

Members of a US Army mortar team fire on Taliban positions with a 120 mm mortar in Kunar province, north-eastern Afghanistan, in January 2010. © Brennan Linsley/AP Photo



Larger but Less Known

AUTHORIZED LIGHT WEAPONS TRANSFERS

INTRODUCTION

While the Kalashnikov-pattern assault rifle has become the symbol of contemporary warfare, light weapons play just as significant a role. Anti-tank missiles can destroy even the most heavily armoured vehicles. Modern man-portable air defence systems can shoot down aircraft from distances of up to eight kilometres. In heavily populated areas, indiscriminate mortar attacks can kill or injure hundreds of civilians. Despite these potential dangers, the international trade in light weapons is significantly less transparent than the trade in small arms. This chapter sheds new light on international transfers of light weapons through an analysis of available data and the strengths and shortcomings of the sources from which this data is drawn.

This study is the third instalment of the Small Arms Survey's multi-year assessment of authorized international transfers of small arms and light weapons, their parts, accessories, and ammunition, previously valued at USD 4 billion per year (Small Arms Survey, 2006, pp. 66–67). This chapter estimates the annual total value of international authorized transfers of light weapons at USD 1.1 billion. Combining this value with the revised estimate for authorized transfers of firearms (USD 1.68 billion¹) and ammunition for small arms and light weapons (USD 4.3 billion) yields a running (incomplete) total of nearly USD 7.1 billion per year.² The *Small Arms Survey 2012* will assess international transfers in parts and accessories for small arms and light weapons. It will also provide an estimate for the entire annual international trade in small arms and light weapons, their parts, accessories, and ammunition. The main findings of this chapter include:

- The annual trade in light weapons is estimated to be USD 1.1 billion. This includes USD 755 million for anti-tank guided weapons (ATGWs), USD 102 million for man-portable air defence systems (MANPADS), and USD 257 million for four types of non-guided light weapons.³
- Despite recent increases in the number of countries reporting transfers of small arms and light weapons to the United Nations Register of Conventional Arms (UN Register), the overall quality and amount of information on light weapon transfers remain low.
- The international trade in MANPADS appears notably small. Only 18 of the 74 countries under review imported any MANPADS between 2003 and 2009, and only 12 imported more than 100 units. Given data limitations, however, these figures are probably underestimates.
- The wars in Iraq and Afghanistan have contributed to significant increases in the procurement of anti-tank guided weapons. For example, the UK's imports of Javelin ATGWs from 2005 to 2009 exceeded total imports for the years 2000 to 2004 by 5,331 units—a 4,000 per cent increase.
- The 2011 Small Arms Trade Transparency Barometer identifies Switzerland, the United Kingdom, Germany, Serbia, and Romania as the most transparent of the major small arms and light weapons exporters. The least transparent major exporters are Iran and North Korea, both scoring zero.

- In 2008 the top exporters of small arms and light weapons (those with annual exports of at least USD 100 million), according to available customs data, were (in descending order) the United States, Italy, Germany, Brazil, Switzerland, Israel, Austria, South Korea, Belgium, the Russian Federation, Spain, Turkey, Norway, and Canada (see Box 1.1).
- In 2008 the top importers of small arms and light weapons (those with annual imports of at least USD 100 million), according to available customs data, were (in descending order) the United States, Canada, the United Kingdom, Germany, Australia, France, and Pakistan.

The top three exporters in 2008 were the United States, Italy, and Germany.

This chapter begins by defining key terms and concepts. It then provides an assessment of transparency in the trade in light weapons, along with the annual update of the Small Arms Trade Transparency Barometer. The chapter then outlines the methods used to calculate an estimated annual value for light weapons transfers. The sections that follow present a detailed analysis of the data mined for six light weapons categories: non-guided light weapons—mortars, grenade launchers, recoilless guns, and portable rocket launchers—and portable missile systems (ATGWs and MANPADS).⁴ The chapter concludes by reflecting on our current understanding of the global authorized trade in light weapons and the gaps in that understanding.

TERMS AND DEFINITIONS

This chapter is based on a definition of ‘light weapons’ provided in *Small Arms Survey 2008: Risk and Resilience*, which is derived from the 1997 report by the UN Panel of Government Experts on Small Arms (UNGA, 1997).⁵ The *Small Arms Survey 2008* modifies the 1997 definition by identifying specific weight limits for light weapons and their ammunition, by increasing the Panel’s calibre threshold for mortars from 100 mm to 120 mm, and by adding man-portable, rail-launched rockets to the Panel’s list of light weapons (Small Arms Survey, 2008, pp. 8–11).

The *Small Arms Survey 2010* further refines the definition to distinguish ‘light weapons’ from ‘light weapons ammunition’. Specifically, it defines MANPADS, rockets in single-shot disposable launch tubes, and rockets fired from rails as light weapons rather than ammunition.

In line with these definitions, this chapter uses the term ‘light weapons’ to refer to the following items:

- mortar systems up to and including 120 mm;
- hand-held (stand-alone), under-barrel, and automatic grenade launchers;
- recoilless guns;
- portable rocket launchers, including rockets in single-shot disposable launch tubes; and
- portable missiles and launchers, namely ATGWs and MANPADS.

This list of light weapons excludes heavy machine guns and anti-materiel rifles, for which transfers data is often aggregated with small arms and is usually impossible to distinguish from that of other firearms. For the purposes of analysing transfers, the Small Arms Survey traditionally has treated these two types of weapons as ‘firearms’—while the UN Governmental Panel of Experts lists them as ‘light weapons’.⁶ Improvised explosive devices are not covered in this chapter since the Small Arms Survey’s definition of authorized transfers does not apply to most international transfers of these weapons (see below). To the extent possible, light weapons designed for or used exclusively on platforms larger than light vehicles are also excluded,⁷ as are parts and accessories,⁸ which will be addressed in the *Small Arms Survey 2012*.

Box 1.1 Trends in the small arms trade

Each year, the United Nations Commodity Trade Statistics Database, or UN Comtrade, receives data on arms transfers from more than 100 countries, making it one of the richest and most consistent sources of data on the small arms trade. Yet since many countries contribute partial data—or none at all—and since UN Comtrade's categorizations and aggregation of different types of equipment do not permit transfers of some types of light weapons and their munitions to be identified, the resulting figures reflect only a portion of the actual trade. Nevertheless, given that these limitations are fairly constant over time, UN Comtrade is still useful for tracking trends in arms transfers.

An analysis of UN Comtrade data reveals that the total value of exports of small arms, light weapons, their ammunition, and associated parts and accessories in 2008 (the latest year for which there is a complete dataset) was USD 4.3 billion (see Annexe 1.1). Fourteen countries recorded exports of USD 100 million or greater, earning them 'top exporter' status—the most ever.⁹ Transfers from each of the largest exporters, Italy and the United States, exceeded USD 500 million. Four countries—Israel, Norway, South Korea, and Spain—exported more than USD 100 million for the first time. Five other countries—the Czech Republic, Japan, the United Kingdom, Sweden, and Finland—exported USD 50–99 million. In descending order, the top importers—those importing weapons worth a total of at least USD 100 million—were the United States, Canada, the United Kingdom, Germany, Australia, France, and Pakistan. In addition, 15 countries imported weapons valued at USD 50–99 million (see Annexe 1.2).

Perhaps most remarkable is the continued growth in US imports, which exceeded USD 1 billion in 2007 and rose again in 2008 to 1.27 billion. Furthermore, preliminary data for 2009 shows the United States as having reported more than 1.77 billion in imports, which would represent a startling 39 per cent increase over 2008. Between 2000 and 2009, US imports increased by some 246 per cent. This rise is probably attributable to purchases by both the US military and civilians.¹⁰

Table 1.1 Exporter rankings for 2008

Ranking	Exports in 2008 (USD million)	Notes comparing 2008 with 2007
Top first tier (> USD 500 million)		
United States	715	
Italy	562	
Top second tier (USD 100–500 million)		
Germany	472	
Brazil	273	
Switzerland	211	
Israel	179	Moved up from major first tier
Austria	173	
South Korea	165	Moved up from major first tier
Belgium	124	
Russian Federation	119	
Spain	116	Moved up from major first tier
Turkey	111	
Norway	101	Moved up from major first tier
Canada	100	
Major first tier (USD 50–99 million)		
Czech Republic	94	
Japan	92	
United Kingdom	75	Moved down from top second tier
Sweden	69	Moved up from major second tier
Finland	65	
Major second tier (USD 10–49 million)		
France	43	
Croatia	43	
Portugal	39	
China	37	Moved down from top second tier
Poland	36	
Taiwan	32	
Serbia	31	
Mexico	28	
Singapore	16	
Cyprus	14	Exported less than 10 million in 2007
Netherlands	13	Exported less than 10 million in 2007
Romania	13	
Argentina	13	
Bosnia and Herzegovina	10	
India	10	Exported less than 10 million in 2007

For the purposes of this chapter, authorized international transfers of light weapons are defined as cross-border movements of light weapons that are authorized by the importing, exporting, or transit states. For a detailed discussion of the definition of international transfers, see Small Arms Survey (2009, p. 9, box 1.1).

TRANSPARENCY IN LIGHT WEAPONS TRANSFERS AND PROCUREMENT

Overall, the amount and quality of information on light weapons transfers remains low, despite a significant increase in the number of countries participating in one or more national or international mechanisms for reporting on arms transfers in recent years. The quality of the information submitted by governments to the main publicly available information sources—public procurement boards, UN Comtrade, and the UN Register—varies significantly in terms of completeness and detail, and few submissions provide a complete accounting of light weapons transfers. Public



A Chinese salesman describes his products to a Russian customer during the China International Defense Electronics Exhibition in Beijing, April 2006.
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procurement boards are rarely used for light weapons,¹¹ and UN Comtrade's reporting mechanism makes disaggregating light weapons transfers virtually impossible.¹²

Of the reporting mechanisms for transfers of small arms and light weapons, the UN Register contains the richest data on light weapons transfers. Since its establishment in 1991, the Register has become the primary international mechanism for reporting on the transfer of conventional weapons. Small arms and light weapons were largely excluded from the reporting mandate until 2003,¹³ when the calibre threshold for mortar systems on which states are to report was reduced to 75 mm, and MANPADS were added.¹⁴ The UN also established a voluntary mechanism for reporting on transfers of small arms and light weapons in 2003. While reporting was initially extremely limited, it has risen steadily in recent years. Only five governments submitted data on small arms transfers in 2005, yet that figure had risen to 47 by 2009¹⁵ (UNODA, 2010a, p. 21). Nonetheless, reporting remains inconsistent, in terms of both frequency and quality. Seventeen of the countries that have submitted small arms reports at some point since 2003 failed to do so in 2009 (UNODA, 2010b, pp. 15–18). Also noteworthy is the absence of data on most light weapons transfers (MANPADS being one notable exception) from the three largest producers of light weapons: China, the Russian Federation, and the United States (Small Arms Survey, 2008, pp. 34–35).

Other important potential sources of information on light weapons transfers are individual government agencies that compile data on national light weapons transfers. In response to queries sent to more than 80 governments over a five-month period in 2010, the governments of Bosnia, Canada, Colombia, Germany, Liechtenstein, Norway, Portugal, Slovakia, Sweden, and the UK provided data on their light weapons imports. Officials from the Netherlands and Thailand completed questionnaires on light weapons procurement practices. At least two other countries—South Africa and the United States—routinely publish detailed procurement data, including data on imports, in publicly available government reports. National data obtained directly from governments is often significantly more detailed and complete than that reported to the UN Register.

