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## Economic aspects of arms trade offsets

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### Introduction

The literature on arms trade offsets (and offsets generally) is cluttered with a babel of terms. These include: direct and indirect offsets; commercial and industrial countertrade; simple and multiple barter; bilateral government trade agreements and bilateral government framework agreements; compensatory arrangements; clearing arrangements; economic cooperation agreements; coproduction; licensed production; subcontractor production; overseas investment; buybacks; technology transfer; and switch trade.<sup>1</sup> Authors arrange these terms into a plausible order and proceed from there.<sup>2</sup> The major themes they then address are captured in the following questions:

1. Are arms trade offsets part of normal trade relations or are they in some sense “extra-normal” and, if so, why would that matter?
2. Why are arms trade offsets agreed to? What economic theory (or theories) would explain offsets? What are the economic rationales of the players involved?
3. Are arms trade offset agreements economically efficient? Is social welfare maximized? What is the benefit, net of cost, for whom? In a word, what is the empirical evidence?
4. What, if anything, should be done about arms trade offsets?

The first question is well addressed in this book by Markowski and Hall (chapter 2) and by Taylor (chapter 3).<sup>3</sup> The objective of this chapter is to address the remaining questions.

### Economic theories of arms trade offsets

The first part of the second question asks how economic theory explains the existence and persistence of voluntary or of mandatory countertrade and arms trade offsets. Important pieces include Murrell (1982), Banks (1985), Mirus and Yeung (1986a, 1986b, 1987), Hennart (1989), Udis and Maskus (1991), Caves and Marin (1992), Amann and Marin (1994), Hall and Markowski (1994), and Taylor (2000). A good review is available in Martin (1996, chapter 2). Briefly, one set of explanations revolves around international trade conditions. For example, since an overvalued currency inhibits exports (by making them too expensive on world markets) an arms trade-related indirect offset purchase agreement essentially amounts to a selective devaluation to stimulate exports in the chosen sector. Another example: countries facing difficulties borrowing on international financial markets to finance arms imports can circumvent this difficulty by engaging in

non-monetary offset trade. Also, since barter by its nature is statistically less visible than monetary transactions, it is possible to engage in difficult-to-detect price discrimination to dump product on the world market that otherwise might be difficult to dispose of.

Another theoretical offering suggests that buyback requirements—instances in which the arms seller agrees to invest in physical plant in the purchasing country and to buy back a certain proportion of the output produced there—serve to hold the arms seller hostage to its own exported plant technology. In this case, uncertainty about the quality of the transferred technology is mitigated by sharing the risk with the seller. The seller is unlikely to dump outdated technology on the buyer if the seller has to buy back part of the output produced. A related and intriguing explanation comes from the observation that licensed technology generates a revenue stream only so long as the technology is current and competitive. Since technology depreciates arms sellers possess an economic incentive to license technology to arms buyers in an offset deal. Yet another set of explanations revolves around search and transaction costs. Small-country arms buyers face steeper market penetration costs for non-defense items than established large-scale international conglomerates do. For example, in 2001 Boeing Corporation rang up sales revenue of US\$58 billion. This would place it as number 45 on the world-GDP list and would exceed the GDP of many of its government clients.<sup>4</sup> Thus, an offset by which Boeing agrees to market products on behalf of its client may be a potent tool to penetrate foreign markets.

Furthermore, Hall and Markowski (1994) argue that the realities of international trade far exceed in complexity simple textbook cash-for-goods (\$3 for a hamburger) markets. Many international trades are joint product trades, so complex that there may well exist economies of scope in drafting complex contracts involving a variety of countertrades. In essence, they argue, countries are not just buying arms; they are buying complex bundles of goods and services and wish to minimize associated transaction costs.<sup>5</sup> In a word, “in a world of imperfect markets, oligopoly rents, complex transactions and asymmetrical information, offsets might enhance the welfare of the purchaser” (Martin and Hartley, 1995, p. 127).

