

A mujahideen soldier squats with a Russian-type, though Chinese-made, machine gun in Kabul Province, Afghanistan, in November 1991. © Mervyn Patterson/Panos Pictures



Multiplying the Sources

LICENSED AND UNLICENSED MILITARY PRODUCTION

INTRODUCTION

For the victims of armed violence, it does not really matter who produced the gun that causes their injury or death. Yet, for those seeking to prevent such violence, the producer is extremely important. New information presented in this chapter indicates that anywhere from 60 to 80 per cent of all military rifles, assault rifles,¹ and carbines—the weapons most frequently used in modern armed conflict—are manufactured by producers that acquired the necessary technology from others.²

Both licensed and unlicensed production involve the acquisition of production technology by an actor that did not previously possess it. While this need not lead to an overall increase in the number of weapons produced, it does involve the dissemination of weapons production know-how to a greater number of actors. As such, knowledge becomes more widespread, and the risk that small arms end up in the wrong hands increases. Simple solutions to this problem are not an option. Production know-how, once transferred, cannot be retrieved.

This chapter examines the impact of licensed and unlicensed production on the proliferation of small arms and light weapons, along with measures that reduce the risk of diversion and misuse. More specifically, it considers the following questions:

- Which states are the major original owners and which states the acquirers of small arms manufacturing technology?
- Which weapons are most frequently produced under licence or as unlicensed copies, and why?
- What is the relative proportion of licensed and unlicensed production?
- What commercial, national, and international measures can curb the uncontrolled proliferation of small arms produced under licence?

This study of licensed and unlicensed production sheds light on a much-neglected, but quantitatively important, aspect of the small arms industry. It also reveals that production arrangements tend to follow the logic of the arms trade and, accordingly, require similar control measures. The chapter's most important findings include the following:

- States that originally own technology are easily outnumbered by those that acquire it. Furthermore, most original owners are themselves acquirers of production technology.
- Only 57 per cent of weapons produced by technology acquirers are produced under licence.
- Man-portable air defence systems (MANPADS) technology is now quite strictly controlled, even though there is still some unlicensed production.
- Production based on former Soviet Union (USSR) technology represents a disproportionately high share of unlicensed production worldwide.

- Every year, 530,000 to 580,000 military rifles, assault rifles, and carbines are produced under licence or as unlicensed copies, representing 60 to 80 per cent of total annual production.
- An effective counter-proliferation strategy, among other things, targets the diversion and export of the manufacturing know-how needed for licensed and unlicensed production.

The first section of this chapter unpacks the issue of licensed weapons production. After a general description of the phenomenon, it takes a closer look at the costs and benefits associated with licensed production, along with accompanying risks. The following section outlines the key features of current licensed and unlicensed production of small arms. It also estimates the annual global production of military rifles, assault rifles, and carbines, including the proportion manufactured under licence or as unlicensed copies. The last section focuses on the problems that licensed and unlicensed production of small arms pose, before presenting a number of best practices and policy options.

Most small arms production licences are non-exclusive in nature.

LICENSED PRODUCTION: A PRIMER

Licensed production in general occurs in virtually all areas of the modern economy. The motives behind it are numerous, ranging from the anticipated increase of market share and returns on investment in research and development on the part of the licensor company, to the wish to develop domestic industry and create jobs on the part of the licensee country. Accordingly, licensed production agreements can involve many different juridical and organizational arrangements.

This section explores the phenomenon of licensed production of small arms, light weapons, and their ammunition. It discusses its forms and specificities, the motives behind it, and the problems surrounding it.

Characteristics of a partnership

In its most general sense, 'a license agreement is a partnership between an IP [intellectual property] owner (licensor) and another who is authorized to use such rights (licensee) under certain conditions' (WIPO, 2003, p. 11). Accordingly, in a licensed production agreement, the licensee (usually a company) is manufacturing a product for which it is granted production rights under certain conditions, while the licensor retains the ownership of the intellectual property necessary for production. In the case of small arms and light weapons, licensing agreements typically bring together a licensor company that supplies technical data, prototypes, and/or machine tools and a licensee company located in another country (Small Arms Survey, 2001, p. 9).

Most small arms production licences are *non-exclusive* in nature, i.e. the licensor retains the right to use the licensed property itself, and to attribute further licences to third parties (Small Arms Survey, 2002, p. 42). In fact, all of the largest small arms producers have production licensing agreements with several manufacturers for models they also produce themselves. Heckler & Koch, for example, used to produce its G3 assault rifle in its own production facilities in Germany. At the same time, it gave production licences to manufacturers in 15 countries between 1961 and the present (DAKS, n.d., pp. 8, 12; Jones and Cutshaw, 2004).³ Much less frequent are *sole licences*, where the licensor retains the right to use the licensed property itself, but cannot grant further licences to third parties; and *exclusive licences*, where not even the licensor retains the right to use the licensed property (Small Arms Survey, 2002, p. 42).

As opposed to intellectual property rights *sales* or *assignments*, licence contracts subject the use of intellectual property to various conditions. Licence contracts may contain provisions restricting weapons production to a certain

period of time or a quantity beyond which further production is illegal. Venezuela, for example, has recently acquired a production licence for AK-103 rifles and ammunition that is limited to ten years and allows the assembly of up to 900,000 rifles from kits supplied by Izhmash, with maximum annual production of 25,000 rifles (BBC, 2006b; 2006c; Pyadushkin, 2006; Vogel, 2006). Restrictions may also be imposed on the weapons' final end use or destination. The Russian Federation has granted a production licence for Kalashnikov rifles to India, whose stated purpose is the supply of the Indian Army and law enforcement bodies (RosBusinessConsulting, 2004). Other restrictions may relate to the licensed activity, e.g. whether small arms are fully produced or partially assembled, and whether entire weapons or only their components are produced. In addition, licence agreements may contain clauses specifying quality standards or addressing the situation where one of the partners makes improvements to the product (Small Arms Survey, 2002, p. 43). Finally, a licence agreement determines the form and scope of compensation given to the intellectual property holder. Usually, the licensor receives direct monetary benefits in the form of a flat fee (lump sum) or a running royalty, frequently a share of the licensee's revenue (WIPO, 2003, p. 11).

Besides these conditions, which are usually explicitly stated in the agreement, there are two basic, but largely implicit, conditions that necessarily underpin any licence agreement: 'the licensor must have ownership of the relevant IP', and 'the IP must be protected by law [e.g. covered by a patent] or at least eligible for protection' (WIPO, 2003,



Venezuelan President Hugo Chávez inspects a Kalashnikov assault rifle being assembled at the Izhmash plant in Izhevsk, Russia, July 2006. © AFP/Getty Images

p. 11). Although this might seem obvious, it cannot always be assumed. Izhmash, for example, cannot claim intellectual property rights for early Kalashnikov designs, because, until 1997, the product had not been patented (ITAR-TASS, 1998; *Petersburg Times*, 1999; Pyadushkin, 2006).

In the area of small arms production, licence agreements involve the voluntary and conscious transfer of technology. Such an agreement may involve several different types of technology transfer:

- **Know-how contract:** The owner of technology communicates its know-how to another person or legal entity, either in *tangible form* (e.g. documents, photographs, blueprints of machines or products, technical drawings, architectural plans, lists of spare parts, manuals, or instructions) or in *intangible form* (e.g. conversations between the engineers of the supplier and the recipient, the observation of a production line, or a training programme for the employees of the recipient).
- **Acquisition of equipment and other capital goods:** The technology owner transfers equipment and other capital goods (machinery, entire production lines, component parts for assembly, etc.) to another person or legal entity through *sale* or *gift*.
- **Joint venture agreements:** The technology owner enters into an alliance with another person or legal entity. In *equity joint ventures*, the supplier and recipient of technology agree on the creation of a separate legal entity, while in *contractual joint ventures* no such entity is created.
- **Turn-key project:** The technology owner hands over an entire industrial plant or production line operating according to agreed performance standards (WIPO, 2006, pp. 4–5).

The costs, benefits, and risks of licensed production

Small arms producers share a common aim, namely to maximize sales in order to increase returns on research, development, and production costs. Licensed manufacturing is one means of achieving this. Others include direct exports, joint ventures, and foreign direct investment. This section discusses why companies engage in licensed small arms production, in particular the associated economic and political benefits and costs.

Costs and benefits for the licensor

Licensing weapons production gives a licensor additional income (royalty payments) that can help recoup research and development costs. Along with direct exports, this may be vital for the small arms industry in countries where domestic demand is too small to sustain the industry (Poth, 2001; Small Arms Survey, 2004, pp. 118–23).

Licensing weapons
production can help
the licensor to
recoup R&D costs.

By granting a licence, the original producer of small arms can indirectly access new markets in a cost-effective way, sometimes penetrating markets that are otherwise inaccessible. The technology owner benefits from the fact that the licensee company knows the local market much better and is able to make necessary changes, such as the translation of labels and instructions, and the adaptation of the product to local regulations. Moreover, owing to its knowledge of the local culture, the licensee may be able to market the product more successfully (WIPO, 2003, p. 12). To cite one example, the 9 x 19 mm Model 92FS self-loading pistol, initially produced by Armi Beretta in Italy, is produced under licence by the US company Beretta as the M9. It has been modified slightly in order to fit US requirements (Jones and Cutshaw, 2004, pp. 267, 311).

Finally, through indirect counter-trade and offset arrangements (see Box 1.1), the licensor country may see an increase in job opportunities in sectors other than the defence sector, or otherwise gain access to investment opportunities in the licensee country. In 2006 Russian Federation business interests gained new investment opportunities

in the Venezuelan energy sector when the two countries agreed on defence deals of more than USD 1 billion, including licensed production of AK-103s (Anderson, 2006b). Yet, as small arms deals are usually relatively small compared to other defence deals, the role of counter-trade and offsets should not be overestimated. Moreover, the overall benefits of an indirect offset deal may be tempered by the loss of jobs in the licensor country's defence sector.

Costs and benefits for the licensee

Most of the countries producing small arms under licence are developing countries. They often seek to establish indigenous defence industries, reduce import dependence, and/or secure and retain jobs within the country. Malaysia's defence industry is too small and its research capabilities too limited to satisfy the government's goal of self-reliance in meeting domestic defence needs. Malaysia therefore tries to spur the transfer of foreign technology to the local defence industry through licensed production agreements (*New Straits Times*, 2003). Similarly, India has not achieved independence in defence production. In 2005, with an Indian manufacturing project lagging behind schedule (Lockwood, 2006a), India concluded a licence agreement with the Russian Federation for the transfer of equipment needed for the assembly of rifles (RosBusinessConsulting, 2004). Libya appears anxious to restore its defence industry after the lifting of the embargo against the country in October 2004. The country reportedly concluded a licensed production agreement with the Russian Federation for Kalashnikov assault rifles in late 2004 (Novichkov, 2004). Turkey shares similar objectives: 'to develop an indigenous high-technology industry in order to reduce Turkey's reliance on foreign companies and encourage the involvement of local companies in defence manufacture' (Sariibrahimoglu, 1999).