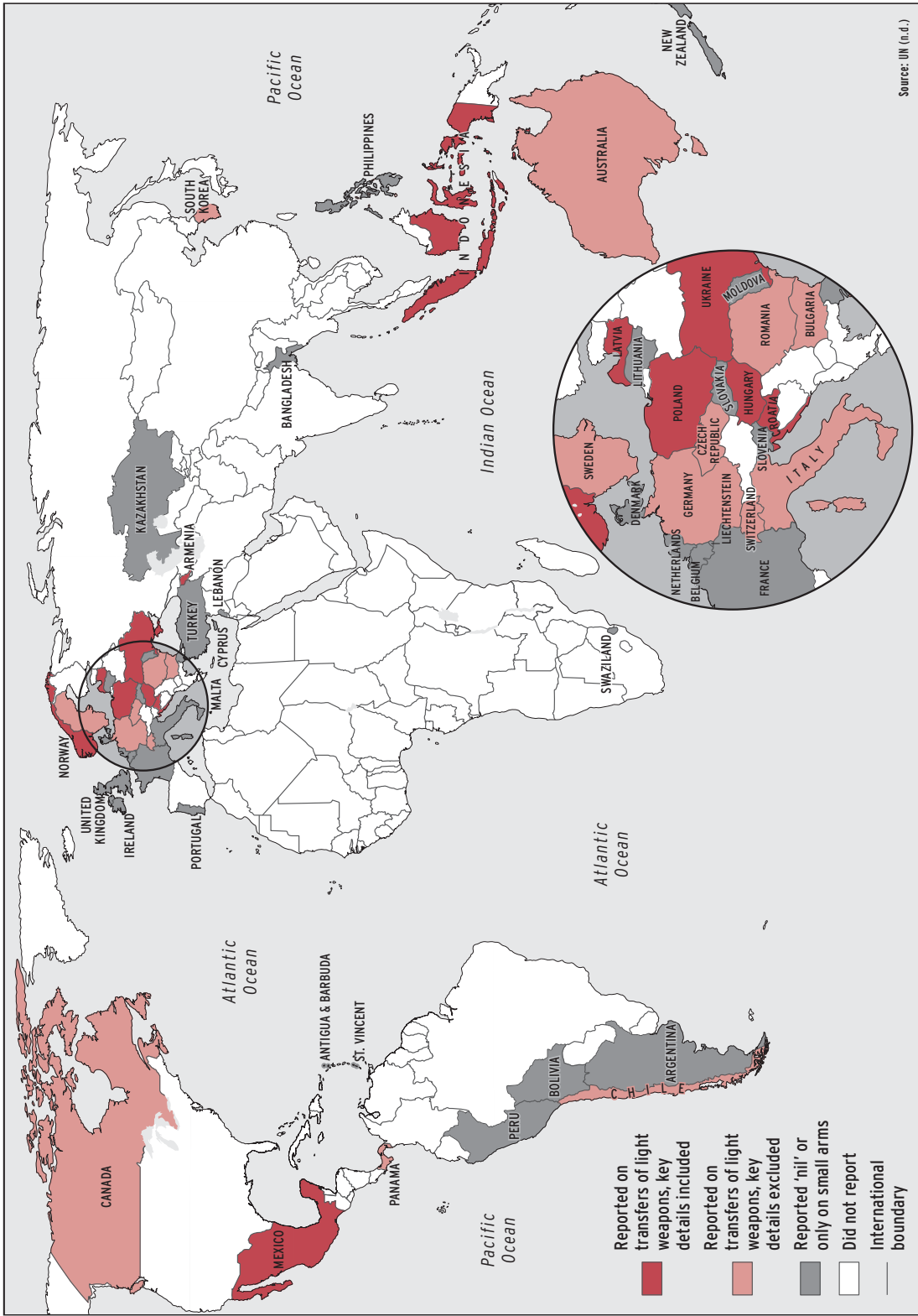
Forty-seven states submitted information on transfers of small arms or light weapons that occurred in 2008 to the UN Register. Twenty of these states provided data on transfers of light weapons; 9 of these states provided detailed data, including all of the following: (1) whether the transfer was an import or export; (2) the states of origin and destination; (3) the weapon type and model; and (4) the quantity of weapons transferred to each destination. Among the eleven states that withheld some or all of these details, weapon model and quantity transferred were the most frequently omitted information. Reporting states withhold information by declaring it 'classified' or by simply leaving parts of the reporting form blank. Panama, for example, declared that it imported light weapons in 2008 but did not identify the exporting state or provide any information on the quantities or models.¹⁶

The other 27 states that submitted information either reported 'nil' with reference to small arms and light weapons transfers (six states) or only provided data on small arms (21 states). It should be noted that, for the purposes of this study, a 'nil' entry is assumed to be an accurate report of an absence of light weapons transfers. It remains unclear why the 21 states that submitted information on small arms did not report on light weapons transfers. Some may not have engaged in any transfers of light weapons. In other cases, data on light weapons transfers may have been withheld because the government considers the information restricted (classified).

As explained above and illustrated by Map 1.1, the light weapons trade remains far from transparent despite the development of international mechanisms for reporting on light weapons. Until the majority of UN member states consistently submit detailed and complete reports on their light weapons transfers to the UN Register, our understanding of the international trade in light weapons will remain limited.

Reporting remains inconsistent, both in terms of frequency and quality.

Map 1.1 Reporting on light weapons transfers to the UN Register, 2008



Notes: This map illustrates the quality of reporting to the UN Register of Conventional Arms on light weapons transfers in 2008. All of the shaded states submitted data on international transfers of small arms and light weapons to the Register. Differences in shading reflect the comprehensiveness and specificity of the information submitted by individual states. States that are shaded red reported on light weapons transfers and included the following details about individual transfers: (1) a clear distinction between imports and exports; (2) the states of origin and destination; (3) the weapon type and model; and (4) the quantity of weapons transferred to each destination. Pink shading is used for states that reported on light weapons transfers, but omitted one or more of the key details identified above. States that are shaded grey either reported 'nil' (no transfers) for 2008, or submitted data only on small arms transfers. For the purposes of this chapter, 'nil' entries are considered transparent reports of transfers. Yet by definition, 'nil' reports do not include the key details upon which the categorization scheme is based; consequently, they could not be included in the assessment of reporting quality. States that only submitted data on small arms transfers are included in the same category as 'nil' reports because it is often unclear whether the state in question did not import or export any light weapons, or failed to report on their light weapons transfers.

THE 2011 TRANSPARENCY BAROMETER

The Small Arms Trade Transparency Barometer was introduced in the *Small Arms Survey 2004* to evaluate countries' transparency in reporting on their small arms and light weapons exports. The Barometer has evolved significantly since its introduction. Points are awarded for timeliness, access and consistency, clarity, comprehensiveness, and inclusion of data on deliveries as well as for reporting on licences granted and refused. The 2011 Barometer examines countries claiming—or believed—to have exported USD 10 million or more of small arms and light weapons, including their parts, accessories, and ammunition, during at least one calendar year between 2001 and 2009.

The 2011 Barometer assesses national transparency in small arms export activities for 2009, based on reporting in 2010.¹⁷ The three main sources are: (1) national arms export reports;¹⁸ (2) the UN Register; and (3) UN Comtrade (see Table 1.2).

As its name indicates, the Barometer is designed to measure—and promote—transparency. It evaluates the quantity, precision, timeliness, and usefulness of the data countries make publicly available and can also be used to highlight trends in national reporting. Although it does not assess the veracity of the data states provide, it can highlight discrepancies between different sources.

This edition assesses the reporting practices of 49 countries: the 48 countries covered in the 2010 Barometer plus the Philippines—believed to have exported roughly USD 14 million worth of relevant materiel in 2009. Additional countries may feature in future Barometers, if and when more information about their international small arms transfers becomes available.

This year's Transparency Barometer identifies Switzerland, the United Kingdom, and Germany as the three most transparent countries. They have held the same top spots for three consecutive years (Lazarevic, 2010, pp. 193–97).¹⁹ Belgium and the United States broke into the top ten this year, replacing Sweden and Denmark (which now rank 11th and 14th, respectively). The least transparent countries are Iran and North Korea, both scoring zero for five successive years (Lazarevic, 2010, pp. 187–99). Although the latter is conspicuously opaque about its international arms transfers, there is clear evidence of its involvement in illicit small arms exports (see Box 1.4). The average score fell slightly since last year (from 11.50 to 11.40), although the average score of the top 10 countries rose from 17.45 to 18.00 points. However, about two-thirds of the countries reviewed received fewer than half the maximum number of points available (that is, less than 12.50 out of 25.00), suggesting that, despite progress among some states, there remains much scope for improved reporting.

Switzerland, the United Kingdom, and Germany are the most transparent countries.

The biggest country-specific declines were experienced by Bosnia and Herzegovina and Saudi Arabia. Both countries' scores were reduced by four points. Bosnia and Herzegovina did not report to UN Comtrade on 2009 activities and its national arms export report was less detailed than in previous years, hence its scoring fell by 31 per cent to 9.00 points. Saudi Arabia's scoring was assessed through its reporting to UN Comtrade. For 2009 activities, Saudi Arabia provided information on re-exports of a single UN Comtrade category.²⁰ As a result, its total score decreased by 55 per cent to 3.25 points. Moreover, several member states of the European Union (EU) experienced a decrease in their points for the categories *clarity* and *licences refused*, as a result of changes in the presentation of *EU Report* data (see Box 1.2).

There were several positive trends in reporting in 2010. For the first time, Serbia and Spain provided the UN Register with 'voluntary background information' on their international small arms and light weapons transfers. Thailand reported to the UN Register for the first time since 2004. Romania has started including information on transit/shipment in its national arms export report. Belgium experienced the greatest point increase with its score rising by

Table 1.2 Small Arms Trade Transparency Barometer 2011, covering major exporters*

