3
Mandatory defense offsets—conceptual foundations

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Introduction

In this chapter we seek to lay conceptual foundations to achieve a clearer understanding of the potential for mandated defense offsets to generate economic and/or defense-strategic benefits for the countries that use them. Mandated offsets may include forms of countertrade, local content arrangements, and bundling. We focus on the operation of a hypothetical Defense Procurement Agency (DPA) in a representative country and assume that it needs to fulfill a given set of requirements for the purchase of military equipment.

In an earlier paper, we defined defense offsets as "compensatory procurement arrangements designed to offset the cost of purchasing defense equipment from overseas by means of a reciprocal (countertrade) commitment by suppliers in support of a purchaser's domestic economy" (Hall and Markowski, 1996, p. 289). We emphasized that these compensatory procurement arrangements are mandated by the government of the importing country in that they apply to either all imported government purchases or to imports by the DPA. We also argued that "offsets-type requirements are often normal contracting arrangements between businesses," as in many commercial transactions "a given purchase or sale is contingent on tied purchase or sale of other products. In that sense, offsets are an aspect of the normal transactional reciprocity between willing buyers and sellers" (p. 308). Transactional reciprocity is thus not peculiar to defense or other government imports.

Literature

Over the past 25 years, a growing literature has focused on barter exchange, countertrade, and the bundling of transactions in domestic and export markets. Bundling transactions refer to counterpurchase, compensation trade, and buyback arrangements that involve goods-for-goods rather than goods-for-money exchanges. Perhaps awkward but common, such forms of transacting business occur in many institutional environments whether faced with shortages of a suitable medium of exchange or not (Mirus and Yeung, 2001). Package enhancements added to the purchase of another product are common (e.g., "buy a telephone subscription plan and get a 'free' mobile phone"). Unlike earlier forms of bundled transactions that emerged in environments lacking suitable monetary media of exchange, the in-kind transactions of the 1970s and 1980s were mediated by convertible (hard) currencies (Mirus and Yeung, 2001).

In a recent literature survey Mirus and Yeung (2001) observe that an "intriguing feature common to barter, counterpurchase, and buyback is 'bundling': the exchanges of goods and services are bundled together [while] in normal market transactions buying and selling of goods and services is unbundled, an arrangement made possible by the use of money and the 'market' as an institution" (p. 363). Mirus and Yeung use the following definitions (2001, p. xii):

> *barter:* the direct exchange of goods and services, completed in a short period of time;
>
> *counterpurchase:* an intertemporal exchange of goods and services, bundling transactions into current buying and future selling; and
>
> *buyback:* a capital-good exporter accepts part or full payment in the form of output produced with the equipment it has sold.

An interesting issue discussed in the countertrade literature is this: when and why would commercial importers adopt seemingly awkward bundling strategies and under what circumstances would commercial exporters agree to do business on that basis? In some cases, the bundling of transactions by commercial buyers and sellers can be shown to be advantageous to private firms in terms of well-defined commercial objectives. If entering into such arrangements undermines the achievement of these objectives, it can only be because traders were ill-informed or subject to misperception.

Mirus and Yeung defined offsets as a form of bundling, i.e., as "requirements placed on exporters by the importer or importing country to produce part of the product, or source parts, or to assemble the product in the importing country" (1993, pp. 412–413). But then they exclude offsets from further discussion. Offsets, they argue, are characterized by "a different analytical content and less often involve an implicit contractual relationship between trading firms" (p. 413). Although Mirus and Yeung narrowed the scope of offset requirements to buyback arrangements, they are right about a distinguishing characteristic of offsets: bundling requirements are trade restrictions imposed on the exporter by the importing *country*. Thus, government offset requirements exclude private bundling deals adopted by commercial importers and exporters. Instead, they arise from restrictive (protectionist) trade policies adopted by importing countries for either strategic defense reasons (defense offsets) or for economic reasons (civil offsets).