Through a licensing agreement, the licensee company gains access to superior technology without having to undertake its own research and development. Further, it avoids the risks inherent in the development of many new products by manufacturing weapons that have already proved their worth (WIPO, 2003). As a consequence, the company can quickly gain access to new domestic markets or even enter the export business. Colombia, for example, produces 5.56 mm Galil rifle ammunition under licence from Israel, which it then exports back to Israel. Reportedly, the aim is to make the Colombian armed forces self-sufficient in small arms and ammunition, and then to take on the regional export market (McDermott, 2004a; 2006). Yet, for non-US and non-European rifle-producing countries engaged in licensed production, export sales are only a secondary goal; their main concern is domestic. Only a handful of them—e.g. Israel Military Industries Ltd. (IMI), Singapore Technologies Kinetics, Denel Ltd. (South Africa), Australian Defence Industries, and China North Industries Corporation (NORINCO)—have a chance to become serious players in a competitive international market (Lockwood, 2006a).

Whether licensed production is a cost-effective means of achieving the goals described above largely depends on the case-specific interaction of costs and benefits. Total royalty payments should not exceed the research and development costs necessary for domestic development. The potential licensee also needs to consider whether the direct imports of small arms would be cheaper than licensed production. Generally, a country will engage in licensed production only if such benefits as national self-reliance, security of supply, job creation, and/or additional export income outweigh the cost of the licensing arrangement.

Costs and benefits for both licensor and licensee

Through a licensed production agreement, the licensor and licensee countries can strengthen their political and military cooperation. This may benefit the licensor in that it enhances its political influence in the licensee state. This was the main motive behind the production licences the USSR granted to countries in its zones of influence (Pyadushkin,

Licensee countries often seek to establish indigenous defence industries or to reduce import dependence.

Box 1.1 Offset policies in the arms trade

Offsets are often demanded as compensation for certain defence deals (Willet and Anthony, 2001, p. 3). *Direct* offsets are directly linked to the arms sale in question. Instead of simply buying weapons from the seller in another country, for example, the buyer country may take over the manufacture of a portion of the weapons that have been ordered, or may secure access to certain technology or know-how connected to the products it is buying. *Indirect* offsets occur when the compensation is unrelated to the actual purchase of arms or defence services. The buyer country, for example, might require the seller country to buy agricultural products or non-defensive industrial goods in return for its arms purchase (Brauer and Dunne, 2004; Willet and Anthony, 2001, p. 3; FAS, 2001).

Licensed production of small arms falls into the category of direct offsets. The recipient 'buys' a certain number of weapons, but in return has technology transferred to its domestic industry. The Greek government, for example, recently selected the Heckler & Koch G36 as its army's standard rifle. Yet the government arms company sought a licence to produce domestically at least 50 per cent of the 112,370 rifles needed (62 per cent of the contract value) (Lockwood, 2006b).

Over recent years, the value of defence offset agreements has been increasing. Whereas in 1998 the average offset requirement was around 58 per cent of the value of the contract (FAS, 2001), offset investments of 100 per cent have become more common since then. Occasionally, compensations of up to 300 per cent have been reported. While offset deals for small arms and light weapons are relatively small compared to other defence contracts, they have followed the same upward trend. For instance, the contract for the licensed production in Turkey of 5.56 mm assault rifles as replacements for the H&K G3, finally won by Heckler & Koch with its HK33E, required a 100 per cent offset (*Jane's Defence Weekly*, 1995). The European Defence Agency's attempts to limit offset requirements to a maximum of 100 per cent reflect the extremes of current practice (Tigner, 2006a). Some purchasers have even requested a non-refundable 'pre-offset' of about 10 per cent from companies competing for a contract (FAS, 2001).

Small arms offset deals, especially those comprising a licensed production agreement, often result in a net loss of jobs in the seller country, as they technically result in the outsourcing of production (Lumpe, 1995). The arms industry claims, however, that without the granting of offsets, a deal would not be possible, and the net loss for the economy would be even bigger. It is difficult for the general public to assess the validity of such arguments, because publicly available information about offset deals remains scarce (FAS, 2001).

Offset arrangements may have a detrimental effect on competition. It is not without reason that the General Agreement on Tariffs and Trade prohibits offset deals in government procurement (WTO, 1994, annex 4b, art. 16). This rule, however, does not automatically cover defence procurements (art. 23) (Willet and Anthony, 2001, p. 22). Stricter regulation of offset deals is needed to limit their negative impacts. As it seeks to facilitate more liberal defence procurement practices, the European Defence Agency is trying to harmonize the elements of a typical offset contract. Despite the European Commission's release of an 'interpretive communication' (EU, 2006) on the subject, Europe's biggest arms-producing countries—Britain, France, Germany, Italy, Spain, and Sweden—are poised for confrontation over the issue with numerous smaller states, which are seeking to develop their domestic defence industries (Tigner, 2006a; 2006b; 2007).

2006). While such arrangements can increase the licensee's political and security dependence on the licensor, they can also confer important practical benefits on both parties, e.g. in the form of increased standardization of military equipment among allies, as is the case among North Atlantic Treaty Organisation (NATO) countries (*Jane's International Defence Review*, 2004).

The risks of licensed production

Various risks are involved in licensed production. For the licensor, it may prove difficult to control the quality of products produced under its licence. It is not always obvious to the consumer who produced a certain weapon, and a weapon produced under licence of lesser quality than the original can damage the reputations of the original licensor and original product. Furthermore, a licence may offer no guarantee of additional income for the licensor. If this is dependent on revenue, and little or no revenue is generated, the licensor will see no financial gain from the deal. Finally, a licensee sometimes becomes a direct competitor of the licensor, reducing overall benefits to the licensor if lost sales outweigh any royalties paid under the licensing agreement (WIPO, 2003, pp. 12–13).

Table 1.1 Benefits, costs, and risks of licensed production

	For the licensor	For the licensee
Benefits	<ul style="list-style-type: none"> • Additional income through royalty payments • Increased return on research and development costs • Access to new markets • Access to investment opportunities in exchange for technology transfer • Strengthened political and military cooperation • Increased political influence on the licensee • Standardization of military equipment among allies • Rights to technological improvements developed by the licensee 	<ul style="list-style-type: none"> • Establishment or strengthening of a domestic small arms industry • Cost-effective way of gaining self-sufficiency in small arms production • Fostering of the domestic high-tech sector • Reduced defence spending abroad • Economic growth • Increased gross domestic product • Job creation • Maintaining or expanding access to international markets • Gaining access to superior technology • Avoiding risks by producing tried and tested defence technology • Strengthened political and military cooperation • Standardization of military equipment among allies
Costs	<ul style="list-style-type: none"> • Loss of jobs in the small arms industry • Net financial loss as a result of exaggerated direct offsets 	<ul style="list-style-type: none"> • Increased political and security dependence • Additional production expenses arising from royalty payments
Risks	<ul style="list-style-type: none"> • Creation of new competitors • Anticipated revenue gains may not materialize • Damaged reputation as a result of quality problems 	<ul style="list-style-type: none"> • Dependence on foreign technology

For the licensee, the only significant risk of licensed production is its continued dependence on foreign technology and political will. This is also the case, however, if the country buys its armaments directly from another country. However, licensed production is preferable for the licensee country in this context in that technology and know-how, once transferred, cannot be taken back, so that even if the licensor country's attitude to the licensee country turns negative, the technology and know-how remain in the latter's possession.

As will be argued below, for the international community, the broader risk connected to licensed production is the irrevocable proliferation of the technology and know-how necessary for small arms production. Even though small arms manufacturing technology is relatively mature and therefore, in principle, accessible, licensed production greatly facilitates the multiplication of sources of small arms. This in turn increases the risk of potential misuse, diversion, and unauthorized transfer.

THE SCOPE OF LICENSED PRODUCTION⁴

This section will outline the scope of licensed production worldwide. The first part focuses on the geographical distribution of licensed small arms production. It provides an overview of major licensors and licensees, and discusses their particular characteristics. The second part of the section takes a closer look at the different kinds of weapons produced under licence, while the last part offers a global estimate of the annual production of the most common military small arms and light weapons. The cut-off date for data compilation was the end of August 2006.

So far, the chapter has not paid much attention to the distinction between licensed production and unlicensed production. This distinction is important, however, both for this section's global mapping exercise and the chapter's later exploration of proliferation risks. In both cases, technology and manufacturing know-how move from the original owner to a different producer. In the case of licensed production, this is done willingly, in exchange for compensation and subject to certain conditions. Unlicensed production, on the other hand, involves the acquisition and use of manufacturing technology without the consent of the original owner.

Information on the licensed production of small arms and light weapons is relatively scarce—even scarcer than for other aspects of the small arms industry. In most cases, information is available on the owner and acquirer country and company, as well as on the models produced. In many cases, however, it is unclear whether the weapons are being produced under proper licence or as unlicensed copies. It is also difficult to obtain data on quantities licensed and eventually produced, or the value of a licensing contract.

As a result, the chapter will distinguish the status of production using the following three categories: (i) licensed production, (ii) unlicensed production, and (iii) licensing situation unclear. The label 'licensed production' is applied only in cases when the sources explicitly refer to the terms 'licence' or 'licensed'. 'Unlicensed production' is applied where the sources mention explicit terms indicating the absence of a licence, such as 'unauthorized copy'. Cases for which no information is available or for which the situation is ambiguous are labelled 'licensing situation unclear'.⁵

For the purposes of this research, the term 'licensed' refers to cases where production takes place on the basis of a licensing agreement between two companies in different countries. The label 'unlicensed production', in turn, implies that production should be based on a licence—because the producer does not own the relevant technology—but is not. It excludes production by the original holder of technology, as well as cases where the right of production is 'inherited' by another legal entity, as with the successor states of the former USSR. The labels 'licensed' and 'unlicensed' merely indicate whether or not production is based on a licence agreement. They say nothing about whether a company is authorized by its government to produce the weapons in question.

Seventeen states own small arms manufacturing technology while 52 have acquired it.