	Total (25 max)	Export report (year covered)**/ EU Annual Report***	UN Comtrade	UN Register	Timeliness (1.5 max)	Access and consistency (2 max)	Clarity (5 max)	Comprehensiveness (6.5 max)	Deliveries (4 max)	Licences granted (4 max)	Licences refused (2 max)
Switzerland	21.00	x (09)	x	x	1.50	1.50	4.00	5.25	3.00	4.00	1.75
United Kingdom	20.00	x (09) / EU Report	x	x	1.50	2.00	4.00	5.00	3.50	2.50	1.50
Germany	18.75	x (09) / EU Report	x	x	1.50	1.50	3.75	3.50	3.50	3.50	1.50
Serbia ¹	18.50	x (08)	x	x	1.50	1.00	3.25	4.75	3.50	2.50	2.00
Romania	18.00	x (09) / EU Report	x	x	1.50	2.00	2.50	4.00	3.00	3.00	2.00
Belgium	17.75	x (09) / EU Report	x	x	1.50	2.00	2.75	3.50	3.50	3.00	1.50
Netherlands	17.00	x (09) / EU Report	x	x	1.50	2.00	3.50	4.00	2.50	2.50	1.00
Spain	16.50	x (09) / EU Report	x	x	1.50	1.50	2.50	3.25	4.00	2.50	1.25
Norway	16.25	x (09)	x	x	1.50	1.50	4.00	3.75	3.50	2.00	0.00
United States ²	16.25	x (08)	x	x	1.50	1.50	2.75	4.50	3.00	3.00	0.00
Sweden	15.50	x (09) / EU Report	x	x	1.50	2.00	3.25	4.25	3.00	1.50	0.00
Italy	15.25	x (09) / EU Report	x	x	1.50	1.50	3.25	4.50	3.00	1.50	0.00
Czech Republic ³	15.00	x (09) / EU Report	x	x (08)	1.50	1.50	2.75	3.50	3.50	1.50	0.75
Denmark	14.75	x (09) / EU Report	x	x	1.50	1.50	3.50	3.25	3.00	2.00	0.00
Finland ⁴	14.00	x (08) / EU Report	x	x	1.50	1.50	3.00	3.00	3.00	2.00	0.00
Poland ⁵	14.00	EU Report	x	x	1.50	1.00	1.75	3.75	4.00	2.00	0.00
France ⁶	13.50	x (09) / EU Report	x	x (08)	1.50	1.50	3.25	2.75	3.00	1.50	0.00
Slovakia	13.50	x (09) / EU Report	x	x	1.50	1.50	2.25	3.25	3.00	2.00	0.00
Montenegro ⁷	12.50	x (09)	x	-	1.50	0.50	2.75	4.25	1.50	2.00	0.00
Austria ⁸	12.25	x (08) / EU Report	x	x	1.50	1.50	1.75	2.50	3.50	1.50	0.00
Portugal ⁹	12.25	x (08) / EU Report	x	x	1.50	1.50	2.00	2.75	3.00	1.50	0.00
Canada ¹⁰	11.75	x (06)	x	x (08)	1.50	1.00	2.25	4.00	3.00	0.00	0.00
Bulgaria	11.50	x (09) / EU Report	x	x	1.50	1.50	2.00	2.00	3.00	1.50	0.00
Israel	10.75	-	x	x	1.50	1.00	1.75	3.50	3.00	0.00	0.00

* Major exporters are countries that export—or are believed to export—at least USD 10 million worth of small arms, light weapons, their parts, accessories, and ammunition in a given year. The 2011 Barometer includes all countries that qualified as a major exporter at least once during the 2001-09 period.

** x indicates that a report was issued.

*** The Barometer assesses information provided in the EU's *Twelfth Annual Report* (CoEU, 2011), reflecting military exports by EU member states in 2009.

Scoring system

The scoring system for the 2011 Barometer is identical to that used in 2010, providing comprehensive, nuanced, and consistent thresholds for the various categories. The Barometer's seven categories assess: timeliness as well as access and consistency in reporting (categories i-ii), clarity and comprehensiveness (iii-iv), and the level of detail provided on actual deliveries, licences granted, and licences refused (v-vii). For more detailed information on the scoring guidelines, see the Small Arms Survey (n.d.b).

Explanatory notes

Note A: The Barometer is based on each country's most recent arms export report, made publicly available between 1 January 2009 and 31 December 2010.

Note B: The Barometer takes into account national reporting to the UN Register from 1 January 2009 to 12 January 2011 as well as information states have submitted to UN Comtrade for their 2009 exports up to 31 December 2010.

Note C: The fact that the Barometer is based on three sources—national arms export reports, reporting to the UN Register, and UN customs data—works to the advantage of states that publish data in all three outlets. Information provided to each of the three sources is reflected in the scoring. The same information is not credited twice, however.

Country-specific notes

1) Serbia published a national arms export report in 2010 that was limited to data from 2008. For the first time, the country is evaluated on a 25-point scale as it can now fulfil the criteria of reporting during three consecutive years and can therefore earn all the points potentially available under 'access and consistency'.

2) The US report is divided into several documents. For the purposes of the Barometer, the 'US annual report' refers to the State Department report pursuant to Section 655 on direct commercial sales, as well as the report on foreign military sales that is prepared by the Department of Defense. The reports are assessed together to provide a composite picture of US government transparency. The State Department did not publish the direct commercial sales report for 2009 by the cut-off date. The United States is therefore evaluated on the basis of its most recent report, covering activities in 2008.

3) The Czech Republic did not submit data to the UN Register for its 2009 activities by the cut-off date. It is therefore evaluated on the basis of its most recent submission, covering export activities in 2008.

4) Finland did not issue a national report for its arms export activities in 2009 by the cut-off date. It is therefore evaluated on the basis of its most recent national report, covering activities in 2008.

5) The authors discovered Poland's (first) national arms export report in February 2011, after the cut-off date for review. Although dated 2010, the report was posted on the website of Poland's Ministry of Foreign Affairs only in February 2011. The report will be assessed as part of the 2012 Barometer if no other national report is published in 2011. For the 2011 edition, Poland is evaluated based on its contribution to the *EU Annual Report*.

6) France did not submit data to the UN Register for its 2009 activities by the cut-off date. It is therefore evaluated on the basis of its most recent submission, covering activities in 2008.

7) For the first time, Montenegro is evaluated on a 25-point scale as it can now fulfil the criteria of reporting during three consecutive years and can therefore earn all the points potentially available under 'access and consistency'.

8) Austria did not issue a national report for its arms export activities in 2009 by the cut-off date. It is therefore evaluated on the basis of its most recent national report, covering activities in 2008.

9) Portugal published a national arms export report in 2010 that was limited to data from 2008. Until last year, Portugal's *Statistical Yearbook of National Defence* was evaluated. Recently, Portugal put online its *Annual Reports on Exports of Military Equipment*. The latter report has been evaluated for the 2011 edition of the Transparency Barometer and will be used for future editions.

10) Canada did not issue a national report on export activities in 2009 by the cut-off date; it is therefore evaluated according to its most recent national report, covering export activities in 2006. Canada did not submit data on 2009 activities to the UN Register by the cut-off date; it is therefore evaluated on the basis of its most recent submission, covering activities in 2008.

11) The authors discovered Croatia's (first) national arms export report in January 2011, after the cut-off date for review. Although dated October 2010, the report was not posted on the website of the Croatian Ministry of Economy, Labour, and Entrepreneurship, but rather uploaded on the website of the South Eastern and Eastern Europe Clearinghouse for the Control of Small Arms and Light Weapons (SEESAC). The report will be assessed as part of the 2012 Barometer if no other national report is published in 2011. Croatia did not submit data to the UN Register for its 2009 activities by the cut-off date. It is therefore evaluated on the basis of its most recent submission, covering activities in 2008.

12) Hungary is one of two EU member states under review that do not publish a national report; however, it does contribute information to the *EU Annual Report*. Hungary did not submit data to UN Comtrade for its 2009 activities by the cut-off date. It is therefore evaluated on the basis of its most recent submission, covering activities in 2008.

13) Pakistan did not submit data to the UN Register for its 2009 activities by the cut-off date. It is therefore evaluated on the basis of its most recent submission, covering activities in 2008.

14) Turkey did not submit data to the UN Register for its 2009 activities by the cut-off date. It is therefore evaluated on the basis of its most recent submission, covering activities in 2008.

15) The Philippines did not submit data to the UN Register for its 2009 activities by the cut-off date. It is therefore evaluated on the basis of its most recent submission, covering activities in 2008.

16) Cyprus is one of two EU member states under review that do not publish a national report; however, it does contribute information to the *EU Annual Report*. Cyprus did not submit data to the UN Register for its 2009 activities by the cut-off date. It is therefore evaluated on the basis of its most recent submission, covering activities in 2008.

17) The United Arab Emirates did not submit data to UN Comtrade for its 2009 activities. It is therefore evaluated on the basis of its most recent submission, covering activities in 2008.

18) South Africa did not submit data to UN Comtrade for its 2009 activities. It is therefore evaluated on the basis of its most recent submission, covering activities in 2008.

Source

Lazarevic (2011)

Box 1.2 Licence refusals in the EU Annual Report

EU member states have been exchanging data on their export licence approvals and refusals since 1999.²¹

Every year, the EU publishes a report on these exchanges of information. The *First Annual Report* was published in 1999. Since then, the data presented and illustrated in the reports has improved. Initially, states provided data on the total value of actual exports, the number of export licences granted, and the number of notified denials without specifying the country of destination or the EU Common Military List (ML) categories (CoEU, 1999; 2000). The *Third Annual Report* provides the same data according to sub-regions (CoEU, 2001). The fourth and fifth *Annual Reports* disaggregate the data by destination country and provide reasons for licence refusals, but data is still not disaggregated by ML categories (CoEU, 2002; 2003). The sixth to the eleventh *Annual Reports* finally provide information on ML categories. These details can be used to identify how many licences each EU member state refused and for what reasons (CoEU, 2004-07; 2008a; 2009).

With the *Twelfth Annual Report*, however, the EU adopted a new approach. The breakdown of refusals is no longer national, but instead aggregated at the EU level (CoEU, 2011); as a result, it is no longer possible to determine how many licences each EU member state has refused, for what ML category, or for what reasons.

Many EU member states thus lose at least 0.5 points in the Transparency Barometer as reflected in the scoring of Denmark, France, Italy, Poland, Portugal, Slovakia, and Sweden. If the information on licence refusals had not been buried in an EU total, but rather disaggregated by member state, then Italy, for example, would have had the same score as in the 2010 Transparency Barometer (Herron et al., 2010, p. 15).

three points (from 14.75 to 17.75) due to better reporting in the Belgian regions²² on temporary exports, on end users, and on licences granted and refused. The greatest increase in percentage terms was Taiwan, whose score rose 24 per cent since last year thanks to better reporting to UN Comtrade.²³

The promotion of national, regional, and global transparency mechanisms enhances confidence, which in turn can improve global standards in reporting on small arms transfers. The South Eastern and Eastern Europe Clearinghouse for the Control of Small Arms and Light Weapons (SEESAC) recently launched an initiative serving the interests of transparency, namely a regional report on arms exports for South-eastern Europe, whose content is also available in an online database (Bromley, 2010; SEESAC, n.d.).²⁴ It documents how countries in the region have sought to increase transparency in their arms export activities. Similarly, Saferworld has developed a database and released a report; both compare information supplied by EU member states on their arms

transfers and shed light on missing information and shortcomings in reporting (Isbister and Okechukwu, 2010; Saferworld, n.d.).

ESTIMATING INTERNATIONAL LIGHT WEAPONS TRANSFERS

The opacity of much of the international trade in light weapons means that generating an estimate of the annual value of international transfers requires extrapolation from the documented trade. This section gives a brief overview of how the study uses data provided by the most transparent states as a basis for estimating values of light weapons imports by less transparent states. Annexe 1.3 presents a more detailed account of this process.

The fundamental assumption of the study is that if the values of light weapons transfers of a representative sample of states are known, it is possible to use this data as a basis from which to make reasonable estimates of the values of transfers of other states. From this methodological starting point, developing a global estimate proceeded in three stages: (a) generating a representative sample of the documented trade; (b) identifying the factors that best account for variations in spending on light weapons among states; and (c) deriving estimated import values for states outside the sample.