Offsets requirements, especially defense offsets, involve addressing a mixture of objectives. Lack of clarity as to what is to be achieved by their use is a key problem in evaluation exercises. Whereas commercial buyers are assumed to be driven by economic self-interest, it is unclear what net benefits will accrue to whom by a policy that mandates public agencies to require some form of defense offsets from sellers of military items. Normally, the DPA is charged with applying offset requirements. The possible arrangements reduce, we argue, to three basic categories:

> *countertrade:* the arms importing country makes a purchase of required goods conditional on a reciprocal (offsetting) sale of local products worth an agreed fraction of the value of the imported equipment. In effect, the seller undertakes to arrange a reciprocal purchase of goods and services

from the buyer, e.g., to buy from a list of exportable products that has been prepared by the buyer; a special case of countertrade is *local content requirement* the buyer makes its purchase conditional on the seller's commitment to source an agreed portion of the contract value in the buyer's territory (buyback). Use may be made of existing local suppliers through subcontracting and licensed production, or new production facilities may be set up through foreign direct investment, joint ventures, and coproduction arrangements;[1] and

the *bundling of requirements:* the buyer ties its purchase decision to the *supply* of other, related or unrelated, products. Such products may be goods or services that the vendor would not otherwise be willing to offer this particular purchaser, or products that the buyer seeks to have supplied for less than the current market price (or free of charge). Examples include technology transfers, training, through-life support, and marketing assistance.

All forms of offsets arrangements involve reciprocity but there are distinctions in the nature of the transactions. Countertrade, if applied to products that were previously only traded domestically, amounts to export creation. Local content requirements induce import substitution. And bundling of requirements influences the quantity and composition of a country's imports of goods and services. Offset arrangements can of course involve a mixture of all three categories.

In the remainder of this chapter we discuss the three types of offsets in turn, ignoring mixtures.

Countertrade

To understand what drives countertrade we compare a countertrade transaction with trade under unencumbered conditions and examine the net benefits to each party. Consider figure 3.1 where country X (the arms buyer) offers to import a weapon system a from an arms supplier in country Y (the arms seller) who recognizes that X will require it to comply with an offset demand that obliges Y to import goods from X. Those goods are represented as a good b, which Y would have the freedom to resell in international markets—and normally would. To meet the policy objectives of X, the obligated exports of b must be a "new activity," i.e., additional to exports of b from X that would otherwise have occurred. In line with the usual institutional arrangements, exports of product b are expressed as a percentage of the value of the weapon system purchased by X. Usually, these additional exports of b are viewed by X as "paying for" (offsetting) at least some of the arms imports.

In the absence of countertrade, X is assumed to require a quantity q_a of weapons at price p_a per unit (not shown in figure 3.1) which, in principle, may be higher or lower than the price paid under countertrade, p^*_a. Y would then obtain revenue $p_a q_a$ from the sale. Normally, offset guidelines do not allow Y to charge a higher price when an offset requirement is imposed by X. However, complex customer-tailored

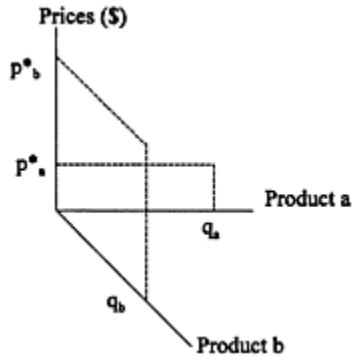

Figure 3.1: Countertrade

products such as weapon systems do not have observable market prices like simple homogenous ("textbook") commodities. It is in the nature of complex weapon deals that there is no unique market price p_a with which p^*_a can be unambiguously compared. X cannot therefore know with certainty how much of the cost to Y of engaging in mandatory countertrade is reflected in the price p^*_a it pays. This makes it difficult for X to be sure that Y has not padded the weapons price—in the sense of charging more than the minimum it required to sell the arms to X in the absence of an offset demand.

If the countertrade transaction proceeds, Y delivers qa for revenue of $p^*_a q_a$ but will have to purchase from X $\alpha(p^*_a q_a)$ of product b, where a is the percentage value of counterpurchase obligated under the mandatory offset scheme. (The parameter α can be equal to, or smaller or greater, than one. In figure 3.1, it is assumed that a> 1, i.e., a more than 100 percent offset value.) Thus, $\alpha(p^*_a q_a)=p^*_b q_b$, where q_b is the quantity of b that Y must purchase at an average price p^*_b to satisfy the offset requirement. For the offset deal to be struck, it must also produce a satisfactory return for key stakeholders in Y.

