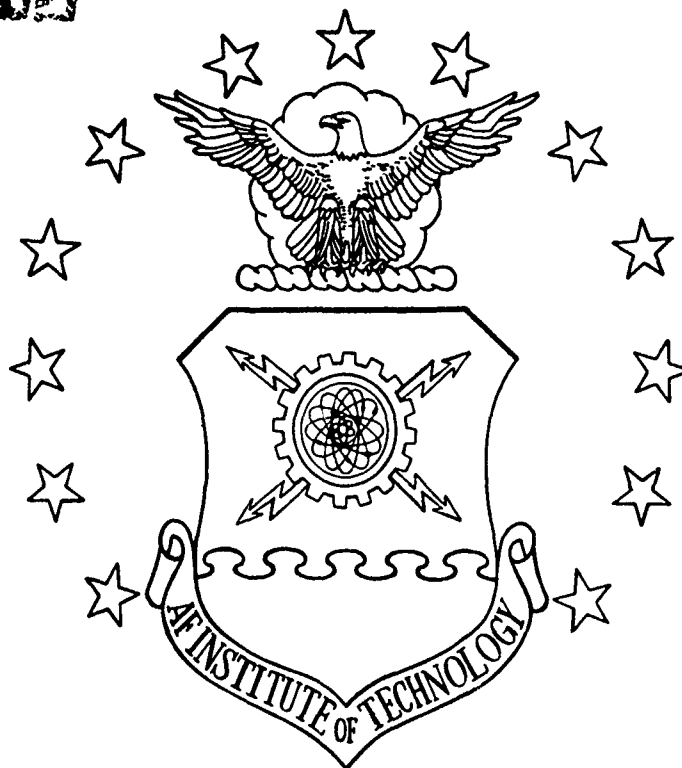


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AN INVESTIGATION INTO THE EFFECTS
WHICH AEROSPACE INDUSTRY OFFSET
TRADE AGREEMENTS HAVE ON UNITED
STATES AIR FORCE MISSION PERFORMANCE

THESIS

Douglas M. Crabb, Captain, USAF

AFIT/GLM/LSM/89S-11

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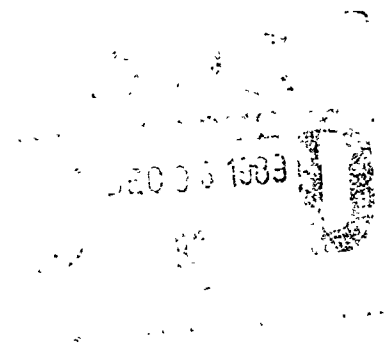
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AN INVESTIGATION INTO THE EFFECTS WHICH AEROSPACE
INDUSTRY OFFSET TRADE AGREEMENTS HAVE ON UNITED
STATES AIR FORCE MISSION PERFORMANCE

THESIS

Presented to the Faculty of the School of Systems and
Logistics of the Air Force Institute of Technology
Air University
In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Logistics Management

Douglas M. Crabb, B.S.

Captain, USAF

September 1989

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Douglas M. Crabb

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Abstract

The purpose of this study was to contribute to the understanding of the subject of aerospace industry offset trade agreements and their effect on USAF mission performance. This study had two objectives: (1) identify those offset effects that might impact USAF mission performance, and (2) describing how these effects could change the ability of the USAF to perform its mission. This thesis did not determine the magnitude of the offset effects, and it did not identify solutions to remedy any negative effects.

Analysis of available literature and responses to research questions revealed that offsets have a wide range of effects on USAF mission performance. While definitive negative and positive effects were identified and validated, it was discovered that the purported impact of certain effects, either negative or positive, was dependent upon the viewer's frame of reference. These perceived effects are at the heart of the government and industry debate over offsets.

This study also found that the debate over the real impact of these perceived effects is greatly confused by the lack of a coordinated U.S. government policy concerning offsets, as well as the absence of a comprehensive centralized database containing offset related data. These findings are disturbing because of the potential magnitude of

the impact which the perceived effects could have on USAF mission performance.

Among the recommendations to correct some of the problems in studying and handling offset agreements was the establishment of a centralized U.S. government offset office charged with studying, and quantifying the impact which offsets have on the United States. This office should also be responsible for recommending policies and actions necessary to correct negative effects while seeking to maximize positive effects.

AN INVESTIGATION INTO THE EFFECTS WHICH AEROSPACE
INDUSTRY OFFSET TRADE AGREEMENTS HAVE ON UNITED
STATES AIR FORCE MISSION PERFORMANCE

I. Introduction

General Issue

Arms producers in the United States are experiencing increased demands for concessions, called offsets, whenever they sell military equipment to foreign governments. In general, an offset is a transaction in which the foreign purchaser requires the seller to perform some service for the purchaser in addition to supplying the product which is the primary subject of the transaction (25:2). This reciprocity beyond that normally associated with the usual market exchange of products is designed to provide the foreign government with an opportunity to recover, or offset, a portion of its investment.

Accompanying this increase in demand for offsets is a growing debate which involves different sectors of the American government along with various manufacturing and labor organizations. The central issue at the heart of this debate is an argument over what effects offsets have on the United States military industrial base and our military forces.

On one side of the issue are those who want to regulate, or even halt, the practice of granting offsets altogether. Meanwhile, on the other side of the issue, there are those who advocate the continuation of offsets as they currently exist.

Opponents of offsets claim that these trade practices have extremely serious negative effects on both the economic and military capabilities of the United States and that action must be taken to control or discontinue them. On the other hand, advocates contend that the benefits brought about by the additional sales which offsets bring far outweigh any negative effects which may result.

Background

Offsets are generally defined as trade agreements associated with the sale of military goods and services wherein the seller must provide some additional service or good above and beyond that normally associated with a straight sale of an item. They usually take the form of one of the following: coproduction, licensed production, subcontractor production, overseas investment, technology transfer, and countertrade (see the glossary at the end of this chapter for a definition of each of these terms).

After WW II, the U.S. gave away weapons to foreign countries through massive aid packages. Our allies needed this aid to rebuild their defenses against the new communist foe, the Soviet Union. These weapons also had to be free

because foreign governments could not pay for the weapons due to the destruction of their economies during the war.

However, as our allies recovered from this situation, and as the world economy improved, the U.S. became less willing to provide such large amounts of aid (46:2).

As a result of this drastic reduction in military aid, foreign governments were forced to find other means of cutting the costs of their defense expenditures. Hence, the increased growth in the demand for offsets.

Originally, offsets, especially coproduction, were designed to help lessen the impact of the growing cost of defense equipment. Countries used offsets to maintain domestic employment, create their own national defense industrial base, acquire modern technology, and assist in their balance of payments. Offsets were viewed as a means to acquire the equipment necessary for defense while also providing a faster avenue to economic development (3:2).

Currently, offsets are so common that many foreign buyers expect offsets as a matter of course. Mr. William B. Forti, a high level manager for a major U.S. aerospace firm, recently stated,

A foreign military sale without an offset is not probable. Today, 100 countries require offsets as a matter of policy or law. (18:3)

Specific examples include Spain which has a law requiring offsets in procuring military equipment, Norway which requires 100 percent offset in all military

purchases, and Australia and Israel, which call for offset percentages of 40 and 25 percent respectively (3:3).

The one hundred countries which currently require offsets represents a dramatic increase over the number that required offsets just fifteen years ago. At that time, only ten countries required offsets, and the amount of the standard offset was usually only between ten and thirty percent of the purchase price of the goods they bought (18).

Further statistical information also indicates that offsets have become a fact of economic life. In the first four years of this decade, \$22.4 billion in U.S. foreign defense sales created \$12.3 billion in offset requirements. During the same period, American arms producers lost an estimated \$1 billion in sales because they did not offer any, or enough, offsets (19:28).

As previously mentioned, foreign buyers expect to benefit by requesting offsets, but why do U.S. arms producers go along with the practice? Most manufacturers would prefer not to give offsets, but they feel pressured into granting them for one major reason, survival.

This reason was explained best by Joel L. Johnson, Vice President of the American League for Exports and Security Assistance, when he said,

The question U.S. companies face in the current competitive international environment is between business with offsets or no business at all; increasing employment by obtaining new contracts with some offset provisions, or maintaining or decreasing employment because of no new foreign business. (25:5)

In simple terms, in today's world environment, if one company is willing to grant an offset to make a sale, all other companies will have to do the same if they wish to remain competitive. If U.S. firms do not keep pace with the competition they will lose market share forcing them to either cut profits or get out of the business. Even though offsets represent a hindrance to the practice of free competition, U.S. companies have realized that they are, however, a necessity in today's global arms market.

While most foreign buyers demand offsets, U.S. companies, however, are not at the mercy of the foreign governments; they do maintain control over what they offer as an offset. Major contractors contend that no reasonable businessperson will sign a contract which does not provide more benefits than losses to their company. Companies are in the business to make a profit, and they will not offer offsets unless they are convinced they are better off with the sale than they would be without it (25:5).

Offset Effects

As foreign governments continue to demand offsets, and U.S. firms are prepared to continue to provide them, the debate over the effects which offsets have on the U.S. continues to grow. While certain effects of offsets are relatively easy to identify and can be categorized as either positive or negative with little, if any, disagreement, the

debate is centered around certain areas where the offset effects cannot be identified and categorized so readily.

The areas where effects are hard to determine are the American industrial base, defense preparedness, employment, and technology transfer. In each these areas, the effects which offsets have are largely perceived effects, which rely of the viewpoint of the individual examining them, to determine if they are positive, negative, both, or neither. Each of these areas and their corresponding arguments are interrelated, so common themes and claims can be found throughout each one.

Industrial Base. Opponents of offsets believe that these concessions increase the competition which foreign companies and governments provide U.S. firms. They state that this increased competition weakens our industrial base by driving American companies out of business. So, as U.S. firms are lost to foreign competition, especially those at the subcontractor level, American industries' ability to support our economy and our military in time of crisis is severely weakened. Without a strong internal industrial base, the U.S. is forced to rely on foreign sources for the items necessary to keep our armed forces mission ready, sources that are not as reliable as internal sources would be in time of international crisis (37:22).

To counter this claim, supporters state that the need for an internal industrial base is obsolete, because the

economies and industrial bases of Western countries are becoming "internationalized". Internationalization is an increasing trend toward business relationships that cross international borders. This is especially true in the aerospace industry where the complexity of the products and the special needs and requirements of the buyers have been the primary motivators for international cooperation and offsets (29:14).

Defense Preparedness. Many opposed to offsets also purport that the defense preparedness of our military forces suffers as a result of the practice of offsets. The essence of their argument is the idea that the more critical defense items sources you have in foreign countries, the harder it will be to protect them and your extended supply routes during wartime. If the United States cannot protect these sources, it will become extremely difficult to ensure the continued availability of the critical items they produce (41:4).

Supporters propose that offsets, to a certain degree, actually strengthen the U.S. defense posture by increasing the standardization of weapons among our allies. This is true to the extent that the sale of existing U.S. weapon systems would not have taken place in the absence of an offset agreement. Standardization helps shorten the American logistics supply line by providing U.S. forces with a source of spare parts and equipment closer to where our forces will

be deployed. It also increases the fighting effectiveness of an allied force because of the interoperability of the common weapon systems found in forces throughout the alliance (62:13).

Department of Defense (DoD) officials also indicate that military sales created by offsets improve the American defense posture. Some claim that the per unit cost of equipment purchased by the U.S. is lowered by the larger production runs that result when additional sales of an item are made to a foreign country. These larger production runs translate into lower fixed costs assigned to each item produced. This lowers the item's per unit cost and increases the buying power of U.S. defense dollars. Increased buying power translates into increased preparedness because the military services are able to fulfill more of their defense needs with the same amount of budgeted dollars (3:4).

Employment. Opponents claim that in the long run, offsets actually reduce the number of jobs for Americans in two ways. First, when major defense contractors sign subcontracting agreements, they let foreign companies produce certain components of the final product. This takes business away from American subcontractors who would normally produce the component for the prime contractor, forcing them to reduce their work force to compensate for the loss of business to foreign firms (46:2).

Secondly, they believe that American jobs are also lost when foreign companies use the technology they gain through technology transfers to compete directly with U.S. companies. One oft cited example is that of a Dutch company, DAF, which is now competing against U.S. firms for new aircraft landing gear contracts using skills and technology gained through a coproduction agreement made with a U.S. aircraft builder (53:111).

Just as major producers claim that offsets reduce American employment, prime contractors which grant offsets are quick to point out the increases in employment which are brought about by the sales generated by offsets. Many claim that the additional sales generated by offsets save thousands of American jobs. Without these sales, prime contractors would face lower production requirements, and management would then have to reduce the number of workers employed by the firm (25:7).

Technology Transfer. Those opposed to offsets have also identified technology transfer as a key factor behind both the reduction in the technological edge which the U.S. has over its enemies, and the erosion of the industrial base. They claim that the important defense related technologies given to foreign countries are not being protected properly. If foreign countries do not safeguard this technology properly, our enemies can easily steal the technology they

need to develop weapons with capabilities that match those of our own (46:10).

Individuals against offsets also attribute part of the decline in the industrial base to the transfer of technology. They explain that foreign companies use the technology they gain through offsets to increase their industrial capabilities so they can compete with American firms. This increased competition takes business away from U.S. interests forcing some to withdraw from the defense market (46:11).

On the other hand, supporters state that by the time a technology is given through an offset, and it is actually employed overseas, the U.S. firm is probably already incorporating a newer and more advanced technology into its own production process. Therefore, the transfer of technology should not have the negative effects put forth by opponents to offsets (25:8).

Supporters also claim that technology transfer is an important tool in strengthening the alliances between the U.S. and its allies. The sharing of technology builds stronger trade ties and contributes to friendlier relations, thus strengthening the bonds between allies as they become more and more interdependent (13:3).

Information Base

Even though the debate over offsets and their effects is intense, very little has actually been proven. Each side of the argument strongly advocates its own particular views and

beliefs. As a result, no definitive answers have been agreed upon as to what effects offsets actually have.

To remedy this situation, the U.S. government has taken steps to increase the information available on the subject. One example is Section 309 of the Defense Production Act Amendments of 1984. This legislation requires the Office of the President to report on the impact which offsets have on defense preparedness, industrial competitiveness, employment, and trade in the United States. It also requests information on the types, terms and magnitude of the offsets.

With the information gathered by these, and other reports, along with the acquired knowledge of individuals working in the field of offsets, it may now be possible to determine specific effects which offsets have on the U.S. military and the industrial base.

The Air Force Mission

The mission of the United States Air Force is to organize, train, and equip aerospace forces to perform offensive and defensive operations with the purpose of defending the United States, deterring aggression, and being ready to conduct warfare to support our national objectives. To accomplish this mission, the USAF will rely on its unique capabilities of responsiveness, mobility, survivability, presence projection, and worldwide destructive firepower delivery (9:3-1).

Specific Problem

Offsets are common throughout the defense industry of the United States, and each military service is affected in different ways. The focus of this research is to analyze information gathered through an extensive literature review and personal interviews with experts in the field to determine what effects offsets have on USAF mission performance.

Scope of the Research

To provide for more in-depth and manageable analysis this research concentrated on the offsets granted by firms in the American aerospace industry. This area was chosen because it is this segment of the military industrial base which has the most evident impact on the United States Air Force.

Specific emphasis was placed on identifying offsets which called for coproduction and/or foreign subcontracts let by major American aerospace firms, and on agreements requiring the transfer of U.S. technology to foreign countries.

Numerous United States Congressional committees, agencies of the Executive Branch, and corporate and private interests have been actively investigating this subject for several years without arriving at a solution to the debate over the overall effect of offsets. To attempt to do what these organizations could not do is beyond the scope of this

thesis. Therefore, this author's sole intent is to contribute to the level of understanding on the subject by identifying the particular offsets and their effects which impact upon the mission performance of the United States Air Force.

Methodology

This research analyzed historical information in conjunction with data gathered through personal interviews to synthesize an index of offsets and their effects which have an impact on USAF mission performance. The framework for conducting this study followed the methods of the historical analysis methodology, and was divided into a four step process.

Step One. This first step, represented in Chapter Two of this work, involved an extensive search for existing literature which contained information on offsets and their effects. This search started with general information concerning the broad subject of offsets in order to provide the researcher with a better understanding of the subject. This general search was followed by a more focused search which concentrated on specific offset practices employed by firms in the United States aerospace industry.

The principal sources of information used for this search were, the Defense Technical Information Center (DTIC), Defense Logistics Studies Information Exchange (DLSIE), and Dialog databases. Further information was gathered from

recorded testimony of Congressional hearings, DoD reports, Air Force studies, and reports from public and private research organizations with interests in the aerospace industry.

Emphasis during this literature review was placed on finding information which dealt with the effects which these offsets have on the United States Air Force. To ensure that the proper emphasis was maintained throughout this lengthy and detailed literature review, the following investigative questions were used as a guide to focus the research effort.

Investigative Questions.

1. What types of offset agreements do U.S. aerospace industries make with foreign countries?
2. What types of offsets have an effect on the American industrial base, the aerospace industries, and the Air Force?
3. Of the offsets which have an effect on the Air Force, how many are there and what type of effect do they have?
4. How many agreements involve technology transfer and what types of technology are being transferred?
5. Would the loss of this technology decrease the technological superiority of the Air Force?
6. What items can only be bought from foreign suppliers because of offset agreements?
7. How important are these items to the Air Force?

8. What would the effect on the Air Force be if these items could not be secured from the foreign suppliers?
9. Does the U.S. military industrial base have the ability to produce these items quickly enough to meet emergency needs should foreign sources be lost?
10. Are U.S. government, Air Force, and industry leaders concerned about offsets and the effects they might have on USAF mission performance? Why or why not?

Step Two. After the initial literature search was conducted, the author developed a sufficient working knowledge of the subject to begin the second step, personal and telephonic interviews with experts in the field of offsets. For the purpose of this research an expert in the field of offsets was considered to be any individual whose duties in an organization require them to deal with the subjects of international trade agreements and/or offsets on a regular basis.

The individuals interviewed during this stage were identified through personal and telephone conversations with individuals in organizations including the United States Department of Commerce, Department of Defense, Congress, General Accounting Office, the Aerospace Industries Association, and other related public and private organizations. Appendix A contains a complete list of all the individuals interviewed during this step.

As with the literature review, the emphasis of this second step was to gather information concerning aerospace industry offsets and their effects on the U.S. Air Force. The same investigative questions used to maintain the focus of the literature review were also used throughout the interview process.

Step Three. During this third step, which consisted of a review and analysis of the information gathered in Steps One and Two, the following key areas were emphasized:

- A. Analyzing the literature gathered in Step One to identify information concerning the offsets which affect the USAF.
- B. Analyzing the information gathered through interviews with experts to identify information concerning offsets which affect the USAF.
- C. Comparing and contrasting the views expressed in existing literature, and held by various experts, concerning the impact which the effects of offsets have on Air Force mission accomplishment.

The results of this analysis are located in Chapter Three of this work. The conclusions drawn about the offsets and their related effects on the USAF are based on this author's interpretation of the information gathered in the first two steps of this methodology.