Countries and companies

Worldwide, there are currently 17 original owner states of small arms manufacturing technology whose products are produced in other countries either under licence or as unlicensed copies. In contrast to this relatively small number of original owners, there are 52 acquirer countries. The numbers of licences acquired or products copied without licence vary considerably by country. This study has identified 212 cases of licensed or unlicensed production (see Table 1.2). In the two cases where a consortium of several states grants a licence (for the production of Euromissiles Milan-2 anti-tank guided weapons) and where a group of states produces under licence together (in the Stinger Project Group), the study counted original owner and acquirer states individually.

The geographic distribution of licensed and unlicensed production of small arms is relatively concentrated (see Map 1.1). On the one hand, a small number of producer countries possess the original technology and manufacturing know-how and can therefore grant licences to others. On the other hand, a large number of countries acquire technology and know-how from others. All but five original owners are also acquirers, the exceptions being Austria, Belgium, the Russian Federation, South Africa, and Switzerland (marked with an asterisk in Table 1.2). Thus, while most acquirer states do not develop any production technology themselves, most original owners of technology acquire certain technology from others. Evidently, even the countries that can afford the research and development costs of some types of weapon prefer to reduce expenses where possible by purchasing licences for other products.

Table 1.2 Current cases of technology transfer and/or acquisition (licensed or unlicensed) by country, to August 2006^s

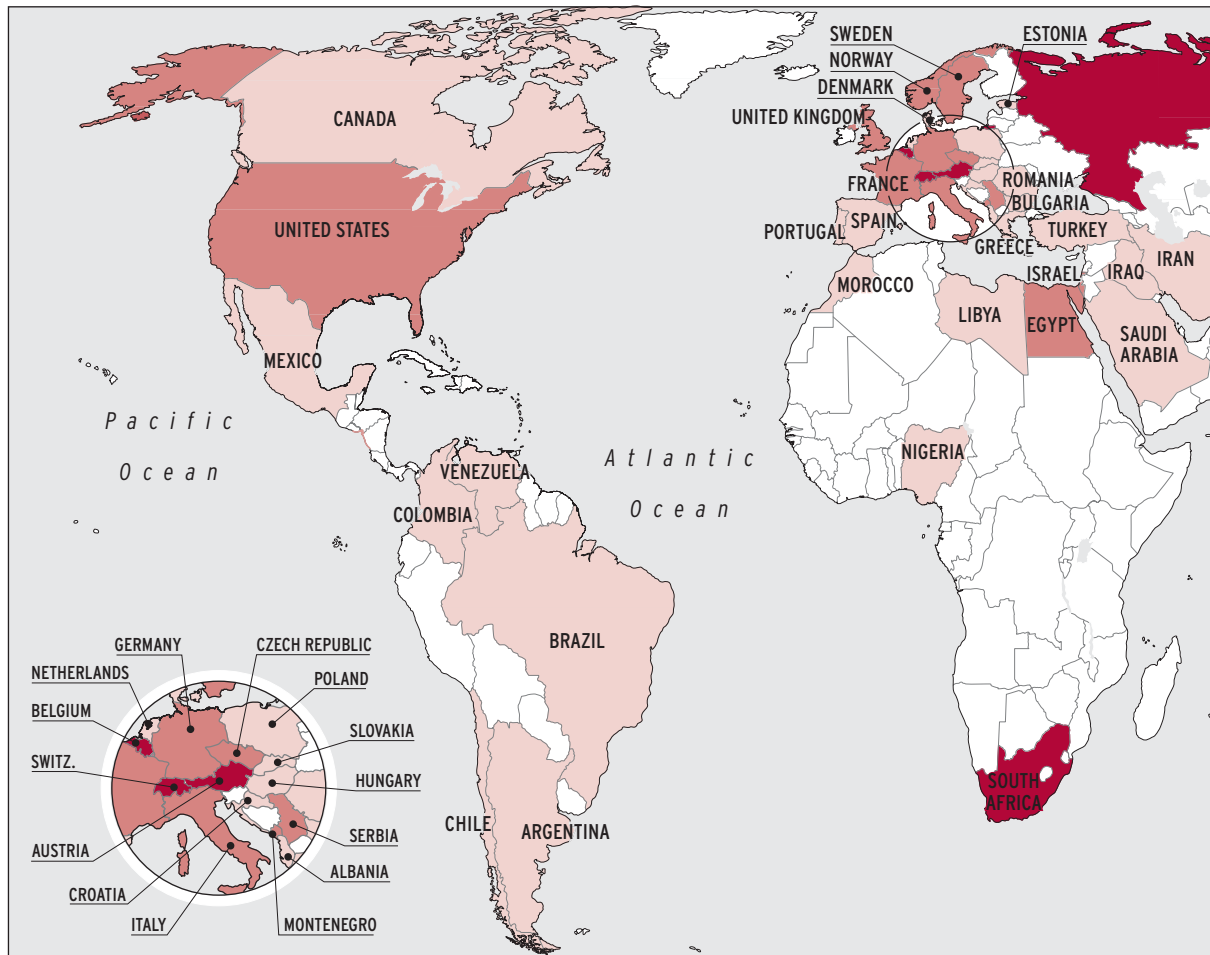
	More than 15 cases	5-15 cases	Fewer than 5 cases	Total
Group 1 Technology owners (17 countries)	Russian Federation (82)* Germany (34) Belgium (27)*	United States (13) Israel (8) Italy (8) China (7) France (7) Switzerland (6)*	Austria (4)* Sweden (4) United Kingdom (4) Czech Republic (3) Norway (2) Egypt (1) Serbia & Montenegro (1) South Africa (1)*	212
Group 2 Technology acquirers (52 countries)	China (24) Bulgaria (17)	Egypt (11) Iran (10) Greece (10) Pakistan (10) India (9) Romania (9) Turkey (9) Poland (8)	Czech Republic (4) Hungary (4) Italy (4) Nigeria (4) Saudi Arabia (4) Serbia & Montenegro (4) Vietnam (4) Argentina (3) Australia (3) Canada (3) Chile (3) Indonesia (3) Malaysia (3) North Korea (3) Singapore (3) South Korea (3) Spain (3) United States (3) Brazil (2) Colombia (2) Iraq (2) Libya (2) Philippines (2) Portugal (2) Sweden (2) Thailand (2) United Kingdom (2) Venezuela (2) Albania (1) Bangladesh (1) Croatia (1) Denmark (1) Estonia (1) France (1) Germany (1) Israel (1) Japan (1) Mexico (1) Morocco (1) Netherlands (1) Norway (1) Slovakia (1)	212

Note: Numbers in brackets indicate total cases of technology transfer and/or acquisition (licensed or unlicensed).

* These countries are not acquirers of technology. The other countries in Group 1 are owners of some technology but are acquirers of other technology and therefore also appear in Group 2.

Source: Gimelli Sulashvili (2006)

Map 1.1 Original owners and acquirers of small arms manufacturing technology, to August 2006



Source: Gimelli Sulashvili (2006)

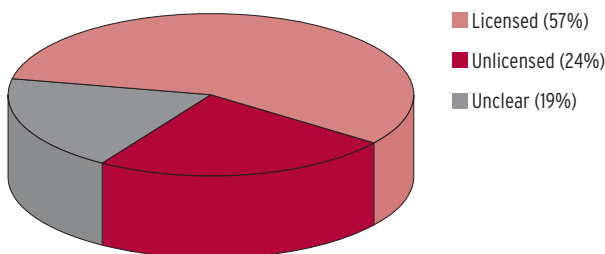
Technology owners are concentrated not only in a limited number of countries, but also in a small number of companies. Many of these companies have a large range of products whose production is licensed or which are copied without licence worldwide. Examples include Izhmash in the Russian Federation, Heckler & Koch in Germany, and FN Herstal in Belgium. Table 1.3 lists 27 cases of licensed and unlicensed manufacture of FN Herstal products by 20 different countries.

Out of the 212 total cases identified by this study, 121, or 57 per cent, are based on a licensing agreement. In 51 cases (24 per cent), weapons are produced without any licence, while for 40 cases (19 per cent) the licensing situation is unclear (see Figure 1.1).

Strikingly, in 17 of the 51 unlicensed cases, China is the acquiring country. Also, out of the 24 cases in which China has acquired manufacturing know-how, only one case is clearly based on a licence, whereas in six cases the licensing status of production is unclear. Production may occur without a licence for several different reasons. In



Figure 1.1 **Proportion of licensed production, unlicensed production, and unclear licensing situations for military small arms and light weapons, to August 2006**



Source: Gimelli Sulashvili (2006)

some cases, the original licence has expired, but production continues none the less. In others, the producer never obtains a licence, acquiring the technology through other—often illicit—means (see next section). Both scenarios may be applicable to China. Given this country’s known violation of intellectual property rights in other sectors, it is plausible that the state is sanctioning—or at least turning a blind eye to—such practices. Other states that frequently produce unlicensed copies of weapons and ammunition include Bulgaria, Iran, Poland, and Romania, though all to a lesser extent than China.

The three former Eastern Bloc countries on this list (Bulgaria, Poland, and Romania) produce weapons whose technology they acquired from the USSR several decades ago. Box 1.2 explains the reasons for this. Not surprisingly, then, the Russian Federation is today the original owner of technology whose products are most subject to unlicensed production. Of the 82 cases where the Russian Federation is the original owner of technology, production is based on a proper licence in only slightly more than a quarter of the cases (22 cases). In 33 cases, manufacture takes place without licence, while the licensing situation is unclear for 27 cases. German weapons, in contrast, are mostly produced abroad under licence. Overall, 27 of the 52 acquiring countries produce only under licence.

