

**A STRATEGY FOR FIRMS FACING OFFSET OBLIGATIONS:
THE CASE OF MARYLAND**

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ABSTRACT. Offsets are contracts that require the seller to provide extra benefits to the purchasing government's economy as a condition for the sale of goods and services. The federal government of the United States does not have an offset policy for procurement. Nor does it intervene in private markets where U.S. firms often face steep offset obligations. Although there have been calls for unilateral government intervention, the U.S. is currently engaged in multilateral discussions with other industrialized nations aimed at reducing or limiting offset bids. The reality in most of the relevant markets is that buyers command significant bargaining power and multilateral talks are likely to fail. This paper offers another approach for firms (in any country) facing offset requirements and presents a case study from the state of Maryland (USA) that demonstrates how cooperation between local firms and the state government can reduce the offset burden at a surprisingly small marginal cost. The case study provides micro-level data and follows several transactions from the initial negotiation stage through offset fulfillment. The analysis details the costs and benefits of this strategy, and the requirements for such a program to be successfully implemented.

INTRODUCTION

Offsets are contracts that require the foreign seller to provide extra benefits to the purchasing government's economy as a condition for the sale of goods and services. The contract is most common in international

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public procurement of big-ticket items. Offsets are the norm in defense, aerospace, telecommunications, and other high technology industries where the U.S. has comparative advantage and sizeable market shares. For example, in 1991 AT&T included an offset in its bid to sell a communications network to Saudi Arabia. AT&T agreed to fulfill the offset obligation by transferring related technology to Saudia firms and establishing a joint venture in the country (Matthews, 1996, p. 250).

The federal government of the United States does not require nor encourage foreign sellers to include offsets with their bids in procurement.¹ The U.S. opposes offsets because “such type of managed trade practices represent a direct government intervention in the marketplace” (Verzariu, 2000, p. 1). The government views offsets as an inefficient, trade-distorting, non-tariff barrier (NTB) that reduces world welfare.²

The implication of this policy stance is two-fold. First, when the U.S. government purchases goods from another country it may bargain for price discounts, not offsets. Second, U.S. companies facing steep offset obligations must fulfill their contractual obligations without assistance from the government. The government will neither intervene nor sign a memorandum guaranteeing the firms’ obligations. In the 1970s, the Department of Defense found itself in the uncomfortable (and costly) position of backing defense firms’ offset commitments. A directive from the Department of Defense known as the Duncan Memorandum ended this policy in 1978.³

Instead of administering a countervailing offset strategy of its own, the government has opted for multilateral discussions with other industrialized nations. The aim of these discussions is to encourage large sellers to reduce or limit offset bids. This is akin to an unstable cartel with different sized members attempting to reduce output. The oligopolistic competition of the aforementioned high technology markets means that such multilateral efforts are likely to fail.

In a buyer’s market, sellers use offsets to differentiate their product “off the price margin.” A transaction that is conducted (at least partially) off the price margin means that a purchasing decision includes other factors not solely pertaining to the price and specifications of the good in

question. The experience and large size of the firms selling high technology goods provide significant unit cost advantages. This induces many new entrants to offer other benefits--often non-monetary--in their bids to win the contract. The defense industry is a good example of this phenomenon because research and development (R&D) and learning curve effects are particularly important. Table 1 lists the largest 15 defense firms according to revenue and their country of origin. Four of the world's top six companies are American. Superior technology and learning curve effects account for much of the U.S. dominance in this industry.

Market exchange promotes competition in terms of price and quality. In addition to price and quality, firms now compete for contracts by offering the best offset packages. Plainly, offsets add a third dimension -- bundled content-- to the exchange. The third dimension enables less efficient firms to compete off the price margin. Entrant firms—typically operating at a unit cost disadvantage compared to incumbents—thus have incentive to leave the price margin by offering offsets in the bidding process. This is why the U.S. Commerce Department's recent efforts to coordinate a seller response are unlikely to bear fruit.⁴ The major sellers of high tech goods are competing in an imperfectly competitive environment. The sellers play a Prisoner's Dilemma game and the Nash equilibrium strategy is to incorporate substantial offsets in the bid.

What, if anything, can be done to assist U.S. suppliers and their subcontractors facing large offset obligations? In the ensuing pages, this question is addressed. In the first section, this article describes the oligopoly market for offsets in procurement and present the Prisoner's Dilemma game to examine seller interdependence. It is clear that governments must choose between a passive or active policy. The passive policy accepts the notion of offsets as a cost of doing business in world markets, but also sees them as opportunities for new penetration. The active policy uses state governments to countervail offsets through their own procurement policies. In the second part of the article, active policy is examined with a case study of Maryland, the first state to formally employ offsets in the U.S. The article concludes with several predictions for the offset industry and suggestions for future research.

TABLE 1
Largest Defense Firms of the World, 2001 (in Millions of U.S. \$)

Company	Core Competences	1999 Rank	2000 Defense Revenue	% of Total Revenue from Defense
1. Lockheed-Martin (U.S.)	a,c,de,it,mu,mo,ps,sp,si	1	18,000.0	71.1%
2. Boeing Co. (U.S.)	a,c,de,h,it,mu,m,o,sp,si	2	17,000.0	33.1%
3. Raytheon Co. (U.S.)	c,de,it,mu,m,o,sp,si	4	14,033.0	83.1%
4. British Aerospace (UK)	a,ar,c,de,it,mu,m,nv,o,ps,sp,si	3	13,247.5	72.0%
5. General Dynamics Corp. (U.S.)	av,c,de,it,mu,nv,o,ps,sp,si	5	6,542.0	63.2%
6. Northrop Grumman (U.S.)*	a,c,de,it,mu,nv,sp,si	7	5,600.0	73.5%
7. EADS (France)	a,m,sp,ps,de,nv,e,h,c,mu	6	4,559.8	20.0%
8. Thales (France)	ar,c,de,it,mu,m,nv,o,ps,si	8	4,261.5	57.5%
9. United Technologies Corp. (U.S.)	sp,e,h,mu	10	4,130.0	15.5%
10. TRW Inc. (U.S.)	a,c,de,e,h,it,mu,m,ps,sp,si	9	3,000.0	23.3%

Legends: a = aircraft; ar = artillery; av = armored vehicles; c = communications; cs = computer services; de = defense electronics; e = engines; h = helicopters; it = information technology; m = missiles; mu = maintenance and upgrades; nv = naval vessels; o = ordnance; ps = professional services si = systems integration; sp = space systems; t = trucks; na = not available; nr = not ranked

Source: www.defensenews.com (2002), "2001 Defense News Top 100."