All of these theories can be read to rationalize arms trade offsets after the fact. They merely suggest that, in principle, offsets may entail net benefits when compared to the *status quo* and that the issue needs to be decided empirically. Comparing the welfare effects of arms trade offsets to the *status quo* of international trade relations is pragmatic but intellectually dicey. For instance, it is surely inappropriate to deal with an overvalued exchange rate by means of arms trade offsets. It is surely inappropriate to deal with access to the heavily protected US and EU textile and agricultural markets with an arms trade offset. And it is surely inappropriate to assume that government makes optimal resource allocation decisions in the first place when deciding on certain levels of arms imports and associated offsets. Who is this “government”? Who makes decisions for whom? This leads to the next section which examines the players involved in offset deals.

### **The arms trade offset players: who wants offsets, and who is opposed?**

The second part of the second question asks who are the interested parties, the players, in the offset game, and what are the benefits they might derive or the costs they might bear? Here is one list.

#### *The exporting firm (i.e., its management and shareholders)*

Firms wish to maximize profits. If deals without offsets maximize profits, those deals will be agreed to. If deals with offsets maximize profits, they will be agreed to. One claim made by arms producers is that without offsets, sales will be lost to competitors who do offer offsets. It is a buyers' market, and offsets are a condition of staying in the market. For general commercial products that may be true; but for military items—especially major weapon systems—this is a disingenuous argument. If the United States government decided to restrict international arms sales, the likes of Lockheed Martin and Boeing would not go out of business. There will simply be *less* business, not no business, possibly leading to higher prices for purely domestic procurement. (But I will show later that this is unlikely, at least for the case of the US.) Arms trade offsets are a condition of business only inasmuch as governments jointly permit the practice.

#### *The exporting firm's employees, and its union(s), if any, and the communities in which the workers live*

Employees, especially unionized ones, can be counted on to oppose competition in the output market. If there were no competition, unionized employees as the seller of labor services would hold effective monopoly power and possess the ability to extract rent from their employer. Accordingly, the US record is unambiguous: labor unions and their spokespersons always oppose arms trade offsets, especially in the form of coproduction and licensed production, on the argument that jobs would be shifted abroad. Union representatives routinely call for greater government regulation, not of arms trade, but of *competitive* arms trade. The communities in which employers and employees live potentially lose tax revenue and are opposed to direct offsets, whereby production might be shifted to another country, also.

#### *The exporting firm's subcontractors, and their workers and communities*

In many instances, arms manufacturers structure offsets such that component production undertaken by subcontractors is outsourced to the buying country. In this case, the prime contractor and its employees are held harmless (or even gain), but the employers, employees, and communities of the subcontractors will be opposed.

*The exporting country's non-military firms*

In a famous case that continues to traverse the literature, Northrop Corporation sold 64 F-18 aircraft to Finland.<sup>6</sup> Part of the deal involved selling Finnish papermaking machinery in the US: an offset. Valmet, a Finnish company, offered such a machine to International Paper Company in the US in direct competition with a US-based firm, Beloit Corporation of Wisconsin, a subsidiary of Harnishfeger Industries. Beloit did win the contract but barely broke even on it. They had to give up profits on account of the Finnish competition. The case inspired US Senator Russell Feingold (D-WI) to sponsor an amendment to the US Arms Export Control Act of 1994, prohibiting "third party incentive payments to secure offset credits."<sup>7</sup> Undoubtedly, offsets can hurt non-military firms. But what Senator Feingold, and others, failed to observe is that the profits the Wisconsin firm lost are the profits International Paper won. The net effect to the US economy was zero.

*The government of the exporting firm's country*

If arms trade offsets assist manufacturers of military goods to stay in business and maintain a certain level of employment and if, simultaneously, subcontractors and non-military business lose employment on account of direct and indirect offsets, the government—the presumed impartial arbiter of all things economic—is in a bind. It would need to consider the net benefits to the country. But the evidence that it does so is thin, in part because the possible effects of offsets ricochet around the economy, as in the Feingold example. Indeed, even if Beloit had lost the sale altogether to the Finnish company, it would still be true that the loss to one US company equals the gain to another.

