The Economics of Arms Export Controls

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Maria Garcia-Alonso, University of Kent
Ron Smith, Birkbeck College London

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Introduction

The economic analysis of ‘bads’, such as illicit drugs, alcohol in prohibition US and Islamic countries, and the proliferation of weapons of mass destruction, shares many features with the more standard economic analysis of goods. In both, it is important to identify the forces that drive demand and supply and thus determine price and quantity. However, whereas with goods the focus is on ensuring that supply equals demand at reasonable prices, with bads the focus is on acting on demand or supply to ensure that price is high (e.g. through taxes on alcohol and tobacco) and quantity is low. As a result, things that are regarded as problems in goods markets (e.g. monopoly or cartels, excessively high prices or inadequate supply) tend to be regarded as solutions in bads markets. Broska (2003) discusses taxation of the arms trade, Becker, Murphy and Grossman (2004) the more general economic theory of illegal goods.

The bads we are concerned with are military. They can be roughly divided into weapons of mass destruction, WMD, typically nuclear, biological and chemical, NBC; major weapons systems; small arms and light weapons; dual purpose goods, which have both military and commercial applications (NBC and others); and services including intangible technology transfer. As with drugs, not everybody agrees that they should be regarded as bad; and those who agree that they are bad do not agree whether the best way to deal with the problem is by demand side or supply side actions. Whereas with illicit drugs the demand prompting concern is largely from rich countries while the supply is largely from poor countries; with the military products the demand prompting concern is largely from poor countries and the supply largely from rich countries. For weapons and related technologies the demand may be by states or non-state actors. The non-state actors are mainly legitimate, e.g. the nuclear, biological and chemical industries, but may be illegitimate, such as terrorist groups. As with illegal drugs, there are large international externalities in arms transfers; what is done by one country has effects on other countries, so there are benefits from coordination.

There has been a substantial economic analysis of arms exports but most of it has been mathematical or econometric within quite specific, often game theory, models. Some of the implications of game theory analysis for arms export control are discussed in a non-technical way in Smith and Udis (2001). The economic analysis has used elements of
new trade theory and regulation theory with the added elements of security perceptions and procurement theory to analyse how export control policies interact with other more traditional policy instruments and objectives. The technical nature of the literature has probably inhibited communication with other disciplines. In this chapter, we try to set out the issues within an economic framework and briefly summarize some of the conclusions of our work in a non-technical way.

The framework that we use first discusses the context, the particular nature of the arms trade, and then asks:

• how do we distinguish legitimate demand (for civilian use or to meet internationally recognized security needs) from illegitimate demand?
• what are the, possibly conflicting, interests of supplier countries and their firms that may lead them to want to control arms exports?
• to the extent that supplier countries have common interests, what are their incentives to coordinate their controls and not cheat on their international obligations?
• given that controls are in place, what are the possible unintended consequences of those controls?

The Arms trade

The arms trade is subject to more extensive controls than trade in most other goods. Almost all countries regulate arms exports to some extent, if only to ensure that the arms they produce are not used against them. These unilateral national control systems are the foundation for multilateral controls, which vary from relatively informal clubs of suppliers, to very formal systems embodied in treaties and involving extensive monitoring systems like that associated with the nuclear Non-Proliferation Treaty (NPT).

We can divide export controls into quantitative and qualitative controls (see Panofsky (1990) for a similar classification). Quantitative export controls include total or partial restriction of weapons exported to a single country or a group of countries. Qualitative export controls include controls on the transfer of state of the art technologies that allow exporter countries to maintain a technological edge over potential adversaries, and controls on the transfer of very sensitive technologies, e.g. weapons of mass destruction. For instance, when exporting advanced systems, the US often ‘black-boxes’ the software, not providing the source code, so the buyer cannot find out how the system works or change it. The UK Ministry of Defence could not use the Chinook HC3 helicopters because it was unable to verify the software, NAO (2004).

