkish arms production see: Jackson, S.T., 'Arms production', SIPRI Yearbook 2011, pp. 244-247.

production of advanced weapons. However, in practice Iran's arms industry does not appear to be able to produce genuinely modern military systems.<sup>5</sup> The Jordanian, Saudi Arabian and UAE arms industries are developing but are still very limited in size, whereas the Iraqi arms industry that was created under Saddam Hussein in the 1980s no longer exists.

In sum, none of the countries in the region is anywhere near self sufficiency with regards to arms procurement, and all are highly dependent on arms imports.

### **Supplier recipient relations**

Key suppliers of advanced weapons to the region as a whole are China, France, Germany, Russia, the UK and the USA.<sup>6</sup> However, supply patterns vary as relations between the arms suppliers and the individual countries in the region vary. Some countries in the region have access to all major arms suppliers. Egypt has mainly received advanced weapons from the USA, largely as military aid, but has also bought weapons from, for example, China and Russia. The USA has supplied a large part of the arms procured by the Arab gulf states, Iraq and Jordan although it has put restrictions on the supply of certain types of long range strike systems to these countries, primarily due to concerns that these systems could be a threat to Israel. However, Saudi Arabia and the UAE have been able to acquire such systems from France and the UK instead. Also Russia has been marketing its arms aggressively to the Gulf States, albeit with limited success. Turkey buys most of its weapons from the USA and Western Europe but has been offered weapons by Russia and has developed a relation with China in the field of rocket artillery and short range ballistic missiles. Most Israeli arms imports come from the USA and to some extent from Germany, all mainly as military aid.

Syria and Iran have had fewer options for their arms imports. Syria has been mainly dependent on Russia for the procurement of major arms in the past two decades. The USA has since long embargoed arms sales to Syria. Most European countries have restricted their arms sales to Syria almost completely in recent years, and in May 2011 the European Union (EU) imposed an arms embargo on the country in reaction to government violence against civilians in Syria.<sup>7</sup> Iran has in the past two decades procured major arms from Russia and China, but could not procure arms from the USA and EU member states. Its access to weapons technology became further restricted when in reaction to Iran not suspending some of its key nuclear activities in December 2006, the United Nations imposed an embargo on the export of technology related to nuclear weapon delivery systems to Iran. The embargo included certain technologies, which can be used in conventional military applications, in particular ballistic missiles and cruise missiles. Finally in June 2010 the UN imposed severe restrictions on arms exports to Iran, prohibiting the supply of most major conventional arms to the country.<sup>8</sup> Russia decided to go beyond the wording of the embargo and also halted the planned supply of a long-range surface-to-air missile (SAM) system.<sup>9</sup> In effect, Iran cannot import any advanced major arms and is now dependent on its own arms industry, possibly with some clandestine support from North Korea.

<sup>5</sup> Wehrey, F., et al, 'Dangerous but not omnipotent', Rand Corporation, 2009, page 69.

<sup>6</sup> All statements in this paper about volumes of arms flows and about actual arms imports are taken from the SIPRI Arms Transfers Database, <<http://www.sipri.org/databases/armstransfers>>.

<sup>7</sup> Council of the EU, 'Council Decision 2011/273/CFSP of 9 May 2011 concerning restrictive measures against Syria', *Official Journal of the European Union*, L121/11, 10 May 2011.

<sup>8</sup> SIPRI Arms embargo database, <<http://www.sipri.org/databases/embargoes>>

<sup>9</sup> Wezeman, P., Kelly, N., Multilateral arms embargoes 2010, Appendix 11A, SIPRI Yearbook 2011, p. 448.

### **Regional capabilities to attack strategic targets**

There are several conventional military options for attacking strategic targets deep inside the territory of an adversary. The range of the systems needed varies depending on the geographical situation, which in the region is highly diverse. For example, Iran and Israel are located relatively far from each other and are separated by countries in between. To be able to reach key targets in each other's territory, systems with a combat radius of over 1000 kilometres are needed. On the other hand, Israel and Syria border each other, and these countries could reach many key targets in each other's territory with relatively short range weapons, including howitzers and rocket artillery. In particular, Israel and the small Gulf countries have little strategic depth and are therefore more vulnerable to attacks by short range systems from nearby potential adversaries.