It is said—and here I pick up an earlier theme—that arms exports, by increasing the production run, lower the average cost of weapon systems and thereby the taxpayers' economic burden. True, in theory: if fixed cost equals \$1,000 and incremental, per-unit cost equals \$100, then a 10-unit production run costs  $\$1,000 + (10 \times \$100) = \$2,000$ , or \$200 per unit. A 20-unit production run would cost  $\$1,000 + (20 \times \$100) = \$3,000$ , or \$150 per unit. Thus, for a 10-unit domestic procurement ordered by government (and a 10-unit order by another government), the domestic taxpayer pays \$1,500 instead of \$2,000. In practice, however, it is little appreciated that a very large chunk of United States arms exports is in fact US taxpayer subsidized. In FY 1995/96, US taxpayer subsidies of US arms exports amounted to nearly \$8 billion (Hartung, 1996, p. 33). This equaled about two-thirds of the total \$12 billion US arms exports that year. In my example, the US taxpayer pays \$1,500 for the ten units for domestic use, but also pays for two-thirds of the other, exported, ten units. That is, roughly,  $7 \times \$150 = \$1,050$ , for a total taxpayer bill of \$2,550, or about 25 percent more than the smaller 10-unit production run at higher average cost (i.e., \$2,550 vs. \$2,000). The \$8 billion arms export subsidy is large enough for each of 160,000 arms export workers to take a permanent, taxpayer-financed vacation at \$50,000 a year. On the face of it, US arms exports *per se* are a bad deal for the US.

*The importing country's government and people*

For the arms importing country, many benefits are claimed for arms trade offsets. Preservation of foreign exchange, employment creation, and technology transfers are among those most often mentioned. I already suggested that these claims may not hold up to factual scrutiny. I examine this in the next section of this chapter.

*The importing country's firms (and their managers, shareholders, employees, unions, and communities) receiving direct or indirect offset contracts*

These would gain, inasmuch as their respective counterparts in the arms exporting country lose. Component production, coproduction, or licensed production obviously create benefits, narrowly construed. But the economist asks at whose cost these benefits are purchased, and what portion of the cost is borne by foreigners and what is borne by the importing country? Suppose for instance that a \$3 billion arms deal results in \$3 billion worth of compensating offsets directed toward indigenous arms component production. That means that \$3 billion worth of taxpayer revenue to purchase the arms has been directed, via the offset, to arms component production and has not been directed into health, housing, and education. The presumption therefore is that the social rate of return on armament component production exceeds the social rate of return on health, housing, and education but this is rarely, if ever, considered or explicitly calculated (and I would surmise that the comparison would not be favorable to the military sector, at least in the case of developing nations).

*The people of various third-party countries who may be affected by arms trade offsets*

If a \$3 billion dollar offset requires me to undertake offset investments in country A, I obviously will not invest wherever else I might have invested, such as in country B. Third-parties will lose. Thus many authors argue that by encouraging bilateralism, mandatory offsets undermine international free-trade agreements. Indeed, for this very reason the WTO Agreement on Government Procurement expressly forbids offsets in government procurement although exceptions are granted to developing countries and, in article 23, further exceptions are granted on account of reasons pertaining to national security and public health. The agreement is “plurilateral,” meaning that not all WTO members have acceded to, and are therefore not bound by, its provisions (see <http://www.wto.org/>).

**Are arms trade offsets economically efficient?**

My third question asks about the evidence. The evidence is weak (and weak evidence should not be taken to support the case for offsets). Anecdotes abound, but case studies are few, and none are comprehensive in the sense of an economic audit that would assess

all costs and all benefits to all people.<sup>8</sup> Consider the following points. First, there is evidence that the US loses some military jobs on account of arms trade offset agreements with highly industrialized countries such as the Netherlands and Switzerland (Dirksen, 1998; Markowski, 1998). The Swiss and the Dutch nonetheless exercise careful control over the specification of arms trade offset agreements to ensure the precise direction into which offset-resources are steered. Almost never are they aimed at increasing indigenous military production capacity. Contrast this to the case of Spain, which had to abandon dreams of an integrated, comprehensive, indigenous arms industry to be generated via arms trade offsets (Molas-Gallart, 1998). The evidence further suggests that offsets are tiered: developed countries (such as the aforementioned Switzerland and the Netherlands but also the UK and Germany) are able to demand and usefully link offsets to their own military industries. In contrast, so-called newly industrialized countries, NICs, tend to demand and integrate offsets more into non-military industries, and LDCs on the whole integrate into non-military industries (US GAO, 1996; also see Matthews, 2002, p. 197).