A central issue is how these controls interact with the patterns of supply and demand. Even in markets for goods it can be quite difficult to determine the relative importance of demand and supply factors on the evolution of prices and quantities, e.g. whether the high oil prices of 2004 were primarily due to demand or supply. For bads it can be even more difficult, because of the secrecy associated with the decisions. Consider the proliferation of nuclear weapons. Initially the evolution of ownership as indicated by tests of nuclear weapons was almost linear: US 1945, USSR 1949, UK 1952 France 1960, China 1964.
This speed of diffusion was limited only by supply constraints: these countries acquired them as rapidly as they could. Extrapolation might have suggested a new country every five years. Mid 1960s predictions based on supply side capabilities (who would be able to make bombs) suggested a much faster spread of nuclear weapons. This was captured in Tom Lehrer’s mid sixties song: “Whose Next?” Which ended “We’ll try to stay serene and calm/When Alabama gets the bomb”.

In fact, since 1965 only two countries have announced conducting tests of nuclear weapons: India and Pakistan. There is some question as to whether two other nuclear weapons states Israel and South Africa did carry out a test. South Africa denuclearised as did the former Soviet Republics of Belarus, Ukraine and Kazakhstan. The status of North Korea and Iran is currently uncertain. Clearly what stopped proliferation in cases such as Sweden and Japan was not supply side constraints, both could easily build nuclear weapons; but demand side factors, they did not see large benefits from doing so.

Estimates of the number of countries capable of building nuclear weapons fairly quickly ranges from 25 upwards, including all those countries with civil nuclear reactors. But most of those countries have no desire to acquire nuclear weapons. In 1965 such a lack of proliferation would have seemed a low probability prediction. But even with hindsight it is difficult to determine how much of the nonproliferation was the result of the supply side constraints associated with the NPT and the Nuclear Suppliers Group and how much was demand side judgments about the limited benefits of possessing nuclear weapons.

Supply side controls tend to increase the cost of the product to the potential acquiring country targeted by the export control. This can be done through direct price increases, prohibition of exports or economic sanctions to restrict the potential of the demanding country to develop the weapons themselves. All controls can be evaded at a price, effective controls are those where the price is too high to be worth evading. Supply side controls influence equilibrium demand by raising price. By demand side factors we mean factors that change the demand for weapons at a given price. These may include a peace agreement or a change in perceived threats that will change demand for weapons even if prices are constant. The most common economic model for demand is an arms race between two antagonists. In this case, the restriction of arms supply to one antagonist has the indirect benefit that it reduces the derived demand for arms by the other antagonist. The economic literature is less good in modeling other reasons for export controls, such as embargoes imposed in response to internal repression or human rights violation.

Although we speak about price, this is a simplification. Arms export contracts are complicated packages that include not just the weapons-systems themselves, but munitions, spares and training. They are often paid for by counter-trade (barter, the UK Al Yamamah arms export package to Saudi Arabia is paid for in oil) and have associated offsets (e.g. the seller promising to set up production in the buyer country), plus soft loans to finance the sale. Brauer and Dunne (2004) provide detail on counter-trade and offsets. Evidence on the financial details of arms contracts is difficult to get. The contract is usually the start of a long-term relationship since the weapons will need munitions, spares, upgrades etc. in the future. A crucial part of the relationship will be whether the supplier is willing to continue supply in time of conflict.
Legitimate and Illegitimate Demand

The demand for arms of various types is influenced by security perceptions of internal or external threats and by price and income, which determine what a state can afford. States then choose whether it is more cost effective to develop and produce the weapons domestically; develop and produce them in collaboration with other countries; to produce under license systems developed elsewhere; or to import the desired arms. If they decide to import they have to choose between competing systems available on the world market. Bribery and corruption are endemic in the arms market and a policy issue for supplier countries is to what extent they take anti-corruption measures. In December 2004 the UK government announced a loosening of anti-corruption controls within the Export Credit Guarantee Department in response to defence companies pressure. However, while the decision-makers who make these choices may be self-interested and quite possibly corrupt, their choices are constrained by the security and economic situation. Prices matter and the main factor constraining the proliferation of major weapons systems is that few countries can afford them. Smith & Tasiran (2004) provide econometric estimates of the demand for arms imports as a function of military expenditure (a proxy for the threat), a (very inaccurate) measure of price and the income of a country. On these estimates, demand is sensitive to price. For constant threat a one percent increase in price causes a roughly one percent fall in the quantity of arms imports demanded.