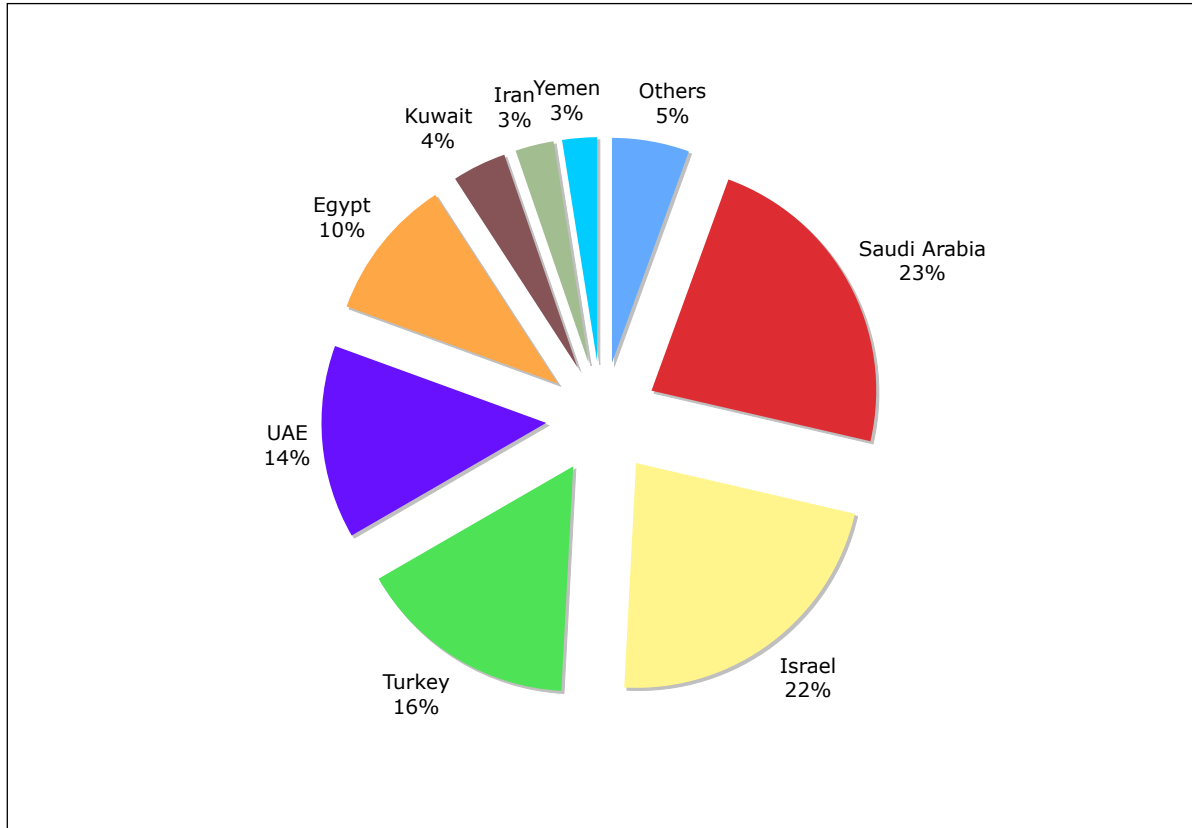
Ballistic missiles or rocket artillery are deployed by all countries discussed in this paper. Although it is not always clear to which extent military considerations or other considerations, such as prestige or internal bureaucratic politics, drove countries to procure, in particular, longer range ballistic missiles, from a technical perspective they are attractive for use in attacks on strategic targets or as weapons of terror. First, ballistic missiles reach their targets with high speed, therefore creating options for surprise attacks. Secondly, their high speed makes them extremely difficult to intercept and therefore to defend against. Even missiles based on 1960s technology still have a good chance to penetrate modern air defences, whereas aircraft need to include modern and expensive technology to do so. Thirdly, mobile ballistic missiles can be hidden relatively easily, which provides a relatively cheap and effective defence against counter strikes. In addition to ballistic missiles, surface launched cruise missiles for use against land targets are increasingly accurate and capable of penetrating air defences.

Despite the advantages of ballistic missiles and even though much attention has been given to, in particular, Iranian missile procurement and tests, such weapons are only one part of the strategic weapons arsenals of Middle Eastern countries. Combat aircraft make up the bulk of the strategic strike capabilities of most of these countries. They are more versatile, are usually more accurate delivery systems and can carry a much higher payload, including stand-off weapons (guided free-fall bombs, winged bombs or powered missiles) that can be launched at some distance from the target. To increase their reach and survivability in the face of well defended targets, aircraft can be armed with cruise missiles with longer ranges.