The documented trade: generating a sample

The first stage was to gather information on documented transfers of light weapons for as large a sample of countries as possible. Data obtained directly from governments, the Arms Transfers Database of the Stockholm International Peace Research Institute (SIPRI),²⁵ and the UN Register serves to build a picture of documented light weapons imports over multiple years.²⁶ This study makes use of data relating to imports between 1998 and 2010, although only very few states provide records for the entire period; the majority of the data relates to the years between 2003 and 2009.²⁷

Countries are excluded from the sample if the authors determined that available import data is overly aggregated, unclear, or incomplete, for example if specific types of light weapons are explicitly excluded. The study also sets thresholds for inclusion based on the number of years of available data.²⁸ These thresholds strike a balance between, on the one hand, maximizing the size of the sample and, on the other, ensuring the data for a specific country is as representative as possible of typical annual light weapons imports by that country. Because of differences in the availability of data on different types of light weapons, varying thresholds are used for MANPADS and their missiles (a minimum of four years of data within the period²⁹), ATGWs and their missiles (a minimum of three years of data), and non-guided light weapons (a minimum of two years of data).

**The average
annual documented
trade in light
weapons totals
USD 242 million.**

The authors identified 73 countries³⁰ that meet these criteria for MANPADS and their missiles, 25 countries for ATGWs and their missiles, and 26 countries for non-guided light weapons. The sum of the average annual light weapons imports to these countries is USD 242 million, a figure that represents the ‘documented trade’. The country sample and the documented value together serve as the basis for generating the global estimate of the authorized trade in these weapons, as described further below.

Explaining variation

The second stage consisted of identifying the factors that best account for variations in spending on light weapons among states. Through an analysis of the documented trade, the authors identified the following four factors:

1. *The size of its armed forces.* As the size of an armed force increases, so does the number of light weapons required to equip it.
2. *The value of a state’s military expenditure per member of its armed forces.* The more a state spends on its soldiers generally, the more likely its soldiers are to be equipped with greater quantities of light weapons and with higher-value types and models.
3. *The extent to which a state is involved in armed conflict.* Troops in active combat are more likely to be equipped with more (and higher-value) light weapons than troops that are engaged solely in peacetime actions. Moreover, weapons are likely to be used more frequently in armed conflict settings and will therefore have to be replaced more quickly.
4. *The availability of domestically produced light weapons.* The capacity to produce light weapons domestically reduces the need for, and acquisition of, imported weapons.

Having identified these four variables—armed force size, military expenditure per member of the armed forces, conflict status, and production capacity—the authors gathered data related to each category for almost every country in the world.³¹

Estimating imports

The third stage consisted of deriving estimated import values for non-sample states. The quantitative methods used were similar to those used to estimate the value of the annual authorized trade in ammunition for light weapons in Small Arms Survey (Herron et al., 2010). This process consisted of four main steps.

The first was to divide countries into nine categories based on armed force size (large, medium, and small) and military expenditure per member of the armed forces (high, medium, and low) (see Table 1.3). The second step was to use light weapons import values for sample countries to generate 'typical' annual import values for each of the nine groups.³² The third was to generate provisional estimates of annual imports by non-sample countries by multiplying the relevant 'typical import value' by the size of the armed force of the non-sample country. The fourth was to modify, where applicable, provisional import estimates for non-sample countries upwards or downwards to take into account a state's conflict status and capacity to produce light weapons domestically.

These steps were carried out separately, and with slight variations, for MANPADS and their missiles; ATGWs and their missiles; and non-guided light weapons. Detailed information on this process is available in Annexe 1.3.

For each of the three light weapons groupings, the sum of the estimates for all non-sample countries yields the US dollar value estimates of the undocumented trade shown in Table 1.4. When added together, the resulting group sub-totals generate an estimated annual value of undocumented light weapons transfers of USD 872 million. Combining this figure with the documented trade of USD 242 million yields a combined estimate of USD 1.1 billion for the annual authorized global trade in light weapons.

Limitations of the estimation model

The methods described above have limitations. One set of caveats relates to underlying assumptions. For example, the methodology assumes that the sample of countries used as the basis of extrapolation is representative of the global trade as a whole. Yet since the sample is not random but rather determined by transparency, a bias in the sample, which would either inflate or deflate the total value, cannot be ruled out.

Table 1.3 Parameters for light weapons import country categories

Military expenditure (USD) per active service person per year	Armed force size		
	> 1,000,000	27,000–1,000,000	< 27,000
> 100,000	High-large	High-medium	High-small
20,000–100,000	Medium-large	Medium-medium	Medium-small
< 20,000	Low-large	Low-medium	Low-small

Table 1.4 Estimated annual values of international transfers of light weapons

	MANPADS (USD million)	ATGWs (USD million)	Other light weapons (USD million)	Total (USD million)
Documented	66	129	47	242
Undocumented	36	626	210	872
Total	102	755	257	1,114

Another set of caveats relates to inherent limitations of the data. One such issue concerns US dollar values for light weapons. Since much of the documented trade is reported in quantities only, it was necessary to convert all such transfers into values using generic unit prices for particular light weapons types, adding an unknown level of imprecision to the value of the import. Perhaps most importantly, determining the veracity of existing data is often difficult; the authors could not always verify that a sample country's reporting accurately reflected its light weapons imports.

Because of these and other limitations, the figure of USD 1.1 billion should be read as a best estimate rather than a definitive accounting. It is worth noting, however, that steps have been taken to prevent an artificial inflation of the figure. For example, wherever possible, the authors excluded any imports of items purchased for use on large vehicles, even if the items fell within this chapter's definition of a light weapon.

A more detailed discussion of limitations of the methods used in this study and the steps taken to mitigate the problems associated with them is presented in Annexe 1.3. Box 1.3 assesses the utility of the Internet as a supplemental research tool.

THE LIGHT WEAPONS TRADE

This section provides an assessment of the major producers, exporters, and importers of light weapons; noteworthy developments in the technology and use of light weapons; and patterns of light weapons transfers in recent years. It is divided into two parts. The

Box 1.3 Using new media to research the arms trade

The Internet has revolutionized research on the arms trade. Information on the production, trade, and holdings of weapons that was previously inaccessible to the public is now available in online databases and publications that are accessible to anyone with an Internet connection. While the full potential of the Internet as an arms trade research tool has yet to be tapped, new media—such as blogs, file-sharing sites, and Web forums—contain a wealth of information that is beginning to shape public understanding of the arms trade.

Among the millions of videos uploaded to video-sharing sites such as YouTube, many contain footage of weapons. The video clips, whether taken by amateurs or professional broadcasters, often provide important information about arms transfers. For example, it had been rumoured that the Russian Federation had exported sophisticated SA-24 MANPADS to Venezuela, but it had not been possible to confirm the transaction. Then, in April 2009, footage of a Venezuelan military parade in which the missiles were on display was uploaded to YouTube. The footage, which includes several close-up shots of the missiles from different angles, not only allows for a positive identification of the weapons as SA-24 MANPADS, but also includes contextual information about their intended use and deployment provided by Venezuelan President Hugo Chávez (Schroeder and Buongiorno, 2009).³³

Blogs are another useful source of data and information on the arms trade. Some blogs (weblogs containing news and commentary uploaded by an individual or a small group of people) are written by individuals with unique or in-depth knowledge of particular weapon systems, regional procurement patterns, or national military holdings, such as current or former military personnel. Other rich sources of information are online discussion forums frequented by individuals with substantive knowledge of the armed forces and military procurement practices of a particular country or region.³⁴ Forums and blogs not only contain valuable information about arms transfers and military procurement, but also offer a chance to communicate directly with well-informed people who would otherwise be difficult to find and contact.

Like all sources, new media have limitations. The video of Venezuela's SA-24 missiles is an unusual case; the authenticity of most videos posted on sites such as YouTube is difficult or impossible to verify, and few are as clear and high-quality as the video of Venezuela's missiles. Some videos are of such poor quality that it is impossible to identify the make or model of the featured weapon with any certainty. Moreover, claims made about the contents of videos may be inaccurate, as a result of either poor analysis or propaganda, and it is often necessary to use other sources to verify video content. Similar caveats apply to blogs and discussion forums. The anonymity of the Internet, including the widespread use of pseudonyms, makes it difficult to verify a source of information.

Nonetheless, new media form an increasingly important supplemental source of information on the international arms trade and particularly on transfers between countries that release little or no public data on their military procurement or arms transfers.

first part looks at the international trade in non-guided light weapons—mortar systems, grenade launchers, recoilless guns, and portable rocket launchers. The second part assesses the trade in portable missiles, namely ATGWs³⁵ and MANPADS. Both sections draw heavily, but not exclusively, on the datasets generated for this study.

It should be noted that recent technological developments in light weapons and their ammunition are blurring the lines between guided and non-guided light weapons. Several countries are producing Global Positioning System (GPS) and laser-guided rounds for 120 mm mortar systems and are developing similar rounds for smaller-calibre mortar systems. Similarly, advancements in ballistics calculators, range finders, and fusing for ammunition are dramatically increasing the accuracy of grenade launchers and other light weapons. The production and use of guided and other ‘smart’ rounds for light weapons remains extremely limited, however, and therefore the distinction between guided and non-guided light weapons is still relevant, at least for the time being.

Non-guided light weapons

For the purposes of this chapter, non-guided light weapons include all light weapons except portable missiles and their launchers (which are covered in the following section) and anti-materiel rifles and heavy machine guns, transfers of which are examined in the 2009 edition of the *Small Arms Survey*.³⁶ Items covered in this section include the following:

- mortar systems up to and including a calibre of 120 mm;³⁷
- hand-held, under-barrel, and automatic grenade launchers;
- recoilless guns; and
- portable rocket launchers (including single-shot, disposable units).³⁸

This is clearly a diverse range of weapons, yet all share some common characteristics. Infantry forces use all of them and their primary targets are often similar: other infantry (or members of armed groups); lightly armoured vehicles; and bunkers or other hard cover. These weapons are produced in several dozen countries and are used by most armed forces.³⁹

All of these weapons are mature technology; mortars and rocket launchers date back centuries, for example. The main technological developments over recent decades have occurred in the production of new forms of ammunition and accessories, such as optics and other devices used in aiming and target acquisition. This divergence between relatively unsophisticated launchers and the availability of more advanced ammunition has led a wide variety of militaries to field light weapons. Well-funded militaries are able to equip their mortars, grenade launchers, rocket launchers, and recoilless guns with advanced ammunition—such as rocket-assisted mortar bombs or proximity-fused grenades—while armed forces with low budgets use similar weapons with much more basic and inexpensive ammunition. To sum up, these light weapons are extensively deployed by armed forces across the globe; the varying sophistication of ammunition means that they have a niche in all armed forces.⁴⁰

In general, the non-guided light weapons used by contemporary armed forces are designed to be rugged, reliable, easily portable, comparatively affordable, and easy to use and maintain. Infantry engaged in counterinsurgency operations can deploy them in harsh environments. Some models have enjoyed a resurgence following the experience of US and associated armed forces fighting in Iraq and Afghanistan. Anti-tank rocket systems previously viewed as obsolete, for example, have been widely used by forces in Iraq and Afghanistan against insurgents ensconced in buildings, bunkers, or other fortifications and caves (see the discussion on the M72 rocket system, below). This deployment and use of light weapons by well-resourced armies fighting in counterinsurgency campaigns has had a

Weapons thought to be obsolete have had renewed use in counterinsurgency roles.

marked effect on the international trade. Since 2005, the largest purchasers of light weapons have been countries heavily involved in Iraq and Afghanistan. This procurement reflects the much greater use of weapons by forces engaged in high-intensity conflict compared to peacetime training.⁴¹

The trade in these four types of light weapons is discussed in greater detail in the following sections.