In the unlikely case that the on-selling of imports of b is particularly lucrative for Y, the offsets deal yields more profit than unencumbered trade. (It would have to be shown, however, why X would have used Y as an intermediary and did not export b directly.) If Y is fully aware of this profit-making opportunity in advance, it might even reduce the price of a, p^*_a, to secure the offset deal. The pricing strategy adopted by Y depends on its market power vis-à-vis X (see below). Suppose, however, that Y anticipates merely breaking even, or even making a loss on the resale of b. In such cases, Y would proceed with the arms-offset deal only if p^*_a were high enough to compensate it for losses from the resale of b.

As a general rule, we conclude that Y is unlikely to be hurt by the offset requirement. It would only consent to it if it expected the two components of the countertrade package together to produce satisfactory returns for key stakeholders, i.e., if p^*_a is high enough to compensate them for losses from the resale of b. If it could not achieve that, it could always walk away from the deal. Alternatively, Y may accept offset obligations but fail to honor them. While the DPA may protect its interests by designing incentive contracts that penalize offset default, such contracts are difficult to enforce.

We now consider the buyer side of the mandated countertrade transaction. In the absence of offsets, X would import q_a at p_a per unit paying paqa in total and sell product b

as an export in the world market. If X had sufficient monopsony power it could seek in its dealings with Y a deep price discount on arms, or a package enhancement, or a combination of the two. It makes economic sense for X to mandate a countertrade requirement only if (a) it believes that it has a degree of market (monopsony) power relative to the arms seller, and (b) it also believes that it is more advantageous to it to use its perceived market power by tying additional exports of b to the import of a. If X's perception were correct, it could negotiate a price discount which could be used to promote (or subsidize) exports of other goods and services. In most cases, X will not have such market power and will therefore be poorly placed to extract any meaningful concessions from Y.

If X has no market power vis-à-vis Y, it will not be able to prevent Y setting p^*_a at whatever level is required by Y to make the entire deal at least minimally worthwhile. If Y is a monopolist, X's offset demand will be ignored or the cost of meeting it factored fully into p^*_a. Since X has no market power, its threat to walk away from Y's offer would not induce Y to lower the price or accept the countertrade demand. If, in contrast, X does have significant market power vis-à-vis Y, the puzzle is why it would restrict its freedom to use it as flexibly as possible. This is what happens when it operates a *mandatory* scheme requiring a *fixed* proportion a of arms imports to be offset through countertrade (with an associated "no-price padding" demand that suppliers may well not comply with). A mandatory scheme *might* achieve as good an outcome for X as an unencumbered competitive tender—but that would be a coincidence. Well-informed negotiators using market power intelligently and flexibly to negotiate price discounts and/or package enhancements should be able to outperform a mandatory scheme most of the time.

In a special case of barter exchange, offset guidelines demand a simple swap of q_a for q_b. For example, intra-COMECON trade provided countless examples of such goods-for-goods exchanges. However, even Soviet bloc countries used a reference currency (US$ or "convertible roubles") to agree on the value of such swaps. In some cases, countertrade requirements may involve part-barter-part-monetary exchange, in which X's countertrade demands may require Y to accept currency for a portion of the value of the weapon system and a quantity of good b for the remainder. Complete (or partial) barter exchange is a special use of defense offset requirements as most offset demanders expect money to be used as a medium of exchange. In the past, these types of countertrade were largely associated with the intra-communist bloc trade and thus applied to military deliveries arranged between members of the Warsaw Pact.

Local content

Under mandatory *local content requirements*, a form of countertrade, the primary demand for arms is combined with a secondary demand for in-country production, related or unrelated to the primary requirement. Normally, this involves the foreign arms supplier (prime contractor) to source at least some of its inputs (usually related to the arms package) from local producers. Alternatively, new production capabilities may be formed in-country through foreign direct investment or joint ventures.