In particular, combat aircraft equipped with stand-off weapons and in combination with force multipliers such as tanker aircraft increasing their range and supported by advanced command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) capabilities can be an effective strategic strike force. Furthermore, whereas most potential suppliers are restricted by their adherence to the Missile Technology Control Regime, which allows the supply of ballistic or cruise missiles with warheads of over 500 kilograms and ranges over 300 km only under very specific conditions, until 2010 the states that are discussed in this paper have found suppliers willing to supply combinations of combat aircraft and related guided weapons and in several cases also tanker aircraft which when used in combination and depending on circumstances can have a combat radius of up to several thousand kilometres. Figure 2 provides an insight into the differences in the imports of combat aircraft by the countries discussed in this paper in the past two decades.

The relevance of aircraft in the regional context is illustrated by the fact that they have been the preferred instrument for Israel to attack long-range targets, despite Israel having the

technical capability to develop and deploy ballistic missiles or cruise missiles that could be used instead. This was particularly well shown when in 2007 Israel used a small number of combat aircraft to destroy with guided bombs an alleged nuclear facility deep inside Syria.<sup>10</sup> Another indication of the importance of air power is that during the first half of 2011, North Atlantic Treaty Organization (NATO) led forces predominantly used aircraft with stand-off weapons or guided bombs to attack strategic targets in Libya such as command and control centres.



**Figure 2.** Relative volumes of imports of countries in the Eastern Mediterranean and the Gulf region, 1991–2010

The chart shows the volume of imports of combat aircraft by individual states as a share of the combined volume of imports of combat aircraft by the seven states.

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

Well developed air defence systems, consisting of combat aircraft, surface-to-air missiles (SAM) systems, related C4ISR and increasingly anti ballistic missile (ABM) systems lower the chances of success of a would be aggressor launching an air offensive. However, they may also be perceived as enhancing the offensive capabilities of the owner as they decrease the possibilities by the target of an offensive to mount successful counter strikes. This is especially true in those cases where one side is superior in both air strike and air defence capabilities. Syria had, for example, no means to retaliate against the 2007 Israeli air strike. Therefore, developments in air defence capabilities can have a major impact on threat

<sup>10</sup> Fulghum, D. A., Wall, R., Barrie, D., 'New satellite surveillance system was key Israeli tool in Syria raid', Aviationweek.com, 2 Nov. 2007.

perceptions of states in the Middle East and influence their decisions about their force structures.

Below a brief overview is provided of the main developments in the strike and air defence capabilities of the countries in the Eastern Mediterranean and the Gulf region.

## **Egypt**

Egypt was until the late 1990s reportedly trying to augment its small arsenal of ballistic missiles with more and longer range missiles. However, since then it has abandoned these plans.<sup>11</sup> Its key strike capability are F-16 aircraft of which it has received 220 from the USA spread over the period 1980–2002 and it is to receive 20 more by 2013. These aircraft are supported by modern C4ISR systems such as Hawkeye-2000 AEW aircraft, seven of which were delivered by the USA during 1999–2010.

Egypt's air defences have not seen any dramatic changes over the past 20 years. In addition to replacing its older combat aircraft with new ones, it has mainly upgraded the land based systems it had procured in the 1970s. Reportedly, Egypt has shown interest in the advanced Russian S-400 SAM/ABM system in reaction to Iran's growing ballistic missile capability.<sup>12</sup>

## **Iran**

Iran is widely assumed to have created since the 1980s the largest and most diverse ballistic missiles arsenal in the Middle East, although actual numbers of missiles in service are not publicly known.<sup>13</sup> Several types of missiles with a range of 150–200 km have been in use since the 1990s. Also in the early 1990s it fielded Shahab-1 and -2 ballistic missiles with ranges of 300–500 km, capable of reaching targets deep inside neighbouring countries. In 2003 it started to field the Shahab-3 ballistic missile with a range of about 900 km and since then it has worked on a version with an estimated range of 1600 km, the Ghadr-1. Iran is also developing a solid propellant ballistic missile with an estimated range of about 2200 km, the Sajjil-2. These missiles are based on older technology, and their very poor accuracy severely limits their effectiveness against military targets if used with conventional warheads. They could be used to wage a terror campaign against population centres, but even if large numbers would be used expected casualties would be low.

Iran has also procured from abroad and produced under licence several types of land based and air launched anti-ship missiles with ranges up to about 100 km. These could be used to attack certain strategic targets such as ships, harbours, and oil and gas rigs in the Gulf. Although the production and development of missiles is increasingly taking place in Iran, the country is still dependent on foreign technology and supplies of key components and materials.<sup>14</sup> Such foreign support has been constrained in particular since the UN imposed an embargo on the supply of technology for long-range missiles to Iran in 2006, although Iran is still suspected of sourcing components and technology from North Korea.<sup>15</sup>

Iran's fleet of combat aircraft and tanker aircraft consists mainly of aircraft procured in the

<sup>11</sup> Nuclear Threat Initiative, Egypt Profile, Feb. 2011, <[http://www.nti.org/e\\_research/profiles/Egypt/Missile/index.html](http://www.nti.org/e_research/profiles/Egypt/Missile/index.html)>.