During the Cold War the western allies had a clear security interest in stopping transfers of arms to the Soviet bloc. Cocom, the Coordinating Committee for Multilateral Export Controls, was set up in 1949 to restrict the flow of technology and weapons to the Eastern bloc. It was wound up in 1994, being replaced in 1996 by the Wassenaar Arrangement on export controls for conventional arms and dual use goods and technology that includes Russia. Within the western alliance during the Cold War military preparations had elements of a public good, the forces of one country had spillover benefits for other countries. There was therefore also a security interest in encouraging sales of arms to allies to increase their capability and enhance interoperability. In practice, the application of these security principles through Cocom and burden sharing debates was fraught with tensions, though Cocom tended to work better when the Soviet threat seemed greater. During the Cold War period sales to non-aligned countries were often seen through a Cold War perspective. After the Cold War the security interest became less clear and there were fewer general principles.

Given the right of states to self-defence, embodied in the UN charter, they have a legitimate right to import arms and few would criticize, for instance, the US supply of arms to the UK during World War II under the Lend-lease program. However, the international community has tried to establish criteria where the import of arms is not legitimate. A typical set of criteria are given in the 1991 guidelines agreed by the five permanent members of the UN Security Council, discussed by Pierre (1997). These indicate that restrictions on exports are required where the transfer would be likely to: prolong or aggravate an existing armed conflict; increase tension in a region or contribute
to regional instability; introduce destabilising military capabilities in a region; contravene embargoes or other relevant internationally agreed restraints to which they are parties; be used other than for the legitimate defence and security needs of the recipient state; support or encourage international terrorism; be used to interfere with the internal affairs of sovereign states; or seriously undermine the recipient states economy. Other factors that may be listed are if the transfer has an adverse effect on national security of the exporter or other countries; facilitates internal repression or breaches of human rights; or encourages the proliferation of weapons of mass destruction. These criteria are quite vague and will involve subjective judgements, about which there may be disputes.

To illustrate the issues in determining legitimacy, consider the case of China. China agreed to the Security Council guidelines listed above in 1991, but withdrew cooperation in 1992 in the response to the decision by President Bush to allow the sale of F16s to Taiwan. Since Taiwan is regarded by China as part of China, it regarded this as interference with the internal affairs of a sovereign state, in contravention of the guidelines. China was itself subject to a European Union embargo introduced after the Tiananmen Square massacre of 1989. At time of writing, in early 2005, the EU was discussing removing the embargo, while at the same time strengthening the arms export Code of Conduct discussed below. Removal of the embargo faced strong opposition from the US who was concerned both with the growth of Chinese military power and the threat to Taiwan. The large European arms manufacturers were ambivalent. China was a large and potentially profitable market and they had a chance to displace Russia and Israel, China’s traditional suppliers. But they feared that sales to China would close off access to US markets and technology and that by transferring technology to China they would be creating a new competitor in the international arms market.

It can also be quite difficult to judge when the development of nuclear, biological or chemical industries by particular states reflects legitimate commercial judgments or covers for illegitimate acquisition of weapons of mass destruction. Potential recipients of the arms may recognize the interest of the supplier groups in restricting the flow of destabilizing weapons, but they are also likely to accuse the suppliers of forming ‘cartels’ to restrict the flow of goods or technology in order to raise prices and maintain military dominance and joint monopoly.

**Interests of Supplier Governments and Firms**

The primary instrument supplier governments have to meet their objectives in this area is their national export control systems. At a minimum, countries do not want to be threatened by their own weapons that they have supplied to enemies. During the First Gulf War after the Iraqi invasion of Kuwait, French Mirages had to be withdrawn from the conflict because they were indistinguishable on radar screens from those France had sold to Iraq. National export control systems typically have a number of elements: lists of products that require a license; lists of countries to which exports can or cannot be made; lists of criteria used to judge particular cases; customs procedures to stop unlicensed
exports; and some system to guarantee the ‘end use’ of the product to stop it being re-exported. The UK produces a quarterly strategic export controls report on licenses granted and refused, available on www.dti.gov.uk/export.control/. However, governments in arms producer countries also promote arms sales through organizations like the Defence Export Services Organisation in the UK, and through export credits and guarantees, like that offered by the Export Credit Guarantee Department in the UK.