Second, after fifty years of substantial offset trade, and after the arms trade and offset hubris of the 1980s, why would—the odd exception notwithstanding—this general observation, that DCs tend to negotiate direct arms trade offsets and LDCs tend to negotiate indirect offsets, obtain? An answer is found in Brauer (1991; 2000). In empirical work he found an almost one-to-one correspondence between a country's potential to produce arms and its actual arms production. He further found that it is not actual arms production that creates the potential, but that the potential permits actual arms production. A country's arms production potential depends on the state of its human and physical capital. What the limited empirical evidence of the offsets literature suggests is that it ties in to Brauer's findings. As a group, developing nations do not possess the requisite capital, neither to engage in arms production nor arms coproduction, and that technology transfer and training do not transfer this capital in a self-sustaining manner. These capabilities apparently cannot be imported; they need to be grown indigenously.<sup>9</sup> Why won't the vaunted technology transfer be self-sustainable? Because the transferring country does not simply stand still while its "beautiful princess" (Williamson, 1983) is shipped abroad and effective competition is created. Instead, the exporting country will further develop its technological prowess, once more leaving the receiving country behind.<sup>10</sup>

Third, even indirect (non-military industry) offsets do not necessarily benefit the importing country. Consider the argument that arms trade offsets conserve scarce foreign currency reserves. A simple example shows why this argument is incorrect. If South Africa sells \$1 worth of mangoes to the US, South Africa's US dollar reserves increase by \$1. If South Africa buys \$5 worth of American apple pie, its US dollar reserves fall by \$5. The net foreign exchange cost to South Africa is \$4. Now suppose that there is an offset deal by which South Africa pays the Americans \$4, instead of \$5, for their apple pie but requires them to sell the mangoes on its behalf in the US market. The Americans get \$4 directly and another \$1 from the mangoes South Africa ships to the US for the Americans to sell there. Thus, the Americans ultimately get their \$5 (although at extra cost since they are not in the mango business which they will need to learn). To South Africa, the net foreign exchange cost is still \$4, namely the \$4 it paid for the apple pie and the mangoes it shipped but did not sell. More formally, an arms trade offset "operation allows a country to import without having to spend foreign exchange but does

not allow it to obtain any from the world market either" (Miramon, 1985, p. 27). Indirect offsets are an attempt to shove non-competitive product onto the world market, thereby betraying the underlying economic inefficiency.

Fourth, suppose the receiving country argues that an offset does not displace trade but generates genuinely new, additional trade. It can be shown that this is wrong, too. Consider this example: suppose South Africa agrees to purchase military items from the EU to the value of R30 billion with a 100 percent offset requirement. The EU contractors agree to find someone willing and able to import R30 billion of South African agricultural products (fruit, juice, wine). From the EUs point of view this is a trade displacement, say from Chilean fruit, juice, and wine suppliers to South African suppliers. In another year, however, suppose that Chile signs an offset contract of equivalent value, requiring the EU to purchase Chilean fruit, juice, and wine. Again, this must result in trade displacement, this time perhaps against the continuation of the South Africa fruit, juice, and wine exports to the EU. The lesson to be learned is that for offsets to carry a genuine economic impact, world demand for the underlying products must be increased. But world demand for commercial product is hurt, not helped, by extra military expenditure. Offsets do not offer additional trade: they merely displace it and probably destroy some of it. In addition, Miramon argues that it is "hardly to the advantage of the developing countries to hand over the responsibility for marketing their...goods to foreign trading partners ...for whom this is a secondary activity" (1985, p. 27).