Step Four. The final step of this research consisted of a formulation of series of recommendations designed to provide for increased knowledge and continued growth of understanding in this complex subject area. While the specific recommendations are given in Chapter Four, their basic theme calls for the formation of a central organization charged with more detailed and expanded study of offsets and their effect on the U.S. industrial base.

Glossary

The following terms and definitions are presented to provide a better understanding of the subject of offsets.

BEST EFFORT - a condition, or clause, in an offset agreement which provides the supplier of an offset with credit for fulfillment of contract obligations. Before credit is given by the buyer, the offset provider must first prove to the buyer that they have done their best to satisfy the requirements of the offset agreement (33:7).

COPRODUCTION - government-to-government agreements which allow foreign countries to acquire the technical information to manufacture all or part of an item of U.S. equipment. This includes government-to-government licensed production, but excludes licensed production based upon direct commercial arrangements by U.S. manufacturers.

COUNTERTRADE - various types of commercial agreements which include at least one of the following:

BARTER - a one time transaction that calls for the exchange of goods or services for another of equivalent value.

COUNTER-PURCHASE - an agreement made by the original exporter to buy, or find a buyer for, a specific value of goods from the original importer.

COMPENSATION - an agreement made by the exporter to accept as full or partial repayment products derived from the originally exported product.

DIRECT LICENSED PRODUCTION - overseas production of a defense related item originally made in the U.S. based upon the transfer of technical information under direct commercial arrangements between a U.S. manufacturer and a foreign government or producer.

INDUSTRIAL BASE - that part of the total privately owned and government owned industrial production and maintenance capacity of the United States, its territories and possessions, as well as capacity located in Canada, expected to be available during emergencies to manufacture and repair items required by the military services (10:343).

MOBILIZATION BASE - the total of all resources available, or that can be made available, to meet foreseeable wartime needs. Such resources include the manpower and material resources and services required for the support of

essential military and civilian activities as well as the elements affecting their state of readiness, such as, but not limited to, manning levels, level of training, modernization of equipment, mobilization material reserves and facilities, and international agreements (26:63).

OFFSET - industrial and commercial compensation practices required as a condition of purchase of military related exports. There are two classifications of offsets:

DIRECT OFFSETS - are agreements that involve goods and services that are related to the exports referenced in the sales agreement.

INDIRECT OFFSETS - agreements that involve goods and services not related to the exports referenced in the sales agreement.

OVERSEAS INVESTMENT - investments arising from offset agreements which take the form of funds invested in a foreign country to establish or expand a subsidiary or joint venture.

SUBCONTRACTOR PRODUCTION - a direct commercial agreement between a U.S. manufacturer and a foreign producer which allows the overseas production of a part or component of a U.S. origin defense article. The subcontract differs from licensed production in that it does not involve the license of technical information or know-how.

TECHNOLOGY TRANSFER - an offset practice which requires the transfer of technology in the form of one of the following: research and development; technical assistance

provided to the subsidiary or joint venture of overseas investment; or other activities under direct commercial arrangement between the U.S. manufacturer and the foreign entity.

With the exception of those noted, these definitions are taken from an Office of Management and Budget report submitted to the Congressional Subcommittee on Economic Stabilization on 18 June 1986 (53:88).

II. Literature Review

Overview

Offsets have been called a "somewhat esoteric issue" and are hard to define and are even harder to control. They have a distorting effect, especially in the context of trade, and their dramatic growth in number, size, and scope during the last few years has become a matter of concern to many government and industry leaders (55:3).

The purpose of this literature review is to examine the existing information on the subject of offsets to determine the effects that they might have on the mission performance of the United States Air Force. While the general topic of offsets is well documented and extensive information is available, there is little information available on the specific area of offset effects on USAF mission performance.

The information that was gathered for this review came from various national and international defense related publications and documents written in the past fifteen years. These publications came from the Air Force Institute of Technology and Wright State University libraries as well as the various public and private organizations listed below.

United States Government Sources.

1. The General Accounting Office
2. Congressional Printing Office
3. Department of Defense
4. Department of the Treasury
5. Department of Commerce
6. The Office of Management and Budget
7. The United States Trade Representatives Office

Private Organizations.

1. The Center for International Business and Trade, Georgetown University,
2. National Council for Industrial Defense,
3. The Aerospace Industries Association of America,
4. Defense Industries Offset Association,
5. National Security Industrial Association,
6. Aerospace Industries Association,
7. The American League for Exports and Security Assistance,
8. The Aerospace Education Association, and
9. The United Automobile and Aerospace Workers Union of America.

Extensive information was also secured through the DTIC, Dialog, and DLSIE databases using the key words listed below.

Offsets	International Trade
Offset Commitments	Aerospace Industry
Technology Transfer	Industrial Base
Competition	Coproduction
Commerce	Aircraft Industry
Cooperation	Codevelopment
Military Equipment	Foreign Military Sales
Military Procurement (Foreign Government)	
Military Exports (United States)	

What Are Offsets?

As defined in the Glossary of Chapter One, offsets are technically defined as industrial and commercial compensation practices required as a condition of purchase of military related exports (53:88). They are, in reality, different things to different people, and what they are depends largely upon the perspective of the viewer. Basically, foreign governments use offsets as a technique to pull back, or offset, the foreign exchange or hard currency they lose when spending vast sums on defense equipment. They use them as a way to get the U.S. exporter to generate exports for the

foreign country in order to recoup some of the dollars they use to purchase U.S. built defense equipment. When a country implements an offset policy it is telling U.S. exporters that if the exporter wants the foreign government to spend its money on U.S. products, the U.S. firm must agree to export products from the foreign country, invest in industry there, or transfer technology to them (43:16).

Offsets are concentrated in certain industries and agreements that have several common characteristics.

Primarily, offset agreements are associated with the purchase of items that have a high cost per unit. The contract amounts usually run in the millions or billions of dollars. The sheer size of these deals means that considerable economic activity will be generated in producing the product. Second, the goods purchased embody highly advanced technology that requires specialized skills to produce. This technology often provides important technological developments that may be used to improve other industries (49:8).

Next, the market environment in which the products are sold is usually very concentrated, with a few sellers competing as rivals in an international buyers market. Finally, offset agreements are largely negotiated with prime contractors that engage in considerable subcontracting for the design and production of components that are assembled to build the final end product (49:8).

A 1985 survey by the U.S. International Trade Commission (ITC) indicated that the business whose exports were the most affected by offsets were those dealing with aircraft and aircraft parts, or in other words, the aerospace industry, the same industry that has the greatest impact upon the USAF and its ability to perform its mission (57:48).

A History of Offsets

Where did offsets come from, what situations led to their rise to such important levels in international arms sales agreements? The following short history of the events and policies that have created an environment where offsets thrive, will answer these questions.

After WW II, the so called western world faced a new foe, Communism. However, at the end of the war, no one except the United States was strong enough to face this foe, because economies and industrial capabilities were in shambles due to the ravages of war. Therefore, the United States had to bear the burden of assisting its allies in rebuilding their industrial capabilities, while also providing the military equipment they needed to meet the challenges of the new communist dictatorships.

To meet this challenge, the Truman Doctrine created the Military Assistance (MAP) Program of grant aid in 1947. This program provided for the transfer of \$654 million worth of defense articles and services to the Greek and Turkish, and later the Chinese and Filipino, governments without demanding

any form of repayment. Then as the U.S. became more involved in collective security agreements, the program was expanded to include the countries in NATO, SEATO, ANZUS, and the Rio Pact (7:2).

In 1949, when NATO was organized, a new act, the Mutual Defense Assistance Act, authorized the extension of grant military aid to any country considered vital to the security of the U.S. It also permitted sales of equipment to friendly nations (30:52).

Under these conditions the U.S. became known as the arsenal of democracy, and according to James Coleman,

This situation continued until the late fifties when several events indicated the need for a change. The biggest need for a change was brought about by a growing deficit in the U.S. balance of payments. Other events that hastened the need for a change included the depletion of U.S. surplus military property, a change in many American attitudes toward the "give away" programs, and the economic recovery of Western Europe. (7:2)

Prior to 1961, nearly all weapons supplied to foreign countries by the United States, were provided without charge. Then in that year, the Foreign Assistance Act of 1961 was passed. This act changed the emphasis from grant aid to military assistance sales (MAS), and set the stage for the introduction of offsets.

To handle this new development in supplying arms to foreign governments, and to promote the sales of defense

articles, DoD established the International Logistics Negotiations Office. This office,

...pursued a vigorous brand of salesmanship, participated in international trade shows, arranged credit for purchasing nations, subsidized interest rates, secured loan guarantees from the DoD, and assisted in getting the Export-Import bank to provide credit. The philosophy was keyed to making the sale and then providing a means for the country to make reimbursement on terms that were sufficiently possible to encourage the purchasing nation to participate. (7:3)

Their efforts paid off. In 1961, U.S. grant aid through MAP totaled \$1.8 billion dollars, while sales through MAS only reached \$327 million. By 1964, MAP was reduced to \$1 billion and MAS sales now topped the \$800 million dollar mark (7:3). Foreign governments were now expected to pay for the weapons they received, and this paved the way for the Foreign Military Sales Program (FMS), another step toward offsets.

The switch to FMS brought about many important changes from the old MAP procedures. Now, the foreign customer had to realize that they would be paying all the costs of supporting their equipment. Therefore, they had to spend funds more wisely by instituting a system of determining their own requirements, stock levels, and reordering points. The customer also had to make his own arrangements for delivery of the purchased goods. Prior to FMS, the respective U.S. military departments were charged with delivering purchases to the customer. Finally, the customer also had to obtain an export license (Coleman,102).

Each of these conditions made the acquisition of U.S. weapons a more cumbersome and costly process for foreign governments. So, to justify the additional workload and cost of this process, foreign governments began to examine ways of offsetting or recouping some of their defense expenditures.

Another factor that contributed to the introduction of offsets, in 1969, was the Nixon Doctrine which shifted more of the common defense burden onto the shoulders of our allies. One of the prime thrusts of that doctrine was,

...in cases involving other types of aggression (i.e., non-nuclear) we (the U.S.) shall furnish military and economic assistance when requested and as appropriate. But we shall look to the nation directly threatened to assume the primary responsibility of providing the manpower for its defense. (31:II-1)

Basically, this told our allies and friends that they would have to take a much larger stake in their own defense. Now our allies had to increase their numbers of conventional weapons, and they either had to buy them or build their own (7:18). Realizing that they had to increase their own defenses, and that they had to pay for this increase, foreign governments began to look for ways to reduce their costs and quicken the pace of their defense industry buildup.

The idea of increased defense burden sharing by U.S. allies was not a new one. As early as the Korean Conflict, the U.S. pushed for the rearmament of its allies to aid in the fight against the spread of communism. While the U.S. was shifting from giving away weapons to making customers pay for

them, the government also sought to reinvigorate the defense industrial base of its allies.

To accomplish this task the U.S. government entered into a variety of agreements which allowed Western Europe, Japan, and Canada to coproduce U.S. aircraft such as the T-33 and the F-86. These agreements served their purpose by creating new industries, plants, and jobs overseas while also reducing our allies' foreign currency expenditures (14:1).

Realizing the benefits of these coproduction agreements, and facing increased domestic production costs and the problems caused by the shift in U.S. arms policy from grant aid to purchase, America's allies began to ask for larger and more varied compensation agreements. As these new agreements became more diverse, they grew into "a whole range of compensation practices that touch virtually every offshore sale of defense goods and services made today." (14:1)

In 1972, the first consciously structured offset arrangement took place between the U.S. and one of its allies, Australia. This arrangement proved to be more of an overall structure of doing business rather than a specific transaction. In this deal the U.S. signed a "Memorandum of Decision," agreeing to assist in the export of Australian goods up to 25 percent of the value of military exports from the U.S. into Australia (43:50).

Offsets did not become popular with European countries until 1975 when two major offset transactions set the

precedent for future deals. One was the sale of F-5s to Switzerland, and the other transaction was the General Dynamics sale of F-16s to a consortium of European countries. Each of these deals, along with several others, are discussed further in the Examples of Offsets section of this chapter.

It may be more than coincidental that European countries did not begin to demand offsets until OPEC sharply increased the price of oil in 1973. In his book, Winning the Countertrade War, Matt Schaffer explains,

It is likely that European governments, faced with large oil bills in dollars, became much more sensitive about major expenditures of dollars even for important defense items. (43:50)

Then in 1977, as more and more countries jumped on the offset bandwagon, and as the U.S. government became concerned over the complicated nature of the agreements, the Pentagon Office of International Acquisitions was organized. The function of this office was to review all offset proposals being offered by U.S. companies.

One year later, 1978, DoD in the Duncan Memorandum declared that, while it would continue to monitor offset deals, it would no longer be involved in backing, negotiating, or satisfying any U.S. firms offset obligations (43:51). A more in depth examination of DoD policy and actions concerning offsets is located in the U.S. Government Policies and Actions section of this chapter.

The Duncan Memorandum effectively left U.S. firms to their own devices in offset dealings with foreign

governments. So, with little U.S. regulation, the practice of demanding offsets spread and by 1981, offsets were firmly entrenched in the sales of military equipment to foreign governments, and no retreat from the current status quo seems likely (43:53).

Examples of Offsets

Offset agreements are as varied as the countries that demand them. While it is impossible in scope of this thesis to present each and every one, a few examples are necessary in order to better understand what is going on in the world of offsets. The following examples are used to provide this insight, and many will be referred to later in Chapter Three to illustrate various offset effects.

F-16s and the European Participating Group. In the early months of 1974 the NATO nations of Belgium, Denmark, the Netherlands, and Norway formed a consortium, called the European Participating Group (EPG), with the intention of finding a replacement for their aging F-104G fighters. The EPG invited Sweden, France, and the United States to submit proposals for a replacement aircraft. Sweden submitted the Saab 37E Viggen, France the Dassault F1E, and the U.S. submitted both the YF-16 and the YF-17 prototypes which had superior performance characteristics over the other entries. At that time the USAF had not yet selected the F-16 for full scale production (38:66).

In January 1975, the USAF announced that it had selected the F-16 to be its next generation fighter, and within five months the EPG also announced its preference for the F-16. The offset terms offered to the EPG by representatives from the U.S. played a key role in the selection of the F-16.

The Memorandum of Understanding (MOU) negotiated between the EPG and the U.S. granted offsets to EPG nations totaling 58 percent of the \$2.8 billion purchase price of the 348 aircraft to be delivered. These offsets were to be in the form of coproduction agreements between EPG nations and the two U.S. prime contractors, General Dynamics and Pratt and Whitney (38:67).

The actual stipulations of the contract stated that EPG nations would receive contracts for 10 percent of the value of the initial 650 F-16s to be purchased by the USAF, 40 percent of the value of the EPG purchase, and 15 percent of the value of any sales to third party countries (43:50).

F-5s to Switzerland. Also in 1975, at about the same time the F-16 deal was negotiated, the U.S. government signed an agreement to sell 72 F-5E fighters to Switzerland. Under this agreement the U.S. government, Northrop (prime contractor), and General Electric (engine subcontractor) would provide Switzerland with offsets valued at 30 percent of the \$400 million sales price (46:6).

The Swiss, unlike the NATO consortium, did not wish to coproduce the fighter in their own country. Instead, they stipulated that Northrop and General Electric would have to use Swiss products in their commercial products while also providing marketing assistance for Swiss goods in the U.S. and third countries.

Northrop itself found international customers for Swiss generators and sold Swiss elevators to Egypt and Swiss refrigerators in Saudi Arabia. They also helped the Holderbank of Switzerland to organize a project to build a \$100 million cement plant in Indonesia (15:3).

For its part of the agreement, DoD agreed to augment offset purchases directly if the industrial efforts did not satisfy the contract agreement (49:4). However, when the industrial offsets were slow in coming, the Swiss government applied pressure, and DoD found itself ill equipped to handle this type of arrangement. The resulting problems led to the Duncan Memorandum that specifically excluded DoD from guaranteeing future offset agreements (46:6).

The overall transaction was viewed as a success by the Swiss, and in 1980 they bought 38 more F-5s in a deal that called for offsets of up to 50 percent of the contract value. A new offset twist was added when the Swiss requested that 37 of these 38 aircraft were to be assembled in Switzerland under a licensing agreement (49:5).

F-18s to Canada. In 1980, McDonnell Douglas signed an agreement with the Canadian government involving the sale of 150 F-18A fighters to that country. In exchange for the sale of \$2.4 billion worth of F-18As, McDonnell Douglas agreed to provide \$2.9 billion, 120 percent, in direct and indirect offsets to Canada (15:5).

The direct offsets totaled \$750 million and were spread through a variety of programs including subcontracts for engine exhaust frame assemblies and nozzle assemblies, final assembly and testing of 150 aircraft, sales of 100 F-18As to third countries, possible coproduction of 2,500 F-18As well in to the 1990s, and construction of a \$70 million turbine engine blade manufacturing plant in Canada (5:34).

The remainder of the offset commitment was to be satisfied through a wide ranging package of indirect offsets. Over \$500 million, in one case, was included for Canadian subcontracting on McDonnell Douglas DC-9s and DC-10s. The indirect offsets also reached into many industries totally unrelated to aircraft. These ranged from funds for research and development cooperation in other industries to establishing offices to promote Canada's exports and tourist industry and the granting of licenses covering proprietary information in areas such as materials bonding techniques and food processing (5:34).

AWACS to the United Kingdom and France. One of the most controversial deals in the history of foreign arms sales is

the 130 percent offset agreement that accompanied the sale of 11 AWACS to the United Kingdom and France.

In December 1986, the British Ministry of Defense announced that it would purchase six AWACS (a seventh was added to the contract later) aircraft to replace their 40 year old early warning aircraft. Two months later, France announced its decision to purchase three AWACS with an option for two more. They later added one more aircraft to the order and dropped the option for the other one (38:76).

When British selection of an early warning aircraft began in June 1986, Boeing, the builder of the AWACS aircraft, quickly submitted a proposal offering a 35 percent offset package. This offer was subsequently upped to 100 percent, the normal minimum required by the British government, the following month (38:77).

Then in September, Britain selected their own Nimrod and the Boeing AWACS as semifinalists among the seven original bidders. Two months later, Boeing and its subcontractors offered a package that included offsets equal to 130 percent of the contract value. The next month, the Ministry of Defense announced its decision to purchase the AWACS. This purchase will cost the British government \$1.134 billion, while Boeing must supply \$1.474 billion in offsets over the next eight years (38:78).

Since this is such a recent agreement, much of the offset obligations have not been fulfilled by Boeing so

specific offset information is not available. The terms of the offset agreement itself were vague and open to interpretation and stated that: (1) offsets are to be fulfilled over an eight year period; (2) only approximately 5 percent of the offsets will be directly associated with the AWACS program, the remainder will be related to other high technology defense and aerospace product areas; (3) Boeing must provide a semi-annual report to the British government outlining progress toward fulfilling the commitment, and (4) contract awards to British firms will be counted toward the offset commitment (38:78).