In some cases, acquirers sub-license a third party with the agreement of the original owner of the production technology. Bulgaria, for example, retransferred production licences for Kalashnikov rifles to Algeria and Tanzania with the permission of the USSR. Hungary did the same with regard to

Table 1.3 Licensed and unlicensed production of FN Herstal products, to August 2006

Acquiring country	Acquiring company	Original designation	Licensing situation
Rifles, assault rifles, carbines			
Argentina	Fábrica Militar Fray Luis Beltrán	FN FAL 7.62 mm rifle	Licensed
Brazil	Imbel	FN FAL 7.62 mm rifle	Licensed
Indonesia	PT Pindad	FNC 5.56 mm assault rifle	Licensed
Nigeria	DICON	FN FAL 7.62 mm rifle	Licensed
Sweden	N/A	FNC 5.56 mm assault rifle	Licensed
United States	DSA	FN FAL 7.62 mm rifle	Licensed
Machine guns, light machine guns, sub-machine guns			
Argentina	Direccion General de Fabricaciones Militares	MAG 7.62 mm general-purpose machine gun	Unclear
Australia	Australian Defence Industries (ADI)	Minimi 5.56 mm light machine gun	Licensed
Canada	Diemaco	Minimi 5.56 mm light machine gun	Licensed
Egypt	Maadi Company for Engineering Industries	MAG 7.62 mm general-purpose machine gun	Licensed
Greece	EBO	Minimi 5.56 mm light machine gun	Licensed
India	OFB	MAG 7.62 mm general-purpose machine gun	Licensed
Singapore	Ordnance Development and Engineering Company of Singapore	MAG 7.62 mm general-purpose machine gun	Unlicensed
Sweden	Bofors Carl Gustav	Browning M2 HB 0.50 machine gun	Licensed
United Kingdom	Manroy Engineering	MAG 7.62 mm general-purpose machine gun	Unclear
Side-arms			
Argentina	Fábrica Militar Fray Luis Beltrán	9 mm High-Power pistol	Licensed
China	NORINCO	9 mm High-Power pistol	Unlicensed
China	NORINCO	9 mm High-Power Mark 2 pistol	Unclear
China	NORINCO	9 mm High-Power Mark 3 pistol	Unlicensed
Hungary	Fegyver es Gaykeszuelekyara	9 mm High-Power M1935GP	Unclear
India	Rifle Factory	9 mm High-Power pistol	Unclear
Indonesia	PT Pindad	9 mm High-Power pistol	Unclear
Israel	KSN Industries Ltd.	9 mm High-Power pistol	Unclear
Ammunition			
Italy	Fiocchi Munizioni	5.7 mm x 28 mm	Licensed
Philippines	Government Arsenal	5.56 mm x 45 mm	Licensed
United States	Winchester Olin	5.7 mm x 28 mm	Licensed
Vietnam	N/A	7.62 mm x 51 mm	Licensed

Source: Gimelli Sulashvili (2006)

Table 1.4 Selected cases of sub-licensing or unlicensed recopying, to August 2006

Original owner of technology	Original model	Acquirer	Licence produced/ copied model	Reacquirer(s)	Means of transmission
USSR/Russian Federation (Izhmash)	Various Kalashnikov rifles	Bulgaria (JSC Arsenal)	Various Kalashnikov rifles	Algeria Tanzania	Sub-licensing with permission of the original owner of technology
United States (Colt)	M16 assault rifle	China (NORINCO)	Type CQ assault rifle	Iran (DIO)	Unlicensed recopying of a product produced without a licence
USSR/Russian Federation (Izhmash)	Kalashnikov assault rifle	China (NORINCO)	Type 81 assault rifle	Bangladesh (BOF)	Licensed production of a product that had previously been copied without a licence
USSR/Russian Federation	12.7 mm DShK 38/46 heavy machine gun	China (NORINCO)	Type 54	Pakistan (POF)	Licensed production of a product that had previously been copied without a licence

Source: Gimelli Sulashvili (2006); Pyadushkin (2006)

Malta and Mozambique, while Romania sub-licensed Zimbabwe (Pyadushkin, 2006). In other instances, products copied without licence are recopied in the same way by a third country. For example, Iran produces unlicensed copies of the Chinese Type CQ assault rifle, which is itself an unlicensed copy of the M16. There are even cases where a licence has been sold for manufacturing technology that had previously been acquired without a licence. Bangladesh and Pakistan are producing weapons under licence from China. China, however, earlier copied the product without licence from the USSR/Russian Federation (Gimelli Sulashvili, 2006). Table 1.4 provides details of some of these cases.

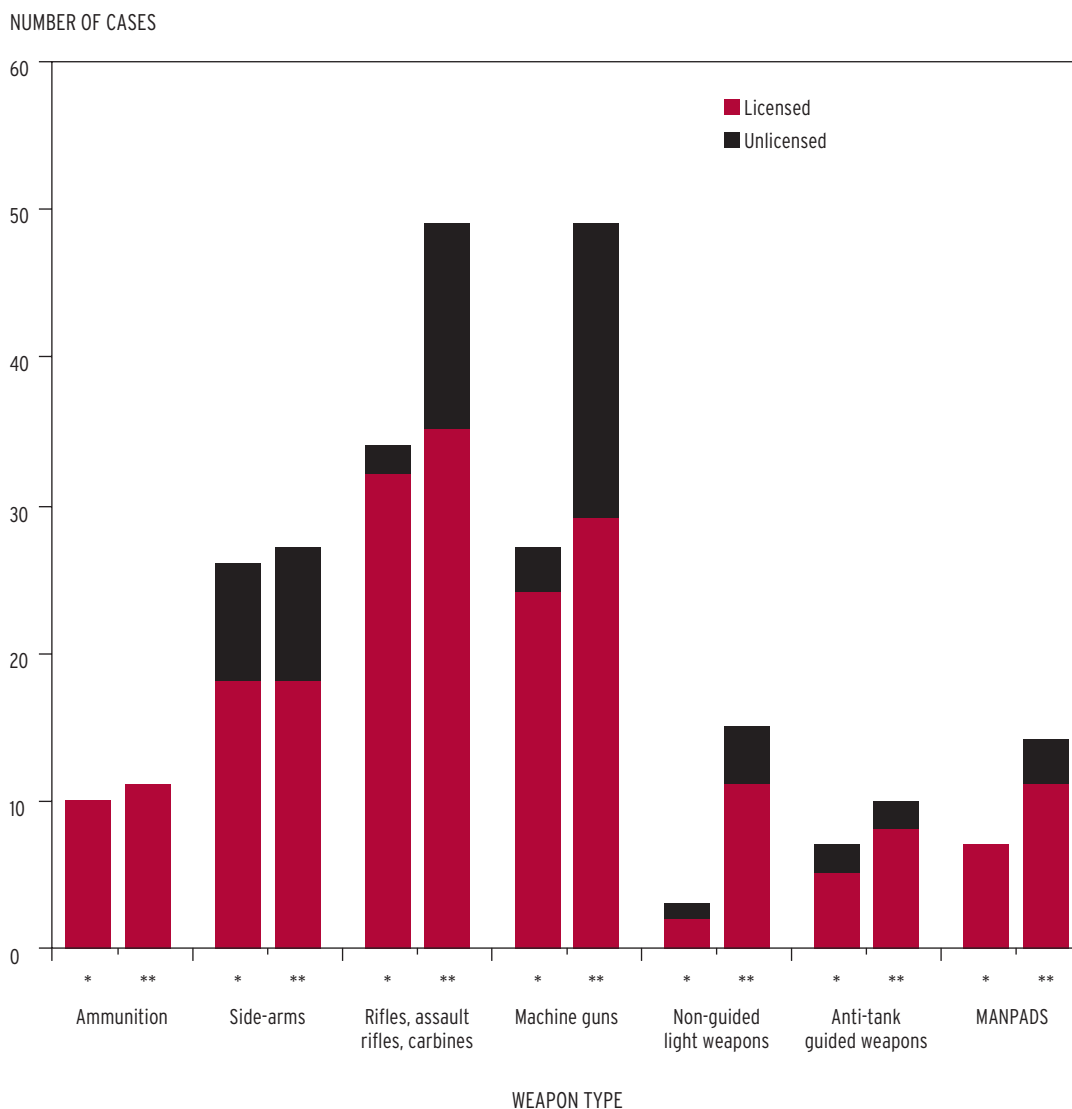
Licensed and unlicensed products

The Russian Federation is the champion among original owners of arms production technology, with its light weapons being produced elsewhere in 36 cases; its rifles, assault rifles, and carbines in 21 cases; and its machine guns in 20 cases. Belgium is the second most important original holder of technology, with its side-arms being produced elsewhere in eight cases and small arms ammunition in four cases. On the side of the acquirers, China is the most important country in the area of side-arms (nine cases); machine guns (seven cases); and rifles, assault rifles, and carbines (four cases), while Bulgaria is the most frequent acquirer of technology for the production of light weapons (nine cases).

As mentioned above, the USSR/Russian Federation represents a special case, since many of its products are manufactured abroad without a licence (see Box 1.2). Therefore, as Figure 1.2 shows, the USSR/Russian Federation cases disproportionately contribute to unlicensed production.

If the USSR/Russian Federation is excluded from the analysis, unlicensed production becomes somewhat less common. This may well be the trend of the future. The Russian Federation has stepped up its efforts to conclude

Figure 1.2 **Proportion of licensed and unlicensed production per weapon type, including/excluding the USSR/Russian Federation, to August 2006**



* Excluding the USSR/Russian Federation

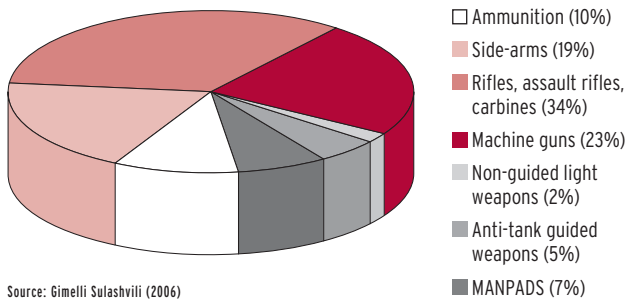
** Including the USSR/Russian Federation

Source: Gimelli Sulashvili (2006)

licensing agreements with a number of countries and to secure greater control over the use of its production technology (Pyadushkin, 2006).

The 96 non-USSR/Russian Federation cases of licensed production identified in this study are unevenly distributed across different weapons categories. Licence agreements are most frequently concluded for the production of military rifles, assault rifles, carbines, side-arms, and machine guns. Licensed production of ammunition and light weapons is relatively rare (Figure 1.3). The reasons for this difference are explored below.

Figure 1.3 Proportion of weapons types among the 96 current cases of licensed production, excluding the USSR/Russian Federation, to August 2006



Source: Gimelli Sulashvili (2006)

ers, especially as major ammunition manufacturers are willing to transfer production machinery without connecting this transfer to a licence agreement (Anders, 2005). Accordingly, there is no incentive for companies to engage in unlicensed production of ammunition either (see Figure 1.2).