Governments have a variety of objectives. These include not only national security and international stability, but also maximizing exports by domestic firms, which may generate profits, employment and tax revenue. It is often argued that arms exports help maintain a domestic defence industrial base and reduce costs to the domestic defence ministry by spreading overheads such as R&D and taking advantage of increasing returns to scale and learning curves. The various objectives of the government may or may not conflict in particular cases, and where objectives do conflict it often appears as conflict between the government departments responsible for export control. In the UK the Department of Trade and Industry is the lead department, but Ministry of Defence, Treasury, Foreign Office and the Department for International Development will all have positions. In a number of cases, there will be pressure on the armed forces to buy equipment that they do not want in order to enhance its export potential. This was a particular problem in France, where the military repeatedly complained that they were forced to buy equipment designed with export markets in mind, Kolodziej (1987)); but it has also happened on occasion in the UK. Where an export contract is very large, such as the UK sales to Saudi Arabia under the al Yamamah contract, it may shape foreign policy.

There has been a substantial debate about the extent to which arms export sales have been subsidized by supplier governments. For many systems there is overcapacity in the arms industry and legitimate sales are very competitive. In 2003 the French government instructed arms suppliers not to offer products at prices below production cost in order to win contracts. The 1993 order for 436 Leclerc tanks from the UAE sold for $3.4billion resulting in a loss of $1.2billion, SIPRI (2004, p457). In 2003 Portugal chose German rather than French submarines after the French producer increased price by 15%, presumably in accordance with government instructions. Chalmers et al. (2002) is the result of a collaboration between Ministry of Defence and academic economists to quantify the costs and benefits of UK defence exports. Ingram and Isbister (2004) argue that arms exports are bad for Britain, both because of the subsidies and the distortion of procurement choices.

In the past it was common for national arms firms to be almost an extension of the state, and were often publicly owned. There has been a trend for the arms firms to become increasing independent from their national governments, a move that was initially taken to increase the efficiency of weapons production. Such situation increases the importance of asymmetric information between firm and government. Within game theory models, information differences between the two parties to a transaction, asymmetric information, can lead to a range of market failures, cases where markets cannot be relied upon to allocate resources efficiently. Of course, even when the firm is owned by the state, the
firm may capture the part of government nominally controlling it and firm interests come to determine policy. This seems to have been the case with a number of French procurement choices. The balance of information and interests becomes more of an issue as competition grows in the international arms market, arms firms become more internationalized, and collaborative projects between countries become more common.

Most high technology industries which require large investments in Research and Development are concentrated and globalized, a few multinational firms dominate the global industry, e.g. Airbus and Boeing in large civil airliners, Intel and AMD in microprocessors. This was not the case in the arms industry because of the desire by national governments to protect their defence industrial base. The SIPRI list of the hundred largest arms producing firms showed that in 1990 the 5 largest firms accounted for 22% of the market. This is a very small percentage compared to other industries. The end of the cold war was followed by a merger wave, with multinational arms firms operating in a number of countries, like Thales, BAE Systems, EADS, and Lockheed Martin, starting to appear. In 2003 the 5 largest firms accounted for 44% of the market. Although concentration has doubled, it is still not high by comparison with similar civilian markets. Increased competition can go along with increased concentration, fewer firms. As competition increases, profit margins fall and the weaker firms are driven out.

National governments now face a further information asymmetry, not only with respect to its own firms but also with respect to the firms and governments of other exporter countries. This globalization of production can raise difficulties, e.g. when Head Up Displays for F16s were supplied by the UK to the US and the F16s were then sold to Israel, when it is unlikely that direct sales would have been allowed. The Foreign Secretary explained on 8 July 2002 in response to a Parliamentary Question, prompted by this case: The restructuring of the defence industry presents new challenges for the Government’s approach to export licensing. Many export license applications are for goods which are to be incorporated in defence equipment in a second country, which thereafter may be exported to a third country.”

There has also been a tendency towards the development of dual use technologies that could spin-off from or spin-in to weapon technology. Dual use technologies make it more difficult to identify a military product as such. Many crucial components within weapons systems or equipment used to produce weapons systems also have legitimate civilian uses. Under the Cocom regime, the Toshiba sale of machine tools to the Soviet Union, which could be used to produce very quiet submarine propellers, was an example of the ambiguity, Mastanduno (1992).