The offset agreement was modified in 1988 in order to clarify which awards would actually count against the offset commitment. At this time it was decided that all new contracts involving high technology and aerospace products will be applied at 100 percent toward the offset obligation. Offset credit of 35 percent would also be granted for commercial engine purchases in Britain, up to a maximum credit of \$800 million (38:79).

Although the sales agreement with the French also called for a 130 percent offset spread over eight years, the terms were significantly different than those of the British sale. In France, Boeing will fulfill 80 percent of the contract value by using French built CFM-56 engines in the British and French AWACS along with the KC-135s it is re-engining for the USAF (38:85).

The remaining 50 percent will be fulfilled through Boeing's commitment to provide local French industries with the opportunities to bid on the equipment Boeing needs for its aircraft. This area will include installation and checkout work normally done by the prime contractor along with contracts unrelated to AWACS aircraft. Emphasis is to be placed on aerospace technologies such as microwave technology, cockpit equipment, and airborne and ground radar systems (38:86).

Current Situation

The most recent and comprehensive study on the subject of offsets and their effects is the December 1988 report, Offsets in Military Exports, published by the Office of Management and Budget. This report is designed to serve as a "baseline description" of what various government agencies know about the subject of offsets in military exports (38:1).

Information Source. To collect the information for this study, a working group comprised of representatives from the International Trade Administration (ITA), the Departments of Commerce, Treasury, Defense, Labor and the Office of Management and Budget, developed a survey which was sent to 52 of the top 100 DoD contractors. The survey was designed to provide information on military export sales contracts that were valued at over \$500,000, were signed between January 1, 1980 and December 31, 1987, and that included an offset agreement (38:7).

Report Findings. In the 8 year time span studied, U.S. military exporters surveyed signed \$34.8 billion worth of contracts involving offset agreements. These agreements, which were valued at \$19.9 billion, were made with 30 countries, or country groups (Table I). While the \$19.9 billion represents an average of 57 percent of the contracts' total face value, actual offset percentages called for in the individual agreements ranged anywhere from 5 to 175 percent of the contract amount.

The firms answering the survey also reported that for almost one-half of the value of the offsets, the types of goods and/or services to be provided as offsets were not determined at the time the contract was signed (Table II). They did, however, report that in contracts totaling 80 percent of the offset commitments, the type of offset was agreed upon when the contract was signed. Approximately 47 percent of the offsets were specified as direct offsets, mostly coproduction and subcontractor production; indirect offsets, mainly subcontractor production and countertrade, accounted for the remaining 53 percent (38:21).

Table I. Value of Military Export Sales Contracts and Associated Offset Obligations by Country, 1980-87 (Millions of Dollars)

<u>Country</u>	<u>Total value of Sales Contract</u>	<u>Value of Offset Obligation</u>	<u>Offset as % of sales</u>
Australia	3,393.5	1,271.4	37.5
Belgium	389.1	336.3	86.4
Canada	3,874.1	3,024.2	78.1
Egypt	383.0	87.8	22.9
EPG (European Participating Group)	5,219.0	2,209.9	42.3
Federal Republic of Germany	1,328.8	792.2	59.6
Greece	841.1	330.9	39.3
Israel	6,083.7	1,384.2	22.8
NATO Group	667.4	320.4	48.0
Netherlands	820.7	512.4	62.4
Republic of Korea	1,055.8	488.0	46.2
Singapore	511.5	153.1	29.9
Spain	2,151.3	2,851.1	132.5
Sweden	381.7	663.3	173.8
Switzerland	370.9	248.5	67.0
Turkey	2,701.7	1,583.1	58.6
United Kingdom	1,800.8	1,896.5	105.3
All others (note)	<u>2,842.8</u>	<u>1,775.7</u>	<u>62.5</u>
Total All Countries	34,816.9	19,929.1	57.2

Note. Consists of Brazil, Denmark, France, Indonesia, Italy, Luxembourg, New Zealand, Norway, Peoples Republic of China, Philippines, Portugal, Saudi Arabia, and Yugoslavia.
(All values taken from 38:11)

The information also revealed that 50 percent of the offset obligations were to be enforced under the "best effort" concept (Table II). In "best effort" agreements the party supplying the offset agrees to do their best to satisfy the terms of the agreement, but they suffer little if any penalty should they not fulfill their obligations.

Table II. Value of Offset Obligations, 1980-87
(Millions of Dollars)

Type of Offset	Obligations All Contracts	Obligations Calling For "Best Efforts"
Direct Offsets		
Coproducton	3,093.9	575.1
Licensed Production	501.1	50.0
Subcontractor	3,403.8	2,119.5
Production		
Overseas Investment	*	*
Technology Transfer	149.7	*
Countertrade	*	*
Not Specified	<u>151.0</u>	<u>107.0</u>
Subtotal Direct	7,338.7	2,869.0
Indirect Offsets		
Coproducton	*	*
Licensed Production	*	*
Subcontractor	3,931.3	2,188.1
Production		
Overseas Investment	485.0	*
Technology Transfer	29.3	*
Countertrade	1,415.2	*
Not Specified	<u>2,274.9</u>	<u>682.0</u>
Subtotal Indirect	8,228.4	3,443.9
Offsets Not Determined	4,362.0	
Determined	4,362.0	3,712.7
	=====	=====
Total All Types	19,929.1	10,015.5

* Information is suppressed to avoid disclosing information on individual firms. (All values taken from 38:16)

To collect information on the specific types of products and services, the survey used the Standard Industry Classification (SIC) system. This system categorizes U.S. industries into related groups using a four digit numeric code. For example, the aircraft engines and engine parts industry is coded as SIC 3724.

Compiling and analyzing the SIC data showed that in agreements where the offsets were predetermined, nearly all of their value was in manufactured goods (Table III). The data

also revealed that the aerospace related industries of aircraft engines and engine parts (SIC 3724), aircraft parts and equipment (SIC 3728), and radar and navigational equipment (SIC 3812) led the manufactured goods list.

Table III. Value of Offset Obligations by Type of Goods and Services, 1980-87
(Millions of Dollars)

<u>SIC Code</u>	<u>Industry Description</u>	<u>Value</u>
3679	Electronic Components	392.7
36xx	All Other Electronic Equipment	<u>176.8</u>
36	Subtotal Electronic Equipment	571.5
3721	Aircraft	301.3
3724	Aircraft Engines and Engine Parts	1,767.7
3728	Aircraft Parts and Equipment	4,799.4
37xx	All Other Transportation Equipment	<u>103.9</u>
37	Subtotal Transportation Equipment	6,972.3
3812	Search and Navigation Equipment	1,996.1
38xx	All Other Instruments and Related Products	<u>70.5</u>
38	Subtotal Instruments and Related Products	2,066.6
	Other Manufacturing Industries	340.5
		=====
	Subtotal All Manufacturing Industries	9,950.1
	Total All Non manufacturing Industries	79.1
	Total Offsets Not Yet Determined	9,899.1
		=====
	Total Value All Products	19,929.1

(All values taken from 38:15)

The preliminary information analysis also revealed that the firms granting offsets were allowed an average of 11 years to carry out the terms of the contract. The actual allowances ranged from 6 years by the Republic of South Korea to 21 years by Sweden. As a result of these extend allowances for contract fulfillment, only about 51 percent of

the offsets obligations were implemented by the end of the survey reporting period (Table IV).

Table IV. Value of Offset Obligations and Offset Implementations by Country, 1980-87
(Millions of Dollars)

Country	Offset Obligations		Offset Implementations	
	Value	Months Allowed to Fulfillment	Value	% of Offset Obligations
Australia	1,271.4	184	555.7	44.5
Belgium	336.3	83	284.0	84.4
Canada	3,024.2	195	2,729.9	90.3
Egypt	87.8	92	12.5	14.2
EPG	2,209.9	102	661.8	30.0
Federal Rep of Germany	792.3	147	500.4	63.2
Greece	330.9	116	44.1	13.3
Israel	1,384.2	103	1,780.9	128.7
NATO Group	320.4	98	321.5	100.3
Netherlands	512.4	120	293.6	57.3
Rep of Korea	488.0	73	268.3	55.0
Singapore	153.1	87	65.9	43.0
Spain	2,851.1	125	705.7	24.8
Sweden	663.3	251	194.9	29.4
Switzerland	248.5	80	207.0	83.3
Turkey	1,583.1	127	220.7	13.9
United Kingdom	1,896.5	101	1,144.8	60.4
All Others	1,775.7	NA	560.1	31.5
(see Note)				
Total				
All Countries	19,929.1	132	10,561.5	51.4

Note. Consists of Brazil, Denmark, France, Indonesia, Italy, Luxembourg, New Zealand, Norway, Peoples Republic of China, Philippines, Portugal, Saudi Arabia, and Yugoslavia.
(All values taken from 38:17)

When examining the data dealing with direct and indirect offsets, the working group discovered a dramatic increase in the demand for the latter type of offset (Table V). One reason for this rise the overcapacity in the worldwide

aerospace industry which coproduction and licensed production have helped to create (29:8). Foreign governments have also realized that direct offsets can be very expensive so they have turned to indirect offsets to create jobs, correct national deficiencies, and assist in the export of goods and services unrelated to the aerospace industry (3:2).

Before 1980, foreign countries only demanded \$216 million of indirect offsets, compared to \$1.7 billion in 1987, an 800 percent increase in just seven years. The rise in indirect offsets is the prime reason for the 900 percent increase in the total number value of offsets demanded in 1987 (38:18).

Table V. Value of Implementations, Annually, 1980-87
(Millions of Dollars)

<u>Year</u>	<u>Type of Offset</u>			<u>Total All Types</u>
	<u>Direct</u>	<u>Indirect</u>	<u>Not Yet Determined</u>	
Pre 1980	*	216.0	*	309.0
1980	*	399.4	*	469.9
1981	*	428.6	*	590.9
1982	235.3	356.5	8.2	600.0
1983	297.5	576.3	10.2	884.1
1984	470.5	800.0	8.4	1,278.4
1985	506.0	960.0	18.8	1,485.8
1986	665.1	966.8	574.2	2,206.1
1987	<u>795.2</u>	<u>1,700.7</u>	<u>240.2</u>	<u>2,736.3</u>
Total				
All Years	3,281.1	6,404.9	875.3	10,561.5

* Information is suppressed to avoid disclosing information on individual firms. (All values taken from 38:18)

One of the working group's key concerns behind this survey was to determine who was paying the price for the offsets granted by the prime contractors. The response to this concern is reflected in the data displayed in Table VI. As expected, the greatest burden of offsets, \$6.065 billion of the \$10.56 billion total, in all types of offsets, in each category of goods and services, is carried by the prime contractors. However, the relatively large amount, \$3.68 billion, borne by the subcontractor was a surprise to many of the working groups members (38:20).

In many cases, because most their economies cannot support a full scale aircraft production facility, foreign governments demand offsets involving goods and services normally provided by U.S. subcontractors (15:13). So, in order to get the sale the prime contractor must pressure it's subcontractors into granting the offsets demanded by the foreign government. This places U.S. subcontractors in a lose-lose situation, wherein they can either go along with the offset and lose some of their sales to foreign firms, or they can refuse to grant offsets and risk losing the prime contractor business altogether (43:9).

Table VI. Value of Offset Implementations by Type of Goods and Service and by Implementing Party, 1980-87
(Millions of Dollars)

<u>Implementing Party</u>	<u>Value of Offsets by Industry</u>			<u>Total</u>
	<u>Manufacturing</u>	<u>Non Manufacturing</u>	<u>Not Yet Assigned</u>	
Prime Contractors				
U.S. Operations	5,357.2	270.7	437.3	6,065.2
Subsidiaries				
Abroad	444.5	*	*	499.6
Subcontractors				
United States	3,398.5	144.5	134.4	3,677.4
Abroad	222.9	*	*	238.1
Other	<u>54.5</u>	<u>*</u>	<u>*</u>	<u>31.2</u>
Total	3,477.5	470.0	613.9	10,561.5

* Information is suppressed to avoid disclosing information on individual firms. (All values taken from 38:20)

Another question the working group sought to answer through the survey was, what role did foreign governments play in the offset process? Survey respondents replied that in three-fourths of the cases, during the offset agreement phase of the process the foreign government was the sole negotiator the U.S. firm faced (Table VII).

After reporting the results of survey, the remainder of the 1988 OMB report presents information concerning the U.S. government policy on offsets, along with an assessment of the impact of offsets on national security, industrial competitiveness, employment, and international trade. Each of these topics will be dealt with later in this chapter.

Table VII. Role of Foreign Government in
Offset Contract Negotiations

<u>Offset Process Phase</u>	<u>Foreign Government Role</u>					
	<u>Sole Negotiator</u>	<u>Active Player</u>	<u>Observer</u>	<u>No Approval Role Only</u>	<u>Approval Only</u>	<u>Other</u>
<u>Sale</u>						
# Responses	76	14	2	14	16	6
Percent	66.1	12.1	1.7	12.1	13.0	
<u>Agreement</u>						
# Responses	88	19	3	11	6	6
Percent	75.2	16.2	2.6	9.4	5.1	
<u>Implementation</u>						
# Responses	29	17	5	16	21	6
Percent	34.5	20.2	6.0	19.0	25.0	

Percentages do not add to 100 because respondents were
allowed to give more than one answer to the question.

(All values taken from 38:44)

Why Are There Offsets?

After examining a short history of offsets, including a
look at the current situation, and answering the question,
"What are Offsets?", the author was now ready to delve into
the reasons why offset agreements are so common.

After careful analysis it became evident that the growth
in the use of offsets was a function of the interaction
among four different areas of influence: the characteristics
of international arms market, policies and actions of foreign
governments, policies and actions of the U.S. government, and
the policies and actions of the aerospace industry itself.

The International Aerospace Arms Market. The dramatic
increase in offsets is partially due to the accelerating

global economic integration in recent years. This globalization, or internationalization, is a growing trend toward business relationships that cross national borders, and it is being spurred on in the aerospace industry by the increasing competition in production as a large number of countries acquire sophisticated technologies (29:6).

The effect which this internationalization has had on the growth of offsets was best explained in the July 1988 newsletter of the Aerospace Industries Association of America which said,

The realities of internationalization have fostered tradeoffs in both the civil and military sectors of aerospace that didn't exist for U.S. manufacturers in the past. It has become a buyers' market where purchasers can demand concessions, such as domestic content requirements and offset agreements, from sellers in both military and commercial aerospace. With two-thirds of the market for commercial transports outside the U.S. and a substantial non-U.S. market for military sales flourishing, foreign customers are frequently in a good position to call the shots. This is particularly true as collaboration increases among foreign firms in the defense sector.... (38:2)

Foreign governments are using offsets to increase the trade between the U.S. and other industrialized nations. This means that American aerospace firms are importing more and more products from foreign aerospace firms as shown in table VIII.

Table VIII. United States Aerospace Imports
1975 and 1985

<u>Country of Origin</u>	<u>Amount Imported (Millions of Dollars)</u>	
	<u>1975</u>	<u>1985</u>
Israel	9	127
Italy	21	131
Japan	24	163
West Germany	41	190
Netherlands	0	211
France	63	1615
Canada	224	1416
United Kingdom	333	1461
Total	715	5314

(All values taken from 29:22)

Another international factor that affects offsets is increased competition. The number of industrial and high-tech competitors has risen in many nations outside the United States. This competition combined with the numbers of domestic competitors and the small number of national buyers creates a buyer's market in which U.S. firms must either offer attractive offset packages or simply not be competitive (43:48). Competition for large aerospace contracts is intense, and offsets can often become the primary reason for selecting a given weapon system.

Higher oil prices are another market factor that has influenced the practice of offsets. When OPEC raised oil prices to record levels in the early 1970s, much of the world found itself spending a great deal more for their energy needs. When oil prices soak up government budgets,

less money is available to be spent elsewhere. To compensate for this, these nations had to develop new ways of generating higher levels of foreign exchange through their own exports, to accomplish this they turned to offsets (43:17).

Foreign interest rates are another market factor that influence the practice of offsets. Because interest rates in many major economic powers are lower than those in the U.S., the costs of borrowing operating capital are lower for foreign arms producers. These lower costs enable foreign producers to lower prices and force U.S. firms to grant more attractive offset packages in order to compensate for the price advantage that the lower rates give foreign weapons exporters (43:21).

Finally, it is important to point out that the international arms market of today is governed more by the objectives and policies of buying and selling governments than by traditional market influences. Governments must often give overriding consideration to the political acceptability of the sale while maintaining the development of domestic defense and commercial industries, fostering employment, and preserving foreign exchange (56:6).

This situation brings out the difficulties associated with attempts to analyze international arms trade from a traditional market orientation. Anyone examining the international arms market must realize that it is more of a "managed trade" market, than a true market in which economic

factors are chief determinants of the terms a seller must offer to stay competitive (56:59).

Foreign Government Policies and Actions. As evidenced in the previous section, foreign governments are in an economic position wherein they can demand offsets. Why do they demand offsets? What are their goals when they require offsets in trade deals with U.S. companies? The reasons when viewed from a business standpoint are reasonably clear.

Offset requirements involve purchases that require considerable outlays of taxpayers' funds for highly visible foreign-made defense products. Since these products are a major drain on the country's foreign exchange and credit lines, governments feel offsets are a way to prove to their people that they are indeed getting the best possible deal in terms of price, jobs, sales of domestic products, and technology transfer (25:4). Also, because most foreign governments devote a much smaller percentage of their gross national product to defense than does the U.S., they feel the need to maximize their leverage through offsets in order to minimize the impact of foreign exchange outlays for expensive defense systems (38:45).

The following excerpts from a Swedish government statement provide interesting insight into what many foreign governments think about offsets.

In the case of large procurements from abroad...it should always be considered if, and how, Swedish industry can be given an opportunity of participating. Various ways of increasing trade, such as industrial

cooperation, technology exchange, and the elimination of trade barriers for Swedish exports, should in the future be discussed in connection with Swedish defense procurements abroad....

...not only in the defense industry but also other Swedish industry can be involved in industrial collaboration. Consequently, Swedish industry other than the defense industry can participate in connection with large defense procurements abroad, and this in turn places great demands on coordination and the striking of a balance between the interests of the defense organization and the other national interest such as those of industrial, labor market, and regional policies.

The objectives for the projects which come into being through industrial collaboration should in general be to establish long term cooperation between Swedish and foreign industry. The projects should also create employment in Sweden and/or lead to an influx of valuable know-how to Sweden.

...the aim of industrial collaboration should primarily be to:

1. ensure that the procurements for defense purposes, as far as possible, give rise to employment opportunities in Sweden within interesting and long term growth industries;
2. ensure that the maintenance of the defense materiel purchased can be carried out in Sweden;
3. stimulate the technological advance of industry by the transfer of technology and know-how to Swedish industry and thereby strengthen...the international competitiveness of the industry;
4. promote regional balance in the distribution of job opportunities and industrial activity;
5. improve the ability of Swedish industry to market its goods on international markets and successfully defend the Swedish home market;
6. improve the terms of trade between the countries.

Attention should be paid to the ability of the defense industry to support development in civilian industry within adjacent areas of economic activity. (47:3)

It should be obvious from these statements that foreign governments are using offsets to do whatever they can to further their own political and economic interests.