Mortars

Mortars fire projectiles indirectly, their ammunition travelling at high ballistic arcs and at slower speeds than other artillery of similar calibres. Since the First World War, the main innovations in mortar technology have been the mounting of mortars on vehicles and the development of automatic loading mechanisms (both of which usually add so much weight that the systems are no longer considered 'light weapons'). More significant are technological improvements to mortar ammunition, including GPS and laser guidance, and rocket assistance.⁴² These developments provide greater accuracy and, in the case of rocket assistance, greater range.

From 2006 to 2009, seven of the 26 countries studied reported a total of 388 imports of mortars up to a calibre of 120 mm. These weapons can be disaggregated by calibre into three categories (see Table 1.5).

Table 1.6 reports the five most significant importers of mortars from 2006 to 2009, accounting for 384 of the 388 mortars imported over the period. The highest total was 173 by Bangladesh, which imported 60 mm and 82 mm



US Army soldiers fire a 120 mm mortar during a fire mission at the combat outpost Zerok in East Paktika province, Afghanistan, September 2009.
© Dima Gavrysh/AP Photo

Table 1.5 Total identified imports of mortar systems, 2006-09

Calibre	Quantity imported
Up to 60 mm	168
61-82 mm	173
83-120 mm	47
Total imports	388

Table 1.6 Top five importers of mortars, 2006-09

Importing country	Quantity imported
Bangladesh	173
Georgia	105
Mexico	62
Portugal	22
Lithuania	22
Total	384

Note: These figures combine all calibres of mortar examined in this sample.

mortars from China. The second-largest importer of mortars was Georgia, which acquired 60 mm and 82 mm mortars from Bosnia and Herzegovina and Bulgaria. Other countries imported fewer than 100 mortars over the four-year period. The low level of procurement suggests that the imported units were not intended to replace a large proportion of existing national stocks—a process known as ‘peak procurement’.⁴³ It is consistent with statements by military officials interviewed for this study who reported that mortar systems are replaced very infrequently; they have an estimated service life of 25 years, and possibly much longer in practice.⁴⁴ In some cases, officials reported that equipment obtained during the cold war, some of which is more than 40 years old, is still in service.⁴⁵

The identity of the importers, along with interviews with military officials, suggest that

the imported mortars were procured for specific military units (such as peacekeepers), were replacements for systems nearing the end of their shelf life, or were supplements for armed forces engaged in, or preparing for, armed conflict.⁴⁶

Grenade launchers

Grenade launchers fire a small projectile (a grenade) that usually contains high explosives, gas or other irritants, smoke, or incendiary materials. This section covers three main types of grenade launchers, all of which use cartridge-based ammunition fired from a conventional barrel with an enclosed breach. *Under-barrel grenade launchers* are mounted to rifle barrels and fire a single projectile. *Hand-held grenade launchers* are self-contained weapons that can be fitted with sights, grips, and a butt. They often have a small magazine and a semi-automatic firing mechanism. *Automatic grenade launchers* are tripod-mounted, crew-served weapons capable of firing hundreds of rounds per minute. The standard US automatic grenade launcher is the Mark 19, which was first fielded in Vietnam during the mid-1960s. Since 1984, updated versions have been exported to some 30 countries (Foss, Gourley, and Tigner, 2008; Kemp, 2007).

Modern projected grenades are used against dispersed troops, personnel, soft-skinned vehicles, and some structures. Like mortars, the most significant recent technological developments in this area concern the ammunition rather than the launchers themselves. Advanced ammunition with airburst capabilities is produced by several companies, including Singapore Technologies Kinetics (STK), Nammo of Norway, and Arsenal of Bulgaria. Airburst grenades usually feature proximity fuses and are designed to detonate above or near troops that are partially hidden. Other innovations in ammunition include ‘kicker’ charges, which bounce the grenade off the ground so that it detonates in the air.⁴⁷ Grenade launchers were imported by 12 of the 26 countries in the sample. These imports are

Table 1.7 Total identified imports of grenade launchers, 2006–09

Type	Quantity imported
Under-barrel	1,912
Hand-held	13
Automatic	342
Unspecified	290
Total imports	2,557

Table 1.8 Top importers of grenade launchers by type, 2006–09

Type	Importing country	Quantity imported
Under-barrel	Mexico	1,429
	Latvia	250
	Poland	123
	Armenia	70
	Croatia	37
Hand-held	Slovakia	13
Automatic	Armenia	100
	Latvia	100
	Georgia	98
	Poland	43
Unspecified	Mexico	108
	Latvia	80
	Poland	53
	Lithuania	46

summarized in Table 1.7, which lists the number imported by type over the period 2006–09. Table 1.8 presents the top importers for each category.

Most transfers consisted of some hundred or fewer grenade launchers, which were probably procured for specific military units. Again, such imports are not indicative of ‘peak procurement’ in which a large proportion of national stocks are procured or replaced.

Recoilless guns

A recoilless gun resembles a conventional gun—its cartridge is loaded into a barrel—except that the rear of the barrel is open and the blast from the explosive propellant is allowed to escape. The projectile is launched from the barrel at a much lower velocity than from a conventional gun (recoilless guns therefore require much more propellant per round). While most recoilless guns have a rifled barrel (and are known as recoilless rifles), some are smoothbore. The advantage of a recoilless gun, as its name suggests, is that the recoil is minimized, meaning the gun does not need a heavy carriage or recuperator. Unlike conventional artillery, recoilless guns are often light enough to be towed by light vehicles or carried by hand. Their projectiles are much heavier than those fired by the grenade or rocket launchers described

in this section. Recoilless guns offer direct fire in comparison to the indirect fire provided by mortars. The drawbacks of recoilless rifles include the comparatively slow velocity of the projectile (which limits its utility against modern tank armour), the need for large quantities of propellant, and the heavy back blast, which can be hazardous and expose the location of the operator (Weir, 2005, pp. 201–04).

One of the most widely exported recoilless rifles is the Swedish Carl Gustaf, currently produced by Saab Bofors Dynamics. Its first prototype was made in 1946, and modern variants are still widely used in some 40 countries (Felstead, 2010). It was originally designed to be an anti-tank weapon and, weighing around 10 kg, it is light enough to be carried and fired by one person or a crew of two (Weir, 2005, p. 204). Its utility against tanks diminished as armour improved, but it continues to be used against light vehicles and buildings, bunkers, and other hard cover.

The 84 mm Carl Gustaf rounds are also far more affordable than guided missiles, and various types of ammunition are available for use against a variety of targets.

Over the period 2006–09, three of the 26 countries in the sample imported a total of 187 recoilless guns. Of these, 182 were identified as Carl Gustaf recoilless rifles, while the remainder were unspecified models. Given

the widespread deployment of the weapon, the small number of importing countries reflects the long service life of these guns, which last 25 years or longer.⁴⁸ Table 1.9 summarizes the procurement data.

Table 1.9 Importers of recoilless guns, 2006–09

Country	Quantity imported
Canada	150
Poland	35
Slovakia	2
Total	187

Portable rocket launchers, rockets, and single-shot, disposable units

Rocket launchers are composed of a tube through which a self-propelled projectile is launched and other components, such as sights, grips, and a firing mechanism. Like recoilless guns, the rear of the tube is open, allowing for a strong back blast, and the firer does not experience strong recoil forces. Rocket launchers are sold as reusable units with separate reloadable ammunition or as single-shot, disposable weapons. Single-shot, disposable units contain a launcher and unguided projectile in a single, sealed unit, which is discarded after use. This section includes recoilless guns in single-shot, disposable units because their operational use and procurement are more similar to those of single-shot, disposable rockets than to those of recoilless guns. In practice, there is no clear dividing line between the two as some systems (such as the RPG-29) fire for such a short time that the rocket has finished burning before it leaves the launch tube. Their launching method is therefore almost indistinguishable from that of recoilless guns.

Recent procurement of the M72 light anti-tank weapon, or LAW, is a good example of how the demand for light weapons has been stimulated by the wars in Iraq and Afghanistan. The M72 first entered service with the US military in 1963 and was used extensively during the Vietnam War (Ohmen, 2005). It is a single-shot, disposable unit; the launcher is supplied with a rocket ready to be fired. By the 1980s, it had been replaced by heavier systems—the AT-4 and the Shoulder-launched Multipurpose Assault Weapon, or SMAW—both of which were deemed to be more effective against contemporary tanks equipped with modern armour. The M72 was brought back into service following US experience in Iraq; the Marine Corps took old weapons out of storage, and new units have been procured. The advantages of this supposedly obsolete weapon are its small size, light weight, low cost, and relatively small back blast. For these reasons, it is much better suited to urban warfare than weapons designed to destroy heavily armoured vehicles. It is also less expensive than other portable rockets and missiles, costing a reported USD 2,500 per unit—a fraction of the cost of a Javelin anti-tank guided missile (*Defense Industry Daily*, 2005). M72 variants have also been deployed by other armed forces fighting in Iraq and Afghanistan, such as Australia, Canada, and the UK. Israel reportedly ordered 28,000 units (*Defense Industry Daily*, 2008); in the period 2006–09, the UK imported 3,280 M72 variants from Norway and the United States. The producer Nammo Talley has developed variants of the M72 specifically for counterinsurgency tasks (*Jane's International Defence Review*, 2006).

The term 'rocket-propelled grenade', or RPG, usually refers to a family of anti-tank systems first developed by the Soviet Union shortly after the Second World War. Variants are now in production in many countries around the world.⁴⁹ RPGs consist of a launcher and rocket-propelled explosive projectiles. An RPG launcher differs from grenade launchers

in that it has an open rear and exhaust gases from the rocket are ejected from the back when it is launched. The ammunition for RPGs has been continuously updated, and modern tandem warheads are capable of penetrating even the reactive armour of contemporary tanks (Richardson, 2008).

Over the period 2006–09, five of the 26 countries studied reported imports of single-shot, disposable systems, totalling 20,818 units (see Table 1.10).

The most frequently imported single-shot, disposable systems were variants of the M72. Between 2006 and 2009 Canada imported 12,000 and the UK imported 4,810. These were most likely intended for use in Iraq or Afghanistan.

Table 1.10 Importers of single-shot, disposable systems, 2006–09

Importing country	Quantity imported
Canada	12,000
United Kingdom	5,810
Slovenia	2,300
Lithuania	381
Mexico	327
Total	20,818

Box 1.4 North Korean arms transfers: insight from the UN Panel of Experts

On 11 December 2009, a Soviet-era cargo aircraft flying from Pyongyang, North Korea, was detained by Thai authorities during a stopover in Bangkok. The crew reportedly told Thai authorities that their aircraft carried 'oil-drilling equipment' and that they intended to refuel and head farther south (Barrowclough, 2009). While inspecting the plane, however, Thai authorities discovered 35 tons of arms and related materiel with an estimated value of USD 18 million. The shipment reportedly contained large quantities of light weapons, including rocket-propelled grenade launchers (RPG-7s), thermobaric RPG rounds (TGB-7Vs), and MANPADS (UNSC, 2010, para. 64).

The seizure in Thailand was one of several arms shipments from North Korea interdicted since 2009, when a UN arms embargo was expanded to include small arms and light weapons exports (UNSC, 2010, para. 18; 2006, para. 8; 2009, para. 9). The Security Council resolution expanding the embargo called on states to 'inspect all cargo' to and from North Korea 'in their territory, including seaports and airports' (UNSC, 2009, para. 11). The subsequent surveillance and interdiction of North Korean arms shipments has shed important light on illicit arms transfers from one of the most opaque and secretive countries in the world.