Anti-tank guided weapons and MANPADS

The technology of anti-tank guided weapons (ATGWs) and MANPADS is highly complex. To develop such weapons, enormous research and development costs are necessary, development takes a long time, and economies of scale are not easily reached. For most countries, therefore, licensed or unlicensed production is the only way to access this technology, especially in the case of MANPADS. The few states that possess the technology have pledged, however, not to make it easily available to others (Small Arms Survey, 2005, pp. 123–41). Excluding the Russian Federation, there are only four original owners of MANPADS technology: China, France, Sweden, and the United States. These states have transferred this know-how to only six other countries—Germany, Greece, the Netherlands, Pakistan, South Korea, and Turkey. As it is difficult and costly to reproduce these complex weapon systems through copying or reverse engineering, states seeking to acquire the technology are dependent on technology owners. This is in line with the findings of this study, which found no cases of unlicensed MANPADS production if the cases involving the former USSR are excluded.⁸

To get the full picture on MANPADS, however, the case of the former USSR has to be included. Currently, all cases of unlicensed production and the majority of cases for which the licensing situation is unclear involve Soviet technology. The former USSR granted MANPADS production licences to other nations (Bulgaria, China, the Czech Republic, Egypt, North Korea, Pakistan, Poland, Romania, and Vietnam) at various times, and all but three of them (the Czech Republic, Pakistan, and Vietnam) continue production, even though the licence has expired (see Box 1.2). Moreover, it appears likely that China, which produces the Soviet ‘Strela’ without licence under the name HN-5, has granted a production licence for this technology to Pakistan (Small Arms Survey, 2004, p. 82; Pyadushkin with Haug and Mateeva, 2003). This gives reason for concern, as intensive efforts by the international community to control strictly the transfer of MANPADS technology are being undermined by unlicensed production based on Soviet technology.

Small arms and non-guided light weapons

In all the remaining weapons categories, which include side-arms, rifles, assault rifles, carbines, machine guns, and non-guided light weapons, the findings are mixed. The technology necessary for the production of these weapons

Small arms ammunition

Forecast International (2006⁷) notes that ‘[d]ue to the unique nature of this market, players rarely, if ever, make licensing arrangements’ in relation to small arms ammunition. The product is of very limited complexity, and research and development costs are therefore low (Anders and Weidacher, 2006, p. 55), so that royalties and the price for a licence may easily exceed them. Moreover, economies of scale can be reached in a short time. As a consequence, licensed production is not very attractive for produc-

is mature, so that it is possible for small arms and light weapons manufacturers to design and produce them on their own without extremely high research and development costs. Economies of scale can also be achieved without too much difficulty. The barriers to entry in the market are, however, somewhat higher than in the case of small arms ammunition. Depending on the circumstances, it may be more efficient to acquire a production licence. In fact, this is often the most cost-effective means of building up an indigenous defence industry.

The proportion of unlicensed production is relatively high in these weapons categories. Even excluding the USSR/Russian Federation, production status is unclear or production takes place without a licence in 29 per cent of the 101 cases identified in this study. For side-arms alone, unlicensed production makes up 47 per cent. If the USSR/Russian Federation is included in the analysis, the overall share of unlicensed or unclear production cases increases to 44 per cent overall (51 per cent for side-arms).

These findings suggest that additional counter-proliferation measures that target licensed production will be most effective for weapons categories other than ammunition, ATGWs, and MANPADS. Such measures will not be effective for ammunition, since there is too little licensed production overall. For ATGWs and MANPADS, the relevant technology is already relatively closely guarded, and many safeguards are in place. Additional measures would only increase effective control in this area if they specifically targeted production based on former Soviet technology.

Estimating global production

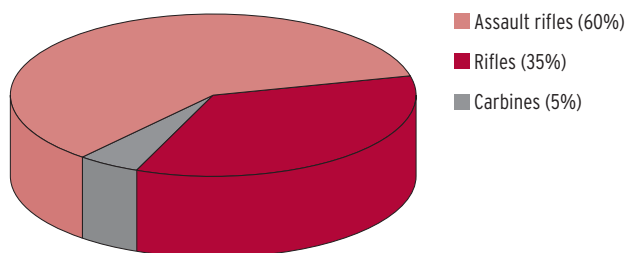
As mentioned above, data on the number of small arms produced under licence is rare. Referring to open source information, this section derives a global estimate for annual licensed and unlicensed production of military small arms, in particular military rifles, assault rifles, and carbines.

Based on the known volume of small arms production in ten selected licensee states, the average number of weapons produced each year under licence can be calculated. Assuming that the duration of a production cycle ranges from 15 to 20 years (Small Arms Survey, 2006, pp. 23–24), the annual average varies between 9,600 and 10,500 weapons for each licence agreement. This may be below the full production capacity of a factory located in an industrialized country, but these numbers seem realistic, as most of the acquirer countries identified in this study are not fully industrialized (Gimelli Sulashvili, 2006).

Currently, there are 55 cases of military rifle, assault rifle, and carbine production, out of which 64 per cent are licensed (35 cases) and 25 per cent unlicensed (14 cases), while in 11 per cent of the cases the licensing situation is

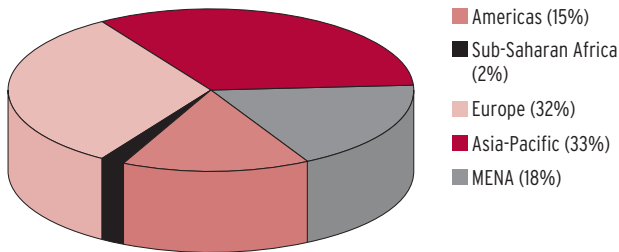
unknown (6 cases). Because there is some doubt about the existence of a licence agreement, the last category is added to that of unlicensed production. Global annual production by acquirer countries can be estimated by multiplying the figure for average annual production, derived above, by the number of existing cases of licensed and unlicensed production. While this admittedly yields a rough estimate, in the absence of more specific data it does provide us with a sense of the overall scale of production.

Figure 1.4 Proportion of military rifles, assault rifles, and carbines in total annual licensed and unlicensed production, to August 2006



Source: Gimelli Sulashvili (2006)

Figure 1.5 Proportion of global licensed and unlicensed production of military rifles, assault rifles, and carbines by region, to August 2006



Source: Gimelli Sulashvili (2006)

Survey, though using different methodologies, concluded that between 700,000 and 900,000 military small arms are produced every year (815,000 in 2000) (Small Arms Survey, 2002, p. 13; 2006, pp. 7–35). The figure for licensed and unlicensed production presented here represents 60 to 80 per cent of this amount.

Europe and the Asia–Pacific region account for the greatest share of licensed and unlicensed production of military assault rifles, rifles, and carbines, followed by the Middle East and the Americas. The African continent accounts for only a very small part of such production. In Europe, unlicensed production of these weapons exceeds licensed production, since several former Eastern Bloc countries continue to manufacture weapons for which the licence has expired (see Figure 1.5).

CURBING PROLIFERATION: PROBLEMS AND SOLUTIONS

As indicated above, the licensed and unlicensed transfer of weapons production technology poses certain risks for technology owners and the international community as a whole. The following sections examine three problem scenarios, as well as the regulatory practices and policy options that can address these. The violation of intellectual property rights (i.e. unlicensed production), examined in the first section, is an obvious concern for technology owners. Yet, for the international community as a whole the key problems are the diversion of manufacturing technology and the irresponsible export of weapons produced under licence. Without adequate control measures, licensed production can easily fuel proliferation and increase the risk that small arms and light weapons end up in the wrong hands.

Unauthorized production

In over a quarter of the cases examined earlier, small arms production takes place without a licence. This is a huge problem for the original owners of technology, as it deprives them of the royalties and other fees they are entitled to.

One way of acquiring the necessary production knowledge without a licence is through reverse engineering—the process of taking a weapon apart and analysing its design in detail in order to construct a new weapon. In many instances, however, production is not unlicensed from the beginning. Often, a producer acquires a licence, produces under licence as long as it is valid, and then continues to produce the weapon beyond the licence expiry date. While Bulgaria was still part of the Soviet Eastern Bloc, Bulgarian State Arsenals acquired a production licence for

Applying this methodology, the annual total of licensed and unlicensed production of military rifles, assault rifles, and carbines can be estimated at between 530,000 and 580,000 weapons. This is roughly equivalent to 320,000–350,000 assault rifles, 182,000–200,000 rifles, and 28,000–30,000 carbines (Figure 1.4). This estimate complements, and is coherent with, previous Survey findings on military small arms production. The 2002 and 2006 editions of the *Small Arms*

Box 1.2 Licensed and unlicensed Kalashnikov production: echoes from the cold war

Throughout the cold war, the USSR used military assistance, including the transfer of arms, as a means of enhancing the military power of its allies and promoting its political influence in various zones of strategic interest. It granted production licences and transferred manufacturing technology only to its closest allies—mostly for small arms and light weapons. In order to obtain a production licence, the acquirer first had to purchase directly a large number of the same weapons that were subsequently to be produced under licence. This continues to be the practice of the Russian Federation.

Much like the arms trade in general, licensed production arrangements were managed by governmental bodies through bilateral agreements with counterparts in allied countries. In such agreements, the transfer of a manufacturing licence was documented by an exchange of letters annexed to military cooperation agreements. Most licences were granted royalty-free, but contained a number of precise conditions.⁹ The most important condition, included in every agreement, stipulated that licensed production could serve domestic needs only, and that export to third countries was strictly subject to the permission of the Soviet government.¹⁰ The same condition applied to the technical modernization of weapons produced under licence. Furthermore, licensed production periods could be limited.

After the demise of the Soviet Union, the situation changed radically. Firstly, domestic military procurement decreased, and arms exports became the major source of revenue for the Russian Federation's defence industry. Secondly, the demand for new Russian Federation small arms diminished as the global market was flooded with surplus stocks from the old USSR and its allies. Thirdly, licensees started to export weapons produced under licence, thus offering serious competition to Russian Federation manufacturers in the global market. As a result, the issue of the licensed manufacture of small arms began to receive increased attention from the Russian Federation defence industry. Rosoboronexport, a merger of several previous governmental arms trade bodies, was established. It took stock of the numerous production licences previously granted to foreign countries and began to assert Russian Federation manufacturers' intellectual property rights.

The Russian Federation government claims that most of the licences formerly granted by the USSR have expired. This would mean that every year a large number of weapons based on the Kalashnikov design are produced as unlicensed copies by companies around the world. Russian Federation production accounts for only about 10–12 per cent of the world market in Kalashnikov rifles. Given that a production licence costs about USD 6–10 million, Kalashnikov's loss in terms of potential overseas licences is huge. The more important problem for the Russian Federation, however, is exporting by former licensees. Rosoboronexport mentions, for example, a tender organized by the US administration in Iraq in 2003 for small arms supplies for the new Iraqi Army. Bulgarian State Arsenal won the contract for 40,000 Kalashnikov rifles at a price of about USD 65 per weapon. From the Russian Federation standpoint, the export of weapons produced under licence to third countries without its approval represents a violation of bilateral agreements concluded with the former USSR. The granting of sub-licences by Soviet-era licensees is a further concern for the Russian Federation.

In order to counter such practices, the Russian Federation has initiated bilateral negotiations with former Soviet licensees, including all those in Eastern Europe. While the licensees generally agree to pay royalties, they balk at making the export of licensed products dependent on Russian Federation permission, as in their view this would give the Russian Federation an unfair commercial advantage.