* In 2002, Northrop Grumman acquired TRW Inc., the tenth ranked company on this list.

OLIGOPOLISTIC COMPETITION

One strategy to lessen the burden of offset obligations on U.S. firms has been to engage other industrialized countries in multilateral discussions. The U.S. Commerce Department has met with European Union officials to convince their high technology sellers to reduce or limit offset offers. The rationale is that if most of the major technology sellers in the U.S. and Europe refuse to include large offset packages in their bids to governments, the sellers will enjoy windfall profits and slow the dissemination of core technologies. The Commerce Department's efforts to curtail offsets are making no headway and this author is skeptical of any progress in the future. To understand why there is such resistance to reducing offset bids, we need to consider the market structure for high technology procurement.

Offsets arise partly because the government is a large buyer. Leveraging its market power, the government may select price discounts, offsets, or a combination of the two. Flamm (1997, p. 41) agrees: "Explicit restrictions and a government-run approval process for foreign investment, technology agreements, and access to local markets can be used . . . to increase the bargaining power of domestic players vis à vis foreign interests." This is particularly the case in high technology markets, where price often exceeds long-run marginal and average cost.

The government, then, is appropriating some of the rents⁵ that sellers usually accrue from research and development (R&D) and core competences. Differences in core competences, technology, and R&D are most apparent in high technology products where imitation is difficult. In competitive markets, price equals long run marginal cost and average cost, so there are no rents to extract. Offsets needlessly add extra costs with few, if any, benefits for the purchasing government in this market structure.

It is therefore not surprising that the defense, aerospace, telecommunications, and information technology industries face the largest share of offset requirements in government procurement.⁶ The firms in these industries compete in an oligopolistic setting. On the demand side, there are a relatively small number of buyers. In the market for the most sophisticated and costly aerospace goods, for

example, there are fewer than twenty buyers. This gives significant market power to the small number of purchasing governments (oligopsony). The buyer's market in government procurement, coupled with the strategic interdependence of a small number of high technology sellers, creates a bilateral oligopoly market for offsets.

A simple Prisoner's Dilemma game can shed light on the bilateral oligopoly for offsets. Consider a market for advanced fighter jets. Lockheed-Martin's (LM) F-16 and the European consortium's (EC) Eurofighter 2000 dominate this market. LM is the larger of the two and enjoys a slightly lower average cost of production from scale economies. We assume that other competitors—principally Boeing (USA) and British Aerospace (UK)—behave the same as EC.

The cost advantages enjoyed by LM allow it to sell its product at a lower price than EC, *ceteris paribus*. Although highly differentiated in operation, most buyers perceive the quality and performance of the jets to be similar. Therefore, price competition usually determines the relative market shares in this industry where the output of several firms is substitutable.

Now suppose that governments announce that they will select LM or EC based on price *and the content of the offset package*. Most governments today mandate offsets as part of the procurement contract. In fact, several governments explicitly state in their procurement guidelines that (assuming quality is the same) the offset package is more important than the price variable in evaluating bids.⁷

If the offset bids are the same, we expect LM to capture a greater market share than EC because its price is nominally lower. Therefore, in the payoff matrix of Figure 1, if both LM and EC select a small or large package of offsets, LM gains market share and the corresponding profits.

The non-cooperative Nash equilibrium of this offset game is for both firms to offer large offset packages. Both LM and EC select a large offset package yielding profits of eight and five, respectively. If the firms cooperate by agreeing to offer small offset packages, joint profit will rise.⁸ However, the positive probability of cheating prompts each firm to select the dominant strategy of large offset packages. This is the rationale for the attractive offset packages we see today.

FIGURE 1
Prisoner's Dilemma Game of Offset Competition: Selection of Offset Size (In Billions of Dollars)

		EC	
		Small	Large
LM	Small	10,7	7,8
	Large	12,4	8,5

Note: The first number in each cell refers to LM's profits, and the second number refers to EC's profits.

There is another reason why offset packages are likely to remain large and multilateral efforts to curb offsets will fail. High cost firms will tend to lose market share if they compete with low cost firms solely on price. The high cost firms have incentive to leave the price margin and compete in another dimension. The offset work may require competences that the low cost firm either does not possess or possesses in a less developed state. This is often the case in indirect offset arrangements that obligate the seller to provide work in areas unrelated to the base good. The implication is that a higher cost firm may win the procurement bid if it enjoys a competitive advantage over the low cost firm in the provision of offsets.

Consider the following scenario. A high cost firm lacking the production efficiencies of a low cost firm decides to strengthen its bid with an offset that can assist recipient firms' marketing skills. If the high cost firm's offset package is more attractive and/or cost-effective than the low cost firm, the high cost firm may win the procurement contract. In this case, a firm with superior production efficiency can lose the contract if it does not possess adequate capabilities in areas related or unrelated (e.g. marketing) to the base good. Offsets, then, move the terms of the exchange from price and quality to bundled content. Large offset packages may be the outcome of a conscious

negotiating strategy by higher cost firms to compete against firms that are more efficient.