<sup>12</sup>[http://www.defaiya.com/defaiyaonline/index.php?option=com\\_content&view=article&id=121&Itemid=2&lang=en](http://www.defaiya.com/defaiyaonline/index.php?option=com_content&view=article&id=121&Itemid=2&lang=en)

<sup>13</sup> The following description of Iranian ballistic missile capabilities is based on: International Institute for Strategic Studies, Iran's ballistic missile capabilities, A net assessment, IISS, 7 May 2010.

<sup>14</sup> International Institute for Strategic Studies, Iran's ballistic missile capabilities, A net assessment, IISS, 7 May 2010, p.

<sup>15</sup> Report of the Panel of Experts established pursuant to resolution 1874 (2009), no date but leaked May 2011, p. 25.



1970s and 1980s, many of which at the time of procurement were very modern but are now outdated. Since 1992 Iran has not received any long range strike aircraft or AEW aircraft even though it reportedly signed a contract with a Russian company in 2006 to upgrade 24 Su-24s, its main long-range strike aircraft.<sup>16</sup> However, since the UN sanctions on Iran were widened in 2010 to include combat aircraft and related equipment and services, Iran is cut off from any significant modernization of its air force and will have increased difficulties to keep its current fleet of combat aircraft in operational condition.

Due to the arms embargo, Iranian C4ISR capabilities are also unlikely to develop much. Iran has a nascent space launch vehicle (SLV) capability, launching a first test satellite into orbit in 2009.<sup>17</sup> Iran launched in June 2011 its first indigenously produced observation satellite of basic design and plans to launch several more satellites in the near future which could be used for limited military reconnaissance.<sup>18</sup> Both this SLV programme and Iran's jamming of commercial satellite broadcasting could be considered first steps towards a rudimentary strategic anti-satellite capability.<sup>19</sup>

The distance between Iran and Israel limits the possibilities for Iran to target Israel. However, Iran has been able to partly overcome that obstacle by supplying, together with Syria, Hezbollah in Lebanon with thousands of rockets, which can hit targets inside Israeli territory. Whereas the threat to Israel of rocket attacks by its non-state adversaries such as the Palestine Liberation Organization or Hezbollah had been small before, in 2006 Hezbollah started its first major rocket offensive, launching around 4000 rockets against Israel. Most of these were lighter 122-mm rockets with a range of up to 35 km, although reportedly Hezbollah also had received a small number of Zelzal-2 rockets with a range of 200 km and a warhead of 600 kg.<sup>20</sup> Hezbollah also fired two anti-ship missiles in 2006, damaging an Israeli corvette. It is widely believed that Hezbollah is continuing to receive surface-to-surface missiles (SSM) from Syria and Iran. However, it remains unclear to which extent Iran has control over Hezbollah's use of these weapons.<sup>21</sup> This development is also a clear illustration of how the capability to strike targets deep inside a country is closely related to the size of the targeted country.

Like Iran's air force, its air defence capabilities have seen very limited development since the 1980s. Its only up to date SAMs are short range Tor-M1s procured from Russia during 2006–2007. It also ordered five S-300PMU-1 long range SAMs from Russia in 2007, which was widely seen as a potential 'game changing' development as deployment of these systems would have made air attacks on Iran, for example on its nuclear facilities, considerably more difficult. However, delivery of the weapons was halted as part of the Russian implementation on the 2010 UN arms embargo on Iran.

<sup>16</sup> 'News briefs', Air Forces Monthly, Feb. 2006, p. 21.

<sup>17</sup> International Institute for Strategic Studies, Iran's ballistic missile capabilities, A net assessment, IISS, 7 May 2010, p. 30.

<sup>18</sup> Covault, C., 'Iran unveils new space rocket and satellite designs', Spaceflight now, 13 Feb. 2010; 'Iran to send satellites into space to prepare maps, photos', Xinhua, 10 May 2011. Borger, J., 'Iran launches second satellite into orbit, claims state TV', The Guardian, 16 June 2010.

<sup>19</sup> In 2009 and early 2010 Iran jammed the satellite broadcasting into Iran of several European broadcasters. Leigh, P., 'EU to move against Iran satellite, internet censorship', euobserver.com, 22 March 2011, <<http://euobserver.com/871/29735>>. Covault, C., 'Iran unveils new space rocket and satellite designs', Spaceflight now, 13 Feb. 2010.