Politically, foreign governments see offsets as a means to improve their image and prestige in the eyes of their citizens and the world community. Offsets are used to demonstrate to its public that the foreign government is obtaining the best possible deal in terms of price, employment, sales of domestic products, and technology transfer (25:18). Also, in the world community, offsets can bring political benefits as foreign governments enter into patron-client relationships with major defense contractors in the United States. These relationships can be interpreted as conveying U.S. approval for the government, thus lending a greater sense of legitimacy and power (43:64).

Military offsets are used by foreign governments to establish a national defense capability by building and/or strengthening their own defense industrial base. Agreements that call for coproduction, licensing, and technology transfer are designed to strengthen or establish a production capability which the offset demanding country can employ to meet its own defense needs. It also increases the governments image by showing its people that the country is not dependent upon other nations for its defense (49:26).

Economically, there are several powerful factors that motivate governments to seek offsets. The most obvious reason is the desire to reduce the amount spent on American weapons and look for a partial return of those funds through offsets. Through offsets, governments seek to conserve their

foreign exchange by reducing the amount of hard currency needed for the high priced aerospace defense systems they purchase. The basic idea is that a fifty percent offset agreement can provide twice as many units of a defense system with same amount of foreign exchange as a deal without offsets (38:60).

Another objective is simply to promote domestic employment of labor and capital or, if unemployment is not a significant problem, to direct resources into more attractive high-technology industries. Offsets can contribute to increased employment by artificially promoting domestic activity. Whether or not this is beneficial to the foreign government is yet to be seen, since restrictions can destroy jobs in one sector of the economy while creating them in another (49:25).

Transferring sophisticated technology into the domestic economy is another motivation for seeking offsets in defense equipment purchase agreements. This technology usually relates to advanced production techniques which might provide benefits when they are applied to other industries or products. Technology transfer can also contribute to upgrading the average skill level of the domestic work force as they assimilate the techniques required to master the new technology. In turn, the economic growth of the country can be accelerated as the higher skilled, and presumably higher paid workers, demand and consume more of the new and/or

improved goods produced by industries improved by the technological spillovers that can come from technology transfer (49:18).

Foreign government officials also see offsets as a short cut to industrial development. By focusing offset requests on technology transfers or on supports for certain industries within their own countries, governments can get greater control over the direction and speed of their development. For example, if a government wanted to strengthen its tool and die industry, it could do so by demanding offsets which would require parts of the final product be produced by its own tool and die companies. They could also call for technology transfers that would bring the know-how needed to refit and modernize its tool and die industry (48:995).

Finally, foreign governments use offsets as a tool to give them access to new markets for their own products. They see the use of subcontracting agreements as a means of entering the American defense acquisition in much the same way as U.S. producers use offsets as a marketing tool to enter foreign markets. The acceptance of their products by the American military can be a very prestigious, and lucrative, event for foreign governments as national pride melds with increased sales (19:32).

Case Studies. The following case studies covering the offset policies of Greece and the Republic of South Korea

will help to illustrate the motivations behind why foreign governments are demanding more offsets.

Greece. In a speech at the Defendory International exhibition held in Athens, 4-8 October 1988, Mr Stathis Yiotas, the Greek Alternate Minister of National Defense, exclaimed,

Our task is to limit the outflow of foreign currency that results because our defense supplies are necessarily provided from abroad. (4:1623)

This statement, along with the upgrading of the technological capability of the country, were emphasized, as Greece's two major parallel trade objectives. The intention is to gradually achieve independence from foreign suppliers of critical defense equipment.

For the next few years Greece's principal effort will be to increase both the quantity and quality of the equipment provided to the Hellenic Defense Forces by Greek Industry. This effort will be supported by increased participation in international coproduction programs, and the selective specialization of certain industries to help create a technological base to support future development. Yiotas emphasized the need for Greece to improve the competitiveness of the defense products industries in the export market when he said, "A strong defense industry is the key to our financial growth and to our national standing as a country." (4:1623)

To accomplish all of this, Greece is relying heavily on the practice of requiring offsets in foreign defense purchases, as evidenced in one of the most unusual offset deals to date.

In April 1986, General Dynamics of the United States agreed to set up the Hellenic Business Development Investment Company (HBDIC) as part of a contract to sell 40 F-16s to Greece. This new company, located in Greece, is jointly owned by General Dynamics, General Electric, Westinghouse, and the Greek government.

As part of the offset contract, the U.S. partners agreed to invest \$50 million dollars into the HBDIC over the next ten years. The HBDIC will then invest in Greek high technology industries, support the transfer of technology to Greece, promote Greek industrial exports, and promote the Greek tourist industry.

Other offsets stemming from the F-16 sale should include the manufacture of the air intake and aft fuselage by the Hellenic Aerospace Industries (HAI). Talks are also under way concerning the 45 General Electric F110-GE-100 engines which Greece has ordered. General Electric is considering a contract with HAI which will allow them to produce engine parts and support equipment. They have also planned to establish a complete jet engine repair and maintenance facility for the F110 engine (4:1623).

South Korea. South Korea is another country which has realized the important role that offsets can play in international arms deals. They formalized their offset policies in 1987 and incorporated them into their Special Law for the Defense Ministry. This law called for the formation of a Offset Program Division in their Defense Procurement Agency. This office has primary responsibility for the offset policy of the nation (48:995).

Korea has had some form of offset policy since 1984 when they required offsets in all overseas government purchases worth more than \$1 million. Although this policy was changed in 1987 to only cover military purchases, it still required the foreign supplier to provide a minimum direct offset package of at least 50 percent of the contracts value.

Then on December 4, 1988, a new Korean law, Bill 552, the Development and Promotion Law for Korean Aerospace Technology, went into effect. This new legislation provides a framework designed to give order and direction to South Korea's aerospace sector. Ahn Byung Wha, South Korea's Minister of Trade and Industry, will chair a high powered government aerospace committee which will include representatives from the Ministry of Defense, the Ministry of Finance, and the Economic Planning Board.

This committee's prime responsibility is to provide impetus to the development of a national integrated aircraft industry with the capability of designing, producing, and

certifying an aircraft without any foreign assistance (48:995).

To support this aggressive goal the South Korean government has developed new offset guidelines that aim to achieve three main objectives: a greater degree of Korean industry participation through improved transfer of technology practices; more licensed production agreements to increase the markets for Korean aerospace goods; and a case by case analysis of offset requirements for government-to-government cash purchases (27:1207).

To increase the level of participation by industry, the Korean government is likely to require a minimum technology transfer offset of 20 percent, with another 20 percent in direct offsets. These figures may be flexible and will be dependent upon the existing trade balance between South Korea and the offset supplier's nation (27:1207).

In meeting the second objective, more licensed production of goods for a foreign contractor, Korea is concentrating more on buy-back arrangements to increase the intra-industry trade going out to other nations. This objective, however, has the lowest priority of the three because the Korean government is more concerned with the issues of technology transfer and defense industry development (48:995).

The third and final objective of the new offset philosophy will give the South Korean government greater

flexibility when negotiating offset deals in the future. A case by case analysis of purchases will allow them to adapt the offset requirements of any agreement to meet their most pressing needs. It will, however, have the strongest effect on the Foreign Military Sales agreements between South Korea and the United States, its main supplier (27:1207).

United States Government Policies and Actions. While many foreign customer nations have extensive offset policies, the United States, as one of the largest exporters of military equipment, lacks a comprehensive approach to monitoring and controlling offsets. Within the government, there is no single agency that monitors offset activity or administers offset transactions (54:7).

Without specific guidance to the contrary, the arms export policies of the United States government are often influenced by foreign policy and national security considerations, and when it comes to offsets they can sometimes conflict with economic efficiency. Because U.S. arms transfer policies support national security objectives, some forms of offsets have become a method of achieving defense sales and furthering national policy goals for the U.S. government (38:22).

Several important trends in U.S. foreign policies have set the stage for the dramatic increase in offsets.

According Thomas Friedman, the U.S. has,

...traditionally pursued certain foreign policy objectives through the use of arms transfers and

defense offsets. These objectives include deterring aggression by enhancing the preparedness of allies and friends; increasing the ability of the United States to project power through the granting of basing or access rights for American forces on foreign soil; supporting interoperability with the forces of friends and allies; and the strengthening of collective security agreements. (19:30)

In the past few years, several policies have advocated the sharing of technology, technology transfer, with our NATO allies. The goal of this policy being increased rationalization, standardization, and interoperability (RSI) through the purchase and employment of common weapon systems (59:46).

This pressure on other nations to expand their military budgets for common defense has led the DoD to push for U.S. firms to have their subcomponents made in foreign countries. By ensuring the continued flow of orders for military goods. DoD tries to minimize the balance of trade problems for other countries, make the military buildup by foreign government more politically palatable to their people, and bolster the image of military trade as a "two way street" (23:3, 60:9).

Government agencies concerned with strengthening relations with members of friendly alliances also see offsets as an ace-in-the-hole to offer foreign governments. In crucial negotiations these agreements can be used as an enticement to nudge our allies into increased defense spending by making such spending "more politically palatable" (49:35).

While the U.S. government has generally viewed offsets as a tool to use to further foreign policy and national interests in the past, the trend is beginning to shift. Now, as the balance of trade swings away from the U.S. in favor of foreign countries, the U.S. is moving its emphasis towards pursuing the economic benefits of trade rather than the foreign policy and national security goals that were the most important concern when the U.S. trade was in balance (29:25).

In support of this movement, officials in several government agencies agree that an official offset policy is needed to incorporate the views of the various affected U.S. government agencies and private industries. They have not, however, agreed on how it should be administered and which organization should have the lead role (3:2).

At this time, the government's closest semblance of an official policy on offsets is the Duncan Memorandum. This directive basically states that DoD will not guarantee offsets, and that FMS credits will not be used to finance coproduction or licensed production abroad (3:2).

Critics of offsets claim that, because of this lack of direction concerning offsets, no one really knows if the national interests of this country are being served when a U.S. firm makes an offset commitment to a foreign firm as a condition for the sale of U.S. defense items (3:2). But, until a new policy is implemented, the current practice of

using offsets as policy tools will probably continue well into the future.

Aerospace Industry Policies and Actions. The U.S. Aerospace industry has been a major exporter of military equipment for many years and it has consistently enjoyed a surplus in its balance of trade. In the past ten years, however, this surplus has continued to shrink as aerospace imports have grown faster than exports as a result of the increased competition and internationalization of production in the aerospace industry (29:25).

Many industry sources indicate that the practice of offsets by so many countries, for so long, has contributed to this dwindling of the aerospace trade surplus. It is no coincidence that the same ten years in which the surplus has fallen are the same average number of years that industries have been negotiating offset agreements. It is also during these ten years that the size of offsets, in terms of a percentage of contract price, have grown tremendously.

If this is all true, then why do U.S. companies accept offsets requirements in arms sales agreements? According to industry spokesmen the answer to that question is simple, "Survival in the face of increased industry competition." In an competitive world like the aerospace market, if one bidder on a contract is willing to grant offsets, other bidders will have to do the same, unless their product is so

unique or superior that it has some other edge over the competition (25:5).

The basic question U.S. companies face in the competitive environment is between business with offsets or no business at all; increasing sales, production, and employment through new contracts offering offsets, or losing sales, production, and employment as contracts are lost by not offering offsets. Or as one official of the Sikorsky helicopter firm put it, "Sixty percent of something is better than 100 percent of nothing." (45:64)

Aerospace industry officials use offsets as a method of increasing their sales and profits by differentiating their product from that of their competition. As long as offsets provide this differentiation cheaper than other methods, i.e., price reductions, the willingness of U.S. firms to provide them will be increased (38:63).

Offsets involving subcontracting also make sense for prime contractors if the costs of doing business with foreign subcontractors are lower than those with domestic subcontractors. This can be the case if domestic subcontractors are inefficient, overpriced, and if the foreign government allows the prime contractor to take offset credit for purchase and services that would normally be a part of the transaction anyway (38:63).

It should be noted at this point that, even though U.S. companies must provide offsets to increase sales, it does not

mean that they are totally at the mercy of the foreign buyers. U.S. firms do maintain control over what they offer in offset deals, and no company will make an offer unless it is convinced that they will receive a net economic benefit from the transaction. Joel Johnson said,

They (U.S. firms) will no more sign an offset commitment which is on balance harmful than they will accept a price for a product which will result in financial loss." (25:5)

Conclusion. Many different factors contribute to the continued growth and existence of offsets. The international aerospace arms market is extremely competitive with fewer buyers than sellers. This puts buyers, foreign governments, in the drivers seat, where they can demand offsets from sellers, in exchange for sales of defense articles.

These foreign buyers, realizing the benefits which offsets bring through increased employment, and reduced outflow of capital. Now actively seek to exploit each and every opportunity to extract the maximum possible offset package from U.S. firms.

The U.S. government lacks a coherent policy on offsets and takes a "hands off" approach to their negotiation and implementation. While not officially participating in offset deals, the U.S. government's pursuit of certain foreign policies and national objectives does encourage them for the indirect benefits they bring in these areas.

Finally, while U.S. firms are not completely at the mercy of foreign governments in offset negotiations, they do

need to provide the largest offset possible at the least cost to themselves. If they do not adequately satisfy the demands of the foreign buyers, U.S. firms will lose sales and profits.

As long as these conditions exist, offsets will be a way of life in the world of international arms sales.

Who Are The Key Players?

Many different players have a stake in the world of offsets. While many of these players can be easily identified through the information presented above, further information is necessary to obtain a more complete understanding of offsets and their effects. This section of the literature review will focus on identifying the roles of key players involved with offsets.

Foreign Governments. The policies and actions of foreign governments are a driving factor in the offset process. The reasons why other governments request offset have already been presented in the "Why Are There Offsets" section of this chapter. The focus of this section will be on the role foreign governments play in the offset process.

Foreign governments play a major role in facilitating and negotiating most offset agreements. Since many governments have national policies that require offsets, the offset process begins when they go shopping for military equipment (59:46). While it may seem like an easy thing to

do, deciding on an appropriate amount and type of offset can be a difficult task.

Often, governments in the market for weapons must balance the political advantages of producing their own defense products against the higher costs that domestic production may entail. In many cases, these governments must take in to account objectives other than obtaining the most effective system at the lowest possible price.

Depending on the needs of the country, combining the objectives of developing a defense industrial capacity, lowering the balance of trade impact of a non-domestic purchase, increasing employment, and improving the countries technology base, in varying degrees may often outweigh the most cost effective consideration (29:51).

Therefore, when foreign governments start the process with an offset request, they are not acting like children in a candy store. They are acting as responsible consumers intent on providing the best possible overall solution to meet their needs at that particular point in time.

United States Government Key Players. As already stated there is no comprehensive U.S. policy concerning offsets, and no single agency is responsible for implementing, monitoring, and reporting their effects on the United States. The following sections will investigate the roles which the different agencies of our government are playing in the offset world.

Congress. As DoD implemented its "hands off" policy concerning offsets and as industry learned to deal with the burdens placed on it, the issue of offsets began to raise concern in Congress. In September 1981, the Economic Stabilization Subcommittee of the House Banking, Finance and Urban Affairs Committee began hearings on offsets and other related committees followed suit. In 1983, concern had grown so much that the chairman of the Economic Stabilization Committee, Rep. John LeFalce (D-NY), requested that the General Accounting Office (GAO) prepare a report on defense offsets (15:6).

This report, Trade Offsets in Foreign Military Sales, issued in April 1984, offered a superficial look into the issue of offsets. The study did report that there was no consistent U.S. policy on offsets and that no coordinated examination of the subject had been done. It also found that there was no single comprehensive database available that could provide information on offsets (15:6).

In an effort to correct this problem the Congress passed the Defense Production Act (DPA) Amendments of 1984 (Public Law 98-265). Section 309 of the DPA was especially noteworthy because it required the President to submit an annual report on "the impact of offsets on defense preparedness, industrial competitiveness, employment and trade of the United States," as well as information about

"types, terms and magnitudes of offsets" and any ongoing international negotiations on offsets (51:sec 309).

As of this writing, four of the five annual reports required by the DFA have been written and are discussed further in the Executive Branch, Office of Management and Budget section of this chapter.

In response to the OMB offset reports, the GAO issued its own report concerning the validity of the OMB findings. This report, entitled Military Exports: Analysis of an Interagency Study on Trade Offsets, raises several questions dealing with the accuracy of the OMB studies. In particular the GAO is concerned with the so-called under representation of subcontractors in the study along with the accuracy and fairness of the survey instrument used to collect the information upon which the OMB findings are based (52:2).

The GAO report acknowledges that gathering information on the impact of offsets is a difficult task, but it does not feel that this justifies the drawing of definitive conclusions without recognizing the important qualifications that need to be placed on the findings (52:1).

Congress has the power to legislate, but to this date they have not yet passed legislation restricting offsets. However, in Congress today, there are several members who are deeply concerned about the effects offsets might have on the U.S. industrial base. Rep. Mary Rose Oakar (D-Ohio), has sponsored a measure that would require the President to

limit, as much as possible, the production of all weapon systems and their components to U.S. plants within the next five years. Another concerned Congressman, Sen. Alan J. Dixon (D-Ill.), has introduced an industrial base revitalization act that would have called for the designation of domestic suppliers for parts deemed critical to the defense of the United States (32:1970).

The Executive Branch. Within the Executive Branch of the United States government there are five major agencies that have a vested interest in offsets and their effects. These agencies are, the Departments of Defense, Treasury, Commerce, State, and the Office of Management and Budget.

While each agency is a part of the same branch, each one has different policy objectives, and these objectives shape the policies and actions each agency takes. As a result of their different objectives, the Executive agencies have failed to reach a consensus on offsets since the first DPA section 309 report was published in 1985 (15:14).

Department of Defense. In the early years of offsets, DoD was a principal player in the negotiation and implementation of offset agreements. Their role was best exemplified by the formation of the Pentagon's International Logistics Negotiation Office in the early 1960s. As previously mentioned, this office was responsible for actively negotiating, implementing, and monitoring the sales of American-made defense products to foreign governments.

For the next decade and a half, the duties of this office, became DoD's standard functions in military sales to foreign governments. This method of operation come to an abrupt halt in 1978.

By 1978 the demand for offsets was expanding rapidly, and it was becoming increasingly difficult for the U.S. government, especially DoD, to negotiate and implement all the guarantees given in these arrangements. Thus, it became necessary for the DoD to rid itself of a burden that it did not have the resources to properly manage (61:4).