For these reasons, U.S. government attempts to coordinate a multilateral reduction in offset bids by sellers in industrial countries are unlikely to be successful. In a finite game of high technology transfer, the cooperative strategy of small offset packages is not stable. The U.S.' proposal for multilateral reductions in offset bids is akin to setting a hungry lion loose: the U.S. has the most low cost firms in the high tech industries.⁹ If foreign competitors abandon offsets, the model predicts higher market shares for the U.S. firms. If multilateral talks are not viable, what --if anything-- can the U.S. government do about offset obligations? The next section examines a countervailing strategy for firms facing offset obligations.

MARYLAND CASE STUDY¹⁰

In 1990, following a inquiry from the Westinghouse electric company, Maryland's Department of Business and Economic Development (DBED) created an offset credit program aimed to assist state firms burdened with offset obligations. This government program was the first attempt to use a state's bargaining power in procurement to reduce offset obligations of firms.

The procedure is straightforward. The State of Maryland purchases an average of \$1-2 million worth of foreign goods and services a year. Maryland awards procurement bids on a competitive basis and does not discriminate or apply state tariffs to foreign sellers.¹¹ Not surprisingly, a percentage of the imports originate from countries that require offsets. Each time the State buys goods or services from a firm in an offset-mandating country, there is an opportunity to bank offset credits. The following example demonstrates precisely how the offset credits are banked and then transferred.

From time to time, the University of Maryland purchases high tech scientific equipment from foreign firms. During the first quarter of 1994, for instance, the University's Department of Procurement and Supply purchased the following (University of Maryland, 1994):

- *AS/SE analysis system*, from Questron Corporation in England, worth \$33,200;
- *Software for electron sources*, from Munro's Electron Beam Software, Ltd. in England, worth \$20,000;
- *Stopped flow reaction analyzer*, from Applied Photophysics in the UK, worth \$54,070; and
- *Simulator and Controller*, from Diversified Education System in France, worth \$32,490.

Maryland is a state university that receives funding from the government. Therefore, any university purchase of above \$10,000 in value qualifies as government procurement is subject to the DBED offset credit program.¹² In this case, the University of Maryland purchased \$139,760 worth of high technology goods from foreign companies. In offset parlance, we would say the State has now banked \$139,760 worth of offset credits that may or may not ultimately be transferred to a private firm in Maryland.

Subsequently, if (1) a Maryland firm has offset obligations with a foreign government, and (2) the State of Maryland has accumulated offset credits through the purchase of goods and services from the same foreign country, the credits may be transferable to the Maryland firm.

To qualify for credit transfer from the State, the Maryland firm must satisfy two conditions. First, the firm needs to approach the foreign offset agency and receive prior approval. Second, the firm must operate in, and contribute to the economy of Maryland. The firm must demonstrate how the assistance from the State will save local jobs and labor hours, and any other benefits the state will receive. If the firm satisfies both conditions, *it may receive offset credits at no cost*. Immediately following the credit transfer from the State, the firm should use the credits to fulfill part or all of its obligations to the foreign government. This reduces the value of the offset debt that a private firm may have accumulated as a result of selling goods and services to foreign governments.¹³

The fixed and variable costs of the offset program are surprisingly small. The State neither purchased any capital equipment (computers,

database software and so forth) nor required more building space to run the program. The variable (administrative) costs to the State of maintaining the program are nominal. In fact, one person is largely responsible for maintaining the Maryland program. Each week Len Elenowitz, director of the offset credit program, scours the procurement publication, *Contract Weekly*, searching for State purchases from firms in offset-mandating countries. If Elenowitz comes across such a purchase, he records the sales data and contacts the state official involved in the procurement. This costs Elenowitz an average of 20 minutes per week.¹⁴

What about the cost to Maryland companies wishing to participate in the offset credit program? Again, the benefits seem to outweigh the costs. As mentioned earlier, the firm pays no explicit fee for the credits. The costs incurred by the firm are *ex ante* administrative work (proposals and paperwork for the State of Maryland) and the transaction costs of negotiating with the foreign offset entity.¹⁵ The alleged *coup de grace* is that the foreign offset agency usually accepts the credit transfer from the State of Maryland to fulfill the offset obligation.

What's wrong with this picture? It appears the companies and the State have nothing to lose and everything to gain. Economists are keenly aware, however, that there is no free lunch. Several concerns immediately come to mind. First, the offset credit program can affect the welfare of the domestic economy at large and the rest of the world. Put differently, is the policy an efficient response to offset obligations incurred by state firms? One can make the argument that the Maryland offset program is simply a cloaked beggar-thy-neighbor initiative that induces foreign countries to increase offset demands.

Moreover, if Maryland's program is cost-effective and a net benefit for the state economy, why haven't other states followed suit? States with large defense industries have the most to gain from the program. California, Texas, Connecticut and New York inquired about the program, but at the time of this writing none of these states had implemented the policy.

Birth of Maryland's Offset Program

Westinghouse, a large electrical company based in Maryland, approached the state in 1989 to discuss the idea of transferring offset credits. Active in both the civil and defense markets abroad, Westinghouse owed millions of dollars in offset obligations to France. These obligations were derived from Westinghouse's relationship with Boeing Aerospace. The Westinghouse Electronic Systems Group supplies electronic components for Boeing's AWACS system. Boeing asked Westinghouse to cover a portion of its offset obligations to France (Patalon, 1990). It is not uncommon for prime contractors (Boeing) to pass on offset obligations to its subcontractors (Westinghouse).

Shortly before broaching the topic with the State's DBED, Westinghouse witnessed one of the largest foreign procurements by Maryland on record. In a well-publicized bidding process, France's Aerospatiale won a contract to supply the state of Maryland with a fleet of Medivac helicopters worth approximately \$50 million.

Ken Kurns, head of the offset division at Westinghouse, noted the sizeable amount of money involved in the procurement. In his mind, here were millions of dollars spent by a U.S. entity (the State) that increased economic activity in France --precisely the aim of the offset obligations burdening his company. The argument he presented to the DBED was that the State had accumulated potentially valuable credits through its foreign purchases. Kurns asked Maryland to "create an asset from an existing resource that has no value [the state purchases]" (Elenowitz, 1992).