The lack of transparency between governments and national champions over the quality exported generates incentives on the side of profit maximizing firms to export forbidden technologies or export to forbidden countries. This would force governments to introduce a penalty system strong enough as to discourage firms from infringing export controls. However, the existence of limited liability on the side of possible infringers of export control regulations imposes constraints on the implementation of such punishments. Governments may be unwilling to drive firms into bankruptcy, therefore the expected
value of cheating to the firm is increased, because the penalty if they are caught is smaller. Asymmetric information may not always have negative effects on the implementation of export controls. If the source of asymmetric information is the procurer government being unsure about the cost effectiveness of the domestic firm, the quantity of exports may decrease. The reason for this is that it will be more difficult for the government to give incentives for firms to behave efficiently. This will result in costs being higher and therefore, optimal prices going up and equilibrium exports going down (see Garcia-Alonso and Levine 2004). Another example of a positive effect of asymmetric information on export controls (broadly defined) would be the case when the importer government is unsure about the quality of the imported military product or whether future replacement needs will be covered, see Garcia-Alonso, Levine and Morga (2004). This will reduce demand. There is often pressure on the exporting government to buy the weapons, even if it does not need them, to signal quality to potential importers.

There are also substantial compliance costs on private firms from arms export controls, though they are difficult to estimate. In the UK the Export Control Organization, ECO, has to return half of all applications to the exporter, either for more information or because the application has been completed wrongly. There is an ECO document “Export License Applications: common pitfalls” 9 November 2004 on [www.dti.gov.uk/export.controls/applying.htm](http://www.dti.gov.uk/export.controls/applying.htm) which illustrates the complexity.

There is a substantial dispute about the extent to which supply side or demand side forces drive consumption: whether arms exports driven by the machinations of the merchants of death or the legitimate security needs of the recipients. Both forces operate within a context set by the supplier state, but if one supplier state does not make the sale, there is the danger that others will. Therefore coordination is important.

**Coordination by Supplier Governments**

The main coordination mechanism on trade is the World Trade Organization, WTO. The WTO is probably the most extensive rule-based system in international relations. However, unlike most other trade, the trade in arms is exempt from WTO rules as it was from the previous General Agreement on Tariffs and Trade, GATT, rules. Therefore practices, which would be illegal for other manufactured goods, e.g. export subsidies, are not for arms. This exemption is recorded in the General Agreement on Tariffs and Trade (GATT):

"...nothing in this Agreement shall be construed...to prevent any contracting party from taking any action which it considers necessary for the protection of its essential security interests

(i) relating to fissionable materials or the materials from which they are derived;
(ii) relating to the traffic in arms, ammunition and implements of war and to such traffic in other goods and materials as is carried on directly or indirectly for the purpose of supplying a military establishment;
(iii) taken in time of war or other emergency in international relations;..." (Article XXI, GATT, Security Exceptions).
At a formal level the situation within the European Union is similar. Article 296 (formerly Article 223) of the Treaty of Rome states:

1. The provisions of this Treaty shall not preclude the application of the following rules:
   (a) No Member State shall be obliged to supply information the disclosure of which it considers contrary to the essential interests of its security;
   (b) Any Member State may take such measures as it considers necessary for the protection of the essential interests of its security which are connected with the production of or trade in arms, munitions and war material; such measures shall not adversely affect the conditions of competition in the common market regarding products which are not intended for specifically military purposes.

2. The Council may, acting unanimously on a proposal from the commission, make changes to the list which it drew up on 15 April 1958, of the products to which the provisions of paragraph 1(b) apply.

This makes the arms industry and arms trade exempt from community rules, e.g. on government procurement and competition. However, given the single market, it is essential that the EU does coordinate its trade. Thus the EU has spoken with a single voice in international negotiations on trade policy, when it has not been able to establish a single voice in other areas. The same applies to arms export controls. Coordination is essential otherwise arms could be transferred from a country with strict rules to a country with less strict rules under the single market and exported from there. This was an issue for the export of Tornado to Saudi Arabia. Although the aircraft was partly built in Germany, it was exported under the laxer UK rules, Anthony (1991). The EU Code of Conduct on Arms Exports was adopted in June 1998 and has been extended since. Enlargement raised particular issues in the need to bring the acceding countries within the Code. Some of the new members did not have strong arms export control systems. The Code is a political commitment but not legally binding. Various proposals to strengthen the Code are under discussion in early 2005.