<sup>20</sup> International Institute for Strategic Studies, Iran's ballistic missile capabilities, A net assessment, IISS, 7 May 2010,, p.49.

<sup>21</sup> Wehrey, F., et al, 'Dangerous but not omnipotent', Rand Corporation, 2009, pp. 98-103.

## Israel

Since its existence as a state, Israel has continuously updated its capabilities to conduct strategic strikes against adversaries in the Middle East and several times used these capabilities with significant military success. It has several types of SSMs, both ballistic and cruise missiles, in its inventory. These were developed and produced by the Israeli arms industry. Since 1990 its longest range SSM in service has been the Jericho-II ballistic missile, with an estimated range of 1500 km.<sup>22</sup> In 2008 the Jericho-3 ballistic missile with a presumed range of 4000 km was tested.<sup>23</sup> The Jericho missiles are assumed to function as delivery systems for nuclear weapons. It is not known if they have a conventional role. There have been persistent rumours that Israel has adapted its fleet of three submarines with land attack cruise missiles, which would give it an increased capability to attack targets anywhere in the coastal areas of the Middle East.<sup>24</sup>

Over the past 20 years Israel continuously modernized its fleet of combat aircraft to the latest standards. In particular the procurement of 25 F-15I combat aircraft in the 1990s and 102 F-16I combat aircraft delivered during 2004–2009 have greatly contributed to Israel's technological edge in the field of air power over other countries in the region. These aircraft are equipped with advanced stand-off weapons and related sensors supplied by the Israeli military industry and by the USA, including highly accurate heavy guided glide bombs and guided missiles with ranges of at least 90 km and possibly up to 400 km.<sup>25</sup> To maintain its technological edge in the region Israel ordered in 2010 a first batch of F-35A combat aircraft from the USA for delivery around 2016. It currently plans to procure a total of 75 F-35As, the most capable strike aircraft offered on the export market. Israel supports its combat aircraft fleet with a small fleet of tanker aircraft and manned and unmanned aircraft with Israeli produced early warning and intelligence gathering and electronic warfare capabilities of the latest generation. A major element and indication of the sophistication of Israel's C4ISR capability are four Israeli designed military reconnaissance satellites put in orbit with Israeli launchers.<sup>26</sup> Finally there are indications that Israel has made significant efforts to acquire a cyber-warfare capability, which can support its existing capabilities to target adversaries' infrastructures. For example, it has been reported that during the 2007 air raid on Syria, Israel hacked its way into and disrupted the Syrian military command and control network.<sup>27</sup>

Israel is developing one of the world's most sophisticated air and missile defence systems. Its Patriot PAC-2 SAM systems supplied by the USA defend against aircraft and cruise missiles. Israeli produced Iron Dome and David's Sling SAM systems defend against shorter range rockets and missiles fired by, for example, Hezbollah. To defend against long-range ballistic missiles, Israel, with significant help from the USA, has developed the Arrow 2 ABM system, deployed since 2000. It is currently developing the improved Arrow 3 ABM system.<sup>28</sup> In support of Israeli ABM systems the USA has also based a AN/TPY-2 long-range

<sup>22</sup> Nuclear Treath Initiative, Israel profile, Nov. 2008 < [http://www.nti.org/e\\_research/profiles/Israel/Missile/index.html](http://www.nti.org/e_research/profiles/Israel/Missile/index.html)>

<sup>23</sup> <http://www.haaretz.com/print-edition/news/missile-test-will-improve-deterrence-1.237555>

<sup>24</sup> Anthony H. Cordesman, 'Israeli Weapons of Mass Destruction', Center for Strategic and International Studies, 2 June 2008, p.8, [www.csis.org](http://www.csis.org).

<sup>25</sup> Lennox, D., Jane's Strategic Weapon Systems, Issue 53, Jane's, Surrey 2010, pp. 80-84.

<sup>26</sup> Pfeffer, A., 'Israel Air Force reveals its satellite secrets', Haaretz, 18 Apr. 2011. <<http://www.haaretz.com/print-edition/news/israel-air-force-reveals-its-satellite-secrets-1.356517>>

<sup>27</sup> Fulghum, D.A., Wall, R., Butler, A., 'Israel shows electronic prowess', aviationweek.com, 25 Nov. 2007.

<sup>28</sup> Nuclear Treath Initiative, Israel profile, Nov. 2008 < [http://www.nti.org/e\\_research/profiles/Israel/Missile/index.html](http://www.nti.org/e_research/profiles/Israel/Missile/index.html)>

ballistic missile detection radar in Israel.<sup>29</sup> Finally, Israeli SLV capabilities in combination with its well-developed guided missile industry provides it with the means to develop an anti satellite capability.