Elenowitz investigated the costs of running such an operation. Discovering that the marginal cost was low and there was almost no fixed cost, he went straight to the legislature. Elenowitz explained that the cost of the program was nominal with a great potential for statewide economic benefits. The most significant cost of the program, Elenowitz contended, would be start-up costs and the opportunity cost of his time. After introducing the State of Maryland's purchasing authorities to the notification procedure, the program would incur minimal marginal costs.¹⁶ The legislature quickly granted the DBED the authority to transfer credits to state firms facing offset obligations. The DBED

proceeded to transfer \$39.9 million of credits to Westinghouse. This meant that Westinghouse's offset obligations to France would fall by a portion of the \$39.9 million. The exact amount subtracted from Westinghouse's obligations would depend on whether the French government would exchange a dollar of offset credits for a dollar of offset obligations.

The governor of Maryland trumpeted the program as a creative approach to international competition that promoted the economic vitality of the state. Indeed, the offset program is politically attractive. The story goes something like this. Offset obligations often require the U.S. prime contractor to establish subcontracts with foreign firms to produce components and subsystems. These obligations divert workloads away from Maryland subcontractors and to foreign offset recipients. The Maryland program, the Governor claimed, would reduce offset obligations.

One American electronics subcontractor described the impact of offsets on his business: "[We] lost contract opportunity to supply exterior lights on a new transport aircraft. We were best in price and technical proposal but the manufacturer of the aircraft chose to place the contract in the country [of the purchasing government to fulfill an offset]" (U.S. Commerce Department, 1997, p. 67). A manufacturer of precision gears commented that "[the U.S. prime contractor] is one of my biggest accounts. They have had an offset program with Spain sending gear work there that I normally would have seen" (U.S. Commerce Department, 1997, p. 68).¹⁷ A U.S. Commerce Department survey (1997) generally supports this claim. The survey found that while offsets do not appear to hurt prime contractors, there is evidence that they negatively impact subcontractors.

The Maryland offset program simply transfers credits (from government purchases of foreign products) to state firms, thereby reducing the offset burden. The governor hailed the program as a job saver with other economic benefits. Westinghouse received approval for the credit transfer from the French offset authority because the helicopter purchase by the State of Maryland constituted high value-added countertrade. Offset agencies are usually selective about the type of work that will fulfill obligations; in this case, helicopters pass the litmus

test because of the high value-added resource requirements of production. Westinghouse was able to lower its offset obligations by \$25 million in indirect offsets. In practical terms, this means that Westinghouse is no longer obligated to buy \$25 million worth of products from French companies.

The French did not approve the entire \$39.9 million for two reasons. First, \$10 million of the \$50 million helicopter value derived from parts originating outside of France. Second, the French offset authority rejected \$4.9 million because Maryland had purchased part of the helicopter fleet from Aerospatiale one year *before* the formation of the program. Nevertheless, the benefits of the program clearly outweighed the costs for Westinghouse.

Structure of the Maryland Offset Credit Program

Firms seeking offset credits must provide the following information to the DBED:

- Indication of whether the firm is a prime contractor or a subcontractor in regards to the foreign government's base procurement;
- The name of the foreign country with which the Maryland firm has offset obligations and its contact information;
- The estimated value of the offset obligation;
- The estimated number of jobs created or saved thanks to the offset credit transfer from the State of Maryland;
- The estimated value of wages and salaries paid to resources in Maryland from the calculation of the number of jobs created;
- The proposed economic benefit to the state, in addition to job creation and retention; and
- The cash payment to the state government, if any.¹⁸ (*DEED/DBR-MCEP*, 1993, pp. 2-3).

The DBED assigns offset credits to one or multiple firms at its discretion. As the social welfare planner of the economy, the DBED

looks to maximize the net benefits for the state. An evaluation committee from the DBED convenes annually to consider proposals from Maryland firms burdened with offset obligations. The committee's decision to accept or reject a firm's proposal depends on three primary considerations.

1. *Fiscal impact.* The estimated capital investment in Maryland due to the initial sale to the foreign government that triggered offsets. In addition, the DBED reviews the estimated wages and salaries that the sale should generate, and any cash transfer from the firm to the state government.
2. *Employment impact.* The number and quality of jobs created or retained by Maryland due to the sale that incurred offsets.
3. *Other economic benefits.* Companies have contributed to the state's economic vitality in many ways. For example, some firms open summer teaching institutes to increase educational opportunities for children in Maryland. One such firm promotes environmental awareness; another started a tree planting campaign. Under this campaign, a different employee of the firm planted a new tree each day for a given period.

In general, if a state houses a number of multinational enterprises that sell to foreign governments, the bidding for offset credits will be competitive. At the limit, we can expect such bidding to capitalize all rents the firms may enjoy in imperfectly competitive markets. The interaction of demand and supply will determine the equilibrium price (cash transfers or in-kind benefits to the state as mentioned above) of the credits. Supply is a function of the total value of Maryland's international procurement, and to what extent the State's purchases will count towards offset credit.

The Finnish Case

In 1991, the State of Maryland aided Westinghouse again. Westinghouse's parent contractor, General Dynamics, was bidding with several other multinational corporations to supply Finland with advanced fighter aircraft.¹⁹ The winning bid would differentiate itself from the price margin with an offset package. Since a number of jobs at

Westinghouse depended on this contract, Westinghouse approached the State inquiring whether Maryland purchased any high technology goods from Finland.

The answer was no, but the State might still be able to influence Finland's purchasing decision. Westinghouse believed that if it could leverage the State's buying power to assist Finnish firms, General Dynamics-Westinghouse could win the bid to supply Finland with aircraft. Westinghouse proposed to serve as an information broker between the Maryland procurement office and Finnish firms, and the DBED agreed to help.

Westinghouse facilitated an information exchange between the State procurement agency and a collection of high technology Finnish firms. Westinghouse convinced the State procurement agency to place these Finnish firms on the list for future bidding. In addition, high technology Finnish firms received important market information about Maryland's procurement --namely, what the state government is buying and when the bidding is taking place.