Documents seized in Bangkok reveal much about the techniques used by the North Korean regime to conceal shipments of illicit weapons. The various parties to the transfer were located in several different countries. The owner of the cargo plane was based in the United Arab Emirates, while the aircraft was registered in Georgia, leased by a shell company in New Zealand, and chartered by another shell company in Hong Kong (UNSC, 2010, para. 64). The Stockholm International Peace Research Institute determined that the cargo plane was previously registered by other companies linked to various well-known arms dealers, including Tomislav Dmanjanovic and Viktor



The only country that reported specific information on imports of reusable rocket launchers was Bangladesh, which imported 200 Type-69 RPGs (a variant of the RPG-7) from China. The lack of reusable RPG imports may be explained, in part, by the sample of countries for which import data was available. Most of these countries use NATO-standard weaponry, which does not include reusable RPGs.

Portable missile systems

This section provides a brief overview of the international trade in portable missiles, specifically ATGWs and MANPADS. It begins with a brief description of these weapons, their main producers, and their roles on the battlefield. Key characteristics of the international trade in portable missiles are then identified through an analysis of the multi-country dataset compiled for this study.

Background

For the purposes of this chapter, the term ‘portable missiles’ refers to two types of weapons: anti-tank guided weapons and man-portable air defence systems. ATGWs are missile systems originally designed for use against tanks and



Bout (Barrowclough, 2009). The airway bill was falsified, stating that the cargo consisted of ‘145 crates of “mechanical parts”’ and providing misinformation about the route and destination of the flight, all of which are well-known masking techniques (UNSC, 2010, para. 64). The shipper was identified as Korea Mechanical Industry Co., Ltd., located in North Korea, and the consignee as Top Energy Institute in Iran, but the ultimate destination of the weapons was obscured by multiple flight plans (UNSC, 2010, para. 64).

UN investigators have identified three additional interdicted shipments, descriptions of which shed further light on North Korea’s arms trafficking infrastructure. According to a report by the investigators, several government agencies are involved in the organization of arms transfers, including the Worker’s Party of Korea and the Second Economic Committee, the latter believed to play ‘the largest and most prominent role’ (para. 55). While the mode of transport varied from shipment to shipment, similar methods were employed to disguise the cargo and the delivery routes. Based on the information collected to date, the UN Panel of Experts concludes that North Korea ‘has established a highly sophisticated international network for the acquisition, marketing and sale of arms and military equipment’ (para. 55).

The UN Panel report is a valuable supplement to existing public sources of data on North Korean arms transfers.⁵⁰ While the shipments documented by the Panel provide important insight into the nature of North Korea’s exports of small arms and light weapons, the full extent of this trade remains unknown. Over time, however, the Panel of Experts may provide a more complete picture of North Korea’s secretive arms trade.

Thai police officers and soldiers remove boxes of weaponry from a foreign-registered cargo plane at Don Muang airport in Bangkok, December 2009. The aircraft was reportedly loaded with North Korean weapons and flying to Iran when it was intercepted. © AP Photo

other armoured vehicles, though they have been employed against a wide array of other targets. Some ATGWs are lightweight, shoulder-fired weapons designed for use by dismounted infantry (foot soldiers) against armoured vehicles at close range. Other systems fire larger missiles that are capable of destroying tanks and other heavily armoured vehicles from distances exceeding 8 km. Many of the latter are fired from several different platforms,⁵¹ including aircraft, naval vessels, tracked and wheeled vehicles, and pedestal mounts.

ATGWs employ a variety of guidance systems. Wire-guided missiles are guided by signals delivered to the missile by a thin wire that unravels as the missile travels to the target. The Russian Malyutka and the US TOW⁵² are common wire-guided ATGWs. Infrared-seeking ATGWs such as the US Javelin guide themselves to the target after locking onto its infrared signature. Beam-riding missiles 'ride' a laser beam directed at the target by the operator. Examples include the Russian Kornet, the South African Ingwe, and the Swedish BILL.⁵³

MANPADS are lightweight, portable surface-to-air missiles that are fired either from the operator's shoulder or from a pedestal mount. MANPADS are often categorized by their guidance systems: passive infrared seeking, semi-autonomous command-line-of-sight, and laser beam-riding.⁵⁴ Engagement ranges vary significantly from system to system. A first-generation Soviet SA-7 has a maximum effective range of about 3,400 metres whereas some newer MANPADS can hit targets 8 km away (O'Halloran and Foss, 2008). Like ATGWs, the missiles fired from MANPADS are also fired from aircraft, ships, and land vehicles.⁵⁵



Soldiers of the US Army's 101st Airborne Division fire a TOW missile at the building housing Saddam Hussein's sons Oday and Ousai in Mosul, Iraq, on 22 July 2003.
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Major producers of portable missiles include China, France, the Russian Federation, Sweden, and the United States. The US TOW missile is among the most numerous and widely deployed portable missile in the world; since 1970, militaries in more than 40 countries have procured more than 650,000 TOW missiles (Foss, 2004). The MILAN, which is produced by the European conglomerate MBDA, has been deployed almost as widely, albeit in smaller numbers.⁵⁶ Far fewer MANPADS have been produced than ATGWs, but they have proliferated as widely;⁵⁷ the US military estimates that more than 150 countries have deployed MANPADS since the 1960s.⁵⁸ The Russian Federation and China are also prominent international suppliers of ATGWs and MANPADS, having exported various systems to several dozen countries (O'Halloran and Foss, 2008; Jones and Ness, 2007). The *Small Arms Survey 2008* estimates that, as of 2007, at least 21 countries were producing ATGWs and 21 countries were producing MANPADS (Small Arms Survey, 2008, pp. 34–35).

Roles for ATGWs have changed significantly since the first systems were produced in the 1950s. The 'classic target set' for ATGWs, as identified by Jane's Information Group, included heavily armoured vehicles such as main battle tanks and lightly armoured and unarmoured vehicles (Gibson and Pengelley, 2004). Exposed infantry was also included, but the main focus was on destroying armoured vehicles. This target set has expanded to reflect the increasing focus on counterinsurgency, urban operations, and other non-traditional military operations over the past 30 years. In 2005, defence analyst Doug Richardson identified 28 major battles dating back to the early 1980s in which ATGWs were used. In only seven of these battles were ATGWs employed against tanks and other heavily armoured vehicles. In every other case, the targets were 'unarmoured vehicles, trucks, buildings, mud huts, bunkers, caves, small boats, and even individual snipers' (Richardson, 2005). This expanded list of targets is not likely to shrink anytime soon, as evidenced by the prolific and varied use of ATGWs in Iraq and Afghanistan.

MANPADS are notably less versatile than ATGWs and therefore their role on the battlefield has changed little over the past 40 years. Low-flying military aircraft remain the primary targets of most MANPADS, with some newer systems also reportedly capable of engaging unmanned aerial vehicles and cruise missiles.

Transfers of portable missiles, 2000–09

This section provides an overview of international transfers of portable missiles. Most of the analysis is based on data collected for estimating US dollar values for annual international transfers of ATGWs and MANPADS (as described above). This data includes records of imports of ATGWs by 25 countries and imports of MANPADS by 74 countries.⁵⁹ Transfers to and from nearly every region of the world are reflected in this data, though not all regions are represented evenly; nearly half of the countries included in the MANPADS dataset are European, for example. Similarly, data on some countries' imports stretches back more than a decade, while data on other countries only captures imports over a few years.

Anti-tank guided weapons. The 25-country dataset on imports of ATGWs highlights several key characteristics of the international trade in these weapons. Notable is the disproportionate significance of just a few states: nearly half of the countries studied reported zero imports of ATGWs, and transfers to the 13 importing countries were highly concentrated among the largest recipients. The largest importer, Slovakia, accounted for 44 per cent of all documented transfers, and the top four recipients—Slovakia, the UK, Turkey, and Norway—accounted for nearly 90 per cent of these transfers. The same is true among exporters, the top three of which accounted for approximately 90 per cent of all imports by the 25 countries studied.

The top four recipients of ATGWs accounted for nearly 90 per cent of these transfers.

The picture of the trade painted by these transfers may be partly distorted by limitations in the data sample used, in terms of both the number of countries and the length of time for which data was available. Nonetheless, the dataset does provide some insight into the global trade. First, the data suggests that the international trade in ATGWs may be somewhat idiosyncratic. A good example is the transfer of 10,498 Malyutka missiles from Hungary to Slovakia in 2009.⁶⁰ Nearly everything about this transfer is unusual. Slovakia has one of the smaller militaries in Europe and, while it is active in Afghanistan and Cyprus, only about 500 Slovak troops are participating in these operations. Similarly, Hungary is not a known producer of the Malyutka, and while it imported several thousand missiles in the 1960s and 1970s, the quantity transferred to Slovakia appears to outnumber total (documented) imports (SIPRI, n.d.b).

Also notable are the types and quantities of imported ATGWs, which are roughly consistent with prevalent assumptions about leading suppliers and their respective markets. Soviet/Russian, US, and French-designed ATGWs accounted for nearly 97 per cent of all imported missiles (see Table 1.11). These countries are established producers and exporters with large client bases and it is not surprising that their systems topped the list of imported ATGWs. The remaining imports consisted of 432 Israeli Spike missiles and launchers and 344 Chinese Red Arrow ATGWs. The comparatively low number of imported Spike missiles is not reflective of its growing market share,⁶¹ and the quantity of these missiles is likely to increase as deliveries are made against new contracts.⁶²

Finally, the dataset underscores the essential role of ATGWs in modern counterinsurgency operations and the recent impact of these operations on the international trade in ATGWs. Despite the high cost per unit, which can exceed USD 100,000 (*Jane's Defense Weekly*, 2010), ATGWs have been used extensively in recent counterinsurgency campaigns, including in Iraq and Afghanistan. In Afghanistan alone, an average of nearly 100 Javelin missiles are fired in combat operations each month (*Jane's Defense Weekly*, 2010). British troops account for the majority of this usage (70 missiles per month), whereas the much larger US force only fires an estimated 25 missiles per month. US troops rely more heavily on the larger and more powerful TOW anti-tank guided missile, roughly 2,000 of which were fired in Afghanistan in the first half of 2010 alone.⁶³ French troops in Afghanistan have used the Eryx and MILAN missiles (*Jane's International Defence Review*, 2010).

Data on British imports of Javelin missiles reflects the high rate of ATGW usage in Afghanistan and its implications for the international trade in these weapons. The UK was the second-largest importer of ATGWs in the 25-country dataset, importing more than 5,600 US Javelin missiles and launchers. Javelin imports have increased significantly during the UK's deployment in Afghanistan, jumping from 135 launch units from 2000 to 2004 to more than 5,466 missiles and launch units in the five-year period ending in 2009 (UKMoD, 2010). Similar patterns are apparent in US budget data, which indicates that funding for the procurement of TOW missiles has

Table 1.11 Imported ATGWs by weapon type, quantity, and percentage of total imports, 2000-09⁶⁴

Producer (type)	Quantity imported	Percentage of total
Russian Federation/ Warsaw Pact (Malyutka, Kornet, Spiral, Spandrel)	11,549	48%
France (Eryx, MILAN)	5,957	25%
United States (Javelin, TOW)	5,731	24%
Israel (Spike)	432	2%
China (Red Arrow)	344	1%
Unspecified/unclear	15	<1%
Total	24,028	100%

increased dramatically since 2005. The number of TOWs procured by the US Army jumped from 200 missiles in US fiscal years 2000 to 2004 to 17,160 missiles in the second half of the decade. While some of these missiles would have been purchased as part of the normal procurement cycle, the total number procured would probably have been much lower had the TOW not become so important a part of US operations in Afghanistan (US Army, 2006–2010).