### **Saudi Arabia**

Saudi Arabia acquired in 1988 from China an estimated 50 DF-3/CSS-2 ballistic missiles with an estimated range of between 2200 and 2600 km. The current status of these missiles remains unclear. The utility of these inaccurate missiles with conventional warheads for Saudi Arabia is questionable, and they are possibly a good example of how non-military rationales such as national prestige may be a driver for major arms procurements.

Much more important in terms of numbers and military utility has been the well equipped Saudi air force. By 1990 Saudi Arabia had acquired an air force consisting of some of the most modern long range combat aircraft available, advanced AEW aircraft, tanker aircraft and command and control infrastructure. It has since continuously modernized its holdings receiving new and advanced combat aircraft such as 72 F-15E and 48 Tornado long range strike aircraft in the late 1990s from the USA and the UK, respectively. A new wave of air force modernization has started from about 2007, and currently it is receiving 72 Typhoon combat aircraft from the UK and six A-330MRTT tanker aircraft from a European consortium and is modernizing many of its 1990s aircraft. A purchase of 84 of the latest model F-15S from the USA is planned. Saudi Arabia has used its good relations with different suppliers to ensure access to advanced weaponry. Whereas the USA has refused to supply long-range air-to-surface missiles to Saudi Arabia, it could order Storm Shadow cruise missiles with a range of at least 250 km from the UK in 2009.<sup>30</sup>

To illustrate the level of the Saudi Arabian investments in C4ISR, already in the 1980s Saudi Arabia received 5 E-3 AEW&C aircraft from the USA. These have since been modernized to the latest standards, and Saudi Arabia also acquired 3 RE-3 electronic intelligence aircraft from the USA during 2004–2007.<sup>31</sup>

Alongside the procurement of advanced combat aircraft, the Saudi air defences were significantly upgraded in the 1990s with the procurement of 21 Patriot PAC-2 SAM systems from the USA. As part of its current military modernization programme, Saudi Arabia decided in 2011 to upgrade its Patriots to the latest PAC-3 version with anti ballistic missile capabilities.<sup>32</sup>

### **Syria**

Syria's main long range strike systems are an unknown quantity of Scud Mod-B, -C and -D missiles, the D version with a range of up to 700 km.<sup>33</sup> It also has large quantities of shorter range artillery and rocket launchers with which it can attack important infrastructure and population centres in Israel. Syria's procurement of other conventional arms has been very modest in the past 20 years. Even with the planned procurement of an estimated 24 new

<sup>29</sup> Putrich, G. S., 'U.S. deploys radar, troops to Israel', Defense News, 26 Sept. 2008, <<http://www.defensenews.com/story.php?i=3744319>>.

<sup>30</sup> Gormley, D.M., *Missile Contagion*, Praeger Security International, Westport USA, 2008, p. 57.

<sup>31</sup> <http://www.defenseindustrydaily.com/saudis-see-awacs-upgrades-04405/>

<sup>32</sup> 'Raytheon receives \$1.7 billion to upgrade Patriot for Saudi Arabia', Raytheon press release, 21 June 2011.

<sup>33</sup> Nuclear Threat Initiative, Syria Profile, Oct. 2010, <[http://www.nti.org/e\\_research/profiles/Syria/Missile/index.html](http://www.nti.org/e_research/profiles/Syria/Missile/index.html)>

MiG-29SMT combat aircraft from Russia, Syria will lag far behind other key regional states in terms of strategic military capability.

Syria remains like Iran mainly dependent on air defence systems procured in the 1970s and 1980s although it has received Pantsyr and ordered BUK-M2 medium range SAMs from Russia since 2005. The weakness of its air defences was clearly illustrated during the Israeli raid of 2007 when it completely failed to hinder the attack.

## Turkey

Turkey's arsenal of ballistic missiles consists of limited numbers of Chinese and US supplied B-611 and ATACMS missiles with ranges up to about 150 km. Its strike capability is based on its fleet of combat aircraft which have been replaced or upgraded continuously since 1990. Key procurements included over 240 F-16C combat aircraft, 7 KC-135 tanker aircraft from the USA and upgrades for 54 F-4Es combat aircraft from Israel. Turkey plans to acquire about 116 F-35 combat aircraft from the USA in the coming decade. Turkish combat aircraft are equipped with advanced guided weapons including SLAM-ER cruise missiles with a range of over 250 km. Turkey is also developing its own 180 km range air launched cruise missile.<sup>34</sup> Turkey is investing heavily in its C4ISR capabilities. For example, it has ordered from the USA four Boeing-737 AEW&C aircraft for delivery from 2011, and its first reconnaissance satellite from Italy will be launched around 2013.