Fifth, what about offsetting physical investment in the receiving country? I mentioned previously that technology transfer offsets provide an opportunity to dispose of technology that is on the verge of being outdated. Offset receiving countries recognize this and can partially protect themselves if they negotiate buyback deals (which obligates the technology exporting country to buy back product made with the transferred technology). Still, an outdated technology combined with low-cost labor might make a buyback deal attractive to the offset offering firm. Alternatively, even if I buy back competitively made product, at some point in time the offset agreement ends, and unless the receiving country has the ability to sustain the momentum, it will fall behind again (which is an implicit argument in Brauer, 1991; 2000). Another line of critique would ask how those unfamiliar with the transferred technology can properly evaluate what they receive? Or perhaps the US does transfer up-to-date technology but counts on being able to consistently outpace its own transferred technology (see Sperling, Louscher, and Salomone, 1995, p. 296).<sup>11</sup> To those who would sing the praises of offset-related technology transfer, it should at least give pause that the US technology lead is widening, not narrowing.

Sixth, it is at times demonstrated that the offset granting exporting firm can benefit by locating competent subcontractors in the offset receiving country. For example, offset consultants Redlich and Miscavage conducted a meeting that brought together various divisions of a major US prime contractor with potential Israeli business partners. The consultants concluded that although "the seminar was obviously connected to the client's offset interests in Israel, it was conducted with the interest of finding business opportunities that the company would want to pursue regardless of any offset credit they might receive" (1996, p. 403). From an economic point of view, what the prime contractor should have done anyway as part of its due diligence obligation toward

shareholders cannot be credited as benefits due to offsets. Likewise, any Israeli business thus generated cannot be credited to the offset deal either since, again, it is business that should have taken place anyway if they had submitted to due diligence in the market place as well.

### **What, if anything, should be done about arms trade offsets?**

My fourth question asks what, if anything, should be done about arms trade offsets. I make a single general point, in three parts. First, if the underlying issue is economic development and growth, the developed countries would do best simply to open up protected markets (see also Miramon, 1985). Legions of people are opposed to what is nebulously referred to as “globalization,” but in my view the greater scandal by far is that a few EU and US farmers are subsidized to the tune of hundreds of billions of dollars a year, sheltered within “non-globalized,” protected home markets, even as millions of peasants around the globe could substantially benefit from an open world agricultural market that would spark a production and export boom in the poor countries. As usual, the problem is not the presence but the absence of free, private, competitive markets. If the issue is economic development, the developing countries should press their counterparts in the West much harder on this issue (instead of on arms trade offsets).

Second, I believe that each country needs an *arms trade offset audit team* whose task it would be to measure the full economic cost of each proposed deal. This is based on the notion that where public funds are expended, costs and benefits should be publicly accounted for. Just as private companies need to account to their shareholders and have their accounts audited and certified to fairly represent the company’s affairs, so public accounts likewise need auditing. The offset audit team should certify that the full economic costs and benefits have been accounted for and publish the details for public inspection. The public-at-large can then decide whether the losses or profits are worth the original objective. There is no need to (or danger of) revealing military and trade secrets. After all, what type of equipment a/o services are to be imported is widely known and reported in the trade press. But especially in countries where external security threats are minuscule and where it can reasonably be argued that there are severe non-military related public needs, such as in the areas of education, housing, and health, elected governments owe it to their constituents to weigh the full economic cost and benefit with special care.<sup>12</sup>