Other forms of coordination by supplier governments in arms export controls take a large variety of forms, which overlap with other non-proliferation and more general arms control measures. These forms range through formal treaties, through political commitments to informal understandings between groups of countries, as well as measures to increase transparency like the UN Register of arms transfers. Their effectiveness will differ depending on the payoffs to the participants from complying or cheating; the monitoring capability of the participants (how easy it is to detect cheating); and the consequences of being detected cheating. Informal arrangements driven by common interests where compliance or non-compliance is transparent may be more effective than more formal arrangements which are legally binding but difficult to enforce. Examples of informal regimes are the NSG, AG, MTCR, Wassenaar and the EU Code of Conduct. No undercutting rules play a major role in such agreements, if one country does not grant an export license it notifies the other countries, each of who should at least consult with the country that denied the export license before proceeding with the export. The UK Government is committed to securing a legally binding global
arms trade treaty (speech by the Foreign Secretary 15/3/05). This is something that a number of Non Governmental Organisations, e.g. Saferworld (www.saferworld.org.uk, have championed, but the negotiations are likely to be complex.

As the disadvantages of non-cooperation become apparent, the benefits for weapon exporters of entering into cooperative agreements to restrict quantity and quality of weapons exported grow. However, implementation of coordination in setting export controls is not an easy task because countries have incentives to unilaterally deviate from such agreements unless the right punishment mechanisms are put into place. As a consequence, international agreements and institutions have an important role to play in restricting trade, just as they do in the case of the WTO with its aim of expanding trade. As Maggi (1999) notes multilateral institutions have an important role to play in: helping coordination; verifying violations of the agreement and inform third parties to facilitate enforcement; and promoting multilateral rule-making procedure in place of a web of bilateral negotiations.

The interaction between weapons exporters aiming to control weapons exports is often characterized by what game theorist call prisoners’ dilemma games. These games describe situations in which parties could increase their payoffs if only they could devise mechanisms that ensure cooperation. Groups of states have a collective interest in restricting supply to all their potential antagonists. State A benefits if state B does not supply to A’s antagonist, just as state B benefits if A does not supply B’s antagonist. However, if antagonists differ, or the threat from the antagonist to the different states differs; there is a classic prisoners’ dilemma problem. State A does best, if state B does not supply A’s antagonists, while A gets the profits from supplying B’s antagonists.

This is a classic collective-action problem. “The trading country achieves a net benefit from trade-associated employment, profits, scale economies, learning by doing economies, while creating security externalities to any country placed in harm’s way by its weapons trade. A trading country only considers its share of the security risks and ignores the risks imposed on others when deciding its trade in weapons; consequently too much arms trade results. The dominant strategy to trade, stemming from the trader specific joint products, is not a desirable outcome from the community of nations' viewpoint.” Sandler (2003, p215) emphasis in original.

The same situation arises when producer countries decide on the amount or quality or weapons exported, even if they share the same antagonists. Because, they only see the negative impact that the exports have on their own security they each export more than they would jointly have decided to export if they could have implemented cooperation. The fact that military goods are exempted from WTO rules means that countries competing in the exports market then have unilateral incentives to give export or R&D subsidies so as to increase their market share. This results in both less security and less welfare for both exporter countries and recipients. Garcia-Alonso and Levine (2002, 2004) and Garcia-Alonso (1999, 2000) provide examples of models that capture these interactions).
An exporter may even create a technological arms race with itself, having to develop new
generations of weapons that are superior to the ones that it previously exported. The
inability of producer countries to coordinate in setting of export controls can sometimes
lead to almost counterintuitive situations, a security concerned country might want to
develop sensitive technologies which it does not want to see exported, not because it
needs them but, just to keep a quality edge relative to other maybe less technologically
advanced exporters that then find it not worth it to try to develop such technologies and
they would be likely to be “beaten” in the exports market should they decide to develop
them anyway (see Garcia-Alonso (2000)).

There are a number of factors affecting the incentives of individual countries to defect
from multilateral export control agreements such as information asymmetries (within and
between countries), the structure of the arms exports market (profits to be made out of
weapons exports), asymmetry of security concerns among exporters, the number
of countries having access to the restricted military product, the type of weapon to be
controlled or the credibility of punishment strategies on defecting firms/countries. These
issues are discussed Garcia-Alonso and Hartley (2000). In simple game theory models
defection can easily be detected, and punishment is credible. This is often not the case in
arms exports controls. Other countries might expect the defecting country to argue: I did
not sell dangerous weapons to X; even if I did the sale was justified; and even if you do
not accept those justifications, trying to punish me is going to hurt you more than it does
me. Thus cooperation can unravel.