The popularity of ATGWs among troops serving in Iraq and Afghanistan—and the consequent rise in procurement, including imports—is explained by several characteristics of the weapons that make them well suited for fighting in such environments. Many ATGWs are accurate well beyond the range of most enemy weapons,⁶⁵ which is useful in Afghanistan given the long lines of sight in the terrain where much of the fighting occurs and the great distances separating the combatants during engagements. Many modern ATGWs also require significantly less skill than sniper rifles and are less likely to cause collateral damage than artillery and close air support (*Jane's International Defence Review*, 2010). These attributes help to explain why the international trade in ATGWs is increasingly significant.

Man-portable air defence systems. The wars in Iraq and Afghanistan have sparked little additional demand for MANPADS by coalition forces, which is not surprising given that none of the opposing armed groups in either country have military aircraft. Some analysts believe that the absence of an enemy air threat in these theatres has resulted in reductions in funding for research, development, and procurement of MANPADS and other land-based air defences (*Jane's International Defence Review*, 2009). Data on international transfers of MANPADS is not sufficiently detailed to identify specific cases in which procurement or development was foregone or scaled back, let alone the reasons behind such decisions. What the data does show, however, is a particularly low level of MANPADS imports among most countries for which data is available.

The data shows a remarkably low level of MANPADS imports.

Of the 74 countries studied, only 18 imported MANPADS or their primary components (missiles or launchers). Also notable is the small number of imported MANPADS, the combined total of which was just 4,935 units⁶⁶ (vs. imports of 24,028 ATGWs by only 12 importing countries).⁶⁷ Of this total, imports by a single country, Venezuela, account for 1,800 units, or 36 per cent, of total documented imports. When Venezuela's imports are excluded, total transfers drop to just 3,135 units for the remaining 73 countries.⁶⁸ This figure is remarkably low, especially since the dataset includes several countries with large and well-equipped armed forces.

What explains this low level of import activity among most countries? Is the international market for MANPADS in long-term decline? While spending on research, development, and procurement of MANPADS may have declined in some countries in recent years, there is little evidence of a significant, permanent contraction in the global MANPADS market. Foreign demand for certain systems, including the Swedish RBS-70 and the Stinger missile, remains strong, according to industry representatives.⁶⁹ Similarly, the UK government's procurement of more than 7,000 Starstreak missiles—approximately 20 per cent of which are to be used with shoulder-fired launchers—since 2000 is a clear signal that MANPADS remain a staple in British arsenals (UKMoD, 2010).

The development of new MANPADS by China and the Russian Federation is also indicative of continued interest in MANPADS. China has introduced several new MANPADS in recent years, the latest of which—the QW-19—was unveiled in November 2010 (Hewson, 2010). Similarly, the Russian Federation is reportedly developing an entirely new system called the Verba, or 'Willow'. Unlike other Russian MANPADS developed since the end of the cold war, the Verba 'will not be a further upgrade of [the] Igla family [. . .] it will have [a] new missile and launcher', according to an industry representative familiar with the programme (Pyadushkin, 2010, p. 2). Poland has also developed a new MANPADS, called the Piorun (Holdanowicz, 2009). It is highly unlikely that government and industry officials in these countries would invest the resources necessary to develop sophisticated new missile systems if domestic and international markets for MANPADS were disappearing.

The modest import figures for the majority of the countries studied are probably the result of data gaps and long procurement cycles. The trade in MANPADS is more transparent than the trade in many other weapons, but data on MANPADS transfers is incomplete. One of the most significant shortcomings is the exclusion of missile-only transfers from the reporting requirements for the UN Register. Member states are only required to submit data on transfers of complete MANPADS or launchers, not shipments consisting solely of missiles. Consequently, an unknown, but perhaps significant, number of imported missiles are not captured in the data submitted to the Register. Since the Register is the only public source of data on many countries' MANPADS transfers, the exclusion of data on missile-only transfers may help to explain the low import totals.

Also missing from the dataset is information on transfers to states that do not consistently report on their imports. As explained above, only data on countries that reported on their imports of MANPADS for a minimum number of years is included in the study.⁷⁰ While this data includes many of the world's largest arms producers and importers, there are some notable exceptions. One is Jordan, which appears to be one of the larger importers of MANPADS in recent years. According to Jordanian import data, the country imported 182 Igla launchers in 2007 alone. But Jordan did not meet the criteria for inclusion and thus is not part of the dataset.

For the abovementioned reasons, the international trade in MANPADS is almost certainly larger than import data used in this study would suggest, but it is unclear how much larger. The number of additional transfers could be



A mannequin holds a Chinese personal anti-aircraft missile at the fifth China Air Show in Zhuhai, China, November 2004.
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minimal, as many states probably have not imported any MANPADS or their missiles in recent years. Six of the seven states for which comprehensive import data was obtained directly from governments (and whose data is therefore considered most complete and reliable) did not report any imports of MANPADS, and imports by the seventh state, Germany, consisted of just two launchers. This is not surprising given the long shelf lives of many MANPADS, low usage rates by many importers, and active or latent domestic production in three of the seven states. Without more complete data on MANPADS transfers, however, it is impossible to determine how closely current estimates of international transfers correspond with the actual global trade.

CONCLUSION

This chapter seeks to determine the annual value of international authorized transfers of light weapons and to gain a better understanding of this trade. It draws on data from dozens of sample countries to derive, through extrapolation, an estimated annual value of USD 1.1 billion for the international trade in light weapons. Transfers of portable missiles—MANPADS and ATGWs—represent the bulk of this total. Imports of ATGWs have dramatically increased among key countries in this sample over the past five years, partially as a result of high demand for ATGWs to equip troops in Iraq and Afghanistan. No comparable spike in MANPADS imports is apparent, in part because the target set against which MANPADS are employed is far more limited.

The trade in light weapons is extremely opaque. Information regarding the procurement practices of many countries remains difficult to obtain. Of the three reporting mechanisms on procurement and international transfers of small arms and light weapons reviewed for this study, only the UN Register contains national data that is sufficiently detailed and complete to be used in generating the estimated annual global value of transfers. The number of states that routinely report on imports of light weapons to the UN Register is still fairly limited, however. Data was thus collected through direct outreach to more than 80 governments, SIPRI's database on arms transfers, and field research. These additional sources yielded several hundred additional records, but much of the international trade in light weapons remains undocumented and poorly understood.

Despite these shortcomings, the light weapons trade is significantly more transparent today than it was a decade ago. The addition of small arms and light weapons transfers as an optional reporting category to the UN Register in 2003 has captured hundreds of transfers, many of which would have otherwise gone unreported. This expanding dataset sheds new light on the international trade in light weapons, particularly transfers to and from Europe. Contributions to the Register by more countries—and more specific and consistent reporting by countries that already contribute—would dramatically improve public data on light weapons transfers and, consequently, public understanding of this critically important trade. ■

LIST OF ABBREVIATIONS

ATGW	Anti-tank guided weapon
EU	European Union
GPS	Global Positioning System

MANPADS	Man-portable air defence system
MILAN	<i>Missile d'infanterie léger antichar</i> (light infantry anti-tank missile)
ML	EU Common Military List (categories)
RPG	Rocket-propelled grenade (shoulder-launched anti-tank weapon)
SIPRI	Stockholm International Peace Research Institute
TOW	Tube-launched, optically tracked wire-guided weapon system
UN Comtrade	United Nations Commodity Trade Statistics Database
UN Register	United Nations Register of Conventional Arms

ANNEXES

Online annexes at <<http://www.smallarmssurvey.org/de/publications/by-type/yearbook/small-arms-survey-2011.html>>

Annexe 1.1 Annual authorized small and light weapons exports for major exporters (yearly exports of more than USD 10 million), 2008

This annexe provides UN Comtrade data on transfers of small arms and light weapons from major exporters in 2008.

Annexe 1.2 Annual authorized small and light weapons imports for major importers (yearly imports of more than USD 10 million), 2008

This annexe provides UN Comtrade data on transfers of small arms and light weapons from major importers in 2008.

Annexe 1.3 Methodology

This annexe provides a detailed summary of the methodology used in this chapter.

ENDNOTES

- 1 This value includes an estimated USD 100 million in undocumented firearms transfers.
- 2 See Small Arms Survey (2009, pp. 28–31; 2010, pp. 17–20) for the methods used to arrive at estimates for the authorized trade in firearms and ammunition for small arms and light weapons.
- 3 These figures do not include the trade in heavy machine guns, covered in the *Small Arms Survey 2009* estimate of the value of the international trade in firearms (Small Arms Survey, 2009, p. 29).
- 4 This chapter does not cover heavy machine guns or anti-materiel rifles, which are frequently categorized as light weapons. These items were included in the Small Arms Survey's assessment of the international trade in firearms, which is summarized in Small Arms Survey (2009).
- 5 The Panel's report defines light weapons as 'designed for use by several persons serving as a crew' (UNGA, 1997, para. 25). It includes the following categories of weapons: 'heavy machine-guns; hand-held under-barrel and mounted grenade launchers; portable anti-aircraft guns; portable anti-tank guns, recoilless rifles; portable launchers of anti-tank missile and rocket systems; portable launchers of anti-aircraft missile systems; [and] mortars of calibers of less than 100 mm' (para. 26). The Panel also specifies that light weapons are transportable 'by two or more people, a pack animal or a light vehicle' (para. 27(a)).
- 6 The term 'firearms' also covers the various 'small arms' that the Panel enumerates. See, for example, Small Arms Survey (2009, pp. 8–11).
- 7 Data on arms transfers often does not indicate whether imported guided missiles are intended for use with a man- or crew-portable launcher, a light vehicle, or larger platforms. If data does specify that the item in question is to be fired from a naval or aerial platform, or from tracked vehicles, it has been excluded. If the context provides no indication as to the platform from which the missile is to be fired, the data is included. In many cases, ambiguity regarding the intended use of the weapon means that some items configured for use on large platforms (that is, items that are not considered light weapons) may be included in data used for this study. This approach differs from that of the *Small Arms Survey 2008*, which covers all transfers of guided missiles that *could* be fired from a light vehicle or crew-portable launcher as a light weapon, regardless of the intended use (Small Arms Survey, 2008, pp. 8–11).

8 For the purposes of this chapter, 'accessories' are items that are not integral to the operation of portable versions of the system. An example would be the Giraffe radar system for the RBS-70 pedestal-mounted air defence system. The radar system enhances the performance of the RBS-70 but is not required for the basic operation of the system.

9 China is also assumed to have significant undocumented exports that would bring its total to more than USD 100 million. This study has revealed that Sweden's exports of light weapons hovered around USD 32 million in 2008, which may be sufficient to put its total exports over the USD 100 million threshold.

10 The overall figure for the increase in US exports between 2000 to 2009 has been adjusted for inflation. The other year-on-year comparisons have not.