The relief DoD needed came in the form of a memorandum from Deputy Secretary of Defense Charles Duncan, on May 4, 1978. The memorandum stated that,

Because of the inherent difficulties in negotiating and implementing compensatory coproduction and offset agreements, and the economic inefficiencies they often entail, DoD shall not normally enter into such agreements. An exception will be made only when there is no feasible alternative to ensure the successful completion of transactions considered to be of significant importance to the United States national security interests (e.g., rationalization of mutual defense arrangements). (12:1)

The memorandum went on to outline the following general guidelines for the handling of exceptions to the new hands of policy:

1. Agreements should be structured as broadly as possible, to obtain maximum credit for U.S. purchases of both defense and nondefense goods and services, regardless of technology content.
2. Specific offset targets should be avoided, whether stated in percentage or money terms.
3. Agreements should be used as vehicles for reducing or waving administrative barriers to Defense trade erected by all parties, e.g., Buy

- National regulations, practices and procedures.
4. Foreign firms bidding on contracts in accordance with the terms of an offset agreement must actively seek bidding opportunities and compete on an equal basis with U.S. firms.
 5. Agreements involving system specific arrangements should specify that the burden for fulfilling any commitment rests with the U.S. firms directly benefiting from the sale. (12:2)

The reasons behind this new policy were fourfold.

First, negotiating and implementing offset obligations is a complicated process which, to be successfully handled, requires extensive amounts of manpower and time. With more and more countries demanding bigger and more complex offsets the management problems and resource drain became too much for DoD to handle.

Secondly, having an agency of the U.S. government directly involved in such agreements created the impression that the government itself was obligated to purchase systems or components from foreign sources, an impression the government wanted greatly to avoid. This impression was closely tied to the third reason, which was the belief that it was not the place of the DoD to be engaged in business transactions. Having top level military officials involved in these agreements raised questions about conflict of interest and ethics issues.

Lastly, DoD felt that it should not be made responsible for the fulfillment of obligations made by industry. If a firm entered into an offset commitment, they should be the ones required to carry out the promise (3:1).

In spite of the "hands off" message of, the Duncan Memorandum, DoD claims that offsets contribute to foreign policy and defense objectives to the degree that they increase the sale of common systems to nations and thereby, encourage a collective defense posture, facilitate defense preparedness, RSI, and two-way trade between allies (15:15).

It has long been the policy of the U.S. to make the best equipment available to both U.S. and allied forces, increase the effectiveness of research and development efforts by sharing resources and eliminating wasteful duplication effort, standardize equipment as much as possible, and create closer ties among allies. The Department of Defense believes that each of these policy goals can be furthered through one or more of the current offset practices (50:5).

DoD does acknowledge that offsets represent a distortion of free trade practices because they are inefficient and can raise defense cost for the buyers. The department also believes that offsets are not as serious a problem to industrial competitiveness as opponents claim and that they cannot be eliminated without also losing the foreign policy benefits they bring (15:16).

While DoD may have strong interests in the success of foreign sales and their associated offsets, it must be emphasized that they do not make policy with regard to arms trade. Their prime responsibility is to carry out the policies determined by the Department of State.

Department of State. The primary role of the Secretary of State in the offset situation comes from the Arms Export Control Act, which gives him the responsibility of supervising and directing foreign military sales, leases, and exports to see that they are integrated with other activities to best serve U.S. foreign policy. It is his responsibility, through the Bureau of Politico-Military Affairs and its Office of Munitions Control, to review all foreign sales requests. The State Department must determine if the proposed foreign military sale is consistent with U.S. security and foreign policy before they issue a license to U.S. firms that want to export military items (3:13).

The State Department's position on offsets is very similar to that of the DoD. They contend that offsets represent such a small portion of worldwide trade that they should not be viewed with undue alarm. They believe that fear of offsets eroding the industrial base is completely unfounded and that technology transfer poses no long term threat (3:17).

Also, much like DoD, State has taken the opinion that,

Although offsets are inherently inefficient and distort trade, the Department of State recognizes that defense related offsets nevertheless can be useful, sometimes crucial, to assuring that U.S. defense products remain competitive. Clearly, the U.S. benefits from defense related exports. They not only improve our balance of trade, but also contribute importantly to national security goals of rationalized production, standardization, and interoperability of military equipment. (55:6)

While this statement makes it sound as if the State Department is totally in favor of offsets, they have acknowledged that offsets do have some potential for long term negative effects on industrial competitiveness and employment. For this reason they have stated they will continue their efforts to persuade our trading partners to discontinue the use of offsets (55:30).

Department of the Treasury. The Treasury Department has an important interest in offsets because they are charged with the responsibility of formulation and executing policies and programs dealing with international finances and currencies. On many occasions, Treasury and DoD must work out credit arrangements when a foreign government wants credit to purchase U.S. military equipment (3:15).

The Treasury Department's stance on offsets is quite different than that taken by DoD and State. Treasury believes that even though offsets are small in magnitude when compared to the total U.S. trade figures, their net effect may still be harmful. In a July 1987 hearing before the House Committee on Foreign Affairs Subcommittee on Arms Control, International Security and Science, a Treasury official stated that they are "extremely concerned" about offsets and they consider them to be a "very serious problem" in terms of the effects they might have on competitiveness and the U.S. industrial base (56:4).

Treasury also claims that the offset practice of technology transfer may actually hurt the U.S. trade position. While strengthening foreign competition to U.S. industry. While calling RSI a "laudable objective," they are not convinced that technology transfer and other offsets really contribute to standardization within the western alliance. Citing a recent example, Treasury claims that the European countries development of their own fighter, without U.S. involvement, might be a result of offsets that have increased our allies industrial base enough to give them the ability to compete with our own aerospace industries (15:19).

To the astute reader it may seem strange that the Treasury Department has not committed to a definite negative opinion on offsets. Each of their statements contains a qualifying "may" or "might" before they discuss offset effects. This is directly attributable to the fact that they do not believe that an accurate understanding of offsets can be reached until a detailed analysis of individual offset transactions is completed (53:6).

Department of Commerce. The Commerce Department is responsible for managing export administration and related activities, including federal policy and programs affecting industry and commercial segments of the economy. Their responsibilities include control over U.S. international trade including items which can be used in both commercial and military applications such as electronics and

computers. They also provide support to DoD by providing foreign industrial and basic marketing information and by informing U.S. industry of NATO business intentions (3:15).

The official Commerce view of offsets is similar to that of Treasury with one exception; Commerce definitely thinks offsets are detrimental to the U.S. They believe offsets weaken the position of U.S. producers and have the potential of reducing the industrial base. Commerce thinks our allies are using technology transfer to further their own economic ends, mainly increasing their ability to compete against U.S. companies (15:15).

The following quotes from the Commerce Departments contribution to the 1986 OMB report, Impact of Offsets in Defense Related Exports, give more insight into their opinion of offsets.,

...offsets are increasing foreign competition through transfer of technology and production capacity, and are contributing to the erosion of the U.S. subcontractor base.

and

To the extent that offsets have and will continue to reduce the U.S. governments capability to purchase adequate numbers of domestically produced defense systems, they will contribute to the erosion of the U.S. defense base. (52:12 Emphasis Added)

However, according to the GAO report, Military Exports: Analysis of an Interagency Study on Trade Offsets, these statements, were edited out of the final report by the OMB, much to the displeasure of Commerce. As a result of this, and what Commerce calls, other procedural and analytical

errors, the Commerce Department feels that the yearly OMB reports to Congress are invalid without certain qualifying statements (52:12).

The Commerce Department feels so strongly about offsets that they claim they should be the leader and focal point in all military coproduction, offsets, and other foreign trade agreements affecting the U.S. industrial base (3:15).

Office of Management and Budget. When section 309 of the Defense Production Act (DPA) requiring the President to submit an annual report on the impact of offsets was passed into law in 1984, there was no clear lead agency within the Executive Branch on the subject of offsets. Since no single agency had a responsibility for studying the subject, and because offsets have the potential to affect so many areas of American society, it was decided that an interagency staff level committee was needed to properly handle the issue. OMB, because of their position in the Executive Branch, was chosen to chair the committee which contained members from the Departments of Commerce, Defense, Labor, State, and Treasury, the Federal Emergency Management Agency, the Arms Control and Disarmament Agency, the United States Trade Representative, the Central Intelligence Agency, and the National Security Council staff (38:118).

Each agency represented on the committee, unofficially called the Coordinating Committee on DPA 309 Reports, was charged with writing the section of the report that pertained

to their particular areas of responsibility. Then as the chair of this committee, it was OMB's responsibility to combine all the agency inputs into the final report.

As a result of their analysis of the data gathered for these reports the OMB has determined that while offsets may have some negative effects, these drawbacks are outweighed by their many positive effects. They claimed that offsets support RSI and increase U.S. employment by increasing sales of American goods overseas (15:7).

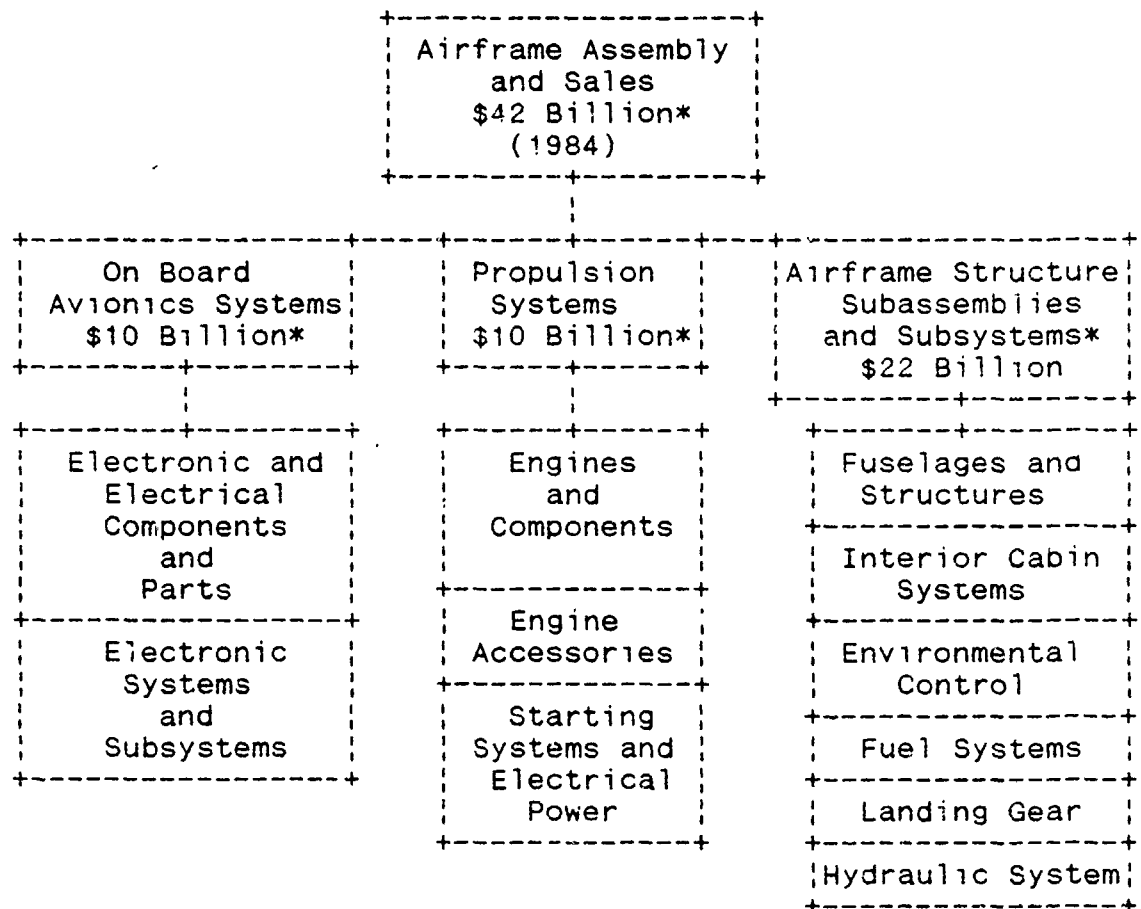
United States Trade Representative. This office has an interest in offset agreements in that they are responsible for the formulation of trade policy and the direction of all trade negotiations for the United States. An important concern of the USTR is the elimination of unfair trade practices that distort the free trade ideal. It is in this area that the USTR is working with other agencies and foreign governments to develop a common policy to altogether stop the practice of offsets (3:15).

Because the USTR views offsets as an unfair trade practice in the free world market, it sees them as something to be eliminated and no concern is given to the effects offsets might have.

The U.S. Aerospace Industry. The aerospace industries in the U.S. today are a leading example of a highly competitive and productive, high-technology industry. They are also the dominant sector in the U.S. defense industrial

base, providing one half the dollar value of all defense exports. This technological superiority and significant contribution to defense makes a strong aerospace industry an important part of the long-range economic, foreign policy, and national security goals of the United States (38:45). Figure 1 illustrates the hierarchy and the industries considered to make up the U.S. aerospace industry.

Figure 1. The Aerospace Industry



* Dollar values represent 1984 sales (29:48)

The high dollar value of the aerospace industries exports helps to lessen the U.S. trade deficit with foreign governments (Table IX). While the overall trade deficit has grown remarkably in the last decade, the trade surplus in the aerospace industry has also grown, up from \$4.4 billion in 1973 to \$16.0 billion in 1987 (38:46).

Table IX. Total United States and Aerospace Industry
Balance of Trade 1973 to 1987
(Millions of Dollars)

<u>Year</u>	<u>Total U.S. Trade Balance</u>	<u>Aerospace Trade Balance</u>	<u>Aerospace Exports</u>	<u>Imports</u>
1973	1,222	4,360	5,142	782
1974	- 2,996	6,350	7,095	745
1975	9,630	7,045	7,792	747
1976	- 7,786	7,267	7,843	576
1977	- 28,970	6,850	7,581	731
1978	- 33,541	9,058	10,001	943
1979	- 30,272	10,123	11,747	1,624
1980	- 27,336	11,952	15,506	3,554
1981	- 30,051	13,134	17,634	4,500
1982	- 35,182	11,035	15,603	4,568
1983	- 60,710	12,619	16,065	3,446
1984	- 110,932	10,082	15,081	4,917
1985	- 136,627	12,592	18,724	6,132
1986	- 162,281	12,802	20,704	7,902
1987	- 171,200	16,019	23,924	7,905

(All values taken from 38:46)

Even though the aerospace industry seems to be doing well, it is still an extremely competitive, capital-intensive, and highly leveraged (high debt-to-equity ratio) industry that must rely on a highly skilled labor pool and advanced technologies in its constant struggle for survival.

Because of these characteristics the industry, especially at the prime contractor level, is filled with business risks where one miscalculation is costing millions of dollars in losses, and put the company's existence on the line (59:47).

So, when foreign governments began demanding offsets, U.S. aerospace firms, stating they would not offer offsets if given a choice, responded by using the practice as a means of reducing the risks of doing business. Major firms were slower to yield to offsets and when they did respond it was usually in the form of coproduction and subcontracting wherein they could retain proprietary rights to the items incorporating advanced technology. These items were provided by the U.S. firm with a minimum of technology sharing. Firms in a weaker market or technology situation were not in a position to be so tight in the bargaining process, and they had to be more willing to share both technology and/or production (49:28).

The nature of the selling firm is especially important in determining its reaction to indirect offsets. Firms that are large and highly diversified are in a much better position to market the product imported from a foreign country as part of a countertrade agreement. Several major aerospace firms, General Dynamics and McDonnell Douglas, have established their own trading companies to handle the distribution and sale of items purchased through offset agreements (49:29).

The U.S. military service with which the firm has its major contracts also, to a certain degree, plays a role in that firm's reaction to offsets. The USAF, in the last few decades, has concentrated on purchasing larger numbers of a few limited types of airframes. Since expanded production in this situation can result in greater economies of scale and lower costs per unit, the Air Force tends to encourage contractors to increase sales through offsets.

The Navy, on the other hand, is buying smaller numbers of a wider variety of aircraft, which leads to small scale high complexity production operations. Under these conditions economies of scale are not as likely to lead to appreciably lower costs per unit, therefore the Navy is less likely to encourage suppliers to offer offsets (49:29).

Foreign government offset policies are so common and open today, that when a U.S. firm enters into a sales negotiation they are normally aware of the required offset. According to the ITC,

Generally, the only variables in the sales contract to be negotiated are the share of the offset of the total contract price, the specific products to be included, scheduling of delivery and the overall time period to be covered. (57:38)

Now that U.S. firms know that an offset is expected, if they hope to sell their products, they can pursue the negotiating objective of supplying the largest possible package at the lowest required cost to themselves.

With this goal , and aerospace firms are now using offset programs as an integral part of their marketing strategy, as both sales incentives and marketing tools. The process for determining the approval of an offset agreement is a well defined as outlined by William Forti,

In the final analysis a go/no go decision on an offset agreement should be decided on the same basis as of normal appropriations project. First, consideration should be given to the importance of the offset agreement to the companies' marketing objectives and/or the overall business base. Secondly, quantitative estimates of all three of the dimension of cost and risks ... should be made. These estimates should be compared against the corporation's hurdle rates including such measures as return on investments, costs of capital, and return on sales. (18:5)

When U.S. firms set their offset negotiating goal, they claim, they carefully consider all the ramifications of what they are willing to offer. In testimony before a House subcommittee, Alan Urban, Director, Offset Management for Pratt and Whitney, and Edward Bursk, Director of International Relations for Raytheon Co., each proclaimed that U.S. firms are prepared to "walk away" from offset requests that are not in the firms short or long term interests. Firms look at the sales, spare parts, profits, jobs created or lost because of the sale, and they ask themselves a simple question, "Can we afford to win this program?" If it does not make economic sense, they cannot afford it, and companies reject the proposal (56:41).

Another factor that companies consider when determining what to offer as an offset is the importance to their

competitive position of the technology which might be transferred when the deal is finalized. U.S. contractors are careful to protect the technology necessary for them to maintain their advantage in the market place (29:60).

Even with all the analysis done by U.S. firms concerning the ramifications of their deals, offsets still end up costing them money. Prime contractors use several methods to absorb these costs. The first is time. While the seller usually receives the purchase price upon delivery, the fulfillment of the offset arrangement takes an average of 12.5 years to complete. Therefore, the seller gets his profits right away while spreading offset costs over a number of years.

Prices of military equipment are also negotiable and foreign governments are often willing to pay a higher price if they receive a satisfactory offset deal. Finally, prime contractors often pass the costs on to their subcontractors and importers who would have normally purchased the countertrade products anyway (56:4).

To take advantage of this final method, companies must develop extensive networks with other companies in order to get as much offset credit as possible. Larger companies have an advantage in this area because they have more capital and a wider range of technologies to choose from.

On the other hand, subcontractors are often hurt by foreign offset commitments. They claim that the technology

they transfer to foreign interests often comes back to haunt them in the form of increased competition. One example involving the EPG and the F-16 describes how the Menesco Company of Texas was required to transfer some of their landing gear technology to a Netherlands firm, DAF. DAF is now using this technology to compete against Menesco for landing gear contracts on other aircraft. Another U.S. company with a similar problem would not disclose any detailed information because they felt it would jeopardize its business with a prime contractor (43:9).

Subcontractors also complain that in order to satisfy offset commitments, prime contractors take their business to foreign companies instead of American ones. As part of the fulfillment of its offset requirements in the sale of AWACS to Britain, Boeing subcontracted with a German (Siemens) and a British firm (Racal) for all the displays and controls for the AWACS in the purchase agreement. These firms were selected over Boeing's normal American subcontractor (Hazeltime) because the foreign companies were in a better position to absorb some of Boeing's offset burden (38:82).