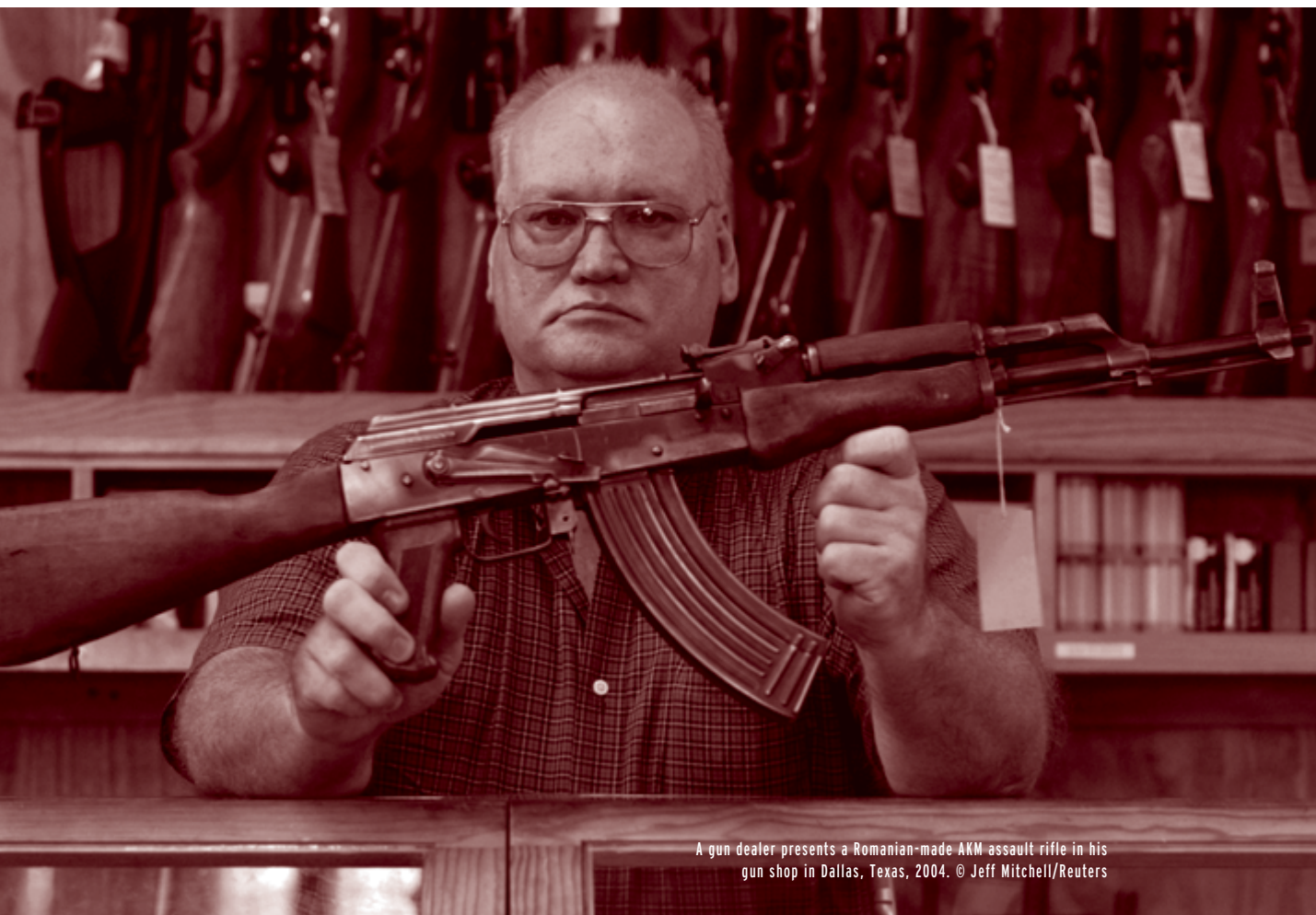
At the same time, Russian small arms manufacturers are trying to protect their intellectual property rights by patenting their small arms technology. Izhmash has patented its design of the AK assault rifle, including components and technical innovations. Since 1997 it has received patents for AK rifles in 14 countries.¹¹ It applied for a patent in Bulgaria as well, but, according to Izhmash, approval is still pending. Izhmash has also patented the Dragunov SVD and SVDS sniper rifles, the Nikonov AN-94 assault rifle, the Bizon sub-machine gun, and the Saiga hunting rifle. Even though patents can help prevent future violations of the patent holder's intellectual property, they have limitations. Firstly, patents are not retroactive. Izhmash cannot patent the original AK-47, but only its own modifications to the original AK design introduced after the introduction of the patent. Secondly, a patent is not universal. It has to be recognized and enforced in each country where the patentee wants to protect its rights. Thirdly, a patent is of limited duration: patent protection is limited to a certain number of years, and thereafter the invention becomes a public good.

The Russian Federation government has supported the efforts of its arms manufacturers by putting the issue on the international agenda. It has defended its exclusive right to manufacture Kalashnikov rifles within the framework of the Wassenaar Arrangement, the Organization for Security and Co-operation in Europe (OSCE) Forum for Security Co-operation, and the United Nations. At the UN Programme of Action Review Conference in 2006, the Russian Federation argued that the term 'illicit small arms and light weapons manufacturing and transfer' should be understood as including 'unlicensed small arms and light weapons manufacturing or small arms and light weapons manufacturing under expired licenses'. Mikhail Kalashnikov himself promoted this position. In addition to its diplomatic efforts, the Russian Federation regularly draws the attention of world media to problem cases of unlicensed production.

Kalashnikovs. The licence expired around 1999, but Bulgaria, in irrevocable possession of the necessary technology, continued production beyond that date (*Dnevnik*, 2006). In other cases, production may exceed the number of units agreed upon in the licence agreement.

There are other, subtler ways of getting around a licence. One common method involves the introduction of slight modifications in the design or functioning of a weapon. It can thus be argued that the resulting weapon is not an unlicensed copy, but rather a new product, not subject to licence (Nassauer and Steinmetz, 2005, p. 14; *Dnevnik*, 2006). The classic example of minor modifications marketed as new weapons designs is the Kalashnikov (see Box 1.2). Croatia offers a further example: the country produces the APS95 assault rifle firing 5.56 mm NATO ammunition. Its design owes much to the Israeli Galil series, but reportedly includes some 'local revisions', e.g. an additional doubling of the optical sight. Furthermore, Croatia has developed a modified version of a 9 mm ERO sub-machine gun, which itself is a copy of the Israeli Uzi (Gander, 1997; Bazargan, 2003). In theory, the original owner of technology could benefit from technological improvements made by an acquirer (WIPO, 2003, p. 12). In practice, however, the acquirer often becomes a rival to the original technology owner in international markets.

The interests of technology owners can be addressed through the enforcement of intellectual property right laws. A well-developed body of national—and even international—norms allows companies and countries to assert their rights and protect their technology from unlicensed production. According to the Wassenaar Arrangement's *Best*



A gun dealer presents a Romanian-made AKM assault rifle in his gun shop in Dallas, Texas, 2004. © Jeff Mitchell/Reuters

Box 1.3 Mexico and the 'new' FX05 Xihuacóatl assault rifle

At the beginning of the 21st century, Mexico decided to replace approximately 146,000 Heckler & Koch G3 rifles, its standard combat rifle. The initial choice of the Mexican Secretariat of National Defence (SEDENA) for the replacement was the HK33 rifle. After an initial phase of experimental assembly with parts and components imported from Germany, however, it shifted its preference to the HK G36 (Dreyfus, 2006).

In May 2005 SEDENA announced that Mexico would launch a six-year programme for the production of the G36 rifle under licence. This programme provided for a USD 45 million investment from the Mexican government and the transfer of production technology from Heckler & Koch to Mexico's General Directorate of Military Industry in the form of a USD 27 million purchase of machinery from Germany. However, calculating that the costs for local research, development, and production would amount to USD 4.4 million, the Mexican Army instead opted for a weapon of indigenous design: the FX05 Fusil Xihuacóatl 2005. During 2006 Mexico intended to produce 10,000 weapons for its special forces, and then replace all the rifles of the Mexican Army over the following seven years (Dreyfus, 2006).

On the surface, the FX05 almost exactly resembles the G36 (the G36K or G36C in particular). There are, however, some significant external differences: there is a different flash suppressor, the cocking handle is on the left instead of on the top, the carrying handle is detachable, there is only one sight, and the butt stock is shaped differently. SEDENA officially argues that the FX05 is not a licensed version of the G36 (Dreyfus, 2006). Heckler & Koch has confirmed that there is no production licence in this case. Currently, the company is investigating whether elements of the firing mechanism have been copied, but has not indicated whether it will take any follow-up action should this be the case.¹²

Practice Guidelines for Exports of Small Arms and Light Weapons, for example, '[p]articipating States agree that unlicensed manufacture of foreign-origin [small arms and light weapons] is inconsistent with these Best Practice Guidelines' (Wassenaar Arrangement, 2002, para. I.4).

The successful implementation of such norms largely rests with the acquirer state. It is up to it to investigate and take legal action against unlicensed producers. Yet a lack of capacity and/or political will results in lacklustre implementation in many cases. In the face of this difficulty, technology owners sometimes try to limit their losses by concluding licensing agreements that provide for the payment of royalties, but do not otherwise reduce competition.

While certainly important, infringements on the intellectual property rights of technology owners are only part of the problem. The uncontrolled proliferation of production technology poses a threat to the international community as a whole. Enforcing intellectual property rights does little, on its own, to address this broader problem, notwithstanding Mikhail Kalashnikov's claim that this would also limit the number of guns landing up in the wrong hands (UNGA, 2006). The enforcement of intellectual property rights could help reduce the number of weapons produced, but would do little to curtail the transfer of technology and weapons to undesirable end users. Measures targeting diversion more directly, including export control measures, are far more effective.

Irresponsible transfer of manufacturing technology

As mentioned earlier, licensors and licensees may have economic or political motivations for licensed production. Very often, these go hand in hand. For example, by acquiring a production licence, a state may be able to reduce procurement costs, create jobs, and increase national self-reliance all at the same time.

Sometimes, however, economic and political goals are squarely opposed. Licensors, in particular, may face a choice between the economic benefits of a production licence and their political or legal commitments. Pursuant to several multilateral agreements, including the commitments outlined in the *OSCE Document on Small Arms and Light Weapons* (OSCE, 2000), as well as many national standards, production licences must be refused if there is a significant risk that the transferred technology or weapons to be produced under licence would be diverted or misused by the recipient (TRANSFER CONTROLS).