11 For example, on 15 August 2010 a search of the European Defence Agency's Defence Contracts Opportunities and the European Union's Tenders Electronic Daily sub-categories for light weapons yielded only six completed contract award notices (all for 60 mm illuminating mortar bombs).

12 UN Comtrade was never intended to be a reporting mechanism for conventional weapons transactions. In addition to aggregating light weapons and other types of items in the same categories, the database fails to identify the weapon model or the type of transfer, such as permanent export or intra-military transfers to troops stationed abroad.

13 The reporting format for small arms and light weapons divides light weapons into the following categories: (1) heavy machine guns; (2) hand-held, under-barrel, and mounted grenade launchers; (3) portable anti-tank guns; (4) recoilless rifles; (5) portable anti-tank missile launchers and rocket systems; (6) mortars of calibres of less than 75 mm; and (7) other weapon types.

14 MANPADS were added as a sub-category (VIIb) of Category VII, 'Missiles and missile launchers'.

15 National reports on arms transfers submitted in 2009 cover deliveries that occurred in 2008.

16 Panama did not provide information on transfers of items in Categories 2 (hand-held, under-barrel, and mounted grenade launchers) and 3 (mortars of calibres of less than 75 mm).

17 There are exceptions to these yearly timeframes. For example, the Barometer takes account of reports submitted in 2010 that cover export activities in 2008 or earlier. In addition, states that failed to provide any information in 2010 are evaluated on their most recent submissions and reports, provided they were issued no earlier than 1 January 2009 (see the notes to Table 1.2). See Lazarevic (2010) for full details of the scoring methodology and a description of the changes to the Transparency Barometer scoring system since its introduction in 2004.

18 This includes information EU states have contributed to the *EU Annual Report* on military exports (CoEU, 2011).

19 For comparisons of 2010 rankings and scores, consult the online version of the 2010 Transparency Barometer (Small Arms Survey, n.d.a).

20 The UN Comtrade category in question is 930120, a mixed category, which includes conventional materiel such as torpedo tubes as well as some light weapons (such as rocket and grenade launchers).

21 In December 2008, the Council Common Position 2008/944CFSP replaced the European Union Code of Conduct on Arms Exports, in force since June 1998 (CoEU, 1998; 2008b, paras. 4, 8; 2011, p. 1).

22 Each Belgian region (Brussels, Flanders, and Wallonia) reports separately on its arms exports. The reports of all three regional parliaments are taken into account in determining the national score for Belgium.

23 Taiwan's score has been generated using the data it submits to UN Comtrade, as published by the International Trade Centre in its Trade Map database (ITC, n.d.).

24 The five states contributing to the regional report are: Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro, and Serbia.

25 The SIPRI database contains data on transfers of MANPADS and ATGWs from a variety of sources, including official national and intergovernmental reports, press articles, and outputs of non-governmental organizations. For more information, see SIPRI (n.d.a).

26 Following a decision that documented imports would capture the greatest proportion of the global trade, import data (rather than export data) is used to build a global value of transfers. This decision was based on a lack of transfer data for a number of states believed to be significant exporters but insignificant importers (such as China and the Russian Federation).

27 Data is clustered around these years because of the expansion of reporting to the UN Register in 2003 (see above). While transfer records are available across a longer time period for some light weapon types in the SIPRI database, the completeness of transfers recorded in the database for a particular state in a particular year is not always easy to judge. As a result, this study relies heavily on data submitted to the UN Register. For more on the selected data sources and their implications for the conclusions, see Annexe 1.3.

28 'Years of available data' includes years for which the authors were able to ascertain that a particular state imported no light weapons, for example, if it submitted an explicit 'nil' report to the UN Register.

29 The threshold for inclusion in the MANPADS model is slightly more complicated than for the other models. Countries are included if there is a minimum of four consecutive years of data—or a total of five or more years of data—on their imports between the years 2003 and 2009.

30 Data on Venezuela's imports in 2009 is also included in the documented trade figure, but has not been used for extrapolation.

31 Data on armed force size and military spending is drawn from IISS (2009), SIPRI (2009), and CIA (n.d.). Data on conflict status was generated from UCDP/PRIO (n.d.) and data on production capacity from Jones and Ness (1997), Leff (2008), and O'Halloran and Foss (2008; 2009).

32 'Typical' light weapons import values of a particular group consist of averages of import values of sample countries belonging to that group.

33 Footage of the parade, including the SA-24 MANPADS, can be viewed at YouTube (2009).

- 34 For example, forum members of the Bangladesh Military Forces website have discussed military procurement by Bangladesh (BMF, n.d.).
- 35 The term 'anti-tank guided weapon' is a slight misnomer as it fails to convey the broad array of targets against which these weapons are increasingly used and the proliferation of new warheads for existing ATGWs that are optimized for targets other than heavily armoured vehicles (see 'Warhead/Target Matrix' in Gibson and Pengeley (2004)). Nonetheless, this chapter uses the term for two reasons. First, 'ATGW' and 'anti-tank guided missile' are still widely used and therefore the introduction of a new term could be confusing for some readers. Secondly, the term is not inaccurate, since many of the weapons in this category have retained their effectiveness against armoured vehicles even as their roles have expanded. See Gibson and Pengeley (2004); Foss (2009).
- 36 Descriptions of the weapons described in this chapter are drawn, in part, from Small Arms Survey (2008, pp. 20–27).
- 37 Mortar systems up to 120 mm are included. An assessment of their weight shows that the majority of identified systems can be transported by a light vehicle (the threshold for being defined as light weapons). The weight parameters used are set out in Small Arms Survey (2008, pp. 8–11).
- 38 Here, the term 'rockets' refers to unguided rocket-propelled projectiles.
- 39 Confidential author communication with industry personnel.
- 40 Confidential author communication with industry personnel.
- 41 Confidential author communication with industry personnel.
- 42 See Herron et al. (2010, p. 34).
- 43 See Small Arms Survey (2006, p. 9).
- 44 Service life estimate from UN (2008).
- 45 Confidential author interviews with government officials and industry personnel.
- 46 For more information about this type of low-level procurement, see Small Arms Survey (2006, p. 9).
- 47 See Foss, Gourley, and Tigner (2008); Kemp (2007); Williams (2008).
- 48 Service life estimate from UN (2008).
- 49 Single-shot, disposable rocket launchers also fire rocket-propelled grenades. Nevertheless, the terms 'RPG' and 'rocket-propelled grenade' are used here to describe projectiles fired from a reusable launcher which was developed in the Soviet Union and allied countries, as this follows the common use of the term.
- 50 According to the UN Panel of Experts, customs data submitted to UN Comtrade recorded a combined total of USD 22.9 million in arms transfers from North Korea between 2000 and 2009. North Korea does not submit national reports on any of its exports of weapons or military goods to the UN Register or to UN Comtrade (Lazarevic, 2010, pp. 101–02); see also the transparency section, above. The figure of USD 22.9 million is based on UN Comtrade information from importing countries only and cannot be regarded as comprehensive. The UN Panel of Experts estimates the total international trade in North Korean arms to be worth at least USD 100 million per year (UNSC, 2010, para. 65).
- 51 Use on certain platforms (including naval, air, or tracked vehicles) places these items outside this chapter's definition of light weapons.
- 52 TOW stands for tube-launched, optically tracked wire-guided weapon system.
- 53 For more information on ATGWs, see Small Arms Survey (2008, pp. 18–20).
- 54 China also reportedly employs a fourth type of guidance system, semi-active laser guidance, in a version of its QW-3 missile (O'Halloran and Foss, 2008, p. 11).
- 55 For more information on MANPADS, see Small Arms Survey (2008, pp. 16–18).
- 56 MILAN stands for *missile d'infanterie léger anticar* (light infantry anti-tank missile).
- 57 The US government estimates that more than one million MANPADS have been produced worldwide since the 1960s (GAO, 2004, p. 10).
- 58 Figure derived from MSIC (n.d.).
- 59 As explained above, three different models were used to calculate the global US dollar value estimate for transfers of MANPADS, ATGWs, and other light weapons. The ATGW model includes data on imports by Antigua and Barbuda, Argentina, Armenia, Bangladesh, Canada, Cyprus, the Czech Republic, Denmark, Germany, Indonesia, Liechtenstein, Lithuania, Mexico, Moldova, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, South Africa, Turkey, the United Kingdom, and the United States. The MANPADS model includes data on all of these countries plus Albania, Australia, Austria, Azerbaijan, Belarus, Belgium, Belize, Bolivia, Bosnia and Herzegovina, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Chile, Costa Rica, Croatia, Cuba, France, Georgia, Guatemala, Hungary, Iceland, Israel, Japan, Kazakhstan, Kyrgyzstan, Latvia, Lebanon, the former Yugoslav Republic of Macedonia, Malaysia, the Maldives, Malta, Mauritius, Mongolia, Namibia, New Zealand, Pakistan, Paraguay, Senegal, Serbia, Singapore, South Korea, Suriname, Sweden, Switzerland, Tajikistan, Trinidad and Tobago, and Ukraine. Imports by Venezuela were included but were not used for purposes of extrapolation. For a detailed explanation of how these countries were selected, see Annex 1.3.
- 60 Hungary's 2009 submission to the UN Register contained no data on the transfer of ATGWs to Slovakia.
- 61 Jane's Information Group recently observed that '[b]eneath TOW's class of heavy ATGW, two designs have really got the Western-leaning market covered: [Raytheon's] Javelin and Rafael's Spike' (*Jane's International Defence Review*, 2010).
- 62 Because of licensed production arrangements, deliveries of Spike missiles to many countries will only represent a fraction of the total number of missiles procured, even at their peak. A 2003 deal with Poland for 2,675 missiles and 264 launchers included licensed production of 70 per cent of the components for—and final assembly of—the missiles in Poland (Small Arms Survey, 2008, p. 20; Holdanowicz, 2007). Similarly, 60 per cent of the 2,600 Spike missiles procured by Spain in 2007 were to be produced locally, as were 70 per cent of the missiles ordered by Germany in 2009 (Ben-David, 2007; Wagstaff-Smith, 2009).

- 63 According to industry and government officials, most TOW missiles are fired from vehicle-mounted launchers. Since some are fired from pedestal-mounted launchers, they are still considered portable missiles and, as mentioned above, are included in the dataset when no information on intended platforms is provided.
- 64 Data on national ATGW imports by the 25 countries studied often does not cover the entire ten-year period.
- 65 The Javelin and TOW missiles have engagement ranges of 2,500 and 3,750 metres, respectively—well beyond the effective ranges of the AK series assault rifles, machine guns, sniper rifles, and other weapons commonly used by insurgents in Afghanistan (Jones and Ness, 2007, pp. 501, 509).
- 66 This total excludes transfers of missiles in which it is clear that they are intended for platforms outside the scope of this study, including aircraft, heavy land vehicles, and naval vessels.
- 67 Only countries that provided data on quantities of imported ATGWs are counted.
- 68 Furthermore, nearly 19 per cent of this total consists of MANPADS imported by the United States for purposes other than short-range air defence: 549 launchers from Bulgaria were ‘demilitarized/destroyed’ and 34 launchers from Ukraine were imported for research on countermeasures. When these transfers are excluded, total imports by the 73 countries drops to just 2,552 units.
- 69 Confidential author interviews with industry officials.
- 70 As noted above, the threshold for inclusion is four consecutive years of reporting, or reporting for five or more years between 2003 and 2009.

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