Note that the State simply added the Finnish firms to the bidding list without any promise to buy a single good. According to Elenowitz, the State did not alter its policy of competitive bidding. Nevertheless, the offset work of Westinghouse benefited all parties in this instance. The arrangement reduced transaction costs in procurement by improving information channels. Before the birth of the offset credit program, neither the state government nor the Finnish firms were aware of the buying and selling opportunities.

Although the Finnish firms did not obtain guaranteed contracts for work from the State of Maryland, Westinghouse's actions certainly increased the probability of future sales. Meanwhile, Westinghouse (General Dynamics) strengthened its bid to supply the F-16 jets by serving as an information broker for Finland. The next section addresses the critical issue of additionality, something that usually determines whether a foreign offset agency will accept or reject a credit transfer.

Demonstrating Additionality

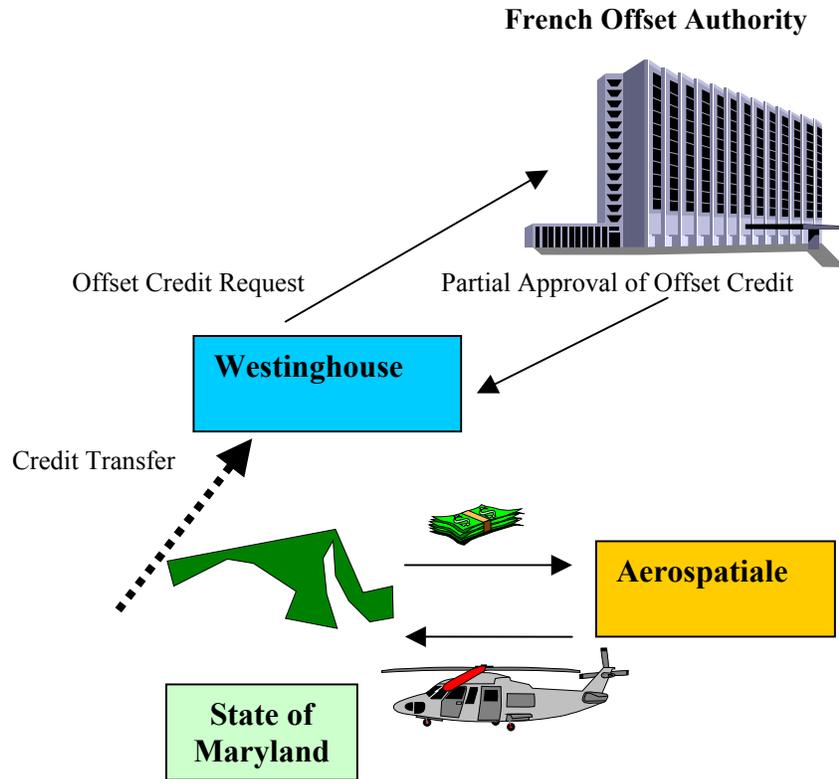
The cases examined above illustrate two distinct models of economic interaction. In the first case, the State of Maryland purchased the Medivac helicopters from Aerospatiale in a competitive bidding process. Westinghouse, the recipient of the offset credits, did not influence the State's purchasing decision. In the second case, Westinghouse did play a role in bringing the buyer (the State) and sellers (the Finnish firms) together.

Offset obligations require the seller to transfer some form of economic activity to the purchasing government's economy. There is, however, another clause in most offset arrangements. To receive credits towards the obligation, it is incumbent upon the seller to show that its actions *caused* new benefits for the purchasing economy that were not otherwise available. The offset agency will reject credit transfer if it determines that the seller did not show *causality*—or “additionality” as it is known in the literature.²⁰ Put differently, serendipitous profit growth of offset recipient firms that the foreign offset authority can trace to favorable exogenous changes will not satisfy the offset requirement.

In the Aerospatiale helicopter sale to the State of Maryland, Westinghouse did not demonstrate additionality. Westinghouse did not generate or transfer any economic activity to France. Rather, Aerospatiale won the contract to supply helicopters because its bid was the most competitive. In the strict interpretation of offset agreements, there was no causality from Westinghouse, despite the credit approval from the French offset authority. Figure 2 depicts this exchange.

The French offset authority's acceptance of the \$25 million credits is worth questioning. Absent of additionality, why would it accept the credit transfer when Westinghouse had no apparent bargaining power? Most likely, the French viewed the situation as a repeated game with the State of Maryland, and feared reprisal in the form of lost future income streams. Perhaps the French believed that Maryland might change its competitive bidding policy to the detriment of French exporters.²¹ An executive at Aerospatiale clearly intimated that maintaining a good relationship with the State of Maryland was more important than the

FIGURE 2
Westinghouse Fails to Satisfy the Additionality Condition



credit transfer. The executive added, “What we [Aerospatiale] would like to do is sell more helicopters to the State of Maryland, so, if this kind of program would encourage more sales, we would be all for it” (Anonymous, 1989, p. 2). In spite of this approval, the theoretical support for granting offset credit in this context is tenuous.