Controlling some weapons may be made easier by the fact that the negative impact of
exporting them on any of the exporters’ security is likely to be high and therefore,
individual incentives to deviate are lower. This probably applies to nuclear weapons,
because of their destructive potential, and to small surface to air missiles, so called man-
portable air-defense systems, MANPADS, because of the vulnerability of civil aviation.
However, even in these cases there may be individual firms or countries that think that
they will not be targeted, as did the US in supplying Stinger missiles to Afghan
insurgents during the Soviet occupation.

Agreements that help control the quantity or quality of weapons exported are not always
export control agreements as such. Cooperative agreements among exporters like cartels
and international mergers would tend to increase export prices and therefore decrease
exports in the same way as export taxes. If there is a monopoly or tight oligopoly it is
profitable to restrict quantity for commercial not arms control reasons, Levine and Smith
(1997) provide an analysis of cartels. Mergers and cartelisation also reduce the number of
potential deviators and decrease asymmetric information issues therefore reinforcing
export control agreements. Such agreements and other collaborative agreements among
weapon producers such as research joint ventures, might result in higher R&D
investments and therefore, higher levels of potential quality to be exported unless
combined with a direct qualitative export control, that is cooperation between firms alone
could result in more quality being exported unless regulated by cooperating governments.
This issue is modeled in Dunne et al. (2004a).
Another example of an agreement that could in principle help export controls is for arms trade to be included within WTO rules prohibiting export subsidies. The fact that the arms industry has been exempted from WTO rules would tend to produce more arms exports than otherwise; as individual producer countries have incentives to give export subsidies. In addition, these subsidies may increase the incentives that individual producer countries would have to defect from standard export control agreements as a given deviation may then result in higher increases in profits. This is modeled in Garcia-Alonso and Levine (2004).

While there are clear incentives for formal coordination among exporters, and coordination takes the form of both conventions and treaties, such as the NPT, which are formal and open to all, and of supplier groups, sometimes called regimes, like the Nuclear Supplier Group, NSG, which are informal with restricted membership. What is surprising is that there are so many different organisations. There are not different organizations to regulate trade in agriculture and cars, so why are there four different organizations to regulate trade in ballistic missiles, conventional arms, chemical and biological weapons and nuclear supplies? This is particularly surprising given that the membership of the regimes overlaps to a considerable extent. SIPRI (2004 p738) lists the membership of the 4 main regimes and the Zangger Committee. There are 42 countries who belong to at least one of the five, with the numbers in each group ranged from 33 in the Australia and MTCR to 40 in the NSG. There were 27 countries which belonged to all 5 regimes and this number will probably increase as China and the new EU states enter more regimes.

Responses to export controls

The overall effect on the welfare of an importing country subject to export controls is complicated. Although qualitative or quantitative export controls may reduce conflict, if applied to all parties involved, the increase in the cost of acquiring these military products (sometime prohibitory) will reduce consumption not just of weapons but also of other goods, especially if the price elasticity for weapon imports is low. The positive impact on security can potentially offset the negative impact on consumption and therefore resulting in a positive welfare effect, see e.g., Levine and Smith (1997) and Dunne et al. (2004a).

However, even if the welfare of importer countries was increased via export controls, they may still have an incentive to unilaterally search for alternative ways to build military capability that would give them an edge with respect to their adversaries. The problem of course being that their adversaries would do exactly the same resulting once again in conflict escalation. It is this situation that explains why export controls can sometimes have unintended consequences. States subject to embargo or control, or who fear that they may be subject to embargo in the future, may develop their own arms industry to produce the weapons that they cannot import. South Africa is an example and the French embargo on Israel also increased the Israeli desire for domestic self sufficiency. Levine and Smith (2000), Levine, Mouzakis and Smith (2003) and Mouzakis (2002) discuss the interaction between export controls and proliferation. States subject to
export controls may develop weapons of mass destruction as a substitute for or supplement to conventional weapons, again Israel and South Africa are examples.