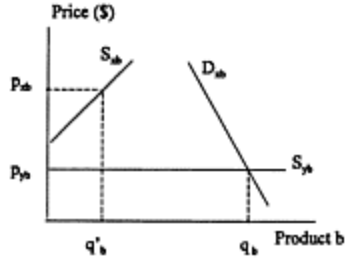

Figure 3.2: Local content

Although local content is a variant of countertrade, as the dominant type of offset requirement applied in practice, it is treated here as a distinct category.

In figure 3.1, the DP A seeks to combine the primary requirement for q_a with a secondary requirement for q_b of product b, which is now defined as a component of weapon system a. A local content target, set as a percentage of the total value of the arms requirement, must be achieved if a supplier is to be successful in tendering for the primary arms contract. Thus, $p_bq_b/p^*_aq_a=\beta$, where β is the percentage local content target. Note that β may exceed 100 percent if the local producer of b supplies large quantities over long periods of time so that, in present-value terms, $p_bq_b>p^*_aq_a$.

In the absence of mandatory offsets, the DPA would seek to source supplies at the lowest price for the required quantity and quality. However, it would include a local content requirement if there were defense strategic reasons to support industry activities. If suppliers knew that b could be produced competitively in X, it might be assumed that they would arrange for local sourcing of b and no price premium should be necessary to achieve the local content target. But suppliers might not be aware of the competitive potential of local producers or may be reluctant to restructure their supply chains and bear the associated cost. To win the contract, the prime contractor would have to make the appropriate sourcing arrangements but cost premiums would be incurred if local production were not world competitive or new capability had to be created.

With a high local content target, the overseas prime contractor would have to include uncompetitive local subcontractors in its supply chain. Consider figure 3.2, where D_{xb} shows a prime contractor's demand for b that is to be integrated into q_a as required by country X. The price p_{yb} is the price of b if it were sourced from a world competitive supplier in country Y, and S_{yb} is the corresponding supply schedule for fully imported b. Product b can also be produced in X, at a higher cost than pyb, and S_{xb} is the domestic supply schedule.

In a normal competitive market, the prime contractor would import the entire requirement, q_b. But under a mandatory local content requirement, the prime contractor is obliged to source b in country X to the value of $\beta(p^*_aq_a)$. The cost of meeting the local content requirement depends on the position and slope of the domestic supply curve, S_{xb}. For example, in figure 3.2, if the achieved local content is q'_b at a (local) price p_{xb}, the imported quantity is q_b—q'_b with the *average* cost of local and imported supplies increasing above pyt,. The price premium associated with offset-induced import substitution will be large, approaching p_{xb}—p_{yb}, if the overseas contractor exercises market power and applies the high local price, p_{xb}, to the imported content of the

transaction. In small countries, the domestic supply schedule is likely to be relatively inelastic and close to the vertical axis as there are not many defense-capable subcontractors. Thus substantial premiums will need to be paid to attract high-cost (less efficient) domestic subcontractors into the supply chain. When local content requirements are substantial and mandated, prime contractors can usually be expected to factor in any associated higher costs and raise their bid price (for a), p^*_a, accordingly. Alternatively, overseas suppliers may renege on their offset promises. This is likely to happen when price premiums for local content are not allowed under the offset guidelines and prime suppliers have significant market power. In any case, foreign prime contractors always retain the option to reject transactions involving offset obligations if the deal would become unprofitable by meeting them.

Arms importers with enough market power to reduce arms sellers' profits may achieve that using normal procurement mechanisms (competitive tenders) rather than mandatory offsets requirements. As we argued earlier, if the DPA has market power vis-à-vis suppliers, the application of mandatory offsets—here in the form of local content requirements—deprives it of a degree of freedom in negotiations to achieve optimal outcomes.