The Westinghouse-Finland case does exhibit a degree of additionality. Westinghouse helped to create new information channels

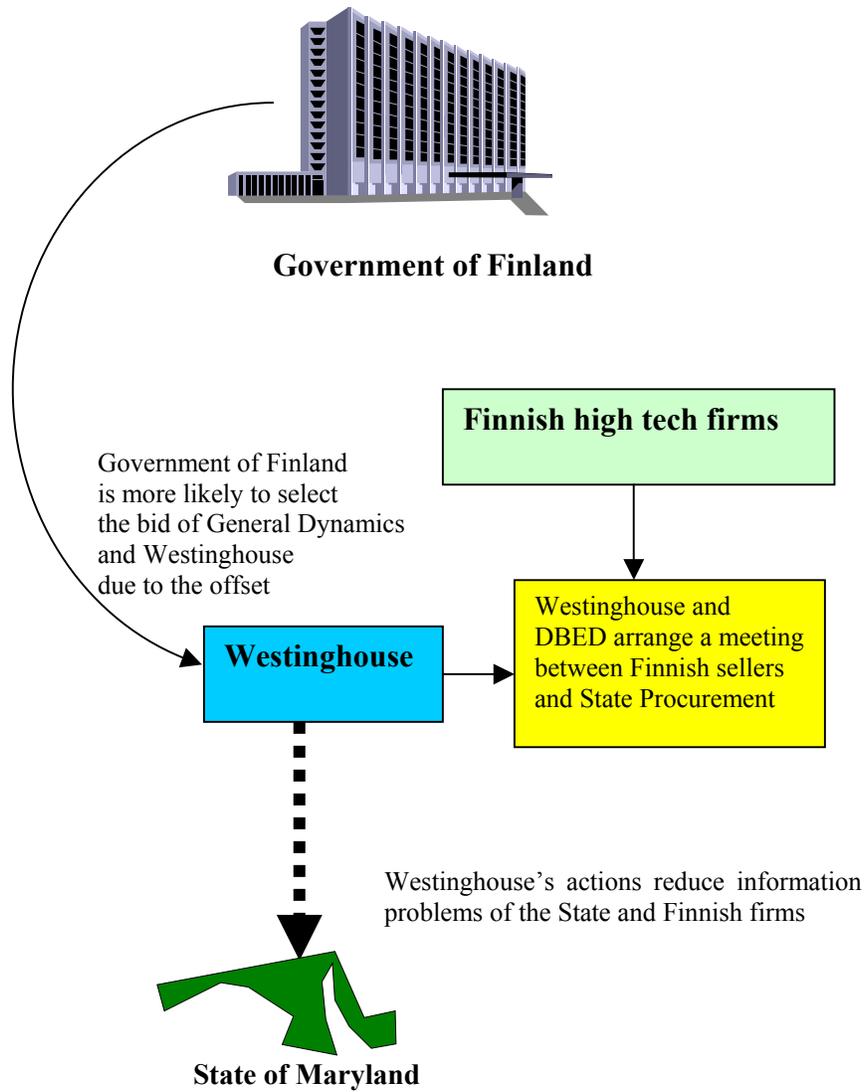
between Finland and the State of Maryland, thereby expanding the opportunity set for Finnish firms. Consider the counterfactual if Westinghouse had not approached the State. It is likely that the information barriers impeding communication between Finnish firms and the State would have remained in place for some time. In the short run, without the brokering efforts of Westinghouse, the Finnish firms were unlikely to be aware of all the selling opportunities with the State. Hence, under this scenario Westinghouse clearly demonstrated some degree of additionality (see Figure 3).

Welfare Effects of the Maryland Offset Credit Program

If the offset credit program is acceptable to the foreign offset authority and does not prompt retaliatory action, the program stands to increase U.S. welfare. In this scenario, the State transfers credits that reduce the firm's offset obligations dollar for dollar. The reduction of offset obligations decreases the firm's total cost of production, and may protect subcontractor work in Maryland. A necessary condition for the positive welfare effect to hold concerns the State's bid acceptance policy. The State can attempt to transfer as few or many credits as it likes, so long as it maintains a competitive bidding policy in procurement. The government should select the bid based on price and quality competition, not favoritism from offsets. If the State alters its competitive bidding policy in procurement to accommodate the Maryland firm's offset requirements, the welfare effect is ambiguous.

The fixed and variable costs of the program are usually less than the expected benefits of the credit transfer, and the transaction costs will fall in the long run. The transaction costs of the program arise from search activity (initially locating the state entities that purchase foreign goods—especially high technology), bargaining (when U.S. sellers must demonstrate causality and seek approval of the credit transfer from the offset authority), and *ex post* monitoring (the state government's annual review of the offset credit program and the appraisal of the credit recipient's efforts to help the Maryland economy).

FIGURE 3
Westinghouse Satisfies the Additionality Condition



The countries may incur welfare losses if the exchange environment deteriorates due to the program. There are two strands to this argument. First, foreign offset authorities may accept the credit transfer, but then retaliate by raising its offset demands by an equivalent percentage. This is a source of concern because the foreign offset authority has incentive to cross-subsidize in markets where it has purchasing power, as opposed to interfering with firms' day-to-day business.

Second, the Maryland program may (unintentionally) promote bilateralism and increase inefficient barter-style exchange. Barter usually leads to a requirement that trade must balance every period. If each purchase by the State is subject to a trade-balancing restriction, the countries cannot reap the gains from exchange and specialization.

Thus far, foreign governments have accepted most of Maryland's proposed credit transfers. This fact begs the following question: if foreign offset authorities generally accept the credit transfers, should the State transfer credits for all categories of goods and services? High technology equipment, professional exchanges, training sessions, and helicopters all qualify as Maryland purchases that are consistent with the reported aims of offset programs. Most--though not all--offset programs require the foreign seller to transfer technology or provide training in some capacity. The recent trend has been toward high technology joint ventures or subcontracting to generate employment in high value-added industries. It seems that such a policy would preclude Maryland credit transfers for low tech goods.

According to Elenowitz, however, Maryland now records all purchases from foreign sellers in hopes of transferring offset credits. For example, in 1991 Maryland bought rock and solar salt from Peru, Mexico, and Tunisia for over \$9.5 million (DBED, 1991).²² Fruits, tuna fish, metal, and birth control products are examples of other low tech goods the State imported that are subject to the offset credit program.