In total the industry position is divided on the effects of offsets. Prime contractors call them "annoying, but not critical", while the subcontractors think of them as a possibly life threatening phenomenon. These differing perceptions will be explored further in the Perceived Effects section of this chapter (15:13).

Private Organizations. The final players in the offset story are the private "lobbying" groups. The philosophy of these various groups runs the full range from tolerance to loathing. On the one hand certain groups advocate the continuation of current government policies, while at the same time, groups are calling for legislation to ban them completely. Other groups, realizing that offsets are going to be a part of international trade for a long time, have formed with the common purpose of helping each other deal with the situation.

The American League for Exports and Security Assistance (ALESA), representing 5 unions and 25 defense firms, is typical of the groups advocating continuation of current policy. While they agree that offsets are a problem, they believe that any U.S. legislative effort to limit them will only serve to limit U.S. companies' ability to do business in the world arms market (25:11).

On the opposite end of the spectrum from ALESA are organizations like the National Council for Industrial Defense (NCID). This group believes that offsets are responsible for the total erosion of the American industrial base. NCID accuses foreign governments of using technology transfers as a means to strengthen their own economies, while "dumping" foreign products on the American market at "low-ball" prices where U.S. firms cannot compete (14:195).

The NCID has even filled a suit in U.S. District Court against the DoD on behalf of their membership, none of whom are identified in the suit. The suit claims that the DoD has violated the Buy America Act and other federal regulations which require the military to make a concerted effort to purchase U.S. made goods and services. While NCID agrees that the DoD is allowed to grant special wavier to these restrictions, NCID believes that the "blanket wavier" granted by the DoD are a violation of federal restrictions (8:797).

Somewhere in between the opposites of ALESA and NCID is the Defense Industries Offset Association. The membership list of this organization, which reads like a who's who of American defense industry, includes high ranking executives from many of the U.S.'s top defense contractors. Their purpose is to spread the word about how to make the best of a not so perfect situation. Members of this organization meet to share insights on how to handle offset requests and negotiations, as well as how to determine the most cost effective amount to offer (18).

Conclusion

Foreign country demands for compensation, offsets, beyond the supplying of the purchased product in a defense equipment transaction are a way of life in today's international aerospace market. These offsets come in many

different forms, and their use and size, as a percentage of the contract value, have constantly increased.

Offsets have become a way of life as a result of various characteristics of the world international aerospace arms market, foreign and U.S. government policies, and the policies of U.S. aerospace industries. In general, these reasons are usually associated with increased internationalization and competition in the world market, the desires of foreign governments to strengthen their strategic and economic positions, the U.S. government's lack of an official policy and agency to manage offsets, and the willingness of aerospace firms to grant offsets in order to survive.

Many different players have a stake in offsets and the role they play in international arms sales. Along with the buyers (foreign governments) and sellers (U.S. aerospace firms), many agencies of the Congressional and Executive Branches of the U.S. government and a number of private lobbying organizations are involved in this issue. The number of parties involved adds to the complexity of the situation, because each one is seeking to protect its own best interests, and the best interest of one is often obtained at the expense of another's.

Because offsets are so much a part of modern arms sales trade agreements, they affect many things in many different ways. Obviously, someone must benefit from offsets or they

would not exist in the first place. However, the issue becomes complicated when they have a effect a party positively in one aspect and negatively in another. Offsets become even more difficult to understand when different parties disagree as whether a particular offset has a positive or a negative effect.

This literature review revealed that a great deal of general information on the subject of is available, but little information was found concerning the particular effects offsets have on USAF mission performance. The general information does, however, provide sufficient information to extrapolate effects on the USAF from the existing data when combined with the information gathered through the personal interviews conducted by the author. These effects are presented in Chapter Three.

III. Analysis of Information

Finding the answer to the question, "What effects do offsets have?", was not easy even though finding documents on the subject was. During the course of reviewing sources for the literature review, this author discovered many documents, articles, etc., that contained information on general effects which offsets did or could have on the U.S. industrial base, military capability, employment, and other areas. However, only a limited number of documents were discovered that contained substantiated or undisputed general effects, and only two written sources and one interview were found that discussed specific offset effects on the USAF.

At this point, the author became somewhat discouraged and felt that there might not be enough data available on the effects of offsets on USAF mission performance, to justify a continuation of this thesis effort. Further investigation, however, revealed that many of the so-called general offset effects could impact USAF mission performance.

Therefore, it was decided that information on all offset effects should be presented in this work. This information, plus that gathered through personal and telephonic interviews, was assessed to determine if any of the general effects might have an impact on Air Force mission performance. This analysis was completed using a three step process.

First, the literature and interview responses were examined to identify the general effects which offsets have on the U.S. and its allies. The next step called for the validation of these general effects through the interview process. During the interviews, individuals were asked if the effects identified by the earlier information analysis were valid based on the subjects knowledge of the offset issue. A complete list of all individuals interviewed during this step is located at Appendix A.

The results of this analysis and validation provided the basis for the final step of this process, identifying the affects which offsets have on the USAF. As previously mentioned, a very limited number of sources directly address this specific subject. Therefore, the general effects were used as a foundation from which specific effects on the USAF were extrapolated.

Offset Effects

This section presents the offset effects as identified by the analysis of the literature and interview information. These general effects have been separated into three categories: negative, positive, and perceived effects. Each effect is assigned an identifying alpha-numeric code which is used to identify that particular effect in later discussions.

The first position(s) of the code are the alpha character(s) corresponding to that effects category, N for Negative, P for Positive, and PE for Perceived. The alpha

character is then followed by the number assigned to that effect in the discussion that follows. Examples are, N1 = Negative effect 1, and PE12 = Perceived effect 12.

The first two categories contain only those effects which are substantiated and/or undisputed. Each of these effects are divided into three subcategories, Economic, Political, and Military, to correspond to their type of impact.

The latter category, Perceived Effects, contains those purported effects which are still disputed or have not been substantiated with enough data. These effects are then divided into four subcategories based upon the impact they are purported to have. The four subcategories are, Industrial Base, Defense Preparedness, Employment, and Technology Transfer.

As stated in Chapter One, the mission of the United States Air Force is to organize, train, and equip aerospace forces to perform offensive and defensive operations with the purpose of defending the United States, deterring aggression, and being ready to conduct warfare to support our national objectives. To accomplish this mission the USAF will rely on its unique capabilities of responsiveness, mobility, survivability, presence projection, and worldwide destructive firepower delivery (9:3-1).

The next several sections of this chapter present each general offset effect along with the authors interpretation

of how that particular offset effect does or does not impact the USAF. The general offset effects are examined to determine the effects which offsets have, or could have, on the capability of the USAF to perform its mission.

Negative Offset Effects. The following offset effects have been identified as having a detrimental impact.

Economic.

N1. While offset agreements provide benefits to foreign buyers, in many cases they serve to raise the cost of the items being purchased. A 1981 Rand Corporation/U.S. Air Force study projected that the F-16s coproduced by the EPG, through the offset deal with General Dynamics, cost foreign governments 35 percent more than if they had bought the aircraft directly from the U.S. manufacturer (34).

Japan also demanded coproduction and licensing offsets when they purchased the F-15. While these concessions gave them their own production capability, it is estimated that the Japanese F-15s cost their government nearly two and one half times more than those they could have bought from the U.S. without offsets (16).

These increased costs are a result of the higher prices foreign governments are willing to pay to get offsets and the additional program management that is required to manage the offset requirements. To handle its foreign sales and offset commitments, McDonnell Douglas has established offices in Melbourne, Australia and Madrid, Spain because of the F/A-18

coproduction efforts in those countries. The cost of supporting these offices is charged to the respective countries (33:45).

McDonnell Douglas also had to establish its own International Division of about fifty people to negotiate, coordinate, and conduct offset operations. This office spends a majority of its time and effort monitoring the fulfillment of both direct and indirect offset commitments. The cost for this division are paid through higher prices charged to foreign governments (33:45).

Foreign governments must also pay for the expanded administrative costs they incur by demanding offsets. Most countries that demand offsets have a special office or representatives to handle the negotiation and administration of the agreements. As an example, the Republic of South Korea has established an Offset Program Division, responsible for implementing that country's offset policy. The cost of operating this division is paid by South Korean government funds (48:995).

It must be noted at this time that whether or not offsets raise foreign government costs depends upon the individual situation. The government of Belgium decided to coproduce an additional 44 F-16s at 10 percent over what they would have paid if they bought directly from the U.S. However, through the increased coproduction, they generated \$472 million in business for their own companies and they

increased their country's employment levels. From this they gained \$280 million in taxes for a net savings of \$206 million, which was well over 10 percent of the purchase price of 44 F-16s (42:9).

This effect indirectly impacts the USAF's ability to deter aggression. Because the U.S. relies on its allies to share the defense burden, the USAF incorporates their forces in war fighting plans. When offsets increase the cost of aerospace weapons for our allies, it decreases the amount they can purchase. If offsets increase the cost by ten percent, then our allies must reduce the number of items they purchase by ten percent.

This means that our allies now only have ninety percent of the aerospace defense capability they could have without offsets. This decreased capability forces the USAF to either accept a weakened deterrent posture or increase its share of the mutual defense burden by increasing forces in the area.

N2. Because offsets agreements are requirements added as a condition to a sale of military equipment to a foreign government, they incur an indirect cost to the U.S. government. This cost is a result of the additional personnel and manhours needed to handle the administrative procedures and communication and manufacturing problems that occur in the coordination of foreign sales with U.S. military purchases (33:42).

As a result of the F-16 sale to the EPG, the USAF F-16 SPO employs additional personnel whose only functions are to monitor and coordinate the fulfillment of offset commitments. However, since this office is unique in the Air Force, and because only four people are dedicated to this effort, it was determined that this general offset effect has only a negligible effect on the USAF. While it does divert defense dollars from more mission related activities to administrative ones, the overall effect is barely noticeable because the money spent on these personnel and procedures is miniscule when compared to the entire Air Force budget (17).

It has also been argued that additional USAF personnel and manhours are devoted to handling the extra administrative procedures that must be followed when the Air Force must purchase spare parts from foreign companies. This may occur when increased competition, fostered by offsets, forces U.S. firms out of business and foreign sources become the only suppliers of a part.

This claim, however, could not be validated because there is no information available on the number of manhours or people dedicated to handling foreign buys. There is also no way to determine how many of these are a result of offsets.

N3. Offsets increase "program risk" when U.S. firms enter into agreements that involve subcontracting newer technology. If foreign subcontractors do not supply the

contracted items at the specified time or in the specified condition, the entire production process slowed. Production delays result in higher production costs and lower profit margins, thus increasing the U.S. firms risks.

While, it was determined that this general offset effect had no effect on the USAF, it may effect an aerospace contractor's relations with foreign governments. In future defense equipment sales involving high-technology transfers, U.S. firms may be more cautious about what and how much they offer in offset deals.

N4. High face values of offsets, as a percentage of the contract value, granted to one country create a precedent for other countries to also demand higher levels. The countries of Spain and Australia are now demanding higher percentages of offsets than they did in the past, as a result of the highly publicized 130 percent offsets granted by Boeing in the AWACS deal described earlier in Chapter Two (38:89).

This general effect was also found to have no effect on USAF mission performance. Aerospace firms, on the other hand, must now be more willing to dig deeper into their pockets to satisfy requests for more and bigger offsets.

N5. Offsets create a situation which results in an outflow of U.S. dollars. This occurs as a result of the purchases which U.S. firms must make from foreign governments to fulfill offset obligations. The foreign

exchange of the U.S. is also decreased relative to deals without offsets. The normal foreign exchange associated with a foreign sale comes into the U.S., but the offset amount must go out, causing a net reduction of foreign exchange (13:3).

This general offset effect can have serious consequences for the U.S. economy as it helps tip the balance of trade in favor of other countries. However, it does not have an effect on the mission performance of the USAF.

N6. Offsets increase competition for U.S. firms. Foreign firms use offsets to gain new technologies to improve their industrial base to enter U.S. arms markets. Examples of this situation include; the DAF corporation of the Netherlands using landing gear technology gained through the EPG F-16 purchase to compete for contracts against the company that gave them the technology, Menesco; Norsk Farvarslekiologi of Norway entering the commercial maritime gyrocompass market using technology gained through offsets (38:68); and the Italian Aspide missile competing against the Raytheon Sparrow using technology gained through an offset deal (14:28).

While increased competition is a known offset effect, its exact impact is still disputed. The effect of increased competition resulting from offsets will be discussed in the Perceived Offset Effects section of this chapter.

While this effect is a negative one for U.S. contractors in that it forces them to reduce their profits by lowering prices or using other costly product differentiation strategies, it has a positive effect on USAF mission performance. This positive effect is discussed in the response to P3 below.

Political.

N7. Offset requests strain relations between foreign governments and U.S. firms as well as certain sections of the U.S. government. As foreign governments demand more and are becoming stricter on offset fulfillment, certain members of U.S. Congress and Executive Branch agencies are calling for restrictions to control or eliminate foreign governments ability to demand offsets.

Anti-offset industrial organizations have also increased their lobbying pressure in an effort highlight the negative effects of offsets. The organizations engaged in this activity are those that represent the subcontractors that suffer because of offsets made by prime contractors (40).

The recent growth in offsets has caused considerable alarm among various congressional leaders and executive branches because of the detrimental effects they attribute to the practice. This has led to the introduction of varying levels of "protectionist" style legislation that would restrict DoD's ability to purchase foreign made defense equipment (24).

This reaction to this particular offset effect could prevent the USAF from realizing the benefits of the lower defense equipment costs that are a result of increased competition as outlined in P3. Facing higher equipment costs in today's world of smaller defense budgets could reduce the buying power of the Air Force, thus diminishing its ability to organize, train, and equip aerospace forces.

Because this is a relatively recent phenomenon, no information beyond speculation could be found to determine what effect this reaction to offsets might have on the USAF. Therefore, this effect could not be validated and can only be considered as a possible effect.

Military.

N8. Offsets, to the extent that they become the primary selection criterion, lead to the selection of a weapon systems that are not the best suited for the needs of the purchasing government. Switzerland recently agreed to purchase 34 F/A-18s largely because of the 100 percent offset package offered by McDonnell Douglas. As a result of this purchase, the Swiss government will now have to spend an additional 200 million in Swiss francs to modify its current subterranean shelters in order to accommodate the wingspan of the F/A-18. The other aircraft considered by Switzerland, the F-16, would have fit into the existing shelters and would have cost 15 percent less than the F/A-18 (8:915).

This general offset effect impacts the USAF in much the same manner as N1. While the mission capability of the Air Force is not directly affected by type of aircraft purchased by a foreign government, it is affected by the impact that purchase has on the mission performance of the foreign government.

When offsets entice other countries to purchase a system that is not the best for their needs, they may lower their ability to contribute to the combined deterrent capability of any alliance they may be a member of. Therefore, if the U.S. is also a member of the same alliance, this decreased capability forces the USAF to either accept a weakened deterrent posture or increase its share of the mutual defense burden by increasing forces in the area.

Positive Offset Effects. The following effects of offsets were found to have beneficial impact on their respective areas.

Economic.

P1. Offsets provide U.S. firms with additional sales of military equipment that would not have occurred without the offset. They provide a firm with a competitive edge in sales negotiations and are useful as a marketing tool. These additional sales also provide greater profits through economies of scale, add to the firm's business base, and expand the firm's influence.

As a result of the AWACS sale to Britain and France, Boeing is meeting with Italian officials to discuss the possible purchase of six AWACS. Spain, Japan, Australia, and Sweden are also voicing interest. These purchases could extend the production of AWACS well into the 1990s, providing Boeing with excellent opportunities to take advantage of economies of scale (38:98).

While increased sales brought about by offsets have a direct impact on U.S. aerospace firms, they also have an indirect impact on the mission performance of the USAF. This impact is a result of the lower costs charged to the Air Force for the items it purchases (6). This indirect impact is explained further in the discussion related to general offset effect, P2.

P2. The cost of military equipment purchased by the United States is reduced by the economies of scale that result from sales generated by offsets. As nations combine to buy large quantities of a single item, DoD pays less because the production costs are lower due to the economies of scale as well as the sharing of the research, development, and testing costs (58:5).

In replies to a 1981 Rand/U.S. Air Force study, F-16 contractors and subcontractors indicated they were able to take advantage of increased production volume to lower per unit costs. They also stated there were cost benefits as a result of the sale of equipment, technology, and licensing

fees that would not have been possible without the coproduction agreement (34). These cost savings were passed on to the USAF through lower prices for the F-16 as the unit fly-away cost, in 1975 constant dollars, for a USAF F-16A declined steadily from \$5 million in 1978 to \$4 million in 1982 (38:66).

The DoD also claims that offset generated foreign sales of the F/A-18 have played a major role in saving the U.S. Navy approximately \$1.6 billion in acquisition costs, through the recouping of nonrecurring production and R&D costs, as well lower production costs resulting from economies of scale (33:39).

When a U.S. firm sells more, the USAF pays less for the items it purchases, because the contractor can spread its fixed costs over larger production runs. As a result, the fixed cost amount assigned to each item and the overall total cost are lower for the purchases made by the USAF. Lower equipment costs increase the buying power of the Air Force, enabling it to purchase increased amounts of other items that it needs to successfully perform its mission.

P3. Offsets lower costs by increasing the competition between subcontracting firms. Creation and/or support of foreign subcontractors eliminates dependence on sole source suppliers and their monopoly pricing practices (22:184). Rockwell International cites an example of how a new foreign supplier they located as a result of an offset

agreement can deliver a forging for 40 percent less than Rockwell's previous domestic supplier (35:209).

The impact of this general offset effect on the USAF is the same as that outlined in P1 in that lower costs increase purchasing power. These lower costs permit the USAF to buy more bang for the buck.

P4. The increased foreign sales that come from giving offsets create higher tax revenues for the United States. These revenues come from the 48 percent tax applied to the corporate revenues of companies involved in foreign sales and the personal income taxes of stockholders and workers (33:41). The Wharton Annual Econometric Model indicates that approximately 65 percent of the value of equipment produced in the U.S. for sale overseas eventually ends up in the U.S. Treasury as receipts (1:24).

While this offset effect is good for the country in general, no evidence was discovered through this research that connected this general effect with the mission capability of the USAF.

Political.

P5. Offsets increase the ability of the U.S. to project power. Offsets increase the power projection of the United States when they are used by the American government as diplomatic tools to bargain for, and win, basing and access rights to strategic areas. While specific negotiations concerning basing and access are classified, it

is known that foreign weapons sales, successfully completed because of offsets, are effectively used by the U.S. to further its defense interests abroad by giving the U.S. military the ability to project power into many areas that could not be reached otherwise (17).

Coproduction also allows the use of local economic and political pressure to achieve mutual defense objectives. When the U.S. wants its allies to increase their sharing of the mutual defense load, its argument is more persuasive if the allies can produce all or part of the necessary weapons themselves (22:75).

The ability of the USAF to project power and deliver destructive firepower quickly to anywhere in the world depends on access to foreign bases and free flight paths over friendly countries. The importance of free access to friendly foreign airspace was highlighted when France denied flyover rights to the USAF F-111s that bombed Tripoli several years ago.