Is there any reason, from X's standpoint, to apply *mandatory* local content requirements? In small countries, governments often argue that local producers are *potentially* world competitive but have had no opportunity to break into the supply chains of international prime contractors. In terms of figure 3.2, policy makers believe that the true local supply schedule is positioned (or could easily shift) below S_{xb}, so that local content could potentially be obtained at prices not higher than pyb. They also believe that foreign prime contractors are unaware of the true potential of local suppliers; that the primes falsely regard S_{xb} as the true domestic supply schedule. Local content requirements are argued to be addressing an information imperfection and expected to result in import substitution at no extra cost. However, similar outcomes could be achieved through normal competitive tendering if the DPA combined its primary requirement for imported weapons with a specific local content demand that the successful contractor would have to comply with.

Policymakers also argue that production set up under local content requirements will offer lasting benefits beyond the completion of the initial contract. But if local suppliers are uncompetitive or only just competitive, the diversion of trade to local sources is likely to be discontinued once the procurement transaction is completed. Since many nations use arms procurement to force relocation of footloose elements in global supply chains, local sourcing is likely to cease unless there is a reasonable prospect of the international prime winning further work in the host economy.

Bundling

Next we consider mandatory *bundling of requirements*. In figure 3.3, country X requires qa, which could be supplied by a firm from country Y at a price p_a, expressed in a common convertible currency. X's demand and Y's supply are shown as D_a and S_a, respectively. To simplify, assume as before the requirement for a to be fixed. Under its mandatory offset scheme, X requires a to be supplied jointly, by the same

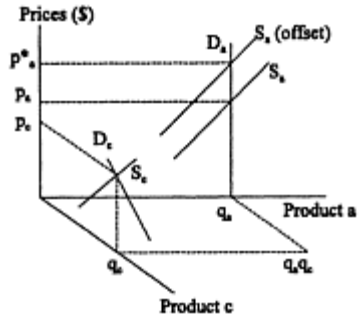

Figure 3.3: Bundling

vendor, with another product c. This requirement is shown on a second horizontal axis, orthogonal to the first. Normally, q_c would be available at price p_c, given X's demand schedule, D_c, and the supply schedule, S_c. The combined requirement for products a and c is shown by the coordinates of q_aq_c in the horizontal (product-product) plane. For country X, the combined cost of sourcing qa equals $p_aq_a+p_cq_c$. The supplier of the joint requirement need not be the producer of c. The vendor is simply the package integrator on the supply side.

X expects the benefits of bundling, equivalent in value to a certain proportion of the primary requirement, $\chi(p^*_aq_a)$, to be achieved at no extra cost to itself. (As before, the parameter χ can be equal to or smaller or greater than one.) Thus, in figure 3.3, q_c is to be supplied as an offset jointly with product a but at no extra cost ($p_c=0$) so that the combined cost to X of the bundle q_aq_c should be no greater than the cost of buying a only, p_aq_a. This assumes that either the marginal cost of supplying c is zero—an untenable assumption—or that the purchaser has enough market power to force the supplier to use profits made on product a to cross-subsidize the unprofitable delivery of package enhancement c. If the marginal cost of supplying c is positive and the buyer has no market power relative to the supplier, the vendor is almost certain to factor expected offset demands into its offer price for product a. In figure 3.3, the price of a would then be raised to p^*_a so that the buyer pays the full price for product c.

As with countertrade, suppliers are unlikely to be hurt by mandatory bundling arrangements as they can walk away from such transactions if they do not believe them to be profitable. Some arms suppliers may accept offset obligations with no intention of discharging them later.

What is the reason, from X' s standpoint, for bundling the requirements together? First, some products are characterized by *strong technical complementarity*, i.e., components must be combined to produce a system that works. In this case a and c must be combined to form the complex product ac. Such components may be sourced from different producers, possibly from different countries. The package provider (system integrator or prime contractor) is responsible for combining them. Second, there may be scope-related efficiencies. On the demand side for example, the buyer may bundle different requirements to lower the administrative cost of contracting them out and in the belief that such scope-related efficiencies will be achieved by large, diversified contractors. In figure 3.3, the buyer may believe that a diversified supplier combining

delivery of a and c into bundle q_aq_c can lower the cost below $(p_aq_a)+(p_cq_c)$ and will pass on cost efficiencies in the form of a lower offer price. But as in the previous cases, X does not need a *mandatory* bundling requirement to achieve this outcome. Demands for the combined delivery of two or more products may easily be incorporated in normal tender specifications.