CONCLUSION AND PREDICTIONS

The Maryland offset credit program is a creative--if not mercantilist--attempt to minimize the labor displacement offsets may cause to a

handful of Maryland firms. Unless the U.S. firm can demonstrate causality in directing the State to purchase goods or services from the foreign country, the Maryland offset credit program is theoretically vacuous. Nevertheless, in practice the bargaining power of the State may be sufficient to overcome any theoretical shortcomings. Furthermore, the oligopoly analysis from section one shows that the credit program is more likely to bear fruit than multilateral efforts to reduce or limit offset bids among sellers. The efficacy of the program hinges on the value of offset credits the State can accumulate, the types of goods and services (high or low tech) the State purchases, and the reaction function of the foreign offset authority (e.g., does the foreign offset authority retaliate with higher offset demands?).

The Maryland case teaches us something about the State purchasing entity: size does matter. For large states with sizeable defense and information technology industries, the offset credit program is worth a try. As a small state, Maryland imports only \$1-2 million of goods per year, which limits the size and number of credit transfers it can provide. The multi-million dollar helicopter purchase was an exception, although large-scale purchases do occur every few years.²³ If the expected benefits of the credit transfer are to exceed the new transaction costs incurred by a Maryland firm, the State must maintain some minimum offset credit account. This, of course, requires the State to import a given amount of goods—particularly high tech—each year. Many firms with offset obligations have elected not to participate in the offset credit program; evidently, the expected benefits do not exceed the expected costs in these cases. In other words, either the firm's offset obligations are relatively small and do not warrant the additional costs associated with the program, or the State does not have enough credits to go around.

Since most of Maryland's large purchases occurred in the early 1990s, it is not surprising that the program was most active between 1990 and 1995. Credit transfers tailed off in 1996, and there was no activity in 1998-2000. In addition to the State's small import figures for government procurement, changes in foreign offset demands curtailed other transfers.

Today, governments are designing increasingly sophisticated offset arrangements. The new arrangements are more complete, require

sellers to transfer more capabilities, include penalty clauses for non-compliance, and possess far fewer loopholes than before. A departure from the “best endeavors” approach to offset fulfillment and improved data collection methods raised the rate of return for a given contract.²⁴ The adoption of such measures by foreign offset authorities reduces the likelihood that Maryland’s offset credit program will spread to other states.

The offset credit program may increase or decrease domestic welfare depending largely on the institutional response of the foreign offset authority. If the foreign offset authority accepts the credit transfer and acts as a Cournot duopolist (e.g., doesn’t change the announced offset demands), the credits will reduce the firm’s obligation dollar for dollar. This is particularly beneficial for second- and third-tier subcontractors who face the most competition from offset obligations. Policymakers must evaluate the potential benefits of the program with the costs, including the possibility of long term retaliatory action and beggar-thy-neighbor policies more generally.

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NOTES

1. Some interpret the U.S.’ “Buy America” laws for defense equipment as an implicit 100% offset.
2. As Hall and Markowski (1994), Martin (1996), and Taylor (2001) have shown, however, this view is inaccurate because it ignores intertemporal welfare changes and organizational efficiencies.
3. This was a Department of Defense Memorandum signed by the Secretary of Defense, Charles Duncan on 4 May 1978. Before this memorandum, the DoD acted as a guarantor of an offset obligation

incurred by a U.S. firm. This policy came to the forefront of debate in Northrop's 1975 sale of F-5 aircraft to Switzerland (Martin, 1996). Northrop was slow in fulfilling its offset obligations to Switzerland, and thus by law the DoD needed to either pay the outstanding balance to Switzerland, or prod Northrop. The DoD encouraged Northrop to fulfill the offset obligation, and the commitment to Switzerland was eventually achieved. The DoD determined that such government intervention was inefficient, and the ensuing debate led to the Duncan Memorandum.

4. The U.S. Commerce Department serves as the offset watchdog for the government. It collects data on offset transactions of U.S. defense firms. When such transactions exceed \$5,000,000, the defense firm offering the offset is required by law to submit a questionnaire to the U.S. Commerce Department detailing the exchange. This questionnaire, however, is the only real authority that the U.S. government possesses at present. In a recent report, the U.S. Commerce Department (1999, p. ix) appeared to take an unrealistic policy stance in regard to multilateral discussions. The report takes on the following flavor: "In the last year, exploratory discussions were conducted with our international trading partners. These discussions were pursued on a bilateral basis, with the goal of multilateral consultations. The objective of these discussions is to reduce or eliminate offsets. The U.S. Trade Representative (USTR) has requested a working group on offsets with our European Union counterparts.... [The] USTR is awaiting a formal response from the E.U." At the time of this writing (not surprisingly), the USTR is still awaiting a response from the E.U.
5. *Rents* are returns on investment or sales that exceed normal profit.
6. That is not to say that governments do not employ offsets in the procurement of competitive market goods--they do. In fact, many governments operate mandatory offset programs that require *any* government purchase from a foreign seller above some threshold dollar value--frequently \$5 million or less—to include offsets. Such a flagrant subversion of market exchange for competitive goods represents a real cost to the buyer's economy. Taylor (2001) discusses this idea more deeply.

7. The Czech Republic, for example, reportedly places the highest priority on the offset. The winning bid is determined by considering the content of the offset package (60%), and price and technology (40%).
8. Since the offset package is smaller, the price of the bundle will typically fall as well. For this reason, it is unlikely that governments would reduce the quantity demanded. In short, although some governments prefer offsets to price discounts, it is not unrealistic to assume the offset elasticity of demand is less than unity.
9. This is largely attributable to significant scale economies and R&D expenditures in the U.S. that are roughly four times greater than those in Europe.
10. Information about Maryland's procurement policy in this section was obtained from discussions with Mr. Len Elenowitz, director of the Maryland offset program at the DBED (June-September, 1999).
11. The exception is for steel purchases. The State has a pro-U.S. purchasing policy for steel to support Bethlehem Steel and other domestic sellers.
12. The State of Maryland determined the threshold dollar value of \$10,000, and this is subject to change.
13. For an introduction to offset contracting, see Martin (1996). A private company may incur offset obligations as a condition for the sale of goods and services to a foreign government. For example, if Westinghouse sells an advanced fiber optic communication system to the French government, the contract may specify that Westinghouse must also buy \$250,000 worth of goods from those listed French companies.
14. Elenowitz explained that the state of Texas inquired about the program, but ultimately elected not to undertake the program because it perceived the costs to be too high. Texas felt that the offset credit program would require a sophisticated database system. Elenowitz maintains, however, that the administrative burden is so small that computers and database software are not necessary.