In a much-cited example from the 1990s, Heckler & Koch won a fierce competition for a contract from Turkey's Silahsan for the replacement of 350,000 G3 rifles (*Jane's Defence Weekly*, 1995; Jones and Cutshaw, 2004, pp. 28–29; Small Arms Survey, 2001, p. 40).¹³ Germany apparently had great economic interest in the deal, otherwise Heckler & Koch would probably not have been willing to grant offsets of 100 per cent in order to secure it (*Jane's Defence Weekly*, 1995). According to Germany's political principles and commitments, however, this licence was problematic, as the Turkish state had a record of systematic human rights violations and was engaged in an armed conflict with the country's Kurdish minority. As a result, the German government temporarily held up its authorization (Sariibrahimoglu, 2005).

Other problematic technology transfers have also occurred in the past. For example, in the 1970s and 1980s, during the time of apartheid, South Africa received military technology from various states. Its R4 assault rifle was a copy of the Israeli Galil. It remains unclear, however, whether it was produced with or without a licence (*Jane's International Defence Review*, 1997b; Nairn, 1986; GlobalSecurity.org, 2005). In 1991, as the former Yugoslavia slid into civil war, France's Manufactures d'Armes Automatiques de Bayonne granted a licence for the manufacture of 9 mm MAB PA-15 pistols to the Serbian company Zastava Arms (Jones and Cutshaw, 2004, p. 250). Iraq under Saddam Hussein produced 9 x 19 mm Helwan pistols under an Egyptian licence (Forecast International, 2006).

Licensor states are expected to treat exports of technology as they would exports of small arms.

Transfers of production technology and manufacturing know-how are irrevocable. Once transferred, such knowledge cannot be taken back. Even though many licence agreements contain safeguard clauses in theory prohibiting the retransfer of manufacturing technology, this is difficult to control in practice. There is always a risk that blueprints for production—as well as the weapons produced under licence—will fall into the wrong hands (Small Arms Survey, 2006, p. 223).

Various measures at the company, national, and international levels can address the problems outlined above.

It is in the licensor company's own interest to collect detailed information concerning the final destination, end user, and intended use of weapons that are going to be produced under its licence. It has a strong interest, moreover, in concluding a licensing agreement only if it can be as sure as possible that weapons produced with its technology will not end up in the wrong hands.

To this end, a licensor company can introduce internal guidelines governing the choice of potential partners in a licensing arrangement, including eligibility criteria. Both licensor and licensee companies can also develop minimum standards for the content of licensing agreements, including safeguards. Under the banner of 'corporate social responsibility', major international companies have subscribed to such standards in such fields as climate change and biodiversity. Numerous governments support initiatives of this kind.¹⁴ There is no reason why such initiatives should not extend to the domain of small arms and light weapons production, but so far this has been quite rare. Saab Bofors Dynamics is an exception.¹⁵

It is, however, the licensor state that is responsible for authorizing (or refusing) the transfer of arms production technology in accordance with applicable international standards. Best practice in this area dictates that the licensor state treat exports of machinery, know-how, and technology in the same way as direct small arms exports. In this way, production licences are refused if the export to the same state of the weapons to be produced under licence would also be refused.

Many of the major original technology-owning states have relatively strict legal regulations excluding the granting of small arms production licences to problematic companies or states. Nevertheless, there is often a problem with the effective application of such laws.

The German government allows the export of war weapons and other military equipment (including manufacturing technology) to NATO countries, European Union (EU) member states, and countries with NATO equivalent status (Germany, 2000, sec. II, para. 1).¹⁶ As a general rule, such products cannot be transferred to countries that are involved in armed conflict or facing an imminent outbreak of conflict. Nor can weapons be exported if this would aggravate the threat of armed conflict (Germany, 2000, sec. III, para. 5). The situation in a licensee country can, however, change in the years following the conclusion of a licensing agreement. The withdrawal of licences in such cases would not usually make much difference, since manufacturing know-how, once transferred, cannot be taken back.

The UK government requires a licence for the export of technology necessary for the development, production, or use of military equipment (BASIC, International Alert, and Saferworld, 2002, p. 9). There is a potential loophole in such legislation, however. Depending on how the requirement of 'necessity' is interpreted, technology that is involved in small arms production, but not exclusively so, can slip past licensing authorities. For this reason, it is important that the licensing agreement as a whole, as well as the final use of exported technology, be considered before a licence is granted.

Few international instruments address the issue of licensed weapons production.

In the United States, licensing agreements have to be authorized by the US State Department under its Direct Commercial Sales Program (United States, 1997, arts. 120.9, 120.10, 124.1, 124.8). The US Congress must be notified before production licence agreements with a value higher than USD 50 million are approved (BASIC, International Alert, and Saferworld, 2002, p. 10). This threshold, however, excludes most licensing agreements for the production of small arms and/or light weapons, which typically are worth less than USD 50 million. Independent observers have argued that the US Congress—or other relevant legislative structures in other countries—should receive notification of small arms/light weapons licensing deals with any country, of any value, along with an explanation as to why the proposed agreement is in the national interest of the licensor country (Lumpe, 1995).

Given the transnational nature of licensed weapons production, there is a clear need for international regulation. Nevertheless, very few international instruments address this issue. One that does is the *European Union Code of Conduct for Arms Exports* (EU, 1998), which prescribes common EU criteria for the export of military equipment.¹⁷ By extension, it has become very difficult for an EU member state to grant a production licence to a country previously denied such a licence by another EU state (EU, 1998, operative provision 3).

Among all small arms and light weapons, MANPADS have been singled out for especially stringent treatment. The *Elements for Export Controls of Man-Portable Air Defence Systems (MANPADS)*, adopted by the Wassenaar Arrangement in December 2003, defines the term 'export' broadly so as to include co-production and licensed production. MANPADS are to be exported 'only to foreign governments or to agents specifically authorised to act on behalf of a government' (Wassenaar Arrangement, 2003, para. 2.1). Any decision to authorize the export of MANPADS is to take into account such things as the recipient government's capacity for and commitment to stockpile security (Wassenaar Arrangement, 2003, para. 2.7). The OSCE adopted the same MANPADS guidelines virtually verbatim in May 2004 (OSCE, 2004, paras. 2.1 and 2.7). Under the Asia-Pacific Economic Cooperation MANPADS guidelines, licensees are to protect transferred technology 'against unauthorized re-transfer, loss, theft and diversion' (APEC, 2003, para. 3).

Irresponsible transfer of weapons produced under licence

Re-export of small arms produced under licence might be deliberate state policy. Capital investment, the payment of royalties, and technical assistance fees make licensed production costly. In order to offset these expenses and thus lower the average cost per weapon for their own armed forces, some countries resort to exporting these weapons

to third countries, even if pursuant to their national regulations or international commitments they are not authorized to do so (Lumpe, 1995). Many production licence agreements oblige the licensee to declare the final recipient of any arms produced under licence. In some cases, the export of such weapons is prohibited outright. Moreover, many agreements oblige both licensor and licensee to ensure that these provisions are upheld. Nevertheless, it is virtually impossible for the licensor to exercise *de facto* control over final recipients.

Governments have, on occasion, deliberately arranged or facilitated the irresponsible transfer of weapons produced under licence. For example, between 1991 and 1995 Argentinean President Menem signed three decrees authorizing the export of small arms and ammunition produced by Argentina under licence. The end-user certificates gave Panama and Venezuela as the final destinations, but the goods eventually ended up in Ecuador,¹⁸ which at the time was involved in an armed border clash with its neighbour, Peru. These weapons also surfaced among belligerent parties in the Yugoslav conflict. Other small arms, such as FN FAL rifles produced under Belgian licence, made their way into the hands of organized criminals, such as the mafia of Rio de Janeiro (Vranckx, 2005, p. 14).

Yet, many irresponsible retransfers are not deliberate. Sometimes, a lack of capacity for effective arms control is the problem; in other cases, a government does not consider itself bound by an agreement brokered by a predecessor. This has been the case with licences for the production of small arms ammunition granted by France and Germany to other states. As a consequence, the two licensors have recently imposed significant restrictions on permissible destinations for ammunition production facilities. Yet not all licensors act with the same rigour. In recent years, independent observers have criticized Belgium for neglecting the question of likely licensee compliance before granting ammunition production licences (Anders, 2005). The controversy surrounding the New Lachaussée ammunition factory in Tanzania offers one prominent example of this problem (Small Arms Survey, 2005, p. 14).

At the end of the day, corruption, neglect, or theft seems to lie at the heart of most unauthorized exports of small arms produced under licence. In 2004 the Colombian

With his Israeli-designed Galil rifle, a Colombian soldier trains to combat leftist armed groups and the cocaine trade. Barrancominas, Colombia, 2001. © Reuters



secret police reported regular flows from Brazil into Colombia of Beretta pistols, as well as 9 mm Model 12 sub-machine guns, which the Brazilian company Imbel produces under licence. The Colombian authorities have also seized 400 rifles bearing the mark of the Venezuelan armed forces (McDermott, 2004b).

Even if small arms produced under licence are not re-exported to a third party, these weapons replace older stocks, which might in turn be transferred abroad. In July 2006 President Chávez stated that Venezuela could supply other countries in need of military equipment, in particular Bolivia. Even though so far there is no evidence for such plans by the Government of Venezuela, the Bush administration suspects that the AK-103s to be produced in Venezuela under a Russian licence might be diverted to armed groups throughout the continent. As Venezuela's production facilities have never operated at full capacity, it is unlikely that the country will even be able to arm all members of its armed forces with new Kalashnikovs.¹⁹ It is possible, however, that Venezuela's surplus stocks of old rifles will 'cascade' to other countries, even though they do not seem to be in the best condition (Baranauskas, 2006a; 2006b; 2006c; Small Arms Survey, 2006, p. 87). Cascading may occur years after the licensed production arrangement is agreed on, and may not appear directly connected to the licence agreement (Nassauer and Steinmetz, 2005, p. 14; Small Arms Survey, 2006, pp. 25–26).

The responsibility of licensor states does not end with an initial transfer of production equipment or technology. It is equally important that they anticipate and act to prevent the illicit transfer of weapons produced under licence. German law provides one example of best practice in this area. The regulations 'Political Principles for the Export of War Weapons and Other Military Equipment' specify that:

Cascading may occur years after the licensed production arrangement is agreed on.

Export licences for war weapons or other military equipment of a quantity and type relevant to war weapons may be granted only on presentation of governmental end-use certificates that preclude re-exports without prior authorization. This applies mutatis mutandis to any other military equipment related to war weapons exported in connection with a manufacturing licence.²⁰ For the export of such equipment used for the manufacture of war weapons definitive end-use certificates must be furnished (Germany, 2000, sec. IV, para. 2).