Turkey's land-based air defence is currently based on upgraded older long range SAM systems. However, it is planning major upgrades to its air defence system in the coming decade, the most significant element of which will be the procurement of a long range SAM system with anti missile capabilities.<sup>35</sup>

Turkish defensive capabilities in particular are closely related to its NATO membership through the commitment in Article 5 of the North Atlantic Treaty by which an attack on one Ally is interpreted as an attack on the Alliance as a whole. Turkey's participation in NATO goes very deep, including hosting US-owned nuclear bombs. In November 2010 NATO decided that ballistic missile defence would become a core element of Alliance collective defence, extending the previous commitment to protect forces in the field from ballistic missiles into a wider commitment to protect the populations and territory of NATO. Moreover, the objective is to implement the policy to provide 'indivisible' security for NATO members—that is to say, protection will be equal for all Allies. How Turkey's own air defence systems will be integrated in the system is not yet clear.<sup>36</sup>

## United Arab Emirates

The UAE has not fielded SSMS other than rocket artillery until now. However in 2010 it ordered from the USA an estimated 100 ATACMS T2K ballistic missiles with a range of up to about 300 km. In the field of long range strike aircraft it has developed significant capabilities since 1991. It replaced the approximately 64 combat aircraft it had with 62 Mirage-2000-5 from France and 80 F-16E combat aircraft from the USA during 2003–2008.

<sup>34</sup> 'Tübitak Sage developed the first cruise missile of Turkey', Tübitak Sage press release, 4 June 2011.

<sup>35</sup> Enginsoy, Ü, 'Turkey refuses to expel Russia, China from defense competition', Hürriyet Daily News, 16 May 2011, <<http://www.hurriyetdailynews.com/n.php?n=turkey-refuses-to-expel-russia-china-from-defense-competition-2011-05-16>>.

<sup>36</sup> Enginsoy, Ü, 'US Raytheon announces missile project worth nearly \$4 bln for Turkey', Hürriyet Daily News, 26 May 2011, <<http://www.hurriyetdailynews.com/n.php?n=us-raytheon-announces-nearly-4-billion-worth-missile-project-for-turkey-2011-05-26>>.

It received in 2010–2011 its first two AEW aircraft, ordered three A-330 tanker aircraft and plans to replace its Mirage-2000-5s with more advanced aircraft. Like Saudi Arabia the UAE has circumvented US refusals to sell long range ASMs by buying Black Shaheen cruise missiles with a range of about 300 km from France.

The modernization and expansion of the UAE's air defence has been dramatic in the past decade. Its air force invested in the advanced medium range air-to-air missiles, and the UAE is currently investing in significant upgrades of its land based air defences. Patriot-3 SAM systems are being delivered by the USA which will give the UAE an advanced air defence capability and its first capability to defend against ballistic missiles. Negotiations are underway for the procurement from the USA of even more specialized THAAD anti-ballistic missile systems.<sup>37</sup> In combination with newly acquired shorter range land and sea based SAM systems, the UAE will in a few years have upgraded its air defence forces to one of the most advanced in the region.

## Others

Bahrain, Jordan, Kuwait, Oman and Qatar have each maintained small numbers of modern combat aircraft and rocket artillery over the past 20 years. Kuwait, Oman and Qatar are all in the process of negotiating the procurement of new combat aircraft to modernize their air forces. Several of these countries have invested in recent years in increasing their strategic capabilities to some extent with regards to longer range missiles and guided bombs. For example, Oman and Qatar have ordered MM-40-3 Exocet ship launched missiles from France which can attack both ships and land targets at a range of up to 70 km, whereas Bahrain has plans to procure 30 ATACMS T2K ballistic missiles with a range of up to 300 km from the USA.<sup>38</sup> However, the strategic capabilities of these countries remain limited as none of them currently has tanker or AEW aircraft of its own. Furthermore, the national air defence capabilities of these countries are relatively modest, except in the case of Kuwait, which had acquired advanced Patriot SAM systems in the 1990s and is currently upgrading these to include a ballistic missile defence capability.

Yemen's limited strategic strike capabilities, which include an unknown number of Scud-C SSMs, have been used in internal conflicts, and due to its geographical position on the edge of the region, appear of little relevance to most of the Middle East. Reportedly, Yemen planned to buy 30 modern MiG-29SMT combat aircraft and S-300 SAM systems in 2010, but it remains unclear what became of these plans in the light of the current turmoil in the country.<sup>39</sup>

Iraq's once large and well-equipped armed forces are gradually being rebuilt after their destruction in 1991 and 2003.<sup>40</sup> Until now, Iraqi arms procurement has focused on weapons for internal use. Iraq has no long-range combat aircraft and has only long term plans to obtain significant numbers. Furthermore, Iraq remains fully dependent on the USA for its air defence.