15. The transaction costs of fulfilling an offset agreement in a foreign country dwarf the transaction costs associated with the Maryland program.
16. There is no single procurement office in the state government that is responsible for all the purchases. Rather, the separate entities that make purchases (state university system, department of transportation, and so forth) were asked to submit a report each year to the DBED detailing any high technology purchases from non-U.S. firms. The startup costs of the program were the costs of developing this reporting system and explaining the procedure to procurement personnel at these purchasing entities.
17. Most (83% of the firms surveyed), U.S. firms reported that offsets hurt their business. A foreign firm often takes work away from U.S. subcontractors when prime contractors are obligated to generate work for foreign firms. Consider an Australian subcontractor that received offset work from a U.S. prime contractor. Prior to the offset, the prime contractor had employed the services of a U.S. subcontractor. The Australian subcontractor, a manufacturer of on-board aircraft systems, commented on the benefits: "We participated with [a U.S. prime contractor] in an aircraft related Australian offset program. We provided kits for assembly and test of electronic control modules. We benefited by expanding our international business" (U.S. Commerce Department, 1997, p. 68).
18. A cash payment is neither required nor expected. However, a firm may strengthen its bid in some cases with a supplemental cash transfer.
19. The other competition included the French Mirage and a company from Sweden.
20. See, for example, Martin (1996), and Hall and Markowski (1994).
21. According to Elenowitz, the only "buy American" bias for the state of Maryland concerns steel procurement.

22. Maryland buys the salt from a U.S. importers Morton Salt Company and Cargill. Fifty percent of the salt purchased from these companies is from foreign countries. It is the responsibility of the Maryland offset program to ascertain the value of the imports. This task represents only one of several costs (time commitment) of the program.
23. For example, in the early 1990s, the State purchased several mechanical cranes from Japan valued at approximately \$10 million.
24. The *best endeavors* policy refers to a common practice in the 1970s and 1980s. Sellers with offset obligations agreed to do their best to fulfill an offset, but were not held liable if they were not able to locate the firms with requisite capabilities to perform the task. Taylor (2001) discusses the advantages and disadvantages of such a policy, and concludes that a best endeavors policy is preferable only in a few cases. Hall and Markowski (1994) use Australian Department of Defence data to show that offset compliance and fulfillment increases when contracts include a penalty clause.

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APPENDIX 1

Maryland Offset Credit Program Application Form for State Firms (1992)

The Maryland Department of Economic and Employment Development invites businesses conducting substantial and significant

economic activity in the State of Maryland (herein after called Maryland businesses) to submit proposals to be awarded for state export offset credits accrued from state purchases from: Belgium, \$103,740.00, Canada, \$99,095.00, France, \$10,056.00, Germany, \$161,490.00, Netherlands, \$17,750.00, United Kingdom, \$461,572.00. The actual amount of export credits will be determined through negotiations between the Maryland company receiving state credits and the foreign government offset authority.

State economic development and procurement policy authorizes the state to reserve the right to assign to any Maryland business the value of export credits derived from state foreign purchases for use in meeting foreign offset requirements by a qualifying Maryland business. The assignment of export credits will be based on an evaluation of economic benefit to be gained by the state by such assignment. It is the responsibility of the business receiving such assignments to negotiate the actual value of credits with foreign government offset authority. However, the state reserves the right to be a party to such negotiations if, in its judgment, such joint negotiations could enhance the acceptance of the state offset assignment.

The information to be included in the proposals is set forth below. Questions about this should be directed to: Mr. Leonard Elenowitz, C.E.D., Division of Business Resources, 217 E. Redwood Street, Baltimore, Maryland 21202.

Name of
Business _____

Address _____

Authorized Contact Person and
Title _____

Telephone _____

FAX
Number _____

Maryland businesses may use authorized export credits to either meet existing offset obligations, or be used as a component of a bid for

contract. Proposals for export offset credits for an existing contract: Applicants must address each point as the decision for assignment of credits will be based on an evaluation of factors which provide for the best interest of the state.

- I. Proposal for export offset credits for support for bidding on proposed contract.
 - a. Indicate whether business is a prime, or subcontractor. If a subcontractor, indicate name and address of prime contractor, and contact person.
 - b. Name of foreign country, and name and address of agency and contact person for offset approval authority.
 - c. Date that Maryland business received the sales contract that incurred the offset obligation.
 - d. Estimated value of the sales contract to the Maryland business facility during the life of the contract.
 - e. Amount of requested state export offset credits which the business seeks.
 - f. Estimated number of jobs to be created, or retained in Maryland due to the sale that incurred offsets during the life of the contract.
 - g. Estimated value of the salaries/wages expended in Maryland due to the sale that incurred offsets during the life of the contract.
 - h. Proposed economic benefit to the state, in addition to job creation or job retention.
 - i. Cash payment to the state, if any.
- II. Indicate any confidential commercial or confidential financial information that the applicant would not want released as public information.
- III. Evaluation Criteria: An evaluation team will be convened to assess responses and to make recommendations to the Secretary. The primary consideration will be to maximize the benefits to Maryland

citizens. Critical factors are: Fiscal impact, Employment impact, and Other economic benefits.

IV. Award of state export credits:

1. Any recommendation made by the Secretary for awarding of export credits is subject to approval by the State Board of Public Works.
2. State export credits may be assigned to one or more Maryland businesses at the state's discretion.

V. The Department reserves the right to extend the deadline for accepting proposals for export credits for an additional sixty (60) days for any of the countries listed above, if an acceptable proposal is not received by the deadline without additional advertisement in the Maryland register.

Businesses interested in receiving future State export credit announcements should file a letter of interest to the program manager.