Without access to French airspace the risks of the mission were greatly increased and mission planning and performance became extremely complicated. Offsets can correct these conditions in future contingencies to the extent that they create additional foreign sales tied to basing and access rights.

P6. The prestige of foreign governments is increased when they receive offsets from U.S. contractors.

At home these governments use offsets to prove that they are getting the best deal possible in exchange for the outlay of large amounts of capital. Providing jobs, bolstering exports, improving the standard of living through new technologies, etc. are ways of showing the people that the government is looking after their citizens best interest.

No connection was found between this general offsets effect and the mission capability of the USAF.

Military.

P7. Offsets increase the ability of our allies to defend themselves. Coproduction and purchases of more modern equipment, which would not be possible without the benefits of offsets, allow nations to modernize, thus increasing the effectiveness of their military forces.

France's new AWACS aircraft, purchased as a result of an offset agreement, are able to detect aircraft and missiles that could not be reliably detected before. These aircraft provide an important link in France's defense against low-level attack and are providing greater protection for their nuclear bombers (38:89).

When offsets facilitate the sale of modern aerospace equipment to our allies it improves their defense capabilities by increasing the effectiveness of their military forces. This has a major impact on the USAF because the Air Force relies on U.S. allies to share the defense burden.

As allied air forces become strong enough to carry a larger portion of their own defense requirements, the USAF does not have to commit as many of its own resources to the defense of that country. With smaller numbers committed to defending our allies, the USAF can dedicate more resources to pursuing other national policies or objectives, thus improving the mission performance of the Air Force.

P8. The ability of the U.S. and its allies to deter aggression through enhanced preparedness is improved by offsets. An alliance is only as strong as its members, and to the degree that they increase the military capabilities of member countries through sales of modern equipment, offsets strengthen alliances.

The purchase of AWACS by both the British and the French is very beneficial to NATO's defense preparedness because it strengthens the alliance's airborne early warning capability. Including these aircraft, the total of AWACS aircraft in Europe is now 29, and the RAF plans to have two of their aircraft airborne at all times. These British AWACS will provide extended coverage of NATO's northern flank and provide coverage of the northwest approach of England (38:89).

As mentioned earlier in the chapter, an alliance is only as strong as its members. If aerospace forces in countries allied to the U.S. are strong and effective, because of purchases made as a result of offset offers, they will

increase the total deterrent capability of the alliance itself.

This increased capability enables the USAF to entrust more of deterrent load to U.S. allies, and as described in P7, it can then improve its mission performance by dedicating more resources to the other Air Force responsibilities.

P9. The United States benefits from the common in-theater maintenance and repair facilities available as a result of coproduction and the purchase of U.S. defense equipment by foreign countries. These facilities improve logistics supportability by providing depot level and organizational/intermediate repair capability, spare parts support, training, and base support.

The USAF is benefitting from the contractor facilities for the F-16 that are available in Europe thanks to the EPG coproduction agreement with General Dynamics. When depot modifications of USAFE F-16s were accomplished at the Belgium plant, built as part of an offset agreement, the expense of flying the aircraft back to the U.S. facilities was eliminated and turnaround times were reduced (62:9).

Also, F-16 components can now receive depot level repair in European countries, thus shortening the parts pipeline and reducing the number of parts in it. Using this in-theater maintenance capability improves logistics supportability and contributes to increased readiness (62:10).

The impact of this general offset effect was the easiest to identify, because it provides such obvious benefits to the USAF. As defense budgets grow smaller, the Air Force must find ways to cut the costs of performing its mission while still supporting national objectives. This general offset effect allows the USAF to do just that.

Foreign repair, depot, and supply facilities located in countries or regions where U.S. aircraft are stationed help the Air Force to save considerable sums of money. With these facilities close at hand, USAF aircraft repair/depot times and costs are reduced because aircraft do not have to be returned to the U.S. mainland for maintenance activities. Shorter turn around times also result in increased readiness, because aircraft are able to spend more time in mission ready status and less time in down for maintenance status (17).

In-theater supply sources also increase readiness levels by providing a spare parts source closer to the need than the sources in the United States. By utilizing in-theater sources, aircraft spend less time "awaiting parts" and more time "mission ready" because the distance and shipping time between the supplier and the user are so much shorter between points in-theater than they are between the theater and the U.S. (62:11).

Perceived Effects. The offset effects in this category have not been substantiated or are disputed by one or more parties. Each Perceived Effect will be followed by a

presentation of opposing viewpoints, or an indication that the perceived effect is not substantiated, or both.

These Perceived Effects are divided into four subcategories. The first three subcategories are areas of the American economy or defense posture where offsets have a purported impact. Technology Transfer, the last subcategory, has been included because of the wide ranging nature of its purported effects.

Industrial Base. Since the two effects identified in this section are the converse of each other their impact on the USAF is addressed after PE2 is presented.

PE1. Offsets contribute to the erosion of the industrial base of the United States by taking business away from U.S. subcontractors. According to a recent Military Forum article, the number of companies producing goods for the DoD dropped dramatically from 118,489 in 1982 to 38,007 in 1987 (21:41).

Individuals against offsets, claim that offsets are "draining the industrial base" of the U.S. by driving second, third and lower tier defense contractors out of business (40). They argue that certain offset practices, coproduction, subcontracting, licensing, etc. shift business away from U.S. to overseas firms. So, as firms lose business, they are forced out of the market, and the U.S. loses the ability to produce their products domestically (33:51).

As an example, the AWACS offsets that involve foreign purchase of subcomponents will increase demand for their products, while it will also reduce sales of American firms that would have produced the subcomponent for Boeing in the absence of an offset requirement (38:90).

Although the decline of the U.S. industrial base and the loss of lower tier subcontractors are facts, there is no hard information directly linking offsets as a cause. This lack of information is largely a function of the sheer numbers of defense subcontractors at the lower tiers. For example, the F/A-18 has about 10,000 subcontractors and vendors involved in its production (33:51). The problem lies in finding which subcontractors do not have work and then determining if it this is a result of offsets or something completely different.

This effect is also disputed by those who claim that the additional sales generated by offsets actually serve to strengthen the industrial base. Their views are expressed further in PE2.

PE2. Offsets that increase overseas sales help to strengthen the U.S. industrial base. These defense exports are an important source of income for U.S. firms, therefore they contribute to a healthy industrial base by increasing demand, keeping plants busy and people employed.

Sales to the U.S. government account for over 80 percent of U.S. defense industry sales, so the negative effects of

offsets relating to the remaining 20 percent are trivial. The additional sales resulting from offsets do, however, provide income that can be used to expand and extend operations (38:23).

Supporters of offsets also state that the concept of a national industrial base is outmoded in the internationalized realm of defense arms sales. They claim that the U.S. industrial base no longer exists and has been replaced by a NATO or even Western base. As levels of intra-industry trade increase, national boundaries are erased by mutually beneficial trade arrangements (38:2).

While opponents agree that offsets strengthen industrial capacity, they claim that it is only the large prime contractors benefit and the lower tier subcontractors lose out (See PE1).

This debate over offset effects on the industrial base is an important one, because a strong industrial base is vital to the development and production of the defense systems which the military services need to defend the U.S. and support the attainment of national objectives. The USAF needs a strong aerospace industrial base to provide it with the aerospace systems it needs to perform its mission effectively.

If the industrial base loses business to foreign companies, the USAF could lose many domestic second and third tier subcontractors that are sources of critical aerospace -

equipment. This could increase aircraft time awaiting parts, and decrease mission availability time because parts must now come from overseas suppliers (44).

The subject of foreign dependency for critical defense items is a common theme throughout the arguments over offset effects involving the industrial base, defense preparedness, and technology transfer, and it will be discussed in greater detail in subsequent sections.

Supporters of offsets claim that the additional sales made possible by concessions actually strengthen the industrial base by reducing costs, increasing profits, and increasing funds available for R&D efforts. If this is true it would have a positive affect on USAF mission performance.

The USAF is often called the high tech service because it relies so heavily on high technology to accomplish its mission. To overcome superior numbers of enemy aircraft, the USAF uses sophisticated technology to increase the killing and survivability characteristics of its own aircraft.

Currently, the USAF enjoys a technological advantage in the skies but potential enemies are constantly striving to eliminate this edge. Therefore, the USAF needs aerospace companies to continue to develop more advanced capabilities through expensive research and development efforts. The additional profits from offset dependent sales provide some of the funds these firms need to finance the effort to maintain USAF technological superiority.

Defense Preparedness.

PE3. Offsets endanger the national security of the U.S. and increase the nation's vulnerability to foreign military aggression by increasing our dependence on foreign producers. Offsets that call for the purchase of defense related goods place many sources of U.S. defense components within easy bombing range of potential enemies. In time of war these choice targets would be quickly eliminated, and the U.S. would not be able to make up for this lost capability (15:195).

It is estimated that a total cutoff from foreign sources stop production of such key U.S. aerospace weapon systems as the Sparrow missile, and the F/A-18 and F-16 fighters for 6 to 14 months (15:195), as well as limiting the U.S. ability to sustain military action beyond a 30 to 60 day period (41:1).

This Perceived Effect has not been substantiated because the DoD does not know the extent to which foreign source parts and components are incorporated into U.S. defense systems. No method of identifying these foreign source parts exists, so there is no way for the U.S. to determine if components would be available in time of crisis (11:47).

Also, individuals of the opposing viewpoint claim that many foreign sources are located in countries throughout the world, therefore it is unlikely that the U.S. would be cut

off completely. If certain facilities were lost, production could be shifted to surviving plants in other areas (20:58).

As mentioned previously, dependence on foreign sources is common theme in several Perceived Offset effects. This foreign dependence can start with the transfer of technology (discussed later in this chapter) which increases foreign competition for U.S. producers. This competition then weakens the U.S. industrial base (discussed in the previous section) as American companies are forced out of markets by the increased competition. Finally, as U.S. firms withdraw from the market place, the USAF is forced to rely on foreign sources for critical defense items.

This foreign dependency can impact the Air Force in many negative ways. A dependency on foreign suppliers could force equipment costs to rise because of higher shipping costs.

Dependency on foreign sources would also add a great deal of instability to the procurement process of critical defense equipment parts and components. With these sources outside the control of the U.S. they would be more susceptible to the political and economic instability of the foreign country. In times of crisis, the flow of many critical items could be cut off and USAF mission performance would suffer greatly. Also, in many cases, the sources on which the USAF would be dependent would be within easy striking distance of potential enemies in time of war.

Employment. As with the Industrial Base effects, the perceived offset effects are the opposite of each other, therefore their impact on USAF mission performance is addressed after the presentation of PE5.

PE4. By shifting work to overseas firms, offsets take work away from U.S. companies, exporting American jobs in the process. Subcontracting, coproduction, and licensing provide aerospace production jobs for foreign workers, while taking them away from the American workers who normally would have done the job if the offset had not been granted.

In the aerospace industry jobs directly related to production have fallen 41 percent from a high of 738,000 in 1968 to 433,000 in 1988. Offset deals are blamed as major reason for this decline (23:9).

Indirect offsets also reduce American employment in areas other than aerospace. As part of the F/A-18 sale to Canada, McDonnell Douglas agreed to promote Canadian tourism. This angered many American workers who make a living in the tourist trade. because the promotions increased the number of Americans who vacationed in Canada instead of the U.S. (14:3).

Proponents of offsets agree that offsets may, to a small degree, transfer work to foreign countries. However, they state that offsets have far greater positive effects on employment. By granting offsets, U.S. firms increase their

sales and employ more people for longer periods. If they do not give offsets, the weapons exporters lose sales to foreign competition, and more Americans would be out of work. Boeing and Westinghouse, prime contractors in the AWACS deal, estimate that between the two firms, the jobs of 2,700 employees have been guaranteed for several years thanks to the additional sales generated by offsets (38:88).

PE5. Additional sales of U.S. defense equipment resulting from offset agreements increase U.S. employment. Foreign sales generate jobs by increasing demand for U.S. products and this increases employment as companies hire or continue the employment of present employees.

DoD testimony before a Congressional committee stated,

A recent ... study concluded that annual foreign defense deliveries at levels ranging between \$5 billion and \$10 billion require between two and three thousand jobs in the U.S. private sector. As the value of U.S. defense deliveries increase, the number of private sector jobs also increase. (55:2)

This Perceived Effect is disputed by opponents of offsets who claim that offsets reduce the number of jobs for Americans. Their arguments are explained in more detail in PE4.

Neither one of these perceived effects were determined to have any measurable impact on USAF mission performance. Several studies have shown that overall unemployment levels in the U.S. do affect the quantity and quality of new recruits trying to enter the Air Force. However, these studies did not provide any information which would link

unemployment levels to offset practices. Therefore, the affect of offsets on unemployment levels in the U.S. was not found to have any impact on USAF mission performance (24).

Technology Transfer. Technology transfer, an offset practice, is given a separate category because its purported effects impact upon each of the three subcategories above. Grouping its effects together provides a clearer picture of how the transfer of technology could affect the U.S.

PE6. Offset agreements that include technology transfer foster the growth of foreign competition to U.S. companies. Foreign companies use the technology they gain in combination with certain other advantages, such as government subsidies and cheap labor, to cut their costs and lower the price of their products.

This increased competition affects the U.S. industrial base in that, U.S. firms are forced out of business when they lose the technological advantages that enabled them keep their prices in par with those of foreign firms. U.S. firms also lose when foreign firms use the technology they gain to enter markets previously controlled by U.S. firms (46:11).

Increased foreign competition also affects employment when foreign firms take business away from U.S. firms. When orders go to foreign competitors, companies in the U.S. are forced to reduce their production capacity to match the lower

demand for U.S. goods. This reduction translates into layoffs and other cut backs in U.S. production employment .

Various Boeing subcontractors are complaining that the offset agreement to promote technology advances in Britain, part of the AWACS deal, is hurting the U.S. Westinghouse, a major AWACS subcontractor, cited a British firm whose technological advances in aerospace composite materials have made its products superior to anything available in the U.S. (38:91).

If technology transfer does increase foreign competition to U.S. companies it could have two different affects on the USAF. First, it could have the negative effect of creating a dependency on foreign suppliers. This would occur if the increased competition was too much for U.S. firms and they withdrew from the market place altogether. As mentioned earlier in this chapter dependency on foreign suppliers could raise equipment costs, add instability to the procurement process of critical defense equipment parts and components, and put the sources of these components within easy striking distance of potential enemies in time of war.

On the positive side, technology transfer could create a more competitive market place by increasing the number of companies vying for USAF contracts. This would lead to lower equipment prices as companies sought an edge in the negotiation process. With equipment costs down the Air Force would be able to spend more money on other areas that could

strengthen its ability to perform its mission. Less money would be spent on spare parts and more could be spent on research and development, procurement of new weapon systems, etc.

PE7. The transfer of technology to foreign governments increases the risk of compromising important defense equipment characteristics that enable the U.S. and its allies to maintain a technological edge on the battlefield.

According to Colonel H.S. Storer, Jr.,

...primarily as a result of offset agreements, the United States has conveyed virtually all of its front line operational aircraft and key technology to current allies. (46:10)

The EPG and other countries have the F-16, Japan has the F-15, Spain and Canada have the F/A-18, and Spain also has the AIM-9L Sidewinder and the AIM-7 Sparrow, two of the USAF's best air-to-air missiles (46:10).

Once these important technologies leave the U.S. they are outside the protection the country provides. Foreign governments have less concern for safeguarding this technology and it becomes an easy target for our enemies to steal. This becomes a valid concern considering the Rotsch espionage case in West Germany. Rotsch, a German engineer, supposedly supplied Warsaw Pact countries with important technology that included a night vision system developed by Litton and an aircraft navigation system (60:28).

The strong resemblance in appearance and performance between the Soviet Fulcrum, Flanker, and Foxhound, and the most modern U.S. fighters, is also used to support this compromise of technology argument (46:10).

Supporters of offsets do not feel technology transfer is the major problem opponents make it out to be. They state that companies within the aerospace industry realize the importance of maintaining a technological edge in business and defense. No company is going to "give away the store" just to make a sale when the benefits derived from that sale are outweighed by the losses incurred.

U.S. firms realize that the best way to keep a technological edge is not by hiding it under a basket, but by "always having newer and better technologies under development." By the time technology is made available in offset deals, and actually employed overseas, the U.S. firm is certain to be using even newer technology (25:7).

Also, since the "half life" of technology is so short it makes little sense to not share it with our allies. If technology is kept from our allies, the U.S. will probably find that one of two undesirable things have happened. The best that could happen is that it will be wasted because it was never fully taken advantage of before it is replaced by newer technology. The worst that could happen would be the incorporation of the same technology into an enemy's weapon system before it found its way into an allied system (60:30).

Finally, it should be pointed out that the bulk of technology transfer occurs through normal transactions, not through offsets. Many U.S. firms specialize in building production facilities in foreign countries, and the U.S. government encourages the export of many high-tech goods. Supporters say offset opponents concerned with U.S. competitiveness and technology transfer will find offsets play a minor role when they examine the issue as a whole (25:11).

The technological superiority of its weapons is an integral part of the USAF defense posture, especially in the face of the numerical superiority of our potential enemy. Therefore, this particular offset effect could have major impact on the mission capability of the Air Force.

If the technology that provides superiority in the air is stolen and employed by the enemies of the U.S., the USAF's ability to deter aggression and successfully conduct offensive and defensive operations in war would be severely limited.

Validation of General Offset Effects

During the course of the interviews, individuals were asked to comment on the offset effects described earlier in this chapter. As the interviews progressed it became apparent that the organizations or agencies identified as key players in the offset issue still felt the same about offsets

as they did when they published the information reviewed for the Literature Review portion of this thesis.

The interviews also confirmed the negative (N1 through N8) and positive (P1 through P9) offset effects as presented in the Offset Effects section of this chapter. When asked about these effects, the subjects agreed that the information they had available supported these conclusions, and they considered them to be valid findings.

The Perceived Effects, however, caused considerable debate among the individuals representing the opposing viewpoint to the Perceived Effect in question. Essentially, individuals representing groups opposed to offsets (Departments of Treasury and Commerce, Congressmen and the General Accounting Office, United States Trade Representative, the National Council for Industrial Defense, the United Automobile and Aerospace Workers Union, and the Aerospace Education Association) felt that the negative Perceived Effects (PE1, PE3, PE4, PE6, and PE7) were correct while the positive Perceived Effects (PE2 and PE5) were totally incorrect.

The individuals representing groups supporting the current policies (Department of Defense, the Office of Management and Budget, the American League for Exports and Security Assistance, USAF, and the Defense Industry Offset Association) heartily agreed with the positive Perceived Effects and disagreed with the negative ones.

The arguments used to support or defend the respective viewpoints of each side of the offset debate were basically the same as those used in the discussions of the Perceived Effects provided in this chapter. It is important to note, however, that since the time the literature used to formulate the Perceived Effects was published, there seems to be little new information available in these areas.

Conclusion

While, many of the sources used in this thesis contained information about general effects which offsets have or could have on U.S. interests, few had sufficient data available to substantiate their claims. Furthermore, only three sources had information dealing with the specific effects which offsets might have on the mission performance of the USAF.