Third, economics is about the material and immaterial well-being of all people.<sup>13</sup> By training, economists cannot but look with great unease at analyses that are limited to one or the other interest group (labor unions, employers, one country). Economists are global public servants. An economic valuation of arms trade offsets must therefore ultimately ask what the contract contributes to the lives of the people that finance it. And it must ask this question not only with regard to the flow-back of funds (the offset part of the deal) but also, and especially, with regard to the out-flow of funds—the arms deal itself. And so I squarely question the notion that developing countries need to import major weapon systems in the first place. The proportion of violent conflict within and among developing nations in which major weapon systems played an important role is small. We know that most wars are small-arms wars and that most killings occur on account of dismissively

labeled “small” arms. We must therefore question that imports of major weapon platforms and weapon systems enhance the security status of the importer. We cannot simply take the stance, as Hall and Markowski do, that once “the objectives of defence procurement have been agreed,” the only question is if “an offset requirement [is] an efficient means of pursuing them” (1994, p. 176). Public choice theory teaches us that there can be no simple presumption that the objectives of defense procurement have been agreed nor, indeed, that the objectives of defense itself have been agreed—and yet public funds are expended.<sup>14</sup> My call for offset audits would go a long way to ask and answer exactly what sort of security purchases a country really wishes to commit itself to. It may yet find that there are plenty of feasible, viable alternatives to imports of major weapon platforms and systems.

And from the exporter’s side, the ultimate question also is not in terms of pure economics, but in terms of political economy, normative even: should arms and arms technology be transferred? As Hartung points out, the US faced its own weapons “the last five times the US has sent significant numbers of troops into combat” (1996, p. 3). This echoes Ann Markusen’s statement, as a member of the US Presidential Offset Commission, that the commission should make “the national security issue a central feature of its work and conduct hearings in which experts on arms trade proliferation and the contribution of offsets thereto are asked to testify” (Markusen, 2001).

## Notes

I thank Mr. Matthias Spoerle for research assistance.

1. This particular list is taken, mostly, from Neuman, 1985, tables 1 and 2. She strives to bring some conceptual order to these terms. For similar efforts, see e.g., Korth, 1987, chapter 1, and Martin, 1996, chapter 2.
2. See, e.g., Matthews (2002) and Martin (1996, chapters 1 and 2).
3. Markowski and Hall (2004) and Taylor (2004).
4. With reference to year-2000 revenue, *Fortune* magazine ranked Boeing as number 16 on its well-known Fortune-100 list ([www.fortune.com](http://www.fortune.com); accessed 16 August 2002). The country GDP is from the World Bank ([www.worldbank.org](http://www.worldbank.org); accessed 16 August 2002) and refers to year-2000 GDP. Company sales volume and country GDP are not of course directly comparable (one is revenue, the other is value-added) but does suggest an order of magnitude. On this measure, Wal-Mart’s \$220 billion sales (*Fortune*’s #1 ranked company) would rank #20 in the world-GDP list, ahead of Turkey’s GDP of \$199 billion, and nearly twice as much as South Africa’s GDP of \$125 billion.
5. On the transaction cost approach, see Taylor (2000) and Taylor (2004; chapter 2 in this book).
6. See Sköns, 2004; chapter 10 in this book.
7. Later, an amendment of the Security Assistance Act of 1999 established a US Presidential Commission to examine the offsets trade. See Sen. Feingold’s statement before the US Presidential Commission on Offsets in International Trade (2001).
8. See Sköns, 2004, for an exception regarding an offset audit in Sweden (1995) and one in Finland (1999).
9. This, apparently, is now recognized in South Africa as well (see Dunne, 2003).
10. Again, there are of course individual instances of effective competition being created by transferred technology. But individual instances do not appear to have accumulated to systemic change. And, again, the economic fact of the matter is that if technology transfer

- leads to more efficient component production, that should have been done in any case, even in the absence of offsets.
11. This is worth quoting: "The supplier nation can follow one of three strategies: seek to suppress the rate of technological diffusion; seek to ensure the development of technological innovation at a constant rate outrunning the rate of diffusion or imitation; or seek to control innovations."
  12. See Glewwe (2002) for a review article on the returns to education in developing countries.
  13. See Frey and Stutzer (2002) for a review article on happiness.
  14. As so often when it comes to military expenditure or military affairs, I find that governments are unduly impressed by those who would ask it for information. When government expends public funds, it ought to welcome—as a matter of routine—opportunities to have its actions examined and audited, especially by disinterested professionals.

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