As with other industries high prices and restricted supply encourage new entrants. States that are tightly coupled into the international community, may find the reputational costs of supplying illegitimate weapons too high to be worth doing. In cases, where the international community has little leverage over a state, it may become a major source of illegitimate supply, as North Korea has become the main exporter of ballistic missiles. Controls can be evaded and may provide incentives for the development of illicit supply channels, such as the nuclear network run by the Pakistani scientist Abdul Qadeer Khan. Embargoes invariably prompt the development embargo-busting networks. The development of such networks may have longer-term implications for the viability of criminal or terrorist organizations.

If one supplier is very strict in its applications of controls, as the US was during Cocom period, other suppliers try design out the components subject to control. Most of the other weapons exporting countries tried to avoid using US components during this period, for this reason, Mastanduno (1991). It is still an issue. In January 2004 a consortium led by EADS won a UK contract for in-air refueling aircraft, which would be leased by the RAF when needed and used commercially as a cargo or charter aircraft otherwise. There was then a protracted dispute about the terms of the contract, in which one issue was the US State Department decision to treat the aircraft as military, even when being used commercially. Because the aircraft would have a significant number of US parts, this would allow the US government to restrict the places the aircraft could fly and who could fly it. In response to this the Financial Times (Peter Spiegel ‘Air Tanker contract flies into turbulence’ p32, 3/11/2003) reported the MoD project team leader, Kevin Johns, as writing to EADS saying “It is vital that you significantly reduce your dependence of your solution on export licenses for US military list equipment... This needs to include identifying the required European licenses for inclusion … and identify the risks to obtaining the relevant licenses.”

A recent development in the security perceptions of weapon exporters that may actually affect the impact that export controls have on the exporter security is asymmetric conflict. The traditional export control agreements implicitly assumed that all countries’ technological defence needs would develop following a pattern similar to that of the exporter countries. Recent events have showed though that this pattern can be broken. Despite having massive technological and military superiority, the US withdrew from Lebanon in 1983, after a suicide bombing killing 241 troops and from Somalia in 1993, after a battle in Mogadishu in which television covered the brutal treatment of two American corpses and one injured prisoner. The bombing of USS Cole in Yemen in 2000 and the attack on the World Trade Centre on September 11 2001 demonstrated US vulnerability to certain sorts of asymmetric attack. Traditional export control systems were not designed with such sort of attacks in mind.

Ensuring that the technology you retain in your own weapons is greater than that in the systems you export may then no longer be enough to shield you from future enemies that
cannot afford high cost traditional weaponry and may therefore decide to use non-traditional methods of aggression. This does not mean that export controls become redundant. Many conflicts in the world use traditional weaponry, this weaponry costs developing countries valuable resources and it is these conflicts that may later need external intervention. The weapons that kill the most, small arms and light weapons, are some of the most difficult to control. It is important to see also that it is not export controls that have provoked asymmetric conflict but, the increase in the cost of traditional weapon systems, that is, the result of many decades of weapon escalation. Dunne et al. (2004b) discuss the difficulties involved in managing asymmetric conflict.

Conclusions

Arms export controls have a long history. Anthony (1991, p8) notes that in the 8th century Charlemagne declared the death penalty for Frankish merchants selling swords to the Vikings. It is now taken for granted that governments have a legal obligation to control the movement of arms to ensure that they do not fall into unauthorized hands. But the economic interests of some actors to sell arms conflict with the security interests of other actors, against whom those arms may be used. Individual governments have the responsibility of trying to reconcile that conflict at a national level, but to be effective the controls have to be international. Thus supplier governments have a common interest in establishing some mechanism, a regime, to coordinate their export control procedures. For such coordination to be effective requires the governments to establish a consensus about how decisions will be made. These decisions will cover what items are to be controlled; what constitutes legitimate and illegitimate demand; what countries can be members of the regime and what standards their national regulation must meet. Coordination will be enhanced by mechanisms to share information about potentially illegitimate uses and to monitor compliance by members. To the extent that these mechanisms are effective they will establish credibility and legitimacy. This provides incentives for members to comply with the agreements, since failure to comply carries a high cost in lost reputation. Such incentives will tend to encourage suppliers who are members of such regimes to put more weight on long-term joint security interests relative to short-term individual economic interests. However, to the extent that such export controls are effective states subject to control have incentives to establish their own arms industry, substitute weapons of mass-destruction for conventional weapons, and adopt asymmetric warfare. Effective controls also increase the incentive for illegitimate sources of supply to develop.

References