In order to determine actual offset effects on the USAF, the author had to use a three step process. First, an extensive literature analysis coupled with personal interviews were used to identify a number of substantiated negative and positive general offset effects. This process also uncovered several unsubstantiated or disputed Perceived Effects.

Next, the interview subjects were asked to validate the general effects based on their knowledge of the subject. The interview responses validated each of the negative and positive general offset effects identified, but no consensus could be reached on the perceived effects. While these

perceived effects were not validated they still merit attention because of the significant effects they are believed to have.

Finally, the results of the literature review were combined with the interview responses to form an information base for identifying the affects which offsets have on USAF mission performance. Each general offset effect was analyzed and specific effects relating to USAF mission performance were determined based upon the author's interpretation of the data.

IV. Conclusions and Recommendations

An investigation into the effects of offset agreements in international arms sales is a complicated undertaking. Many sources have opinions about what they think the effects are, but little has actually been proven. In an effort to increase the understanding of this complex topic, this chapter presents the answers to the Investigative Questions discovered through the application of the thesis methodology outlined in Chapter One.

These answers are followed by a series of conclusions dealing with offsets and their effects as determined by this author's investigation and analysis of this topic. Finally this chapter presents a set of recommendations for improving the study and handling of offsets in defense related sales.

Answers to Investigative Questions

Question 1. What types of offset agreements do U.S. aerospace industries make with foreign countries?

The answer to this question is quite simple: any and all forms of offsets are used in order to make a sale. Aerospace industries must be willing to provide the forms of offsets demanded by the purchasing government, because, in foreign sales, the buyer usually establishes an offset requirement as to percentage and type, and it is up to the seller to meet those requirements (6).

While coproduction is the oldest and most prevalent form of offset, more governments are shifting the focus of their requests. Currently, foreign governments are demanding more industrial investment and broader technology transfer through offset agreements. They have realized that offsets can be a short cut to economic and industrial development, and they are seeking to capitalize on this opportunity by requesting sellers to invest in, and aid in the development of, industries and ventures completely unrelated to the aerospace industry. Foreign governments are also, according to an DoD spokesman, taking a "harder line" on the fulfillment of offset objectives by U.S. sellers. They are becoming more careful of what they allow U.S. firms to count as offset credit (24).

Question 2. What type of offsets have an effect on the American industrial base, aerospace industries, and the USAF?

All forms of offsets were thought to have some effect on the American industrial base and the aerospace industry, whether it was beneficial or harmful. It was not, however, agreed that all offsets had an impact on the USAF.

Several sources did provide speculation that direct offsets involving technology transfer, coproduction, licensed production, subcontracting, and compensation could have some kind of effect on USAF mission performance. On the other hand, indirect offsets, such as the countertrade forms of barter and counter-purchase, overseas investment, and the

transfer of non aerospace industry related technology were not associated with having a direct effect on the mission performance of the USAF.

Question 3. Of the offsets which have an effect on the Air Force, how many are there and what type of effect do they have?

While information was available on the number and value of the different types of offsets used by aerospace industries, no one was using this data to determine those that had an effect on the USAF. Several sources did, however, state that every offset deal between a U.S. firm and a foreign government usually involves some form of offset that effects the USAF as identified in the response to Question 2 (i.e. technology transfer, coproduction, subcontracting, and licensed production, and compensation).

As for the second half of this question, the effects which these types of offsets have on the USAF, very little information was uncovered on specific offset effects on the USAF. Of the three sources that did address this specific issue, two stated that offsets definitely have a positive affect on USAF mission performance, while the third thought that offsets would have a negative impact.

Question 4. How many agreements involve technology transfer and what types of technology are being transferred?

Technology transfer, as mentioned previously, is becoming a larger and larger part of new offset agreements.

In the past they usually represented less than 10 percent of the offset value. Recently this figure has grown, but none of the researched sources presented a specific figure concerning the current percentage. Several individuals during the interview process did estimate the technology transfer value of offsets to be about 15 to 20 percent of the value of the offsets demanded (2).

The targets of most technology transfer agreements are the process technologies used in sophisticated high tech industries. Because these technologies are complex and costly to develop, foreign countries see technology transfer as way of gaining what they need more quickly and cheaply than if they tried to develop it on their own.

Each country does, however, have a different means of achieving its goals when they go after the latest technology. Therefore, the technology they ask for varies according to what the country thinks it needs to further its development.

Question 5. Would the loss of this technology decrease the technological edge of the Air Force?

The answer to this question were split down "party" lines. Those opposed to offsets were convinced that technology transfer was a serious threat to the continued technological superiority which the USAF has enjoyed in the past. Several opponents attributed the incredible similarities in performance and appearance between some of the new Soviet and USAF fighter aircraft to the theft of

technology transferred to friendly countries through various offset agreements. A theft that is made easier because transferred technology is supposedly not as well protected in foreign countries as it is in the United States.

On the other hand, sources supporting offsets stated that the technology transferred to other countries is not the state of the art, therefore it does not represent the cutting edge technology that gives air superiority. So, if this technology was stolen, it would not decrease our technological advantage in the skies by increasing the capabilities of our enemies.

Question 6. What items can only be bought from foreign suppliers because of offset agreements?

The answer to this question was the same for each source that addressed this question: "Nobody knows for sure!" In the current system of tracking the origin of a part or component, the source is only identified back to the prime contractor, first tier, and on rare occasions the second tier subcontractor. For many of the subcomponents which are produced and/or bought overseas by U.S. firms in fulfillment of offset requirements, the U.S. contractor is not required to identify the country of origin to the DoD. This makes it extremely difficult for individuals outside the U.S. company to determine where a part might be coming from.

While, certain critical industries and natural resources are monitored and/or controlled to insure that they are

available in time of crisis, no information is maintained concerning the origin of defense components. The DoD does collect data on contracts over \$25,000, but they do not require contractors to provide detailed information on their suppliers. With tens of thousands of defense contractors in the multi-tiered U.S. and foreign industrial bases, the task of collecting data on sources of all components would be a monumental task.

Question 7. How important are these items to the USAF?

Supporters of offsets replied that, if no one cares enough to require the identification of every part bought overseas, all of them must not be crucial to the USAF as far as mission performance is concerned. Those parts that are critical to defense interests have been identified and they are given the special attention they deserve.

A few sources expressing opinions against offsets did not agree with this interpretation. They argued that many of the complicated electronic parts used in many aerospace products are extremely important to the Air Force, and they require much more attention than they are currently receiving.

Question 8. What would the effect on the USAF be if these items could not be secured from the foreign suppliers?

The answer to this question is much like the answer to Question 5 in that it was divided between the Pro and Con sides of the issue. Those against offsets said the fighting

capability of the U.S. will disintegrate rapidly as soon as the on-hand levels of these parts were depleted. They claim that the American industrial base is not strong enough to support the wartime needs of the USAF and the lack of certain parts and components will force a dramatic reduction in mission capability if they cannot be secured from their foreign sources.

Those supporting current offset policies provided a much different view of this subject. They stated that even though U.S. companies no longer produce certain parts, they still retain the capability to produce any of the items in question, i.e., those no longer produced in the U.S. because of offset supported competition from overseas.

Question 9. Does the U.S. military industrial base have the ability to produce these items quick enough to meet emergency needs should foreign sources be lost?

As with several other questions the answer to this one was divided between those for, and those against offsets. Those against offsets said that offsets have weakened the U.S. industrial base so much that we are now dependent on foreign countries for many critical defense items. They claim that for many aircraft and electronic components, the U.S. industry cannot restore production of many necessary items in time to meet our needs.

Conversely, supporters of offsets claim many of the components produced overseas are minor, inexpensive set-up

items that will not incur any major difficulties in order to restart domestic production. For more complicated and technical items they mentioned that the start up time will be relatively short since U.S. firms still have the capability to produce all the necessary items not currently in production.

Question 10. Are U.S. government, Air Force, and industry leaders concerned about these offsets and the effects they might have on USAF mission performance?

Although concern over the effects of offsets on the U.S. industrial base and economy are growing, little if any of this concern has filtered down below the macro level. It seems that the attention of the top managers is still directed at determining the effects which offsets have on a much larger scale.

While only a limited number of written sources addressed the issue of offset effects on the USAF, all of the individuals interviewed at the Congressional, Executive, and private organization levels could name possible effects which offsets might have on the USAF. However, they did have to qualify these attempts as speculation only. They did not have enough information on the subject to allow them to verify their speculations.

Conclusions

The following conclusions dealing with offset effects are a result of this author's investigation and analysis of this topic.

1. The United States has no national policy dealing with the administration of offsets and the views of all the various U.S. government agencies and private organizations affected by offsets. Without policy guidance on offsets no agency monitors all aspects of offset activity and no one is responsible for ensuring that the national interests are served when a U.S. company enters into an offset agreement.

2. Because no one agency is given full responsibility for monitoring the offset issue, there is no single complete and accurate database which contains information about offsets and their effects. Each U.S. agency and organization involved in studying the subject has some data available in their special area of interest, but aggregated data in a form usable to every organization does not currently exist. This lack of complete data available to all parties involved has contributed to the growing confusion surrounding the offset issue.

3. Offset agreements are alleged to have both positive and negative economic, political, and military effects. While these effects are known, the lack of a complete central data base has precluded the determination of the magnitude of these effects.

As a result of the analysis process used in this thesis effort the following have been identified and substantiated as general offset effects.

Negative Offset Effects.

- N1. Offset agreements raise the buyers cost of purchasing defense items.
- N2. Offset agreements cost the U.S. government money for the additional personnel and procedures necessary to monitor and analyze offsets.
- N3. Production risks for U.S. firms are increased when offsets call for coproduction or subcontracting of newer technology.
- N4. High face values of offsets, as a value of the contract face value, set a precedent for other countries to also demand higher levels.
- N5. Offsets cause an net outflow of U.S. dollars.
- N6. Defense equipment subcontractors are hurt by increased foreign competition fostered by offsets.
- N7. Offset requests strain relations between foreign governments and members of Congress and certain private industrial organizations.
- N8. Using offset offers as the primary selection criterion leads to the selection of weapons systems that are not the best suited to the buyers needs.

Positive Offset Effects.

- P1. Offsets increase sales and profits for prime contractors in the U.S. defense industry.
- P2. The cost of military equipment purchased by the U.S. is reduced by the larger production runs that offsets bring through additional sales.
- P3. Offsets lower costs of parts and components by increasing the amount of competition for subcontracts.
- P4. Increased sales to foreign countries increases U.S. tax revenues.
- P5. Offsets increase the U.S. ability to project power.
- P6. The prestige of foreign governments is increased when they receive offsets from U.S. contractors.
- P7. Offsets increase the defensive capabilities of U.S. allies.
- P8. The U.S. and its allies are better able to deter aggression because of offsets.
- P9. U.S. military forces stationed overseas benefit from the in-theater maintenance and supply facilities available as a result of coproduction and the purchase of U.S. equipment by foreign countries.

4. Many of the effects which offsets are purported to have are basically Perceived Effects. Because these effects have not been substantiated, or are disputed by various

agencies and organizations, determining whether they have a negative or positive impact depends entirely on the perception of the examiner.

- PE1. Offsets contribute to the erosion of the U.S. industrial base by taking business away from U.S. subcontractors.
- PE2. Increased sales brought about by offset agreements strengthen the U.S. industrial base by increasing the income of defense contractors.
- PE3. Offsets endanger the national security of the U.S. and increase the nations vulnerability to foreign military aggression by increasing our dependence on foreign producers.
- PE4. Offsets shift work away from U.S. companies to overseas companies, exporting American jobs in the process.
- PE5. Additional sales of U.S. made defense equipment resulting from offset agreements increase American employment.
- PE6. Offsets that include technology transfer increase foreign competition for U.S. companies.
- PE7. The transfer of technology to foreign firms increases the risk of having this technology stolen by enemies of the U.S.

5. The practice of demanding offsets has spread rapidly in the past fifteen years as a result of the interaction

between the characteristics of the international arms market, and the policies and actions of foreign governments, the U.S. government, and the U.S. aerospace industry.

6. Information concerning the effects which aerospace industry offset agreements have on the United States Air Force is virtually nonexistent. An extensive literature search uncovered only two documents concerning specific offset effects on the USAF. As a result, the impact which offsets have on USAF mission performance are not known, and can only be extrapolated from the effects which offsets have on other areas.

Negative Offset Effects.

1. Offset agreements that increase the cost of defense systems purchased by foreign governments indirectly affect the USAF's ability to deter aggression.
2. Offsets have only been proven to cause a negligible increase in the number of U.S. personnel and administrative procedures necessary to coordinate defense sales and purchases with foreign governments.
3. Offsets that strain relations between foreign governments and certain sectors of the U.S. government may result in "protectionist" style legislation that would restrict DoD's ability to purchase foreign made defense equipment. This reaction to this particular offset effect could

prevent the USAF from realizing the benefits of the lower defense equipment costs that are a result of increased competition.

4. Offsets that lead to the selection of weapon systems that are not best suited to the needs of the purchasing government indirectly reduces the USAF's ability to deter aggression.

Positive Offset Effects.

1. Offsets that provide U.S. firms with additional sales of military equipment result in lower costs charged to the Air Force for the items it purchases.
2. Offsets that lower the cost of military equipment purchased by the USAF increase its buying power, thus enabling it to purchase more of what it needs to successfully perform its mission.
3. Offsets also lower Air Force costs by increasing the competition between subcontracting firms.
4. The ability of the USAF to project power is increased by the basing and access rights the U.S. gains through military sales brought about by offsets.
5. Offsets that increase the ability of U.S. allies to defend themselves lessens the mutual defense burden that the USAF must carry.
6. The ability of the USAF and allied air forces to deter aggression is improved by offsets that

facilitate the sale of modern equipment to friendly nations.

7. The USAF benefits from the common in-theater maintenance, repair, and supply facilities available as a result coproduction and the purchase of U.S. defense equipment by foreign countries.

Perceived Offset Effects.

1. Offsets that contribute to the erosion of the U.S. industrial base may increase USAF dependence on foreign suppliers of critical parts and components.
2. Offsets that increase overseas sales help to strengthen the U.S. industrial base and improve USAF mission performance by providing additional profits to be used in advanced R&D efforts.
3. Offsets that create foreign dependence may reduce competition for USAF contracts causing equipment costs to rise.
4. Dependency on foreign sources could also add a great deal of instability to the procurement process of critical defense equipment parts and components.
5. Technology transferred by offsets may be stolen and employed by enemies of the U.S. thus reducing the USAF's technological superiority and its ability to deter aggression and successfully conduct offensive and defensive operations in war.

Recommendations

The following recommendations are presented in an attempt to correct some of the problems that exist in the study and handling of offset agreements.

1. The United States government should adopt a coordinated offset policy as soon as possible. This policy should ensure that the national interests of the U.S. are given full consideration in each and every offset deal made by U.S. firms.

This policy should also provide for the organization of an Offset Office made up of individuals representing the interests of all the government and private agencies and organizations affected by offsets. This broad spectrum of members will help ensure that the needs of everyone are considered before an offset negotiation is completed.

2. A comprehensive centralized database containing information on offsets and foreign defense sales and contracts should be established to support the activities of the Offset Office proposed in the previous recommendation. While retrieval of information from this database should be limited to prevent the disclosure of classified information, this database should include all the information available to ensure that the national interests and individual interests are met.

3. The United States should actively pursue multilateral negotiations between itself and its trading

partners. These negotiations should be focused on eliminating or setting limits on the level of offsets that are demanded. These negotiations must be sure to include the participation and agreement of the defense industries involved.

4. The USAF should also establish an Offset Office charged with studying the impact which aerospace industry offset agreements have on mission performance. This office should devote special attention to the affects involving sustainability, RSI, and technology transfer. It is in these areas where offsets may have the most deleterious impact on USAF mission performance. Other responsibilities of this office should be: (1) determine if the perceived offset effects actually affect the Air Force, (2) quantify the impact which substantiated offset effects have on USAF mission performance, and (3) recommend policies and actions to correct negative effects while also seeking to maximize positive effects.

Appendix A: Individuals Interviewed

The following individuals representing U.S. Congressmen and the General Accounting Office, the Executive Branch Departments and the Office of Management and Budget, the United States Trade Representatives Office, the U.S. Air Force, and a sample of private organizations all provided much needed assistance during this thesis effort.

Barber, Edward. Department of the Treasury, Washington, DC.

Botwin, Brad. Far Eastern Affairs, U.S. Commerce Department, Washington, DC.

Chavez, Anthony. Office of Management and Budget, Washington, DC.

D'Amostino, David. National Security and International Affairs Division, United States General Accounting Office, Washington, DC.

Falken, Stephen. United States Trade Representatives Office, Washington, DC.

Feeser, Timothy. Lt Col, USAF, Offset and Coproduction Manager, F-16 System Program Office, Wright-Patterson AFB, OH.

Flynn, Brian. Staff Director, Economic Stabilization Committee, House of Representatives, Washington, DC.

Francisco, Stephen. Congressional Staff Member for Representative Bruce Vento, House of Representatives, Washington, DC.

Hardesty, Mark. United Automobile and Aerospace Workers Union, Detroit, MI.

Harper, Vance. Research Assistant, Center for International Business and Trade, Georgetown University, Washington DC.

Hill, John. Office of International Development and Trade Policy, Department of Defense, Washington, DC.

Johnson, Joel L. Vice President, The American League for Exports and Security Assistance, Washington, DC.

Kuhns, Douglas. International Association of Machinist and Aerospace Workers, Washington, DC.

Phillips, William. President, National Council for Industrial Defense, Washington, DC.

Smith, Charles. Congressional Staff Member for Senator Samuel Dixon, United States Senate, Washington, DC.

Zindar, John. Associate, Center for Defense Information, Washington, DC.

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~~X~~ The purpose of this study was to contribute to the understanding of the subject of aerospace industry offset trade agreements and their effect on USAF mission performance. This study had two objectives: (1) identify those offset effects that might impact USAF mission performance, and (2) describing how these effects could change the ability of the USAF to perform its mission. This thesis did not determine the magnitude of the offset effects, and it did not identify solutions to remedy any negative effects.

Analysis of available literature and responses to research questions revealed that offsets have a wide range of effects on USAF mission performance. While definitive negative and positive effects were identified and validated, it was discovered that the purported impact of certain effects, either negative or positive, was dependent upon the viewer's frame of reference. These perceived effects are at the heart of the government and industry debate over offsets.

This study also found that the debate over the real impact of these perceived effects is greatly confused by the lack of a coordinated U.S. government policy concerning offsets, as well as the absence of a comprehensive centralized database containing offset related data. These findings are disturbing because of the potential magnitude of the impact which the perceived effects could have on USAF mission performance. *Theses.* ←

Among the recommendations to correct some of the problems in studying and handling offset agreements was the establishment of a centralized U.S. government offset office charged with studying, and quantifying the impact which offsets have on the United States. This office should also be responsible for recommending policies and actions necessary to correct negative effects while seeking to maximize positive effects.

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