Mandatory offset demands are less likely to achieve efficient outcomes as they do not refer to the *specific* additional requirements that should *best* be bundled with the primary ones. Invariably, they are defined in terms of nominal dollar amounts calculated as percentages of arms imports and refer to some vaguely specified package enhancements: technology transfers, training, or other broadly-defined products *deemed* without further valuation to be of benefit to the purchaser *(direct offset)* or, even more vaguely, to society at large *(indirect offset)*. If there are no complementarities between the offsets and the primary requirements, the purchaser may have been better off sourcing the two requirements separately from different vendors. If the arms supplier has no competitive advantage in bundling additional offsets with arms deliverables, it will unavoidably be more costly for it to include offsets in its offer and, under a mandatory offset scheme, these costs will be anticipated at the time the arms supplier makes its offer to X. In some cases, the DPA may have market power to limit price-raising by suppliers. If it does, the DPA might be better off by buying the two products separately and using its bargaining power to secure price cuts in each.

The problem with mandatory bundling requirements is not the bundling of requirements *per se*, which may be optimal when specified and negotiated with precision. Since *any* package enhancement that meets the nominal target calculated as a percentage of arms imports is deemed to be of *equal* benefit, it is the *untargeted* nature of bundling-based offset demands which may prevent the achievement of optimal outcomes. This is often combined with a naive belief that such package enhancements can be extracted from suppliers at no cost.

Conclusion

Why do governments, despite all the doubts about the efficacy and social usefulness of such policies, persist with mandatory, broadly targeted offsets rather than leaving DPAs to negotiate specific offsets on a case-by-case basis when advantageous? At the least, governments must lack confidence in the negotiating and market scoping skills of their procurement agencies. If an agency has market power to counter the monopolistic power of large international prime contractors, it should be able to use it effectively with or without offset obligations. If it lacks such power, the application of mandatory offsets will not provide the benefits it seeks.[2]

Individual countries may argue that since everyone else insists on offsets, international suppliers price them in as a matter of course—so they should demand offsets themselves as they are paying for them anyway. Against this, buyers with any market power at all can negotiate price discounts as easily as package enhancements—and their preference for offsets remains to be explained.

On the face of it, government procurement agencies seeking to engage suppliers under offset schemes are doing nothing different from normal market operators attempting to

exercise market power in their best interests. But when such reciprocal arrangements take the form of *mandatory* offset requirements, and the buyers become "so inflexible that they *insist* on an 'in kind' package enhancement (rather than an equivalent or greater price discount), their behaviour undermines their own best interests by restricting their options" (Hall and Markowski, 1996, p. 309). When offset requirements are bureaucratically mandated and applied broadly to some vaguely specified national interest (e.g., employment, foreign currency savings, or technology transfer), it is difficult to evaluate the net benefits that may or may not exist.

Notes

The authors are most grateful to Jurgen Brauer for many insightful comments on an earlier version of the chapter.

1. As the term "local content" suggests, offsets arrangements are normally applied to foreign vendors while local prime contractors are exempt from such offsetting requirements. But the distinction between foreign and local may be difficult to apply in practice. The prime contractor may, for example, be a local subsidiary of a multinational firm. The prime may also be a local system integrator that imports a significant proportion of its inputs.
2. Offset obligations are normally met *after* a defense contract has been signed and—usually—after delivery of the arms or weapon system has taken place, or at least commenced. (The main exceptions are offset credits which may result from contracts completed earlier.) This means there is scope for suppliers to promise offsets before the contract is signed but then to renege on their obligations later, or offer less value than the purchaser had been led to expect. Given the difficulty involved in pursuing a large, overseas contractor and the costs of enforcing a contract, purchaser governments are often exposed to risk when incorporating offsets in a deal that they would avoid if the transaction were an unencumbered money payment for a weapon system. On this topic, see Taylor (2004).

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