The same regulations state that 'stringent standards are to be applied in assessing whether the recipient country is capable of carrying out effective export controls' (Germany, 2000, sec. IV, para. 2). This provision would preclude a transfer of technology to states that have inadequate end-user controls or a record of violating international arms embargoes.

In order to address the problem of 'cascading' surpluses, Germany makes it a condition of new licensed production arrangements that old stocks be destroyed on a one-to-one basis:

In the export of technology and production equipment, there is the fundamental rule that no licences are issued in connection with the opening of new production lines for small arms and ammunition in third countries. For third countries, the 'new for old' principle is also applied wherever possible. This calls for sales contracts to be worded to ensure that the recipient destroys weapons that are to be replaced by the new consignment, rather than reselling them. Moreover, insofar as possible, the exporter is to require the consignee in a third country in new supply contracts to destroy the weapons supplied in the case of a later removal from use (Germany, 2003, p. 17).

Best practice can achieve little if it constitutes the exception rather than the rule. International norms help raise standards across the board, yet remain rare. The *OSCE Document on Small Arms and Light Weapons* offers one example of international regulation in this area:

Participating States will make every effort within their competence to ensure that licensing agreements for small arms production concluded with manufacturers located outside their territory will contain, where appropriate, a clause applying the above criteria to any exports of small arms manufactured under license in that agreement (OSCE, 2000, sec. III.A.3).

The ‘above criteria’ that the provision mentions are the same as those applied by the *OSCE Document* to the direct export of small arms and light weapons (OSCE, 2000, sec. III.A.2). These provisions, though politically (but not legally) binding, are still significant: the 56 participating states of the OSCE include all of the world’s major original technology owners.

The regulatory challenge

As noted above, there are relatively few norms governing licensed production at the regional or global levels. Only the *OSCE Document on Small Arms and Light Weapons* explicitly regulates both the initial transfer of arms manufacturing technology and the subsequent transfer of weapons produced under licence. Other instruments, such as the *EU Code*, cover only the initial technology transfer. While the *UN Programme of Action* makes reference to ‘illegal’ or ‘illicit’ manufacturing (UNGA, 2001, sec. II, paras. 2–4, 6), these provisions would, at most, apply only to unlicensed production. They do not address the broader proliferation problems outlined above. At present, there are no norms of universal application that explicitly govern licensed production. Existing international instruments on MANPADS could serve as a model in this regard.

Enhanced international cooperation could also bring much-needed transparency to licensed production—encouraging states to exchange information on such things as pending authorizations and the behaviour of licensees.²¹ Improved transparency would help in particular to curb the irresponsible transfer of small arms and light weapons produced under licence.

Normative development is one challenge, effective enforcement another. The enforcement of norms governing licensed production rests entirely with states—both the original owners of technology and its acquirers. Key national-level action includes the following:

- enforcing intellectual property laws within the national territory;
- encouraging corporate social responsibility in the small arms industry;
- applying the criteria used for direct weapons exports to the authorization of production licensing agreements;
- addressing the issue of weapons superseded by new production when authorizing licensing agreements;
- strictly enforcing national laws governing the international transfer of manufacturing technology;
- ensuring consistent legislative oversight;
- collecting and updating information on production licensing agreements; and
- exchanging information on licensed production with other states.

These measures are often resource-intensive, yet the risks inherent in the transfer of weapons manufacturing technology justify concerted action. It is difficult to forecast the consequences of a particular technology transfer. Alliances may change. Countries that seem stable may suddenly lapse into conflict. Sustained vigilance is therefore necessary.

The enforcement of norms governing licensed production rests entirely with states.

CONCLUSION

The licensed and unlicensed manufacture of small arms and light weapons is an often-neglected aspect of small arms production. Yet, new information presented in this chapter indicates that together they account for a large share of military small arms production—60 to 80 per cent. These are the weapons most often used in armed conflict: military rifles, assault rifles, and carbines. The chapter estimates that anywhere from 530,000 to 580,000 of these weapons are produced annually, either under licence or as unlicensed copies. These findings are consistent with earlier estimates of annual military small arms production (Small Arms Survey, 2002, p. 13; 2006, pp. 7–35).

With the exception of MANPADS, the know-how required to manufacture small arms and light weapons is no longer concentrated in a handful of technology *owners*, but is instead distributed over a large number of technology *acquirers*. While most manufacturing technology is transferred under licence, unlicensed production represents roughly one-quarter of all known cases of technology transfer.

The licensed production of small arms and light weapons offers many benefits to licensors and licensees, but it also poses certain risks, including proliferation risks that are of concern to the international community as a whole. Manufacturing technology can be diverted to irresponsible end users, and weapons produced under licence may end up being misused.

The chapter presents examples of best practice, especially at the national level, designed to strengthen control over the initial transfer of manufacturing technology, as well as the subsequent sale of weapons produced under licence. While any strategy designed to curb global small arms proliferation needs to address the issue of licensed production, only exceptionally do regional and international instruments explicitly regulate this activity.

The chapter outlines a range of options for the regulation of licensed production at the company, national, and multilateral levels. It also emphasizes that the measures that are most effective in curbing weapons proliferation are those that directly target diversion and strengthen control over the initial transfer of manufacturing technology. Initiatives designed to strengthen the enforcement of intellectual property rights, though potentially beneficial to the technology owner, have only a limited impact on proliferation.

Existing instruments for the control of MANPADS offer a useful model for more concerted efforts to grapple with the problem of licensed production. New and existing measures must also be effectively applied and enforced, especially at the national level, where the main power of regulation resides.

The risks of licensed production are becoming clearer, yet international efforts to address these lag behind. Best practice has yet to proliferate. ■

LIST OF ABBREVIATIONS

ATGW	anti-tank guided weapon	OSCE	Organization for Security and Co-operation in Europe
EU	European Union		
IMI	Israel Military Industries Ltd.	SEDENA	Secretaría de la Defensa Nacional (Secretariat of National Defence)
IP	intellectual property		
MANPADS	man-portable air defence system(s)	USD	United States dollar
NATO	North Atlantic Treaty Organisation	USSR	Union of Soviet Socialist Republics (Soviet Union)
NORINCO	China North Industries Corporation		

ENDNOTES

- 1 There is no clear distinction between rifles and assault rifles. All assault rifles have the capacity of fully automatic fire, but so do some rifles. In general, assault rifles tend to be shorter, lighter, and fire smaller ammunition, and are therefore more portable.
- 2 This chapter focuses on military weapons only, for a number of reasons. These are the weapons of 'main concern' for modern armed conflict, as reflected in the report of the UN Panel of Governmental Experts on Small Arms. Paragraph 24 of the report reads: 'The small arms and light weapons which are of main concern for the purpose of the present report are those which are manufactured to military specifications for use as lethal instruments of war'; while paragraph 27 holds that they 'are also of particular advantage for irregular warfare or terrorist and criminal action' (UN, 1997). While non-military weapons such as sporting and hunting rifles are also produced under licence, they do not pose the same proliferation dangers as do military arms. Handguns are a major problem, in particular because they are used in civilian violence worldwide, but the unavailability of production data makes their general inclusion in this study realistically impossible, and only those specifically manufactured for military use are included. Furthermore, this focus on military weapons allows comparison with the findings of the *Small Arms Survey 2006* on production for armed forces (Small Arms Survey, 2006, pp. 7–35).
- 3 Brazil, France, Greece, Iran, Malaysia, Mexico, Myanmar, Norway, Pakistan, the Philippines, Portugal, Saudi Arabia, Sweden, Thailand, Turkey.
- 4 If not stated otherwise, this section is based on Gimelli Sulashvili (2006).
- 5 In most cases, the status of production is known so that the catch-all category of 'licensing situation unclear' is not very frequent (only 19 per cent of all cases).
- 6 A detailed list of all 212 cases referred to in this table is available in Annexe 1 on the Small Arms Survey Web site: <http://www.smallarmssurvey.org/files/sas/publications/yearb2007.html>
- 7 On p. 1 of the sections entitled 'Small Arms Ammunition (Europe)', 'Small Arms Ammunition (International)', and 'Small Arms Ammunition (United States)'.
- 8 There is, however, one case where the licensing situation is unclear (Pakistan's production of a Swedish model).
- 9 Only in a few cases, such as Libya, did the licensee have to pay for the licence.
- 10 Warsaw Pact allies were allowed, however, to transfer the licensed weapons among one other in the framework of intra-pact industrial cooperation.
- 11 Azerbaijan, China, the Czech Republic, Finland, Georgia, Hungary, Poland, Romania, Slovenia, Turkey, and the Ukraine, while the Eurasian patent is valid in Belarus, the Russian Federation, and Tajikistan.
- 12 Interview with a spokesperson of Heckler & Koch, Oberndorf, Germany, January 2007.
- 13 Its rivals in the deal were FN Herstal (Belgium), Giat Industries (France), IMI (Israel), Chartered Industries (Singapore), and Colt (United States).
- 14 See, for example, Canada (2006) and United Kingdom (2006).
- 15 Pursuant to its basic principles on sustainability and citizenship, the company pledges to act in accordance with the law of the countries in which it conducts business and to help protect human rights. Moreover, the company points out that it is subject to Swedish law and administrative procedures (Saab Bofors Dynamics, 2006).
- 16 Countries with NATO equivalent status are Australia, Japan, New Zealand, and Switzerland.
- 17 Notwithstanding the lack of explicit reference to licensed production or production facilities, the term 'military equipment' can be interpreted as encompassing technology and know-how, as practice in the United Kingdom demonstrates (BASIC, International Alert, and Saferworld, 2002, p. 9).
- 18 Ten thousand small arms produced by Fabricaciones Militares under licence from the Belgian company FN Herstal, and ten million rounds of ammunition (Vranckx, 2005, p. 14).
- 19 Projections for the up-coming Kalashnikov production range from 250,000 to 500,000 units over the ten years covered by the production licence. Venezuela's forces amount to approximately 500,000 members (127,000 full-time army personnel, 172,000 part-time army personnel, 38,000 National Guard paramilitary personnel, and reservists). Under the cautious assumption that the production facilities would run at full capacity, and adding the 100,000 rifles that will be directly imported from the Russian Federation, not a lot of surplus weapons would remain for export (Baranauskas, 2006a).
- 20 '[O]ther military equipment related to war weapons' can be a 'plant or documentation for the manufacture of war weapons' (Germany, 2000, sec. III, para. 5).
- 21 EU (1998); Wassenaar Arrangement (2003); APEC (2003); OSCE (2004).

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