<sup>37</sup> Attwood, E., 'No quick decision on \$7bn UAE missile deal', Arabian business.com 21 Feb. 2011.

<sup>38</sup> US Defense Security Cooperation Agency, 'Bahrain- Army Tactical Missile Systems T2K unitary', DSCA news release, 4 Nov. 2010.

<sup>39</sup> 'Russia to sell \$1 bln worth of arms to Yemen- expert', RIA Novosti, 1 July 2010.

<sup>40</sup> Holtom, P., et al, International arms transfers, SIPRI Yearbook 2010, pp. 302-305.

### III. Conclusions

Although an assessment of the number and type of weapons in an individual state's inventory can only be one aspect of an assessment of the asymmetries in military capabilities in the Middle East, the differences between the discussed countries clearly show that such asymmetries exist.

Egypt, Israel, Saudi Arabia, Turkey and the UAE have in the period 1991–2010 to varying degrees maintained or built-up well-equipped forces for use in strategic strikes. Also, they are increasingly able to defend themselves against such strikes and are continuing to upgrade their forces. In contrast, Iran and Syria have been hindered by lack of funding and supplier restraints from doing so, and the qualitative and quantitative gap in advanced military capabilities between Iran and Syria on the one hand and the other countries on the other is widening. In response, Iran and to a lesser extent Syria are likely to try to continue fielding rockets, ballistic missiles and possible cruise missiles of different ranges. These are the only weapon types that have a reasonable chance of penetrating the defences of adversaries that these two countries might be able to acquire through import in the case of Syria and through indigenous production based on indigenously available and clandestinely imported materials in the case of Iran.

Strengthened by recent examples of the possible effect of military asymmetry, such as the defencelessness of the Libyan regime against strategic attacks by well-equipped forces, the military asymmetries could put pressure on countries which are lagging behind in military technology to seek counterbalancing capabilities in the form of weapons of mass destruction.

This paper illustrates that the strategic environment is highly complex with new military capabilities being introduced, but at different speeds and different levels of sophistication. While in the past the structure of the armed forces in the region made them broadly comparable, cross country comparisons increasingly have to take into account new asymmetries such as the military use of space and the development of new strategic defence systems such as anti-ballistic missiles and anti-satellite capabilities.

Other strategies and capabilities to attack strategic targets or sow terror than those discussed here will have to be taken into account in order to better understand actual asymmetries and threat perceptions. For example, a new and particularly difficult to understand, assess and control strategic offensive capability is cyber warfare in which computer malware could be used to disrupt industries, communications or financial systems in increasingly complex societies that depend on financial services for a growing share of their economic well-being. In the case of the Middle East, Israel in particular is assumed to have developed a considerable cyber warfare capacity.<sup>41</sup>

A more traditional and difficult to assess strategic capability that a state could develop is a network of agents or the co-optation of militant opposition groups in target countries to terrorize an adversary or attack its key infrastructure or key persons using bombs, suicide bombers or other means. In the past decade, such bomb attacks have caused scores of casualties throughout the Middle East, in particular Iraq and Israel, even though allegations of state support for these attacks have been difficult to prove.<sup>42</sup>

<sup>41</sup> Ben-David, A., 'On the Offensive', *Aviation Week & Space Technology*, 29 Mar. 2010, pp. 56-57. For example it is widely believed that Israel disrupted to unknown extent the Iranian nuclear programme by inserting malware known as Stuxnet in key control systems. Hopkins, N., 'Stuxnet attack forced Britain to rethink the cyber war', *The Guardian*, 30 May 2011.

<sup>42</sup> See: US National Counterterrorism Center, Worldwide Incidents Tracking System <<https://wits.nctc.gov/FederalDiscoverWITS/index.do?N=0>>

Another key issue which requires closer examination is how combinations of actors are perceived by individual countries. Another complex issue is how military capabilities and intentions of extra-regional players, in particular the USA and NATO, affect threat perceptions in the region. Considering the region's dependence on arms imports there is a clear role for arms suppliers in relation to controlling conventional arms in the region. Although after the 1990 Iraqi invasion of Kuwait many suppliers acknowledged that the Middle East was a region prone to destabilizing build-ups of weapons, all major arms exporting countries continue to be involved in fierce competition for arms sales to most countries in the Middle East.

As much as practically possible, a regional security dialogue in the Middle East will have to include ways to objectively determine and carefully take into account the existing asymmetries in the capabilities to use violence on the strategic level of all countries involved.